Hong Kong Aviation Requirements

HKAR-66

Licensing of Maintenance Personnel (Certifying Staff - Maintenance)

Issue 3 Revision 3
31 August 2023

CAD 66
Civil Aviation Department
HONG KONG, CHINA

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Please note that HKAR-66 is available at CAD website:
https://www.cad.gov.hk/english/airworthiness.html

Hardcopies will not be published.

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(CERTIFYING STAFF - MAINTENANCE)

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FOREWORD

1. The Civil Aviation Department of the Hong Kong Special Administrative Region (HKSAR) of the People's Republic of China has published comprehensive and detailed aviation requirements, referred to as the Hong Kong Aviation Requirements (HKARs) with a view to setting up standards and minimising type certification problems, to facilitate the export and import of aviation products, to make it easier for maintenance carried out in Hong Kong. In addition, maintenance personnel should be trained and qualified to an international standard to assist the aviation industry in obtaining suitable staff.

2. Article 12 of the Air Navigation (Hong Kong) Order 1995 gives the Chief Executive of the Hong Kong Special Administrative Region authority of granting aircraft maintenance licences, subject to such conditions as he thinks fit, upon his being satisfied that the applicant is a fit person to hold the licence and furnished such evidence and passed such examinations and test as the Chief Executive may require of him for the purpose of establishing that he has sufficient knowledge, experience, competence and skill in aeronautical engineering.

3. The requirements of this HKAR-66 recognise the Standards prescribed by the Annex 1 to the Convention on International Civil Aviation of the International Civil Aviation Organisation for the grant and extension of licences.

4. Part-66 of the European Aviation Safety Agency (EASA) has been selected to provide where appropriate the content of the HKAR-66.

5. HKAR-66 became effective on 1 April 2002 and was fully implemented by 1April 2004.

6. 'HKAR-2' means Hong Kong Aviation Requirements – Administrative & Guidance Material.

7. 'HKAR-145' means Hong Kong Aviation Requirements – Approved Maintenance Organisations.

8. 'HKAR-147' means Hong Kong Aviation Requirements – Approved Maintenance Training/Examinations.

9. 'HKAR-AMEL' means Hong Kong Aviation Requirements – Aircraft Maintenance Engineer Licence.

10. Amendments are incorporated into the text by means of a 'Revision' or a complete 'Re-issue'.

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CHECKLIST OF PAGES

ISSUE 1, dated 1 December 2000
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ISSUE 1 Revision 2, dated 30 September 2002
ISSUE 1 Revision 3, dated 16 September 2008
ISSUE 2, dated 20 February 2009
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ISSUE 2 Revision 2, dated 10 December 2012
ISSUE 2 Revision 3, dated 31 January 2013
ISSUE 2 Revision 4, dated 30 January 2014
ISSUE 2 Revision 5, dated 30 October 2015
ISSUE 2 Revision 6, dated 31 August 2016
ISSUE 3, dated 8 November 2018
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PREAMBLES

The preambles are intended to be a summarised record of the main changes introduced by each amendment of HKAR-66.

ISSUE 1 ***1 December 2000***

New requirement for the maintenance certifying staff to qualify for the issuing of certificates of release to service.

It should be noted that HKAR-66 is applicable to the release to service of aeroplanes and helicopters.

ISSUE 1 Revision 1 ***1 April 2002***

Amend the effective and compliance dates stated in HKAR 66.3 from 1 January 2002 and 1 January 2004 to 1 April 2002 and 1 April 2004 respectively.

ISSUE 1 Revision 2 ***30 September 2002***

Added a new Appendix 4 to Section 2 to provide guidance to complete the Record of Experience.

ISSUE 1 Revision 3 ***16 September 2008***

Revised the suggested study material in Appendix 3 to Section 2.

ISSUE 2 ***20 February 2009***

– Changed the structure of the HKAR-66 publication. There are four sections where Section 1 contains the requirements and Sections 2, 3 and 4 contain the Acceptable Means of Compliance (AMC), the Guidance Material (GM) and the Appendices respectively.

– Aligned, as applicable, the paragraph contents and numbering of the HKAR-66 to those of EASA Part 66.

– Transferred applicable paragraphs from HKAR 66.1 General to HKAR 66.70 Conversion provisions.

– Amended definitions of CAD and Director-General in HKAR 66.5

– Amended HKAR 66.15 Eligibility to state that applicant shall be at least 18 years of age.

– Amended HKAR 66.30 Experience requirements to align with EASA Part 66.

– Amended HKAR 66.40 Continuity of the aircraft maintenance licence to reflect a maximum 5 years renewal period.

– Added HKAR 66.70 Conversion provisions to align with EASA Part 66.

– Removed INTERPRETATIVE / EXPLANATORY MATERIAL (IEM) from Section 2. Some of the IEM became Guidance Material (GM) at Section 3.

– Added definition of line and base maintenance at AMC 66.20(a) Privileges.

– Added knowledge and practical training requirements at AMC 66.45(d) Type/task training and ratings to align with EASA Part 66.

– Added AMC 66.70 Conversion provisions to provide information on HKAR-66 licence conversion.

– Added new Section 3 Guidance Material (GM) to provide relevant information.

– Added GM 66.20(b)(3) Privileges to specify the need of a general knowledge of the language used within the maintenance environment of certifying staff.

– Moved Section 2 Appendices 1 to 4 to the new Section 4 Appendices 1 to 4.

– Amended Section 4 Appendix 1 to align with Appendix 1 to EASA Part 66 applicable modules/subject and added Hong Kong Aviation Regulations at Module 10 to include the requirements of Safety Management System and Influence of psychoactive substances.

– Added Section 4 new Appendices 5 to 7.

ISSUE 2 Revision 1 ***30 November 2010***

– Amended HKAR 66.30(b)(2) and AMC 66.30(b) to include a provision to accept three years of practical maintenance experience on operating aircraft for a graduated candidate holding an appropriate engineering degree for Category B applicant.

– Corrected minor typographical error at Section 4 Appendix 1 page 4-APP 1-3 the qualification matrix on basic subjects.

ISSUE 2 Revision 2 ***10 December 2012***

– Amended address and telephone number of CAD in page ii and Appendix 3 of Section 4.

ISSUE 2 Revision 3 ***31 January 2013***

– Amended HKAR 66.20(a)(3) Privileges to change the term “electrical power systems” to electrical systems.

– Amended Section 4 Appendix 1 - Basic Knowledge Requirements on Module 13 and 14 to align with EASA Part 66.

– Amended Section 4 Appendix 4 Table 1 and Table 2.

– Amended Section 4 Appendix 5 paragraph 2 - Type Training Standard for Category B2 certifying staff.

– Amended Section 4 Appendix 7 - Aircraft Type Practical Experience List of Tasks to add tasks on Integrated Modular Avionics (ATA 42), Cabin Systems (ATA 44) and Information Systems (ATA 46).

ISSUE 2 Revision 4 ***30 January 2014***

– Amended HKAR 66.1 - General to include Category B2*. Note was changed to Note 1 and added Note 2.

– Amended HKAR 66.5 - Added definitions of "Electrical system", "Avionics system" and "Simple test".

– Amended HKAR 66.10 - to reflect application form required to be submitted to the Director-General.

– Amended HKAR 66.20 - Privileges to define the certification privileges of Category B2*. Note was changed to Note 1 and added Note 2.

– Amended Section 4 Appendix 1 - Basic Knowledge Requirements in Module 13 and 14 to reflect the requirements for Category B2 and B2*.

– Amended Section 4 Appendix 3 – Suggested Study Material to add reference materials for Module 13.

– Amended Section 4 Appendix 4 – Record of Experience Table 1 to reflect the requirements for Category B2 and B2*.

– Amended Section 4 Appendix 5 – Type Training and Examination Standard paragraph 2 to reflect the requirements of type training standards for Category B2 and B2*.

ISSUE 2 Revision 5 ***30 October 2015***

– Changed the aircraft ratings endorsement of aircraft maintenance licences to include group and subgroup ratings to align with the EASA Part 66.

– Aligned, as applicable, the paragraph contents of the HKAR-66 to those of the EASA Part 66.

– Amended Section 4 Appendix 1 – To align with the EASA Part 66 applicable modules/subject, basic knowledge requirements in various modules to reflect the requirements for Category B3.

– Amended Section 4 Appendix 4 – Record of Experience Table 1 to include additional experience requirements on ATA 42, 44, 45 and 46 for various Licence Categories.

– Amended Section 4 Appendix 5 – In particular added the nominal time spending to answer a type examination question and the number of questions in a type examination in paragraph 4.

– Amended Section 4 Appendix 7 – Aircraft Type Practical Experience List of Tasks to add tasks on various ATA chapters.

ISSUE 2 Revision 6 ***31 August 2016***

– Amended HKAR 66.25 – To include the requirement of accrediting HKAR-147 Certificate of Recognition (CoR) as an acceptable basic knowledge qualification for the HKAR-66 AML application.

ISSUE 2 Revision 7 ***31 March 2017***

– Amended Section 4 Appendix 3 – To update the publication website.

Amended Section 4 Appendix 5 – Added the maximum number of training hours per day and minimum participation time for the theoretical element of the aircraft type training course to align with the EASA Part 66 AMC to Appendices.

ISSUE 3 ***8 November 2018***

– Added full names and abbreviations of HKAR-2, HKAR-145, HKAR-147 and HKAR-AMEL and editorial changes in Foreword.

– Retitled HKAR 66.1 to "Scope", moved the contents of 66.1(b) and Note 2 to 66.3, and deleted the remaining information.

– Renumbered and relocated the contents of HKAR 66.2 as HKAR 66.5 "Aircraft groups".

– Deleted the original HKAR 66.3 "Effectively" and added a new HKAR 66.3 "Licence categories".

– Renumbered HKAR 66.5 as HKAR 66.2 "Definitions", added definitions of "Complex maintenance tasks", "Complex motor-powered aircraft" and "Minor scheduled line maintenance", and relocated definitions of "Electrical system", "Avionics system", and "Simple test" to GM 66.20(a).

– Customised HKAR 66.10 to reflect CAD processes.

– Amended HKAR 66.20 to add privileges to category B2 licence holder for issuing certificates of release to service following minor scheduled line maintenance and simple defect rectification, and added situation for holder of type-rated licence for simple light aeroplanes and some helicopters as determined by the Director-General in HKAR 66.20 (b)(1).

– Added new HKAR 66.25(c).

– Retitled HKAR 66.30 to "Basic experience requirements", editorially changed and renumbered the sub-paragraphs, and added new HKAR 66.30(f).

– Retitled HKAR 66.40 to "Continued validity of the aircraft maintenance licence", editorially changed and renumbered the sub-paragraphs, and added new HKAR 66.40(b).

– Amended HKAR 66.45 and renumbered the sub-paragraphs.

– Renumbered HKAR 66.47 "Limitations "to HKAR 66.50.

– Renumbered HKAR 66.50 "Medical fitness" to HKAR 66.47.

– Editorially changed HKAR 66.55, and changed the reasonable time of showing the licence from 5 working days to 24 hours to align with HKAR-145.

– Editorially changed HKAR 66.70 and added a new sub-paragraph (e).

– Moved contents of AMC 66.20(a) to GM 66.20(a).

– Editorially changed AMC 66.20(b)3 to reflect HKAR-AMEL.

– Added a new paragraph 4 to AMC 66.25 to reflect CAD policy and renumbered other paragraphs of AMC 66.25.

– Retitled AMC 66.30 to "Basic experience requirements", and amended the paragraph as 66.30(b).

– Retitled "AMC 66.45(b)(3), (c)(1)iii and (c)(2)i" to "AMC 66.45(d), (e) 3, (f) 1 and (g)1".

– Renumbered AMC 66.47 (b) "Limitations" as AMC 66.50(b).

– Added a new paragraph "Medical fitness" and assigned as GM 66.47.

– Amended the module numbers in AMC 66.70 paragraph 5 to align with Section 4 Appendix I.

– Added a new paragraph GM 66.3, of which the contents were from the old GM 66.20(a)2.

– Editorially changed GM 66.20 and renumbered the sub-paragraphs.

– Removed category B2 from GM 66.25(a).

– Deleted GM 66.30(b) and the contents were amended and moved to AMC 66.30(b)4.

– Added a new paragraph 1 to GM 66.40. and renumbered the remaining sub-paragraphs.

– Renumbered GM 66.50 to GM 66.47 “Medical Fitness”.

– Editorially changed GM 66.65.

– Editorially changed Section 4 Appendix I, including renumbered the modules.

– Renumbered Section 4 Appendix 2 “Specimen examination questions” to Section 4 Appendix X.

– Renumbered Section 4 Appendix 3 “Suggested study material” to Section 4 Appendix XI.

– Added new Section 4 Appendix II “Basic examination standard”.

– Added new Section 4 Appendix III “Aircraft type training and examination standard — On the job training” which incorporated the applicable contents of the old Appendix 5 and adopted the applicable requirements of the EASA Regulation (EU) No. 1321/2014. The requirement of ‘On the Job Training shall comprise a period of 4 months’ was removed.

– Moved Section 4 Appendix 4 “Record of Experience” to a new Appendix IX. The original Appendix 6 “Experience requirements for extending a HKAR-66 Aircraft Maintenance Licence” was relocated to Appendix IV.

– Moved the contents of Section 4 Appendix 5 to Appendix III and replaced with a new Appendix V “Application forms”.

– Added Appendix VI “Aircraft maintenance licence referred to in HKAR-66”.

– Moved the contents of Section 4 Appendix 7 “Aircraft type practical experience list of tasks” to the new Section 5 Appendix II “Aircraft type practical experience and on-the-job training - list of tasks”.

– Added new Section 4 Appendix VII “Differences between B2 and B2* in basic knowledge requirements”.

– Added new Section 4 Appendix VIII “Complex maintenance tasks”.

– Added new Section 4 Appendix X “Specimen examination questions” to incorporate the contents of the old Appendix 2.

– Added new Section 4 Appendix XI "Suggested Study Material" to incorporate the contents of the old Appendix 3, and changed reference book "Electrical Technology" to "Electrical and Electronic Technology".

– Added new Section 5 "Appendices to AMCs to HKAR-66".

– Added new Section 5 Appendix I "Aircraft type ratings for HKAR-66 aircraft maintenance licences".

– Added new Section 5 Appendix III "Evaluation of the competence: assessment and assessors".

ISSUE 3 Revision 1 ***15 April 2019***

– Amended Section 2 – To amend typo, changing AMC 66.30(b) to AMC 66.30(a).

– Amended Section 4 Appendix I – To update wording from "Duplicate inspections" to "Duplicate / independent inspection"

– Amended Section 4 Appendix III – To add EDTO wording to ETOPS

ISSUE 3 Revision 2 ***14 March 2022***

– Amended HKAR 66.2 – To editorially change the reference of 'Complex maintenance tasks'.

– Amended HKAR 66.10(a) – To update the reference of DCA 35.

– Amended HKAR 66.10(b) – To update the reference of DCA 35A.

– Amended HKAR 66.10(c) – To update the reference of DCA 35C.

– Amended HKAR 66.20(a)(3)(ii) – To editorially change references of new syllabi in Modules 7A, 13 and 14, and differences between B2 and B2* in basic knowledge requirements in Note 2.

– Amended HKAR 66.25(a) – To editorially change the reference of Section 4 Appendix I in Note

– Amended HKAR 66.30(b) – To update references of minimum civil aircraft maintenance experience requirements and examination for extension of aircraft maintenance licence.

– Amended HKAR 66.40(a) – To update the reference of application for the renewal of aircraft maintenance licence.

– Amended HKAR 66.45(c) – To editorially change the reference of Section 4 Appendix III.

– Amended HKAR 66.45(d) – To editorially change the reference of Section 4 Appendix III.

– Amended HKAR 66.50(c) – To update the reference of removal of limitation.

– Amended HKAR 66.70(b) – To update the reference of qualification conversion.

– Amended HKAR 66.70(d) – To update the reference of conversion from AMEL to HKAR-66 licence.

– Amended HKAR 66.70(e) – To update the reference for conversion of HKAR-66 licence from non HKAR-66 licence.

– Amended AMC 66.20(b)3 – To editorially change references of Section 5 Appendix I and Section 4 Appendix I.

– Amended AMC 66.25(1) & (2) – To editorially change references of Section 4 Appendix I.

– Amended AMC 66.45(d), (e)3, (f)1 and (g) – To editorially change references of Section 5 Appendix II in subparagraph 1 and 2.

– Amended AMC 66.45(e)3 – To editorially change references of Section 5 Appendix I.

– Amended GM 66.45 – To editorially change references of Section 4 Appendix III in paragraph 1 and Note.

– Amended GM 66.45(b) – To editorially change the reference of Section 5 Appendix I.

– Deleted GM 66.65.

– Amended Section 4 Appendix II – To editorially change the reference of essay questions in paragraph 1.4.

– Amended Section 4 Appendix III – To editorially change the 'Appendix III' to 'this Appendix' in paragraph 1(c)(ii).

– Amended Section 4 Appendix III – To editorially change the Category 'B2' to 'B2*' in paragraph 4.1(e).

– Amended Section 4 Appendix III, AMC to Paragraphs 1(b), 3.2 and 4.2 of Appendix III to HKAR-66 'Aircraft Type Training and Examination Standard - On-the-Job Training' – To editorially change the reference of 'HKAR-66 Appendix III' in paragraph 2, 3 and 5.

– Amended Section 4 Appendix III, AMC to Paragraphs 1(c) of Appendix III to HKAR-66 'Aircraft Type Training and Examination Standard - On-the-Job Training' – To editorially change the reference of differences training.

– Amended Section 4 Appendix III, AMC to Paragraphs 3.1 (d) of Appendix III to HKAR-66 'Aircraft Type Training and Examination Standard - On-the-Job Training' – To editorially change the reference of 'HKAR-66 Appendix III' in paragraph 1, 2 and 5(b), (c), (d), and (g).

– Amended Section 4 Appendix III, AMC to Paragraphs 6 of Appendix III to HKAR-66 'Aircraft Type Training and Examination Standard - On-the-Job Training' – To editorially change the reference of 'Section 5 Appendix II' in paragraph 4 and reference for guidance of assessors in paragraph 8.

– Amended Section 4 Appendix V –To update the CAD website for application forms.

– Amended Section 4 Appendix VI – To update the reference for Aircraft Type Ratings for HKAR-66 Aircraft Maintenance Licence in paragraph 6.

– Amended Section 4 Appendix IX – To update the CAD website for DCA 35B in paragraph 2.4 and attached updated sample of DCA 35B.

– Added Section 4 Appendix XII, procedures for initial issue, variation or renewal of HKAR-66 Aircraft Maintenance Licence.

– Added Section 4 Appendix XIII, HKAR-66 Aircraft Maintenance Licence.

– Added Section 4 Appendix XIV, HKAR-66 Aircraft Maintenance Licence type endorsement - Acceptance of aircraft maintenance qualification – type training not issued / approved by the Director-General.

– Added Section 4 Appendix XV, Limitations on HKAR-66 Aircraft Maintenance Licence.

– Added Section 4 Appendix XVI, Procedures and basis for HKAR-66 Aircraft Maintenance Licence examinations.

– Added Section 4 Appendix XVII, HKAR-AMEL to HKAR-66 conversion examinations requirements.

– Added Section 4 Appendix XVIII, exemptions from HKAR-66 examinations.

– Added Section 4 Appendix XIX, HKAR-66 examinations for extensions to basic licence categories.

– Amended Section 5 Appendix I- To update aircraft type rating and codes.

ISSUE 3 Revision 3 ***31 August 2023***

– Amended Section 4 Appendix II – To add the new requirement of split essay examination into separate papers by module and marking standard.

– Amended Section 4 Appendix II – To renumber paragraphs and elaborate the definition of waiting period after a maximum of three attempts.

– Amended Section 4 Appendix II – To add the penalty for candidates who is proven to be cheating or breaching the examination rules.

– Amended Section 4 Appendix VI – To elaborate the requirement for aircraft type endorsement and update the reference in the limitation code table.

– Amended Section 4 Appendix XI – To update the suggested study material list.

– Amended Section 4 Appendix XII – To update the procedures for the initial issue / variation / renewal of the HKAR-66 Aircraft Maintenance Licence.

– Amended Section 4 Appendix XIV – To update the reference of the list of aircraft types.

– Deleted Section 4 Appendix XVI, Procedures and basis for HKAR-66 Aircraft Maintenance Licence examinations.

– Amended Section 4 Appendix XVIII - To update the list of non HKAR-66 licences and the required module examinations.

– Added Section 4 Appendix XX, Certification Privileges for HKAR-AMEL group type ratings transferred onto HKAR-66 AML.

– Amended Section 5 Appendix I- To update aircraft type rating and codes.

SECTION 1 - REQUIREMENTS

1 GENERAL

This Section 1 contains the Requirements for Licensing of Maintenance Personnel (Certifying Staff - Maintenance).

2 PRESENTATION

2.1 The requirements of HKAR-66 are presented in full page width on loose pages, each page being identified by the date of issue or issue/revision number under which it is reissued or amended.

2.2 Sub-headings are in bold typeface.

2.3 Explanatory Notes not forming part of the requirements appear in smaller typeface.

2.4 New, amended and corrected text is indicated by a marginal line.

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HKAR 66.1 Scope

This section defines the aircraft maintenance licence and establishes the requirements for application, issue and continuation of its validity.

HKAR 66.2 Definitions

For the purpose of this HKAR-66, the following definitions shall apply:

'Aircraft maintenance licence' means a document issued as evidence of qualification confirming that the person to whom it refers has met the HKAR-66 knowledge and experience requirements for any aircraft basic category and aircraft type rating specified in the document.

'CAD' means Civil Aviation Department of the Hong Kong Special Administrative Region of the People's Republic of China.

'Certification' means the issuance of a certificate of release to service.

'Complex maintenance tasks' means the tasks listed in Section 4 Appendix VIII.

'Complex motor-powered aircraft' means:

(i) an aeroplane:

- with a maximum certificated take-off mass exceeding 5700 kg, or
- certificated for a maximum passenger seating configuration of more than nineteen, or
- certificated for operation with a minimum crew of at least two pilots, or
- equipped with (a) turbojet engine(s) or more than one turboprop engine,

OR

(ii) a helicopter:

- for a maximum certificated take-off mass exceeding 3175 kg, or
- certificated for a maximum passenger seating configuration of more than nine, or
- certificated for operation with a minimum crew of at least two pilots,

OR

(iii) a tilt rotor aircraft.

'Director-General' means the Director-General of Civil Aviation who is authorised for the purpose under the Air Navigation (Hong Kong) Order 1995 by the Chief Executive of the

Hong Kong Special Administrative Region of the People's Republic of China and includes any person who is delegated for that purpose.

'Full GROUP 3 RATING' means a group rating classified for group 3 aircraft.
An example of this kind of group rating to be printed on the licence is shown below:

"Full group 3"

'Full SUBGROUP RATING' means a group rating classified for group 2 aircraft under a single subgroup. An example of this kind of group rating to be printed on the licence is shown below:

"Full subgroup 2b"

'Large aircraft' means an aircraft, classified as an aeroplane with a maximum take-off mass (MTOM) of more than 5700 kg, or multi-engined helicopter.

'Manufacturer SUBGROUP RATING' means a group rating classified for either a subgroup 2a, subgroup 2b, or subgroup 2c aircraft under the same manufacturer. An example of this kind of group rating to be printed on the licence is shown below:

"Subgroup 2c (Robinson)"

'Minor scheduled line maintenance' means any minor scheduled inspection / check up to and including a weekly check specified in the aircraft maintenance programme. For aircraft maintenance programmes that do not specify a weekly check, the Director-General will determine the most significant check that is considered equivalent to a weekly check. This definition is for the purposes of HKAR 66.20(a)(1) and HKAR 66.20(a)(3)(ii) personnel.

'Organisation procedures' means the procedures applied by the HKAR-145 Approved Maintenance Organisations in accordance with the maintenance organisation exposition within the scope of the approval.

'Simple light aeroplane' means a piston-engine non-pressurised aeroplane with MTOM of 2000 kg and below, and not fitted with a full authority coupled autopilot/flight director.

'**Wooden aeroplane'** means an aeroplane fitted with wooden wing spars.

HKAR 66.3 Licence categories
(See GM 66.3)

(a) Aircraft maintenance licences include the following categories:

Category A
Category B1
Category B2/B2*
Category B3
Category C

(b) Categories A and B1 are subdivided into subcategories relative to combinations of aeroplanes, helicopters, turbine and piston engines. These subcategories are:

A1 and B1.1 Aeroplanes Turbine
A2 and B1.2 Aeroplanes Piston
A3 and B1.3 Helicopters Turbine
A4 and B1.4 Helicopters Piston

Note: All descriptions and requirements applicable to category B2 are also applicable to category B2*. Also, additional descriptions and requirements are included for category B2*.

(c) Category B3 is applicable to piston-engine non-pressurised aeroplanes with MTOM of 2000 kg and below.

HKAR 66.5 Aircraft groups

For the purpose of ratings on aircraft maintenance licences, aircraft shall be classified in the following groups:

1. Group 1: complex motor-powered aircraft as well as multiple engine helicopters, aeroplanes with maximum certified operating altitude exceeding FL290, aircraft equipped with fly-by-wire systems and other aircraft requiring an aircraft type rating when defined so by the Director-General.

2. Group 2: aircraft other than those in group 1 belonging to the following subgroups:

Subgroup 2a: single turbo-propeller engine aeroplanes
Subgroup 2b: single turbine engine helicopters
Subgroup 2c: single piston engine helicopters

3. Group 3: piston engine aeroplanes other than those in group 1.

HKAR 66.7 Applicability

(a) This HKAR-66 prescribes the requirements for the qualification of those personnel authorised by a HKAR-145 approved maintenance organisation to issue certificates of release to service.

Such personnel are required to hold a valid type rated, subgroup rated or group rated HKAR-66 aircraft maintenance licence, which attests to their knowledge and experience and in the case of HKAR-145 a valid HKAR-145 certification authorisation which grants certification privileges to the individual.

Note: A type rated, subgroup rated or group rated HKAR-66 aircraft maintenance licence normally does not confer any certification privileges on the holder in their own right. Such licence must be used in conjunction with a certification authorisation unless otherwise accepted by the Director-General.

(b) For the issue of HKAR-66 aircraft maintenance licence compliance is required with HKAR 66.15, HKAR 66.25 and HKAR 66.30 for the appropriate HKAR 66.20 basic category/categories.

The HKAR-66 aircraft maintenance licence will be endorsed with the relevant HKAR 66.20 basic category/categories and where appropriate any aircraft type ratings granted under HKAR 66.45.

Note: The HKAR-66 aircraft maintenance licence can be issued without any aircraft type ratings.

(c) For the issue of HKAR-145 certification authorisation compliance is required with paragraph (b), HKAR 66.40, HKAR 66.45, HKAR 66.50 and HKAR 66.55.

Note: HKAR-145 contains additional requirements to qualify to make certification(s).

(d) This HKAR-66 also prescribes the requirements for the qualification of those personnel who are permitted to issue certificate of release to service under the certification privileges specifically endorsed on the type rated HKAR-66 aircraft maintenance licence.

Note: A type rated HKAR-66 aircraft maintenance licence with certification privileges to make certification(s) is normally limited to simple light aeroplanes and some helicopters, as determined necessary by the Director-General.

HKAR 66.10 Application
(See AMC 66.10)

(a) An application for grant or extension of an aircraft maintenance licence shall be made to the Director-General on CAD Form DCA 35 in accordance with Section 4 Appendix XII.

(b) An application for renewal of an aircraft maintenance licence shall be made to the

Director-General on CAD Form DCA 35A in accordance with Section 4 Appendix XII.

(c) An application for transfer of HKAR-AMEL licence to HKAR-66 aircraft maintenance licence shall be made to the Director-General on CAD Form DCA 35C and in accordance with Section 4 Appendix XVII.

(d) An application for HKAR-66 aircraft maintenance licence written examination shall be made to the Director-General on CAD Form DCA 35E.

(e) Each application shall be supported by documentation to demonstrate compliance with the applicable theoretical knowledge, practical training and experience requirements at the time of application.

(f) Application for category B2 basic licence, category B2 type rating and category B2 group rating is no longer accepted.

HKAR 66.15 Eligibility

An applicant for an aircraft maintenance licence shall be at least 18 years of age.

HKAR 66.20 Privileges
(See AMC 66.20 and GM 66.20)

(a) The following privileges shall apply:

1. A category A aircraft maintenance licence permits the holder to issue certificates of release to service following minor scheduled line maintenance and simple defect rectification within the limits of tasks specifically endorsed on the certification authorisation referred to in HKAR 145.35. The certification privileges shall be restricted to work that the licence holder has personally performed in the maintenance organisation that issued the certification authorisation.

2. A category B1 aircraft maintenance licence shall permit the holder to issue certificates of release to service and to act as B1 support staff following:

   - maintenance performed on aircraft structure, powerplant and mechanical and electrical systems,

   - work on avionic systems requiring only simple tests to prove their serviceability and not requiring troubleshooting.

   Category B1 includes the corresponding A subcategory.

3. A category B2 aircraft maintenance licence shall permit the holder to issue certificates of release to service following maintenance on avionic and electrical system.

A category B2* aircraft maintenance licence shall permit the holder:

(i) to issue certificates of release to service and to act as B2* support staff for following:

- maintenance performed on avionic and electrical systems, and
- electrical and avionics tasks within powerplant and mechanical systems, requiring only simple tests to prove their serviceability.

(ii) to issue certificates of release to service following minor scheduled line maintenance and simple defect rectification within the limits of tasks specifically endorsed on the certification authorisation referred to in HKAR 145.35. This certification privilege shall be restricted to work that the licence holder has personally performed in the maintenance organisation which issued the certification authorisation and limited to the ratings already endorsed in the B2* licence.

Note 1: Category B2 aircraft maintenance licence holder can qualify for any A subcategory subject to compliance with the appropriate A subcategory requirements.

Note 2: The new syllabi in Modules 7A, 13 and 14 came into effect on 1 August 2013 for B2*. Refer to Section 4 Appendix I for details. The differences between B2 and B2* in basic knowledge requirements are tabulated in Section 4 Appendix VII.

4. A category B3 aircraft maintenance licence shall permit the holder to issue certificates of release to service and to act as B3 support staff for:

- maintenance performed on aeroplane structure, powerplant and mechanical and electrical systems,
- work on avionic systems requiring only simple tests to prove their serviceability and not requiring troubleshooting.

5. A category C aircraft maintenance licence shall permit the holder to issue certificates of release to service following base maintenance on aircraft. The privileges apply to the aircraft in its entirety.

Note 1: HKAR-145 specifies the personnel required to support category C certifying staff in base maintenance, including in particular the requirement for qualified category B1 and B2/B2* staff.

Note 2: HKAR-145 does not require a category C certifying staff for the certification of simple light aeroplanes as category B3 or B1.2 or B1.4 covers all maintenance.

(b) The holder of an aircraft maintenance licence may not exercise its privileges unless:

1. in compliance with the applicable requirements of HKAR-145, or the limitations in the licence for simple light aeroplanes and some helicopters as determined necessary by the Director-General, whichever applicable.

2. in the preceding two-year period he/she has, either had six months of maintenance experience in accordance with the privileges granted by the aircraft maintenance licence or, met the provision for the issue of the appropriate privileges.

3. he/she has the adequate competence to certify maintenance on corresponding aircraft; and

4. he/she is able to read, write and communicate to an understandable level in the language(s) in which the technical documentation and procedures necessary to support the issue of the certificate of release to service are written.

HKAR 66.25 Basic knowledge requirements
(See AMC 66.25 and GM 66.25)

(a) An applicant for an aircraft maintenance licence, or the addition of a category or subcategory to such a licence, shall demonstrate by examination a level of knowledge in the appropriate subject modules in accordance with Section 4 Appendix I to this requirement. The examination shall be conducted either by a training organisation appropriately approved in accordance with HKAR-147 or by the Director-General.

Note: HKAR-66 Section 4 Appendix I contains detailed information on levels of knowledge for categories A, B1, B2*, B3 and C.

(b) The training courses and examinations shall be passed within 10 years prior to the application for an aircraft maintenance licence or the addition of a category or subcategory to such aircraft maintenance licence. Should this not be the case, examination credits may however be obtained in accordance with paragraph (c).

(c) The applicant may apply to the Director-General for full or partial examination credit to the basic knowledge requirements for:

1. basic knowledge examinations that do not meet the requirement described in paragraph (b) above; and

2. any other technical qualification considered by the Director-General to be equivalent to the knowledge standard of HKAR-66.

(d) Credits expire 10 years after they were granted to the applicant by the Director-General. The applicant may apply for new credits after expiration.

HKAR 66.30 Basic experience requirements
(See AMC 66.30)

(a) An applicant for an aircraft maintenance licence shall have acquired:

1. for category A, subcategories B1.2 and B1.4 and category B3:

   (i) 3 years of practical maintenance experience on operating aircraft, if the applicant has no previous relevant technical training; or

   (ii) 2 years of practical maintenance experience on operating aircraft and completion of training considered relevant by the Director-General as a skilled worker, in a technical trade; or

   (iii) 1 year of practical maintenance experience on operating aircraft and completion of a basic training course approved in accordance with HKAR-147;

2. for category B2* and subcategories B1.1 and B1.3:

   (i) 5 years of practical maintenance experience on operating aircraft if the applicant has no previous relevant technical training; or

   (ii) 3 years of practical maintenance experience on operating aircraft and completion of training considered relevant by the Director-General as a skilled worker, in a technical trade; or

   (iii) 2 years of practical maintenance experience on operating aircraft and completion of a basic training course approved in accordance with HKAR-147; or

   (iv) 3 years of practical maintenance experience on operating aircraft and completion of training acceptable to CAD for a graduated candidate holding an appropriate engineering degree.

3. for category C with respect to complex motor-powered aircraft:

   (i) 3 years of experience exercising category B1.1, B1.3 or B2/B2* privileges on complex motor-powered aircraft or as support staff according to HKAR 145.35, or, a combination of both; or

   (ii) 5 years of experience exercising category B1.2 or B1.4 privileges on complex motor- powered aircraft or as support staff according to HKAR 145.35, or a combination of both;

4. for category C with respect to other than complex motor-powered aircraft: 3 years of experience exercising category B1 or B2/B2* privileges on other than complex motor-powered aircraft or as support staff according to HKAR 145.35, or a combination of both;

5. for category C obtained through the academic route: an applicant holding an academic degree in a technical discipline, from a university or other higher

educational institution recognised by the Director-General, 3 years of experience working in a civil aircraft maintenance environment on a representative selection of tasks directly associated with aircraft maintenance including 6 months of observation of base maintenance tasks.

(b) An applicant for an extension to an aircraft maintenance licence shall have a minimum civil aircraft maintenance experience requirement appropriate to the additional category or subcategory of licence applied for as defined in Section 4 Appendix IV and take the examination as defined in Section 4 Appendix XIX.

(c) The experience shall be practical and involve a representative cross section of maintenance tasks on aircraft.

(d) At least 1 year of the required experience shall be recent maintenance experience on aircraft of the category/subcategory for which the initial aircraft maintenance licence is sought. For subsequent category/subcategory additions to an existing aircraft maintenance licence, the additional recent maintenance experience required may be less than 1 year, but shall be at least 3 months. The required experience shall be dependent upon the difference between the licence category/subcategory held and applied for. Such additional experience shall be typical of the new licence category/subcategory sought.

(e) Notwithstanding point (a), aircraft maintenance experience gained outside a civil aircraft maintenance environment shall be accepted when such maintenance is equivalent to that required by this HKAR-66 as established by the Director-General. Additional experience of civil aircraft maintenance shall, however, be required to ensure adequate understanding of the civil aircraft maintenance environment.

(f) Experience shall have been acquired within the 10 years preceding the application for an aircraft maintenance licence or the addition of a category or subcategory to such a licence.

HKAR 66.40 Continued validity of the aircraft maintenance licence
(See GM 66.40)

(a) An aircraft maintenance licence shall remain valid for the period as specified in it, but not to exceed 5 years. Upon receipt of an application for renewal in accordance with Section 4 Appendix XII, the Director-General may renew the applicant's licence if being satisfied that he/she is a fit person and appropriately qualified in accordance with HKAR-66.

(b) The holder of an aircraft maintenance licence shall complete the appropriate CAD application form and submit it to the Director-General.

(c) Any certification privilege based upon an aircraft maintenance licence becomes invalid as soon as the aircraft maintenance licence is invalid.

(d) The aircraft maintenance licence is only valid when issued, renewed and / or amended by the Director-General and when the holder has signed the document.

HKAR 66.45 Endorsement with aircraft ratings
(See AMC 66.45 and GM 66.45)

(a) In order to be entitled to exercise certification privileges on a specific aircraft type, the holder of an aircraft maintenance licence need to have his / her licence endorsed with the relevant aircraft ratings.

For category B1, B2*, B3 or C the relevant aircraft ratings are the following:

1. For group 1 aircraft, the appropriate aircraft type rating.
2. For group 2 aircraft, the appropriate aircraft type rating, manufacturer subgroup rating or full subgroup rating.
3. For group 3 aircraft, the appropriate aircraft type rating or full group rating.

For category B3, the relevant rating is 'piston-engine non-pressurised aeroplanes with MTOM of 2000 kg and below'.

For category A, no rating is required, subject to compliance with the requirements of HKAR 145.35.

(b) The endorsement of aircraft type ratings requires the satisfactory completion of the relevant category B1, B2* or C aircraft type training.

(c) In addition to the requirement of paragraph (b), the endorsement of the first aircraft type rating within a given category/subcategory requires satisfactory completion of the corresponding On the Job Training, as described in Section 4 Appendix III.

(d) By derogation from paragraphs (b) and (c), for group 2 and 3 aircraft, aircraft type ratings may also be granted after:

– satisfactory completion of the relevant category B1, B2* or C aircraft type examination described in Section 4 Appendix III, and

– in the case of B1 and B2* category, demonstration of practical experience on the aircraft type. In that case, the practical experience shall include a representative cross section of maintenance activities relevant to the licence category.

In the case of a category C rating for a person qualified by holding an academic degree as specified in point HKAR 66.30(a)(5), the first relevant aircraft type examination shall be at the category B1 or B2/B2* level.

(e) For group 2 aircraft:

1. the endorsement of manufacturer subgroup ratings for category B1 and C licence holders requires complying with the aircraft type rating requirements of at least two aircraft types from the same manufacturer which combined are representative of the applicable manufacturer subgroup;

2. the endorsement of full subgroup ratings for category B1 and C licence holders requires complying with the aircraft type rating requirements of at least three aircraft types from different manufacturers which combined are representative of the applicable subgroup;

3. the endorsement of manufacturer subgroups and full subgroup ratings for category B2* licence holders requires demonstration of practical experience which shall include a representative cross section of maintenance activities relevant to the licence category and to the applicable aircraft subgroup.

(f) For group 3 aircraft:

1. the endorsement of the full group 3 rating for category B1, B2* and C licence holders requires demonstration of practical experience, which shall include a representative cross section of maintenance activities relevant to the licence category and to the group 3.

2. for category B1, unless the applicant provides evidence of appropriate experience, the group 3 rating shall be subject to the following limitations, which shall be endorsed on the licence:

G 01 – Aeroplanes with metal tubing structure covered with fabric.

G 02 – Composite structure aeroplanes

G 03 – Metal structure aeroplanes

G 04 – Pressurised aeroplanes (B1.2 licence ONLY)

G 05 – Wooden structure aeroplanes

(g) For the B3 licence:

1. the endorsement of the rating 'piston-engine non-pressurised aeroplanes with MTOM of 2000 kg and below' requires demonstration of practical experience which shall include a representative cross-section of maintenance activities relevant to the licence category.

2. unless the applicant provides evidence of appropriate experience, the rating referred to in paragraph 1 shall be subject to the following limitations, which shall be endorsed on the licence:

G 01 – Aeroplanes with metal tubing structure covered with fabric.

G 02 – Composite structure aeroplanes

G 03 – Metal structure aeroplanes

G 05 – Wooden structure aeroplanes

HKAR 66.47 Medical fitness
(See GM 66.47)

Certifying staff must not exercise the privileges of their certification authorisation if they know or suspect that their physical or mental condition renders them unfit to exercise such privileges.

HKAR 66.50 Limitations
(See AMC 66.50)

(a) Limitations introduced on an aircraft maintenance licence are exclusions from the certification privileges and affect the aircraft in its entirety.

(b) For limitations referred to in HKAR 66.45, limitations shall be removed upon:

1. demonstration of appropriate experience; or

2. after a satisfactory practical assessment performed by the Director-General.

(c) For limitations referred to in HKAR 66.70, limitations shall be removed upon satisfactory completion of examination on those modules / subjects defined in Section 4 Appendix XIX.

HKAR 66.55 Evidence of qualification
(See GM 66.55)

Personnel exercising certification privileges as well as support staff shall produce their licence, as evidence of qualification, within 24 hours upon request by an authorised person.

HKAR 66.60 Equivalent safety cases
(See AMC 66.60)

The Director-General may exempt any person, required to be qualified in accordance with HKAR-66, from any requirement in HKAR-66 when satisfied that a situation exists not covered by HKAR-66 and subject to compliance with any supplementary condition(s) the Director-General considers necessary to ensure equivalent safety. Such exemption and supplementary condition(s) must be agreed by the Director-General to ensure continued recognition of the person.

HKAR 66.65 Revocation, suspension or limitation of the HKAR-66 aircraft maintenance licence

(a) The Director-General may, on reasonable grounds after due enquiry, revoke, suspend or limit the HKAR-66 aircraft maintenance licence or direct the HKAR-145 approved maintenance organisation to revoke, suspend or limit the HKAR-145 certification authorisation if the Director-General is not satisfied that the holder of the licence and authorisation is a fit and proper person to hold such licence and authorisation subject to the conditions of paragraph (a)(1) or (a)(2) as appropriate.

1. Before revoking or limiting the HKAR-66 aircraft maintenance licence or directing the HKAR-145 approved maintenance organisation, the Director-General must first give at least 28 days notice to the affected party or parties in writing of his/her intention so to do and the reasons for its proposal and must offer the affected party or parties an opportunity to make representations and the Director-General will consider those representations.

2. In the case where the Director-General has determined that the safe operation of the aircraft is adversely affected, the Director-General may in addition to sub-paragraph (a)(1) provisionally suspend the HKAR-66 aircraft maintenance licence without prior notice until the sub-paragraph (a)(1) procedure is complete.

(b) For the Director-General to consider a person to be not a fit and proper person means that there is clear evidence that the person has knowingly carried out or been involved in one or more of the following activities:

1. Obtained the HKAR-66 aircraft maintenance licence and/or the HKAR-145 certification authorisation by falsification of submitted evidence.

2. Failed to carry out requested maintenance combined with failure to report such fact to

the organisation that requested the maintenance.

3. Failed to carry out required maintenance resulting from own inspection combined with failure to report such fact to the organisation for whom the maintenance was intended to be carried out.

4. Negligent maintenance.

5. Falsification of the maintenance record.

6. The issue of a certificate of release to service knowing that the maintenance specified on the certificate of release to service has not been carried out or without verifying that such maintenance has been carried out.

