

NEPALESE CIVIL AIRWORTHINESS REQUIREMENTS

SECTION C

MAINTENANCE REQUIREMENTS

CHAPTER C.6

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MASS AND BALANCE

1. GENERAL

- 1.1 Every aircraft registered in Nepal in respect of which a Certificate of Airworthiness is issued or rendered valid under these Requirements shall be weighed and the position of its centre-of-gravity determined, at such times and in such manner as described in this Chapter or as the CAA Nepal may require or approve in the case of that aircraft.
- 1.2 The person responsible for continuing airworthiness of an aircraft, prior to its entry into service must ensure that:
 - (a) the empty mass of the aircraft and the empty mass centre of gravity of the aircraft when the aircraft is in its empty mass configuration, is established by actual weighing at such times as stated in this Chapter, in accordance with a method acceptable to the CAA Nepal and recorded; and
 - (b) the record of that information is kept up to date.

2. WEIGHING REQUIREMENTS

- 2.1 Newly manufactured aircraft where the determination of mass and centre of gravity has been previously determined by the manufacturer and recorded are eligible to be placed into operation without reweighing if the mass and balance records have been adjusted for alterations or modifications to the aircraft.
- 2.2 All aircraft shall be weighed to determine the Empty Mass and Empty Mass Centre of Gravity (C of G) before initial issue of a Nepalese Certificate of Airworthiness.
- 2.3 The CAA Nepal may exempt a particular aircraft from the requirement of paragraph (2.2) above if he is satisfied that the empty mass and empty mass centre of gravity are given accurately by a recent Mass and Balance Report issued by the manufacturer or an authorised organisation, unless more than 5 years have elapsed since the last weighing.
- 2.4 The empty mass and empty mass centre of gravity position of each aircraft shall be re-established periodically.
 - (a) Aircraft with , Maximum Authorised Total Mass exceeding 5700 kg, shall be reweighed within two years after the date of manufacture, and subsequent check weighing shall be made at intervals not exceeding five years, and at such times as the CAA Nepal may require.
 - (b) Aircraft with Maximum Authorised Total Mass of 5700 kg or less shall be weighed at intervals not exceeding five years, and at such times as the CAA Nepal may require.
- 2.5 if the CAA Nepal or the operator is of the opinion that adequate mass control has not been exercised over an aircraft during a modification, the the CAA Nepal may require that a new empty mass and empty centre of gravity position be determined for the aircraft by weighing.

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- 2.6 All aircraft shall be weighed when, as a result of a modification or series of modifications incorporated since the last recorded weighing, the following changes have occurred in the empty mass or empty mass centre of gravity position:
- a) the empty mass has changed by more than 0.5 percent of the maximum landing mass; or
 - b) The empty mass centre of gravity position has changed by more than 0.5 per cent of the mean aerodynamic chord.
- 2.7 Notwithstanding the provisions of paragraph (2.6) above if the CAA Nepal is satisfied that adequate mass control has been maintained over an aircraft throughout a modification or series of modifications of any magnitude, the aircraft need not be re-weighed.

3. WEIGHING PROCEDURE

- 3.1 Aircraft mass determination should be performed by a person authorized to perform mass and balance calculations on behalf of the operator or aircraft owner. Aircraft should be prepared for mass determination and the mass determined in accordance with manufacturer's instructions.
- 3.2 Where no mass determination procedure is prescribed by the manufacturer the operator shall use a procedure approved by the CAA Nepal.
- 3.3 Prior to the initial issue of a Certificate of Airworthiness for each aircraft, a list of equipment and other items of load such as fluids in tanks, included in the empty mass should be established. If an operating mass is used, a similar list of removable equipment and disposable load included in the operating mass should also be established. Where a change occurs in the items included in either the empty mass or, if applicable, the operating mass of an aircraft, the appropriate list should be amended by the operator.
- 3.4 Normal precautions must be taken consistent with good practices in the mass determination, ensuring such as:
- (a) aircraft and equipment are checked for completeness in accordance with paragraph 3.3;
 - (b) fluids are properly accounted for;
 - (c) that the aircraft is clean;
 - (d) mass determination is carried out in an closed building, to avoid the effect of wind; and
 - (e) the scales used are properly calibrated and used in accordance with the manufacturer's instructions.
- 3.4 The empty mass and the corresponding centre of gravity position shall be determined and entered in the Weighing Report.

