



# Australian Government

## Civil Aviation Safety Authority

### **Civil Aviation Order 100.5 (General requirements in respect of maintenance of Australian aircraft) 2011 (as amended)**

made under subregulations 30B (1) and 42A (6), regulations 38 and 43, subregulation 50A (2), regulation 50B and subregulation 50C (1) of the *Civil Aviation Regulations 1988*.

This compilation was prepared on 1 August 2013 taking into account amendments up to *Civil Aviation Order 100.5 Amendment Instrument 2013 (No. 2)*.

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#### **1A Name of instrument**

This instrument is *Civil Aviation Order 100.5 (General requirements in respect of maintenance of Australian aircraft) 2011*.

#### **1B Commencement**

This Order commences on gazettal.

#### **1 Application**

- 1.1 Subject to paragraph 1.2, this section applies to all Australian aircraft in respect of which an Australian certificate of airworthiness is in force, other than an aircraft to which Part 42 of the *Civil Aviation Safety Regulations 1998* applies

- 1.2 CASA may, in writing, determine that this section, or a specified provision of this section, does not apply to an Australian aircraft specified in the determination.
- 1.3 Before making a determination, CASA must take into account any relevant considerations relating to the interests of safety.

## **2 Interpretation**

- 2.1 In this section, unless the contrary intention appears:  
*time-in-service*, in relation to an aircraft, means the time from when the aircraft leaves the ground on a flight until it touches the ground for the purpose of landing at the end of the flight.  
*time-in-service*, in relation to an aircraft component, means the time during which a component is installed in an aircraft, being the time commencing from the moment the aircraft leaves the ground on a flight and ending when it touches the ground for the purpose of landing at the end of the flight.  
*Regulations* means the *Civil Aviation Regulations 1988*.

## **3 Aircraft log books**

- 3.1 For the purposes of subregulation 50A (2) of the Regulations, CASA's instructions in relation to aircraft log books are set out in paragraphs 3.2 and 3.3.
- 3.2 An aircraft log book must:
  - (a) identify the aircraft and the type and model of engine and propeller fitted to the aircraft and must state whether the aircraft is equipped for I.F.R. operations, V.F.R. (Day) operations or V.F.R. (Night) operations; and
  - (b) identify the aircraft's maintenance program (including details of maintenance release inspections); and
  - (c) identify any approved variations or exemptions to the aircraft's maintenance schedules; and
  - (d) have provision for the recording and certification of maintenance carried out on the aircraft; and
  - (e) have provision for the recording and certification of maintenance carried out on the aircraft's engine and, if applicable, the propeller; and
  - (f) contain a record of when the engine and, if applicable, the propeller, was installed or removed and a record of the date and aircraft time-in-service of the installation or removal; and
  - (g) contain a record of when any time-lifed components were installed or removed, including a record of the date and aircraft time-in-service of the installation or removal; and
  - (h) contain a record of compliance with all applicable airworthiness directives, including a record of the date and time-in-service of the compliance; and
  - (i) contain a summary of any changes to the empty weight of the aircraft; and
  - (j) have all log book sections incorporating certification pages sequentially numbered, and bound or held together in a way that protects each page from inadvertent misplacement, loss or removal.
- 3.3 An aircraft's log books, and documents referred to in an aircraft's log book, must be made available to CASA and to persons engaged in maintenance on the aircraft.

*Note* If an aircraft log book fully complies with the requirements of paragraph 3.2, there is no requirement that it be submitted to CASA for approval. It must, however, under paragraph 3.3, be made available to CASA on request. It must also be made available to each person engaged in maintenance on the aircraft. If a document does not fully comply with the requirements of paragraphs 3.2 and 3.3, subsection 4 may apply to it.

#### **4 Alternative to aircraft log book**

- 4.1 The use, in relation to an Australian aircraft, of an alternative to an aircraft log book (*alternative aircraft log*) is approved, subject to the following conditions:
- (a) the alternative aircraft log must comply with the conditions in paragraphs 4.2 and 4.3;
  - (b) the use must be the subject of a written confirmation of approval from CASA.
- 4.2 An alternative aircraft log must comply with the instructions set out in paragraph 3.2, including subparagraph 3.2 (j) but only as if subparagraph 3.2 (j) reads as follows:
- (j) have all parts of the aircraft log book which incorporate certification pages or certification records managed in accordance with a secure system (which may be or include an electronic system), which sequentially or chronologically numbers or orders each page, and protects it from the following:
    - (i) any inadvertent misplacement, loss, or removal;
    - (ii) any inadvertent deletion, amendment, alteration or erasure;
    - (iii) any deletion, amendment, alteration or erasure:
      - (A) that is not immediately visible on the face of the document; or
      - (B) for an electronic system — that cannot be traced through the system to identify the user who made the deletion, amendment, alteration or erasure;
    - (iv) any deletion, amendment, alteration or erasure that renders the previous version illegible, or inaccessible in the system.

*Note* Under subregulation 50B (5) of the Regulations, it is a strict liability offence if a person engages in conduct that results in the alteration of any entry in an alternative to an aircraft log book (including electronic versions) if: (a) the alteration is not a single line through the words to be struck out; and (b) the words struck out do not remain visible.

- 4.3 Following written confirmation of approval from CASA, an approved alternative aircraft log must be made available in an easily accessible and usable form:
- (a) to each person engaged in maintenance on the aircraft; and
  - (b) to CASA at any time on request.
- 4.4 In the application of paragraph 3.2 to an alternative aircraft log (including subparagraph 3.2 (j) as amended by paragraph 4.2), references in the paragraph to an aircraft log book are to be read as references to an alternative aircraft log.
- 4.5 In this subsection, references to an alternative aircraft log include references to an alternative section of an aircraft log book.

