



CIVIL AVIATION DIRECTIVE – 8110

INSTALLATION OF REPAIRS

CAAM PART 21 SUBPART M-1

CIVIL AVIATION AUTHORITY OF MALAYSIA

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Introduction

In exercise of the powers conferred by section 24O of the Civil Aviation Act 1969 [Act 3], the Chief Executive Officer makes this Civil Aviation Directive (CAD) 8110 – Installation of Repairs (CAAM Part 21 Subpart M-1), pursuant to Regulation 21, 24, 31 and 193 of the Malaysia Civil Aviation Regulation (MCAIR) 2016.

This CAD provides the requirement for embodiment of repairs on Malaysian aircraft and for any matters connected therewith.

This CAD 8110 – Installation of Repairs (CAAM Part 21 Subpart M-1) is published by the Chief Executive Officer under section 24O of the Civil Aviation Act 1969 [Act 3] and come into operation on 15th November 2022.

Non-compliance with this CAD

Any person who contravenes any provision in this CAD commits an offence and shall on conviction be liable to the punishment under section 24O of the Civil Aviation Act 1969 [Act 3] and/or under Malaysia Civil Aviation Regulation 2016.



(Datuk Captain Chester Voo Chee Soon)
Chief Executive Officer
Civil Aviation Authority of Malaysia

Civil Aviation Directive components and Editorial practices

This Civil Aviation Directive is made up of the following components and are defined as follows:

Standards: Usually preceded by words such as “*shall*” or “*must*”, are any specification for physical characteristics, configuration, performance, personnel or procedure, where uniform application is necessary for the safety or regularity of air navigation and to which Operators must conform. In the event of impossibility of compliance, notification to the CAAM is compulsory.

Recommended Practices: Usually preceded by the words such as “*should*” or “*may*”, are any specification for physical characteristics, configuration, performance, personnel or procedure, where the uniform application is desirable in the interest of safety, regularity or efficiency of air navigation, and to which Operators will endeavour to conform.

Definitions: Terms used in the Standards and Recommended Practices which are not self-explanatory in that they do not have accepted dictionary meanings. A definition does not have an independent status but is an essential part of each Standard and Recommended Practice in which the term is used, since a change in the meaning of the term would affect the specification.

Tables and Figures: These add to or illustrate a Standard or Recommended Practice and which are referred to therein, form part of the associated Standard or Recommended Practice and have the same status.

Notes: Included in the text, where appropriate, Notes give factual information or references bearing on the Standards or Recommended Practices in question but not constituting part of the Standards or Recommended Practices;

Attachments: Material supplementary to the Standards and Recommended Practices or included as a guide to their application.

It is to be noted that some Standards in this Civil Aviation Directive incorporates, by reference, other specifications having the status of Recommended Practices. In such cases, the text of the Recommended Practice becomes part of the Standard.

The units of measurement used in this document are in accordance with the International System of Units (SI) as specified in CAD 5. Where CAD 5 permits the use of non-SI alternative units, these are shown in parentheses following the basic units. Where two sets of units are quoted it must not be assumed that the pairs of values are equal and interchangeable. It may, however, be inferred that an equivalent level of safety is achieved when either set of units is used exclusively.

Any reference to a portion of this document, which is identified by a number and/or title, includes all subdivisions of that portion.

Throughout this Civil Aviation Directive, the use of the male gender should be understood to include male and female persons.

Record of revisions

Revisions to this CAD shall be made by authorised personnel only. After inserting the revision, enter the required data in the revision sheet below. The '*Initials*' has to be signed off by the personnel responsible for the change.

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Summary of Changes

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1 General

1.1 Citation

- 1.1.1 These Directives are the Civil Aviation Directives 8110 – Installation of Repairs (CAAM Part 21 Subpart M-1) [CAD 8110], Issue 02/Revision 00, and comes into operation on 15th November 2022
- 1.1.2 This CAD 8110 – Installation of Repairs (CAAM Part 21 Subpart M-1), Issue 02/Revision 00 will remain current until withdrawn or superseded.