7. Carrying out maintenance or issuing a certificate of release to service when adversely affected by alcohol or drugs.

HKAR 66.70 Conversion provisions

(See AMC 66.70 and GM 66.70)

(a) Personnel qualified to exercise certification privileges in accordance with Hong Kong aviation regulations valid before the effective date of HKAR-66, remain eligible to exercise those privileges.

(b) Personnel undergoing a qualification process equivalent to the appropriate HKAR-66 requirements before 1 April 2004, may complete such qualification process in accordance with Section 4 Appendix XIV. The qualifications gained will be recognised as pre-existing certification privileges in accordance with paragraph (a).

(c) Personnel qualified in accordance with paragraph (a) or (b) must be issued a HKAR-66 aircraft maintenance licence. Limitations will be applied where appropriate to the basic licence and to aircraft types or group ratings reflecting the scope of the certification privileges previously held prior to conversion. To remove limitations, the relevant conversion examinations must be passed and any appropriate experience requirements met.

(d) Personnel holding HKAR-AMEL may apply for conversion to HKAR-66 licence in accordance with Section 4 Appendix XVII.

(e) Personnel holding non HKAR-66 licences, as listed in Section 4 Appendix XVIII may apply for conversion to HKAR-66 licence in accordance with the Appendix.

SECTION 2 - ACCEPTABLE MEANS OF COMPLIANCE (AMC)

1 GENERAL

1.1 This Section contains Acceptable Means of Compliance that has been agreed for inclusion in HKAR-66. Acceptable Means of Compliance (AMC) illustrate a means, or several alternative means, but not necessarily the only possible means by which a requirement can be met.

1.2 Where a particular HKAR paragraph does not have an Acceptable Means of Compliance or any Guidance Material, it is considered that no supplementary material is required.

2 PRESENTATION

2.1 The Acceptable Means of Compliance is presented in full page width on loose pages, each page being identified by the date of issue or the issue/revision number under which it is reissued or amended.

2.2 A numbering system has been used in which the Acceptable Means of Compliance uses the same number as the HKAR paragraph to which it refers. The number is introduced by the letters AMC to distinguish the material from the HKAR itself.

2.3 Explanatory Notes not forming part of the AMC text appear in a smaller typeface.

2.4 New, amended or corrected text is indicated by a marginal line.

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AMC 66.10 Application

1. Maintenance experience should be written up in a manner that the reader has a reasonable understanding of where, when and what maintenance constitutes the experience. A task by task account is not necessary but at the same time a bland statement 'X years maintenance experience completed' is not acceptable. A log book of maintenance experience is desirable and some authorities may require such log book to be kept. It is acceptable to cross refer in the application form to other documents containing information on maintenance.
2. Applicants claiming the maximum reduction in HKAR 66.30(a) total experience based upon having successfully completed HKAR 147.200 approved basic training should include the HKAR-147 certificate of recognition for approved basic training.
3. Applicants claiming reduction in HKAR 66.30(a) total experience based upon having successfully completed technical training in an organisation or institute recognised by the Director-General as a competent organisation or institute, should include the relevant certificate of successful completion of training.

AMC 66.20(b)2 Privileges

The 6 months maintenance experience in 2 years should be understood as consisting of two elements, duration and nature of the experience. The minimum to meet the requirements for these elements may vary depending on the size and complexity of the aircraft and type of operation and maintenance.

1. Duration

   Within an approved maintenance organisation:

   - 6 months continuous employment within the same organisation; or

   - 6 months split up into different blocks, employed within the same or in different organisations

   The 6 months period can be replaced by 100 days of maintenance experience in accordance with the privileges, whether they have been performed within an approved organisation or as independent certifying staff in compliance with the requirements laid down in HKAR-66 except for complex maintenance tasks, or as a combination thereof.

   When licence holder maintains and releases aircraft as the above-mentioned independent certifying staff, in certain circumstances this number of days may even be reduced by 50% when agreed in advance by the Director-General. These circumstances consider the cases where the licence holder happens to be the owner of an aircraft and carries out maintenance on his own aircraft, or where a licence holder maintains an aircraft operated for low utilization, that does not allow the licence holder to accumulate the required experience. This reduction should not be combined with the 20% reduction permitted when carrying out technical support, or maintenance planning, continuing airworthiness management or engineering activities. To avoid a too long period without experience,

the working days should be spread over the intended 6 months period.

2. Nature of the experience:

Depending on the category of the aircraft maintenance licence, the following activities are considered relevant for maintenance experience:

- Servicing;
- Inspection;
- Operational and functional testing;
- Trouble-shooting;
- Repairing;
- Modifying;
- Changing component;
- Supervising these activities;
- Releasing aircraft to service.

For category A licence holders, the experience should include exercising the privileges, by means of performing tasks related to the authorisation on at least one aircraft type for each licence subcategory. This means tasks as mentioned in AMC 145.30(g), including servicing, component changes and simple defect rectifications.

For category B1, B2/B2* and B3, for every aircraft included in the authorisation the experience should be on that particular aircraft or on a similar aircraft within the same licence (sub)category. Two aircraft can be considered as similar when they have similar technology, construction and comparable systems, which means equally equipped with the following (as applicable to the licence category):

- Propulsion systems (piston, turboprop, turbofan, turboshaft, jet-engine or push propellers); and
- Flight control systems (only mechanical controls, hydro-mechanically powered controls or electro-mechanically powered controls); and
- Avionic systems (analogue systems or digital systems); and
- Structure (manufactured of metal, composite or wood).

For licences endorsed with (sub)group ratings:

- In the case of B1 licence endorsed with (sub)group ratings (either manufacturer sub-group or full (sub)group) as defined in HKAR 66.45 the holder should show experience on at least one aircraft type per (sub)group and per aircraft structure (metal, composite, wood).

- In the case of a B2/B2* licence endorsed with (sub)group ratings (either manufacturer subgroup or full (sub)group) as defined in HKAR 66.45 the holder should show experience on at least one aircraft type per (sub)group.

- In the case of a B3 licence endorsed with the rating 'piston-engine non-pressurised aeroplanes with MTOM of 2000 kg and below' as defined in HKAR 66.45, the holder should show experience on at least one aircraft type per aircraft structure (metal, composite, wooden).

For category C, the experience should cover at least one of the aircraft types endorsed on the licence.

For a combination of categories, the experience should include some activities of the nature shown in paragraph 2 in each category.

A maximum of 20% of the experience duration required may be replaced by the following relevant activities on an aircraft type of similar technology, construction and with comparable systems:

- Aircraft maintenance related training as an instructor/assessor or as a student;
- Maintenance technical support / engineering;
- Maintenance management / planning.

The experience should be documented in an individual log book or in any other recording system (which may be an automated one) containing the following data:

- Date;
- Aircraft type;
- Aircraft identification i.e. registration;
- ATA chapter (optional);
- Operation performed i.e. 100 FH check, MLG wheel change, engine oil check and
- complement, SB embodiment, trouble shooting, structural repair, STC embodiment…;
- Type of maintenance i.e. base, line;
- Type of activity i.e. perform, supervise, release;
- Category used A, B1, B2*, B3 or C.
- Duration in days or partial-days

AMC 66.20(b)3 Privileges

The wording 'has the adequate competence to certify maintenance on the corresponding aircraft' means that the licence holder and, if applicable, the organisation where he/she is contracted/employed, should ensure that he/she has acquired the appropriate knowledge, skills, attitude and experience to release the aircraft being maintained. This is essential because some systems and technology present in the particular aircraft being maintained may not have been covered by the training/examination/experience required to obtain the licence and ratings.

This is typically the case, among others, in the following situations:

- Type ratings which have been endorsed on a licence in accordance with Section 5 Appendix I 'Aircraft type ratings for HKAR-66 aircraft maintenance licences' after attending type training/on-the-job training which did not cover all the models/variants included in such rating. For example, a licence endorsed with the rating Airbus A318/A319/A320/A321 (CFM56) after attending type training/on-the-job training covering only the Airbus A320 (CFM56).

- Type ratings which have been endorsed on a licence in accordance with Section 5 Appendix I 'Aircraft type ratings for HKAR-66 aircraft maintenance licences' after a new variant has been added to the rating in Section 5 Appendix I, without performing difference training. For example, a licence endorsed with the rating Boeing 737-600/700/800/900 for a person who already had the rating Boeing 737-600/700/800, without performing any difference training for the Boeing 737-900.

- Work being carried out on a model/variant for which the technical design and maintenance techniques have significantly evolved from the original model used in the type training/on-the- job training.

- Specific technology and options selected by each customer which may not have been covered by the type training/on-the-job training.

- Changes in the basic knowledge requirements of Section 4 Appendix I not requiring re-examination of existing licence holders (grandfathered privileges).

- The endorsement of group/subgroup ratings based on experience on a representative number of tasks/aircraft or based on type training/examination on a representative number of aircraft.

- Persons meeting the requirements of 6 months of experience every 2 years only on certain similar aircraft types as allowed by AMC 66.20(b)2.

- Persons holding a HKAR-66 licence with limitations, obtained through conversion of HKAR-AMEL (HKAR 66.70), where such limitations are going to be lifted after performing the corresponding basic knowledge examinations. In this case, the type ratings endorsed in the licence may have been obtained in the national system without covering all the aircraft systems (because of the previous limitations) and there will be a need to assess and, if applicable, to train this person on the missing systems.

Additional information is provided in AMC 145.35(a).

AMC 66.25 Basic knowledge requirements

1. For an applicant being a person qualified by holding an academic degree in an aeronautical, mechanical or electronic discipline from a recognised university or other higher educational institute the need for any examination will depend upon the course taken in relation to Section 4 Appendix I.

   Note: Any university or other higher educational institute accredited by the Hong Kong Council for Academic Accreditation is recognised by the Director-General.

2. Knowledge gained and examinations passed during previous experiences, for example, in military aviation and civilian apprenticeships will be credited where the Director-General is satisfied that such knowledge and examinations are equivalent to that required by Section 4 Appendix I.

3. The basic knowledge examinations may be conducted by an appropriately approved HKAR-147 training organisation or by the Director-General.

4. The mix of results from module examination conducted by appropriately approved HKAR-147 training organisations and the Director-General is not acceptable.

AMC 66.30(a) Basic experience requirements

1. For a category C applicant holding an academic degree the representative selection of tasks should include the observation of hangar maintenance, maintenance planning, quality assurance, record-keeping, approved spare parts control and engineering development.

2. While an applicant to a category C licence may be qualified by having 3 years experience as category B1 or B2/B2* certifying staff only in line maintenance, it is however recommended that any applicant to a category C holding a B1 or B2/B2* licence demonstrate at least 12 months experience as a B1 or B2/B2* support staff.

3. A skilled worker is a person who has successfully completed a training, acceptable to the Director-General, involving the manufacture, repair, overhaul or inspection of mechanical, electrical or electronic equipment. The training would include the use of tools and measuring devices.

4. Maintenance experience on operating aircraft:

   - Means the experience of being involved in maintenance tasks on aircraft which are being operated by airlines, air taxi organisations, owners, etc:

   - Should cover a wide range of tasks in length, complexity and variety;

   - Aims at gaining sufficient experience in the real environment of maintenance as opposed to only the training school environment.

   - May be gained within different types of maintenance organisations (HKAR-145, FAR-145, etc) or under the supervision of independent certifying staff;

   - May be combined with HKAR-147 approved training so that periods of training can be intermixed with periods of experience, similar to an apprenticeship.

5. A graduated candidate category B applicant holding an appropriate engineering degree

means an applicant holding an academic degree in a technical discipline from a university or other higher educational institution, and has successfully completed a structured training programme acceptable to the Director-General. The 3 years experience means working in a civil aircraft maintenance environment on a selection of tasks including the maintenance planning, quality assurance, and at least 24 months practical experience in line and / or base maintenance.

AMC 66.30(d) Basic experience requirements

1. To be considered as recent experience; at least 50% of the required 12-month recent experience should be gained within the 12-month period prior to the date of application for the aircraft maintenance licence. The remainder of the recent experience should have been gained within the 7-year period prior to application. It must be noted that the rest of the basic experience required by HKAR 66.30 must be obtained within the 10 years prior to the application as required by HKAR 66.30(f).

2. Different aircraft types may be considered to be typical when the construction and operation of the airframe, powerplant, systems including avionic systems are of similar technology.

AMC 66.30(e) Basic experience requirements

1. For category A the additional experience of civil aircraft maintenance should be a minimum of 6 months. For category B1, B2* or B3 the additional experience of civil aircraft maintenance should be a minimum of 12 months.

2. Aircraft maintenance experience gained outside a civil aircraft maintenance environment may include aircraft maintenance experience gained in armed forces, coast guards, police etc. or in aircraft manufacturing.

AMC 66.45(d), (e)3, (f)1 and (g)1 Endorsement with aircraft ratings

1. The 'practical experience' should cover a representative cross section including at least 50% of tasks contained in Section 5 Appendix II relevant to the licence category and to the applicable aircraft type ratings or aircraft (sub)group ratings being endorsed. This experience should cover tasks from each paragraph of the Section 5 Appendix II list. Other tasks than those in the Section 5 Appendix II may be considered as a replacement when they are relevant. In the case of (sub)group ratings, this experience may be shown by covering one or several aircraft types of the applicable (sub)group and may include experience on aircraft classified in group 1, 2 and / or 3 as long as the experience is relevant. The practical experience should be obtained under the supervision of authorised certifying staff.

2. In the case of endorsement of individual type ratings for group 2 and group 3 aircraft, for the second aircraft type of each manufacturer (sub)group the practical experience should be reduced to 30% of the tasks contained in the Section 5 Appendix II relevant

to the licence category and to the applicable aircraft type. For subsequent aircraft types of each manufacturer (sub) group this should be reduced to 20%.

3. Practical experience should be demonstrated by the submission of records or a log book showing the Section 4 Appendix II tasks performed by the applicant. Typical data to be recorded are similar to those described in AMC 66.20(b)2.

AMC 66.45(e) Endorsement with aircraft ratings

1. For the granting of manufacturer subgroup ratings for group 2 aircraft, for B1 and C licence holders, the sentence 'at least two aircraft types from the same manufacturer which combined are representative of the applicable manufacturer subgroup' means that the selected aircraft types should cover the technologies relevant to the manufacturer subgroup in the following areas:

   - Flight control systems (mechanical controls / hydro-mechanically powered controls / electro-mechanically powered controls); and

   - Avionic systems (analogue systems / digital systems); and

   - Structure (manufactured of metal / composite / wood).

   In cases where there are very different aircraft types within the same manufacturer subgroup, it may be necessary to cover more than two aircraft types to ensure adequate representation.

   For this purpose it may be possible to use aircraft types from the same manufacturer classified in group 1 as long as the selected aircraft belong to the same licence subcategory for which the rating will be endorsed.

2. For the granting of full subgroup ratings for group 2 aircraft, for B1 and C licence holders, the sentence 'at least three aircraft types from different manufacturers which combined are representative of the applicable subgroup' means that the selected aircraft types should cover all the technologies relevant to the manufacturer subgroup in the following areas:

   - Flight control systems (mechanical controls / hydro-mechanically powered controls / electro-mechanically powered controls); and

   - Avionic systems (analogue systems / digital systems); and

   - Structure (manufactured of metal / composite / wood).

   In cases where there are very different aircraft types within the same subgroup, it may be necessary to cover more than three aircraft types to ensure adequate representation.

For this purpose it may be possible to use aircraft types from different manufacturers classified in group 1 as long as the selected aircraft belong to the same licence subcategory for which the rating will be endorsed.

3. For manufacturer subgroup ratings, the term 'manufacturer' means the TC holder defined in the certification data sheet, which is reflected in the list of type ratings in Section 5 Appendix I.

   In the case of an aircraft rating where the type rating refers to a TC holder made of a combination of two manufacturers which produce a similar aircraft (i.e. AGUSTA / BELL HELICOPTER TEXTRON or any case of aircraft similarly built by another manufacturer) this combination should be considered as one manufacturer.

   As a consequence:

   - When a licence holder gets a manufacturer type or a manufacturer subgroup rating made of a combination of manufacturers, it covers the combination of such manufacturers.

   - When a licence holder who intends to endorse a full subgroup rating selects three aircraft from different manufacturers, this means from different combinations of manufacturers as applicable.

AMC 66.50(b) Limitations

1. The appropriate experience required to remove the limitations referred in HKAR 66.45(f) and (g) should consist of the performance of a variety of tasks appropriate to the limitations under the supervision of authorised certifying staff. This should include the tasks required by a scheduled annual inspection. Alternatively, this experience may also be gained, if agreed by the Director-General, by theoretical and practical training provided by the manufacturer, as long as an assessment is further carried out and recorded by this manufacturer.

2. It may be acceptable to have this experience on just one aircraft type, provided this type is representative of the (sub)group in relation to the limitation being removed.

3. The application for the limitation removal should be supported by a record of experience signed by the authorised certifying staff or by an assessment signed by the manufacturer after completion of the applicable theoretical and practical training.

AMC 66.60 Equivalent safety cases

All proposed equivalent safety cases should be agreed in principle with the Director-General before they are submitted to the Director-General for consideration as an acceptable case.

AMC 66.70 Conversion provisions

1. HKAR 66.70(a) 'personnel qualified to exercise certification privileges' means:

   - Personnel holding a pre HKAR-66 licence with or without certification privileges, or,
   - Personnel holding a pre HKAR-66 licence with or without certification privileges and a current HKAR-145 certification authorisation, or,
   - Personnel do not hold any Hong Kong licence, but, hold a current HKAR-145 certification authorisation in accordance with that HKAR-145 approved maintenance organisation's approved procedures.

2. HKAR 66.70(b) 'personnel undergoing a qualification process' means:

   - Personnel who have passed some of the examinations leading to a Hong Kong licence, or,
   - Personnel undergoing a course of approved basic or type training.

3. Personnel holding pre HKAR-66 qualifications in accordance with paragraphs HKAR 66.70(a) or (b) will be granted a HKAR-66 aircraft maintenance licence per HKAR 66.70(c) in the appropriate category/subcategory without further examination except that such licence will contain limitations in relation to the certification privileges previous held prior to conversion.

4. Personnel who wish to remove limitations from their HKAR-66 licence as specified in HKAR 66.70(c) or to add other basic category/subcategory to their HKAR-66 licence as specified in HKAR 66.70(d) have to sit and pass the appropriate conversion examinations. Modules / sub-modules, listed in Section 4 Appendix I with the exception of human factors, that are required for conversion examinations should limit to those technical subjects that have not previously been examined and/or not covered by relevant experience by the personnel.

5. The policies with regard to conversion examinations are as follows.

   - With regard to those subjects not previously examined, this means those subjects that are contained in each relevant subject module of Section 4 Appendix I but were not, or are not, specified in the relevant Hong Kong licence standard. Where if the total number of multi-choice questions required for the conversion examination is less than 15, then such conversion examination is not required. This is based on the consideration that the difference in technical knowledge is so minimal that such

examination is deemed not necessary.

- With regard to those subjects covered by relevant experience, this means the knowledge requirement for those subjects that are contained in each relevant subject module of Section 4 Appendix I has been assessed and considered to be satisfied by the applicant's past and current experience. A good example is module M7A 'Maintenance Practices'.

- With regard to sub-paragraphs (a) and (b), it should generally be acceptable to partially exempt personnel from conversion examinations on subject modules in relation to Section 4 Appendix I, dependant upon their existing qualification, expertise and experience as specified in sub-paragraphs (d) and (e).

- 'Mechanical' personnel do not need to be examined in modules M1, M2, M6, M7A or M7B as applicable, M8 or M10 except that to support conversion to module M11A, M11B or M11C as applicable, or M12 personnel will need to be examined in module M8 and to support conversion to module M16 or M17A or M17B as applicable personnel will need to be examined in module M2 subject 2.3. 'Mechanical' personnel will need to be examined in modules M3, M4 M5 and as applicable in whole or in part in modules M11A, M11B or M11C as applicable, M12, M15, M16 or M17A or M17B as applicable unless previously examined under the Hong Kong aviation regulations prior to HKAR-66. Modules M13 and M14 are not relevant to the mechanical discipline.

- 'Avionic' personnel do not need to be examined in modules M1, M2, M4, M6, M7A or M7B as applicable, or M10. 'Avionic' personnel will need to be examined in modules M3, M5, M8, M14 and the applicable parts of module M13 unless previously examined under the Hong Kong aviation regulations prior to HKAR-66. Modules M11A, M11B or M11C as applicable, M12, M15, M16 and M17A or M17B as applicable are not relevant to the avionic discipline.

- The exemption from Human Factors (HF), module M9A, is only applicable to those personnel who have attended a CAD approved HF training course before the conversion.

6. Personnel undertaking conversion to the full HKAR-66 licence will still need to show that they meet the experience requirement of HKAR 66.30.

SECTION 3 - GUIDANCE MATERIAL (GM)

1 GENERAL

1.1 This Section contains Guidance Material that has been agreed for inclusion in HKAR-66.

1.2 Where a particular HKAR paragraph does not have an Acceptable Means of Compliance or any Guidance Material, it is considered that no supplementary material is required.

2 PRESENTATION

2.1 The Guidance Material is presented in full page width on loose pages, each page being identified by the date of issue or the issue/revision number under which it is reissued or amended.

2.2 A numbering system has been used in which the Guidance Material uses the same number as the HKAR paragraph to which it refers. The number is introduced by the letters GM to distinguish the material from the HKAR itself.

2.3 Guidance Material (GM) helps to illustrate the meaning of a requirement.

2.4 Explanatory Notes not forming part of the GM text appear in a smaller typeface.

2.5 New, amended or corrected text is indicated by a marginal line.

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GM 66.3 Licence categories

Individual aircraft maintenance licence holders need not be restricted to a single category. Provided that each qualification requirement is satisfied, any combination of categories may be granted.

GM 66.20 (a) Privileges

1. The following definitions apply:

Avionics system means an aircraft system that transfers, processes, displays or stores analogue or digital data using data lines, data buses, coaxial cables, wireless or other data transmission medium, and includes the system's components and connectors. Examples of avionics systems include the following:

- Autoflight;
- Communication, Radar and Navigation;
- Instruments (see NOTE below);
- In Flight Entertainment Systems;
- Integrated Modular Avionics (IMA);
- On-Board Maintenance Systems;
- Information Systems;
- Fly by Wire Systems (related to ATA27 'Flight Controls');
- Fibre Optic Control Systems.

Note: Instruments are formally included within the privileges of the B2/B2* licence holders. However, maintenance on electromechanical and pitot-static components may also be released by a B1 licence holder.

Base Maintenance means any task falling outside the criteria that are given below for Line Maintenance.

Note: Aircraft maintained in accordance with 'progressive' type programmes need to be individually assessed in relation to this paragraph. In principle, the decision to allow some 'progressive' checks to be carried out is determined by the assessment that all tasks within the particular check can be carried out safely to the required standards at the designated line maintenance station.

Electrical system means the aircraft electrical power supply source, plus the distribution system to the different components contained in the aircraft and relevant connectors. Lighting systems are also included in this definition. When working on cables and connectors which are part of these electrical systems, the following typical practices are included in the privileges:

- Continuity, insulation and bonding techniques and testing;
- Crimping and testing of crimped joints;
- Connector pin removal and insertion;

- Wiring protection techniques.

Line maintenance means any maintenance that is carried out before flight to ensure that the aircraft is fit for the intended flight. It may include:

- trouble shooting;

- defect rectification;

- component replacement with use of external test equipment, if required. Component replacement may include components such as engines and propellers;

- scheduled maintenance and/or checks including visual inspections that will detect obvious unsatisfactory conditions/discrepancies but do not require extensive in depth inspection. It may also include internal structure, systems and powerplant items which are visible through quick opening access panels/doors;

- minor repairs and modifications which do not require extensive disassembly and can be accomplished by simple means;

- for temporary or occasional cases (Airworthiness Directives, hereinafter AD; service bulletins, hereinafter SB) the quality manager may accept base maintenance tasks to be performed by a line maintenance organisation provided all requirements are fulfilled. The Director-General will prescribe the conditions under which these tasks may be performed.

Simple test means a test described in approved maintenance data and meeting all the following criteria:

- The serviceability of the system can be verified using aircraft controls, switches, Built-in Test Equipment (BITE), Central Maintenance Computer (CMC) or external test equipment not involving special training.

- The outcome of the test is a unique go – no go indication or parameter, which can be a single value or a value within an interval tolerance. No interpretation of the test result or interdependence of different values is allowed.

- The test does not involve more than 10 actions as described in the approved maintenance data (not including those required to configure the aircraft prior to the test, i.e. jacking, flaps down, etc, or to return the aircraft to its initial configuration). Pushing a control, switch or button, and reading the corresponding outcome may be considered as a single step even if the maintenance data shows them separated.

Troubleshooting means the procedures and actions necessary, using approved maintenance data, in order to identify the root cause of a defect or malfunction. It may

include the use of BITE or external test equipment.

2. The category B3 licence does not include any A subcategory. Nevertheless, this does not prevent the B3 licence holder from releasing maintenance tasks typical of the A1.2 subcategory for piston-engine non-pressurised aeroplanes with MTOM of 2000 kg and below, within the limitations contained in the B3 licence.

3. The category C licence permits certification of scheduled base maintenance by the issue of a single certificate of release to service for the complete aircraft after the completion of all such maintenance. The basis for this certification is that the maintenance has been carried out by competent mechanics and category B1, B2 / B2* and B3 support staff, as appropriate, have signed for the maintenance tasks under their respective specialisation. The principal function of the category C certifying staff is to ensure that all required maintenance has been called up and signed off by the category B1, B2/B2* and B3 support staff, as appropriate, before issue of the certificate of release to service. Only category C personnel who also hold category B1, B2 / B2* or B3 qualifications may perform both roles in base maintenance.

4. The following titles shown against each category designator provide a readily understandable indication of the job function :

Category A:	Line maintenance certifying mechanic.
Category B1:	Maintenance certifying technician – mechanical.
Category B2/B2*:	Maintenance certifying technician – avionic.
Category B3:	Simple light aeroplane maintenance certifying technician.
Category C:	Base maintenance certifying engineer.

5. Tasks permitted by HKAR 66.20(a)(1) to be certified under the category A certification authorisation as part of minor scheduled maintenance or simple defect rectification are specified in HKAR-145 which contains a typical example list of such tasks.

6. For the purposes of category A minor scheduled line maintenance means any minor check up to but not including the A check where functional tests can be carried out by the aircrew to ensure system serviceability. In the case of an aircraft type not controlled by a maintenance programme based upon the A/B/C/D check principle, minor scheduled line maintenance means any minor check up to and including the weekly check or equivalent.

7. The category B1 and B3 licence also permits the certification of work involving avionic systems, providing the serviceability of the system can be established by a simple self-test facility, other on-board test systems/equipment or by simple ramp test equipment. Defect rectification involving test equipment which requires an element of decision making in its application – other than a simple go / no-go decision – cannot be certified.

8. The category B2/B2* will need to be qualified as category A in order to carry out simple mechanical tasks and be able to make certifications for such work.

GM 66.20(b)2 Privileges

The sentence 'met the provision for the issue of the appropriate privileges' included in HKAR 66.20(b)2 means that during the previous 2 years the person has met all the requirements for the endorsement of the corresponding aircraft rating (for example, in the case of aircraft in Group 1, theoretical plus practical element plus, if applicable, on-the-job training). This supersedes the need for 6 months of experience for the first 2 years. However, the requirement of 6 months of experience in the preceding 2 years will need to be met after the second year.

GM 66.20(b)4 Privileges

1. Holders of a HKAR-66 aircraft maintenance licence may not exercise certification privileges unless they have a general knowledge of the language used within the maintenance environment including knowledge of common aeronautical terms in the language. The level of knowledge should be such that the licence holder is able to:

    - read and understand the instructions and technical manuals used for the performance of maintenance;

    - make written technical entries and any maintenance documentation entries, which can be understood by those with whom they are normally required to communicate;

    - read and understand the maintenance organisation procedures;

    - communicate at such a level as to prevent any misunderstanding when exercising certification privileges.

2. In all cases, the level of understanding should be compatible with the level of certification privileges exercised.

GM 66.25(a) Basic knowledge requirements

The levels of knowledge for each licence (sub)category are directly related to the complexity of the certifications related to the corresponding licence (sub)category, which means that category A should demonstrate a limited but adequate level of knowledge, whereas category B1, B2* and B3 should demonstrate a complete level of knowledge in the appropriate subject modules.

GM 66.40 Continued validity of the aircraft maintenance licence

1. The validity of the aircraft maintenance licence is not affected by recency of maintenance experience whereas the validity of the HKAR 66.20 privileges is affected by maintenance experience as specified in HKAR 66.20(a).

2. The Director-General will issue the HKAR-66 aircraft maintenance licence with a period of five years and the licence holder remains responsible for making application for renewal to the Director-General by completing the relevant sections of CAD Form DCA 35A.

3. Licence will normally be renewed provided that during the 24 months preceding the date of expiry of the licence the holder has been engaged for periods totalling at least six months on the maintenance of operating aircraft.

   Note: Relevant aircraft maintenance activities such as quality auditing or surveillance, teaching in aeronautical engineering subjects or performing duties as a flight engineer are considered as maintenance of operating aircraft.

4. Application for renewal will not be accepted if there are more than 60 days before expiry of the licence.

5. Where the Director-General permits the use of a particular HKAR-66 type, group or subgroup rated aircraft maintenance licence for the release of aircraft that is not required to be maintained by a HKAR-145 approved maintenance organisation, the licence holder has to demonstrate six months of maintenance experience in each 12-month period to ensure continuity of such licence. In the case where it is not possible to demonstrate such maintenance experience, the Director-General will specify the conditions to re-establish continuity of the licence.

6. It is the responsibility of the licence holder to ensure that his licence remains valid. Any certifications, issued by the licence holder after the licence has expired, will be invalidated and the Certificate of Airworthiness of the aircraft being certified will also be affected. In addition, any HKAR-145 certification authorisation granted on the basis of a current licence will be invalidated should that licence expires.

GM 66.45 Endorsement with aircraft ratings

The following table shows a summary of the aircraft rating requirements contained in HKAR 66.45, HKAR 66.50 and Section 4 Appendix III.

The table contains the following:

- The different aircraft groups.

- For each licence (sub)category, which ratings are possible (at the choice of the applicant):

- Individual type ratings.
- Full and/or Manufacturer (sub)group ratings

- For each rating option, which are the qualification options.

- For the B1.2 licence (group 3 aircraft) and for the B3 licence (piston-engine non-pressurised aeroplanes with MTOM of 2000 kg and below), which are the possible limitations to be included in the licence if not sufficient experience can be demonstrated in those areas.

Note: OJT means 'On-the-Job Training' (Paragraph 6 of Section 4 Appendix III) and is only required for the first aircraft rating in the licence (sub)category.

Aircraft rating requirements **Aircraft Groups**	**B1/B3 licence**	**B2* licence**	**C licence**
Group1 Complex motor-powered aircraft. Multiple engine helicopters. Aeroplanes certified above FL290. Aircraft equipped with fly-by-wire. Other aircraft when defined by the Agency.	(For B1) **Individual TYPE RATING** Type training: - Theory + examination - Practical + assessment **PLUS** OJT (for first aircraft in licence subcategory)	 **Individual TYPE RATING** Type training: - Theory + examination - Practical + assessment **PLUS** OJT (for first aircraft in licence subcategory)	 **Individual TYPE RATING** Type training: - Theory + examination

Aircraft rating requirements **Aircraft Groups**	**B1/B3 licence**	**B2* licence**	**C licence**
Group 2 Subgroups: 2a: single turboprop aeroplanes (*) 2b: single turbine engine helicopters (*) 2c: single piston engine helicopters (*) (*) Except those classified in Group 1.	(For B1.1, B1.3, B1.4) **Individual TYPE RATING** (type training + OJT) **or** (type examination + practical experience) **Full SUBGROUP RATING** (type training + OJT) **or** (type examination + practical experience) on at least 3 aircraft representative of that subgroup **Manufacturer SUBGROUP RATING** (type training + OJT) **or** (type examination + practical experience) on at least 2 aircraft representative of that manufacturer subgroup	**Individual TYPE RATING** (type training + OJT) **or** (type examination + practical experience) **Full SUBGROUP RATING** based on demonstration of practical experience **Manufacturer SUBGROUP RATING** based on demonstration of practical experience	**Individual TYPE RATING** type training **or** type examination **Full SUBGROUP RATING** type training **or** type examination on at least 3 aircraft representative of that subgroup **Manufacturer SUBGROUP RATING** type training **or** type examination on at least 2 aircraft representative of that manufacturer subgroup

Aircraft rating requirements **Aircraft Groups**	**B1/B3 licence**	**B2* licence**	**C licence**
Group3 Piston engine aeroplanes (except those classified in Group 1)	(For B1.2) **Individual TYPE RATING** (type training + OJT) **or** (type examination + practical experience) **Full GROUP 3 RATING** based on demonstration of practical experience **Limitations:** - Pressurized aeroplanes - Metal aeroplanes - Composite aeroplanes - Wooden aeroplanes - Metal tubing & fabric Aeroplanes	**Individual TYPE RATING** (type training + OJT) **or** (type examination + practical experience) **Full GROUP 3 RATING** based on demonstration of appropriate experience	**Individual TYPE RATING** type training **or** type examination **Full GROUP 3 RATING** based on demonstration of practical experience
Piston-engine non-pressurized aeroplanes of 2000 kg MTOM and below	(For B3) **FULL RATING "Piston-engine non-pressurized aeroplanes of 2000 kg MTOM and below"** based on demonstration of practical experience **Limitations:** - Metal aeroplanes - Composite aeroplanes - Wooden aeroplanes - Metal tubing & fabric aeroplanes	**Not applicable**	**Not applicable**

GM 66.45(b) Endorsement with aircraft ratings

An aircraft type rating includes all the aircraft models/variants listed in column 2 of Section 5 Appendix I.

When a person already holds a type rating on the licence and such type rating is amended in the Appendix I to AMC to HKAR-66 in order to include additional models/variants, there is no need for additional type training for the purpose of amending the type rating in the licence. The rating should be amended to include the new variants, upon request by the applicant, without additional requirements. However, it is the responsibility of the licence holder and, if applicable, the maintenance organisation where he / she is employed to comply with HKAR 66.20(b)3 and HKAR 145.35(a), as applicable, before he/she exercises certification privileges.

Similarly, type training courses covering certain, but not all the models/variants included in a type rating, are valid for the purpose of endorsing the full type rating.

GM 66.47 Medical fitness

1. Medical opinion considers that alcohol present in the blood stream in any quantity affects the ability to make decisions. It is the responsibility of all certifying staff to ensure that they are not adversely affected.

2. The use of any legally administered drug, or medicines, including those used for the treatment of a disease or disorder, which has been shown to exhibit adverse side effects, which affect the decision making ability of the user, should be administered according to medical advice. No other drugs should be used.

3. Certifying staff are responsible for ensuring that their physical condition does not adversely affect their ability to satisfactorily certify the work for which they are responsible. Eyesight, including, where applicable, colour vision, is particularly important in this respect.

4. In the context of this HKAR, mental condition means psychological integrity, particularly in operational attitudes or any relevant personality factor.

GM 66.55 Evidence of qualification

An authorised person means any person who is required to establish that the holder has a valid HKAR-66 aircraft maintenance licence including the scope of such licence.

Authorised persons include:

- any officer from the CAD; and

- the HKAR-145 approved maintenance organisation for the purpose of qualifying the holder for issue / renewal / amendment of the HKAR-145 certification authorisation.

GM 66.70 Conversion provisions

For example, a technical limitation could be where a person holds a pre HKAR-66 licence limited to the release of the airframe and engine but not the electrical power system. This person would be issued with an HKAR-66 aircraft maintenance licence in the B1 category with a limitation excluding electrical power generation and distribution systems.

Appendix I - Basic knowledge requirements

1. Knowledge Levels - Category A, B1, B2*, B3 and C Certifying Staff

Basic knowledge for categories A, B1, B2* and B3 are indicated by knowledge levels (1, 2 or 3) against each applicable subject. Category C applicants shall meet either the category B1 or the category B2* basic knowledge levels.
The knowledge level indicators are defined on 3 levels as follows:

- ***LEVEL 1****: A familiarisation with the principal elements of the subject.*

  (a) The applicant should be familiar with the basic elements of the subject.
  (b) The applicant should be able to give a simple description of the whole subject, using common words and examples.
  (c) The applicant should be able to use typical terms.

- ***LEVEL 2****: A general knowledge of the theoretical and practical aspects of the subject and an ability to apply that knowledge.*

  (a) The applicant should be able to understand the theoretical fundamentals of the subject.
  (b) The applicant should be able to give a general description of the subject using, as appropriate, typical examples.
  (c) The applicant should be able to use mathematical formulae in conjunction with physical laws describing the subject.
  (d) The applicant should be able to read and understand sketches, drawings and schematics describing the subject.
  (e) The applicant should be able to apply his knowledge in a practical manner using detailed procedures.

- ***LEVEL 3****: A detailed knowledge of the theoretical and practical aspects of the subject and a capacity to combine and apply the separate elements of knowledge in a logical and comprehensive manner.*

  (a) The applicant should know the theory of the subject and interrelationships with other subjects.
  (b) The applicant should be able to give a detailed description of the subject using theoretical fundamentals and specific examples.
  (c) The applicant should understand and be able to use mathematical formulae related to the subject.
  (d) The applicant should be able to read, understand and prepare sketches, simple drawings and schematics describing the subject.
  (e) The applicant should be able to apply his knowledge in a practical manner using manufacturer's instructions.
  (f) The applicant should be able to interpret results from various sources and measurements and apply corrective action where appropriate.

2. Modularisation

Module	Subject
1.	Mathematics
2.	Physics
3.	Electrical Fundamentals
4.	Electronic Fundamentals
5.	Digital Techniques / Electronic Instrument Systems
6.	Materials and Hardware
7A.	Maintenance Practices
7B.	Maintenance Practices
8.	Basic Aerodynamics
9A.	Human Factors
9B.	Human Factors
10.	Aviation Legislation
11A.	Turbine Aeroplane Aerodynamics, Structures and Systems
11B.	Piston Aeroplane Aerodynamics, Structures and Systems
11C.	Piston Aeroplane Aerodynamics, Structures and Systems
12.	Helicopter Aerodynamics, Structures and Systems
13.	Aircraft Aerodynamics, Structures and Systems
14.	Propulsion
15.	Gas Turbine Engine
16.	Piston Engine
17A.	Propeller
17B.	Propeller

Note 1: The subject modules may be sub-divided into sub-modules for the purpose of training and/or examination.

Note 2: The levels specified in this Appendix will be subjected to regular review in the light of experience.

Qualification on basic subjects for each aircraft maintenance licence category or subcategory should be in accordance with the following matrix, where applicable subjects are indicated by an 'X':

Subject Module	A or B1 aeroplane with:		A or B1 helicopter with:		B2* Avionics	B3 Piston-engine non-pressurised aeroplanes with MTOM of 2000 kg and below
	Turbine engine(s)	Piston engine(s)	Turbine engine(s)	Piston engine(s)		
1	X	X	X	X	X	X
2	X	X	X	X	X	X
3	X	X	X	X	X	X
4	X	X	X	X	X	X
5	X	X	X	X	X	X
6	X	X	X	X	X	X
7A	X	X	X	X	X	
7B						X
8	X	X	X	X	X	X
9A	X	X	X	X	X	
9B						X
10	X	X	X	X	X	X
11A	X					
11B		X				
11C						X
12			X	X		
13					X	
14					X	
15	X		X			
16		X		X		X
17A	X	X				
17B						X

Module 1. Mathematics

		Level			
		A	**B1**	**B2***	**B3**
1.1	**Arithmetic** Arithmetical terms and signs, methods of multiplication and division, fractions and decimals, factors and multiples, weights, measures and conversion factors, ratio and proportion, averages and percentages, areas and volumes, squares, cubes, square and cube roots.	1	2	2	2
1.2	**Algebra** a) Evaluating simple algebraic expressions, addition, subtraction, multiplication and division, use of brackets, simple algebraic fractions;	1	2	2	2
	(b) Linear equations and their solutions; Indices and powers, negative and fractional indices; Binary and other applicable numbering systems; Simultaneous equations and second degree equations with one unknown; Logarithms.	—	1	1	1
1.3	**Geometry** (a) Simple geometrical constructions;	—	1	1	1
	(b) Graphical representation; nature and uses of graphs, graphs of equations/functions;	2	2	2	2
	(c) Simple trigonometry; trigonometrical relationships, use of tables and rectangular and polar coordinates.	—	2	2	2

Module 2. Physics

Students should be conversant with Metric, Imperial (British) and US units and measurements.