#### **5 Retention of aircraft maintenance records**

- 5.1 For the purposes of subregulation 50C (1) of the Regulations, CASA directs that aircraft maintenance records must be retained in accordance with paragraph 5.2.

- 5.2 Aircraft maintenance records must be retained for the following periods:
- (a) in the case of an aircraft log book — a period of 1 year commencing immediately after the aircraft's operating life has ended or the aircraft has been permanently removed from the Register of Australian Aircraft;
  - (b) in the case of an engine log book — a period of 1 year commencing immediately after the engine has been permanently withdrawn from use;
  - (c) in the case of a propeller log book — a period of 1 year commencing immediately after the propeller has been permanently withdrawn from use;
  - (d) in the case of a Major Assembly History Card and Component History Card — until certification is made for the next overhaul following the last overhaul or a period of 1 year commencing immediately after the component has been permanently withdrawn from use, as the case requires;
  - (e) in the case of a maintenance release — a period of 1 year commencing after the aircraft's operating life has ended or the aircraft has been permanently removed from the Register of Australian Aircraft, as the case requires;
  - (f) where certifications are made on documents other than aircraft log books:
    - (i) in the case of the record for certification for completion of a mandatory inspection, test or check which is required to be repeated at specified intervals — until a subsequent certification has been made for the completion of the inspection; and
    - (ii) in the case of the record for certification for completion of a mandatory inspection, test or check which is not required to be repeated and for completion of a modification, major repair or the installation of a major aircraft component — a period of 1 year commencing immediately after the certification;
  - (g) in the case of a copy of a maintenance release held by the authorised person who issued the maintenance release — a period of 1 year commencing immediately after the date of issue.
- 5.3 If an Australian aircraft is exported from Australia the aircraft's maintenance records must accompany the aircraft.

## **6 Maintenance releases for class A aircraft**

- 6.1 For the purposes of subregulation 43 (1) of the Regulations, CASA directs that the maintenance release for a class A aircraft is the maintenance release that is identified in an operator's maintenance control manual.
- 6.2 Subject to regulation 47 of the Regulations, a maintenance release for a class A aircraft remains in force only for the period specified in the manual.
- 6.3 A copy of the maintenance release must be retained by the person issuing it.
- 6.4 Before a maintenance release for a class A aircraft is issued, it is to be signed by:
- (a) the person certifying for the co-ordination of the maintenance release inspection; or
  - (b) where the maintenance release inspection has been certified by 1 person, that person;
- using the procedures specified in the certificate of approval holders procedures manual.

- 6.5 The person signing a maintenance release must ensure that the following information is recorded on the maintenance release at the time it is issued:
- (a) the aircraft type, and the registration mark of the aircraft, to which the release relates;
  - (b) the name of the certificate of approval holder issuing the maintenance release;
  - (c) the place, date and time, of issue of the release;
  - (d) the date on which, and the total aircraft time-in-service when, the maintenance release ceases to be in force;
  - (e) the total time-in-service of the aircraft at the time of issue of the release;
  - (f) all requirements and conditions relating to maintenance (other than daily inspections) required to be carried out on the aircraft by the Regulations and Orders during the period the maintenance release is to remain in force, including the total time-in-service or date, as applicable, at which that maintenance is due;
  - (g) any permissible unserviceabilities carried over from the previous maintenance release.

## **7 Maintenance releases for class B aircraft**

- 7.1 For the purposes of subregulation 43 (1) of the Regulations, CASA directs that the maintenance release for a class B aircraft is the CAA Maintenance Release Form DA741 or an alternative that is approved by CASA.
- 7.2 Subject to regulation 47 of the Regulations and paragraph 7.3, a maintenance release for a class B aircraft remains in force for whichever of the following periods ends first:
- (a) a period not exceeding 1 year;
  - (b) the aircraft time-in-service that is identified by the certificate of registration holder in the aircraft's log book statement as the period for which the maintenance release is to remain in force.
- 7.3 Subparagraph 7.2 (b) does not apply to private class B aircraft being maintained to the CAA Maintenance Schedule.
- 7.4 Before a maintenance release for a class B aircraft is issued, it is to be signed by:
- (a) the person certifying for the co-ordination of the maintenance release inspection; or
  - (b) where the maintenance release inspection has been certified by 1 person — that person;
- and the person must be present during the time the maintenance release inspection is being performed.
- 7.5 The person signing the maintenance release must ensure that the following information is recorded on the maintenance release at the time it is issued:
- (a) the information referred to in paragraph 6.5;
  - (b) for private class B aircraft being maintained annually to the CASA Maintenance Schedule — all calendar time maintenance due for the next 12 months and a reasonable estimate, based on the aircraft's operating cycle, of maintenance due on a time-in-service basis.
- 7.6 The information required under subparagraph 7.5 (b) must be recorded in the "Maintenance Required" section of the maintenance release.

## **7A Composite structures maintenance of specified aircraft**

7A.1 In this subsection:

**CAR 30 maintenance organisation** means the holder of a certificate of approval under regulation 30 of CAR 1988 for carrying out maintenance on aircraft, aircraft components or aircraft materials.

**CAR 1988** means the *Civil Aviation Regulations 1988*.

**CASR 1998** means the *Civil Aviation Safety Regulations 1998*.

**composite maintenance** means maintenance of the composite structures of a composite structure aircraft.

**composite structure aircraft** means an aircraft of fibre reinforced plastic composite construction.

**Group 7 LAME** means the holder of an aircraft maintenance engineer licence issued under regulation 31 of CAR 1988 and endorsed with a category airframes Group 7 rating as described in Civil Aviation Order 100.91 (**CAO 100.91**).