1.2 Applicability

- 1.2.1 This CAD shall be applicable to:
- a) an organisation that is approved to manufacture aeronautical product under regulation 21 of the MCAR;
 - b) a holder of an approval for the design of repairs under regulation 24 of the MCAR;
 - c) an organisation that is approved to engage in continuing airworthiness management issued under regulation 31 of the MCAR; and
 - d) an organisation that is approved to engage in maintenance of aeronautical product issued under regulation 31 of the MCAR.

1.3 Revocation

- 1.3.1 This CAD revokes Civil Aviation Directives 8110 – Installation of Repairs (CAAM Part 21 Subpart M-1) (CAD 8110) Issue 01/Revision 00, dated 1st May 2021.

1.4 Definition

- 1.4.1 In this CAD, unless the context otherwise requires:
- Aeronautical Product** means any aircraft, aircraft engine, aircraft propeller or a part to be installed thereon;
- AMO** means approved maintenance organisation;
- CAMO** means the organisation that is approved to engage in continuing airworthiness management of an aircraft;
- EASA** means European Union Aviation Safety Agency;
- FAA** means Federal Aviation Administration;
- MCAR** means Civil Aviation Regulations 2016;
- Modification** means a change to the type design of an aeronautical product which is not a repair;

Product Approval Holder means the holder of the design approval for an aeronautical product;

Repair means the restoration of an aeronautical product to an airworthy condition as defined by the appropriate airworthiness requirements;

State of Design means the State having jurisdiction over the organisation responsible for the type design;

STC means supplemental type certificate;

TC means type certificate;

TSO means Technical Standard Order issued by the State of Design; and

Type Certificate means a Type Certificate issued by the Director General under regulation 23 of the MCAR.

2 Repair Compliance

- 2.1 All repairs must comply with airworthiness requirements acceptable to the State of Registry and must be approved with respect to the State of Registry's requirement.
- 2.2 The CAMO of an aircraft has the overall responsibility to ensure that repairs incorporated in their aircraft are approved by the State of Registry accordingly.
- 2.3 All design of repairs to be embodied on Malaysian aircraft shall be:
 - a) approved under requirements of CAD 8106; or
 - b) complies to the requirements of chapter 5 of this CAD.

3 Production or Fabrication of Repair Parts

- 3.1 Parts and appliances to be used for the repair shall be produced or fabricated in accordance with approved data based upon all the necessary design data as provided by the repair design approval holder by:
 - a) an organisation appropriately approved in accordance with CAD 8201;
 - b) an appropriately approved maintenance organisation within its scope of approval; or
 - c) the production organisation under the arrangement with type certificate or supplemental type certificate holder.
- 3.2 Any deviations to the approved data provided by the design approval holder required during production or fabrication shall be deemed as a revision to a repair design and shall be approved accordingly.

4 Repair Embodiment

- 4.1 The embodiment of a repair shall be made in accordance with CAD 8601 or CAD 8602 as appropriate, or by a production organisation appropriately approved in accordance with the privilege under CAD 8201.
- 4.2 The design organisation shall transmit to the organisation managing and performing the repair all the necessary repair instructions.
- 4.3 Any deviations to the repair instructions provided by the design approval holder required during the embodiment of repair shall be deemed as a revision to a repair design and shall be approved accordingly.

5 Aeronautical Product Manufacturer's Repair Design

- 5.1 Repair design data originating from by the holder of the TC, STC, TSO authorisation or product approval holder as applicable are considered approved by CAAM subject to following conditions:
 - a) the repair design is contained in instructions for continued airworthiness manuals (such as the manufacturer's structural repair manual, maintenance manuals and engine manuals) provided by the holder of the TC, STC, TSO authorisation or product approval holder as applicable which are explicitly identified as approved or accepted by the State of Design or designees from the State of Design; or
 - b) the repair design data is approved or accepted by the foreign National Aviation Authority under the scope of an agreement between Malaysia and the foreign state and the repair design data is specified in CAGM 8110; or
 - c) the qualified repair design document in compliance with paragraph 5.2 of this CAD is specified in CAGM 8110.
- 5.2 In order for the repair design to be qualified to comply with paragraph 5.1 c) of this CAD, the following criteria applies:
 - a) the repair design approval holder is the TC, STC, TSO authorisation or product approval holder of the product;
 - b) the repair design is explicitly identified as approved by the State of Design or designees from the State of Design;
 - c) adequate level of information regarding applicable damage and repair provided in the repair design data transmittal;
 - d) the process description of the repair design approval and its transmittal to the operators has been submitted to CAAM; and
 - e) the process submitted in paragraph d) is deemed acceptable by CAAM.