		Level			
		A	**B1**	**B2***	**B3**
2.1	**Matter** Nature of matter : the chemical elements, structure of atoms, molecules; Chemical compounds; States: solid, liquid and gaseous; Changes between states.	1	1	1	1
2.2	**Mechanics**				
2.2.1	**Statics** Forces, moments and couples, representation as vectors; Centre of gravity; Elements of theory of stress, strain and elasticity: tension, compression, shear and torsion; Nature and properties of solid, fluid and gas; Pressure and buoyancy in liquids (barometers).	1	2	1	1
2.2.2	**Kinetics** Linear movement: uniform motion in a straight line, motion under constant acceleration (motion under gravity); Rotational movement: uniform circular motion (centrifugal/centripetal forces); Periodic motion: pendular movement; Simple theory of vibration, harmonics and resonance; Velocity ratio, mechanical advantage and efficiency.	1	2	1	1
2.2.3	**Dynamics**				

		Level			
		A	**B1**	**B2***	**B3**
	(a) Mass; Force, inertia, work, power, energy (potential, kinetic and total energy), heat, efficiency;	1	2	1	1
	(b) Momentum, conservation of momentum; Impulse; Gyroscopic principles; Friction: nature and effects, coefficient of friction (rolling resistance).	1	2	2	1
2.2.4	**Fluid dynamic**				
	(a) Specific gravity and density;	2	2	2	2
	(b) Viscosity, fluid resistance, effects of streamlining; Effects of compressibility on fluids; Static, dynamic and total pressure: Bernoulli's Theorem, venturi.	1	2	1	1
2.3	**Thermodynamics**				
	(a) Temperature: thermometers and temperature scales: Celsius, Fahrenheit and Kelvin; Heat definition;	2	2	2	2
	(b) Heat capacity, specific heat; Heat transfer: convection, radiation and conduction; Volumetric expansion; First and second law of thermodynamics; Gases: ideal gases laws; specific heat at constant volume and constant pressure, work done by expanding gas; Isothermal, adiabatic expansion and compression, engine cycles, constant volume	—	2	2	1

		Level			
		A	**B1**	**B2***	**B3**
	and constant pressure, refrigerators and heat pumps; Latent heats of fusion and evaporation, thermal energy, heat of combustion.				
2.4	**Optics (Light)** Nature of light; speed of light; Laws of reflection and refraction: reflection at plane surfaces, reflection by spherical mirrors, refraction, lenses; Fibre optics.	—	2	2	—
2.5	**Wave Motion and Sound** Wave motion: mechanical waves, sinusoidal wave motion, interference phenomena, standing waves; Sound: speed of sound, production of sound, intensity, pitch and quality, Doppler effect.	—	2	2	—

Module 3. Electrical Fundamentals

		Level			
		A	**B1**	**B2***	**B3**
3.1	**Electron Theory** Structure and distribution of electrical charges within: atoms, molecules, ions, compounds; Molecular structure of conductors, semiconductors and insulators.	1	1	1	1
3.2	**Static Electricity and Conduction** Static electricity and distribution of electrostatic charges; Electrostatic laws of attraction and repulsion; Units of charge, Coulomb's Law; Conduction of electricity in solids, liquids, gases and a vacuum.	1	2	2	1
3.3	**Electrical Terminology** The following terms, their units and factors affecting them: potential difference, electromotive force, voltage, current, resistance, conductance, charge, conventional current flow, electron flow.	1	2	2	1
3.4	**Generation of Electricity** Production of electricity by the following methods: light, heat, friction, pressure, chemical action, magnetism and motion.	1	1	1	1
3.5	**DC Sources of Electricity** Construction and basic chemical action of: primary cells, secondary cells, lead acid cells, nickel cadmium cells, other alkaline cells; Cells connected in series and parallel; Internal resistance and its effect on a battery;	1	2	2	2

		Level			
		A	**B1**	**B2***	**B3**
	Construction, materials and operation of thermocouples; Operation of photo-cells.				
3.6	**DC Circuits** Ohms Law, Kirchoff's Voltage and Current Laws; Calculations using the above laws to find resistance, voltage and current; Significance of the internal resistance of a supply.	—	2	2	1
3.7	**Resistance / Resistor**				
	(a) Resistance and affecting factors; Specific resistance; Resistor colour code, values and tolerances, preferred values, wattage ratings; Resistors in series and parallel; Calculation of total resistance using series, parallel and series parallel combinations; Operation and use of potentiometers and rheostats; Operation of Wheatstone Bridge.	—	2	2	1
	(b) Positive and negative temperature coefficient conductance; Fixed resistors, stability, tolerance and limitations, methods of construction; Variable resistors, thermistors, voltage dependent resistors; Construction of potentiometers and rheostats; Construction of Wheatstone Bridge.	—	1	1	—

		Level			
		A	**B1**	**B2***	**B3**
3.8	**Power** Power, work and energy (kinetic and potential); Dissipation of power by a resistor; Power formula; Calculations involving power, work and energy.	—	2	2	1
3.9	**Capacitance / Capacitor** Operation and function of a capacitor; Factors affecting capacitance area of plates, distance between plates, number of plates, dielectric and dielectric constant, working voltage, voltage rating; Capacitor types, construction and function; Capacitor colour coding; Calculations of capacitance and voltage in series and parallel circuits; Exponential charge and discharge of a capacitor, time constants; Testing of capacitors.	—	2	2	1
3.10	**Magnetism**				
	(a) Theory of magnetism; Properties of a magnet; Action of a magnet suspended in the Earth's magnetic field; Magnetisation and demagnetisation; Magnetic shielding; Various types of magnetic material; Electromagnets construction and principles of operation;	—	2	2	1

		Level			
		A	**B1**	**B2***	**B3**
	Hand clasp rules to determine: magnetic field around current carrying conductor.				
	(b) Magnetomotive force, field strength, magnetic flux density, permeability, hysteresis loop, retentivity, coercive force reluctance, saturation point, eddy currents; Precautions for care and storage of magnets.	—	2	2	1
3.11	**Inductance / Inductor** Faraday's Law; Action of inducing a voltage in a conductor moving in a magnetic field; Induction principles; Effects of the following on the magnitude of an induced voltage: magnetic field strength, rate of change of flux, number of conductor turns; Mutual induction; The effect the rate of change of primary current and mutual inductance has on induced voltage; Factors affecting mutual inductance: number of turns in coil, physical size of coil, permeability of coil, position of coils with respect to each other; Lenz's Law and polarity determining rules; Back emf, self induction; Saturation point; Principle uses of inductors.	—	2	2	1
3.12	**DC Motor / Generator Theory** Basic motor and generator theory; Construction and purpose of components in DC generator;	—	2	2	1

		Level			
		A	**B1**	**B2***	**B3**
	Operation of, and factors affecting output and direction of current flow in DC generators; Operation of, and factors affecting output power, torque, speed and direction of rotation of DC motors; Series wound, shunt wound and compound motors; Starter Generator construction.				
3.13	**AC Theory** Sinusoidal waveform: phase, period, frequency, cycle; Instantaneous, average, root mean square, peak, peak to peak current values and calculations of these values, in relation to voltage, current and power; Triangular / Square waves; Single / 3 phase principles.	1	2	2	1
3.14	**Resistive (R), Capacitive (C) and Inductive (L) Circuits** Phase relationship of voltage and current in L, C and R circuits, parallel, series and series parallel; Power dissipation in L, C and R circuits; Impedance, phase angle, power factor and current calculations; True power, apparent power and reactive power calculations.	—	2	2	1
3.15	**Transformers** Transformer construction principles and operation; Transformer losses and methods for overcoming them; Transformer action under load and no-load conditions; Power transfer, efficiency, polarity markings; Calculation of line and phase voltages and currents;	—	2	2	1

		Level			
		A	**B1**	**B2***	**B3**
	Calculation of power in a three phase system; Primary and Secondary current, voltage, turns ratio, power, efficiency; Auto transformers.				
3.16	**Filters** Operation, application and uses of the following filters: low pass, high pass, band pass, band stop.	—	1	1	—
3.17	**AC Generators** Rotation of loop in a magnetic field and waveform produced; Operation and construction of revolving armature and revolving field type AC generators; Single phase, two phase and three phase alternators; Three phase star and delta connections advantages and uses; Permanent Magnet Generators.	—	2	2	1
3.18	**AC Motors** Construction, principles of operation and characteristics of: AC synchronous and induction motors both single and polyphase; Methods of speed control and direction of rotation; Methods of producing a rotating field: capacitor, inductor, shaded or split pole.	—	2	2	1

Module 4. Electronic Fundamentals

		Level			
		A	**B1**	**B2***	**B3**
4.1	**Semiconductors**				
4.1.1	**Diodes**				
	(a) Diode symbols; Diode characteristics and properties; Diodes in series and parallel; Main characteristics and use of silicon controlled rectifiers (thyristors), light emitting diode, photo conductive diode, varistor, rectifier diodes; Functional testing of diodes.	—	2	2	1
	(b) Materials, electron configuration, electrical properties; P and N type materials: effects of impurities on conduction, majority and minority characters; PN junction in a semiconductor, development of a potential across a PN junction in unbiased, forward biased and reverse biased conditions; Diode parameters: peak inverse voltage, maximum forward current, temperature, frequency, leakage current, power dissipation; Operation and function of diodes in the following circuits: clippers, clampers, full and half wave rectifiers, bridge rectifiers, voltage doublers and triplers; Detailed operation and characteristics of the following devices: silicon controlled rectifier (thyristor), light emitting diode, Schottky diode, photo conductive diode, varactor diode, varistor, rectifier diodes, Zener diode.	—	—	2	—
4.1.2	**Transistors**				

		Level			
		A	**B1**	**B2***	**B3**
	(a) Transistor symbols; Component description and orientation; Transistor characteristics and properties.	—	1	2	1
	(b) Construction and operation of PNP and NPN transistors; Base, collector and emitter configurations; Testing of transistors; Basic appreciation of other transistor types and their uses; Application of transistors: classes of amplifier (A, B, C); Simple circuits including: bias, decoupling, feedback and stabilisation; Multistage circuit principles: cascades, push-pull, oscillators, multivibrators, flip-flop circuits.	—	—	2	—
4.1.3	**Integrated Circuits**				
	(a) Description and operation of logic circuits and linear circuits / operational amplifiers.	—	1	-—	1
	(b) Description and operation of logic circuits and linear circuits; Introduction to operation and function of an operational amplifier used as: integrator, differentiator, voltage follower, comparator; Operation and amplifier stages connecting methods: resistive capacitive, inductive (transformer), inductive resistive (IR), direct; Advantages and disadvantages of positive and negative feedback.	—	—	2	—

		Level			
		A	**B1**	**B2***	**B3**
4.2	**Printed Circuit Boards** Description and use of printed circuit boards.	—	1	2	—
4.3	**Servomechanisms**				
	a) Understanding of the following items: Open and closed loop systems, feedback, follow up, analogue transducers; Principles of operation and use of the following synchro system components/features: resolvers, differential, control and torque, transformers, inductance and capacitance transmitters;	—	1	—-	—-
	(b) Understanding of the following terms: Open and closed loop, follow up, servomechanism, analogue transducer, null, damping, feedback, deadband; Construction, operation and use of the following synchro system components: resolvers, differential, control and torque, E and I transformers, inductance transmitters, capacitance transmitters, synchronous transmitters; Servomechanism defects, reversal of synchro leads, hunting.	—	—	2	—

Module 5. Digital Techniques Electronic Instrument Systems

		Level				
		A	**B1.1** **B1.3**	**B1.2** **B1.4**	**B2***	**B3**
5.1	**Electronic Instrument Systems** Typical systems arrangements and cockpit layout of electronic instrument systems.	1	2	2	3	1
5.2	**Numbering Systems** Numbering systems: binary, octal and hexadecimal; Demonstration of conversions between the decimal and binary, octal and hexadecimal systems and vice versa.	—	1	—	2	—
5.3	**Data Conversion** Analogue Data, Digital Data; Operation and application of analogue to digital, and digital to analogue converters, inputs and outputs, limitations of various types.	—	1	—	2	—
5.4	**Data Buses** Operation of data buses in aircraft systems, including knowledge of ARINC and other specifications. Aircraft Network/Ethernet.	—	2	—	2	—
5.5	**Logic Circuits**					
	(a) Identification of common logic gate symbols, tables and equivalent circuits; Applications used for aircraft systems, schematic diagrams.	—	2	—	2	1
	(b) Interpretation of logic diagrams.	—	—	—	2	—

		Level				
		A	**B1.1** **B1.3**	**B1.2** **B1.4**	**B2***	**B3**
5.6	**Basic Computer Structure**					
	(a) Computer terminology (including bit, byte, software, hardware, CPU, IC, and various memory devices such as RAM, ROM, PROM); Computer technology (as applied in aircraft systems).	1	2	—	—	—
	(b) Computer related terminology; Operation, layout and interface of the major components in a microcomputer including their associated bus systems; Information contained in single and multiaddress instruction words; Memory associated terms; Operation of typical memory devices; Operation, advantages and disadvantages of the various data storage systems.	—	—	—	2	—
5.7	**Microprocessors** Functions performed and overall operation of a microprocessor; Basic operation of each of the following microprocessor elements: control and processing unit, clock, register, arithmetic logic unit.	—	—	—	2	—
5.8	**Integrated Circuits** Operation and use of encoders and decoders; Function of encoder types; Uses of medium, large and very large scale integration.	—	—	—	2	—

		Level				
		A	**B1.1** **B1.3**	**B1.2** **B1.4**	**B2***	**B3**
5.9	**Multiplexing** Operation, application and identification in logic diagrams of multiplexers and demultiplexers.	—	—	—	2	—
5.10	**Fibre Optics** Advantages and disadvantages of fibre optic data transmission over electrical wire propagation; Fibre optic data bus; Fibre optic related terms; Terminations; Couplers, control terminals, remote terminals; Application of fibre optics in aircraft systems.	—	1	1	2	—
5.11	**Electronic Displays** Principles of operation of common types of displays used in modern aircraft, including Cathode Ray Tubes, Light Emitting Diodes and Liquid Crystal Display.	—	2	1	2	1
5.12	**Electrostatic Sensitive Devices** Special handling of components sensitive to electrostatic discharges; Awareness of risks and possible damage, component and personnel anti-static protection devices.	1	2	2	2	1
5.13	**Software Management Control** Awareness of restrictions, airworthiness requirements and possible catastrophic effects of unapproved changes to software	—	2	1	2	1

		Level				
		A	**B1.1** **B1.3**	**B1.2** **B1.4**	**B2***	**B3**
	programmes.					
5.14	**Electromagnetic Environment** Influence of the following phenomena on maintenance practices for electronic system: EMC—Electromagnetic Compatibility EMI—Electromagnetic Interference HIRF—High Intensity Radiated Field Lightning / lightning protection	—	2	2	2	1
5.15	**Typical Electronic / Digital Aircraft Systems** General arrangement of typical electronic/digital aircraft systems and associated BITE (Built In Test Equipment) testing such as: (a) For B1 and B2* only: ACARS — ARINC Communication and Addressing and Reporting System EICAS — Engine Indication and Crew Alerting System FBW — Fly-by-Wire FMS — Flight Management System IRS — Inertial Reference System; (b) For B1, B2* and B3: ECAM—Electronic Centralised Aircraft Monitoring EFIS — Electronic Flight Instrument System	—	2	2	2	1

		Level				
		A	**B1.1** **B1.3**	**B1.2** **B1.4**	**B2***	**B3**
	GPS — Global Positioning System TCAS — Traffic Alert Collision Avoidance System Integrated Modular Avionics Cabin Systems Information Systems.					

Module 6. Materials and Hardware

		Level			
		A	**B1**	**B2***	**B3**
6.1	**Aircraft Materials — Ferrous**				
	(a) Characteristics, properties and identification of common alloy steels used in aircraft; Heat treatment and application of alloys steels.	1	2	1	2
	(b) Testing of ferrous materials for hardness, tensile strength, fatigue strength and impact resistance.	—	1	1	1
6.2	**Aircraft Materials — Non-Ferrous**				
	(a) Characteristics, properties and identification of common non—ferrous materials used in aircraft; Heat treatment and application of non-ferrous materials.	1	2	1	2
	(b) Testing of non-ferrous material for hardness, tensile strength, fatigue strength and impact resistance.	—	1	1	1
6.3	**Aircraft Materials — Composite and Non-Metallic**				
6.3.1	**Composite and non-metallic other than wood and fabric**				
	(a) Characteristics, properties and identification of common composite and non-metallic materials, other than wood, used in aircraft; Sealants and bonding agents.	1	2	2	2
	(b) The detection of defects / deterioration in composite and non-metallic material. Repair of composite and non-metallic material.	1	2	—	2

		Level			
		A	**B1**	**B2***	**B3**
6.3.2	**Wooden structures** Construction methods of wooden airframe structures; Characteristics, properties and types of wood and glue used in aeroplanes; Preservation and maintenance of wooden structure; Types of defects in wood material and wooden structures; The detection of defects in wooden structure; Repair of wooden structure.	1	2	—	2
6.3.3	**Fabric covering** Characteristics, properties and types of fabrics used in aeroplanes; Inspections methods for fabric; Types of defects in fabric; Repair of fabric covering.	1	2	—	2
6.4	**Corrosion**				
	(a) Chemical fundamentals; Formation by: galvanic action process, microbiological, stress;	1	1	1	1
	(b) Types of corrosion and their identification; Causes of corrosion; Material types, susceptibility to corrosion.	2	3	2	2
6.5	**Fasteners**				
6.5.1	**Screw threads** Screw nomenclature;	2	2	2	2

		Level			
		A	**B1**	**B2***	**B3**
	Thread forms, dimensions and tolerances for standard threads used in aircraft; Measuring screw threads.				
6.5.2	**Bolts, studs and screws** Bolt types: specification, identification and marking of aircraft bolts, international standards; Nuts: self locking, anchor, standard types; Machine screws: aircraft specifications; Studs: types and uses, insertion and removal; Self tapping screws, dowels.	2	2	2	2
6.5.3	**Locking devices** Tab and spring washers, locking plates, split pins, pal-nuts, wire locking, quick release fasteners, keys, circlips, cotter pins.	2	2	2	2
6.5.4	**Aircraft rivets** Types of solid and blind rivets: specifications and identification, heat treatment.	1	2	1	2
6.6	**Pipes and Unions**				
	(a) Identification of, and types of rigid and flexible pipes and their connectors used in aircraft.	2	2	2	2
	(b) Standard unions for aircraft hydraulic, fuel, oil, pneumatic and air system pipes.	2	2	1	2
6.7	**Springs** Types of springs, materials, characteristics and applications.	—	2	1	1
6.8	**Bearings** Purpose of bearings, loads, material, construction;	1	2	2	1

		Level			
		A	**B1**	**B2***	**B3**
	Types of bearings and their application.				
6.9	**Transmissions** Gear types and their application; Gear ratios, reduction and multiplication gear systems, driven and driving gears, idler gears, mesh patterns; Belts and pulleys, chains and sprockets.	1	2	2	1
6.10	**Control Cables** Types of cables; End fittings, turnbuckles and compensation devices; Pulleys and cable system components; Bowden cables; Aircraft flexible control systems.	1	2	1	2
6.11	**Electrical Cables and Connectors** Cable types, construction and characteristics; High tension and co-axial cables; Crimping; Connector types, pins, plugs, sockets, insulators, current and voltage rating, coupling, identification codes.	1	2	2	2

Module 7A. Maintenance Practices

		Level		
		A	**B1**	**B2***
7.1	**Safety Precautions—Aircraft and Workshop** Aspects of safe working practices including precautions to take when working with electricity, gases especially oxygen, oils and chemicals. Also, instruction in the remedial action to be taken in the event of a fire or another accident with one or more of these hazards including knowledge on extinguishing agents.	3	3	3
7.2	**Workshop Practices** Care of tools, control of tools, use of workshop materials; Dimensions, allowances and tolerances, standards of workmanship; Calibration of tools and equipment, calibration standards.	3	3	3
7.3	**Tools** Common hand tool types; Common power tool types; Operation and use of precision measuring tools; Lubrication equipment and methods; Operation, function and use of electrical general test equipment.	3	3	3
7.4	**Avionic General Test Equipment** Operation, function and use of avionic general test equipment.	—	2	3
7.5	**Engineering Drawings, Diagrams and Standards** Drawing types and diagrams, their symbols, dimensions, tolerances and projections; Identifying title block information;	1	2	2

		Level		
		A	**B1**	**B2***
	Microfilm, microfiche and computerised presentations; Specification 100 of the Air Transport Association (ATA) of America; Aeronautical and other applicable standards including ISO, AN, MS, NAS and MIL; Wiring diagrams and schematic diagrams.			
7.6	**Fits and Clearances** Drill sizes for bolt holes, classes of fits; Common system of fits and clearances; Schedule of fits and clearances for aircraft and engines; Limits for bow, twist and wear; Standard methods for checking shafts, bearings and other parts.	1	2	1
7.7	**Electrical Wiring Interconnection System (EWIS)** Continuity, insulation and bonding techniques and testing; Use of crimp tools: hand and hydraulic operated; Testing of crimp joints; Connector pin removal and insertion; Co-axial cables: testing and installation precautions; Identification of wire types, their inspection criteria and damage tolerance; Wiring protection techniques: Cable looming and loom support, cable clamps, protective sleeving techniques including heat shrink wrapping, shielding; EWIS installations, inspection, repair, maintenance and cleanliness standards.	1	3	3
7.8	**Riveting**	1	2	—

		Level		
		A	**B1**	**B2***
	Riveted joints, rivet spacing and pitch; Tools used for riveting and dimpling; Inspection of riveted joints.			
7.9	**Pipes and Hoses** Bending and belling / flaring aircraft pipes; Inspection and testing of aircraft pipes and hoses; Installation and clamping of pipes.	1	2	—
7.10	**Springs** Inspection and testing of springs.	1	2	—
7.11	**Bearings** Testing, cleaning and inspection of bearings; Lubrication requirements of bearings; Defects in bearings and their causes.	1	2	—
7.12	**Transmissions** Inspection of gears, backlash; Inspection of belts and pulleys, chains and sprockets; Inspection of screw jacks, lever devices, push-pull rod systems.	1	2	—
7.13	**Control Cables** Swaging of end fittings; Inspection and testing of control cables; Bowden cables; aircraft flexible control systems.	1	2	—
7.14	**Material handling**			
7.14.1	**Sheet Metal** Marking out and calculation of bend allowance;	—	2	—

		Level		
		A	**B1**	**B2***
	Sheet metal working, including bending and forming; Inspection of sheet metal work.			
7.14.2	**Composite and non-metallic** Bonding practices; Environmental conditions; Inspection methods	—	2	—
7.15	**Welding, Brazing, Soldering and Bonding**			
	(a) Soldering methods; inspection of soldered joints.	—	2	2
	(b) Welding and brazing methods; Inspection of welded and brazed joints; Bonding methods and inspection of bonded joints.	—	2	—
7.16	**Aircraft Weight and Balance**			
	(a) Centre of Gravity / Balance limits calculation: use of relevant documents;	—	2	2
	(b) Preparation of aircraft for weighing; Aircraft weighing.	—	2	—
7.17	**Aircraft Handling and Storage** Aircraft taxiing/towing and associated safety precautions; Aircraft jacking, chocking, securing and associated safety precautions; Aircraft storage methods; Refuelling/defuelling procedures; De-icing/anti-icing procedures; Electrical, hydraulic and pneumatic ground supplies. Effects of environmental conditions on aircraft handling	2	2	2

		Level		
		A	**B1**	**B2***
	and operation.			
7.18	**Disassembly, Inspection, Repair and Assembly Techniques**			
	(a) Types of defects and visual inspection techniques; Corrosion removal, assessment and reprotection.	2	3	3
	(b) General repair methods, Structural Repair Manual; Ageing, fatigue and corrosion control programmes.	—	2	—
	(c) Non-destructive inspection techniques including: penetrant, radiographic, eddy current, ultrasonic and boroscope methods.	—	2	1
	d) Disassembly and re—assembly techniques.	2	2	2
	e) Trouble shooting techniques.	—	2	2
7.19	**Abnormal Events**			
	(a) Inspections following lightning strikes and HIRF penetration.	2	2	2
	(b) Inspections following abnormal events such as heavy landings and flight through turbulence.	2	2	—
7.20	**Maintenance Procedures**	1	2	2
	Maintenance planning; Modification procedures; Stores procedures; Certification / release procedures; Interface with aircraft operation; Maintenance Inspection / Quality Control / Quality Assurance; Additional maintenance procedures; Control of life limited components.			

Module 7B. Maintenance Practices

		Level
		B3
7.1	**Safety Precautions—Aircraft and Workshop** Aspects of safe working practices including precautions to take when working with electricity, gases especially oxygen, oils and chemicals. Also, instruction in the remedial action to be taken in the event of a fire or another accident with one or more of these hazards including knowledge on extinguishing agents.	3
7.2	**Workshop Practices** Care of tools, control of tools, use of workshop materials; Dimensions, allowances and tolerances, standards of workmanship; Calibration of tools and equipment, calibration standards.	3
7.3	**Tools** Common hand tool types; Common power tool types; Operation and use of precision measuring tools; Lubrication equipment and methods; Operation, function and use of electrical general test equipment.	3
7.4	**Avionic General Test Equipment** Operation, function and use of avionic general test equipment.	—
7.5	**Engineering Drawings, Diagrams and Standards** Drawing types and diagrams, their symbols, dimensions, tolerances and projections; Identifying title block information; Microfilm, microfiche and computerised presentations; Specification 100 of the Air Transport Association (ATA) of America; Aeronautical and other applicable standards including ISO, AN, MS,	2

		Level
		B3
	NAS and MIL; Wiring diagrams and schematic diagrams.	
7.6	**Fits and Clearances** Drill sizes for bolt holes, classes of fits; Common system of fits and clearances; Schedule of fits and clearances for aircraft and engines; Limits for bow, twist and wear; Standard methods for checking shafts, bearings and other parts.	2
7.7	**Electrical Wiring Interconnection System (EWIS)** Continuity, insulation and bonding techniques and testing; Use of crimp tools: hand and hydraulic operated; Testing of crimp joints; Connector pin removal and insertion; Co-axial cables: testing and installation precautions; Identification of wire types, their inspection criteria and damage tolerance. Wiring protection techniques: Cable looming and loom support, cable clamps, protective sleeving techniques including heat shrink wrapping, shielding.	2
7.8	**Riveting** Riveted joints, rivet spacing and pitch; Tools used for riveting and dimpling; Inspection of riveted joints.	2
7.9	**Pipes and Hoses** Bending and belling / flaring aircraft pipes; Inspection and testing of aircraft pipes and hoses;	2

		Level
		B3
	Installation and clamping of pipes.	
7.10	**Springs** Inspection and testing of springs.	1
7.11	**Bearings** Testing, cleaning and inspection of bearings; Lubrication requirements of bearings; Defects in bearings and their causes.	2
7.12	**Transmissions** Inspection of gears, backlash; Inspection of belts and pulleys, chains and sprockets; Inspection of screw jacks, lever devices, push-pull rod systems.	2
7.13	**Control Cables** Swaging of end fittings; Inspection and testing of control cables; Bowden cables; aircraft flexible control systems.	2
7.14	**Material handling**	
7.14.1	**Sheet Metal** Marking out and calculation of bend allowance; Sheet metal working, including bending and forming; Inspection of sheet metal work.	2
7.14.2	**Composite and non-metallic** Bonding practices; Environmental conditions; Inspection methods	2

		Level
		B3
7.15	**Welding, Brazing, Soldering and Bonding**	
	(a) Soldering methods; inspection of soldered joints.	2
	(b) Welding and brazing methods; Inspection of welded and brazed joints; Bonding methods and inspection of bonded joints.	2
7.16	**Aircraft Weight and Balance**	
	(a) Centre of Gravity / Balance limits calculation: use of relevant documents;	2
	(b) Preparation of aircraft for weighing; Aircraft weighing.	2
7.17	**Aircraft Handling and Storage** Aircraft taxiing/towing and associated safety precautions; Aircraft jacking, chocking, securing and associated safety precautions; Aircraft storage methods; Refuelling/defuelling procedures; De-icing/anti-icing procedures; Electrical, hydraulic and pneumatic ground supplies. Effects of environmental conditions on aircraft handling and operation.	2
7.18	**Disassembly, Inspection, Repair and Assembly Techniques**	
	(a) Types of defects and visual inspection techniques; Corrosion removal, assessment and reprotection.	3
	(b) General repair methods, Structural Repair Manual; Ageing, fatigue and corrosion control programmes.	2
	(c) Non-destructive inspection techniques including: penetrant, radiographic, eddy current, ultrasonic and boroscope methods.	2

		Level
		B3
	d) Disassembly and re—assembly techniques.	2
	e) Trouble shooting techniques.	2
7.19	**Abnormal Events**	
	(a) Inspections following lightning strikes and HIRF penetration.	2
	(b) Inspections following abnormal events such as heavy landings and flight through turbulence.	2
7.20	**Maintenance Procedures** Maintenance planning; Modification procedures; Stores procedures; Certification / release procedures; Interface with aircraft operation; Maintenance Inspection / Quality Control / Quality Assurance; Additional maintenance procedures; Control of life limited components.	2

Module 8. Basic Aerodynamics

		Level			
		A	**B1**	**B2***	**B3**
8.1	**Physics of the Atmosphere** International Standard Atmosphere (ISA), application to aerodynamics.	1	2	2	1
8.2	**Aerodynamics** Airflow around a body; Boundary layer, laminar and turbulent flow, free stream flow, relative airflow, upwash and downwash; vortices, stagnation; The terms: camber, chord, mean aerodynamic chord, profile (parasite) drag, induced drag, centre of pressure, angle of attack, wash in and wash out, fineness ratio, wing shape and aspect ratio; Thrust, Weight, Aerodynamic Resultant; Generation of Lift and Drag: Angle of Attack, Lift coefficient, Drag coefficient, polar curve, stall; Aerofoil contamination including ice, snow, frost.	1	2	2	1
8.3	**Theory of Flight** Relationship between lift, weight, thrust and drag; Glide ratio; Steady state flights, performance; Theory of the turn; Influence of load factor : stall, flight envelope and structural limitations; Lift augmentation.	1	2	2	1
8.4	**Flight Stability and Dynamics** Longitudinal, lateral and directional stability (active and passive).	1	2	2	1

Module 9A. Human Factors

Note: This module does not apply to category B3. Relevant subject matters for category B3 are defined in module 9B.

		Level		
		A	**B1**	**B2***
9.1	**General** The need to take human factors into account; Incidents attributable to human factors / human error; 'Murphy's' law.	**1**	**2**	**2**
9.2	**Human Performance and Limitations** Vision; Hearing; Information processing; Attention and perception; Memory; Claustrophobia and physical access.	**1**	**2**	**2**
9.3	**Social Psychology** Responsibility: individual and group; Motivation and de-motivation; Peer pressure; 'Culture' issues; Team working; Management, supervision and leadership.	**1**	**1**	**1**
9.4	**Factors Affecting Performance** Fitness / health; Stress: domestic and work related; Time pressure and deadlines;	**2**	**2**	**2**

		Level		
		A	**B1**	**B2***
	Workload: overload and underload; Sleep and fatigue, shiftwork; Alcohol, medication, drug abuse.			
9.5	**Physical Environment** Noise and fumes; Illumination; Climate and temperature; Motion and vibration; Working environment.	1	1	1
9.6	**Tasks** Physical work; Repetitive tasks; Visual inspection; Complex systems.	1	1	1
9.7	**Communication** Within and between teams; Work logging and recording; Keeping up to date, currency; Dissemination of information.	2	2	2
9.8	**Human Error** Error models and theories; Types of error in maintenance tasks; Implications of errors (i.e. accidents); Avoiding and managing errors.	1	2	2

		Level		
		A	**B1**	**B2***
9.9	**Hazards in the Workplace** Recognising and avoiding hazards; Dealing with emergencies.	1	2	2

Module 9B. Human Factors

Note: The scope of this module shall reflect the less demanding environment of maintenance for B3 licence holders.

		Level
		B3
9.1	**General** The need to take human factors into account; Incidents attributable to human factors / human error; 'Murphy's' law.	2
9.2	**Human Performance and Limitations** Vision; Hearing; Information processing; Attention and perception; Memory; Claustrophobia and physical access.	2
9.3	**Social Psychology** Responsibility: individual and group; Motivation and de-motivation; Peer pressure; 'Culture' issues; Team working; Management, supervision and leadership.	1
9.4	**Factors Affecting Performance** Fitness / health; Stress: domestic and work related; Time pressure and deadlines;	2

		Level
		B3
	Workload: overload and underload; Sleep and fatigue, shiftwork; Alcohol, medication, drug abuse.	
9.5	**Physical Environment** Noise and fumes; Illumination; Climate and temperature; Motion and vibration; Working environment.	1
9.6	**Tasks** Physical work; Repetitive tasks; Visual inspection; Complex systems.	1
9.7	**Communication** Within and between teams; Work logging and recording; Keeping up to date, currency; Dissemination of information.	2
9.8	**Human Error** Error models and theories; Types of error in maintenance tasks; Implications of errors (i.e. accidents); Avoiding and managing errors.	2

		Level
		B3
9.9	**Hazards in the Workplace** Recognising and avoiding hazards; Dealing with emergencies.	2

MODULE 10. Aviation Legislation

		Level			
		A	**B1**	**B2***	**B3**
10.1	**Aircraft Maintenance Licences** Air Navigation (Hong Kong) Order 1995 requirements; Responsibilities: by statutory law and by the need to fly aircraft in a satisfactory condition, i.e. common / civil / constitutional law; Penalties — under statutory law and resulting from civil law suits; HKAR-66: Licensing of Maintenance Personnel (Certifying Staff - Maintenance); Categories - applicability; Area and extent of limitations and privileges within Categories; Overlap of Category applicability; Relevant Airworthiness Notices.	2	2	2	2
10.2	**Certifications** Air Navigation (Hong Kong) Order 1995 requirements; HKAR-1 Airworthiness Procedures; Certificates of : Release to Service; Maintenance Review; Fitness for Flight; Duplicate / independent inspection; Contributory certifications and reliance on other documentation and persons; Certification—acceptance investigation and judgment procedures.	1	2	2	2
10.3	**Aircraft, Engine and VP Propeller Log Books** Air Navigation (Hong Kong) Order 1995 requirements; HKAR-1 Airworthiness Procedures;	1	2	2	2

		Level			
		A	**B1**	**B2***	**B3**
	CAD Approval: light aircraft, large aircraft; Worksheets; Data to be entered in log books; Condition reports—e.g. heavy landing checks, defect investigations, NDT and other inspections, mandatory and non-mandatory; Maintenance records; Cross—reference to other files / records; Preservation of documents: AN(HK)O 1995.				
10.4	**Technical Log** Air Navigation (Hong Kong) Order 1995 requirements; HKAR-1 Airworthiness Procedures; Technical Log—Air Operator's Certificates Requirements Document.	2	2	2	2
10.5	**Aircraft Documentation and Requirements** Type Certification; Supplementary Type Certification; Weight schedule; External, and internal markings and signs, e.g. nationality and registration, no smoking and fasten seat belt, placards and requirements, doors and exits; Certificate of Airworthiness Categories, purposes of flight; Certificate of Registration; Noise Certificate; Air Operator's Certificate; Schedule 5 requirements for equipment; Radio station licence and approval;	1	2	2	2

		Level			
		A	**B1**	**B2***	**B3**
	Change of ownership; Maintenance checks and inspections; Maintenance records; Maintenance documentation; Continuing airworthiness; Master Minimum Equipment Lists, Minimum Equipment Lists, Dispatch Deviation Lists; Service Bulletins, manufacturers service information; Modifications and repairs; Test flights; EDTO: maintenance and dispatch requirements; All Weather Operation (AWO): CAT 2/3 operations and minimum equipment requirements; Reduced Vertical Separation Minima (RVSM) requirements.				
10.6	**Approvals** Design/Production Organisations; Maintenance Organisations; AOC interface; Maintenance Schedules and Programmes; Stores: systems; release of parts.	1	2	2	2
10.7	**Defect Reporting** Air Navigation (Hong Kong) Order 1995 requirements; CAD382 The Mandatory Occurrence Reporting Scheme; Defects which are to be reported;	2	2	2	2

		Level			
		A	**B1**	**B2***	**B3**
	Reporting of accidents and incidents.				
10.8	**Hong Kong Aviation Requirements** Airworthiness Notices; Airworthiness Directives; Mandatory Modifications and Inspections:— - HK CAD - UK CAA - FAA - Authorities other than above: aircraft, engines, equipment; HKAR-1: Airworthiness Procedures; HKAR-2: Administrative & Guidance Material; HKAR-21: Certification of Aircraft and Related Products, Parts and Appliances, and of Design and Production Organisations; HKAR-66: Licensing of Maintenance Personnel; HKAR-145: Approved Maintenance Organisations; HKAR-147: Approved Maintenance Training/ Examinations; HKAR-MMEL/MEL: Master Minimum Equipment List/Minimum Equipment List; CAD 360: Air Operator's Certificates (AOC) Requirements Document. CAD 382: The Mandatory Occurrence Reporting Scheme Information and Guidance; CAD 418: Condition Monitored Maintenance - an Explanatory Handbook; CAD 452: Aircraft Maintenance Schedules and	1	2	2	2

		Level			
		A	**B1**	**B2***	**B3**
	Programmes Information and Guidance; CAD 513: Extended Diversion Time Operations (EDTO).				
10.9	**EASA Requirements** Certification rules: such as EASA CS 23/25/27/29	1	1	1	1
10.10	**Hong Kong Aviation Legislation** Influence of psychoactive substances on physical or mental condition of the holder of the AML; Safety management system.	1	2	2	2

Module 11A. Turbine Aeroplane Aerodynamics, Structures and Systems

		Level	
		A1	**B1.1**
11.1	**Theory of Flight**		
11.1.1	**Aeroplane Aerodynamics and Flight Controls** Operation and effect of: - roll control: ailerons *and spoilers;* - pitch control: elevators, stabilators, variable incidence stabilisers and canards; - yaw control, rudder limiters; Control using elevons, ruddervators; High lift devices, slots, slats, flaps, flaperons; Drag inducing devices, spoilers, lift dumpers, speed brakes; Effects of wing fences, saw tooth leading edges; Boundary layer control using, vortex generators, stall wedges or leading edge devices; Operation and effect of trim tabs, balance and antibalance (leading) tabs, servo tabs, spring tabs, mass balance, control surface bias, aerodynamic balance panels.	1	2
11.1.2	**High Speed Flight** Speed of sound, subsonic flight, transonic flight, supersonic flight; Mach number, critical Mach number, compressibility buffet, shock wave, aerodynamic heating, area rule; Factors affecting airflow in engine intakes of high speed aircraft; Effects of sweepback on critical Mach number.	1	2
11.2	**Airframe Structures — General Concepts**		
	(a) Airworthiness requirements for structural strength; Structural classification, primary, secondary and tertiary;	2	2

		Level	
		A1	**B1.1**
	Fail safe, safe life, damage tolerance concepts; Zonal and station identification systems; Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue; Drains and ventilation provisions; System installation provisions; Lightning strike protection provision; Aircraft bonding.		
	(b) Construction methods of: stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, methods of skinning, anti-corrosive protection, wing, empennage and engine attachments; Structure assembly techniques: riveting, bolting, bonding; Methods of surface protection, such as chromating, anodising, painting; Surface cleaning; Airframe symmetry: methods of alignment and symmetry checks.	1	2
11.3	**Airframe Structures — Aeroplanes**		
11.3.1	**Fuselage (ATA 52/53/56)** Construction and pressurisation sealing; Wing, stabiliser, pylon and undercarriage attachments; Seat installation and cargo loading system; Doors and emergency exits: construction, mechanisms, operation and safety devices; Windows and windscreen construction and mechanisms.	1	2

		Level	
		A1	**B1.1**
11.3.2	**Wings (ATA 57)** Construction; Fuel storage; Landing gear, pylon, control surface and high lift / drag attachments.	1	2
11.3.3	**Stabilisers (ATA 55)** Construction; Control surface attachment.	1	2
11.3.4	**Flight Control Surfaces (ATA 55/57)** Construction and attachment; Balancing — mass and aerodynamic.	1	2
11.3.5	**Nacelles/Pylons (ATA 54)** Construction; Firewalls; Engine mounts.	1	2
11.4	**Air Conditioning and Cabin Pressurisation (ATA 21)**		
11.4.1	**Air supply** Sources of air supply including engine bleed, APU and ground cart.	1	2
11.4.2	**Air Conditioning** Air conditioning systems; Air cycle and vapour cycle machines; Distribution systems; Flow, temperature and humidity control system.	1	3

		Level	
		A1	**B1.1**
11.4.3	**Pressurisation** Pressurisation systems; Control and indication including control and safety valves; Cabin pressure controllers.	1	3
11.4.4	**Safety and warning devices** Protection and warning devices.	1	3
11.5	**Instruments / Avionic Systems**		
11.5.1	**Instrument Systems (ATA 31)** Pitot static: altimeter, air speed indicator, vertical speed indicator; Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator; Compasses: direct reading, remote reading; Angle of attack indication, stall warning systems; Glass cockpit; Other aircraft system indication.	1	2
11.5.2	**Avionic Systems** Fundamentals of system lay-outs and operation of: - Auto Flight (ATA 22); - Communications (ATA 23); - Navigation Systems (ATA 34).	1	1
11.6	**Electrical Power (ATA 24)** Batteries Installation and Operation; DC power generation; AC power generation;	1	3

		Level	
		A1	**B1.1**
	Emergency power generation; Voltage regulation; Power distribution; Inverters, transformers, rectifiers; Circuit protection; External / Ground power.		
11.7	**Equipment and Furnishings (ATA 25)**		
	(a) Emergency equipment requirements; Seats, harnesses and belts.	2	2
	(b) Cabin lay-out; Equipment lay-out; Cabin furnishing Installation; Cabin entertainment equipment; Galley installation; Cargo handling and retention equipment; Airstairs.	1	1
11.8	**Fire Protection (ATA 26)** (a) Fire and smoke detection and warning systems; Fire extinguishing systems; System tests.	1	3
	(b) Portable fire extinguisher.	1	1
11.9	**Flight Controls (ATA 27)** Primary controls: aileron, elevator, rudder, spoiler; Trim control;	1	3

		Level	
		A1	**B1.1**
	Active load control; High lift devices; Lift dump, speed brakes; System operation: manual, hydraulic, pneumatic, electrical, fly-by-wire; Artificial feel, Yaw damper, Mach trim, rudder limiter, gust lock systems; Balancing and rigging; Stall protection/warning system.		
11.10	**Fuel Systems (ATA 28)** System lay-out; Fuel tanks; Supply systems; Dumping, venting and draining; Cross-feed and transfer; Indications and warnings; Refuelling and defuelling; Longitudinal balance fuel systems.	1	3
11.11	**Hydraulic Power (ATA 29)** System lay-out; Hydraulic fluids; Hydraulic reservoirs and accumulators; Pressure generation: electric, mechanical, pneumatic; Emergency pressure generation; Filters;	1	3

		Level	
		A1	**B1.1**
	Pressure Control; Power distribution; Indication and warning systems; Interface with other systems.		
11.12	**Ice and Rain Protection (ATA 30)** Ice formation, classification and detection; Anti-icing systems: electrical, hot air and chemical; De-icing systems: electrical, hot air, pneumatic and chemical; Rain repellent; Probe and drain heating; Wiper systems.	1	3
11.13	**Landing Gear (ATA 32)** Construction, shock absorbing; Extension and retraction systems: normal and emergency; Indications and warning; Wheels, brakes, antiskid and autobraking; Tyres; Steering; Air-ground sensing.	2	3
11.14	**Lights (ATA 33)** External: navigation, anti collision, landing, taxiing, ice; Internal: cabin, cockpit, cargo; Emergency.	2	3
11.15	**Oxygen (ATA 35)**	1	3

		Level	
		A1	**B1.1**
	System lay-out: cockpit, cabin; Sources, storage, charging and distribution; Supply regulation; Indications and warnings.		
11.16	**Pneumatic / Vacuum (ATA 36)** System lay-out; Sources: engine/APU, compressors, reservoirs, ground supply; Pressure control; Distribution; Indications and warnings; Interfaces with other systems.	1	3
11.17	**Water/Waste (ATA 38)** Water system lay-out, supply, distribution, servicing and draining; Toilet system lay-out, flushing and servicing; Corrosion aspects.	2	3
11.18	**On Board Maintenance Systems (ATA 45)** Central maintenance computers; Data loading system; Electronic library system; Printing; Structure monitoring (damage tolerance monitoring).	1	2
11.19	**Integrated Modular Avionics (ATA 42)** Functions that may be typically integrated in the Integrated Modular Avionic (IMA) modules are, among others: Bleed Management, Air Pressure Control, Air Ventilation and	1	2

		Level	
		A1	**B1.1**
	Control, Avionics and Cockpit Ventilation Control, Temperature Control, Air Traffic Communication, Avionics Communication Router, Electrical Load Management, Circuit Breaker Monitoring, Electrical System BITE, Fuel Management, Braking Control, Steering Control, Landing Gear Extension and Retraction, Tyre Pressure Indication, Oleo Pressure Indication, Brake Temperature Monitoring, etc. Core System; Network Components.		
11.20	**Cabin Systems (ATA 44)** The units and components which furnish a means of entertaining the passengers and providing communication within the aircraft (Cabin Intercommunication Data System) and between the aircraft cabin and ground stations (Cabin Network Service). Includes voice, data, music and video transmissions. The Cabin Intercommunication Data System provides an interface between cockpit/cabin crew and cabin systems. These systems support data exchange of the different related LRU's and they are typically operated via Flight Attendant Panels. The Cabin Network Service typically consists on a server, typically interfacing with, among others, the following systems: - Data / Radio Communication, In-Flight Entertainment System. The Cabin Network Service may host functions such as: - Access to pre-departure/departure reports, - E-mail/intranet/Internet access, - Passenger database; Cabin Core System; In-flight Entertainment System; External Communication System; Cabin Mass Memory System;	1	2

		Level	
		A1	**B1.1**
	Cabin Monitoring System; Miscellaneous Cabin System.		
11.21	**Information Systems (ATA 46)** The units and components which furnish a means of storing, updating and retrieving digital information traditionally provided on paper, microfilm or microfiche. Includes units that are dedicated to the information storage and retrieval function such as the electronic library mass storage and controller. Does not include units or components installed for other uses and shared with other systems, such as flight deck printer or general use display. Typical examples include Air Traffic and Information Management Systems and Network Server Systems; Aircraft General Information System; Flight Deck Information System; Maintenance Information System; Passenger Cabin Information System; Miscellaneous Information System.	1	2

Module 11B. Piston Aeroplane Aerodynamics, Structures and Systems

Note 1: This module does not apply to category B3. Relevant subject matters for category B3 are defined in Module 11C.