**specially qualified person** means a person who:

- (a) holds a category B1 licence issued under Part 66 of CASR 1998; and
- (b) is also 1 of the following:
  - (i) a person who at any time before 27 June 2011 was a Group 7 LAME, provided that the person's licence had not been cancelled by CASA; or  
*Note* The relevant rating may, or may not, have expired, and may, or may not, have been renewed as long as it had once been held and the licence has not been cancelled.
  - (ii) a person to whom regulation 202.342 of CASR 1998 applies who would have been a person mentioned in sub-subparagraph (b) (i) but for the suspension of his or her licence on or before 26 June 2011, provided that the suspension has been revoked by CASA; or
  - (iii) a person for whom CASA determines under regulation 202.343 or 202.344 of CASR 1998 that it would have issued an aircraft maintenance engineer licence under regulation 31 of CAR 1988, endorsed with a category airframes Group 7 rating as described in CAO 100.91; or
  - (iv) a person who holds at least 1 of the following:
    - (A) AQF qualification MEA405B;
    - (B) a Transport Canada AME licence endorsed with an "S" rating;
    - (C) a New Zealand AME licence endorsed with an aeroplane Group 4 rating;
    - (D) another qualification approved in writing by CASA as an appropriate qualification for performing composite maintenance.

**specified aircraft** means an aircraft specified in Table 1.

7A.2 Composite maintenance on a specified aircraft must be carried out by:

- (a) a Part 145 organisation; or
- (b) a CAR 30 maintenance organisation.

7A.3 If composite maintenance is carried out on a specified aircraft by a CAR 30 maintenance organisation, the organisation must ensure that only a specially qualified person, employed by the organisation, performs the maintenance.

*Note* Apart from the separate privileges of a Part 145 organisation, composite maintenance of a specified aircraft may only be performed by a qualified person employed by a CAR 30 maintenance organisation. Therefore, such maintenance may **not** be carried out by a person

referred to in paragraph 42ZC (4) (b) of CAR 1988, sometimes known as an independent LAME or a LAME employed by an independent LAME.

**Table 1 — Specified composite structure aircraft**

Aerodesign Pulsar	Extra 300/300S	Quickie Q1/Q2 Series
Buchanan BAC 204	Grob 520 Egrett	Quickie 200
Cirrus SR20/SR22	Grob G115	Rand KR2
CoZ Cosy	Gyroflug SCO1B-160	Rutan Defiant
Diamond DA 40	HOAC DV 20 Katana/ Diamond DA 20A1	Rutan Long Eze
Diamond DA 42	III SkyArrow 650	Rutan Vari Eze
Diamond DV22/DA22	Jabiru LSA	Stoddard Hamilton Glasair Series
Diamond HK-36	Lancair/Columbia Series	Stoddard Hamilton Glastar
Eagle X/XTS Series	Liberty XL2	

## 8 Inadequate maintenance schedules

- 8.1 For the purposes of subregulation 42A (6) of the Regulations, CASA declares that the manufacturers' maintenance schedules for the following aircraft are inadequate and must not be used as the maintenance schedules for the aircraft:

Aero 145;	de Havilland DH89 (Dragon Rapide);
Aero L40;	de Havilland DH90 (Dragonfly);
Aero L200A;	Fairchild 24;
Aero Commander 500 (excluding the 500S model);	Junkers A50;
Auster, all aircraft;	Klemm, all aircraft;
Avro, all aircraft;	Lockheed L-12;
Beagle Airedale;	Percival Gull;
Beagle Terrier;	Percival Proctor;
Beechcraft 17;	Piaggio P166;
Beechcraft 18;	Piper J2;
Beechcraft 50;	Piper J3;
British Aircraft Manufacturing Co.	Piper PA11;
Swallow;	Piper Colt;
Callair A9;	Piper Tripacer;
Chrislea CH 3-4;	Piper PA23 Apache;
De Havilland DH60 (Moth);	Piper PA25 Pawnee;
de Havilland DH82 (Tiger Moth);	Porterfield, all aircraft;
de Havilland DH 84 (Dragon);	SAAB 91;
de Havilland DH87 (Hornet Moth);	Stinson, all aircraft;
	Waco, all aircraft.

*Note* Acceptable alternatives for these aircraft are the CASA Maintenance Schedule or a schedule developed by the holder of the certificate of registration for an aircraft and approved by CASA under regulation 42M of the Regulations.

## **8A Maintenance of airframe parachute systems**

8A.1 In this subsection:

**approved course of training** means a course of formal training, or a period of relevant practical experience, or both a course of formal training and a period of practical experience:

- (a) designed to:
  - (i) convey detailed knowledge of GARD equipment, and the aircraft controls, systems and precautions for use of such equipment; and
  - (ii) in the light of such knowledge, enable the holder of a relevant category B1 licence to safely perform maintenance on GARD equipment; and
- (b) approved in writing for the licence holder by his or her CAR 30 maintenance organisation.

**CAR 30 maintenance organisation** means the holder of a certificate of approval under regulation 30 of CAR 1988 for carrying out maintenance on aircraft, aircraft components or aircraft materials.

**general aviation recovery device (GARD equipment)** means an airframe parachute system which is installed on an aircraft and which, however it is activated and the parachute deployed, is designed to control the aircraft's descent in an emergency such as engine failure or loss of aerodynamic control.

