



Advisory Circular

AC66-2.33

Revision 2 (0)

Aircraft Maintenance Engineer Licence — Airframe Overhaul (Subject 009)

14 December 2021

General

Civil Aviation Authority Advisory Circulars contain information about standards, practices, and procedures that the Director has found to be an **Acceptable Means of Compliance (AMC)** with the associated rule.

An AMC is not intended to be the only means of compliance with a rule, and consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices, or procedures are found to be acceptable they will be added to the appropriate Advisory Circular.

An Advisory Circular may also include **guidance material (GM)** to facilitate compliance with the rule requirements. Guidance material must not be regarded as an acceptable means of compliance.

Purpose

This Advisory Circular provides an AMC for the syllabus content in respect of written examinations for Airframe Overhaul.

This Advisory Circular also provides GM for recommended study material in respect of the examination syllabi in this Advisory Circular.

Related Rules

This Advisory Circular relates specifically to Civil Aviation Rule Part 66 Subpart E - Certificate of Inspection Authorisation.

Change Notice

Subject to “Memorandum for Technical Cooperation” between the CAA of Mongolia and New Zealand on mutual cooperation in implementation of the International Civil Aviation Organization Resolution of Global Rule Harmonization, which urges States to promote global harmonization of national rules, dated 6th of May, 1999, Mongolian Civil Aviation Safety Regulation has been reconciled to the Civil Aviation Regulation of New Zealand.

Amendment 164 of Annex 1 to the Chicago Convention on International Civil Aviation urges flight crew members, ATC personnel and aircraft maintenance engineers to comply with the language proficiency requirements; and

Under Article 14 of the Civil Aviation Law of Mongolia 1999, “Use of foreign language in civil aviation” the AC has been released in English version only, in order to prevent any mistranslation and misuse of the aviation safety related documents.

In Revision 2, editorial changes were made to standardize formatting and to correct references specific to New Zealand.

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Eligibility requirements

Rule 66.203(3) requires an applicant for a certificate of inspection authorisation to have passed an examination in airframe overhaul that is acceptable to the Director.

The examinations acceptable to the Director should comply with the syllabus contained in this Advisory Circular.

Knowledge Levels

This syllabus provides for the subject material covered in the Airframe Overhaul examinations.

Each topic within the syllabus has a level number which provides an indication of the degree or level of knowledge required. There are three level numbers and they are defined as follows:

Level 1: A familiarisation with the principal elements of the subject

Objectives: The applicant should be:

- 1) familiar with the basic elements of the subject
- 2) able to give simple descriptions of the whole subject, using common words and examples
- 3) able to use typical terms.

Level 2: A general knowledge of the theoretical and practical aspects of the subject

An ability to apply the knowledge.

Objectives: The applicant must be able to:

- 1) understand the theoretical fundamentals of the subject
- 2) give a general description of the subject using, as appropriate, typical examples
- 3) use mathematical formulae in conjunction with physical laws describing the subject
- 4) read and understand sketches, drawings and schematics describing the subject
- 5) apply his/her knowledge in a practical manner using detailed procedures

Level 3: A detailed knowledge of the theoretical and practical aspects of the subject.

A capacity to combine and apply the separate elements of knowledge in a logical and comprehensive manner.

Objectives: The applicant must:

- 1) know the theory of the subject and the interrelationships with other subjects
- 2) be able to give a detailed description of the subject using theoretical fundamentals and specific examples
- 3) understand and be able to use mathematical formulae related to the subject
- 4) be able to read, understand and prepare sketches, simple drawings and schematics describing the subject
- 5) be able to apply his/her knowledge in a practical manner using manufacturer's instructions
- 6) be able to interpret results and measurements from various sources and apply corrective action where appropriate.

Subject 9

Airframe Overhaul

Resource Study Material

This resource study guide is produced to show where suitable material may be obtained. CAA is not bound to use these books for examining purposes, nor is CAA liable if these books are unavailable at commercial bookshops. You are advised that this list is a sample only. Many other titles may be equally as helpful in preparing for this examination.

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| 1. | A & P Mechanics Airframe Handbook | AC65-15A |
| 2. | EA AC43-13-1A and 2. | |
| 3. | Aircraft Sheet Metal Construction & Repair | EA-SMF |
| 4. | Aircraft Corrosion Control | EA-CC1. |
| 5 | Aircraft Painting and Finishing | EA-AP-2. |
| 6 | Aircraft Bonded Structure | EA-NMP. |
| 7 | FAA AC120-17A, Maintenance Control by Reliability Methods | |
| 8 | FAA FAR 23 and 25 | |
| 9 | Welding Guidelines | EA-WB |

The following books are acceptable alternatives to the A & P Handbooks. EA-ITP-GB General, EA-ITP-AB Airframe, EA-ITP-P Powerplant.