Note 2: The scope of this Module shall reflect the technology of aeroplanes pertinent to the A2 and B1.2 subcategory.

		Level	
		A2	**B1.2**
11.1	**Theory of Flight**		
11.1.1	**Aeroplane Aerodynamics and Flight Controls** Operation and effect of: - roll control: ailerons *and spoilers;* - pitch control: elevators, stabilators, variable incidence stabilisers and canards; - yaw control, rudder limiters; Control using elevons, ruddervators; High lift devices, slots, slats, flaps, flaperons; Drag inducing devices, spoilers, lift dumpers, speed brakes; Effects of wing fences, saw tooth leading edges; Boundary layer control using, vortex generators, stall wedges or leading edge devices; Operation and effect of trim tabs, balance and antibalance (leading) tabs, servo tabs, spring tabs, mass balance, control surface bias, aerodynamic balance panels.	1	2
11.1.2	**High Speed Flight – N/A**	—	—
11.2	**Airframe Structures — General Concepts**		
	(a) Airworthiness requirements for structural strength; Structural classification, primary, secondary and tertiary; Fail safe, safe life, damage tolerance concepts;	2	2

		Level	
		A2	**B1.2**
	Zonal and station identification systems; Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue; Drains and ventilation provisions; System installation provisions; Lightning strike protection provision; Aircraft bonding.		
	(b) Construction methods of: stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, methods of skinning, anti-corrosive protection, wing, empennage and engine attachments; Structure assembly techniques: riveting, bolting, bonding; Methods of surface protection, such as chromating, anodising, painting; Surface cleaning; Airframe symmetry: methods of alignment and symmetry checks.	1	2
11.3	**Airframe Structures — Aeroplanes**		
11.3.1	**Fuselage (ATA 52/53/56)** Construction and pressurisation sealing; Wing, tail-plane, pylon and undercarriage attachments; Seat installation; Doors and emergency exits: construction and operation; Windows and windscreen attachment.	1	2
11.3.2	**Wings (ATA 57)** Construction;	1	2

		Level	
		A2	**B1.2**
	Fuel storage; Landing gear, pylon, control surface and high lift / drag attachments.		
11.3.3	**Stabilisers (ATA 55)** Construction; Control surface attachment.	1	2
11.3.4	**Flight Control Surfaces (ATA 55 / 57)** Construction and attachment; Balancing — mass and aerodynamic.	1	2
11.3.5	**Nacelles / Pylons (ATA 54)** Nacelles/Pylons: - Construction; - Firewalls; - Engine mounts.	1	2
11.4	**Air Conditioning and Cabin Pressurisation (ATA 21)** Pressurisation and air conditioning systems; Cabin pressure controllers, protection and warning devices; Heating systems.	1	3
11.5	**Instruments / Avionic Systems**		
11.5.1	**Instrument Systems (ATA 31)** Pitot static: altimeter, air speed indicator, vertical speed indicator; Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator; Compasses: direct reading, remote reading; Angle of attack indication, stall warning systems;	1	2

		Level	
		A2	**B1.2**
	Glass cockpit; Other aircraft system indication.		
11.5.2	**Avionic Systems** Fundamentals of system lay-outs and operation of: - Auto Flight (ATA 22); - Communications (ATA 23); - Navigation Systems (ATA 34).	1	1
11.6	**Electrical Power (ATA 24)** Batteries Installation and Operation; DC power generation; Voltage regulation; Power distribution; Circuit protection; Inverters, transformers.	1	3
11.7	**Equipment and Furnishings (ATA 25)**		
	(a) Emergency equipment requirements; Seats, harnesses and belts.	2	2
	(b) Cabin lay-out; Equipment lay-out; Cabin furnishing installation; Cabin entertainment equipment; Galley installation; Cargo handling and retention equipment; Airstairs.	1	1

		Level	
		A2	**B1.2**
11.8	**Fire Protection (ATA 26)** (a) Fire and smoke detection and warning systems; Fire extinguishing systems; System tests.	1	3
	(b) Portable fire extinguisher.	1	3
11.9	**Flight Controls (ATA 27)** Primary controls: aileron, elevator, rudder; Trim tabs; High lift devices; System operation: manual; Gust locks; Balancing and rigging; Stall warning system.	1	3
11.10	**Fuel Systems (ATA 28)** System lay-out; Fuel tanks; Supply systems; Cross-feed and transfer; Indications and warnings; Refuelling and defuelling.	1	3
11.11	**Hydraulic Power (ATA 29)** System lay-out; Hydraulic fluids; Hydraulic reservoirs and accumulators;	1	3

		Level	
		A2	**B1.2**
	Pressure generation: electric, mechanical; Filters; Pressure Control; Power distribution; Indication and warning systems.		
11.12	**Ice and Rain Protection (ATA 30)** Ice formation, classification and detection; De-icing systems: electrical, hot air, pneumatic and chemical; Probe and drain heating; Wiper systems.	1	3
11.13	**Landing Gear (ATA 32)** Construction, shock absorbing; Extension and retraction systems: normal and emergency; Indications and warning; Wheels, brakes, antiskid and autobraking; Tyres; Steering; Air-ground sensing.	2	3
11.14	**Lights (ATA 33)** External: navigation, anti collision, landing, taxiing, ice; Internal: cabin, cockpit, cargo; Emergency.	2	3
11.15	**Oxygen (ATA 35)** System lay-out: cockpit, cabin;	1	3

		Level	
		A2	**B1.2**
	Sources, storage, charging and distribution; Supply regulation; Indications and warnings.		
11.16	**Pneumatic / Vacuum (ATA 36)** System lay-out; Sources: engine/APU, compressors, reservoirs, ground supply; Pressure control; Distribution; Indications and warnings; Interfaces with other systems.	1	3
11.17	**Water/Waste (ATA 38)** Water system lay-out, supply, distribution, servicing and draining; Toilet system lay-out, flushing and servicing; Corrosion aspects.	2	3

Module 11C. Piston Aeroplane Aerodynamics, Structures and Systems

Note: The scope of this module shall reflect the technology of aeroplanes pertinent to the B3 category.

		Level
		B3
11.1	**Theory of Flight**	
11.1.1	**Aeroplane Aerodynamics and Flight Controls** Operation and effect of: - roll control: ailerons *and spoilers;* - pitch control: elevators, stabilators, variable incidence stabilisers and canards; - yaw control, rudder limiters; Control using elevons, ruddervators; High lift devices, slots, slats, flaps, flaperons; Drag inducing devices, spoilers, lift dumpers, speed brakes; Effects of wing fences, saw tooth leading edges; Boundary layer control using, vortex generators, stall wedges or leading edge devices; Operation and effect of trim tabs, balance and antibalance (leading) tabs, servo tabs, spring tabs, mass balance, control surface bias, aerodynamic balance panels.	1
11.1.2	**High Speed Flight – N/A**	—
11.2	**Airframe Structures — General Concepts**	
	(a) Airworthiness requirements for structural strength; Structural classification, primary, secondary and tertiary; Fail safe, safe life, damage tolerance concepts; Zonal and station identification systems; Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue;	2

		Level
		B3
	Drains and ventilation provisions; System installation provisions; Lightning strike protection provision; Aircraft bonding.	
	(b) Construction methods of: stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, methods of skinning, anti-corrosive protection, wing, empennage and engine attachments; Structure assembly techniques: riveting, bolting, bonding; Methods of surface protection, such as chromating, anodising, painting; Surface cleaning; Airframe symmetry: methods of alignment and symmetry checks.	2
11.3	**Airframe Structures — Aeroplanes**	
11.3.1	**Fuselage (ATA 52/53/56)** Construction and pressurisation sealing; Wing, tail-plane, pylon and undercarriage attachments; Seat installation; Doors and emergency exits: construction and operation; **Windows and windscreen attachment.**	1
11.3.2	**Wings (ATA 57)** Construction; Fuel storage; Landing gear, pylon, control surface and high lift / drag attachments.	1
11.3.3	**Stabilisers (ATA 55)**	1

		Level
		B3
	Construction; Control surface attachment.	
11.3.4	**Flight Control Surfaces (ATA 55 / 57)** Construction and attachment; Balancing — mass and aerodynamic.	1
11.3.5	**Nacelles / Pylons (ATA 54)** Nacelles/Pylons: - Construction; - Firewalls; - Engine mounts.	1
11.4	**Air Conditioning and Cabin Pressurisation (ATA 21)** Heating and ventilation systems.	1
11.5	**Instruments / Avionic Systems**	
11.5.1	**Instrument Systems (ATA 31)** Pitot static: altimeter, air speed indicator, vertical speed indicator; Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator; Compasses: direct reading, remote reading; Angle of attack indication, stall warning systems; Glass cockpit; Other aircraft system indication.	2

		Level
		B3
11.5.2	**Avionic Systems** Fundamentals of system lay-outs and operation of: - Auto Flight (ATA 22); - Communications (ATA 23); - Navigation Systems (ATA 34).	1
11.6	**Electrical Power (ATA 24)** Batteries Installation and Operation; DC power generation; Voltage regulation; Power distribution; Circuit protection; Inverters, transformers.	2
11.7	**Equipment and Furnishings (ATA 25)**	
	Emergency equipment requirements; Seats, harnesses and belts.	2
11.8	**Fire Protection (ATA 26)** Portable fire extinguisher.	2
11.9	**Flight Controls (ATA 27)** Primary controls: aileron, elevator, rudder; Trim tabs; High lift devices; System operation: manual; Gust locks; Balancing and rigging;	3

		Level
		B3
	Stall warning system.	
11.10	**Fuel Systems (ATA 28)** System lay-out; Fuel tanks; Supply systems; Cross-feed and transfer; Indications and warnings; Refuelling and defuelling.	2
11.11	**Hydraulic Power (ATA 29)** System lay-out; Hydraulic fluids; Hydraulic reservoirs and accumulators; Pressure generation: electric, mechanical; Filters; Pressure Control; Power distribution; Indication and warning systems.	2
11.12	**Ice and Rain Protection (ATA 30)** Ice formation, classification and detection; De-icing systems: electrical, hot air, pneumatic and chemical; Probe and drain heating; Wiper systems.	1
11.13	**Landing Gear (ATA 32)** Construction, shock absorbing;	2

		Level
		B3
	Extension and retraction systems: normal and emergency; Indications and warning; Wheels, brakes, antiskid and autobraking; Tyres; Steering.	
11.14	**Lights (ATA 33)** External: navigation, anti collision, landing, taxiing, ice; Internal: cabin, cockpit, cargo; Emergency.	2
11.15	**Oxygen (ATA 35)** System lay-out: cockpit, cabin; Sources, storage, charging and distribution; Supply regulation; Indications and warnings.	2
11.16	**Pneumatic / Vacuum (ATA 36)** System lay-out; Sources: engine/APU, compressors, reservoirs, ground supply; Pressure control; Distribution; Indications and warnings; Interfaces with other systems.	2

Module 12. Helicopter Aerodynamics, Structures and Systems

		Level	
		A3 **A4**	**B1.3** **B1.4**
12.1	**Theory of Flight — Rotary Wing Aerodynamics** Terminology; Effects of gyroscopic precession; Torque reaction and directional control; Dissymmetry of lift, Blade tip stall; Translating tendency and its correction; Coriolis effect and compensation; Vortex ring state, power settling, overpitching; Auto-rotation; Ground effect.	1	2
12.2	**Flight Control Systems** Cyclic control; Collective control; Swashplate; Yaw control: Anti-Torque Control, Tail rotor, bleed air; Main Rotor Head: Design and Operation features; Blade Dampers: Function and construction; Rotor Blades: Main and tail rotor blade construction and attachment; Trim control, fixed and adjustable stabilisers; System operation: manual, hydraulic, electrical and fly-by-wire; Artificial feel;	2	3

		Level	
		A3 **A4**	**B1.3** **B1.4**
	Balancing and rigging.		
12.3	**Blade Tracking and Vibration Analysis** Rotor alignment; Main and tail rotor tracking; Static and dynamic balancing; Vibration types, vibration reduction methods; Ground resonance.	1	3
12.4	**Transmissions** Gear boxes, main and tail rotors; Clutches, free wheel units and rotor brake; Tail rotor drive shafts, flexible couplings, bearings, vibration dampers and bearing hangers.	1	3
12.5	**Airframe Structures**		
	(a) Airworthiness requirements for structural strength; Structural classification, primary, secondary and tertiary; Fail safe, safe life, damage tolerance concepts; Zonal and station identification systems; Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue; Drains and ventilation provisions; System installation provisions; Lightning strike protection provision;	2	2
	(b) Construction methods of: stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties,	1	2

		Level	
		A3 **A4**	**B1.3** **B1.4**
	beams, floor structures, reinforcement, methods of skinning and anti-corrosive protection. Pylon, stabiliser and undercarriage attachments; Seat installation; Doors: construction, mechanisms, operation and safety devices; Windows and windscreen construction; Fuel storage; Firewalls; Engine mounts; Structure assembly techniques: riveting, bolting, bonding; Methods of surface protection, such as chromating, anodising, painting; Surface cleaning; Airframe symmetry: methods of alignment and symmetry checks.		
12.6	**Air Conditioning (ATA 21)**		
12.6.1	**Air supply** Sources of air supply including engine bleed and ground cart.	1	2
12.6.2	**Air Conditioning** Air conditioning systems; Distribution systems; Flow and temperature control systems; Protection and warning devices.	1	3
12.7	**Instruments / Avionic Systems**		

		Level	
		A3 **A4**	**B1.3** **B1.4**
12.7.1	**Instrument Systems (ATA 31)** Pitot static: altimeter, air speed indicator, vertical speed indicator; Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator; Compasses: direct reading, remote reading; Vibration indicating systems — HUMS; Glass cockpit; Other aircraft system indication.	1	2
12.7.2	**Avionic Systems** Fundamentals of system layouts and operation of: Auto Flight (ATA 22); Communications (ATA 23); Navigation Systems (ATA 34).	1	1
12.8	**Electrical Power (ATA 24)** Batteries Installation and Operation; DC power generation, AC power generation; Emergency power generation; Voltage regulation, Circuit protection; Power distribution; Inverters, transformers, rectifiers; External / Ground power.	1	3
12.9	**Equipment and Furnishings (ATA 25)**		
	(a) Emergency equipment requirements;	2	2

		Level	
		A3 **A4**	**B1.3** **B1.4**
	Seats, harnesses and belts; Lifting systems.		
	(b) Emergency flotation systems; Cabin lay-out, cargo retention; Equipment lay-out; Cabin furnishing installation.	1	1
12.10	**Fire Protection (ATA 26)** Fire and smoke detection and warning systems; Fire extinguishing systems; System tests.	1	3
12.11	**Fuel Systems (ATA 28)** System lay-out; Fuel tanks; Supply systems; Dumping, venting and draining; Cross-feed and transfer; Indications and warnings; Refuelling and defuelling.	1	3
12.12	**Hydraulic Power (ATA 29)** System lay-out; Hydraulic fluids; Hydraulic reservoirs and accumulators; Pressure generation: electric, mechanical, pneumatic;	1	3

		Level	
		A3 **A4**	**B1.3** **B1.4**
	Emergency pressure generation; Filters; Pressure Control; Power distribution; Indication and warning systems; Interface with other systems.		
12.13	**Ice and Rain Protection (ATA 30)** Ice formation, classification and detection; Anti-icing and De-icing systems: electrical, hot air and chemical; Rain repellent and removal; Probe and drain heating; Wiper system.	1	3
12.14	**Landing Gear (ATA 32)** Construction, shock absorbing; Extension and retraction systems: normal and emergency; Indications and warning; Wheels, Tyres, brakes; Steering; Air-ground sensing; Skids, floats.	2	3
12.15	**Lights (ATA 33)** External: navigation, landing, taxiing, ice; Internal: cabin, cockpit, cargo;	2	3

		Level	
		A3 **A4**	**B1.3** **B1.4**
	Emergency.		
12.16	**Pneumatic/Vacuum (ATA 36)** System lay-out; Sources: engine/APU, compressors, reservoirs, ground supply; Pressure control; Distribution; Indications and warnings; Interfaces with other systems.	1	3
12.17	**Integrated Modular Avionics (ATA42)** Functions that may be typically integrated in the Integrated Modular Avionic (IMA) modules are, among others: Bleed Management, Air Pressure Control, Air Ventilation and Control, Avionics and Cockpit Ventilation Control, Temperature Control, Air Traffic Communication, Avionics Communication Router, Electrical Load Management, Circuit Breaker Monitoring, Electrical System BITE, Fuel Management, Braking Control, Steering Control, Landing Gear Extension and Retraction, Tyre Pressure Indication, Oleo Pressure Indication, Brake Temperature Monitoring, etc. Core System; Network Components.	1	2
12.18	**On Board Maintenance Systems (ATA45)** Central maintenance computers; Data loading system; Electronic library system; Printing;	1	2

		Level	
		A3 **A4**	**B1.3** **B1.4**
	Structure monitoring (damage tolerance monitoring).		
12.19	**Information Systems (ATA46)** The units and components which furnish a means of storing, updating and retrieving digital information traditionally provided on paper, microfilm or microfiche. Includes units that are dedicated to the information storage and retrieval function such as the electronic library mass storage and controller. Does not include units or components installed for other uses and shared with other systems, such as flight deck printer or general use display. Typical examples include Air Traffic and Information Management Systems and Network Server Systems. Aircraft General Information System; Flight Deck Information System; Maintenance Information System; Passenger Cabin Information System; Miscellaneous Information System.	1	2

Module 13. Aircraft Aerodynamics, Structures and Systems

		Level
		B2*
13.1	**Theory of Flight**	
	(a) Aeroplane Aerodynamics and Flight Controls Operation and effect of: - roll control: ailerons and spoilers, - pitch control: elevators, stabilators, variable incidence stabilisers and canards, - yaw control, rudder limiters; Control using elevons, ruddervators; High lift devices: slots, slats, flaps; Drag inducing devices: spoilers, lift dumpers, speed brakes; Operation and effect of trim tabs, servo tabs, control surface bias;	1
	(b) High Speed Flight Speed of sound, subsonic flight, transonic flight, supersonic flight; Mach number, critical Mach number;	1
	(c) Rotary Wing Aerodynamics Terminology; Operation and effect of cyclic, collective and anti-torque controls.	1
13.2	**Structures — General Concepts**	
	(a) Fundamentals of structural systems.	1
	(b) Zonal and station identification systems; Electrical bonding; Lightning strike protection provision.	2
13.3	**Autoflight (ATA 22)**	3

		Level
		B2*
	Fundamentals of automatic flight control including working principles and current terminology; Command signal processing; Modes of operation: roll, pitch and yaw channels; Yaw dampers; Stability Augmentation System in helicopters; Automatic trim control; Autopilot navigation aids interface; Autothrottle systems; Automatic Landing Systems: principles and categories, modes of operation, approach, glideslope, land, go-around, system monitors and failure conditions.	
13.4	**Communication / Navigation (ATA 23 / 34)** Fundamentals of radio wave propagation, antennas, transmission lines, communication, receiver and transmitter; Working principles of following systems: - Very High Frequency (VHF) communication, - High Frequency (HF) communication, - Audio, - Emergency Locator Transmitters, - Cockpit Voice Recorder, - Very High Frequency omnidirectional range (VOR), - Automatic Direction Finding (ADF), - Instrument Landing System (ILS), - Microwave Landing System (MLS), - Flight Director systems, Distance Measuring Equipment (DME),	3

		Level
		B2*
	- Very Low Frequency and hyperbolic navigation (VLF/Omega), - Doppler navigation, - Area navigation, RNAV systems, - Flight Management Systems, - Global Positioning System (GPS), Global Navigation Satellite Systems (GNSS), - Inertial Navigation System, - Air Traffic Control transponder, secondary surveillance radar, - Traffic Alert and Collision Avoidance System (TCAS), - Weather avoidance radar, - Radio altimeter, - ARINC communication and reporting.	
13.5	**Electrical Power (ATA 24)** Batteries Installation and Operation; DC power generation; AC power generation; Emergency power generation; Voltage regulation; Power distribution; Inverters, transformers, rectifiers; Circuit protection; External/Ground power.	3
13.6	**Equipment and Furnishings (ATA 25)** Electronic emergency equipment requirements; Cabin entertainment equipment.	3

		Level
		B2*
13.7	**Flight Controls (ATA 27)**	
	(a) Primary controls: aileron, elevator, rudder, spoiler, Trim control; Active load control; High lift devices; Lift dump, speed brakes; System operation: manual, hydraulic, pneumatic; Artificial feel, Yaw damper, Mach trim, rudder limiter, gust locks; Stall protection systems;	2
	(b) System operation: electrical, fly by wire.	3
13.8	**Instruments (ATA 31)** Classification; Atmosphere; Terminology; Pressure measuring devices and systems; Pitot static systems; Altimeters; Vertical speed indicators; Airspeed indicators; Machmeters; Altitude reporting/alerting systems; Air data computers; Instrument pneumatic systems; Direct reading pressure and temperature gauges;	3

		Level
		B2*
	Temperature indicating systems; Fuel quantity indicating systems; Gyroscopic principles; Artificial horizons; Slip indicators; Directional gyros; Ground Proximity Warning Systems; Compass systems; Flight Data Recording systems; Electronic Flight Instrument Systems; Instrument warning systems including master warning systems and centralised warning panels; Stall warning systems and angle of attack indicating systems; Vibration measurement and indication; Glass cockpit.	
13.9	**Lights (ATA 33)** External: navigation, anti-collision, landing, taxiing, ice; Internal: cabin, cockpit, cargo; Emergency.	3
13.10	**On Board Maintenance Systems (ATA 45)** Central maintenance computers; Data loading system; Electronic library system; Printing; Structure monitoring (damage tolerance monitoring).	3
13.11	**Air Conditioning and Cabin Pressurisation (ATA21)**	

		Level
		B2*
13.11.1	**Air supply**	2
	Sources of air supply including engine bleed, APU and ground cart;	
13.11.2	**Air Conditioning**	
	Air conditioning systems; Air cycle and vapour cycle machines; Distribution systems; Flow, temperature and humidity control system.	2 3 1 3
13.11.3	**Pressurisation**	3
	Pressurisation systems; Control and indication including control and safety valves; Cabin pressure controllers.	
13.11.4	**Safety and warning devices**	3
	Protection and warning devices.	
13.12	**Fire Protection (ATA 26)**	
	(a) Fire and smoke detection and warning systems; Fire extinguishing systems; System tests;	3
	(b) Portable fire extinguisher.	1
13.13	**Fuel Systems (ATA 28)**	
	System lay-out; Fuel tanks; Supply systems; Dumping, venting and draining; Cross-feed and transfer;	1 1 1 1 2

		Level
		B2*
	Indications and warnings;	3
	Refuelling and defuelling;	2
	Longitudinal balance fuel systems.	3
13.14	**Hydraulic Power (ATA 29)**	
	System lay-out;	1
	Hydraulic fluids;	1
	Hydraulic reservoirs and accumulators;	1
	Pressure generation: electrical, mechanical, pneumatic;	3
	Emergency pressure generation;	3
	Filters;	1
	Pressure control;	3
	Power distribution;	1
	Indication and warning systems;	3
	Interface with other systems.	3
13.15	**Ice and Rain Protection (ATA 30)**	
	Ice formation, classification and detection;	2
	Anti-icing systems: electrical, hot air and chemical;	2
	De-icing systems: electrical, hot air, pneumatic, chemical;	3
	Rain repellent;	1
	Probe and drain heating;	3
	Wiper Systems.	1
13.16	**Landing Gear (ATA 32)**	
	Construction, shock absorbing;	1
	Extension and retraction systems: normal and emergency;	3

		Level
		B2*
	Indications and warnings; Wheels, brakes, antiskid and autobraking; Tyres; Steering; Air-ground sensing.	3 3 1 3 3
13.17	**Oxygen (ATA 35)**	
	System lay-out: cockpit, cabin; Sources, storage, charging and distribution; Supply regulation; Indications and warnings.	3 3 3 3
13.18	**Pneumatic/Vacuum (ATA 36)**	
	System lay-out; Sources: engine/APU, compressors, reservoirs, ground supply; Pressure control; Distribution; Indications and warnings; Interfaces with other systems.	2 2 3 1 3 3
13.19	**Water / Waste (ATA 38)**	2
	Water system lay-out, supply, distribution, servicing and draining; Toilet system lay-out, flushing and servicing;	
13.20	**Integrated Modular Avionics (ATA 42)**	3
	Functions that may be typically integrated in the Integrated Modular Avionic (IMA) modules are, among others: Bleed Management, Air Pressure Control, Air Ventilation and Control, Avionics and Cockpit Ventilation Control, Temperature Control, Air Traffic Communication, Avionics Communication Router, Electrical	

		Level
		B2*
	Load Management, Circuit Breaker Monitoring, Electrical System BITE, Fuel Management, Braking Control, Steering Control, Landing Gear Extension and Retraction, Tyre Pressure Indication, Oleo Pressure Indication, Brake Temperature Monitoring, etc.; Core System; Network Components.	
13.21	**Cabin Systems (ATA 44)**	3
	The units and components which furnish a means of entertaining the passengers and providing communication within the aircraft (Cabin Intercommunication Data System) and between the aircraft cabin and ground stations (Cabin Network Service). Includes voice, data, music and video transmissions. The Cabin Intercommunication Data System provides an interface between cockpit/cabin crew and cabin systems. These systems support data exchange of the different related LRU's and they are typically operated via Flight Attendant Panels. The Cabin Network Service typically consists on a server, typically interfacing with, among others, the following systems: - Data/Radio Communication, In-Flight Entertainment System. The Cabin Network Service may host functions such as: - Access to pre-departure / departure reports, - E-mail/intranet/internet access, - Passenger database; Cabin Core System; In-flight Entertainment System; External Communication System; Cabin Mass Memory System; Cabin Monitoring System;	

		Level
		B2*
	Miscellaneous Cabin System.	
13.22	**Information Systems (ATA 46)**	3
	The units and components which furnish a means of storing, updating and retrieving digital information traditionally provided on paper, microfilm or microfiche. Includes units that are dedicated to the information storage and retrieval function such as the electronic library mass storage and controller. Does not include units or components installed for other uses and shared with other systems, such as flight deck printer or general use display. Typical examples include Air Traffic and Information Management Systems and Network Server Systems. Aircraft General Information System; Flight Deck Information System; Maintenance Information System; Passenger Cabin Information System; Miscellaneous Information System.	

Module 14. Propulsion

		Level
		B2*
14.1	**Turbine Engines**	
	Constructional arrangement and operation of turbojet, turbofan, turboshaft and turbopropeller engines;	1
	Electronic engine control and fuel metering systems (FADEC).	2
14.2	**Engine Indicating Systems** Exhaust gas temperature / Interstage turbine temperature systems; Engine speed; Engine Thrust Indication: Engine Pressure Ratio, engine turbine discharge pressure or jet pipe pressure systems; Oil pressure and temperature; Fuel pressure, temperature and flow; Manifold pressure; Engine torque; Propeller speed.	2
14.3	**Starting and Ignition Systems**	2
	Operation of engine start systems and components; Ignition systems and components; Maintenance safety requirements.	

Module 15. Gas Turbine Engine

		Level	
		A	**B1**
15.1	**Fundamentals** Potential energy, kinetic energy, Newton's laws of motion, Brayton cycle; The relationship between force, work, power, energy, velocity, acceleration; Constructional arrangement and operation of turbojet, turbofan, turboshaft, turboprop.	1	2
15.2	**Engine Performance** Gross thrust, net thrust, choked nozzle thrust, thrust distribution, resultant thrust, thrust horsepower, equivalent shaft horsepower, specific fuel consumption; Engine efficiencies; By-pass ratio and engine pressure ratio; Pressure, temperature and velocity of the gas flow; Engine ratings, static thrust, influence of speed, altitude and hot climate, flat rating, limitations.	—	2
15.3	**Inlet** Compressor inlet ducts; Effects of various inlet configurations; Ice protection.	2	2
15.4	**Compressors** Axial and centrifugal types; Constructional features and operating principles and applications; Fan balancing; Operation: Causes and effects of compressor stall and surge;	1	2

		Level	
		A	**B1**
	Methods of air flow control: bleed valves, variable inlet guide vanes, variable stator vanes, rotating stator blades; Compressor ratio.		
15.5	**Combustion Section** Constructional features and principles of operation.	1	2
15.6	**Turbine Section** Operation and characteristics of different turbine blade types; Blade to disk attachment; Nozzle guide vanes; Causes and effects of turbine blade stress and creep.	2	2
15.7	**Exhaust** Constructional features and principles of operation; Convergent, divergent and variable area nozzles; Engine noise reduction; Thrust reversers.	1	2
15.8	**Bearings and Seals** Constructional features and principles of operation.	—	2
15.9	**Lubricants and Fuels** Properties and specifications; Fuel additives; Safety precautions.	1	2
15.10	**Lubrication Systems** System operation/lay-out and components.	1	2

		Level	
		A	**B1**
15.11	**Fuel Systems** Operation of engine control and fuel metering systems including electronic engine control (FADEC); Systems lay-out and components.	1	2
15.12	**Air Systems** Operation of engine air distribution and anti-ice control systems, including internal cooling, sealing and external air services.	1	2
15.13	**Starting and Ignition Systems** Operation of engine start systems and components; Ignition systems and components; Maintenance safety requirements.	1	2
15.14	**Engine Indication Systems** Exhaust Gas Temperature / Interstage Turbine Temperature; Engine Thrust Indication: Engine Pressure Ratio, engine turbine discharge pressure or jet pipe pressure systems; Oil pressure and temperature; Fuel pressure and flow; Engine speed; Vibration measurement and indication; Torque; Power.	1	2
15.15	**Power Augmentation Systems** Operation and applications; Water injection, water methanol; Afterburner systems.	—	1

		Level	
		A	**B1**
15.16	**Turbo-prop Engines** Gas coupled/free turbine and gear coupled turbines; Reduction gears; Integrated engine and propeller controls; Overspeed safety devices.	1	2
15.17	**Turbo—shaft engines** Arrangements, drive systems, reduction gearing, couplings, control systems.	1	2
15.18	**Auxiliary Power Units (APUs)** Purpose, operation, protective systems.	1	2
15.19	**Powerplant Installation** Configuration of firewalls, cowlings, acoustic panels, engine mounts, anti-vibration mounts, hoses, pipes, feeders, connectors, wiring looms, control cables and rods, lifting points and drains.	1	2
15.20	**Fire Protection Systems** Operation of detection and extinguishing systems.	1	2
15.21	**Engine Monitoring and Ground Operation** Procedures for starting and ground run-up; Interpretation of engine power output and parameters; Trend (including oil analysis, vibration and boroscope) monitoring; Inspection of engine and components to criteria, tolerances and data specified by engine manufacturer; Compressor washing/cleaning; Foreign Object Damage.	1	3

		Level	
		A	**B1**
15.22	**Engine Storage and Preservation** Preservation and depreservation for the engine and accessories / systems.	—	2

Module 16. Piston Engine

		Level		
		A	**B1**	**B3**
16.1	**Fundamentals** Mechanical, thermal and volumetric efficiencies; Operating principles — 2 stroke, 4 stroke, Otto and Diesel; Piston displacement and compression ratio; Engine configuration and firing order.	1	2	2
16.2	**Engine Performance** Power calculation and measurement; Factors affecting engine power; Mixtures / leaning, pre-ignition.	1	2	2
16.3	**Engine Construction** Crank case, crank shaft, cam shafts, sumps; Accessory gearbox; Cylinder and piston assemblies; Connecting rods, inlet and exhaust manifolds; Valve mechanisms; Propeller reduction gearboxes.	1	1	2
16.4	**Engine Fuel Systems**			
16.4.1	**Carburettors** Types, construction and principles of operation; Icing and heating;	1	2	2

		Level		
		A	**B1**	**B3**
16.4.2	**Fuel injection systems** Types, construction and principles of operation.	1	2	2
16.4.3	**Electronic engine control** Operation of engine control and fuel metering systems including electronic engine control (FADEC); Systems lay-out and components.	1	2	2
16.5	**Starting and Ignition Systems** Starting systems, pre-heat systems; Magneto types, construction and principles of operation; Ignition harnesses, spark plugs; Low and high tension systems.	1	2	2
16.6	**Induction, Exhaust and Cooling Systems** Construction and operation of: induction systems including alternate air systems; Exhaust systems, engine cooling systems — air and liquid.	1	2	2
16.7	**Supercharging / Turbocharging** Principles and purpose of supercharging and its effects on engine parameters; Construction and operation of supercharging / turbocharging systems; System terminology; Control systems; System protection.	1	2	2
16.8	**Lubricants and Fuels** Properties and specifications; Fuel additives;	1	2	2

		Level		
		A	**B1**	**B3**
	Safety precautions.			
16.9	**Lubrication Systems** System operation / lay-out and components.	1	2	2
16.10	**Engine Indication Systems** Engine speed; Cylinder head temperature; Coolant temperature; Oil pressure and temperature; Exhaust Gas Temperature; Fuel pressure and flow; Manifold pressure.	1	2	2
16.11	**Powerplant Installation** Configuration of firewalls, cowlings, acoustic panels, engine mounts, anti-vibration mounts, hoses, pipes, feeders, connectors, wiring looms, control cables and rods, lifting points and drains.	1	2	2
16.12	**Engine Monitoring and Ground Operation** Procedures for starting and ground run-up; Interpretation of engine power output and parameters; Inspection of engine and components: criteria, tolerances, and data specified by engine manufacturer.	1	3	2
16.13	**Engine Storage and Preservation** Preservation and depreservation for the engine and accessories / systems.	—	2	—

Module 17A. Propeller

		Level	
		A	**B1**
17.1	**Fundamentals** Blade element theory; High/low blade angle, reverse angle, angle of attack, rotational speed; Propeller slip; Aerodynamic, centrifugal, and thrust forces; Torque; Relative airflow on blade angle of attack; Vibration and resonance.	1	2
17.2	**Propeller Construction** Construction methods and materials used in wooden, composite and metal propellers; Blade station, blade face, blade shank, blade back and hub assembly; Fixed pitch, controllable pitch, constant speeding propeller; Propeller/spinner installation.	1	2
17.3	**Propeller Pitch Control** Speed control and pitch change methods, mechanical and electrical/electronic; Feathering and reverse pitch; Overspeed protection.	1	2
17.4	**Propeller Synchronising** Synchronising and synchrophasing equipment.	—	2

		Level	
		A	**B1**
17.5	**Propeller Ice Protection** Fluid and electrical de-icing equipment.	1	2
17.6	**Propeller Maintenance** Static and dynamic balancing; Blade tracking; Assessment of blade damage, erosion, corrosion, impact damage, delamination; Propeller treatment/repair schemes; Propeller engine running.	1	3
17.7	**Propeller Storage and Preservation** Propeller preservation and depreservation.	1	2

Module 17B. Propeller

		Level
		B3
17.1	**Fundamentals** Blade element theory; High/low blade angle, reverse angle, angle of attack, rotational speed; Propeller slip; Aerodynamic, centrifugal, and thrust forces; Torque; Relative airflow on blade angle of attack; Vibration and resonance.	2
17.2	**Propeller Construction** Construction methods and materials used in wooden, composite and metal propellers; Blade station, blade face, blade shank, blade back and hub assembly; Fixed pitch, controllable pitch, constant speeding propeller; Propeller/spinner installation.	2
17.3	**Propeller Pitch Control** Speed control and pitch change methods, mechanical and electrical/electronic; Feathering and reverse pitch; Overspeed protection.	2
17.4	**Propeller Synchronising** Synchronising and synchrophasing equipment.	2

		Level
		B3
17.5	**Propeller Ice Protection** Fluid and electrical de-icing equipment.	2
17.6	**Propeller Maintenance** Static and dynamic balancing; Blade tracking; Assessment of blade damage, erosion, corrosion, impact damage, delamination; Propeller treatment/repair schemes; Propeller engine running.	2
17.7	**Propeller Storage and Preservation** Propeller preservation and depreservation.	2

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Appendix II — Basic examination standard

1. General

1.1 All basic examinations shall be carried out using the multi-choice question format and essay questions as specified below. The incorrect alternatives shall seem equally plausible to anyone ignorant of the subject. All of the alternatives shall be clearly related to the question and of similar vocabulary, grammatical construction and length. In numerical questions, the incorrect answers shall correspond to procedural errors such as corrections applied in the wrong sense or incorrect unit conversions: they shall not be mere random numbers.

1.2 Each multi-choice question shall have three alternative answers of which only one shall be the correct answer and the candidate shall be allowed a time per module which is based upon a nominal average of 75 seconds per question.

1.3 Each essay question requires the preparation of a written answer and the candidate shall be allowed 20 minutes to answer each such question.

1.4 Each essay paper of the basic examination can be selected from a combination of one to three modules. The result for each module will be provided separately. A pass will be recorded for the individual module attaining 75 % of the total mark of that module irrespective of the number of modules selected.

1.5 Suitable essay questions shall be drafted and evaluated using the knowledge syllabus in Section 4 Appendix I Modules 7A, 7B, 9A, 9B and 10.

1.6 Each question will have a model answer drafted for it, which will also include any known alternative answers that may be relevant for other subdivisions.

1.7 The model answer will also be broken down into a list of the important points known as Key Points.

1.8 The pass mark for each module and sub-module multi-choice part of the examination is 75 %.

1.9 The pass mark for each essay question is 75 % in that the candidates answer shall contain 75 % of the required key points addressed by the question and no significant error related to any required key point.

1.10 Answer to an essay question must be presented in a technical report style. For each essay question, 60% of the full mark is allocated to the technical content whilst 40% of the full mark is allocated to the presentation skill.

1.11 If either the multi-choice part only or the essay part only is failed, then it is only necessary to retake the multi-choice or essay part, as appropriate.

1.12 Penalty marking systems shall not be used to determine whether a candidate has passed.

1.13 The time periods required by HKAR 66.25 apply to each individual module examination, with the exception of those module examinations which were passed as part of another category licence, where the licence has already been issued.

1.14 A failed module may not be retaken for at least 90 days following the date of the failed module examination, except in the case of a maintenance training organisation approved in accordance with HKAR-147 which conducts a course of retraining tailored to the failed subjects in the particular module when the failed module may be retaken after 30 days.

1.15 A one year waiting period is needed after a maximum of three attempts, within the said 12-month period, for each module.

The applicant shall confirm in writing to the approved maintenance training organisation or the Director-General to which they apply for an examination, the number and dates of attempts during the last 12 months and the organisation or the Director-General where these attempts took place. The maintenance training organisation or the Director-General is responsible for checking the number of attempts within the applicable timeframes.

1.16 Candidate who is proven to be cheating or breaching the examination rules will be banned from taking any CAD examination for at least 12 months after the date of the incident.

2. Number of questions per module

2.1 Module 1 — Mathematics

Category A: 16 multi-choice and 0 essay questions. Time allowed 20 minutes.

Category B1: 32 multi-choice and 0 essay questions. Time allowed 40 minutes.

Category B2*: 32 multi-choice and 0 essay questions. Time allowed 40 minutes.

Category B3: 28 multi-choice and 0 essay questions. Time allowed 35 minutes.

2.2 Module 2 — Physics

Category A: 32 multi-choice and 0 essay questions. Time allowed 40 minutes.

Category B1: 52 multi-choice and 0 essay questions. Time allowed 65 minutes.

Category B2*: 52 multi-choice and 0 essay questions. Time allowed 65 minutes.

Category B3: 28 multi-choice and 0 essay questions. Time allowed 35 minutes.

2.3 Module 3 — Electrical Fundamentals

Category A: 20 multi-choice and 0 essay questions. Time allowed 25 minutes.

Category B1: 52 multi-choice and 0 essay questions. Time allowed 65 minutes.

Category B2*: 52 multi-choice and 0 essay questions. Time allowed 65 minutes.

Category B3: 24 multi-choice and 0 essay questions. Time allowed 30 minutes.

2.4 Module 4 — Electronic Fundamentals

Category B1: 20 multi-choice and 0 essay questions. Time allowed 25 minutes.

Category B2*: 40 multi-choice and 0 essay questions. Time allowed 50 minutes.

Category B3: 8 multi-choice and 0 essay questions. Time allowed 10 minutes.

2.5 Module 5 — Digital Techniques / Electronic Instrument Systems

Category A: 16 multi-choice and 0 essay questions. Time allowed 20 minutes.

Category B1.1 and B1.3: 40 multi-choice and 0 essay questions. Time allowed 50 minutes.

Category B1.2 and B1.4: 20 multi-choice and 0 essay questions. Time allowed 25 minutes.

Category B2*: 72 multi-choice and 0 essay questions. Time allowed 90 minutes.

Category B3: 16 multi-choice and 0 essay questions. Time allowed 20 minutes.

2.6 Module 6 — Materials And Hardware

Category A: 52 multi-choice and 0 essay questions. Time allowed 65 minutes.

Category B1: 72 multi-choice and 0 essay questions. Time allowed 90 minutes.

Category B2*: 60 multi-choice and 0 essay questions. Time allowed 75 minutes.

Category B3: 60 multi-choice and 0 essay questions. Time allowed 75 minutes.

2.7 Module 7A — Maintenance Practices

Category A: 72 multi-choice and 2 essay questions. Time allowed 90 minutes and 40 minutes respectively.

Category B1: 80 multi-choice and 2 essay questions. Time allowed 100 minutes and 40 minutes respectively.

Category B2*: 60 multi-choice and 2 essay questions. Time allowed 75 minutes and 40 minutes respectively.

Module 7B — Maintenance Practices

Category B3: 60 multi-choice and 2 essay questions. Time allowed 75 minutes and 40 minutes respectively.

2.8 Module 8 — Basic Aerodynamics

Category A: 20 multi-choice and 0 essay questions. Time allowed 25 minutes.

Category B1: 20 multi-choice and 0 essay questions. Time allowed 25 minutes.