**specially qualified LAME** means a licensed aircraft maintenance engineer who:

- (a) holds a category B1 licence, issued under Part 66 of CASR 1998 in a subcategory relevant to the aircraft on which the person performs work; and
- (b) has successfully completed an approved course of training in the operation and maintenance of GARD equipment.

8A.2 Maintenance of GARD equipment must be carried out by:

- (a) a Part 145 organisation; or
- (b) a CAR 30 maintenance organisation.

8A.3 If maintenance of GARD equipment is carried out by a CAR 30 maintenance organisation, the organisation must ensure that only a specially qualified LAME, employed by the organisation, may perform the maintenance.

*Note* Apart from the separate privileges of a Part 145 organisation, maintenance of GARD equipment may only be carried out by a specially qualified LAME employed by a CAR 30 maintenance organisation. Therefore, such maintenance may not be carried out by a person referred to in paragraph 42ZC (4) (b) of CAR 1988, sometimes known as an independent LAME or a LAME employed by an independent LAME.

## **9 Mandatory maintenance requirements**

9.1 For subregulation 38 (1) of the Regulations, CASA directs the registered operator of an Australian aircraft to comply with the mandatory maintenance requirements identified in the aircraft's approved design as 1 or both of the following:

- (a) the Certification Maintenance Requirements (CMR);
- (b) airworthiness limitations (AWL).

*Note 1* **Approved design** is defined in subregulation 42.015 of CASR 1998.

*Note 2* Contravention of a CASA maintenance direction under this subsection is a strict liability offence under regulation 38 of the Regulations.



9.2 For paragraph 9.1:

**Certification Maintenance Requirements** or **CMR** means the required scheduled maintenance tasks which were established during the design certification of an aircraft as operating limitations of the aircraft's type certificate (TC) or supplemental type certificate (STC).

## **9A Electronic navigational databases**

9A.1 The pilot in command of an aircraft may update the navigation system database of the Global Navigation Satellite System (**GNSS**) of an aircraft on the following conditions:

- (a) he or she must be authorised under Civil Aviation Order 40.2.1 to use the GNSS;
- (b) he or she must satisfy all the requirements in paragraph 13.7 of Civil Aviation Order 40.2.1;
- (c) he or she may only use data that is supplied by an organisation that is approved in writing by CASA to provide the data;
- (d) he or she may update the navigation database system only if it involves the insertion into the navigation data unit of a data card, a disk or a similar device;
- (e) he or she must ensure that the update of the navigation database system is carried out in accordance with the instructions of the manufacturer of the GNSS navigation equipment.

## **10 Notice of events**

*Note* Subsection 10, Notice of events, was made under regulation 30B of the Regulations. Schedule 2 of the *Civil Aviation and Civil Aviation Safety Amendment Regulations 2011 (No. 2)* (SLI 2011 No. 77) repealed regulation 30B of the Regulations, thereby also repealing subsection 10. The notification obligations of certificate of approval holders are now contained in Part 11 of the *Civil Aviation Safety Regulations 1998 (CASR 1998)*; see, for example, regulations 11.070 to 11.074. This Note is for information only and is not intended to have any effect on any obligations under Civil Aviation Order 100.5 or CASR 1998.

### **Maintenance control manual**

*Note* Regulation 42ZV of the Regulations provides that the operator of a class A aircraft must ensure that the operator's maintenance control manual is complied with. This manual must describe the procedures that are in place to control the performance of all maintenance activities on the aircraft.

*Note* The manual must identify the aircraft to which it relates, the Certificate of Registration holder of the aircraft, the aircraft's system of maintenance and maintenance control procedures.

*Note* CASA has produced CAAP 42ZV-1 which provides guidance for compiling a maintenance control manual and provides a description of maintenance control procedures.

## **11 Additional maintenance requirements**

11.1 This subsection contains CASA directions for subregulation 38 (1) of the Regulations.

*Note* Contravention of a CASA maintenance direction under this subsection is a strict liability offence under regulation 38 of the Regulations.

11.2 Subject to subsection 12, the registered operator of an Australian aircraft (the **operator**) must comply, and ensure compliance, with each additional maintenance requirement set out in Appendix 1 as it applies to or for the aircraft (the **relevant aircraft**).

## **12 Transitional requirements for additional maintenance**

- 12.1 For subclauses 3.2 and 3.4 of Appendix 1, the first pitot-static system leaks tests required after 1 August 2013 must be carried out not later than the date when whichever of the following first occurs:
- (a) the day that is 24 months from the date of the last *verified* pitot-static system leak test that is at least of a standard equivalent to that under clause 1 in Attachment 1 to Appendix 1; or
  - (b) if there is no such verified pitot-static system leak test — when the first pressure altimeter tests mentioned in subclause 4.2 required after 1 August 2013 are carried out or should be carried out under subsection 12.2; or
  - (c) if paragraph 3.4 (b) or 3.4 (c) of Appendix 1 applies — the first occasion after 1 August 2013 of the change or modification mentioned in paragraph 3.4 (b), or of the maintenance mentioned in paragraph 3.4 (c).
- 12.2 For subclauses 4.2 and 4.4 of Appendix 1, the first pressure altimeter tests required after 1 August 2013 must be carried out within 24 months after the date on which the last pressure altimeter tests required under the following were carried out, or should have been carried out, before 1 August 2013:
- (a) Requirement 1 of Airworthiness Directive AD/INST/8 Amdt 4;
  - (b) Requirement 1 of Airworthiness Directive AD/INST/9 Amdt 6.
- 12.2A For subclauses 4.2 and 4.4 of Appendix 1, the first pressure altimeter tests required after 1 August 2013 must be carried out within 36 months after the date on which the last pressure altimeter tests required under the following were carried out, or should have been carried out, before 1 August 2013:
- (a) Requirement 2 a. of Airworthiness Directive AD/INST/8 Amdt 4;
  - (b) Requirement 2 a. of Airworthiness Directive AD/INST/9 Amdt 6.
- 12.3 For subclauses 4.6 and 4.7 of Appendix 1, the first automatic pressure altitude encoder tests required after 1 August 2013 must be carried out not later than the date when whichever of the following first occurs:
- (a) the first pressure altimeter tests mentioned in paragraph 12.2, and in conjunction with those tests; or
  - (b) if subclause 4.8 applies — the first occasion after 1 August 2013 of the removal or the installation of, or a change to, or a modification to, a system component or the system interwiring.
- 12.4 For subclauses 5.2 and 5.4 of Appendix 1, the first airspeed indicator tests, including determination of the scale error of the aircraft's installed airspeed indicator, required after 1 August 2013 must be carried out:
- (a) not later than the day that is 48 months from the date of the last verified airspeed indicator test that is at least of a standard equivalent to that under subclause 5.3 in Appendix 1; or
  - (b) if there is no such verified airspeed indicator test — when the first pressure altimeter tests mentioned in subclause 4.2 required after 1 August 2013 are carried out or should be carried out under paragraph 12.2.