4. WEIGHING REPORT

- 4.1 Upon the aircraft being weighed, the owner or operator of the aircraft shall prepare an Aircraft Weighing Report showing —

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- (a) the Basic Mass of the aircraft, and the position of the centre of gravity of the aircraft when the aircraft contains only the items included in the empty mass, or
 - (b) such other mass and position of their centre of gravity as may be approved by the CAA Nepal in the case of that aircraft.
- 4.2 Aircraft Weighing Report shall be completed in form and manner specified by the manufacturer in flight manual or the aircraft Mass and Balance Schedule. The report must be complete with the Basic Equipment List and must ensure that this accurately defines the condition of the aircraft at the time of weighing.
- 4.3 Whenever a new Weighing Report is issued, a new Mass and Balance Supplement shall be inserted in the Flight Manual as prescribed by Chapter E.4. Additionally, the Weighing Report shall be inserted in the aircraft logbook and the relevant Aircraft Mass and Centre of Gravity Schedule as a permanent record.
- 4.4 Where a manufacturer specified weighing report format is not available, the report shall be prepared in accordance with the format given in Appendix 1 to this Chapter.
- 4.4 The empty mass and empty centre of gravity position should be determined and certified by the person determined in paragraph 3.1 in accordance with the recorded results of the measurements.

5. CHANGE IN BASIC MASS

- 5.1 When an item of Basic Equipment is added, removed or repositioned in an aircraft, calculations must be made to determine the effect on both Empty Mass and the Empty Mass Centre of Gravity. This information should then be used to revise the aircraft Mass and Centre-of-Gravity Schedule or equivalent document.
- 5.2 After completion of modification the total mass and moment for additional equipment given in the appropriate modification document shall be used to revise the aircraft Mass and Centre of Gravity Schedule or equivalent document.
- 5.3 Where the total mass and moment for additional equipment is not quoted in the appropriate modification document, the equipment and any parts used for attachment purposes, such as brackets, nuts, bolts, rivets, sealant, etc. must be accurately weighed. The position of the additional material must then be determined, and its moment calculated relative to the centre of gravity datum.
- 5.4 If there is a change to:
- (a) the empty mass of the aircraft; or
 - (b) the position of the centre of gravity on the aircraft when the aircraft is in its empty mass configuration;
- the owner or operator must ensure that the record of the required information is updated before the aircraft is released for flight after the weighing.

6. WEIGHING EQUIPMENT

- 6.1. Any equipment used for weighing must be properly calibrated, zeroed, and used in accordance with the manufacturer's instructions. Each scale must be calibrated either by

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the manufacturer or by an appropriately authorised organisation within 2 years or within a time period defined by the manufacturer of the weighing equipment, whichever is less. The equipment must enable the mass of the aircraft to be established accurately.

7. MASS AND BALANCE RECORDS

- 7.1 A copy of weighing report containing records of the weighing and the calculations involved shall be made available to the CAA Nepal, and such records shall be retained by the operator. When the aircraft is again weighed the previous weighing record shall be retained with the aircraft records.
- 7.2 The mass and balance record system should include procedures that allows for updating and maintaining a current and continuous record of the mass and Centre of Gravity of the aircraft.
- 7.3 Mass and balance records should reflect changes in mass and balance and list all modifications affecting the mass or balance of the aircraft.
- 7.4 Revised empty mass and Centre of Gravity changes should be identified by the date, aircraft make, model and serial number. The revised mass and balance information should be signed by a qualified and authorised person determined in 3.1.

Civil Aviation Authority of Nepal