Category B2*: 20 multi-choice and 0 essay questions. Time allowed 25 minutes.

Category B3: 20 multi-choice and 0 essay questions. Time allowed 25 minutes.

2.9 Module 9A — Human Factors

Category A: 20 multi-choice and 1 essay question. Time allowed 25 minutes and 20 minutes respectively.

Category B1: 20 multi-choice and 1 essay question. Time allowed 25 minutes and 20 minutes respectively.

Category B2*: 20 multi-choice and 1 essay question. Time allowed 25 minutes and 20 minutes respectively.

Module 9B — Human Factors

Category B3: 16 multi-choice and 1 essay questions. Time allowed 20 minutes and 20 minutes respectively.

2.10 Module 10 — Aviation Legislation

Category A: 32 multi-choice and 1 essay question. Time allowed 40 minutes and 20 minutes respectively.

Category B1: 40 multi-choice and 1 essay question. Time allowed 50 minutes and 20 minutes respectively.

Category B2*: 40 multi-choice and 1 essay question. Time allowed 50 minutes and 20 minutes respectively.

Category B3: 32 multi-choice and 1 essay questions. Time allowed 40 minutes and 20 minutes respectively.

2.11 Module 11A — Turbine Aeroplane Aerodynamics, Structures and Systems

Category A: 108 multi-choice and 0 essay questions. Time allowed 135 minutes.
Category B1: 140 multi-choice and 0 essay questions. Time allowed 175 minutes.

Module 11B — Piston Aeroplane Aerodynamics, Structures and Systems

Category A: 72 multi-choice and 0 essay questions. Time allowed 90 minutes.
Category B1: 100 multi-choice and 0 essay questions. Time allowed 125 minutes.

Module 11C — Piston Aeroplane Aerodynamics, Structures and Systems

Category B3: 60 multi-choice and 0 essay questions. Time allowed 75 minutes.

2.12 Module 12 — Helicopter Aerodynamics, Structures and Systems

Category A: 100 multi-choice and 0 essay questions. Time allowed 125 minutes.
Category B1: 128 multi-choice and 0 essay questions. Time allowed 160 minutes.

2.13 Module 13 — Aircraft Aerodynamics, Structures And Systems

Category B2*: 180 multi-choice and 0 essay questions. Time allowed 225 minutes. Questions and time allowed may be split into two examinations as appropriate.

2.14 Module 14 — Propulsion

Category B2*: 24 multi-choice and 0 essay questions. Time allowed 30 minutes.

2.15 Module 15 — Gas Turbine Engine

Category A: 60 multi-choice and 0 essay questions. Time allowed 75 minutes.
Category B1: 92 multi-choice and 0 essay questions. Time allowed 115 minutes.

2.16 Module 16 — Piston Engine

Category A: 52 multi-choice and 0 essay questions. Time allowed 65 minutes.
Category B1: 72 multi-choice and 0 essay questions. Time allowed 90 minutes.

Category B3: 68 multi-choice and 0 essay questions. Time allowed 85 minutes.

2.17 Module 17A — Propeller

Category A: 20 multi-choice and 0 essay questions. Time allowed 25 minutes.
Category B1: 32 multi-choice and 0 essay questions. Time allowed 40 minutes.

Module 17B — Propeller

Category B3: 28 multi-choice and 0 essay questions. Time allowed 35 minutes.

Appendix III — Aircraft type training and examination standard — On the job training

1. General

Aircraft type training shall consist of theoretical training and examination, and, except for the category C ratings, practical training and assessment.

(a) Theoretical training and examination shall comply with the following requirements:

(i) Shall be conducted by a maintenance training organisation appropriately approved in accordance with HKAR-147 or, when conducted by other organisations, as directly approved by the Director-General.

(ii) Shall comply, except as permitted by the differences training described in paragraph (c), with:

the relevant elements defined in the mandatory part of the Operational Suitability Data - Maintenance Certifying Staff Data (OSD-MCSD) established by the Type Certificate holder and approved by the State of Design or, if such elements are not available, the standard described in point 3.1 of this Appendix, and

the type training examination standard described in paragraph 4.1 of this Appendix.

(iii) In the case of a category C person qualified by holding an academic degree as specified in point HKAR 66.30(a)(5), the first relevant aircraft type theoretical training shall be at the category B1 or B2* level.

(iv) Shall have been started and completed within the 3 years preceding the application for a type rating endorsement.

(b) Practical training and assessment shall comply with the following requirements:

(i) Shall be conducted by a maintenance training organisation appropriately approved in accordance with HKAR-147 or, when conducted by other organisations, as directly approved by the Director-General.

(ii) Shall comply, except as permitted by the differences training described in paragraph (c), with:

the relevant elements defined in the mandatory part of the Operational Suitability Data - Maintenance Certifying Staff Data (OSD-MCSD)

established by the Type Certificate holder and approved by the State of Design or, if such elements are not available, the standard described in point 3.2 of this Appendix, and

the type training assessment standard described in paragraph 4.2 of this Appendix.

(iii) Shall include a representative cross section of maintenance activities relevant to the aircraft type.

(iv) Shall include demonstrations using equipment, components, simulators, other training devices or aircraft.

(v) Shall have been started and completed within the 3 years preceding the application for a type rating endorsement.

(c) Differences training

(i) Differences training is the training required in order to cover the differences between two different aircraft type ratings of the same manufacturer as determined by the Director-General.

(ii) Differences training has to be defined on a case-to-case basis taking into account the requirements contained in this Appendix in respect of both theoretical and practical elements of type rating training.

(iii) A type rating shall only be endorsed on a licence after differences training when the applicant also complies with one of the following conditions:

- having already endorsed on the licence the aircraft type rating from which the differences are being identified, or
- having completed the type training requirements for the aircraft from which the differences are being identified.

2. Aircraft type training levels

The three levels listed below define the objectives, the depth of training and the level of knowledge that the training is intended to achieve.

- *Level 1: A brief overview of the airframe, systems and powerplant as outlined in the Systems Description Section of the Aircraft Maintenance Manual/Instructions for Continued Airworthiness.*

Course objectives: Upon completion of Level 1 training, the student will be able to:

(a) provide a simple description of the whole subject, using common words and examples, using typical terms and identify safety precautions related to the airframe, its systems and powerplant;

(b) identify aircraft manuals, maintenance practices important to the airframe, its systems and powerplant;

(c) define the general layout of the aircraft's major systems;

(d) define the general layout and characteristics of the powerplant;

(e) identify special tooling and test equipment used with the aircraft.

- *Level 2: Basic system overview of controls, indicators, principal components, including their location and purpose, servicing and minor troubleshooting. General knowledge of the theoretical and practical aspects of the subject.*

Course objectives: In addition to the information contained in the Level 1 training, at the completion of Level 2 training, the student will be able to:

(a) understand the theoretical fundamentals; apply knowledge in a practical manner using detailed procedures;

(b) recall the safety precautions to be observed when working on or near the aircraft, powerplant and systems;

(c) describe systems and aircraft handling particularly access, power availability and sources;

(d) identify the locations of the principal components;

(e) explain the normal functioning of each major system, including terminology and nomenclature;

(f) perform the procedures for servicing associated with the aircraft for the following systems: Fuel, Power Plants, Hydraulics, Landing Gear, Water/Waste, and Oxygen;

(g) demonstrate proficiency in use of crew reports and on-board reporting systems (minor troubleshooting) and determine aircraft airworthiness per the MEL/CDL;

(h) demonstrate the use, interpretation and application of appropriate documentation including instructions for continued airworthiness, maintenance manual, illustrated parts catalogue, etc.

- *Level 3: Detailed description, operation, component location, removal/installation*

and bite and troubleshooting procedures to maintenance manual level.

Course objectives: In addition to the information contained in Level 1 and Level 2 training, at the completion of Level 3 training, the student will be able to:

(a) demonstrate a theoretical knowledge of aircraft systems and structures and interrelationships with other systems, provide a detailed description of the subject using theoretical fundamentals and specific examples and to interpret results from various sources and measurements and apply corrective action where appropriate;

(b) perform system, powerplant, component and functional checks as specified in the aircraft maintenance manual;

(c) demonstrate the use, interpret and apply appropriate documentation including structural repair manual, troubleshooting manual, etc.;

(d) correlate information for the purpose of making decisions in respect of fault diagnosis and rectification to maintenance manual level;

(e) describe procedures for replacement of components unique to aircraft type.

3. Aircraft type training standard

Although aircraft type training includes both theoretical and practical elements, courses can be approved for the theoretical element, the practical element or for a combination of both.

3.1. Theoretical element

(a) Objective

On completion of a theoretical training course the student shall be able to demonstrate, to the levels identified in the syllabus in paragraph 3.1(e) of this Appendix, the detailed theoretical knowledge of the aircraft's applicable systems, structure, operations, maintenance, repair, and troubleshooting according to approved maintenance data. The student shall be able to demonstrate the use of manuals and approved procedures, including the knowledge of relevant inspections and limitations.

(b) Level of training:

Training levels are those levels defined in paragraph 2 above.

After the first type course for category C certifying staff all subsequent courses need only be to level 1.

During a level 3 theoretical training, level 1 and 2 training material may be used to teach the full scope of the chapter if required. However, during the training the majority of the course material and training time shall be at the higher level.

(c) Duration:

The theoretical training minimum tuition hours are contained in the following table:

Category	**Hours**
Aeroplanes with a maximum take-off mass above 30000 kg:	
B1.1	150
B1.2	120
B2*	100
C	30
Aeroplanes with a maximum take-off mass equal or less than 30000 kg and above 5700 kg:	
B1.1	120
B1.2	100
B2*	100
C	25
Aeroplanes with a maximum take-off mass of 5700 kg and below (see [1] below)	
B1.1	80
B1.2	60
B2*	60
C	15
Helicopters (see [2] below)	
B1.3	120
B1.4	100
B2*	100
C	25

[1] For non-pressurised piston engine aeroplanes below 2000 kg MTOM the minimum duration can be reduced by 50 %.

[2] For helicopters in group 2 (as defined in HKAR 66.42) the minimum duration can be reduced by 30 %.

For the purpose of the table above, a tuition hour means 60 minutes of teaching and excludes any breaks, examination, revision, preparation and aircraft visit.

These hours apply only to theoretical courses for complete aircraft/engine combinations according to the type rating as defined by the Director-General.

(d) Justification of course duration:

Training courses carried out in a maintenance training organisation approved in

accordance with HKAR-147 and courses directly approved by the Director-General shall justify their hour duration and the coverage of the full syllabus by a training needs analysis based on:

- the design of the aircraft type, its maintenance needs and the types of operation,

- detailed analysis of applicable chapters — see contents table in paragraph 3.1(e) below,

- detailed competency analysis showing that the objectives as stated in paragraph 3.1(a) above are fully met.

Where the training needs analysis shows that more hours are needed, course lengths shall be longer than the minimum specified in the table.

Similarly, tuition hours of differences courses or other training course combinations (such as combined B1 / B2* courses), and in cases of theoretical type training courses below the figures given in paragraph 3.1(c) above, these shall be justified to the Director-General by the training needs analysis as described above.

In addition, the course must describe and justify the following:

- The minimum attendance required to the trainee, in order to meet the objectives of the course.
- The maximum number of hours of training per day, taking into account pedagogical and human factors principles.

If the minimum attendance required is not met, the certificate of recognition shall not be issued. Additional training may be provided by the training organisation in order to meet the minimum attendance time.

(e) Content:

As a minimum, the elements in the Syllabus below that are specific to the aircraft type shall be covered. Additional elements introduced due to type variations, technological changes, etc. shall also be included.

The training syllabus shall be focused on mechanical and electrical aspects for B1 personnel, and electrical and avionic aspects for B2*.

Licence category	Aeroplanes Turbine		Aeroplanes Piston		Helicopters Turbine		Helicopters Piston		Avionics
Chapters Level	B1	C	B1	C	B1	C	B1	C	B2*
Introduction module									
05 Time limits/maintenance checks	1	1	1	1	1	1	1	1	1
06 Dimensions/Areas (MTOM, etc.)	1	1	1	1	1	1	1	1	1
07 Lifting and Shoring	1	1	1	1	1	1	1	1	1
08 Levelling and weighing	1	1	1	1	1	1	1	1	1
09 Towing and taxiing	1	1	1	1	1	1	1	1	1
10 Parking/mooring, Storing and Return to Service	1	1	1	1	1	1	1	1	1
11 Placards and Markings	1	1	1	1	1	1	1	1	1
12 Servicing	1	1	1	1	1	1	1	1	1
20 Standard practices - only type particular	1	1	1	1	1	1	1	1	1
Helicopters									
18 Vibration and Noise Analysis (Blade tracking)	—	—	—	—	3	1	3	1	—
25 Emergency Flotation Equipment	—	—	—	—	3	1	3	1	1
53 Airframe Structure (Helicopter)	—	—	—	—	3	1	3	1	—
60 Standard Practices Rotor	—	—	—	—	3	1	3	1	—
62 Rotors	—	—	—	—	3	1	3	1	1
62A Rotors — Monitoring and indicating	—	—	—	—	3	1	3	1	3
63 Rotor Drives	—	—	—	—	3	1	3	1	1
63A Rotor Drives — Monitoring and indicating	—	—	—	—	3	1	3	1	3
64 Tail Rotor	—	—	—	—	3	1	3	1	1
64A Tail rotor —	—	—	—	—	3	1	3	1	3

Licence category	Aeroplanes Turbine		Aeroplanes Piston		Helicopters Turbine		Helicopters Piston		Avionics
Chapters Level	B1	C	B1	C	B1	C	B1	C	B2*
Monitoring and indicating									
65 Tail Rotor Drive	—	—	—	—	3	1	3	1	1
65A Tail Rotor Drive — Monitoring and indicating	—	—	—	—	3	1	3	1	3
66 Folding Blades/Pylon	—	—	—	—	3	1	3	1	—
67 Rotors Flight Control	—	—	—	—	3	1	3	1	—
Airframe structures									
27A Flight Control Surfaces (All)	3	1	3	1	—	—	—	—	1
51 Standard practices and structures (damage classification, assessment and repair)	3	1	3	1	—	—	—	—	1
52 Doors	3	1	3	1	—	—	—	—	1
53 Fuselage	3	1	3	1	—	—	—	—	1
54 Nacelles/Pylons	3	1	3	1	—	—	—	—	1
55 Stabilisers	3	1	3	1	—	—	—	—	1
56 Windows	3	1	3	1	—	—	—	—	1
57 Wings	3	1	3	1	—	—	—	—	1
Zonal and Station Identification Systems.	1	1	1	1	1	1	1	1	1
Airframe systems									
21 Air Conditioning	3	1	3	1	3	1	3	1	3
21A Air Supply	3	1	3	1	1	3	3	1	2
21B Pressurisation	3	1	3	1	3	1	3	1	3
21C Safety and Warning Devices	3	1	3	1	3	1	3	1	3
22 Autoflight	2	1	2	1	2	1	2	1	3
23 Communications	2	1	2	1	2	1	2	1	3
24 Electrical Power	3	1	3	1	3	1	3	1	3

Licence category	Aeroplanes Turbine		Aeroplanes Piston		Helicopters Turbine		Helicopters Piston		Avionics
Chapters Level	B1	C	B1	C	B1	C	B1	C	B2*
25 Equipment and Furnishings	3	1	3	1	3	1	3	1	1
25A Electronic Equipment including emergency equipment	1	1	1	1	1	1	1	1	3
26 Fire Protection	3	1	3	1	3	1	3	1	3
27 Flight Controls	3	1	3	1	3	1	3	1	2
27A Sys. Operation: Electrical / Fly-by-Wire	3	1	—	—	—	—	—	—	3
28 Fuel Systems	3	1	3	1	3	1	3	1	2
28A Fuel Systems — Monitoring and indicating	3	1	3	1	3	1	3	1	3
29 Hydraulic Power	3	1	3	1	3	1	3	1	2
29A Hydraulic Power — Monitoring and indicating	3	1	3	1	3	1	3	1	3
30 Ice and Rain Protection	3	1	3	1	3	1	3	1	3
31 Indicating/Recording Systems	3	1	3	1	3	1	3	1	3
31A Instrument Systems	3	1	3	1	3	1	1	3	3
32 Landing Gear	3	1	3	1	3	1	3	1	2
32A Landing Gear — Monitoring and indicating	3	1	3	1	3	1	3	1	3
33 Lights	3	1	3	1	3	1	3	1	3
34 Navigation	2	1	2	1	2	1	2	1	3
35 Oxygen	3	1	3	1	—	—	—	—	2
36 Pneumatic	3	1	3	1	3	1	3	1	2
36A Pneumatic — Monitoring and indicating	3	1	3	1	3	1	3	1	3
37 Vacuum	3	1	3	1	3	1	3	1	2
38 Water/Waste	3	1	3	1	—	—	—	—	2
41 Water Ballast	3	1	3	1	—	—	—	—	1
42 Integrated modular avionics	2	1	2	1	2	1	2	1	3

Licence category	Aeroplanes Turbine		Aeroplanes Piston		Helicopters Turbine		Helicopters Piston		Avionics
Chapters Level	B1	C	B1	C	B1	C	B1	C	B2*
44 Cabin Systems	2	1	2	1	2	1	2	1	3
45 On-Board Maintenance System (or covered in 31)	3	1	3	1	3	1	—	—	3
46 Information Systems	2	1	2	1	2	1	2	1	3
50 Cargo and Accessory Compartments	3	1	3	1	3	1	3	1	1
Turbine Engine									
49 Auxiliary Power Units (APUs)	3	1	—	—	—	—	—	—	2
70 Standard Practices — Engines,	3	1	—	—	3	1	—	—	1
70A constructional arrangement and operation (Installation Inlet, Compressors, Combustion Section, Turbine Section, Bearings and Seals, Lubrication Systems).	3	1	—	—	3	1	—	—	1
70B Engine Performance	3	1	—	—	3	1	—	—	1
71 Powerplant	3	1	—	—	3	1	—	—	1
72 Engine Turbine/Turbo Prop/Ducted Fan/Unducted fan	3	1	—	—	3	1	—	—	1
73 Engine Fuel and Control	3	1	—	—	3	1	—	—	1
73A FADEC	3	1	—	—	3	1	—	—	3
74 Ignition	3	1	—	—	3	1	—	—	3
75 Air	3	1	—	—	3	1	—	—	1
76 Engine controls	3	1	—	—	3	1	—	—	1
77 Engine Indicating Systems	3	1	—	—	3	1	—	—	3
78 Exhaust	3	1	—	—	3	1	—	—	1
79 Oil	3	1	—	—	3	1	—	—	1
80 Starting	3	1	—	—	3	1	—	—	1

Licence category Chapters Level	Aeroplanes Turbine		Aeroplanes Piston		Helicopters Turbine		Helicopters Piston		Avionics
	B1	**C**	**B1**	**C**	**B1**	**C**	**B1**	**C**	**B2***
82 Water Injections	3	1	—	—	3	1	—	—	1
83 Accessory Gear Boxes	3	1	—	—	3	1	—	—	1
84 Propulsion Augmentation	3	1	—	—	3	1	—	—	1
Piston Engine									
70 Standard Practices — Engines	—	—	3	1	—	—	3	1	1
70A Constructional arrangement and operation (Installation, Carburettors, Fuel injection systems, Induction, Exhaust and Cooling Systems, Supercharging/Turbocharging, Lubrication Systems).	—	—	3	1	—	—	3	1	1
70B Engine Performance	—	—	3	1	—	—	3	1	1
71 Powerplant	—	—	3	1	—	—	3	1	1
73 Engine Fuel and Control	—	—	3	1	—	—	3	1	1
73A FADEC	—	—	3	1	—	—	3	1	3
74 Ignition	—	—	3	1	—	—	3	1	3
76 Engine Control	—	—	3	1	—	—	3	1	1
77 Engine Indication Systems	—	—	3	1	—	—	3	1	3
79 Oil	—	—	3	1	—	—	3	1	1
80 Starting	—	—	3	1	—	—	3	1	1
81 Turbines	—	—	3	1	—	—	3	1	1
82 Water Injections	—	—	3	1	—	—	3	1	1
83 Accessory Gear Boxes	—	—	3	1	—	—	3	1	1
84 Propulsion Augmentation	—	—	3	1	—	—	3	1	1
Propellers									
60A Standard Practices — Propeller	3	1	3	1	—	—	—	—	1

Licence category	**Aeroplanes Turbine**		**Aeroplanes Piston**		**Helicopters Turbine**		**Helicopters Piston**		**Avionics**
Chapters Level	**B1**	**C**	**B1**	**C**	**B1**	**C**	**B1**	**C**	**B2***
61 Propellers/Propulsion	3	1	3	1	—	—	—	—	1
61A Propeller Construction	3	1	3	1	—	—	—	—	—
61B Propeller Pitch Control	3	1	3	1	—	—	—	—	—
61C Propeller Synchronising	3	1	3	1	—	—	—	—	1
61D Propeller Electronic control	2	1	2	1	—	—	—	—	3
61E Propeller Ice Protection	3	1	3	1	—	—	—	—	—
61F Propeller Maintenance	3	1	3	1	—	—	—	—	1

(f) Multimedia Based Training (MBT) methods may be used to satisfy the theoretical training element either in the classroom or in a virtual controlled environment subject to the acceptance of the Director-General approving the training course.

3.2. Practical element

(a) Objective

The objective of practical training is to gain the required competence in performing safe maintenance, inspections and routine work according to the maintenance manual and other relevant instructions and tasks as appropriate for the type of aircraft, for example troubleshooting, repairs, adjustments, replacements, rigging and functional checks. It includes the awareness of the use of all technical literature and documentation for the aircraft, the use of specialist/special tooling and test equipment for performing removal and replacement of components and modules unique to type, including any on-wing maintenance activity.

(b) Content

At least 50 % of the crossed items in the table below, which are relevant to the particular aircraft type, shall be completed as part of the practical training.

Tasks crossed represent subjects that are important for practical training purposes to ensure that the operation, function, installation and safety significance of key maintenance tasks is adequately addressed; particularly

where these cannot be fully explained by theoretical training alone. Although the list details the minimum practical training subjects, other items may be added where applicable to the particular aircraft type.

Tasks to be completed shall be representative of the aircraft and systems both in complexity and in the technical input required to complete that task. While relatively simple tasks may be included, other more complex tasks shall also be incorporated and undertaken as appropriate to the aircraft type.

Glossary of the table:

LOC: Location;
FOT: Functional/Operational Test;
SGH: Service and Ground Handling;
R/I: Removal/Installation;
MEL: Minimum Equipment List;
TS: Troubleshooting.

Licence category / Chapters	B1/B2* LOC	B1 FOT	B1 SGH	B1 R/I	B1 MEL	B1 TS	B2* FOT	B2* SGH	B2* R/I	B2* MEL	B2* TS
Introduction module											
5 Time limits/maintenance checks	X/X	—	—	—	—	—	—	—	—	—	—
6 Dimensions/Areas (MTOM, etc.)	X/X	—	—	—	—	—	—	—	—	—	—
7 Lifting and Shoring	X/X	—	—	—	—	—	—	—	—	—	—
8 Levelling and weighing	X/X	—	X	—	—	—	—	X	—	—	—
9 Towing and taxiing	X/X	—	X	—	—	—	—	X	—	—	—
10 Parking/mooring, Storing and Return to Service	X/X	—	X	—	—	—	—	X	—	—	—
11 Placards and Markings	X/X	—	—	—	—	—	—	—	—	—	—
12 Servicing	X/X	—	X	—	—	—	—	X	—	—	—
20 Standard practices — only type particular	X/X	—	X	—	—	—	—	X	—	—	—
Helicopters											
18 Vibration and Noise Analysis (Blade tracking)	X/—	—	—	—	—	X	—	—	—	—	—
25 Emergency Flotation Equipment	X/X	X	X	X	X	X	X	X	—	—	—
53 Airframe Structure (Helicopter) Note: covered under Airframe structures											
60 Standard Practices Rotor — only type specific	X/X	—	X	—	—	—	—	X	—	—	—
62 Rotors	X/—	—	X	X	—	X	—	—	—	—	—
62A Rotors — Monitoring and indicating	X/X	X	X	X	X	X	—	—	X	—	X
63 Rotor Drives	X/—	X	—	—	—	X	—	—	—	—	—
63A Rotor Drives — Monitoring and	X/X	X	—	X	X	X	—	—	X	—	X

Licence category / Chapters	B1/B2* LOC	B1 FOT	B1 SGH	B1 R/I	B1 MEL	B1 TS	B2* FOT	B2* SGH	B2* R/I	B2* MEL	B2* TS
indicating											
64 Tail Rotor	X/—	—	X	—	—	X	—	—	—	—	—
64A Tail rotor - Monitoring and indicating	X/X	X	—	X	X	X	—	—	X	—	X
65 Tail Rotor Drive	X/—	X	—	—	—	X	—	—	—	—	—
65A Tail Rotor Drive — Monitoring and indicating	X/X	X	—	X	X	X	—	—	X	—	X
66 Folding Blades/Pylon	X/—	X	X	—	—	X	—	—	—	—	—
67 Rotors Flight Control	X/—	X	X	—	X	X	—	—	—	—	—
Airframe structures											
27A Flight Control Surfaces	X/—	—	—	—	—	X	—	—	—	—	—
51 Standard Practices and Structures (damage classification, assessment and repair)											
52 Doors	X/X	X	X	—	—	—	—	X	—	—	—
53 Fuselage	X/—	—	—	—	—	X	—	—	—	—	—
54 Nacelles / Pylons	X/—	—	—	—	—	—	—	—	—	—	—
55 Stabilisers	X/—	—	—	—	—	—	—	—	—	—	—
56 Windows	X/—	—	—	—	—	X	—	—	—	—	—
57 Wings	X/—	—	—	—	—	—	—	—	—	—	—
Airframe systems											
21 Air Conditioning	X/X	X	X	—	X	X	X	X	—	X	X
21A Air Supply	X/X	X	—	—	—	—	X	—	—	—	—
21B Pressurisation	X/X	X	—	—	X	X	X	—	—	X	X
21C Safety and warning Devices	X/X	—	X	—	—	—	—	X	—	—	—
22 Autoflight	X/X	—	—	—	X	—	X	X	X	X	X

Licence category / Chapters	B1/B2* LOC	B1 FOT	B1 SGH	B1 R/I	B1 MEL	B1 TS	B2* FOT	B2* SGH	B2* R/I	B2* MEL	B2* TS
23 Communications	X/X	—	X	—	X	—	X	X	X	X	X
24 Electrical Power	X/X	X	X	X	X	X	X	X	X	X	X
25 Equipment and Furnishings	X/X	X	X	X	—	—	X	X	X	—	—
25A Electronic Equipment including emergency equipment	X/X	X	X	X	—	—	X	X	X	—	—
26 Fire Protection	X/X	X	X	X	X	X	X	X	X	X	X
27 Flight Controls	X/X	X	X	X	X	X	X	—	—	—	—
27A Sys. Operation: Electrical / Fly-by-Wire	X/X	X	X	X	X	—	X	—	X	—	X
28 Fuel Systems	X/X	X	X	X	X	X	X	X	—	X	—
28A Fuel Systems — Monitoring and indicating	X/X	X	—	—	—	—	X	—	X	—	X
29 Hydraulic Power	X/X	X	X	X	X	X	X	X	—	X	—
29A Hydraulic Power — Monitoring and indicating	X/X	X	—	X	X	X	X	—	X	X	X
30 Ice and Rain Protection	X/X	X	X	—	X	X	X	X	—	X	X
31 Indicating/Recording Systems	X/X	X	X	X	X	X	X	X	X	X	X
31A Instrument Systems	X/X	X	X	X	X	X	X	X	X	X	X
32 Landing Gear	X/X	X	X	X	X	X	X	X	X	X	—
32A Landing Gear — Monitoring and indicating	X/X	X	—	X	X	X	X	—	X	X	X
33 Lights	X/X	X	X	—	X	—	X	X	X	X	—
34 Navigation	X/X	—	X	—	X	—	X	X	X	X	X
35 Oxygen	X/—	X	X	X	—	—	X	X	—	—	—
36 Pneumatic	X/—	X	—	X	X	X	X	—	X	X	X
36A Pneumatic — Monitoring and indicating	X/X	X	X	X	X	X	X	X	X	X	X
37 Vacuum	X/—	X	—	X	X	X	—	—	—	—	—
38 Water/Waste	X/—	X	X	—	—	—	X	X	—	—	—

Licence category / Chapters	B1/B2* LOC	B1 FOT	B1 SGH	B1 R/I	B1 MEL	B1 TS	B2* FOT	B2* SGH	B2* R/I	B2* MEL	B2* TS
41 Water Ballast	X/—	—	—	—	—	—	—	—	—	—	—
42 Integrated modular avionics	X/X	—	—	—	—	—	X	X	X	X	X
44 Cabin Systems	X/X	—	—	—	—	—	X	X	X	X	X
45 On-Board Maintenance System (or covered in 31)	X/X	X	X	X	X	X	X	X	X	X	X
46 Information Systems	X/X	—	—	—	—	—	X	—	X	X	X
50 Cargo and Accessory Compartments	X/X	—	X	—	—	—	—	—	—	—	—
Emergency equipment											
Turbine/Piston Engine Module											
70 Standard Practices — Engines — only type particular	—	—	X	—	—	—	—	X	—	—	—
70A Constructional arrangement and operation (Installation Inlet, Compressors, Combustion Section, Turbine Section, Bearings and Seals, Lubrication Systems)	X/X	—	—	—	—	—	—	—	—	—	—
Turbine engines											
70B Engine Performance	—	—	—	—	—	X	—	—	—	—	—
71 Power Plant	X/—	X	X	—	—	—	—	X	—	—	—
72 Engine Turbine/Turbo Prop/Ducted Fan/ Unducted fan	X/—	—	—	—	—	—	—	—	—	—	—
73 Engine Fuel and Control	X/X	X	—	—	—	—	—	—	—	—	—
73A FADEC Systems	X/X	X	—	X	X	X	X	—	X	X	X
74 Ignition	X/X	X	—	—	—	—	X	—	—	—	—
75 Air	X/—	—	—	X	—	X	—	—	—	—	—
76 Engine Controls	X/—	X	—	—	—	X	—	—	—	—	—

Licence category / Chapters	B1/B2* LOC	B1 FOT	B1 SGH	B1 R/I	B1 MEL	B1 TS	B2* FOT	B2* SGH	B2* R/I	B2* MEL	B2* TS
77 Engine Indicating	X/X	X	—	—	X	X	X	—	—	X	X
78 Exhaust	X/—	X	—	—	X	—	—	—	—	—	—
79 Oil	X/—	—	X	X	—	—	—	—	—	—	—
80 Starting	X/—	X	—	—	X	X	—	—	—	—	—
82 Water Injection	X/—	X	—	—	—	—	—	—	—	—	—
83 Accessory Gearboxes	X/—	—	X	—	—	—	—	—	—	—	—
84 Propulsion Augmentation	X/—	X	—	—	—	—	—	—	—	—	—
Auxiliary Power Units (APUs)											
49 Auxiliary Power Units (APUs)	X/—	X	X	—	—	X	—	—	—	—	—
Piston Engines											
70 Standard Practices — Engines — only type particular	—	—	X	—	—	—	—	X	—	—	—
70A Constructional arrangement and operation (Installation Inlet, Compressors, Combustion Section, Turbine Section, Bearings and Seals, Lubrication Systems)	X/X	—	—	—	—	—	—	—	—	—	—
70B Engine Performance	—	—	—	—	—	X	—	—	—	—	—
71 Power Plant	X/—	X	X	—	—	—	—	X	—	—	—
73 Engine Fuel and Control	X/X	X	—	—	—	—	—	—	—	—	—
73A FADEC Systems	X/X	X	—	X	X	X	X	X	X	X	X
74 Ignition	X/X	X	—	—	—	—	X	—	—	—	—
76 Engine Controls	X/—	X	—	—	—	X	—	—	—	—	—
77 Engine Indicating	X/X	X	—	—	X	X	X	—	—	X	X
78 Exhaust	X/—	X	—	—	X	X	—	—	—	—	—
79 Oil	X/—	—	X	X	—	—	—	—	—	—	—

Licence category / Chapters	B1/B2* LOC	B1 FOT	B1 SGH	B1 R/I	B1 MEL	B1 TS	B2* FOT	B2* SGH	B2* R/I	B2* MEL	B2* TS
80 Starting	X/—	X	—	—	X	X	—	—	—	—	—
81 Turbines	X/—	X	X	X	—	X	—	—	—	—	—
82 Water Injection	X/—	X	—	—	—	—	—	—	—	—	—
83 Accessory Gearboxes	X/—	—	X	X	—	—	—	—	—	—	—
84 Propulsion Augmentation	X/—	X	—	—	—	—	—	—	—	—	—
Propellers											
60A Standard Practices — Propeller	—	—	—	X	—	—	—	—	—	—	—
61 Propellers / Propulsion	X/X	X	X	—	X	X	—	—	—	—	—
61A Propeller Construction	X/X	—	X	—	—	—	—	—	—	—	—
61B Propeller Pitch Control	X/—	X	—	X	X	X	—	—	—	—	—
61C Propeller Synchronising	X/—	X	—	—	—	X	—	—	—	X	—
61D Propeller Electronic control	X/X	X	X	X	X	X	X	X	X	X	X
61E Propeller Ice Protection	X/—	X	—	X	X	X	—	—	—	—	—
61F Propeller Maintenance	X/X	X	X	X	X	X	X	X	X	X	X

4. Type training examination and assessment standard

4.1. Theoretical element

After the theoretical portion of the aircraft type training has been completed, a written examination shall be performed, which shall comply with the following:

(a) Format of the examination is of the multi-choice type. Each multi-choice question shall have 3 alternative answers of which only one shall be the correct answer. The total time is based on the total number of questions and the time for answering is based upon a nominal average of 90 seconds per question.

(b) The incorrect alternatives shall seem equally plausible to anyone ignorant of the subject. All the alternatives shall be clearly related to the question and of similar vocabulary, grammatical construction and length.

(c) In numerical questions, the incorrect answers shall correspond to procedural errors such as the use of incorrect sense (+ versus -) or incorrect measurement units. They shall not be mere random numbers.

(d) The level of examination for each chapter [1] shall be the one defined in paragraph 2 'Aircraft type training levels'. However, the use of a limited number of questions at a lower level is acceptable.

(e) The examination shall be of the closed book type. No reference material is permitted. An exception will be made for the case of examining a B1 or B2* candidate's ability to interpret technical documents.

(f) The number of questions shall be at least 1 question per hour of instruction. The number of questions for each chapter and level shall be proportionate to:

- the effective training hours spent teaching at that chapter and level,
- the learning objectives as given by the training needs analysis.

The Director-General will assess the number and the level of the questions when approving the course.

(g) The minimum examination pass mark is 75 %. When the type training examination is split in several examinations, each examination shall be passed with at least a 75 % mark. In order to be possible to achieve exactly a 75 % pass mark, the number of questions in the examination shall be a multiple of 4.

(h) Penalty marking (negative points for failed questions) is not to be used.

(i) End of module phase examinations cannot be used as part of the final examination unless they contain the correct number and level of questions required.

4.2. Practical element assessment standard

After the practical element of the aircraft type training has been completed, an assessment must be performed, which must comply with the following:

(a) The assessment shall be performed by designated assessors appropriately qualified.

(b) The assessment shall evaluate the knowledge and skills of the trainee.

[1] For the purpose of this paragraph 4, a 'chapter' means each one of the rows preceded by a number in the table contained in paragraph 3.1(e).

5. Type examination standard

Type examination shall be conducted by training organisations appropriately approved under HKAR-147 or by the Director-General.

The examination shall be oral, written or practical assessment based, or a combination thereof and it shall comply with the following requirements:

(a) Oral examination questions shall be open.

(b) Written examination questions shall be essay type or multi-choice questions.

(c) Practical assessment shall determine a person's competence to perform a task.

(d) Examinations shall be on a sample of chapters [2] drawn from paragraph 3 type training/examination syllabus, at the indicated level.

(e) The incorrect alternatives shall seem equally plausible to anyone ignorant of the subject. All of the alternatives shall be clearly related to the question and of similar vocabulary, grammatical construction and length.

(f) In numerical questions, the incorrect answers shall correspond to procedural errors such as corrections applied in the wrong sense or incorrect unit conversions: they shall not be mere random numbers.

(g) The examination shall ensure that the following objectives are met:

1. Properly discuss with confidence the aircraft and its systems.

2. Ensure safe performance of maintenance, inspections and routine work according to the maintenance manual and other relevant instructions and tasks as appropriate for the type of aircraft, for example troubleshooting, repairs, adjustments, replacements, rigging and functional checks such as engine run, etc., if required.

3. Correctly use all technical literature and documentation for the aircraft.

4. Correctly use specialist/special tooling and test equipment, perform removal and replacement of components and modules unique to type, including any on-wing

[2] For the purpose of this paragraph, a 'chapter' means each one of the rows preceded by a number in the tables contained paragraphs 3.1(e) and 3.2(b).

maintenance activity

(h) The following conditions apply to the examination:

1. The maximum number of consecutive attempts is three. Further sets of three attempts are allowed with a one year waiting period between sets. A waiting period of 30 days is required after the first failed attempt within one set, and a waiting period of 60 days is required after the second failed attempt.

   The applicant shall confirm in writing to the HKAR-147 approved maintenance training organisation or the Director-General to which they apply for an examination, the number and dates of attempts during the last year and the maintenance training organisation or the Director-General where these attempts took place. The maintenance training organisation or the Director-General is responsible for checking the number of attempts within the applicable timeframes.

2. The type examination shall be passed and the required practical experience shall be completed within the 3 years preceding the application for the rating endorsement on the aircraft maintenance licence.

3. Type examination shall be performed with at least one examiner present. The examiner(s) shall not have been involved in the applicant's training.

(i) A written and signed report shall be made by the examiner(s) to explain why the candidate has passed or failed.

6. On the Job Training

On the Job Training (OJT) shall be approved by the Director-General who has issued the licence.

It shall be conducted at and under the control of a maintenance organisation appropriately approved for the maintenance of the particular aircraft type and shall be assessed by designated assessors appropriately qualified.

It shall have been started and completed within the 3 years preceding the application for a type rating endorsement.

(a) Objective:

The objective of OJT is to gain the required competence and experience in performing safe maintenance.

(b) Content:

OJT shall cover a cross section of tasks acceptable to the Director-General. The OJT tasks to be completed shall be representative of the aircraft and systems both in complexity and in the technical input required to complete that task. While relatively simple tasks may be included, other more complex maintenance tasks shall also be incorporated and undertaken as appropriate to the aircraft type.

Each task shall be signed off by the student and countersigned by a designated supervisor. The tasks listed shall refer to an actual job card/work sheet, etc.

The final assessment of the completed OJT is mandatory and shall be performed by a designated assessor appropriately qualified.

The following data shall be addressed on the OJT worksheets/logbook:

1. Name of Trainee;
2. Date of Birth;
3. Approved Maintenance Organisation;
4. Location;
5. Name of supervisor(s) and assessor, (including licence number if applicable);
6. Date of task completion;
7. Description of task and job card/work order/tech log, etc.;
8. Aircraft type and aircraft registration;
9. Aircraft rating applied for.

In order to facilitate the verification by the Director-General, demonstration of the OJT shall consist of (i) detailed worksheets/logbook and (ii) a compliance report demonstrating how the OJT meets the requirement of this Part.

AMC to Appendix III to HKAR-66 'Aircraft Type Training and Examination Standard — On-the-Job Training'

Aircraft Type Training and On-the-Job Training

The theoretical and practical training providers, as well as the OJT provider, may contract the services of a language translator in the case where training is imparted to students not conversant in the language of the training material. Nevertheless, it remains essential that the students understand all the relevant maintenance documentation.

During the performance of examinations and assessments, the assistance of the translator should be limited to the translation of the questions, but should not provide clarifications or help in relation to those questions.

AMC to Paragraph 1 of Appendix III to HKAR-66 'Aircraft Type Training and Examination Standard — On-the-Job Training'

Aircraft Type Training

1. Aircraft type training may be sub-divided in airframe and/or powerplant and/or avionics/electrical systems type training courses.

   - Airframe type training course means a type training course including all relevant aircraft structure and electrical and mechanical systems excluding the powerplant.

   - Powerplant type training course means a type training course on the bare engine, including the build-up to a quick engine change unit.

   - The interface of the engine/airframe systems should be addressed by either airframe or powerplant type training course. In some cases, such as for general aviation, it may be more appropriate to cover the interface during the airframe course due to the large variety of aircraft that can have the same engine type installed.

   - Avionics/electrical systems type training course means type training on avionics and electrical systems covered by but not necessarily limited to ATA (Air Transport Association) Chapters 22, 23, 24, 25, 27, 31, 33, 34, 42, 44, 45, 46, 73 and 77 or equivalent.

2. Practical training may be performed either following or integrated with the theoretical elements. However, it should not be performed before theoretical training.

3. The content of the theoretical and practical training should:

   - address the different parts of the aircraft which are representative of the structure, the systems/components installed and the cabin; and

   - include training on the use of technical manuals, maintenance procedures and the interface with the operation of the aircraft.

   Therefore it should be based on the following elements:

   - Type design including relevant type design variants, new technology and techniques;

   - Feedback from in-service difficulties, occurrence reporting, etc;

   - Significant applicable airworthiness directives and service bulletins;

   - Known human factor issues associated with the particular aircraft type;

- Use of common and specific documentation, (when applicable, such as MMEL, AMM, MPD, TSM, SRM, WD, AFM, tool handbook), philosophy of the troubleshooting, etc.;

- Knowledge of the maintenance on-board reporting systems and ETOPS / EDTO maintenance conditions where applicable;

- Use of special tooling and test equipment and specific maintenance practices including critical safety items and safety precautions;

- Significant and critical tasks/aspects from the MMEL, CDL, Fuel Tank Safety (FTS), airworthiness limitation items (ALI) including Critical Design Configuration Control Limitations (CDCCL), CMR and all ICA documentation such as MRB, MPD, SRM, AMM, etc., when applicable.

- Maintenance actions and procedures to be followed as a consequence of specific certification requirements, such as, but not limited to, RVSM (Reduced Vertical Separation Minimum) and NVIS (Night Vision Imaging Systems);

- Knowledge of relevant inspections and limitations as applicable to the effects of environmental factors or operational procedures such as cold and hot climates, wind, moisture, sand, de-icing / anti-icing, etc.

The type training does not necessarily need to include all possible customer options corresponding to the type rating described in the Appendix I to AMC to HKAR-66.

4. Limited avionic system training should be included in the category B1 type training as the B1 privileges include work on avionics systems requiring simple tests to prove their serviceability.

5. Electrical systems should be included in both categories of B1 and B2* type training.

6. The theoretical and practical training should be complementary and may be:

   - Integrated or split

   - Supported by the use of training aids, such as trainers, virtual aircraft, aircraft components, synthetic training devices (STD), computer based training devices (CBT), etc.

AMC to Paragraphs 1(b), 3.2 and 4.2 of Appendix III to HKAR-66 'Aircraft Type Training and Examination Standard — On-the-Job Training'

Practical Element of the Aircraft Type Training

1. The practical training may include instruction in a classroom or in simulators but part of the practical training should be conducted in a real maintenance or manufacturer environment.