- 12.5 For subclauses 6.2 and 6.4 of Appendix 1, the first determination of the accuracy of the aircraft-installed system for measuring fuel required after 1 August 2013 must be carried out:
- (a) not later than the day that is 48 months from the date of the last verified determination of the accuracy of the aircraft-installed system for measuring fuel that is at least of a standard equivalent to that under subclause 6.3 in Appendix 1; or
  - (b) if there is no such verified determination of accuracy — when the first pressure altimeter tests mentioned in subclause 4.2 required after 1 August 2013 are carried out or should be carried out under paragraph 12.2.
- 12.6 In this subsection:
- verified*** in relation to a test means recorded in one of the following for the relevant aircraft:
- (a) the aircraft log book;
  - (b) the approved alternative to the aircraft log book;
  - (c) the approved alternative to a particular section of the aircraft log book.

## Appendix 1

### **Additional maintenance requirements — pitot-static systems, pressure altimeters, airspeed indicators and fuel quantity gauges**

*Note* For the timing of first tests under this Appendix after 1 August 2013, see subsection 12 of this Order.

#### **1 Definitions**

For this Appendix:

**exempted aircraft** means an aircraft with an approved system of maintenance (**SOM**) under regulation 42M of CAR 1988, or with a maintenance schedule under regulation 41 of CAR 1988, but only if the SOM or the schedule incorporates instructions for the continuing airworthiness of instruments and instrument systems fitted to the aircraft that would otherwise be subject to the additional maintenance requirements set out in clauses 2 to 6 of this Appendix.

**tests**, for an instrument or instrument system, means the procedures, in accordance with this Appendix, and used in conjunction with the relevant aircraft manufacturer's approved data, that are required to confirm the accuracy and correct functioning of the instrument or system.

*Note* The tests described in this Appendix are not comprehensive or exclusive test procedures and for this reason must be used in conjunction with the relevant aircraft manufacturer's approved data.

#### **2 Balloon etc. intervals**

Despite the interval mentioned in any other provision to this Appendix, where a provision to this Appendix applies for an aircraft that is a balloon or a thermal airship without an approved SOM, the interval is not to exceed 36 months.

*Note* Under civil aviation legislation and for this Appendix, a balloon or a thermal airship falls within the scope of the word "aircraft" unless specifically excluded.

#### **3 Pitot-static systems**

- 3.1 This clause applies to an aircraft except an exempted aircraft.
- 3.2 Tests must be carried out on an aircraft for pitot-static system leaks.
- 3.3 For subclause 3.2, the tests must be carried out in accordance with each of the testing procedures set out in clause 1 of Attachment 1 to this Appendix.
- 3.4 The tests mentioned in subclause 3.2 must be performed:
  - (a) at intervals not exceeding every 24 months; or
  - (b) if any pitot-static system components, including instruments, are changed or modified — at the same time as the change or modification, and then at intervals not exceeding every 24 months after that time; or
  - (c) if maintenance is carried out on the pitot-static system that involves disconnection of any of the pitot-static lines — at the same time as the maintenance, and then at intervals not exceeding every 24 months after that time.

#### **4 Testing pressure altimeters and air data computers**

- 4.1 This clause applies to an aircraft except an exempted aircraft.

- 4.2 Subject to subclause 4.3, the pressure altimeters installed in an aircraft must be tested in accordance with:
- (a) each of the testing procedures set out in clause 2 of Attachment 1 to this Appendix; or
  - (b) each of the applicable testing procedures of a recognised foreign national airworthiness authority (*NAA*) listed in regulation 21.012 of CASR 1998 that is the *NAA* of the state of design for the aircraft.

- 4.3 For an aircraft certificated for single-pilot operations:

- (a) the pilot's pressure altimeter must be tested under subclause 4.2; and
- (b) any other pressure altimeter that is not tested must be appropriately placarded to that effect.

- 4.4 The pressure altimeter tests mentioned in subclause 4.2 must be carried out at intervals not exceeding every 24 months.

*Note 1* Test errors must not exceed those specified for pressure altimeters in Attachment 1 to this Appendix.

*Note 2* Appropriate test equipment may allow pressure altimeter tests to be carried out either while the altimeter is installed on the aircraft, or in a workshop.