6 Compatibility of Repairs

- 6.1 The CAMO of an aircraft has the ultimate responsibility to verify compatibility with other modifications and repairs before installing any new repairs.
- 6.2 The installer of the repair specified in paragraph 4.1 of this CAD shall survey the aircraft records and the aircraft itself to determine what other modification or repair exist on the aircraft. Any questions of incompatibility with other modifications or repairs arising from the survey shall be referred for resolution to the CAMO of the aircraft.
- 6.3 The CAMO contracting with an installer specified in paragraph 4.1 of this CAD for incorporation of any aircraft modification or repair shall provide the installer with information on all existing modification or repair to the aircraft so that compatibility may be verified. Any questions of repair incompatibility which may arise during installation or in service shall be thoroughly investigated by consultation with the repair design approval authority or repair design approval holder.
- 6.4 In every case of incompatibility between modifications or repairs, the problem shall be corrected and it must be established to the satisfaction of the CAAM of that the repaired aircraft continues to comply with the applicable standards of airworthiness.
- 6.5 The CAMO shall promptly report any repair incompatibilities detected during installation or in service to the repair design approval holder, to the installer and to CAAM.

7 Records

- 7.1 The CAMO of an aircraft shall ensure that:
 - a) Procedure is established to ensure that the repair substantiating data supporting compliance with the airworthiness requirements are retained;
 - b) in addition to the records of design approval and return-to-service approval, the following kind of data that shall be included, as applicable:
 - 1) a master drawing list and the individual drawings, photographs, specifications and records which identify the design change and location on the aircraft;
 - 2) mass and moment change records; and
 - 3) a record of any change in electrical load caused by incorporation of the design change.
 - c) part of the records includes structural repair manual reference, if applicable;

- d) the details of repairs to an aircraft and its major components retained for a minimum period of 12 months after the unit to which the records refer has been permanently withdrawn from service;
 - e) in the event of a temporary change of operator, the records shall be made available to the new operator; and
 - f) In the event of any permanent change of operator, the records shall be transferred to the new operator.
- 7.2 When applicable, the CAMO shall incorporate into the existing operating data supplements to the approved aircraft flight manual, maintenance instructions, instructions for continuing airworthiness and repair instructions pertaining to a repair. The CAMO shall record the incorporation of the required supplements in the appropriate revision logs.
- 7.3 All changes to limited life component limits, if applicable, shall be incorporated in the maintenance programme following the repair design approval.
- 7.4 In the case where the CAMO is also the design approval holder, the operator shall retain the modification design record and the modification embodiment record independently.

8 Embodiment of Repairs Pending Design Data Approval

- 8.1 A partial embodiment of repairs on aircraft may be required before the complete repair design is approved (e.g. for damage assessment or repair design development purpose) with the involvement of the repair design approval holder, the AMO and the CAMO of an aircraft.
- 8.2 The repair design approval holder may provide instructions to the CAMO by any means during the repair design development process. The CAMO shall ensure that the instructions are transcribed accordingly to a common work card or worksheet system and they shall be clearly identified as “unapproved data”. The “unapproved data” may be used by the AMO for the embodiment of the repair, however, maintenance release shall not be issued.
- 8.3 When the repair design data has been approved, the CAMO shall ensure that there are no deviations to the approved repair design data in comparison to the common work card or worksheet established in paragraph 8.2 of this CAD. A new set of a common work card or worksheet shall be issued by the CAMO based on the approved repair design data. The AMO shall then certify the repair in accordance with the new set of common work card or worksheet issued by the CAMO before issuing maintenance release.



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