



Australian Government

Civil Aviation Safety Authority

I, MARK ALAN SKIDMORE, Director of Aviation Safety, on behalf of CASA, make this instrument under subsection 98 (4A) of the *Civil Aviation Act 1988* and subregulations 5 (1) and 235 (1) of the *Civil Aviation Regulations 1988*.

[Signed M. Skidmore]

Mark Skidmore AM
Director of Aviation Safety

6 July 2015

Civil Aviation Order 100.7 Instrument 2015

1A Name of instrument

- 1A.1 This instrument is the *Civil Aviation Order 100.7 Instrument 2015*.
- 1A.2 This instrument may be cited as Civil Aviation Order 100.7.
- 1A.3 A reference in an instrument to section 100.7 of the Civil Aviation Orders is a reference to this instrument.

1B Commencement

This instrument commences on the day of registration.

1C Repeal

Civil Aviation Amendment Order (No. R85) 2004, also known as F2005B00929, including section 100.7 of the Civil Aviation Orders as set out in Schedule 1 of that instrument, as amended, is repealed.

1 Application

In this Order, aircraft does not include:

- (a) a balloon;
- (b) an airship;
- (c) an aircraft that has been weighed in accordance with the approved procedures of an approved self-administering aviation organisation.

2 Definitions

Terms and abbreviations used in this Order have the following meanings:

CAR 1988 means the *Civil Aviation Regulations 1988*.

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

CG means the centre of gravity position of an aircraft.

empty weight means the weight, as determined in accordance with this section of the Civil Aviation Orders, of an aircraft, including all items of fixed equipment and other equipment which is mandatory for all operations, fixed ballast, unusable fuel and total quantities of oil, engine coolant and hydraulic fluid but excluding all other items of disposable load.

fleet means 2 or more aeroplanes of the same model and configuration that are operated by the same operator.

fleet (weight and CG) values means the average operating weight and average CG established for the aircraft in a fleet.

load data sheet means a document prepared in respect of an individual aircraft to provide weight and centre of gravity information for use in the loading system.

loading system means a system for ensuring that an aircraft is loaded within approved weight and centre of gravity limits at all times during flight.

maximum landing weight means the maximum aircraft weight as set out in the flight manual or a type certificate data sheet at which the aircraft may land under normal circumstances.

MTOW means the maximum take-off weight of an aircraft.

operating weight, in relation to a particular type of operation of an aircraft, means the empty weight of the aircraft plus those items of removable equipment and disposable load which remain constant for the type of operation being conducted.

removable equipment means items of equipment which are carried on some or all operations of an aircraft but which are not included in its empty weight.

validation, in relation to an aircraft's weight, means the determination of the aircraft's weight in accordance with paragraph 3.5.

weight control means the determination of the empty weight and empty weight CG, the development and approval of loading data, the keeping of a record of weight alterations and the overall supervision of these activities and, to the extent necessary, oversight of the control, maintenance and operation of the aircraft, in such a way as to ensure that at all times the provisions of CAR 1988 in respect of loading, weight and CG can be complied with.

weight control officer means a person holding an airworthiness authority issued under paragraph 33B (1) (e) of CAR 1988.

3 Weighing intervals

3.1 Initial weighing

- (1) Except as specified in paragraph 3.1 (2), all aircraft must be weighed before the initial issue of a certificate of airworthiness.
- (2) The weighing of an aircraft mentioned in paragraph 3.1 (1), other than a prototype aircraft, before the initial issue of a certificate of airworthiness is not required if the empty weight and empty weight CG have been established by another means to the satisfaction of a weight control officer, whose appointment covers the activity, or a person referred to in paragraph 4.1A.
- (3) CASA may require an aircraft to be weighed or reweighed, as applicable, if reasonable doubt exists as to the accuracy of the weight and balance data submitted in respect of that aircraft.

3.2 Subject to paragraph 3.2.1, if:

- (a) the weight of an aircraft of a type referred to in column 2 of items 1 to 4 (inclusive) of the following table has been determined under paragraph 3.1; and
- (b) the aircraft is used in commercial operations;
the aircraft must:
- (c) in the case of an aircraft of a type referred to in column 2 of items 1 and 2 — be reweighed at the intervals set out in column 3 of the item; and

- (d) in the case of an aircraft of a type referred to in column 2 of items 3 and 4 — be reweighed, or have its weight validated, at the intervals set out in column 3 of the item.