- 4.5 Any air data computer installed in an aircraft must be tested in accordance with the manufacturer's maintenance manual.

*Note* Electronic displays do not require testing.

#### Automatic altitude reporting equipment correspondence checks

- 4.6 If any of the following devices are installed in an aircraft:

- (a) an automatic pressure altitude encoder;
- (b) an air data computer;
- (c) any equivalent device reporting directly to air traffic control (*ATC*) via the aircraft's transponder;

the device must be tested in accordance with each of the testing procedures set out in clause 3 of Attachment 1 to this Appendix.

*Note* Test errors must not exceed those specified in Attachment 1 to this Appendix for the relevant encoders, computers or other devices.

- 4.7 Subject to subclause 4.8, the automatic pressure altitude encoders mentioned in subclause 4.6 must be tested in conjunction with the aircraft's pressure altimeter tests mentioned in subclause 4.2.

*Note* See subclause 4.4 for the interval.

- 4.8 If the following apply:

- (a) an aircraft uses a separate direct reading altimeter for the primary control of altitude;
- (b) the aircraft has an automatic altitude reporting system comprising a separate automatic pressure encoder, air data computer, or other equivalent device reporting directly to *ATC* via the aircraft's transponder;

then the reporting system must be tested in accordance with subclause 4.6 on each occasion of the removal or the installation of, or a change to, or a modification to:

- (c) a system component; or
- (d) the system interwiring.

## **5      Airspeed indicator**

- 5.1 This clause applies to an aircraft except an exempted aircraft.
- 5.2 The airspeed indicator tests, including determination of the scale error of the aircraft's installed airspeed indicator must be determined through testing in accordance with subclause 5.3.
- 5.3 For subclause 5.2, the scale errors at the major graduations of the scale must not exceed  $\pm 4$  knots up to the maximum speed of the aircraft, when tested first with the pressure increasing, and then with the pressure decreasing. During the test, operation of the airspeed indicator must be smooth and continuous.
- 5.4 Airspeed indicator tests, including determination of the scale error of the aircraft's installed airspeed indicator, must be performed at intervals not exceeding every 48 months.

## **6      Fuel quantity gauges**

- 6.1 This clause applies to an aircraft except an exempted aircraft.
- 6.2 The accuracy of an aircraft-installed system for measuring fuel (the *system*) must be tested and determined.
- 6.3 For subclause 6.2, the determination must be made in accordance with the following test requirements:
  - (a) subject to the tolerances mentioned in this subclause — the indicated quantity of fuel must equal the actual fuel in the fuel tank less the unusable quantity of fuel;
  - (b) fuel quantity gauges must be checked for accuracy at all major graduations;
  - (c) subject to paragraph (d) — scale errors at empty must not exceed + 0.5% or – 5% of the nominal fuel tank capacity;
  - (d) for a system where it is impracticable to correct the empty reading — scale errors at empty must not exceed + 0.5% or – 8% of the nominal fuel tank capacity;
  - (e) if either of the following apply:
    - (i) scale errors or the ungaugable quantity of fuel exceeds  $\pm 5\%$  of the nominal fuel tank capacity; or
    - (ii) the gauge is calibrated in fractions of fuel tank capacity;  
then, a placard must be displayed adjacent to the fuel quantity gauge showing:
    - (iii) the corrected readings at all major graduations; and
    - (iv) the ungaugable quantities of fuel;
  - (f) fuel quantity gauges must be checked with the aircraft positioned to simulate level flight attitude;
  - (g) for paragraph (f):
    - (i) electrically operated gauges must have normal system voltages applied;  
and
    - (ii) the fuel quantity at each calibration point must be made by:
      - (A) measurement of the fuel added to the fuel tank; or
      - (B) a dip or drip stick previously calibrated for the fuel tank;

- (h) during the test, the motion of any fuel quantity gauge must be smooth and continuous.
- 6.4 Determination of the accuracy of the system must be performed:
- (a) at intervals not exceeding every 48 months; and
  - (b) if any system component or system interwiring is changed or modified — at the same time as the change or modification, and then after that at intervals not exceeding every 48 months.

**Attachment 1 to Appendix 1**

*Note* See subclauses 3.3, 4.2 and 4.6 in Appendix 1.

**Testing procedures for:**

**Pitot-static systems  
Pressure altimeter systems  
Air data computers  
Automatic pressure altitude encoders  
Other transponder devices**

**Clause 1 Pitot-static system test**

**(1) Static pressure systems**

Performance of the test procedures set out below, with all static instruments connected, must ensure that any leakage present is within the tolerance specified for the procedure.

- (a) Visually inspect the ports, plumbing, accessories and instruments connected to the static system. Repair or replace those parts which are defective, for example, broken “B” nuts, cracked flare sleeves, deteriorated flexible tubing and quick disconnects, bad valves etc. If purging is necessary, use compressed air or nitrogen to remove foreign matter which may have accumulated in the tubing. Ensure that all static instruments are disconnected before commencing to purge.
- (b) Ensure that no alterations or deformations of the airframe surface are present that would affect static air sensing. This is of particular importance for RVSM aircraft.
- (c) Check any static port heaters to assure proper operation.
- (d) If an aircraft has more than 1 static system, test each system separately to assure its independence and that the leak rate for each system is within tolerance.
- (e) Connect the test equipment directly to the static ports, if practicable. If not practicable, connect to a static system drain or tee connection and seal off the static ports. If the test equipment is connected to the static system at any point other than the static port, it must be made at a point where the connection may be readily inspected for system integrity after the system is returned to its normal configuration.
- (f) Determine that any leakage is within the tolerances mentioned in paragraph (g) or (h) (as the case requires).
- (g) For unpressurised airplanes — evacuate the static pressure system to a pressure differential of approximately 33 hPa or to a reading on the altimeter that is 1 000 feet above the aircraft’s elevation at the time of the test. Without additional pumping for a period of 1 minute, the loss of indicated altitude must not exceed 100 feet on the altimeter.
- (h) For pressurised airplanes — evacuate the static pressure system until a pressure differential equivalent to the maximum cabin pressure differential for which the airplane is type certificated is achieved. Without additional



pumping for a period of 1 minute, the loss of indicated altitude must not exceed 2 per cent of the equivalent altitude of the maximum cabin differential pressure or 100 feet, whichever is greater.