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| 1. | NON DESTRUCTIVE TESTING OF STRUCTURES | 2 | Magnetic particle inspection. Dye Penetrant inspection. Radiography. Ultrasonic testing. Eddy current testing. Visual inspection. Interpretation of test results. NDT Operator Qualification. |
| 2. | WELDING, BRAZING, SOFT SOLDERING & HARD SOLDERING | 2 | Use and application. Approved welders - limitations, periodic testing. Support, preheat, pressure relief. Cleaning and preparation. Fluxes, and filler and welding rods. |

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| | | | <p>Weldable and non-weldable materials.</p> <p>Strength of welded joints.</p> <p>Inspection before, during, and after welding.</p> <p>Pre and Post treatments.</p> <p>Welding processes including:</p> <ul style="list-style-type: none"> • Oxy-acetylene • Electric Arc • Tungsten inert gas • Metal inert gas • Spot welding • Shielded metal spot welding. <p>Expansion and contraction of metals.</p> <p>Metal cutting.</p> |
| 3. | AIRCRAFT PAINTING | 2 | <p>Finishing materials.</p> <p>Paint touch-up.</p> <p>Identification of paint finishes</p> <p>Paint removal.</p> <p>Restoration of paint finishes.</p> <p>Acrylic nitro-cellulose lacquer finishes.</p> <p>Epoxy finishes.</p> <p>Polyurethane finishes.</p> <p>Enamel finishes.</p> |
| | | 2 | <p>Paint system compatibility.</p> <p>Methods of applying finishes.</p> <p>Preparation of paint.</p> <p>Common paint troubles.</p> <p>Dopes and doping.</p> <p>Anticorrosive internal finishes.</p> <p>Chemical solvents.</p> <p>Materials handling safety and painting precautions.</p> |

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| 4. | CORROSION | 3 | <p>Corrosion control.</p> <p>Forms of corrosion.</p> <p>Factors affecting corrosion.</p> <p>Preventative maintenance.</p> <p>Corrosion prone areas.</p> <p>Corrosion removal.</p> <p>Corrosion of ferrous materials.</p> <p>Corrosion of aluminium and aluminium alloys.</p> <p>Corrosion of magnesium alloys.</p> <p>Treatment of titanium and titanium alloys.</p> <p>Protection of dissimilar metal contacts.</p> <p>Corrosion limits.</p> <p>Processes and materials used in corrosion control.</p> <p>Chemical treatments.</p> |
| 5 | RELIABILITY FUNDAMENTALS & AIRCRAFT STRUCTURAL MAINTENANCE CONCEPTS | 1 | <p>Loads on an aircraft in flight.</p> <p>Ground loads.</p> <p>Design concepts FAR 23 and 25.</p> <p>Factor of safety.</p> <p>Damage tolerance.</p> <p>Fail-safe.</p> <p>Safe-life.</p> <p>Principal structural elements.</p> <p>Primary structure.</p> <p>Secondary structure.</p> <p>Single load paths.</p> |
| | | 1 | <p>Multiple Load Paths.</p> <p>Structural deterioration through:</p> <ul style="list-style-type: none"> • Fatigue • Corrosion • Stress corrosion cracking • Impact damage • Abrasion and erosion |

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| | | <ul style="list-style-type: none"> • Wear • Cleanliness. <p>Methods of limiting structural deterioration.</p> <p>Redundancy.</p> <p>Maintenance criteria:</p> <ul style="list-style-type: none"> • Hard Time • On condition • Condition monitoring. <p>Scheduled maintenance.</p> <p>Unscheduled maintenance.</p> <p>Reliability.</p> <p>Importance of reliability</p> <p>Failure considerations including:</p> <ul style="list-style-type: none"> • Failure detection methods • Consequences of failure • Failure rates • Meantime between failure. <p>Maintenance Programs:</p> <ul style="list-style-type: none"> • Equalised maintenance • Opportunity maintenance • Centralised and decentralised maintenance • Structural inspection programs • Supplementary inspection programs • Failure in ageing aircraft. <p>Structural symmetry and alignment checks.</p> <p>Heavy landing inspections and inspections after abnormal flight loads.</p> <p>Identification of stress raisers and stress defects.</p> |
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| 6 | TECHNICAL REPORT | 1 | The candidate may be required to write a brief technical report with sketches on an aircraft structures topic or structural defect. |
| 7 | QUALITY CONTROL & AIRWORTHINESS | 1 | Purpose of quality control. Typical quality control system. Methods of quality assurance. Function and responsibility of a Chief Inspector and QA staff. |

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