Table

Column 1	Column 2	Column 3
Item	Type of aircraft	Interval
1	Multi-engine aeroplanes with an MTOW of more than 2 800 kg	The aeroplane must be reweighed at: (a) the first maintenance release inspection; or (b) the first scheduled maintenance inspection; following the third anniversary of the day on which the aircraft was last weighed.
2	Rotorcraft with an MTOW of more than 2 800 kg	The rotorcraft must be reweighed at: (a) the first maintenance release inspection; or (b) the first scheduled maintenance inspection; following the third anniversary of the day on which the aircraft was last weighed.
3	Multi-engine aeroplanes with an MTOW of more than 2 000 kg and not exceeding 2 800 kg	The aeroplane must be reweighed or have its weight validated at: (a) the first periodic inspection; or (b) the first maintenance release inspection; following the third anniversary of the day on which the aircraft was last weighed or had its weight validated.
4	Rotorcraft with an MTOW of more than 2 000 kg and not exceeding 2 800 kg	The rotorcraft must be reweighed or have its weight validated at: (a) the first periodic inspection; or (b) the first maintenance release inspection; following the third anniversary of the day on which the aircraft was last weighed or had its weight validated.
3.2.1	Paragraph 3.2 does not apply to an aeroplane with an MTOW of more than 2 800 kg, if the operator: (a) includes it in a fleet in accordance with subsection 3A; and (b) complies with the requirements of subsection 3B.	
3.3	An aircraft that: (a) is used in private operations; and (b) has not been reweighed or had its weight validated at whichever interval set out in column 3 of the table to paragraph 3.2 is applicable to the aircraft; must not be used in commercial operations unless it is reweighed or has its weight validated before it is used in such operations.	

- 3.4 The registered operator of an aircraft referred to in paragraph 3.3 must ensure that:
- (a) the aircraft's logbook or alternative document; and
 - (b) the aircraft's load data sheet;
- are endorsed with the following words:
- “THIS AIRCRAFT IS RESTRICTED TO PRIVATE OPERATIONS UNTIL IT HAS BEEN WEIGHED IN ACCORDANCE WITH CAO 100.7.”.
- 3.5 In the case of aircraft of a type referred to in column 2 of items 3 and 4 of the table to paragraph 3.2, a weight control officer may validate the weight of the aircraft, and issue a load data sheet, as follows:
- (a) the officer must:
 - (i) examine the aircraft and its logbook; and
 - (ii) examine the weighing summary and equipment list from the immediately preceding weighing;to check if the record of empty weight and centre of gravity changes are an accurate and complete record of changes in the aircraft's weight and balance that have occurred since the aircraft was last weighed or had its weight validated;
 - (b) if the officer considers that the record is accurate and complete, the officer may declare in writing that the record shows the aircraft's current empty weight and empty weight centre of gravity for the purposes of issuing of a new load data sheet;
 - (c) after making a declaration under subparagraph (b), the officer may issue a new load data sheet;
 - (d) if the officer issues a load data sheet under subparagraph (c), he or she must make a note:
 - (i) on the aircraft's load data sheet; and
 - (ii) in the aircraft's logbook;to the effect that that load data sheet has been prepared by the validation of cumulative data and not by weighing the aircraft.

3A Use of fleet weight and CG values

- 3A.1 An operator of an aeroplane to which paragraph 3.2.1 refers may include it in a fleet in accordance with this subsection and operate it using the fleet (weight and CG) values.
- 3A.2 When first establishing fleet (weight and CG) values, an operator must do so using the current weight and CG of each aeroplane in the fleet.
- 3A.3 An operator must not include an aeroplane in a fleet unless it has been weighed within the previous 4 years to establish its weight and CG.
- 3A.4 An operator who operates aeroplanes using fleet (weight and CG) values must have documented procedures for the establishment, review and use of those values. The procedures must:
- (a) provide for the identification of aeroplanes in the fleet; and
 - (b) ensure compliance with the requirements of this subsection and subsection 3B.