- (i) On completion of the static pressure system test, ensure that all static port seals are removed.
- (2) **Pitot-systems**
  - (a) The pitot system is tested for leaks by applying a pressure at the pitot head sufficient to cause the airspeed indicator to read 120 knots, or the maximum indicated speed, whichever is the greater.
  - (b) There must be no discernible lag in the movement of the airspeed indicator pointer with the application of the pressure, as such a lag indicates restrictions in the piping.
  - (c) There must be no decrease in the reading when the system is sealed for at least 10 seconds.

## **Clause 2 Tests for altimeters and air data computers**

*Note* For testing of air data computers, see subclause 2 (8) below.

- (1) **Environmental conditions test**
  - (a) Vibration (intended to minimise the effects of friction). If suitable test equipment is available, each test for performance may be conducted with the instrument installed in the aircraft. If suitable test equipment for an installed test is not available, or if the instrument fails the installed test, the instrument must be removed from the aircraft and tested or retested with vibration applied.
  - (b) Temperature. When tests are conducted with the temperature substantially different from ambient temperature of approximately 25°C, allowance must be made for that temperature difference.
- (2) **Scale error test**
  - (a) With the barometric pressure scale at 1 013 hPa, the altimeter must be successively subjected to pressures corresponding to the altitude specified in Table 1 up to the maximum, normally expected, operating altitude of the aircraft in which the altimeter is, or is to be, installed.
  - (b) The reduction in pressure must be made at a rate not in excess of 20 000 feet per minute to within approximately 2 000 feet of the test point.
  - (c) The test point must be approached at a rate compatible with the test equipment.
  - (d) The altimeter must be kept at the pressure corresponding to each test point for at least 1 minute, but not more than 10 minutes, before a reading is taken.
  - (e) The error at all test points must not exceed the tolerances specified in Table 1.

**Table 1      Scale error**

<b>Altitude</b>	<b>Equivalent pressure</b>	<b>Tolerance</b>
	<b>Hectopascals</b>	<b>± (feet)</b>
-1 000	1050	20
0	1013	20
500	995	20
1 000	977	20
1 500	960	25
2 000	942	30
3 000	908	30
4 000	875	35
6 000	812	40
8 000	753	60
10 000	697	80
12 000	644	90
14 000	595	100
16 000	549	110
18 000	506	120
20 000	466	130
22 000	428	140
25 000	376	155
30 000	301	180
35 000	238	205
40 000	188	230
45 000	147	255
50 000	116	280

**(3) Hysteresis test**

- (a) The hysteresis test must begin within 15 minutes of the altimeter's initial exposure to the pressure corresponding to the upper limit of the scale error test in subclause (2). While the altimeter is at this pressure, the hysteresis test is to commence.
- (b) Pressure must be increased at a rate simulating a descent in altitude at the rate of 5 000 to 20 000 feet per minute until within 3 000 feet of the first test point (50 per cent of maximum altitude).

- (c) The test point is then to be approached at a rate of approximately 3 000 feet per minute. The altimeter must be kept at this pressure for at least 5 minutes, but not more than 15 minutes, before the test reading is taken.
  - (d) After the reading has been taken, the pressure must be increased further, in the same manner as before, until the pressure corresponding to the second test point (40 per cent of maximum altitude) is reached. The altimeter must be kept at this pressure for at least 1 minute, but not more than 10 minutes, before the test reading is taken.
  - (e) After the reading has been taken, the pressure must be increased further, in the same manner as before, until atmospheric pressure is reached.
  - (f) The reading of the altimeter at either of the 2 test points must not differ by more than the tolerance specified in Table 2 in subclause 2 (4) from the reading of the altimeter for the corresponding altitude recorded during the scale error test prescribed in subclause (2).
- (4) **After effect test**
- Within 5 minutes following the completion of the hysteresis test set out in subclause (3), the reading of the altimeter (corrected for any change in atmospheric pressure) must not differ from the original atmospheric pressure reading by more than the tolerance specified in Table 2.

**Table 2 Test tolerances**

<b>Test</b>	<b>Tolerance (feet)</b>
Case leak test	±100
Hysteresis test:	
First test point (50 per cent of maximum altitude)	75
Second test point (40 per cent of maximum altitude)	75
After effect test	30

- (5) **Friction test**
- (a) The altimeter is to be subjected to a steady rate of decrease of pressure approximating 750 feet per minute.
  - (b) At each altitude listed in Table 3, the change in reading of the pointers after vibration (using a light tapping of the instrument panel adjacent to the altimeter if the altimeter does not have an integral vibrator) must not exceed the corresponding tolerance listed in Table 3.
  - (c) If the altimeter fails the friction test while installed on the aircraft, the altimeter must be removed and retested.