2. The tasks should be selected because of their frequency, complexity, variety, safety, criticality, novelty, etc. The selected tasks should cover all the chapters described in the table contained in paragraph 3.2 of this Appendix.

3. The duration of the practical training should ensure that the content of training required by paragraph 3.2 of this Appendix is completed.

   Nevertheless, for aeroplanes with a MTOM equal or above 30000kg, the duration for the practical element of a type rating training course should not be less than two weeks unless a shorter duration meeting the objectives of the training and taking into account pedagogical aspects (maximum duration per day) is justified to the Director-General.

4. The organisation providing the practical element of the type training should provide trainees a schedule or plan indicating the list of tasks to be performed under instruction or supervision. A record of the tasks completed should be entered into a logbook which should be designed such that each task or group of tasks may be countersigned by the designated assessor. The logbook format and its use should be clearly defined.

5. In paragraph 4.2 of this Appendix, the term 'designated assessors appropriately qualified' means that the assessors should demonstrate training and experience on the assessment process being undertaken and be authorised to do so by the organisation.

   Further guidance about the assessment and the designated assessors is provided in Section 5 Appendix III.

6. The practical element (for powerplant and avionic systems) of the Type Rating Training may be subcontracted by the approved HKAR-147 organisation under its quality system according to the provisions of HKAR 147.145(d)3 and the corresponding Guidance Material.

AMC to Paragraph 1(c) of Appendix III to HKAR-66 'Aircraft Type Training and Examination Standard — On-the-Job Training'

Differences Training

Approved difference training is not required for different variants within the same aircraft type rating (as specified in Section 5 Appendix I) for the purpose of type rating endorsement on the aircraft maintenance licence.

However, this does not necessarily mean that no training is required before a certifying staff authorisation can be issued by the maintenance organisation (refer to AMC 66.20(b)3).

AMC to paragraph 3.1(d) of Appendix III to HKAR-66 'Aircraft Type Training and Examination Standard — On-the-Job Training'

Training Needs Analysis for the Theoretical Element of the Aircraft Type Training

1. The minimum duration for the theoretical element of the type rating training course, as described in this Appendix, has been determined based on:

   - generic categories of aircraft and minimum standard equipment fit

2. The purpose of the Training Needs Analysis (TNA) is to adapt and justify the duration of the course for a specific aircraft type. This means that the TNA is the main driver for determining the duration of the course, regardless of whether it is above or below the minimum duration described in this Appendix .

3. The content and the duration deriving from this TNA may be supported by an analysis from the Type Certificate holder.

4. In order to approve a reduction of such minimum duration, the evaluation done by the Director-General should be performed on a case-by-case basis appropriate to the aircraft type. For example, while it would be exceptional for a theoretical course for a transport category complex motor-powered aircraft such as an A330 or B757 to be below the minimum duration shown, it would not necessarily be exceptional in the case of a General Aviation (GA) business aircraft such as a Learjet 45 or similar. Typically the TNA for a GA aircraft course would demonstrate that a course of a shorter duration satisfies the requirements.

5. When developing the TNA the following should be considered:

(a) The TNA should include an analysis identifying all the areas and elements where there is a need for training as well as the associated learning objectives, considering the design philosophy of the aircraft type, the operational environment, the type of operations and the operational experience. This analysis should be written in a manner which provides a reasonable understanding of which areas and elements constitute the course in order to meet the learning objectives.

(b) As a minimum, the Training Need Analysis (TNA) should take into account all the applicable elements contained in paragraph 3.1 of this Appendix and associated AMCs.

(c) The TNA should set-up the course content considering the Appendix III objectives for each level of training and the prescribed topics in the theoretical element table contained in paragraph 3.1 of this Appendix.

(d) For each chapter described in the theoretical element table contained in paragraph 3.1 of this Appendix, the corresponding training time should be recorded.

(e) Typical documents to be used in order to identify the areas and elements where there is a need for training typically include, among others, the Aircraft Maintenance Manual, MRB report, CMRs, airworthiness limitations, Troubleshooting Manual, Structural Repair Manual, Illustrated Parts Catalogue, Airworthiness Directives and Service Bulletins.

(f) During the analysis of these documents:

- Consideration should be given to the following typical activities:

  - Activation/reactivation;
  - Removal/Installation;
  - Testing;
  - Servicing;
  - Inspection, check and repairs;
  - Troubleshooting / diagnosis.

- For the purpose of identifying the specific elements constituting the training course, it is acceptable to use a filtering method based on criteria such as:

  - Frequency of the task;
  - Human factor issues associated to the task;
  - Difficulty of the task;
  - Criticality and safety impact of the task;
  - In-service experience;
  - Novel or unusual design features (not covered by HKAR-66 Appendix I);
  - Similarities with other aircraft types;
  - Special tests and tools/equipment.

- It is acceptable to follow an approach based on:

- Tasks or groups of tasks, or
- Systems or subsystems or components

(g) The TNA should:

- Identify the learning objectives for each task, group of tasks, system, subsystem or component;

- Associate the identified tasks to be trained to the regulatory requirements (table in Paragraph 3.1 of this Appendix);

- Organise the training into modules in a logical sequence (adequate combination of chapters as defined in this Appendix);

- Determine the sequence of learning (within a lesson and for the whole syllabus);

- Identify the scope of information and level of detail with regard the minimum standard to which the topics of the TNA should be taught according to the set-up objectives.

- Address the following:

  - Description of each system/component including the structure (where applicable);

  - System / component operation taking into account:

    (a) Complexity of the system (e.g. the need of further break down into subsystems, etc.);

    (b) Design specifics which may require more detailed presentation or may contribute to maintenance errors;

    (c) Normal and emergency functioning;

    (d) Troubleshooting;

    (e) Interpretation of indications and malfunctions;

    (f) Use of maintenance publications;

    (g) Identification of special tools and equipment required for servicing and maintaining the aircraft;

    (h) Maintenance Practices;

(i) Routine inspections, functional or operational tests, rigging / adjustment, etc.

- Describe the following:

  - The instructional methods and equipment, teaching methods and blending of the teaching methods in order to ensure the effectiveness of the training;

  - The maintenance training documentation/material to be delivered to the student;

  - Facilitated discussions, questioning session, additional practiced-oriented training, etc.;

  - The homework, if developed;

  - The training provider's resources available to the learner.

(h) It is acceptable to differentiate between issues which have to be led by an instructor and issues which may be delivered through interactive simulation training devices and/or covered by web based elements. Overall time of the course will be allocated accordingly.

(i) The maximum number of training hours per day for the theoretical element of type training should not be more than 6 hours. A training hour means 60 minutes of tuition excluding any breaks, examination, revision, preparation and aircraft visit. In exceptional cases, the Director-General may allow deviation from this standard when it is properly justified that the proposed number of hours follows pedagogical and human factors principles. These principles are especially important in those cases where:

- Theoretical and practical training are performed at the same time;

- Training and normal maintenance duty/apprenticeship are performed at the same time.

(j) The minimum participation time for the trainee in order to meet the objectives of the course should not be less than 90% of the tuition hours of the theoretical training course. Additional training may be provided by the training organisation in order to meet the minimum participation time. If the minimum participation defined for the course is not met, a certificate of recognition should not be issued.

(k) The TNA is a living process and should be reviewed/updated based on operation feedback, maintenance occurrences, airworthiness directives, major service bulletins impacting maintenance activities or requiring new competencies for mechanics, alert service bulletins, feedback from trainees or customer satisfaction, evolution of the

maintenance documentation such as MRBs, MPDs, MMs, etc. The frequency at which the TNA should be reviewed/updated is left to the discretion of the organisation conducting the course.

NOTE: The examination is not part of the TNA. However, it should be prepared in accordance with the learning objectives described in the TNA.

AMC to Paragraph 5 of Appendix III to HKAR-66 'Aircraft Type Training and Examination Standard — On-the-Job Training'

Type Examination Standard

This Paragraph 5 'Type Examination Standard' does not apply to the examination performed as part of type training. This Section only applies to those cases where type examination is performed as a substitute for type training.

AMC to Paragraph 6 of Appendix III to HKAR-66 'Aircraft Type Training and Examination Standard — On-the-Job Training'

On-the-Job Training (OJT)

1. 'A maintenance organisation appropriately approved for the maintenance of the particular aircraft type' means a HKAR-145 approved maintenance organisation holding an A rating for such aircraft or equivalent which is acceptable to the Director-General.

2. The OJT should include one to one supervision and should involve actual work task performance on aircraft/components, covering line and/or base maintenance tasks.

3. The use of simulators for OJT should not be allowed.

4. The OJT should cover at least 50% of the tasks contained in Section 5 Appendix II. Some tasks should be selected from each paragraph of the Section 5 Appendix II list. Tasks should be selected among those applicable to the type of aircraft and licence (sub)category applied for. Other tasks than those in the Section 5 Appendix II may be considered as a replacement when they are relevant. Typically, in addition to the variety and the complexity, the OJT tasks should be selected because of their frequency, safety, novelty, etc.

5. Up to 50% of the required OJT may be undertaken before the aircraft theoretical type

training starts.

6. The organisation providing the on-the-job training should provide trainees a schedule or plan indicating the list of tasks to be performed under supervision. A record of the tasks completed should be entered into a logbook which should be designed such that each task or group of tasks is countersigned by the corresponding supervisor. The logbook format and its use should be clearly defined.

7. Regarding the day-to-day supervision of the OJT programme in the approved maintenance organisation and the role of the supervisor(s), the following should be considered:

- It is sufficient that the completion of individual OJT tasks is confirmed by the direct supervisor(s), without being necessary the direct evaluation of the assessor.

- During the day-to-day OJT performance, the supervision aims at overseeing the complete process, including task completion, use of manuals and procedures, observance of safety measures, warnings and recommendations and adequate behaviour in the maintenance environment.

- The supervisor(s) should personally observe the work being performed to ensure the safe completeness and should be readily available for consultation, if needed during the OJT performance.

- The supervisor(s) should countersign the tasks and release the maintenance tasks as the trainee is still not qualified to do so.

- The supervisor(s) should therefore:

  - have certifying staff or support staff privileges relevant to the OJT tasks;

  - be competent for the selected tasks;

  - be safety-orientated;

  - be capable to coach (setting objectives, giving training, performing supervision, evaluating, handling trainee's reactions and cultural issues, managing objectively and positively debriefing sessions, determining the need for extra training or reorientate the training, reporting, etc.);

  - be designated by the approved maintenance organisation to carry out the supervision.

8. Regarding the assessor, the following should be considered:

- The function of the assessor, as described in Paragraph 6 *On the Job Training* of this Appendix, is to conduct the final assessment of the completed OJT. This assessment

should include confirmation of the completion of the required diversity and quantity of OJT and should be based on the supervisor(s) reports and feedback.

- In Paragraph 6 of this Appendix, the term 'designated assessor appropriately qualified' means that the assessor should demonstrate training and experience on the assessment process being undertaken and should be authorised to do so by the organisation. Further guidance about the assessment and the designated assessors is provided in Appendix III of Section 5.

9. The procedures for OJT should be included into the maintenance organisation exposition (MOE) of the approved maintenance organisation under the title of *Training procedures for on-the-job training*.

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Appendix IV — Experience requirements for extending a HKAR-66 aircraft maintenance licence

The table below shows the experience requirements for adding a new category or subcategory to an existing HKAR-66 licence.

The experience shall be practical maintenance experience on operating aircraft in the subcategory relevant to the application.

The experience requirement will be reduced by 50 % if the applicant has completed an approved HKAR-147 course relevant to the subcategory.

To / From	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2*	B3
A1	—	6 months	6 months	6 months	2 years	6 months	2 years	1 year	2 years	6 months
A2	6 months	—	6 months	6 months	2 years	6 months	2 years	1 year	2 years	6 months
A3	6 months	6 months	—	6 months	2 years	1 year	2 years	6 months	2 years	1 year
A4	6 months	6 months	6 months	—	2 years	1 year	2 years	6 months	2 years	1 year
B1.1	None	6 months	6 months	6 months	—	6 months	6 months	6 months	1 year	6 months
B1.2	6 months	None	6 months	6 months	2 years	—	2 years	6 months	2 years	None
B1.3	6 months	6 months	None	6 months	6 months	6 months	—	6 months	1 year	6 months
B1.4	6 months	6 months	6 months	None	2 years	6 months	2 years	—	2 years	6 months
B2*	6 months	6 months	6 months	6 months	1 year	1 year	1 year	1 year	—	1 year
B3	6 months	None	6 months	6 months	2 years	6 months	2 years	1 year	2 years	—

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Appendix V —Application forms

The following application forms are available at the following CAD website:

https://www.cad.gov.hk/english/public_forms.html

DCA 35	HKAR-66 Aircraft Maintenance Licence - Application for Grant or Extension of Licence
DCA 35A	Application for Renewal of HKAR-66 Aircraft Maintenance Licence
DCA 35B	HKAR-66 Aircraft Maintenance Licence - Record of Experience
DCA 35C	Application for Transfer of HKAR-AMEL Licence to HKAR-66 Aircraft Maintenance Licence
DCA 35E	HKAR-66 Aircraft Maintenance Licence - Application for Written Examination

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Appendix VI — Aircraft maintenance licence referred to in HKAR-66

1. An example of the aircraft maintenance licence referred to in HKAR-66 can be found on the pages 5 and 6 of this Appendix.

2. Each licence holder should have a unique licence number based upon a numeric designator.

3. Each page issued will be in this format and contains the specified information for that page.

4. The licence will have the original issue date, an expiry date and date of issue printed. Name, address, nationality, date of birth of the licence holder will also be stated. The licence holder should sign the document in ink after having checked the correctness of the information contained. The aircraft type rating need not be issued until the first type endorsement is included.

5. The licence shall clearly indicate that the limitations are exclusions from the certification privileges. If there are no limitations applicable, the LIMITATIONS page will be issued stating 'No limitations'.

6. Aircraft type endorsement will use the standard codes contained in Section 5 Appendix I. The aircraft types will be granted only where type training approved by the Director-General or by an appropriately approved HKAR-147 maintenance training organisation has been completed to the appropriate HKAR-66 Category B1, B2/B2*, B3 or C syllabus and the required practical experience, if appropriate, can be demonstrated. This includes aircraft types which are not on the Hong Kong register but may be maintained under a HKAR-145 approval.

7. The HKAR-66 aircraft maintenance licence once issued is required to be kept by the person to whom it applies in good condition and who shall remain accountable for ensuring that no unauthorised entries are made.

8. Failure to comply with paragraph 5 of this section may invalidate the licence and could lead to the holder not being permitted to hold any HKAR-145 certification authorisation and may result in prosecution under the law.

9. It is important to understand that the existence of the HKAR-66 aircraft maintenance licence alone does not permit the holder to issue a HKAR 145.50 certificate of release to service. To issue a HKAR 145.50 certificate of release to service requires a valid HKAR-66 aircraft maintenance licence type rated for the aircraft AND an appropriate valid HKAR-145 certification authorisation. The HKAR-145 certification authorisation is issued by the HKAR-145 approved maintenance organisation.

10. A type rated HKAR-66 aircraft maintenance does not normally confer any certification

privileges on the holder in their own right. Such licences must be used in conjunction with a certification authorisation.

11. A type rated HKAR-66 aircraft maintenance licence may only be used to make certification(s) where the licence is endorsed to permit this.

12. The scope of Category B2 has been revised to include 'Electrical Components in Mechanical System' at HKAR-66 ISSUE 2 Revision 3 with effect on 1 August 2013. Category B2 (Basic Category and Type Rating) on HKAR-66 Aircraft Maintenance Licence will be marked as Category B2* upon successful completion of approved basic and type training to indicate compliance with HKAR-66 ISSUE 2 Revision 3 and the later editions.

13. Limitation codes may be applied singly or in combination to basic categories and type ratings to reflect the scope of protected rights transferred to a HKAR-66 Licence. The limitation codes and their translation which is printed on the licence are listed below:

Code	**Limitations**
1	Airframe only Excluding electrical power generation & distribution systems
2	Turbine engine only
3	Jet - turbine engines only
4	Piston engines only
5	Turbine engined rotorcraft only
6	Piston engined rotorcraft only
11	Electrical power systems only
12	Instrument systems only
13	Instrument-autopilot (aeroplanes) autoland & autothrottle systems only
14	Radio communication/navigation systems only
15	Radio communication/navigation and radar systems only
16	Compass compensation and adjustment only
17	Autopilot (helicopter) only
18	Autopilot (aeroplanes) only
21	Excluding airframe
22	Excluding engine
23	Excluding propeller-turbine engines
24	Excluding electrical systems and components

Code	Limitations
25	Excluding avionic LRUs
31	Including electrical components in mechanical systems
32	Excluding electrical power systems
33	Excluding instrument systems
34	Excluding autopilot system on aeroplanes
35	Excluding autopilot system on helicopters
36	Excluding automatic landing and autothrottle system on aeroplanes
37	Excluding radio communication/navigation and radar systems
38	Excluding radio radar systems
41	Excluding compass compensation and adjustment
42	Unpressurised aeroplanes (wood or combined wood and metal) only
43	Unpressurised aeroplanes (excluding wood and composite) only
44	Instrument system (General Aviation) An instrument system specified in sub-paragraphs 8.1* and 8.3* to 8.4* of Section 4 Appendix XX
45	Electrical system (General Aviation) An electrical system specified in sub-paragraphs 9.1* and 9.2* to 9.4* of Section 4 Appendix XX
46	Autopilot system (General Aviation) An autopilot system specified in sub-paragraphs 13.1* or 13.2* of Section 4 Appendix XX
47	VHF communication equipment only Replacement of VHF communication equipment for aeroplane/rotorcraft has a MTWA not exceeding 2730 kg
999	Paragraphs endorsed under the CERTIFICATION PRIVILEGES are the paragraphs of Section 4 Appendix XX. Limited to the PARAGRAPHS endorsed, this licence may also be used to certify within the appropriate privileges set out in Section 4 Appendix XX.
G 01	Aeroplanes with metal tubing structure covered with fabric
G 02	Composite structure aeroplanes
G 03	Metal structure aeroplanes
G 04	Pressurised aeroplanes (B1.2 licence ONLY)
G 05	Wooden structure aeroplanes

* Component replacements only, provided that functional checks to prove serviceability do not require the use of test apparatus.

Aircraft Maintenance Licence

A sample of Aircraft Maintenance Licence is shown below:

I **Hong Kong, China, Civil Aviation Department**
II **AIRCRAFT MAINTENANCE LICENCE**

III Licence Number:

Original Issue: Last Expiry:

This Issue: Expires:

IV Name:

V Address:

VI Nationality:

IVa Date of Birth:

VII Signature of Holder: .....

VIII Issued in accordance with the provisions of the Air Navigation (Hong Kong) Order 1995 for the time being in force and any Order amending or replacing that Order (in this licence referred to as 'the Order') and with Annex 1 to the Convention on International Civil Aviation signed at Chicago on 7th December 1944.

X Issued by:

.....
for Director-General of Civil Aviation

Date of Issue:

XI Stamp:

XII HKAR-66 CATEGORIES, SUBCATEGORIES & TYPE RATINGS **DATE**

IX CONDITIONS

1. Endorsement of any (sub) categories only on the page(s) entitled HKAR-66 Categories, Sub categories and Type Ratings does not permit the holder to issue a certificate of release to service for an aircraft.

2. Endorsement of aircraft types on the page(s) entitled HKAR-66 Categories, Sub-categories and Type Ratings means the holder is qualified to issue certificates to release to service for such aircraft from the date of endorsement in conjunction with a valid HKAR-145 certification authorisation.

3. This Licence when endorsed in category B1 or B2 or C together with a valid aircraft type HKAR-145 certification authorisation meets the intent of ICAO Annex 1. Category B2* is in compliance with HKAR-66 ISSUE 2 Revision 3, as amended.

4. The privileges of the licence are set out in Article 12 of the Order.

5. It is the responsibility of the holder to ensure that certificates of release to service are only issued within the limitations of this licence and both HKAR-66 and HKAR-145 except as specified in paragraph 6.

6. This licence may only be used outside an HKAR-145 organisation if a specific statement to such effect is endorsed in this licence on the page(s) entitled REMARKS.

7. This licence remains current until the expiry date on the overleaf page whilst in compliance with HKAR 66.40 unless previously suspended or revoked.

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XIII REMARKS

(No entries)

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HKAR-66 LIMITATIONS

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Appendix VII — Differences between B2 and B2* in basic knowledge requirements

1 GENERAL

The basic examination syllabi for Category B2* was introduced in August 2013. For reference purpose, the differences between the B2 and B2* syllabi in HKAR-66 Section 4 Appendix 1 Issue 2 Revision 5 are reproduced in this appendix.

2 DIFFERENCES IN B2 AND B2* BASIC EXAMINATION SYLLABI

The above-mentioned differences between the B2 and B2* syllabi are in modules 7.7, 7.18 a), 13.7, 13.10 to 13.22, and 14.3, and are shown in the following table.

	MODULE 7. MAINTENANCE PRACTICES	**Level B2/B2***
7.7	**Electrical Wiring Interconnection System (EWIS) / Cables and Connectors** Continuity, insulation and bonding techniques and testing; Use of crimp tools: hand and hydraulic operated; Testing of crimp joints; Connector pin removal and insertion; Co-axial cables: testing and installation precautions; Wiring protection techniques: Cable looming and loom support, cable clamps, protective sleeving techniques including heat shrink wrapping, shielding; Identification of wire types, their inspection criteria and damage tolerance; EWIS installations, inspection, repair, maintenance and cleanliness standards.	2 / 3
7.18	**Disassembly, Inspection, Repair and Assembly Techniques** a) Types of defects and visual inspection techniques; Corrosion removal, assessment and reprotection.	2 / 3

	MODULE 13. AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS	**Level** **B2/B2***
13.7	**Flight Controls (ATA 27)**	
	a) Primary controls: aileron, elevator, rudder, spoiler, Trim control; Active load control; High lift devices; Lift dump, speed brakes; System operation: manual, hydraulic, pneumatic; Artificial feel, Yaw damper, Mach trim, rudder limiter, gust locks; Stall protection systems;	1 / 2
	b) System operation: electrical, fly by wire.	2 / 3
13.10	**On board Maintenance Systems (ATA 45)** Central maintenance computers; Data loading system; Electronic library system; Printing; Structure monitoring (damage tolerance monitoring).	2 / 3
13.11	**Air Conditioning and Cabin Pressurisation (ATA21)**	
13.11.1	**Air supply** Sources of air supply including engine bleed, APU and ground cart;	— / 2

13.11.2	**Air supply**	
	Air conditioning systems;	— / 2
	Air cycle and vapour cycle machines;	— / 3
	Distribution systems;	— / 1
	Flow, temperature and humidity control system.	— / 3
13.11.3	**Pressurisation**	— / 3
	Pressurisation systems;	
	Control and indication including control and safety valves;	
	Cabin pressure controllers.	
13.11.4	**Safety and warning devices**	— / 3
	Protection and warning devices.	
13.12	**Fire Protection (ATA 26)**	
	(a) Fire and smoke detection and warning systems;	— / 3
	Fire extinguishing systems;	
	System tests;	
	(b) Portable fire extinguisher.	— / 1
13.13	**Fuel Systems (ATA 28)**	
	System lay-out	— / 1
	Fuel tanks;	— / 1
	Supply systems;	— / 1
	Dumping, venting and draining;	— / 1
	Cross-feed and transfer;	— / 2
	Indications and warnings;	— / 3
	Refuelling and defuelling;	— / 2
	Longitudinal balance fuel systems.	— / 3

13.14	**Hydraulic Power (ATA 29)**	
	System lay-out;	— / 1
	Hydraulic fluids;	— / 1
	Hydraulic reservoirs and accumulators;	— / 1
	Pressure generation: electrical, mechanical, pneumatic;	— / 3
	Emergency pressure generation;	— / 3
	Filters;	— / 1
	Pressure control;	— / 3
	Power distribution;	— / 1
	Indication and warning systems;	— / 3
	Interface with other systems.	— / 3
13.15	**Ice and Rain Protection (ATA 30)**	
	Ice formation, classification and detection;	— / 2
	Anti-icing systems: electrical, hot air and chemical;	— / 2
	De-icing systems: electrical, hot air pneumatic and chemical;	— / 3
	Rain repellent;	— / 1
	Probe and drain heating;	— / 3
	Wiper systems.	— / 1
3.16	**Landing Gear (ATA 32)**	
	Construction, shock absorbing;	— / 1
	Extension and retraction systems: normal and emergency;	— / 3
	Indications and warning;	— / 3
	Wheels, brakes, antiskid and autobraking;	— / 3
	Tyres;	— / 1
	Steering;	— / 3
	Air-ground sensing.	— / 3

13.17	**Oxygen (ATA 35)**	
	System lay-out: cockpit, cabin;	— / 3
	Sources, storage, charging and distribution;	— / 3
	Supply regulation;	— / 3
	Indications and warnings.	— / 3
13.18	**Pneumatic / Vacuum (ATA 36)**	
	System lay-out;	— / 2
	Sources: engine / APU, compressors, reservoirs, ground supply;	— / 2
	Pressure control;	— / 3
	Distribution;	— / 1
	Indications and warnings;	— / 3
	Interfaces with other systems.	— / 3
13.19	**Water / Waste (ATA 38)**	— / 2
	Water system lay-out, supply, distribution, servicing and draining;	
	Toilet system lay-out, flushing and servicing;	
13.20	**Integrated Modular Avionics (ATA42)**	— / 3
	Functions that may be typically integrated in the Integrated Modular Avionics (IMA) modules are, among others:	
	Bleed Management,	
	Air Pressure Control,	
	Air Ventilation and Control,	
	Avionics and Cockpit Ventilation Control,	
	Temperature Control,	
	Air Traffic Communication,	
	Avionics Communication Router,	
	Electrical Load Management,	
	Circuit Breaker Monitoring,	

	Electrical System BITE, Fuel Management, Braking Control, Steering Control, Landing Gear Extension and Retraction, Tyre Pressure Indication, Oleo Pressure Indication, & Brake Temperature Monitoring, etc.; Core System; Network Components.	
13.21	**Cabin Systems (ATA 44)** The units and components which furnish a means of entertaining the passengers and providing communication within the aircraft (Cabin Intercommunication Data System) and between the aircraft cabin and ground stations (Cabin Network Service) including voice, data, music and video transmissions. The Cabin Intercommunication Data System provides an interface between cockpit / cabin crew and cabin systems. These systems support data exchange of the different related LRU's and they are typically operated via Flight Attendant Panels. The Cabin Network Service typically consists of a server, typically interfacing with, among others, the following systems: — Data / Radio Communication, — In-Flight Entertainment System. The Cabin Network Service may host functions such as: — Access to pre-departure / departure reports, — E-mail / intranet / Internet access, — Passenger database; Cabin Core System;	— / 3

	In-flight Entertainment System; External Communication System; Cabin Mass Memory System; Cabin Monitoring System; Miscellaneous Cabin System	
13.22	**Information Systems (ATA 46)** The units and components that furnish a means of storing, updating and retrieving digital information traditionally provided on paper, microfilm or microfiche. This includes units that are dedicated to the information storage and retrieval function such as the electronic library mass storage and controller, but does not include units or components installed for other uses and shared with other systems, such as flight deck printer or general use display. Typical examples include: - Air Traffic and Information Management Systems and Network Server Systems. - Aircraft General Information System; - Flight Deck Information System; - Maintenance Information System; - Passenger Cabin Information System; - Miscellaneous Information System.	— / 3
	MODULE 14. PROPULSION	**Level** **B2/B2***
14.3	**Starting and Ignition Systems** Operation of engine start systems and components; Ignition systems and components; Maintenance safety requirements.	— / 2

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Appendix VIII — Complex maintenance tasks

The following constitutes the complex maintenance tasks.

1. The modification, repair or replacement by riveting, bonding, laminating, or welding of any of the following airframe parts:

   (a) a box beam;
   (b) a wing stringer or chord member;
   (c) a spar;
   (d) a spar flange;
   (e) a member of a truss-type beam;
   (f) the web of a beam;
   (g) a keel or chine member of a flying boat hull or a float;
   (h) a corrugated sheet compression member in a wing or tail surface;
   (i) a wing main rib;
   (j) a wing or tail surface brace strut;
   (k) an engine mount;
   (l) a fuselage longeron or frame;
   (m) a member of a side truss, horizontal truss or bulkhead;
   (n) a seat support brace or bracket;
   (o) a seat rail replacement;
   (p) a landing gear strut or brace strut;
   (q) an axle;
   (r) a wheel; and
   (s) a ski or ski pedestal, excluding the replacement of a low-friction coating.

2. The modification or repair of any of the following parts:

   (a) aircraft skin, or the skin of an aircraft float, if the work requires the use of a support, jig or fixture;

   (b) aircraft skin that is subject to pressurization loads, if the damage to the skin measures more than 15 cm (6 inches) in any direction;

   (c) a load-bearing part of a control system, including a control column, pedal, shaft, quadrant, bell crank, torque tube, control horn and forged or cast bracket, but excluding

      (i) the swaging of a repair splice or cable fitting, and

      (ii) the replacement of a push-pull tube end fitting that is attached by riveting; and

(d) any other structure, not listed in (1), that a manufacturer has identified as primary structure in its maintenance manual, structural repair manual or instructions for continuing airworthiness.

3. The performance of the following maintenance on a piston engine:

(a) dismantling and subsequent reassembling of a piston engine other than (i) to obtain access to the piston/cylinder assemblies; or (ii) to remove the rear accessory cover to inspect and/or replace oil pump assemblies, where such work does not involve the removal and re-fitment of internal gears;

(b) dismantling and subsequent reassembling of reduction gears;

(c) welding and brazing of joints, other than minor weld repairs to exhaust units carried out by a welder suitably approved in accordance with the requirements in HKAR-1 Sub-section 1.8-10 but excluding component replacement;

(d) the disturbing of individual parts of units which are supplied as bench tested units, except for the replacement or adjustment of items normally replaceable or adjustable in service.

4. The balancing of a propeller, except:

(a) for the certification of static balancing where required by the maintenance manual; or

(b) dynamic balancing on installed propellers using electronic balancing equipment where permitted by the maintenance manual or other approved airworthiness data.

5. Any additional task that requires:

(a) specialized tooling, equipment or facilities; or

(b) significant coordination procedures because of the extensive duration of the tasks and the involvement of several persons.

Appendix IX — Record of experience

1 General

HKAR 66.30 states that the licence applicant must fulfill the experience requirement. To fulfill this requirement, applicants should record their practical experience on form DCA 35B or CAD approved log book and submit to Personal Licensing Office as part of an application for an HKAR-66 licence. This appendix gives guidance to the completion of Record of Experience.

2 Items to be recorded

2.1 The Record of Experience must be practical and involved with a representative cross section of maintenance tasks on aircraft appropriate to the licence category being applied. They should be grouped under suitable ATA chapters in order that the distribution and depth of coverage can be assessed. Section 4 Appendix I and Section 5 Appendix II provide guidance to the modules and systems relevant to each licence category.

2.2 The amount of detail should be related to the construction and complexity of the category of aircraft concerned. Account should also be taken of maintenance procedures, defect rectification and the duties and responsibilities which devolve on the licence holder.

2.3 It is not sufficient to make simple statements such as, for example, "No.1 inverter replaced", "Hydraulic pump replaced", or "50-hour check carried out". The replacement of items requires subsequent specific functional checks to be carried out, and therefore evidence of such checks must also be given in the Record of Experience. In the case of time-cycled check, reference should also be made to the extent of work involved relevant to the systems and/or equipment covered by the check. Checking/inspection items are of limited worth, but the work items which follow from such check/inspection can provide greater experience.

2.4 A sample of form DCA 35B, Record of Experience, is attached to this Appendix. The latest version of this form is available at CAD website https://www.cad.gov.hk/english/public_forms.html.

3 Confirmation signatory

Items and dates entered in the Record of Experience should be countersigned by a person of supervisory status to whom the applicant is responsible in relation to the work experience recorded and who should confirm that the experience is reflected accurately in the document.

4 Assessment by the Director-General

4.1 It should be assumed that the person assessing the Record of Experience is not acquainted either with the applicant or the company by whom he/she is employed.

For this reason, emphasis is placed on the way in which work is recorded against specific registration and type of aircraft, on overall practical experience and on countersigned certifications.

4.2 The Director-General may request the applicant to produce copy of maintenance record to support the claimed experience for verification purpose. Failure to comply with the request would render the submitted Record of Experience invalid. For falsification of Record of Experience, Director-General may ban the applicant from future application of an HKAR-66 licence for a period deemed appropriate by the Director-General.

5 Retention of record of experience

After assessment by the Director-General, the Record of Experience will be returned to the applicant for continuous recording of his/her maintenance experience that may be required for future licence application.

Attachment - SAMPLE OF DCA 35B

HONG KONG CIVIL AVIATION DEPARTMENT

RECORD OF EXPERIENCE

Notes: (1) Record of Experience is used to record work experience in operating aircraft. It is intended being recorded and updated on a regular basis.

(2) Entries must be made, endorsed and certified within a reasonable time of task being carried out.

(3) The person in charge should endorse and certify each item when he is satisfied that the applicant has participated in, or satisfactorily carried out the work / inspection. The status of the person in charge must be in an authoritative position e.g. Quality Manager, Licensed Engineer in appropriate category, Instructor, etc. of the company.

(4) Applicants are encouraged to maintain a personal logbook in which to record details of work carried out. The personal log book may consist of this front page and continuation sheets of second page of DCA 35B.

(5) A **CAD approved** log book can be used as substitute of the form DCA 35B.

(6) The authenticity of entries is vital and therefore any false statements made in this Record of Experience may be liable for suspension of licence or licensing examination.

I hereby declare that the information given on this form is true in every aspect.

Signature : _____ Date : _____

Name : _____ ATA Chapter No. _____ Page No. _____

Aircraft Registration & Type	item	Details of Work Undertaken	Date(s) & Place Work Undertaken	Signature, position & name of person in-charge, name of organisation & company stamp

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Name : _____ ATA Chapter No. _____ Page No. _____

Aircraft Registration & Type	item	Details of Work Undertaken	Date(s) & Place Work Undertaken	Signature, position & name of person in-charge, name of organisation & company stamp

If necessary add continuation sheets and number in sequence.

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Personal Data Collection Statement

1. **Purposes of Collection**

The personal data provided by means of this form, including all the supporting documents included in the application, will be used by Civil Aviation Department for the following purposes:

a. Processing of your application in this form;
b. Carrying out relevant provisions of the Civil Aviation Ordinance (Chapter 448) and its subsidiary Orders / Regulations;
c. Assisting in the enforcement of any other Ordinances and Regulations by other Government Bureaux and Departments;
d. For communication purposes between Civil Aviation Department and yourself;
e. For validation and verification of authenticity of your supporting documents in association with the application;
f. For statistics and research purposes on the condition that the resulting statistics or results will not be made available in a form which will identify the data subjects.

It is obligatory for you to supply the personal data as required in this form. If you fail to supply the required data, we may not be able to process your application.

2. **Classes of Transferees**

The personal data you provided by means of this form may be disclosed to:

a. Other Government Bureaux and Departments for the purposes mentioned in paragraph 1 above;
b. Other Contracting States of the International Civil Aviation Organisation and Civil Aviation Authorities for the purpose mentioned in paragraph 1 above;
c. Other organisations or agencies for execution of their duties as required by Civil Aviation Department.

3. **Access to Personal Data**

You have a right of access and correction with respect to personal data as provided for in Sections 18 and 22 and Principle 6 of Schedule 1 of the Personal Data (Privacy) Ordinance. Your right of access includes the right to obtain a copy of your personal data provided by this form.

4. **Enquiries**

Enquiries concerning the personal data collected by means of this form, including the making of access and correction, should be addressed to:

Airworthiness Office
Flight Standards and Airworthiness Division
Civil Aviation Department Headquarters
1 Tung Fai Road
Hong Kong International Airport
Lantau, Hong Kong

(Attn.: Senior Airworthiness Officer (Standards))

Anti-bribery Reminder

Anyone, while having dealings of any kind with the Civil Aviation Department (CAD), should not offer advantage to the CAD officers, or else he may commit an offence under section 4(1) and/or section 8 of the Prevention of Bribery Ordinance (Chapter 201 of Laws of Hong Kong), and be liable to a maximum penalty of a fine of $500,000 and imprisonment for 7 years.

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Appendix X — Specimen examination questions

1. Multi-Choice Questions

1.1 Level 1 questions

1.1.1 A hydraulic regulator (cut out):-

A) will control the maximum pressure automatically.

B) will reduce the working pressure as selected.

C) will regulate the amount of fluid in the reservoir.

1.1.2 The turbine in an air cycle machine/cold air unit:-

A) increases the air pressure above that of the cabin.

B) drives the compressor which provides pressurisation.

C) drive the compressor in the unit and creates a temperature drop in the pressurising air.

1.1.3 Balance marks on an aircraft tyre and tube are normally:-

A) a coloured line on tyre and tube.

B) two parallel coloured lines 1 inch apart on the tyre, and two coloured dots on the tube.

C) a coloured line on the tube and a coloured dot on the tyre.

1.2 Level 2 questions

1.2.1 Centrifugal turning (or twisting) moment (C.T.M.) assists the propeller pitch change mechanism when:-

A) turning the blades to fine pitch.

B) turning the blades to coarse pitch.

C) unfeathering the blades.

1.2.2 Vibration from a propeller defect will generally be:-

A) of a higher frequency than vibration from a turbine defect.

B) of higher frequency than vibration from an auxiliary gearbox defect.

C) of lower frequency than vibration from a turbine defect.

1.2.3 When a propeller is ‘windmilling’:-

A) energy is extracted from the airflow to turn the propeller resulting in a large

increase in drag.

B) the propeller is caused to turn by the airflow thus giving a small residual thrust and little drag.

C) the propeller normal direction of rotation is reversed giving rise to a large increase in drag.

1.3 Level 3 questions

1.3.1 The intent of a one-way restrictor valve in a hydraulic landing gear system is to restrict the flow of hydraulic fluid:-

A) to the brakes when the gear is retracting.

B) during gear extension.

C) during gear retraction.

1.3.2 When fuel tanks are inhibited with Biobor JF biocide against the attack from biological growth it is:-

A) applied to the tank dry and left.

B) applied to tank wet and flushed out.

C) poured into the tank, allowed to stand and burnt with fuel.

1.3.3 If the pressure in an oxygen system is allowed to drop lower than normal (500 lb/in^2) and remain with a low supply of oxygen:-

A) the diluter regulator will stick and require serving.

B) the oxygen will degenerate, allowing bacterial to grow and produce smell.

C) condensation may occur which can cause corrosion.

Appendix XI —Suggested study material

A study of the following official publications relevant to the subject of Regulations and Airworthiness Requirements is essential in respect of examinations associated with the various categories of licence. The publications may be purchased from Government Publication Centre and/or the Civil Aviation Department.

The Air Navigation (Hong Kong) Order 1995*	Government Publication Centre

* *The above publication can be accessed on Internet at http://www.legislation.gov.hk (Please note that the Internet version is not to be relied on as an authentic version of the law.)*

Hong Kong Aviation Requirements:

HKAR-1	Airworthiness Procedures
HKAR-21	Certification of Aircraft and Related Products, Parts and Appliances, and of Design and Production Organisations
HKAR-66	Licensing of Maintenance Personnel (Certifying Staff – Maintenance)
HKAR-145	Approved Maintenance Organisations
HKAR-181	Approval of Organisations to Recommend Certificate of Airworthiness Renewal
HKAR-183	Representatives of the Director-General
HKAR-HTSO	Hong Kong Technical Standard Orders
CAD 455	Airworthiness Notices
CAD 712	Safety Management Systems (SMS) for Air Operators, International Non-Public Transport Operators, Maintenance Organisations and Flying Training Organisations

The following publications provide useful information for study in connection with the Licence, and may be obtained directly from the publishers, or through bookshops. Books may also be available in libraries.