- 3A.5 Subject to paragraphs 3A.6, 3A.7 and 3A.8, an operator must not include in a fleet an aeroplane:
- (a) whose actual operating weight varies from the fleet's average operating weight by more than 0.5% of the maximum landing weight; or
 - (b) whose actual CG varies from the fleet's average CG by more than 0.5% of the mean aerodynamic chord.
- 3A.6 An operator may include in a fleet an aeroplane whose actual CG exceeds the maximum permitted variation under subparagraph 3A.5 (b), but only if it is operated with its individual CG.
- 3A.7 An operator may include in a fleet an aeroplane that has, compared to other aeroplanes in the fleet, a physical, accurately accountable difference that causes it to exceed the maximum permitted variations under paragraph 3A.5.
- 3A.8 An operator, who includes in a fleet an aeroplane to which paragraph 3A.7 applies, must make appropriate corrections when calculating the weight, CG, or both, of that aeroplane, to take account of the difference referred to in that paragraph.
- 3A.9 If an operator omits an aeroplane from a fleet and does not include it in another fleet in accordance with this subsection, the operator must:
- (a) operate that aeroplane with its individual operating weight and CG; and
 - (b) reweigh that aeroplane in accordance with paragraph 3.2.
- 3A.10 An operator may have more than 1 fleet, with different fleet (weight and CG) values, for aeroplanes of the same model and configuration.
- 3A.11 An operator must only include in a fleet aeroplanes for which a mean aerodynamic chord has been published.

3B Weighing aeroplanes to establish fleet (weight and CG) values

- 3B.1 An operator must re-establish fleet (weight and CG) values for aeroplanes in a fleet at least every 4 years.
- 3B.2 To re-establish fleet (weight and CG) values, an operator must in the previous 4 years have weighed, on a sample basis, not less than the applicable number of aeroplanes determined in accordance with the following table:

Number of aeroplanes in fleet	Minimum number to be weighed
2	2
3	3
4 or 5	4
6 or 7	5
8-13	6
14-23	7
More than 23	6, + 10% of the number of aeroplanes over 9, rounded up, in the case of a decimal point, to the next whole number

- 3B.3 An operator must re-establish the fleet (weight and CG) values by using the weights and CG of those aeroplanes that have been weighed in accordance with paragraph 3B.2.

- 3B.4 An operator must ensure that the aeroplanes that have not been weighed for the longest time are selected when the weighing of aircraft in a fleet is undertaken for the purposes of paragraphs 3B.1 and 3B.2.
- 3B.5 Each aeroplane in a fleet must be weighed at least once every 9 years.

4 Weighing procedure

- 4.1 Aircraft weighings must be carried out under the control of a weight control officer whose appointment covers the activity, or a person referred to in paragraph 4.1A.

Note Subject to compliance with paragraphs 4.1 and 4.7, a person, other than a weight control officer, may carry out the weighing of an aircraft.

- 4.1A A person may carry out the weighing of aircraft and prepare a weighing summary for aircraft (other than power-assisted sailplanes, powered sailplanes or sailplanes) that are to be certified under regulation 21.190 and 21.195A of CASR 1998 for a purpose mentioned in paragraph 21.191 (g), (h) or (j) of CASR 1998 if the person:
- (a) has successfully completed an aircraft weighing procedures course approved by CASA within the last 2 years; and
 - (b) has had practical experience in setting the aircraft up in the levelled or flying position for the purpose of conducting symmetry checks, rigging angles and control surface travels, if applicable; and
 - (c) weighs the aircraft on scales that are approved by CASA or an organisation that has been approved by CASA for the purpose of this subparagraph; and
 - (d) ensures flight tests are conducted in accordance with subregulation 262AP (3) of CAR 1988 with the aircraft at maximum and minimum permitted take-off weights and loaded so that it is tested at forward and aft CG limits; and
 - (e) complies with any other condition that CASA deems necessary.
- 4.2 Aircraft must be weighed on scales that:
- (a) have an accuracy over the temperature range for which the scales are designed of:
 - (i) $\pm 0.2\%$ of the applied load; or
 - (ii) ± 2 kg;whichever is the greater; and
 - (b) are of a type suitable for the purpose.
- 4.3 Each scale must have been calibrated either by the manufacturer or by a laboratory that is accredited with the National Association of Testing Authorities (Australia) or a similar national accreditation body that is a member of the International Laboratory Accreditation Cooperation within a period of 1 year before the weighing of any aircraft.
- 4.4 Sufficient personnel and equipment, including scales, must be provided to satisfactorily carry out the weighing.
- 4.5 The empty weight and empty weight CG must be determined from the results of 2 consecutive and independent weighings. The load must be completely removed from the scales between each weighing.
- 4.6 If the difference between the first 2 weighings exceeds 0.2% of the mean weight or 10 kg, whichever is the greater, further weighings must be performed until the results of 2 consecutive and independent weighings agree within that tolerance.
- 4.7 The empty weight and empty weight CG must be certified as correct by a weight control officer whose appointment covers the activity, or a person referred to in

paragraph 4.1A. Weighing details and the determination of the empty weight and empty weight CG must be entered in an aircraft weighing summary approved by CASA.

