

Revision 0

### Aircraft Maintenance Engineer Licence — Airframe Overhaul (Subject 009)

1 December 2008

#### 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

This is a new Advisory Circular that contains, unchanged, all the information (resource study material, scope and outline syllabus) for Airframe Overhaul (Subject 009) previously promulgated in AC66-2.4

AC66-2.4 now contains the objectivised syllabus for Subject 4 (Aeroplanes 1).

Published by  
Civil Aviation Authority  
PO Box 31441  
Lower Hutt

Authorised by  
Manager Rules Development

## Table of Contents

Eligibility requirements .....	3
Knowledge Levels .....	3
Subject 9 .....	4
Airframe Overhaul .....	4

## **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: General appreciation of principles and a broad understanding of the subject.
- Level 2: Comprehension of principles and salient features. Simple relevant calculations may be required.
- Level 3: Detailed knowledge of all aspects of the subject including relevant calculations.

## 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.

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.*

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	<p>Use and application.</p> <p>Approved welders - limitations, periodic testing.</p> <p>Support, preheat, pressure relief.</p> <p>Cleaning and preparation.</p> <p>Fluxes, and filler and welding rods.</p> <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"><li>• Oxy-acetylene</li><li>• Electric Arc</li><li>• Tungsten inert gas</li><li>• Metal inert gas</li><li>• Spot welding</li><li>• Shielded metal spot welding.</li></ul> <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>
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"> <li>• Fatigue</li> <li>• Corrosion</li> <li>• Stress corrosion cracking</li> <li>• Impact damage</li> <li>• Abrasion and erosion</li> <li>• Wear</li> <li>• Cleanliness.</li> </ul> <p>Methods of limiting structural deterioration.</p> <p>Redundancy.</p> <p>Maintenance criteria:</p> <ul style="list-style-type: none"> <li>• Hard Time</li> <li>• On condition</li> <li>• Condition monitoring.</li> </ul> <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"> <li>• Failure detection methods</li> <li>• Consequences of failure</li> <li>• Failure rates</li> <li>• Meantime between failure.</li> </ul> <p>Maintenance Programmes:</p> <ul style="list-style-type: none"> <li>• Equalised maintenance</li> <li>• Opportunity maintenance</li> <li>• Centralised and decentralised maintenance</li> <li>• Structural inspection programmes</li> <li>• Supplementary inspection programmes</li> <li>• Failure in ageing aircraft.</li> </ul> <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>
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	<p>Purpose of quality control.</p> <p>Typical quality control system.</p> <p>Methods of quality assurance.</p> <p>Function and responsibility of a Chief Inspector and QA staff.</p>