Book Title	Author	Publisher
Basic Knowledge		
Open Tech Study Plans Learning Packages		Aviation Training Association
CAP 562 – Civil Aircraft Airworthiness Information and Procedures		U.K. Civil Aviation Authority
Aviation Dictionary		Jeppesen
Mechanical Testing of Materials	A J Fenner	Newnes
Physics for Today and Tomorrow	T Duncan	John Murray
Electronics for Today and Tomorrow	T Duncan	Hodder Murray
Mechanics of Flight	A C Kermode	Longman Group Publications
Advanced Mathematics for the Aircraft Technician	EA-MAT	Aviation Maintenance Foundation Inc (USA)
Into Thin Air	E W Still	Normalair-Garrett
Airframe and Mechanical		
Understanding Aircraft Structures	J Cutler	Blackwell Scientific Publications
The Aeroplane Structure	A C Kermode	Longman Group Publications
Light Aircraft Inspection	J E Heywood	T & A D Poyser
Light Aircraft Maintenance	J E Heywood	Blackwell Scientific Publications
Aircraft Maintenance and Repair	Bent & McKinley	McGraw-Hill
Maintenance of Aeroplane Vehicles	Northrop Institute of Technology	McGraw-Hill
A & P Mechanics General Handbook	EA-AC65-9A	Aviation Maintenance Foundation Inc (USA)

Book Title	Author	Publisher
A & P Mechanics Airframe Handbook	EA-AC65-15A	Aviation Maintenance Foundation Inc (USA)
Aviation Maintenance Handbook and Standard Hardware Digest	EA-AHS-1	Aviation Maintenance Foundation Inc (USA)
Transport Category Aircraft Systems	EA-363	Aviation Maintenance Foundation Inc (USA)
Aircraft Weight and Balance	EA-BAL	Aviation Maintenance Foundation Inc (USA)
Aircraft Corrosion Control	EA-CC-1	Aviation Maintenance Foundation Inc (USA)
Aircraft Air Conditioning Systems	EA-AAC-1	Aviation Maintenance Foundation Inc (USA)
Aircraft Fabric Covering	EA-ADF	Aviation Maintenance Foundation Inc (USA)
Aircraft Hydraulic Systems	EA-AH-1	Aviation Maintenance Foundation Inc (USA)
Aircraft Oxygen Systems	EA-AOS	Aviation Maintenance Foundation Inc (USA)
Aircraft Painting and Finishing	EA-AP-2	Aviation Maintenance Foundation Inc (USA)
Aircraft Tires and Tubes	EA-ATT	Aviation Maintenance Foundation Inc (USA)
Aircraft Wheels, Brakes and Anti-skid Systems	EA-AWB	Aviation Maintenance Foundation Inc (USA)
Aircraft Bonded Structure	EA-NMR	Aviation Maintenance Foundation Inc (USA)
Aircraft Sheet Metal Construction and Repair	EA-SMF	Aviation Maintenance Foundation Inc (USA)
The Anatomy of the Aeroplane	Darrol Stinton	Blackwell Scientific Publications
The Helicopter – Its History and How it Flies	J Fay	David and Charles

Book Title	Author	Publisher
Helicopter Flight Theory for Pilots and Mechanics	J R Montgomery	Sikorsky
Dynamics of Helicopter Flight	Saunders	John Wiley & Sons
Fundamentals of Helicopter Maintenance	EA-HF-1	Aviation Maintenance Foundation Inc (USA)
Pilot's Handbook of Aeronautical Knowledge	FAA-H-8083-25C	U.S. Department of Transportation Federal Aviation Administration (USA)
Maintenance Practices: Module 7A (B1)		Aircraft Technical Book Company
Powerplants		
The Jet Engine	Rolls-Royce	Rolls-Royce
Aircraft Powerplants	Bent & McKinley	McGraw-Hill
Powerplants for Aerospace Vehicles	Northrop Institute of Technology	McGraw-Hill
The Aircraft Gas Turbine Engine	Pratt & Whitney	Pratt & Whitney
Aircraft Propellers and Controls	EA-APC	Aviation Maintenance Foundation Inc (USA)
Aircraft Reciprocating Engines	EA-ARE	Aviation Maintenance Foundation Inc (USA)
Aircraft Fuel and Metering Systems	EA-FMS	Aviation Maintenance Foundation Inc (USA)
Aircraft Ignition and Electrical Power Systems	EA-IGS	Aviation Maintenance Foundation Inc (USA)
Aircraft Gas Turbine Powerplants	EA-TEP-1	Aviation Maintenance Foundation Inc (USA)
Jet Aircraft Power Systems	Cassamassa & Bert	McGraw-Hill
Aircraft Gas Turbine engine Technology	Irwin E Tregar	McGraw-Hill

Book Title	Author	Publisher
Electrical / Electronic and Avionics		
Aircraft Flight Instruments and Integrated Systems	E Pallett	Longman Group Publications
Aircraft Electrical Systems	E Pallett	Longman Group Publications
Aircraft Radio Systems	J Powell	Longman Group Publications
Automatic Flight Control	E Pallett	Blackwell Scientific Publications
Electrical and Electronic Technology	Edward Hughes / John Hiley / Keith Brown	Pearson
Electronics II, III	D C Green	Longman Group Publications
Microprocessors/Microcomputers:	Givens/Roesser	McGraw-Hill
An Introduction		
Elements of Electronics	Hickey/Villines	McGraw-Hill
Handbook for Electronic Engineering	Kaufman/Siedman	McGraw-Hill
Technicians		
Aircraft Electricity and Electronics	Eisman / Bent / McKinley	McGraw-Hill
Electronic Computers Made Simple	Jacobweitz	W H Allen
Aircraft Batteries	EA-AB-1	Aviation Maintenance Foundation Inc (USA)
Basic Electricity for A & P Mechanics	EA-BE-1	Aviation Maintenance Foundation Inc (USA)
Basic Electronics and Radio Installation	EA-BEM	Aviation Maintenance Foundation Inc (USA)
Aviation Electronics	EA-AEG-1	Aviation Maintenance Foundation Inc (USA)

Book Title	Author	Publisher
D C Circuits	EA-DCC	Aviation Maintenance Foundation Inc (USA)
Manual of Avionics	Brian Kendal	PSP Professional Books
Digital Avionic Systems	GRS Spitzer	Prentice Hall
Modern Aviation Electronics	A Helfrich	
Avionic Fundamentals		IAP Inc TrainingManual
Avionics: Systems & Troubleshooting	T K Eismin	Avotek
Digital Techniques & Systems	D C Green	Longman
Principle of Avionics	A Hefrick	Airlines Avionics
Fibre Optics Communication and Other Applications	H Zanger	Prentice Hall
Design and Maintenance of Aircraft Electrical Systems	T K Eismin	
Principles of Avionics Systems	T K Eismin	
Module 13 - Aircraft Aerodynamics, Structures and Systems for EASA Part-66 Volume 1 to Volume 5		TTS Integrated Training Systems
Human Factors		
ATA Specification 113 for Maintenance Human Factors Program Guidelines		Air Transport Association of America
ICAO Doc 9683 – Human Factors Training Manual		ICAO
ICAO Circular 216 Human Factors Digest No.1 – Fundamental Human Factors Concepts		ICAO
ICAO Circular 253 Human Factors Digest No. 12 – Human Factors in Aircraft Maintenance and Inspection		ICAO

Book Title	Author	Publisher
CAP 715 - An Introduction to Aircraft Maintenance Engineering Human Factors for JAR 66		U.K. Civil Aviation Authority
CAP 716 - Aviation Maintenance Human Factors (EASA /JAR145 Approved Organisations) Guidance Material on the UK CAA Interpretation of Part-145 Human Factors and Error Management Requirements		U.K. Civil Aviation Authority

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Procedures for the initial issue / variation / renewal of the HKAR-66 Aircraft Maintenance Licence

1. General

1.1 This Appendix specifies the procedures to be followed for the issue, variation or renewal of HKAR-66 Aircraft Maintenance Licence. Supplemental information is presented in Section 4 Appendix XIII.

1.2 HKAR-66 sets out requirements and procedures for the application of an HKAR-66 Aircraft Maintenance Licence and associated licence examinations. Additional information, such as examination schedule and application forms, can be downloaded from the CAD website or obtained from the CAD Personnel Licensing Office.

1.3 Application for issue, variation or renewal of HKAR-66 AML can be submitted by email, fax, post or in person together with the required fee and supporting documentation. For application by email, fax or post, the application will be processed provided that the required fee has been paid.

1.4 Applicants should have studied the current Air Navigation (Hong Kong) Order 1995, HKAR-1, HKAR-66 and Hong Kong Airworthiness Notices.

1.5 The applicant shall pay the fee as prescribed in the Hong Kong Air Navigation (Fees) Regulations.

1.6 Where the applicant is not a resident of Hong Kong, the application will only be accepted if the Director-General is satisfied that there is a need for such licence.

1.7 All examinations will be held at CAD Examination Center at Civil Aviation Department Headquarters, 1 Tung Fai Road, Hong Kong International Airport, Lantau, Hong Kong. Enquires about the availability of the written examination sittings should be made to the Personnel Licensing Office.

1.8 HKAR-66 AML is required to be renewed every five years. It is the

responsibility of the Licence holder to ensure that his/her Licence remains valid. Any certifications, issued by the Licence holder after the Licence has expired, which are based on the privileges or validity of the Licence, will also have an impact on the validity of the Certificate of Airworthiness of the aircraft being certified. In addition, any company authorisations granted on the basis of a current Licence will be invalidated should that Licence expire.

1.9 Licence which has lapsed for less than 2 years may be considered for renewal without examination provided that the requirements of HKAR 66.40 are met, except that the qualifying period will be the 6 months in the 12 months immediately preceding the date of receipt of the renewal application. Licence cannot be backdated and in the case of lapsed Licence the reissue will only be effected after all requirements have been met. Any lack of continuity in the validity of the Licence will be recorded on the reissued Licence.

1.10 Licence which has lapsed for more than 2 years will not be considered for renewal without examination.

2 Procedure for the issue of a HKAR-66 aircraft maintenance licence

2.1 The applicant must complete CAD Form DCA35 and send it to CAD together with the required fee and any relevant paragraph 2.2 to paragraph 2.6 supporting documentation.

2.2 Maintenance experience must be written up by means of the CAD Form DCA35B, Record of Experience, in a manner that the reader has a reasonable understanding of where, when and what maintenance constitutes the experience. A task by task account is desirable but a blank statement "X years maintenance experience completed" is not acceptable. The Record of Experience should have sufficient depth to reflect the system complexity of different subjects and adequate coverage of relevant ATA chapters. Alternatively, a CAD approved log book of maintenance experience may be used instead of filling the DCA35B. It is acceptable to cross refer in the DCA35 to other documents containing information on maintenance experience, such as log book, except that such experience must be countersigned by a person acceptable to the Director-General. A typical example of a log book page is shown in Section 4 Appendix IX.

2.3 Applicant has to meet the experience requirements as per HKAR 66.30 before the issue/extension of the AML. The Record of Experience can be submitted together with the application for examination or application for licence issue/extension when the applicant has passed the required examinations.

2.4 Applicants claiming the maximum reduction in HKAR 66.30(a) total experience based upon having successfully completed HKAR 147.85 approved basic training, should include the HKAR-147 certificate of recognition for approved basic training.

2.5 Applicants claiming the reduction in HKAR 66.30(a) total experience based upon having successfully completed technical training in an organisation or institute recognised by the Director-General as a competent organisation or institute, should include the relevant certificate of successful completion of training.

2.6 Applicants claiming credit against the HKAR 66.30(a) total experience requirement by virtue of HKAR 66.30(e) non-civil aircraft maintenance experience, may only be granted such credit where the Director-General has recognised such non-civil aircraft maintenance experience. The Director-General in recognising non-civil aircraft maintenance experience will have specified who within the non-civil environment may make a statement that the applicant has met the relevant maintenance experience. The applicant should include a detailed statement of such maintenance experience signed by the non-civil maintenance authority in accordance with the conditions specified in the CAD letter of recognition.

2.7 On receipt of the CAD Form DCA35 and any supporting documentation submitted to the Director-General, it will be checked for completeness and ensure that the experience claimed meets the requirement of HKAR-66 and that the experience record satisfies paragraph 2.2 in terms of content and the countersigning signature.

2.8 The Director-General will either conduct the examination or request that such examinations be carried out by an appropriately approved HKAR-147 maintenance training organisation.

2.9 Exemptions from AML Examinations

2.9.1 Exemptions from part of the HKAR-66 written examination may be granted by the Director-General based on qualifications held and the category for which application has been made.

(a) Holder of a restricted HKAR-66 licence in one or more Categories, when applying for conversion to a full HKAR-66 licence Basic Category, will be granted exemptions from those modules which form part of the examinations for the Categories already held. The applicant should approach CAD for the details of the examinations required.

(b) Holder of a non HKAR-66 licences that have been assessed by the Director-General, when applying for the issue of a HKAR-66 licence in Basic Category, may be granted exemptions from part of the HKAR-66 examinations as are so specified. This will be dependent on the Categories for which application has been made and the candidate will be advised accordingly once the application has been accepted. Details of non HKAR-66 licences and the required conversion examination are listed in Section 4 Appendix XVIII of HKAR-66.

2.9.2 Exemptions will only be considered provided the relevant supporting documents are submitted with the application form DCA35. Where a licence granted by other aviation authority is the basis of request for exemption it must be valid on the date of application.

2.9.3 Holder of an aircraft maintenance licence issued by an aviation authority other than those listed in Section 4 Appendix XVIII of HKAR-66 can apply to the Personnel Licensing Office of CAD for exemptions. A copy of the relevant aviation requirements detailing the aircraft maintenance licensing system and its syllabus should be submitted with the application form for assessment. CAD will consider whether to proceed with the assessment and advise the applicant accordingly,

2.10 The Director-General shall grant examination credits to the applicant with the reference to the Certificate of Recognition (CoR) issued by the accredited* HKAR-147 AMTO after 1 September 2016.

(a) Credits shall expire 10 years after they are granted.

(b) Upon expiration of the credits, the applicant may apply for new credits. The Director-General will continue the validity of the credits for an additional period of 10 years without further consideration if basic knowledge requirements defined in HKAR-66 Section 4 Appendix I have not been changed.

(c) Applicant shall submit the certified CoR copy for examination credits application.

* HKAR-147 AMTO accreditation is not inherent and shall be individually granted from Director-General.

2.11 When satisfied that the applicant meets the standards of knowledge and experience required by HKAR-66, the Director-General will issue the HKAR-66 aircraft maintenance licence to the applicant.

3 Procedure for the variation of a HKAR-66 aircraft maintenance licence to include an additional basic category

3.1 Application for additional basic categories, that is, HKAR-66 category A or B1 or B2* or C to the HKAR-66 aircraft maintenance licence must follow the procedures of sub-section 2.2 to 2.3 except that in addition the applicant's current original licence should be presented to the CAD with the CAD Form DCA35.

3.2 At the completion of the sub-section 2 procedures, the Director-General will reissue the HKAR-66 aircraft maintenance licence to include the additional basic category.

4 Procedure for the variation of a HKAR-66 aircraft maintenance licence to include an aircraft type

4.1 Aircraft types are entered in the HKAR-66 aircraft maintenance licence category B1 or B2* or C when the applicant is qualified on the particular aircraft type as specified in HKAR-66, in terms of having completed the particular aircraft type training course conducted by an appropriately approved HKAR-147 maintenance training organisation or such an aircraft type training course approved by the Director-General and has been successfully examined on the aircraft type by either the Director-General or by an appropriately approved HKAR-147 maintenance training organisation **and** has completed the necessary type practical maintenance experience and therefore application to include an aircraft type in the HKAR-66 aircraft maintenance licence must follow the procedure of this sub-section.

4.2 The HKAR-145 approved maintenance organisation must ensure that the applicant meets the HKAR-66 requirement for the aircraft type to be entered in the HKAR-66 aircraft maintenance licence before signing the CAD Form DCA35 recommendation. The HKAR-145 organisation is used to recommend the applicant because of the need to endorse the aircraft practical experience but nothing prevents such HKAR-145 organisation from using its HKAR-147 training department, if it has one, to co-ordinate the applicant's evidence of compliance on behalf of the organisation. The recording and countersigning of aircraft practical experience gained inside or outside the HKAR-145 environment must satisfy the conditions specified in paragraph 2.2. The aircraft type practical experience can be demonstrated by means of a personal log book as described in paragraph 2.2.

4.3 The acceptance standards for applicants who hold aircraft certification qualifications or have attended aircraft type trainings that have not been ccepted/approved by the Director-General, are described in Appendix XIV.

4.4 When in compliance with HKAR-66 as summarised in para 4.1, the HKAR-66 aircraft maintenance licence holder must complete the relevant aircraft type rating parts of CAD Form DCA35, request the maintenance organisation to endorse the DCA35 with an appropriate aircraft type recommendation and present the completed CAD Form DCA35 together with the holder's licence to the CAD.

4.5 On receipt of a satisfactory CAD Form DCA35, certificate of relevant aircraft type training, records of practical experience and the accompanying HKAR-66 aircraft maintenance licence, the Director-General will reissue said licence to include the aircraft type.

4.6 Where a HKAR-145 approved maintenance organisation qualifies an engineer or mechanic for HKAR-66 aircraft maintenance licence aircraft type endorsement but chooses not to issue the HKAR-145 certification authorisation for economic reasons, the Director-General will, on request of the applicant, still proceed with the endorsement of the HKAR-66 aircraft maintenance licence.

The purpose of this provision is to cover the case where the HKAR-145 approved maintenance organisation is attempting to qualify more personnel than it may need to issue aircraft certificates of release to service on the basis that some personnel may fail to qualify and normal unpredicted staff turnover, such as those leaving the organisation at short notice, etc.

5 Procedure for the renewal of a HKAR-66 aircraft maintenance licence

5.1 The HKAR-66 aircraft maintenance licence will be renewed subject to confirmation that the requirements stated in HKAR 66.40 are met, and the HKAR-66 aircraft maintenance licence held by CAD has the same endorsements as contained in the holder's copy of the document and the licence holder is not under investigation for possible revocation, suspension or variation of the HKAR-66 aircraft maintenance licence in accordance with HKAR 66.65.

5.2 Renewal form DCA35A is for renewal of HKAR-66 licence and DCA 35C is for renewal and transfer of HKAR-AMEL licence to HKAR-66 licence. Copies of these forms may be downloaded from the CAD website or obtained from the CAD Personnel Licensing Office.

5.3 The holder of a HKAR-66 aircraft maintenance licence must complete the relevant parts of CAD Form DCA35A and submit it with the holder's licence to the CAD. A licence may be renewed provided that the holder is in compliance with the requirements specified in HKAR 66.40.

5.4 Licence cannot be backdated. In order to ensure that continuation of Licence cover is maintained, an acceptable application for renewal of HKAR-66 licence must be received by the Personnel Licensing Office at least FIVE working days prior to the expiry date of the Licence. For the renewal and transfer of HKAR-AMEL licence to HKAR-66 licence with application for Type Rating endorsement, the application must be received by the Personnel Licensing Office at least FOUR WEEKS prior to the expiry date of Licence.

5.5 The Director-General can only renew a Licence upon being satisfied that the information supplied by the Licence holder on the renewal form is correct and on receipt of the appropriate fee.

In the case where holder of the Licence is not a resident of Hong Kong the following will apply: -

(a) For a Licence to be renewed the applicant must pay the requisite fee and produce written verification to the satisfaction of the Director-General that the work detailed in the renewal form was performed on aircraft registered in Hong Kong; or alternatively

(b) If the applicant can produce written verification to the satisfaction of the Director-General that the work detailed in the renewal form was performed while he/she was employed by a company holding AN(HK)O Approval, and provided such work is acceptable for the purpose of Licence renewal, the Licence may be renewed upon payment of the requisite fee.

(c) In cases where the Licence holder is employed by organisations located outside Hong Kong not holding an AN(HK)O Approval and he/she is not engaged in the certification of Hong Kong registered aircraft, the Licence will not be renewed but will be held in abeyance by the Personnel Licensing Office. It will be reinstated without any loss of experience already accrued, whenever the applicant can show compliance with paragraphs 5.5(a) or 5.5(b) above.

NOTE: 1. Where a Licence holder can demonstrate to the Director-

General that he/she has a need to maintain his/her licence valid the Director-General may consider the renewal of the Licence, provided the requirements of HKAR 66.40 are met.

2. For the Licence holder employed by a company holding CCAR-145 or MAR-145 maintenance organisation approval and the company is located within the jurisdictional area of the Authority granting the approval, a company letter is required to support the application for the renewal of the Licence.

5.6 The Director-General will compare the holder's HKAR-66 aircraft maintenance licence with the CAD file and verify any pending revocation, suspension or variation action pursuant to HKAR 66.65. If the documents are identical and no action is pending pursuant to HKAR 66.65 action, the maintenance experience is satisfied then the licence will be renewed and the copy held on file will be updated accordingly. The Director-General will not be carrying out any investigation to ensure that the licence holder is in current **aircraft type** maintenance practice as this is a matter for the HKAR-145 approved maintenance organisation in ensuring validity of the HKAR-145 certification authorisation.

5.7 If the licence copy held by CAD is different to that held by the licence holder, the Director-General will investigate the reasons for such differences and act accordingly.

5.8 To act accordingly in the case where the Director-General is unable to establish that the different endorsements were properly obtained to the standard of HKAR-66 means that the Director-General may not renew the HKAR-66 aircraft maintenance licence and will inform both the licence holder and the affected HKAR-145 approved maintenance organisation of such fact and may need to consider to take action under HKAR 66.65 to revoke, suspend or vary the licence in question.

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HKAR-66 Aircraft Maintenance Licence

1 Each licence holder should have a unique licence number based upon a numeric designator.

2 The licence will have the original issue date, an expiry date and date of issue printed. Name, address, nationality, date of birth of the licence holder will also be stated. The licence holder should sign the document in ink after having checked the correctness of the information contained. The aircraft type rating need not be issued until the first type endorsement is included.

3 Aircraft type endorsement will use the standard codes contained in Section 5 Appendix I.

4 The HKAR-66 aircraft maintenance licence once issued is required to be kept by the person to whom it applies in good condition and who shall remain accountable for ensuring that no unauthorised entries are made.

5 Failure to comply with para 4 may invalidate the licence and could lead to the holder not being permitted to hold any HKAR-145 certification authorisation and may result in prosecution under the law.

6 It is important to understand that the existence of the HKAR-66 aircraft maintenance licence alone does not permit the holder to issue a HKAR 145.50 certificate of release to service. To issue a HKAR 145.50 certificate of release to service requires a valid HKAR-66 aircraft maintenance licence type rated for the aircraft **AND** an appropriate valid HKAR-145 certification authorisation. The HKAR-145 certification authorisation is issued by the HKAR-145 approved maintenance organisation.

A type rated HKAR-66 aircraft maintenance does not normally confer any certification privileges on the holder in their own right. Such licences must be used in conjunction with a certification authorisation.

7 A type rated HKAR-66 aircraft maintenance licence may only be used to make certification(s) where the licence is endorsed to permit this.

8 The scope of Category B2 has been revised to include ‘Electrical Components in Mechanical System’ at HKAR-66 ISSUE 2 Revision 3 with effect on 1 August 2013. Category B2 (Basic Category and Type Rating) on HKAR-66 Aircraft Maintenance Licence will be marked as Category B2* upon successful completion of approved basic and type training to indicate compliance with HKAR-66 ISSUE 2 Revision 3.

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HKAR-66 Aircraft Maintenance Licence type rating endorsement - acceptance of aircraft maintenance qualification & type training not issued / approved by the Director-General

1 Introduction

1.1 In accordance with the HKAR 66.45 requirement, the endorsement of a type rating to an HKAR-66 Aircraft Maintenance Licence (AML) requires the applicant to complete an approved aircraft type knowledge and practical training process.

1.2 Aircraft maintenance qualifications (e.g. type rated licence and maintenance authorisation), which are not issued by the Director-General, do not automatically meet the HKAR-66 requirements for the type endorsement to the HKAR-66 AML. Neither does the type training, which is not approved by the Director-General.

1.3 It should be reminded that, for aircraft types as listed in paragraph 14 of the HKAR-66 Section 4 Appendix XX, the type endorsement on the HKAR-66 AML does not provide the licence holder the certification privilege on commercial air transport aircraft. As per HKAR 145.35, the HKAR-145 approved maintenance organisation (AMO) must establish the competence and qualification of all prospective certifying staff for certification authorisation. The assessment, performed by the HKAR-145 AMO, on competence and qualification may result in requiring additional training.

1.4 The Director-General has evaluated the situation and has defined the acceptance standards and the competence test requirements for type endorsement applications made in accordance with this Appendix.

1.5 The competence test is a process to transfer the aircraft maintenance qualifications not issued by the Director-General into HKAR-66 type rating system. The knowledge of the applicant on the aircraft type being endorsed will be tested on sampling basis.

2 Acceptance Standards

2.1 The Director-General accepts the certification authorisations issued before 1 July 2004, by maintenance organisations holding HKAR-145 approval. Competence tests are not required for such type rating endorsements.

2.2 Except as provided in paragraph 2.1 above, other type rating endorsement applications, which are based on an aircraft maintenance qualification not issued by the Director-General or type training equivalent to Level 3 of ATA 104 Specification but not approved by the Director-General, the applicant

must satisfy the competence test process, as stipulated in paragraph 3 of this Appendix.

2.3 Type rating endorsement application using the process as stipulated in paragraph 2.2 is not applicable to person who has already held an HKAR-66 AML. The application will not normally be accepted by the Director-General unless there is a justification of needs. The type rating applied shall be within the scope listed in the Section 5 Appendix I.

2.4 Applicant using paragraph 2.2 for type rating endorsement shall apply for all required aircraft type ratings in one application together with or immediately after his/her HKAR-66 AML conversion process.

2.5 For each aircraft type endorsement application, the applicant is allowed three attempts of the competence test maximum. If the applicant failed the first test, he/she shall not make the second attempt within 30 days of the date of the failed test, and so on. If the applicant fails all three attempts, he/she cannot endorse the same type rating adopting this process again. Paragraph 3.1 of Section 4 Appendix XII shall be followed for the type rating endorsement.

2.6 Type ratings will only be endorsed to an HKAR-66 AML with appropriate Basic Category / Sub-category.

2.7 When the privileges of the certification qualification are not equivalent to the full privileges of the HKAR-66 Category / Sub-category applied, the type rating endorsement, if granted, will have appropriate limitations on the HKAR-66 AML.

2.8 The Director-General will normally not consider the type rating endorsement application if the applicant's aircraft type training has been completed for more than three years and without evidence of recent certification experience on the particular aircraft / engine type.

3 Competence Test Process

3.1 A competence test will have 40 multi-choice (MC) questions. Each MC question will have three choices and an allowed nominal completion time of 90 seconds. The pass mark of the examination is 75% with no penalty marking.

3.2 The competence test can be conducted by the CAD or by an appropriately approved HKAR-147 training organisation.

3.3 For aircraft / engine types of less complexity, the Director-General may waive the competence test requirement.

3.4 Applicant who wishes to take the competence test shall write to the CAD Personnel Licencing Office with a letter issued by a Hong Kong aviation

organisation justifying the needs. The letter should state the aircraft and engine type rating the applicant wishes to apply for the test.

4 Aeroplanes below 5700 Kg MTWA and Rotorcraft below 2730 Kg MTWA

4.1 These aircraft are less complex than large aircraft and in view of this, the Director-General can exercise special consideration when endorsing such type ratings to the HKAR-66 AML.

4.2 When an application is not supported by evidence of a type-training course, the applicant must pass a competence test.

4.3 The competence test for aircraft types within this paragraph can be an oral examination.

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Limitations on HKAR-66 Aircraft Maintenance Licence

Limitation codes may be applied singly or in combination to basic categories and type ratings to reflect the scope of protected rights transferred to a HKAR-66 Aircraft Maintenance Licence. The limitation codes and their translation which is printed on the licence are listed below:

Code	Limitations
1	Airframe only Excluding electrical power generation & distribution systems
2	Turbine engine only
3	Jet - turbine engines only
4	Piston engines only
5	Turbine engined rotorcraft only
6	Piston engined rotorcraft only
11	Electrical power systems only
12	Instrument systems only
13	Instrument-autopilot (aeroplanes) autoland & autothrottle systems only
14	Radio communication/navigation systems only
15	Radio communication/navigation and radar systems only
16	Compass compensation and adjustment only
17	Autopilot (helicopter) only
18	Autopilot (aeroplanes) only
21	Excluding airframe
22	Excluding engine
23	Excluding propeller-turbine engines
24	Excluding electrical systems and components
25	Excluding avionic LRUs
31	Including electrical components in mechanical systems
32	Excluding electrical power systems
33	Excluding instrument systems
34	Excluding autopilot system on aeroplanes
35	Excluding autopilot system on helicopters
36	Excluding automatic landing and autothrottle system on aeroplanes
37	Excluding radio communication/navigation and radar systems
38	Excluding radio radar systems
41	Excluding compass compensation and adjustment
42	Unpressurised aeroplanes (wood or combined wood and metal) only
43	Unpressurised aeroplanes (excluding wood and composite) only

Code	Limitations
44	Instrument system (General Aviation) An instrument system specified in sub-paragraphs 8.1* and 8.3* to 8.4* of Airworthiness Notice No. 10
45	Electrical system (General Aviation) An electrical system specified in sub-paragraphs 9.1* and 9.2* to 9.4* of Airworthiness Notice No. 10
46	Autopilot system (General Aviation) An autopilot system specified in sub-paragraphs 13.1* or 13.2* of Airworthiness Notice No. 10
47	VHF communication equipment only Replacement of VHF communication equipment for aeroplane/rotorcraft has a MTWA not exceeding 2730 kg
999	Paragraphs endorsed under the CERTIFICATION PRIVILEGES are the paragraphs of Airworthiness Notice No. 10. Limited to the PARAGRAPHS endorsed, this licence may also be used to certify within the appropriate privileges set out in Airworthiness Notices No. 3 & 10.
G 01	Aeroplanes with metal tubing structure covered with fabric
G 02	Composite structure aeroplanes
G 03	Metal structure aeroplanes
G 04	Pressurised aeroplanes (B1.2 licence ONLY)
G 05	Wooden structure aeroplanes

* Component replacements only, provided that functional checks to prove serviceability do not require the use of test apparatus.

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HKAR-AMEL to HKAR-66
Conversion examination requirements

1 Conversion examinations are designed for HKAR-AMEL licence holders who wish to convert to a **FULL** HKAR-66 licence. Where possible conversion examinations will cover complete HKAR-66 modules or complete topics within a module. However due to the complexity of comparing knowledge items between the HKAR-AMEL and the HKAR-66 syllabuses and the broaden scope of the Category B1 or B2 licence categories, it has been necessary to introduce specialised examinations within certain modules to cover a selected range of HKAR-66 syllabus paragraphs.

2 Module 9 - Human Factors of HKAR-66 is not required to be examined in all conversion examinations for those applicants who have attended an initial human factors training course approved by the Director-General. An applicant may elect to attempt the Module 9 examination if otherwise.

3 The conversion examination requirements for the HKAR-AMEL licences of popular combination of major categories are shown in Table 1. Applicants holding HKAR-AMEL licences with categories other than those listed should approach the CAD for details of the conversion examination requirements.

Table 1

From HKAR-AMEL with category (Note 1)	**To HKAR-66 category**	HKAR-66 Modules and /or Partial Modules **required for conversion examination (Note 2)**	**No. of question**
A2	B1.1	Partial Module 3 – Topics 3.9 to 3.18 Module 4 Module 5 Partial Module 7 – Topics 7.4 & 7.7 Partial Module 11 – Topics 11.5, 11.6, 11.8, 11.10 & 11.14 Module 15 Module 17	40 20 40 16 70 90 30
TE & JTE	B1.1	Partial Module 3 – Topics 3.9 to 3.18 Module 4 Module 5 Partial Module 7 – Topics 7.4, 7.7, 7.8, 7.14, 7.16 to 7.19 Module 8 Module 11 Module 17 (for JTE only)	40 20 40 40 20 130 30
E	B1.1	Module 5 Module 6 Partial Module 7 – Topics 7.6, 7.8 to 7.20 Module 8 Partial Module 11 – Topics 11.1 to 11.5, 11.7, 11.9 to 11.11, 11.13 & 11.15 to 11.17 Module 15 Module 17	40 70 50 20 110 90 30
A2/TE & A2/JTE	B1.1	Partial Module 3 – Topics 3.9 to 3.18 Module 4 Module 5 Partial Module 7 – Topics 7.4 & 7.7 Partial Module 11 – Topics 11.5, 11.6, & 11.14 Module 17 (for A2/JTE only)	40 20 40 16 50 30

A2/TE/E & A2/JTE/E	B1.1	Module 5 Partial Module 11 – Topics 11.5 Module 17 (for A2/JTE/E only)	40 16 30
TER	B1.3	Partial Module 3 – Topics 3.9 to 3.18 Module 4 Module 5 Partial Module 7 – Topics 7.4 & 7.7 Partial Module 12 – Topics 12.7, 12.8 & 12.15	40 20 40 16 50
E	B2	Module 5 Module 8 Partial Module 13 – Topics 13.1, 13.3, 13.4 & 13.6 to 13.8 Module 14	70 20 120 25
CC	B2	Partial Module 13 – Topics 13.1.3, 13.3 (SAS only), 13.4 (C&N only), 13.5, 13.6, 13.8 (CCA only) & 13.9	80
R	B2	Module 8 Partial Module 13 – Topics 13.1 to 13.3, 13.4 (FD & INS only), 13.5 & 13.7 to 13.9 Module 14	20 110 25
E/CC	B2	Partial Module 13 – Topics 13.1.3, 13.3 (SAS only), 13.4 (C&N only), 13.6 & 13.8 (CCA only)	60
E/R	B2	Module 8 Partial Module 13 – Topics 13.1, 13.3, 13.4 (FD & INS only), 13.7 & 13.8 Module 14	20 90 25
CC/R	B2	Partial Module 13 – Topics 13.1.3, 13.3 (SAS only), 13.5, 13.8 (CCA only) & 13.9	45
E/CC/R	B2	Partial Module 13 – Topics 13.1.3, 13.3 (SAS only) & 13.8 (CCA only)	25

Note:

1. Abbreviation for HKAR-AMEL Licence Categories:

A2	AMEL Cat. A - Aeroplanes 2
CC	AMEL Cat. X - Combined Category
E	AMEL Cat. X - Electrical
JTE	AMEL Cat. C - Jet Turbine Engine – Aeroplanes
R	AMEL Cat. R - Communication/Navigation and Radar
TE	AMEL Cat. C - Turbine Engine – Aeroplanes
TER	AMEL Cat. A&C – Turbine-engined Rotorcraft

2. Abbreviation for examination topics:

SAS	Stability Augmentation System in helicopters
C&N	Communication and Navigation Systems
CCA	Compass Compensation and Adjustment
FD	Flight Director
INS	Inertia Navigation/Reference Systems

Exemptions from HKAR-66 examinations

1 Conversion examinations to FULL HKAR-66 Licence in Basic Category/ Sub-category

1.1 Time after time applications have been received by CAD requesting exemption from HKAR-66 examinations under various circumstances using different non HKAR-66 licences. It is therefore important to state clearly that the purpose of such "relief" is to take credits of the technical knowledge and aircraft maintenance experience of certain non HKAR-66 licence holders that when they are intended to be employed by Hong Kong aviation organisations will not be required to start from scratch in the HKAR-66 licence examinations. Candidate who has applied for HKAR-66 licence examinations or has already been granted with a HKAR-66 Aircraft Maintenance Licence (AML) would not be normally considered for exemption from HKAR-66 examinations by claiming credit from a non HKAR-66 licence subsequently.

1.2 Holders of non HKAR-66 licences as listed in paragraph 1.5, when applying for the initial grant of a HKAR-66 Aircraft Maintenance Licence (AML) in a Basic Category/Sub-category, may be granted exemptions from part of the written examinations on certain HKAR-66 modules. The required modules and/or partial modules to be taken by the applicant are shown in paragraph 1.5. For applicant who holds more than one non HKAR-66 licences, only one non HKAR-66 licence can be considered in the application for the initial grant of HKAR-66 AML. The applicant should clearly indicate which non HKAR-66 licence he/she prefers to use. Once the HKAR-66 AML is granted, subsequent Basic Category/Sub-category extension should follow the requirements stipulated in Section 4 Appendix XIX.

1.3 The applicant must fulfill the experience requirements stipulated in HKAR 66.30(d) and the non HKAR-66 licence being held must be valid on the date of application for the grant of a HKAR-66 AML.

1.4 The applicant must demonstrate the "need" to CAD for exemptions from HKAR-66 examinations with a company letter issued by a Hong Kong aviation organisation or any other documents to substantiate the application.

1.5 Required Examination on HKAR-66 Modules and/or Partial Modules:

Non HKAR-66 Licence	**In Categories**	**Convert to HKAR-66 Categories / Sub-category**	**Required Examination on HKAR-66 Modules and/or Partial Modules**
Australia CASR Part 66	B1.1	B1.1	Module 10 (40 MC + 1 essay question)
CAAC CCAR-66 with Technical English level 3 or 4 endorsement	TA: Aeroplanes Turbine	B1.1 and B2*	Module 10 (40 MC + 1 essay question)
	PA: Aeroplanes Piston	B1.2 and B2*	Module 10 (40 MC + 1 essay question)
	TR: Rotorcrafts Turbine	B1.3 and B2*	Module 10 (40 MC + 1 essay question)
	PR: Rotorcrafts Piston	B1.4 and B2*	Module 10 (40 MC + 1 essay question)

Non HKAR-66 Licence	**In Categories**	**Convert to HKAR-66 Categories / Sub-category**	**Required Examination on HKAR-66 Modules and/or Partial Modules**
EASA Part-66	A or B	A or B in relevant Category/ Sub-category	Module 10 (40 MC + 1 essay question)
FAA	Airframe & Powerplant (A & P) Mechanic Certificate	B1.1	Module 4 (20 MC) Module 5 (40 MC) Module 9 (20 MC + 1 essay question) Module 10 (40 MC + 1 essay question) Partial Module 11 – Topic 11.5 (24 MC)
		B1.3	Module 4 (20 MC) Module 5 (40 MC) Module 9 (20 MC + 1 essay question) Module 10 (40 MC + 1 essay question) Partial Module 12 – Topics 12.1 to 12.4 & 12.7 (50 MC)
		B2*	Module 4 (40 MC)

Non HKAR-66 Licence	**In Categories**	**Convert to HKAR-66 Categories / Sub-category**	**Required Examination on HKAR-66 Modules and/or Partial Modules**
		(HKAR-66 ISSUE 2 Revision 4)	Module 5 (70 MC) Module 9 (20 MC + 1 essay question) Module 10 (40 MC + 1 essay question) Partial Module 13 – Topics 13.1.3, 13.3, 13.4, 13.6 & 13.8, 13.11 to 13.22 (150 MC)
Macau AACM MAR-66	B1.1	B1.1	Module 10 (40 MC + 1 essay question)
	B1.2	B1.2	Module 10 (40 MC + 1 essay question)
	B1.3	B1.3	Module 10 (40 MC + 1 essay question)
	B1.4	B1.4	Module 10 (40 MC + 1 essay question)
	B2	B2*	Module 10 (40 MC + 1 essay question)
Malaysia DCAM Part-66	B1.1 and B2	B1.1 and B2*	Module 10 (40 MC + 1 essay question)

Non HKAR-66 Licence	**In Categories**	**Convert to HKAR-66 Categories / Sub-category**	**Required Examination on HKAR-66 Modules and/or Partial Modules**
New Zealand CAA AMEL	A & C Type Rated in relevant Group/Type	B1	Module 4 (20 MC) Module 5 (40 MC) Module 9 (20 MC + 1 essay question) Module 10 (40 MC + 1 essay question) Partial Module 11 – Topics 11.5 (24 MC) Note: Module 9 will be exempted if the licence is issued based on syllabus dated 1 April 1997 or later revision.
	E + I + R Type Rated in relevant Group/Type	B2* (HKAR-66 ISSUE 2 Revision 4)	Module 9 (20 MC + 1 essay question) Module 10 (40 MC + 1 essay question) Note: Module 9 will be exempted if the licence is issued based on syllabus dated 1 April 1997 or later revisions.

Non HKAR-66 Licence	**In Categories**	**Convert to HKAR-66 Categories / Sub-category**	**Required Examination on HKAR-66 Modules and/or Partial Modules**
Singapore CAAS SAR-66	B1.1 and B2	B1.1 and B2*	Module 10 (40 MC + 1 essay question)

HKAR-66 examinations for extensions to basic licence categories

1 Introduction

Because the modular syllabus of HKAR-66 often requires different levels of knowledge for the different licence categories (A, B1 and B2*) within a module, there are "conversion" examinations applicable to certain modules for licence holders wishing to extend a HKAR-66 licence to include another category. The most common cases of licence extensions are set out below.

2 Extension of Category B1 to include Category B2* (HKAR-66 ISSUE 2 Revision 3)

Note 1: Because of the impracticability of setting an examination for the single topic (avionic general test equipment) that has to be covered in Module 7, questions for that subject will be included in the Module 5 conversion examination.

Category Held	HKAR-66 Modules and / or Topics required for Conversion Examination	Number of Questions
B1.1	**Partial Module 4 -** Topics 4.1.1 b) all, 4.1.2 all, 4.1.3 b) all, 4.2 all, 4.3 b) all. **Partial Module 5 and 7 -** Topics 5.1 to 5.3 all, 5.6 b) all, 5.7 to 5.10 all, 7.4 all. (see Note 1) **Partial Module 13 -** Topics 13.1.3 all, 13.3 & 13.4 all, 13.6 all, 13.8 all.	20 40 100
B1.2	**Partial Module 4 -** Topics 4.1.1 b) all, 4.1.2 all, 4.1.3 b) all, 4.2 all, 4.3 b) all. **Partial Module 5 and 7 -** Topics 5.1 to 5.3 all, 5.6 b) all, 5.7 to 5.10 all, 7.4 all. (see Note 1) **Partial Module 13 -** Topics 13.1.3 all, 13.3 & 13.4 all, 13.6 all, 13.8 all. **Module 14 all.**	20 40 100 25

Category Held	HKAR-66 Modules and / or Topics required for Conversion Examination	Number of Questions
B1.3	**Partial Module 4 -** Topics 4.1.1 b) all, 4.1.2 all, 4.1.3 b) all, 4.2 all, 4.3 b) all. **Partial Module 5 and 7 -** Topics 5.1 to 5.3 all, 5.6 b) all, 5.7 to 5.10 all, 7.4 all. (see Note 1) **Partial Module 13 -** Topics 13.1 all, 13.3 & 13.4 all, 13.6 to 13.8 all.	20 40 100
B1.4	**Partial Module 4 -** Topics 4.1.1 b) all, 4.1.2 all, 4.1.3 b) all, 4.2 all, 4.3 b) all. **Partial Module 5 and 7 -** Topics 5.1 to 5.3 all, 5.6 b) all, 5.7 to 5.10 all, 7.4 all. (see Note 1) **Partial Module 13 -** Topics 13.1 all, 13.3 & 13.4 all, 13.6 to 13.8 all. **Module 14 all.**	20 40 100 25

3 **Extension of Category B2 / B2* to include Category B1**

Note 2: The following Table applies to full Category B2 / B2* AML holders only. Category B2 licence holders with any limitations must remove those limitations first by taking the appropriate conversion examinations or can qualify for B1 by following the conventional route and be examined on the complete modules required for B1.

To Category	HKAR-66 Modules and / or Topics required for Conversion Examination	Number of Questions
B1.1	**Partial Module 6 -** Topics 6.1 a) all, 6.2 a) all, 6.3 b) all, 6.4 b) all, 6.5.4 all, 6.6 b) all, 6.7 all, 6.10 all. **Partial Module 7 -** Topics 7.6 all, 7.8 to 7.14 all, 7.15 b) all, 7.16 b) all, 7.18 b) & c) all, 7.19 b) all. **Partial Module 11 -** Topics 11.1 to 11.4 all, 11.7 to 11.13 all, 11.15 to 11.17 all.	20 40 90

To Category	HKAR-66 Modules and / or Topics required for Conversion Examination	Number of Questions
B1.1 (continued)	**Partial Module 15 -** Topics 15.1 to 15.13 all, 15.15 to 15.22 all. **Module 17 all.**	70 30
B1.2	**Partial Module 6 -** Topics 6.1 a) all, 6.2 a) all, 6.3 b) all, 6.4 b) all, 6.5.4 all, 6.6 b) all, 6.7 all, 6.10 all. **Partial Module 7 -** Topics 7.6 all, 7.8 to 7.14 all, 7.15 b) all, 7.16 b) all, 7.18 b) & c) all, 7.19 b) all. **Partial Module 11 -** Topics 11.1 to 11.4 all, 11.7 to 11.13 all, 11.15 to 11.17 all. **Partial Module 16 -** Topics 16.1 to 16.9 all, 16.11 to 16.13 all. **Module 17 all.**	20 40 90 55 30
B1.3	**Partial Module 6 -** Topics 6.1 a) all, 6.2 a) all, 6.3 b) all, 6.4 b) all, 6.5.4 all, 6.6 b) all, 6.7 all, 6.10 all. **Partial Module 7 -** Topics 7.6 all, 7.8 to 7.14 all, 7.15 b) all, 7.16 b) all, 7.18 b) & c) all, 7.19 b) all. **Partial Module 12 -** Topics 12.1 to 12.6 all, 12.9 to 12.14 all, 12.16 all. **Partial Module 15 -** Topics 15.1 to 15.13 all, 15.15 to 15.22 all.	20 40 80 70
B1.4	**Partial Module 6 -** Topics 6.1 a) all, 6.2 a) all, 6.3 b) all, 6.4 b) all, 6.5.4 all, 6.6 b) all, 6.7 all, 6.10 all. **Partial Module 7 -** Topics 7.6 all, 7.8 to 7.14 all, 7.15 b) all, 7.16 b) all, 7.18 b) & c) all, 7.19 b) all. **Partial Module 12 -** Topics 12.1 to 12.6 all, 12.9 to 12.14 all, 12.16 all.	20 40 80

To Category	HKAR-66 Modules and / or Topics required for Conversion Examination	Number of Questions
B1.4 (continued)	**Partial Module 16 -** Topics 16.1 to 16.9 all, 16.11 to 16.13 all.	55

4 **Extension of Category A1 to include Category B1.1**

Category Held	HKAR-66 Modules and / or Topics required for Conversion Examination	Number of Questions
A1	Module 1 all	30
	Module 2 all	50
	Module 3 all	50
	Module 4 all	20
	Module 5 all	40
	Module 6 all	70
	Partial Module 7, topics 7.4 to 7.16, 7.18 & 7.20.	60
	Module 8 all	20
	Partial Module 10, topics 10.2, 10.3, 10.5, 10.6 & 10.8.	20
	Module 11 all	130
	Module 15 all	90
	Module 17 all	30

5 **Extension of Category B2 to Category B2* (HKAR-66 ISSUE 2 Revision 3)**

5.1 The scope of Category B2 has been revised to include 'Electrical Components in Mechanical System' at HKAR-66 Issue 2 Revision 3 with effect on 1 August 2013. Category B2 (Basic Category and Type Rating) on HKAR-66 Aircraft Maintenance Licence will be marked as Category B2* upon successful completion of approved basic and type training to indicate compliance with HKAR-66 Issue 2 Revision 3.