- 4.8 A list of equipment included in the empty weight must be prepared for each aeroplane and rotorcraft.

5 Loading data

- 5.1 In those cases, where loading data prepared in accordance with this subsection is approved by CASA, that data must be deemed to be directions under regulation 235 of CAR 1988 with respect to the method of loading of persons and goods (including fuel) on aircraft.

5.2 Preparation and approval of loading data

- (1) A load data sheet must be prepared for each aircraft, specifying the empty weight and empty weight CG. In addition, if an operating weight is used, the operating weight and operating weight CG must also be specified on the load data sheet and a list of removable equipment and disposable load included in that operating weight must be prepared. If the aircraft will require reweighing, or will need to have its weight validated under paragraph 3.2, the load data sheet must include the date of the third anniversary of the last reweighing or validation of the aircraft.
- (2) A loading system must be prepared for each aircraft unless it can be shown that the aircraft cannot be loaded in such a manner that the weight and centre of gravity falls outside the approved range while observing all compartment and seating limitations.
- (2A) The loading system for an aircraft with an MTOW of 5 700 kg or less may be set out on placards placed at appropriate places on the aircraft if the information relating to the loading system can be readily set out in placard form.
- (3) Loading data prepared in accordance with the provisions of this subsection may be approved by a weight control officer whose appointment covers the activity. Where a flight manual page is used as the load data sheet or to specify any required loading system, 2 copies of the same must be submitted to CASA.
Note Such flight manual pages will be issued by CASA as a flight manual amendment.
- (4) An aircraft's loading data must be stated using the metric system of measurement except in the case where the aircraft's flight manual gives the relevant information in relation to the aircraft in pounds and in such a case the loading data may be stated in pounds.
- (5) The owner or operator must keep in a safe place on the ground duplicate copies of all current approved loading data applicable to his or her aircraft.

6 Record of weight alterations

- 6.1 A complete, current and continuous record of changes in empty weight and empty weight CG and, where appropriate, operating weight and operating weight CG, must be maintained for each aircraft, and this record must contain details of all alterations affecting the weight and balance of the aircraft.
- 6.1A If changes to an aircraft's empty weight or operating weight occur due to changes in the aircraft's equipment, the aircraft's equipment list must be amended in accordance with the equipment changes.
- 6.2 A new record of weight alterations must be raised after each weighing.
- 6.3 Unless otherwise agreed to by CASA, the load data sheet for an aircraft must be renewed before further flight whenever, as the result of a modification or as

otherwise shown in the record of weight alterations, changes exceeding the following have occurred:

- (a) for aeroplanes:
 - (i) the empty weight has changed by more than 0.5% of the MTOW or 10 kg, whichever is the greater; or
 - (ii) the empty weight CG has changed by more than 2% of the maximum permissible centre of gravity range or 5 mm, whichever is the greater; and
- (b) for rotorcraft:
 - (i) the empty weight has changed by more than 1% of the MTOW or 10 kg, whichever is the greater; or
 - (ii) the empty weight CG has changed by more than 10 mm or 10% of the maximum permissible centre of gravity range, whichever is the greater.

- 6.4 Whenever, under the circumstances described in paragraph 6.3 of this subsection, a load data sheet is renewed, the need for the corresponding introduction of a loading system, or loading system revision, must be determined in accordance with the provisions of paragraph 5.2 (3) of this section.
- 6.5 Further to the provisions of paragraph 6.1 of this subsection, if CASA considers that adequate weight control has not been exercised over an aircraft, CASA may require that the aircraft be weighed or reweighed, as applicable, and a new empty weight and empty weight CG determined.
- 6.6 A glider must be weighed or reweighed, as applicable, when, in the opinion of CASA or an authorised person in the Gliding Federation of Australia, such a weighing is necessary. In that case, a new empty weight and empty weight centre of gravity must be established and the need for the corresponding introduction of a loading system, or loading system revision, must be determined in accordance with the provisions of paragraph 5.2 (2) of this section.
- 6.7 Loading data renewed in accordance with this section must be based on the new empty weight and empty weight CG and must be prepared and approved in accordance with paragraph 5.2 (3) of this section.

7 Current empty weight

- 7.1 For the purposes of a direction under subregulation 235 (1) of CAR 1988 setting out the method of estimating with respect to an aircraft at any time the relevant weight and CG, the applicable empty weight and empty weight CG must be the empty weight and empty weight CG most recently determined and specified in a load data sheet for the aircraft, in accordance with this or previous issues of this section.