**Table 3      Friction**

<b>Altitude (feet)</b>	<b>Tolerance (feet)</b>
1 000 -	±70
2 000 -	70
3 000	70
5 000	70
10 000	80
15 000	90
20 000	100
25 000	120
30 000	140
35 000	160
40 000	180
50 000	250

**(6) Case leak test**

The leakage of the altimeter case, when the pressure within it corresponds to an altitude of 18 000 feet, must not change the altimeter reading by more than the tolerance shown in Table 2 in subclause 2 (4) during an interval of 1 minute.

**(7) Barometric scale error test**

At constant atmospheric pressure, the barometric pressure scale must be set at each of the pressures (falling within its range of adjustment) that are listed in Table 4, and this must cause the pointer to indicate the equivalent altitude difference shown in Table 4 within a tolerance of plus or minus 25 feet.

**Table 4      Pressure-altitude difference**

<b>Pressure (hectopascal)</b>	<b>Altitude difference (feet)</b>
952	-1 727
965	-1 340
982	-863
999	-392
1013	0
1033	+531
1046	+893
1049	+974

**(8) Air data computers test**

- (a) The tests set out in subclauses (1) to (7) do not apply for air data computers or for systems similar to air data computers (a *similar type*).
- (b) Paragraph (c) sets out the tests for the following altimeters:
  - (i) an altimeter that is an air data computer or similar type with associated computing systems;
  - (ii) an altimeter that incorporates air data correction internally.
- (c) An altimeter mentioned in paragraph (b), must be tested as follows:
  - (i) in the manner, and to the specifications, provided by the manufacturer of the equipment or aircraft in which the altimeter is installed;
  - (ii) in accordance with the instructions for continuing airworthiness incorporated in a modification approval for the equipment or aircraft in which the altimeter is installed.

**Clause 3 Automatic pressure altitude encoders and ATC transponder system integration test**

**Automatic pressure altitude encoder test and other transponder devices**

Measure the automatic pressure altitude value at the output of the installed ATC transponder when interrogated on Mode C at a sufficient number of test points to ensure that the altitude reporting equipment, altimeters, and ATC transponders perform their intended functions as installed in the aircraft. The difference between the automatic reporting output and the altitude displayed at each altimeter must not exceed 125 feet.

## Notes to Civil Aviation Order 100.5 (General requirements in respect of maintenance of Australian aircraft) 2011

### Note 1

The Civil Aviation Order (in force under the *Civil Aviation Regulations 1988*) as shown in this compilation comprises Civil Aviation Order 100.5 amended as indicated in the Tables below.

#### Table of Orders

Year and number	Date of notification in <i>Gazette</i> / registration on FRLI	Date of commencement	Application, saving or transitional provisions
CAO 2004 No. R83	23 December 2004	23 December 2004 (see s. 2)	
CAO 100.5 2008 No. 1	FRLI 27 March 2008 (see F2008L00598)	28 March 2008 (see s. 2)	
CAO 100.5 2011 No. 1	FRLI 22 June 2011 (see F2011L01193)	27 June 2011 (see s. 2)	
CAO 100.5 2012 No. 1	FRLI 6 February 2012 (see F2012L00171)	7 February 2012 (see s. 2 and <i>Gazette</i> 2012, No. S14)	
CAO 100.5 2012 No. 2	FRLI 6 February 2012 (see F2012L00175)	7 February 2012 (see s. 2 and <i>Gazette</i> 2012, No. S15)	
CAO 100.5 2012 No. 3	FRLI 14 September 2012 (see F2012L01872)	15 September 2012 (see s. 2)	
CAO 100.5 2013 No. 1	FRLI 8 July 2013 (see F2013L01330)	1 August 2013 (see s. 2 and <i>Gazette</i> notice C2013G01042)	
<b>as amended by</b> CAO 100.5 2013 No. 2	FRLI 31 July 2013 (see F2013L01486)	1 August 2013 (see s. 2 and <i>Gazette</i> notice C2013G01180)	

#### Table of Amendments

ad. = added or inserted   am. = amended   rep. = repealed   rs.= repealed and substituted

Provision affected	How affected
s. 100.5 .....	rs. CAO 2004 No. R83
s. 1 .....	rep. CAO 100.5 2011 No. 1
s. 1A.....	ad. CAO 100.5 2011 No. 1
s. 2 (renumbered s. 1B).....	CAO 100.5 2011 No. 1
s. 3 .....	rep. CAO 100.5 2011 No. 1
Schedule heading .....	rep. CAO 100.5 2011 No. 1
CAO title .....	rep. CAO 100.5 2011 No. 1
subs. 1 .....	am. CAO 100.5 2013 No. 1
subs. 3 .....	am. CAO 100.5 2012 No. 3
subs. 4 .....	rs. CAO 100.5 2012 No. 3
subs. 7A.....	ad. CAO 100.5 2011 No. 1 rs. CAO 100.5 2012 No. 1
subs. 8A.....	ad. CAO 100.5 2012 No. 2

## *Civil Aviation Order 100.5*

### **Table of Amendments**

ad. = added or inserted   am. = amended   rep. = repealed   rs.= repealed and substituted

Provision affected	How affected
subs. 9 .....	am. CAO 100.5 2013 No. 1 (as am. by CAO 100.5 2013 No. 2)
subs. 9A.....	ad. CAO 100.5 2008 No. 1
subs. 10 .....	rs. CAO 100.5 2012 No. 3
subs. 11 .....	ad. CAO 100.5 2013 No. 1
subs. 12 .....	ad. CAO 100.5 2013 No. 1 (as am. by CAO 100.5 2013 No. 2)
Appendix 1 .....	ad. CAO 100.5 2013 No. 1
Attachment 1 to Appendix 1	ad. CAO 100.5 2013 No. 1