5.2 The following table provided the extension requirement from Basic Category B2 to B2* (HKAR-66 ISSUE 2 Revision 3).

Category Held	HKAR-66 Modules and / or Topics required for Conversion Examination	Number of Questions
B2 with Limitation 31 only, or B2 with B1	Training and examination are not required. Basic Category B2* will be included on the next convenient opportunity when the Licence reached CAD after 1 August 2013. (Note: Limitation 31 will no longer be required on AML with Category B2*)	N/A
B2	**Partial Module 13 –** Topics 13.11 to 13.22 all	50
B2 with Limitation other than Limitation 31	Those Limitations other than Limitation 31 must be removed in accordance with HKAR-2 Chapter 23 Appendix 1. The extension to Basic Category B2* can then follow the route B2 shown in this table.	Variable

6 **Requirements for other extensions to Basic Licence Categories**

Applicants wish to apply for extensions to Basic Licence Categories other than those listed should approach the CAD for details of the conversion examination requirements.

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Appendix XX - Certification Privileges for HKAR-AMEL group type ratings transferred onto HKAR-66 AML

1. In accordance with HKAR 66.45 and AMC 66.45, under certain conditions, the AML holder may hold specific aircraft manufacturers group type or specific aircraft group type ratings.

2. HKAR-AMEL licence holders are entitled to 'protected rights' under HKAR-66 on existing licence and authorisation privileges. HKAR-AMEL group type ratings, when transferred onto HKAR-66 licences, are for purposes of reflecting continuing privileges, and aircraft types may need to be individually identified. Where a type of aircraft (or its engines or systems) is defined by one of the group type ratings in paragraphs 8 to 9, 12, 13 or 15 of this appendix, an engineer may exercise the certification privileges in respect of that type provided that:-

   (a) he/she holds a valid HKAR-66 Type Rated Licence in the appropriate Category, endorsed with the appropriate sub-paragraph of this appendix and

   (b) an aircraft of the type is registered in Hong Kong and holds a Hong Kong Certificate of Airworthiness.

   NOTE: Sub-paragraphs indicated thus * in paragraphs 8, 9, 12, 13 and 15 of this appendix are not obtainable as new endorsements on an HKAR-66 licence.

3. Where a type of aircraft (or its engines or systems) is not defined by a group type rating or is not listed by name, an application for the Type Rating of a licence in respect of that type of aircraft, engines or systems, will be considered provided that:

   (a) an aircraft of the type is registered in Hong Kong and holds a Hong Kong Certificate of Airworthiness, or

   (b) an aircraft is not of the type registered in Hong Kong but may be maintained under a HKAR-145 approval.

4. **Reserved.**

5. **Reserved**.

6. **Reserved.**

7. **Reserved.**

8. **Certification Privileges - Instruments**

(a) A rating granted in relation to any of the sub-paragraphs 8.1 to 8.4 inclusive, includes all of the instruments fitted to those aircraft in which are installed systems defined by or listed in that sub-paragraph excluding those aircraft listed in paragraph 14, and as limited by paragraphs 1 to 3 of this appendix.

(b) A rating granted in relation to sub-paragraph 8.8 relates to Instruments - Direct and remote reading compasses only, but excludes compasses on those aircraft listed in paragraph 14 and is limited by paragraph 2 of this appendix.

NOTES: (1) A Type Rated Licence which is valid for sub-paragraphs 8.3 or 8.4 also includes sub-paragraph 8.1.

(2) Where a system is combined flight director/automatic pilot the rating does not include items of equipment associated solely with the automatic pilot.

*8.1 General aircraft instrument systems but excluding instruments installed on any aircraft which has installed a Flight Director System.

8.2 Reserved

*8.3 Flight Director Systems employing air driven gyroscopes (attitude).

*8.4 Flight Director Systems employing electrically driven gyroscopes (attitude).

8.5 Reserved

8.6 Reserved

8.7 Reserved

*8.8 ‘X’ Instruments (compasses)
Direct and remote reading compasses.

9. Certification Privileges - Electrical

A rating granted in relation to any sub-paragraph of paragraph 9 of this appendix includes the generation system and the electrical installation in aircraft as defined by that sub-paragraph, as limited by paragraphs 1 to 3 of this appendix.

NOTES: A Type Rated Licence which is valid for sub-paragraph 9.2 or sub-paragraph 9.3 also includes sub-paragraph 9.1.

*9.1 Aircraft in which the main generation system output is dc (including alternators having a self-contained rectifier system) and in which secondary alternators having an individual power rating not exceeding 1.5 kVA may be fitted.

*9.2 Aircraft in which the main generation system output is dc and which have installed 'frequency wild' alternators with an individual power rating exceeding 1.5 kVA for auxiliary services.

*9.3 Aircraft in which the main generation system output is 'frequency wild' ac and dc power is supplied from transformer rectifier units.

*9.4 Aircraft in which the main generation system output is 'constant frequency' ac from alternators driven by constant speed drive units, or variable speed constant frequency (VSCF) generator/converter systems, and dc power is supplied from transformer rectifier units.

10. Reserved.

11. Reserved.

12. Certification Privileges - Radio

A rating granted in relation to any sub-paragraph of paragraph 12 of this appendix includes all the types of radio systems listed in that sub-paragraph, as limited by paragraphs 1 to 3 of this appendix.

NOTE: Certification Privileges - Radio includes Ground Proximity Warning Systems only when the licence is endorsed to that effect.

*12.1 Airborne Communication Systems.

*12.2 Airborne Communication Systems, Airborne Navigation Systems.

*12.3 Airborne Radar Systems.

13. Certification Privileges - Automatic Pilots

A rating granted in relation to any sub-paragraph of paragraph 13 of this appendix includes all the automatic pilot systems defined by that sub-paragraph when installed in aircraft, excluding those aircraft listed in paragraph 14 and as limited by paragraphs 1 to 3 of this appendix.

NOTES: (1) A Type Rated Licence which is valid for sub-paragraph 13.2 also includes sub-paragraph 13.1.

A Typed Rated Licence which is valid for sub-paragraph 13.3 also

includes sub-paragraph 13.1 and sub-paragraph 13.2.

A Typed Rated Licence which is valid for sub-paragraph 13.5 also includes sub-paragraph 13.4.

(2) For the purpose of licensing, automatic stabilisers are deemed to be automatic pilots.

(3) Automatic pilots include related systems such as yaw dampers and/or roll dampers, mach trim systems and automatic throttle systems

*13.1 Non-Radio-Coupled Automatic Pilots (Aeroplanes).

*13.2 Radio-Coupled Automatic Pilots (Aeroplanes) excluding ILS Coupled (LOC and GS) Automatic Pilots.

*13.3 ILS Coupled (LOC and GS) Automatic Pilots (Aeroplanes).

*13.4 Non-Radio-Coupled Automatic Pilots (Rotorcraft).

*13.5 Radio-Coupled Automatic Pilots (Rotorcraft)

14. Aircraft for which maintenance is carried out and certified under company Approval

Pressurised Aeroplanes

Airbus	A300 Series
	A319/320/321 Series
	A330 Series
	A350 Series
Boeing	737 Series
	747 Series
	777 Series
Bombardier	CL-600-2B16 Series
Jetstream	Jetstream 41 Series
Gulfstream	GV-SP Series
	GVI Series

Rotorcraft

Leonardo S,p.A. Helicopters	AW139 Series
Airbus Helicopters	AS 332L2 Series
	EC 155 Series
	EC 175 Series
MD Helicopters	369 Series
	500N Series
	MD900 Series

***15 Compass compensation and adjustment**

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Appendix I — Aircraft type ratings for HKAR-66 aircraft maintenance licences

Introduction

1. The following aircraft type ratings and codes are regularly updated to add new aircraft type ratings and to ensure common terminologies are used.

2. Aircraft type ratings and codes that have been endorsed on the HKAR-66 Aircraft Maintenance Licence and have been revised in subsequent Revisions remain valid where appropriate. They would be amended in opportunity basis.

3. It is important to note that the inclusion of an aircraft type in the HKAR-66 Aircraft Maintenance Licence does not indicate that the aircraft type has been granted a type certificate in Hong Kong, these lists being only intended for the purpose of maintenance.

1. Group 1 Aeroplane

TC Holder	Aeroplane Model	Commercial Designation	Type Rating Endorsement
AIRBUS	A300 B4-601		Airbus A300-600 (GE CF6)
AIRBUS	A300 B4-603		Airbus A300-600 (GE CF6)
AIRBUS	A300 B4-605 R		Airbus A300-600 (GE CF6)
AIRBUS	A300 C4-605 R Variant F		Airbus A300-600 (GE CF6)
AIRBUS	A300 F4-605 R		Airbus A300-600 (GE CF6)
AIRBUS	A300 B4-622		Airbus A300-600 (PW 4000)
AIRBUS	A300 B4-622 R		Airbus A300-600 (PW 4000)
AIRBUS	A300 F4-622 R		Airbus A300-600 (PW 4000)
AIRBUS	A310-203		Airbus A310 (GE CF6)
AIRBUS	A310-203 C		Airbus A310 (GE CF6)
AIRBUS	A310-204		Airbus A310 (GE CF6)
AIRBUS	A310-304		Airbus A310 (GE CF6)
AIRBUS	A310-308		Airbus A310 (GE CF6)
AIRBUS	A310-324		Airbus A310 (PW 4000)
AIRBUS	A310-325		Airbus A310 (PW 4000)
AIRBUS	A310-221		Airbus A310 (PW JT9D)
AIRBUS	A318-111		Airbus A318/A319/A320/A321 (CFM56)
AIRBUS	A318-112		Airbus A318/A319/A320/A321 (CFM56)
AIRBUS	A319-111		Airbus A318/A319/A320/A321 (CFM56)
AIRBUS	A319-112		Airbus A318/A319/A320/A321 (CFM56)

TC Holder	Aeroplane Model	Commercial Designation	Type Rating Endorsement
AIRBUS	A319-113		Airbus A318/A319/A320/A321 (CFM56)
AIRBUS	A319-114		Airbus A318/A319/A320/A321 (CFM56)
AIRBUS	A319-115		Airbus A318/A319/A320/A321 (CFM56)
AIRBUS	A320-111		Airbus A318/A319/A320/A321 (CFM56)
AIRBUS	A320-211		Airbus A318/A319/A320/A321 (CFM56)
AIRBUS	A320-212		Airbus A318/A319/A320/A321 (CFM56)
AIRBUS	A320-214		Airbus A318/A319/A320/A321 (CFM56)
AIRBUS	A320-215		Airbus A318/A319/A320/A321 (CFM56)
AIRBUS	A320-216		Airbus A318/A319/A320/A321 (CFM56)
AIRBUS	A321-111		Airbus A318/A319/A320/A321 (CFM56)
AIRBUS	A321-112		Airbus A318/A319/A320/A321 (CFM56)
AIRBUS	A321-211		Airbus A318/A319/A320/A321 (CFM56)
AIRBUS	A321-212		Airbus A318/A319/A320/A321 (CFM56)
AIRBUS	A321-213		Airbus A318/A319/A320/A321 (CFM56)
AIRBUS	A319-151N	A319 NEO	Airbus A319/A320/A321 (CFM LEAP-1A)
AIRBUS	A319-152N	A319 NEO	Airbus A319/A320/A321 (CFM LEAP-1A)
AIRBUS	A319-153N	A319 NEO	Airbus A319/A320/A321 (CFM LEAP-1A)
AIRBUS	A320-251N	A320 NEO	Airbus A319/A320/A321 (CFM LEAP-1A)
AIRBUS	A320-252N	A320 NEO	Airbus A319/A320/A321 (CFM LEAP-1A)
AIRBUS	A320-253N	A320 NEO	Airbus A319/A320/A321 (CFM LEAP-1A)
AIRBUS	A321-251N	A321 NEO	Airbus A319/A320/A321 (CFM LEAP-1A)
AIRBUS	A321-251NX	A321 NEO	Airbus A319/A320/A321 (CFM LEAP-1A)
AIRBUS	A321-252N	A321 NEO	Airbus A319/A320/A321 (CFM LEAP-1A)

TC Holder	Aeroplane Model	Commercial Designation	Type Rating Endorsement
AIRBUS	A321-253N	A321 NEO	Airbus A319/A320/A321 (CFM LEAP-1A)
AIRBUS	A319-171N	A319 NEO	Airbus A319/A320/A321 (IAE PW1100G)
AIRBUS	A319-172N	A319 NEO	Airbus A319/A320/A321 (IAE PW1100G)
AIRBUS	A319-173N	A319 NEO	Airbus A319/A320/A321 (IAE PW1100G)
AIRBUS	A320-271N	A320 NEO	Airbus A319/A320/A321 (IAE PW1100G)
AIRBUS	A320-272N	A320 NEO	Airbus A319/A320/A321 (IAE PW1100G)
AIRBUS	A320-273N	A320 NEO	Airbus A319/A320/A321 (IAE PW1100G)
AIRBUS	A321-271N	A321 NEO	Airbus A319/A320/A321 (IAE PW1100G)
AIRBUS	A321-272N	A321 NEO	Airbus A319/A320/A321 (IAE PW1100G)
AIRBUS	A319-131		Airbus A319/A320/A321 (IAE V2500)
AIRBUS	A319-132		Airbus A319/A320/A321 (IAE V2500)
AIRBUS	A319-133		Airbus A319/A320/A321 (IAE V2500)
AIRBUS	A320-231		Airbus A319/A320/A321 (IAE V2500)
AIRBUS	A320-232		Airbus A319/A320/A321 (IAE V2500)
AIRBUS	A320-233		Airbus A319/A320/A321 (IAE V2500)
AIRBUS	A321-131		Airbus A319/A320/A321 (IAE V2500)
AIRBUS	A321-231		Airbus A319/A320/A321 (IAE V2500)
AIRBUS	A321-232		Airbus A319/A320/A321 (IAE V2500)
AIRBUS	A330-201		Airbus A330 (GE CF6)
AIRBUS	A330-202		Airbus A330 (GE CF6)
AIRBUS	A330-203		Airbus A330 (GE CF6)
AIRBUS	A330-301		Airbus A330 (GE CF6)
AIRBUS	A330-302		Airbus A330 (GE CF6)
AIRBUS	A330-303		Airbus A330 (GE CF6)
AIRBUS	A330-223		Airbus A330 (PW 4000)
AIRBUS	A330-223F		Airbus A330 (PW 4000)
AIRBUS	A330-321		Airbus A330 (PW 4000)

TC Holder	Aeroplane Model	Commercial Designation	Type Rating Endorsement
AIRBUS	A330-322		Airbus A330 (PW 4000)
AIRBUS	A330-323		Airbus A330 (PW 4000)
AIRBUS	A330-243		Airbus A330 (RR RB 211 Trent 700)
AIRBUS	A330-243F		Airbus A330 (RR RB 211 Trent 700)
AIRBUS	A330-341		Airbus A330 (RR RB 211 Trent 700)
AIRBUS	A330-342		Airbus A330 (RR RB 211 Trent 700)
AIRBUS	A330-343		Airbus A330 (RR RB 211 Trent 700)
AIRBUS	A330-941	A330 NEO	Airbus A330 (RR Trent 7000)
AIRBUS	A340-211		Airbus A340 (CFM56)
AIRBUS	A340-212		Airbus A340 (CFM56)
AIRBUS	A340-213		Airbus A340 (CFM56)
AIRBUS	A340-311		Airbus A340 (CFM56)
AIRBUS	A340-312		Airbus A340 (CFM56)
AIRBUS	A340-313		Airbus A340 (CFM56)
AIRBUS	A340-541		Airbus A340 (RR RB 211 Trent 500)
AIRBUS	A340-542		Airbus A340 (RR RB 211 Trent 500)
AIRBUS	A340-642		Airbus A340 (RR RB 211 Trent 500)
AIRBUS	A340-643		Airbus A340 (RR RB 211 Trent 500)
AIRBUS	A350-941		Airbus A350 (RR Trent XWB)
AIRBUS	A350-1041		Airbus A350 (RR Trent XWB)
AIRBUS	A380-861		Airbus A380 (EA GP7200)
AIRBUS	A380-841		Airbus A380 (RR RB 211 Trent 900)
AIRBUS	A380-842		Airbus A380 (RR RB 211 Trent 900)
BAE SYSTEMS (OPERATIONS) Ltd	Jetstream 4100 Series		Jetstream 41 (Honeywell TPE331)
BOEING COMPANY	737-100	B737 Classic	Boeing 737-100/200 (PW JT8D)
BOEING COMPANY	737-200	B737 Classic	Boeing 737-100/200 (PW JT8D)
BOEING COMPANY	737-200C	B737 Classic	Boeing 737-100/200 (PW JT8D)
BOEING COMPANY	737-300	B737 Classic	Boeing 737-300/400/500 (CFM56)

TC Holder	Aeroplane Model	Commercial Designation	Type Rating Endorsement
BOEING COMPANY	737-400	B737 Classic	Boeing 737-300/400/500 (CFM56)
BOEING COMPANY	737-500	B737 Classic	Boeing 737-300/400/500 (CFM56)
BOEING COMPANY	737-600	B737 Next Generation	Boeing 737-600/700/800/900 (CFM56)
BOEING COMPANY	737-700	B737 Next Generation	Boeing 737-600/700/800/900 (CFM56)
BOEING COMPANY	737-800	B737 Next Generation	Boeing 737-600/700/800/900 (CFM56)
BOEING COMPANY	737-900	B737 Next Generation	Boeing 737-600/700/800/900 (CFM56)
BOEING COMPANY	737-900ER	B737 Next Generation	Boeing 737-600/700/800/900 (CFM56)
BOEING COMPANY	737-8	B737 MAX	Boeing 737-8/9 (CFM LEAP-1B)
BOEING COMPANY	737-9	B737 MAX	Boeing 737-8/9 (CFM LEAP-1B)
BOEING COMPANY	747-100B		Boeing 747-100 (RR RB211)
BOEING COMPANY	747SR		Boeing 747-100/747SR (PW JT9D)
BOEING COMPANY	747-100		Boeing 747-100/747SR (PW JT9D)
BOEING COMPANY	747-100B		Boeing 747-100/747SR (PW JT9D)
BOEING COMPANY	747-100B SUD		Boeing 747-100/747SR (PW JT9D)
BOEING COMPANY	747SR		Boeing 747SR (GE CF6)
BOEING COMPANY	747-200B	B747	Boeing 747-200/300 (GE CF6)
BOEING COMPANY	747-200C	B747	Boeing 747-200/300 (GE CF6)
BOEING COMPANY	747-200F	B747	Boeing 747-200/300 (GE CF6)
BOEING COMPANY	747-300	B747	Boeing 747-200/300 (GE CF6)
BOEING COMPANY	747-200B	B747	Boeing 747-200/300 (PW JT9D)
BOEING COMPANY	747-200C	B747	Boeing 747-200/300 (PW JT9D)
BOEING COMPANY	747-200F	B747	Boeing 747-200/300 (PW JT9D)
BOEING COMPANY	747-300	B747	Boeing 747-200/300 (PW JT9D)

TC Holder	Aeroplane Model	Commercial Designation	Type Rating Endorsement
BOEING COMPANY	747-200B	B747	Boeing 747-200/300 (RR RB211)
BOEING COMPANY	747-200C	B747	Boeing 747-200/300 (RR RB211)
BOEING COMPANY	747-200F	B747	Boeing 747-200/300 (RR RB211)
BOEING COMPANY	747-300	B747	Boeing 747-200/300 (RR RB211)
BOEING COMPANY	747-400	B747	Boeing 747-400 (GE CF6)
BOEING COMPANY	747-400BCF	B747F/SF	Boeing 747-400 (GE CF6)
BOEING COMPANY	747-400F	B747	Boeing 747-400 (GE CF6)
BOEING COMPANY	747-400	B747	Boeing 747-400 (PW 4000)
BOEING COMPANY	747-400CF	B747F/SF	Boeing 747-400 (PW 4000)
BOEING COMPANY	747-400F	B747	Boeing 747-400 (PW 4000)
BOEING COMPANY	747-400	B747	Boeing 747-400 (RR RB211)
BOEING COMPANY	747-400CF	B747F/SF	Boeing 747-400 (RR RB211)
BOEING COMPANY	747-400F	B747	Boeing 747-400 (RR RB211)
BOEING COMPANY	747-8	B747	Boeing 747-8 (GE GEnx)
BOEING COMPANY	747-8F	Freighter	Boeing 747-8 (GE GEnx)
BOEING COMPANY	757-200	B757	Boeing 757-200/300 (PW 2000)
BOEING COMPANY	757-200PF	B757	Boeing 757-200/300 (PW 2000)
BOEING COMPANY	757-300	B757	Boeing 757-200/300 (PW 2000)
BOEING COMPANY	757-200	B757	Boeing 757-200/300 (RR RB211)
BOEING COMPANY	757-200CB	B757	Boeing 757-200/300 (RR RB211)
BOEING COMPANY	757-200PF	B757	Boeing 757-200/300 (RR RB211)
BOEING COMPANY	757-300	B757	Boeing 757-200/300 (RR RB211)
BOEING COMPANY	767-200	B767	Boeing 767-200/300 (PW 4000)

TC Holder	Aeroplane Model	Commercial Designation	Type Rating Endorsement
BOEING COMPANY	767-300	B767	Boeing 767-200/300 (PW 4000)
BOEING COMPANY	767-300CF	B767	Boeing 767-200/300 (PW 4000)
BOEING COMPANY	767-200	B767	Boeing 767-200/300 (PW JT9D)
BOEING COMPANY	767-300	B767	Boeing 767-200/300 (PW JT9D)
BOEING COMPANY	767-300CF	B767	Boeing 767-200/300 (PW JT9D)
BOEING COMPANY	767-200	B767	Boeing 767-200/300/400 (GE CF6)
BOEING COMPANY	767-300	B767	Boeing 767-200/300/400 (GE CF6)
BOEING COMPANY	767-300CF	B767	Boeing 767-200/300/400 (GE CF6)
BOEING COMPANY	767-300F	B767	Boeing 767-200/300/400 (GE CF6)
BOEING COMPANY	767-400ER	B767	Boeing 767-200/300/400 (GE CF6)
BOEING COMPANY	767-300	B767	Boeing 767-300 (RR RB211)
BOEING COMPANY	777-200	B777	Boeing 777-200/300 (GE 90)
BOEING COMPANY	777-200LR	B777	Boeing 777-200/300 (GE 90)
BOEING COMPANY	777-300ER	B777	Boeing 777-200/300 (GE 90)
BOEING COMPANY	777F	Freighter	Boeing 777-200/300 (GE 90)
BOEING COMPANY	777-200	B777	Boeing 777-200/300 (PW 4000)
BOEING COMPANY	777-300	B777	Boeing 777-200/300 (PW 4000)
BOEING COMPANY	777-200	B777	Boeing 777-200/300 (RR RB211 Trent 800)
BOEING COMPANY	777-300	B777	Boeing 777-200/300 (RR RB211 Trent 800)
BOEING COMPANY	787-8	Dreamliner	Boeing 787-8/9/10 (GE GEnx)
BOEING COMPANY	787-9	Dreamliner	Boeing 787-8/9/10 (GE GEnx)
BOEING COMPANY	787-10	Dreamliner	Boeing 787-8/9/10 (GE GEnx)
BOEING COMPANY	787-8	Dreamliner	Boeing 787-8/9/10 (RR RB 211 Trent 1000)

TC Holder	Aeroplane Model	Commercial Designation	Type Rating Endorsement
BOEING COMPANY	787-9	Dreamliner	Boeing 787-8/9/10 (RR RB 211 Trent 1000)
BOEING COMPANY	787-10	Dreamliner	Boeing 787-8/9/10 (RR RB 211 Trent 1000)
BOMBARDIER	BD-100-1A10	Challenger 300 Challenger 350	Bombardier BD-100-1A10 (Honeywell AS907)
BOMBARDIER	BD-700-1A10	Global Express Global 6000 Global 6500	Bombardier BD-700 Series (RRD BR700-710)
BOMBARDIER	BD-700-1A11	Global 5000 Global 5000 GVFD Global 5500	Bombardier BD-700 Series (RRD BR700-710)
BOMBARDIER	BD-700-2A12	Global 7500	Bombardier BD-700 2A12 (GE Passport 20)
BOMBARDIER	BD-700-2A13	Global 5000 Global 5000 GVFD	Bombardier BD-700 Series (RRD BR700-710)
BOMBARDIER	CL-600-2A12 (601 Variant)	Challenger 601	Bombardier CL-600-2A12/2B16 (601/601-3A/3R Variant) (GE CF34)
BOMBARDIER	CL-600-2B16 (601-3A Variant)	Challenger 601-3A	Bombardier CL-600-2A12/2B16 (601/601-3A/3R Variant) (GE CF34)
BOMBARDIER	CL-600-2B16 (601-3R Variant)	Challenger 601-3R	Bombardier CL-600-2A12/2B16 (601/601-3A/3R Variant) (GE CF34)
BOMBARDIER	CL-600-2B16 (604 Variant)	Challenger 604 (MSN < 5701) Challenger 605 (5701<=MSN <= 5990) Challenger 650 (MSN ≥ 6050)	Bombardier CL-600-2B16 (604 Variant) (GE CF34)
BOMBARDIER	CL-600-2B19 (RJ Series 100)	Regional Jet Series 100/200/440/ Challenger 850/ CRJ SE	Bombardier CL-600-2B19/2C10/2D15/2D24/2E25 (GE CF34)

TC Holder	Aeroplane Model	Commercial Designation	Type Rating Endorsement
BOMBARDIER	CL-600-2C10 (RJ 700/701/702)	Regional Jet Series 700/701/702	Bombardier CL-600-2B19/2C10/2D15/2D24/2E25 (GE CF34)
BOMBARDIER	CL-600-2D15 (RJ Series 705)	Regional Jet Series 705	Bombardier CL-600-2B19/2C10/2D15/2D24/2E25 (GE CF34)
BOMBARDIER	CL-600-2D24 (RJ Series 900)	Regional Jet Series 900	Bombardier CL-600-2B19/2C10/2D15/2D24/2E25 (GE CF34)
BOMBARDIER	CL-600-2E25 (RJ Series 1000)	Regional Jet Series 1000	Bombardier CL-600-2B19/2C10/2D15/2D24/2E25 (GE CF34)
Commercial Aircraft Corporation of China, Ltd. (COMAC)	ARJ21-700		COMAC ARJ21 (GE CF34)
Commercial Aircraft Corporation of China, Ltd. (COMAC)	C919		COMAC C919 (CFM LEAP-1C)
TEXTRON AVIATION Inc.	560XL	Citation Excel Citation XLS Citation XLS+	Cessna 560XL/XLS (PWC PW545)
TEXTRON AVIATION Inc.	680	Citation Sovereign Citation Sovereign+	Cessna 680 (PWC PW306)
TEXTRON AVIATION Inc.	680A	Latitude	Cessna 680 (PWC PW306)
DASSAULT AVIATION	Falcon 2000EX	F2000EX EASy F2000DX F2000LX F2000LXS F2000S	Falcon 2000EX EASy (PWC PW308C)
DASSAULT AVIATION	Falcon 7X	Falcon 7X Falcon 8X	Falcon 7X (PWC PW307)
DASSAULT AVIATION	Falcon 900EX	F900EX EASy F900DX F900LX	Falcon 900EX EASy (Honeywell TFE731)
EMBRAER S.A.	EMB-135BJ	Legacy 600 Legacy 650	Embraer EMB-135/145 (RR Corp AE3007A)

TC Holder	Aeroplane Model	Commercial Designation	Type Rating Endorsement
EMBRAER S.A.	EMB-135ER		Embraer EMB-135/145 (RR Corp AE3007A)
EMBRAER S.A.	EMB-135LR		Embraer EMB-135/145 (RR Corp AE3007A)
EMBRAER S.A.	EMB-145		Embraer EMB-135/145 (RR Corp AE3007A)
EMBRAER S.A.	EMB-145EP		Embraer EMB-135/145 (RR Corp AE3007A)
EMBRAER S.A.	EMB-145ER		Embraer EMB-135/145 (RR Corp AE3007A)
EMBRAER S.A.	EMB-145EU		Embraer EMB-135/145 (RR Corp AE3007A)
EMBRAER S.A.	EMB-145LR		Embraer EMB-135/145 (RR Corp AE3007A)
EMBRAER S.A.	EMB-145LU		Embraer EMB-135/145 (RR Corp AE3007A)
EMBRAER S.A.	EMB-145MK		Embraer EMB-135/145 (RR Corp AE3007A)
EMBRAER S.A.	EMB-145MP		Embraer EMB-135/145 (RR Corp AE3007A)
EMBRAER S.A.	ERJ 170-100 LR	ERJ-170	Embraer ERJ-170 Series (GE CF34)
EMBRAER S.A.	ERJ 170-100 STD	ERJ-170	Embraer ERJ-170 Series (GE CF34)
EMBRAER S.A.	ERJ 170-200 LR	ERJ-175	Embraer ERJ-170 Series (GE CF34)
EMBRAER S.A.	ERJ 170-200 STD	ERJ-175	Embraer ERJ-170 Series (GE CF34)
EMBRAER S.A.	ERJ 190-100 ECJ	Lineage 1000	Embraer ERJ-190 Series (GE CF34)
EMBRAER S.A.	ERJ 190-100 IGW	ERJ-190 AR	Embraer ERJ-190 Series (GE CF34)
EMBRAER S.A.	ERJ 190-100 LR	ERJ-190	Embraer ERJ-190 Series (GE CF34)
EMBRAER S.A.	ERJ 190-100 SR	ERJ-190	Embraer ERJ-190 Series (GE CF34)
EMBRAER S.A.	ERJ 190-100 STD	ERJ-190	Embraer ERJ-190 Series (GE CF34)
EMBRAER S.A.	ERJ 190-200 IGW	ERJ-195 AR	Embraer ERJ-190 Series (GE CF34)
EMBRAER S.A.	ERJ 190-200 LR	ERJ-195	Embraer ERJ-190 Series (GE CF34)
EMBRAER S.A.	ERJ 190-200 STD	ERJ-195	Embraer ERJ-190 Series (GE CF34)
GULFSTREAM AEROSPACE Corporation	G-IV	Gulfstream G-IV/GIV-SP	Gulfstream GIV/GIV-SP Series (RRD Tay)
GULFSTREAM AEROSPACE Corporation	GIV-X	Gulfstream G350 Gulfstream G450	Gulfstream GIV-X Series (RRD Tay)

TC Holder	Aeroplane Model	Commercial Designation	Type Rating Endorsement
GULFSTREAM AEROSPACE Corporation	GV	Gulfstream GV	Gulfstream GV basic model (RRD BR710)
GULFSTREAM AEROSPACE Corporation	GV-SP	Gulfstream G500 Gulfstream G550	Gulfstream GV-SP Series (RRD BR710)
GULFSTREAM AEROSPACE Corporation	GVI (G650)	G650 G650ER	Gulfstream GVI (RRD BR725)
GULFSTREAM AEROSPACE LP (GALP)	Gulfstream 200/Galaxy	G200/Galaxy	Gulfstream (IAI) 200/Galaxy (PWC PW306)
GULFSTREAM AEROSPACE LP (GALP)	Gulfstream G280	G280	Gulfstream (IAI) G280 (Honeywell AS907)
HAWKER BEECHCRAFT	BAe.125 Series 800A	BAe.125	BAe 125 Series (Honeywell TFE731)
HAWKER BEECHCRAFT	BAe.125 Series 800B	BAe.125	BAe 125 Series (Honeywell TFE731)
HAWKER BEECHCRAFT	BH.125 Series 400A	BH.125	BAe 125 Series (Honeywell TFE731)
HAWKER BEECHCRAFT	BH.125 Series 600A	BH.125	BAe 125 Series (Honeywell TFE731)
HAWKER BEECHCRAFT	DH.125 Series 1A	DH.125	BAe 125 Series (Honeywell TFE731)
HAWKER BEECHCRAFT	DH.125 Series 3A	DH.125	BAe 125 Series (Honeywell TFE731)
HAWKER BEECHCRAFT	DH.125 Series 3A/RA	DH.125	BAe 125 Series (Honeywell TFE731)
HAWKER BEECHCRAFT	DH.125 Series 400A	DH.125	BAe 125 Series (Honeywell TFE731)
HAWKER BEECHCRAFT	Hawker 800		BAe 125 Series (Honeywell TFE731)
HAWKER BEECHCRAFT	HS.125 Series 400A	HS.125	BAe 125 Series (Honeywell TFE731)
HAWKER BEECHCRAFT	HS.125 Series 600A	HS.125	BAe 125 Series (Honeywell TFE731)
HAWKER BEECHCRAFT	HS.125 Series 700A	HS.125	BAe 125 Series (Honeywell TFE731)
HAWKER BEECHCRAFT	HS.125 Series 700B	HS.125	BAe 125 Series (Honeywell TFE731)
HAWKER BEECHCRAFT	HS.125 Series F3B	HS.125	BAe 125 Series (Honeywell TFE731)
HAWKER BEECHCRAFT	HS.125 series F3B/RA	HS.125	BAe 125 Series (Honeywell TFE731)

TC Holder	Aeroplane Model	Commercial Designation	Type Rating Endorsement
HAWKER BEECHCRAFT	HS.125 Series F400B	HS.125	BAe 125 Series (Honeywell TFE731)
HAWKER BEECHCRAFT	HS.125 Series F403B	HS.125	BAe 125 Series (Honeywell TFE731)
HAWKER BEECHCRAFT	HS.125 series F600B	HS.125	BAe 125 Series (Honeywell TFE731)
McDONNELL DOUGLAS Corporation BOEING COMPANY	DC-10-10		DC-10/MD-10 (GE CF6)
McDONNELL DOUGLAS Corporation BOEING COMPANY	DC-10-10F		DC-10/MD-10 (GE CF6)
McDONNELL DOUGLAS Corporation BOEING COMPANY	DC-10-15		DC-10/MD-10 (GE CF6)
McDONNELL DOUGLAS Corporation BOEING COMPANY	DC-10-30		DC-10/MD-10 (GE CF6)
McDONNELL DOUGLAS Corporation BOEING COMPANY	DC-10-30F		DC-10/MD-10 (GE CF6)
McDONNELL DOUGLAS Corporation BOEING COMPANY	MD-11	MD-11	MD-11 (GE CF6)
McDONNELL DOUGLAS Corporation BOEING COMPANY	MD-11F	MD-11	MD-11 (GE CF6)
McDONNELL DOUGLAS Corporation BOEING COMPANY	MD-11	MD-11	MD-11 (PW 4000)

TC Holder	Aeroplane Model	Commercial Designation	Type Rating Endorsement
McDONNELL DOUGLAS Corporation BOEING COMPANY	MD-11F	MD-11	MD-11 (PW 4000)
McDONNELL DOUGLAS Corporation BOEING COMPANY	DC-9-81 (MD-81)	MD-81	MD-80 Series (PW JT8D)
McDONNELL DOUGLAS Corporation BOEING COMPANY	DC-9-82 (MD-82)	MD-82	MD-80 Series (PW JT8D)
McDONNELL DOUGLAS Corporation BOEING COMPANY	DC-9-83 (MD-83)	MD-83	MD-80 Series (PW JT8D)
McDONNELL DOUGLAS Corporation BOEING COMPANY	DC-9-87 (MD-87)	MD-87	MD-80 Series (PW JT8D)
McDONNELL DOUGLAS Corporation BOEING COMPANY	MD-88		MD-80 Series (PW JT8D)
McDONNELL DOUGLAS Corporation BOEING COMPANY	MD-90 Series		MD-90 (IAE V2500)

2. Group 1 Helicopters

TC Holder	Helicopter Model	Commercial Designation	Type Rating Endorsement
Agusta Westland	AB139		Agusta AB139 / AW139 (PWC PT6)
Agusta Westland	AW139		Agusta AB139 / AW139 (PWC PT6)
Airbus Helicopters	AS 332 L2		Eurocopter AS 332 L2 (Turbomeca Makila 1A2)
Airbus Helicopters	AS 355 N	Ecureuil II / TwinStar	Eurocopter AS 355 (Turbomeca Arrius 1)
Airbus Helicopters	AS 355 NP	Ecureuil II / TwinStar	Eurocopter AS 355 (Turbomeca Arrius 1)
Airbus helicopters	EC 135 P1 Series		Eurocopter EC 135 (PWC PW206)
Airbus Helicopters	EC 135 P2 Series		Eurocopter EC 135 (PWC PW206)
Airbus Helicopters	EC 635 P2+		Eurocopter EC 135 (PWC PW206)
Airbus Helicopters	EC 155 B		Eurocopter EC 155 (Turbomeca Arriel 2)
Airbus Helicopters	EC 155 B1		Eurocopter EC 155 (Turbomeca Arriel 2)
Airbus Helicopters	EC 175 B		Eurocopter EC 175 (PWC PT6C)
MD Helicopters, Inc.	MD900		MD Helicopters MD900 (PWC PW206/207)
Sikorsky Aircraft	S-70A		Sikorsky S-70 (GE T700)
Sikorsky Aircraft	S-76A	S-76A+ S-76A++	Sikorsky S-76A (Turbomeca Arriel 1)
Sikorsky Aircraft	S-76C		Sikorsky S-76C (Turbomeca Arriel 1)
Sikorsky Aircraft	S-76C	S-76C+ S-76C++	Sikorsky S-76C (Turbomeca Arriel 2)

3. Subgroup 2a: Single Turbo-Propeller Engine Aeroplanes (Other than those in Group 1)

TC Holder	Aeroplane Model	Commercial Designation	Type Rating Endorsement
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4. Subgroup 2b: Single Turbine Engine Helicopters (Other than those in Group 1)

TC Holder	Helicopter Model	Commercial Designation	Type Rating Endorsement
Airbus Helicopters	AS 350 B	Écureuil	Eurocopter AS 350 (Turbomeca Arriel 1)
Airbus Helicopters	AS 350 B1	Écureuil	Eurocopter AS 350 (Turbomeca Arriel 1)
Airbus Helicopters	AS 350 B2	Écureuil	Eurocopter AS 350 (Turbomeca Arriel 1)
Airbus Helicopters	AS 350 BA	Écureuil	Eurocopter AS 350 (Turbomeca Arriel 1)
Airbus Helicopters	AS 350 BB	Écureuil	Eurocopter AS 350 (Turbomeca Arriel 1)
Airbus Helicopters	AS 350 B3	Écureuil	Eurocopter AS 350 (Turbomeca Arriel 2)
Airbus Helicopters	EC 120 B	Colibri	Eurocopter EC 120 (Turbomeca Arrius 2F)
Airbus Helicopters	SA 315 B	Alouette III Lama	Eurocopter SA 315B (Turbomeca Artouste)
Bell Helicopter Textron Canada Limited	206A		Agusta AB206 / Bell 206 (RR Corp 250)
Bell Helicopter Textron Canada Limited	206A-1		Agusta AB206 / Bell 206 (RR Corp 250)
Bell Helicopter Textron Canada Limited	206B		Agusta AB206 / Bell 206 (RR Corp 250)
Bell Helicopter Textron Canada Limited	206L		Agusta AB206 / Bell 206 (RR Corp 250)
Bell Helicopter Textron Canada Limited	206L-1		Agusta AB206 / Bell 206 (RR Corp 250)
Bell Helicopter Textron Canada Limited	206L-3		Agusta AB206 / Bell 206 (RR Corp 250)
Bell Helicopter Textron Canada Limited	206L-4		Agusta AB206 / Bell 206 (RR Corp 250)
Bell Helicopter Textron Canada Limited	206LT	Twin Ranger	Bell 206LT (RR Corp 250)
Leonardo S.P.A.	AB206 A		Agusta AB206 / Bell 206 (RR Corp 250)
Leonardo S.P.A.	AB206 B		Agusta AB206 / Bell 206 (RR Corp 250)

TC Holder	Helicopter Model	Commercial Designation	Type Rating Endorsement
MD Helicopters Inc. (MDHI)	369D		MD Helicopters 369 Series / SEI NH-500D (RR Corp 250)
MD Helicopters Inc. (MDHI)	369E		MD Helicopters 369 Series / SEI NH-500D (RR Corp 250)
MD Helicopters Inc. (MDHI)	369FF		MD Helicopters 369 Series / SEI NH-500D (RR Corp 250)
MD Helicopters Inc. (MDHI)	369H		MD Helicopters 369 Series / SEI NH-500D (RR Corp 250)
MD Helicopters Inc. (MDHI)	369HE		MD Helicopters 369 Series / SEI NH-500D (RR Corp 250)
MD Helicopters Inc. (MDHI)	369HM		MD Helicopters 369 Series / SEI NH-500D (RR Corp 250)
MD Helicopters Inc. (MDHI)	369HS		MD Helicopters 369 Series / SEI NH-500D (RR Corp 250)
MD Helicopters Inc. (MDHI)	500N		MD Helicopters 500N/600N AMD500N (RR Corp 250)
MD Helicopters Inc. (MDHI)	600N	HU60	MD Helicopters 500N/600N AMD500N (RR Corp 250)
Robinson Helicopter Company	R66		Robinson R66 (RR Corp 250)

5. Subgroup 2c: Single Piston-Engine Helicopters (Other than those in Group 1)

TC Holder	Helicopter Model	Commercial Designation	Type Rating Endorsement
Helicoptères Guimbal	CABRI G2	Cabri	Cabri G2 (Lycoming)
Robinson Helicopter Company	R22		Robinson R22/R44 Series (Lycoming)
Robinson Helicopter Company	R22 Alpha		Robinson R22/R44 Series (Lycoming)
Robinson Helicopter Company	R22 Beta		Robinson R22/R44 Series (Lycoming)
Robinson Helicopter Company	R22 Mariner		Robinson R22/R44 Series (Lycoming)
Robinson Helicopter Company	R44	Astro Raven	Robinson R22/R44 Series (Lycoming)
Robinson Helicopter Company	R44 II	Raven II	Robinson R22/R44 Series (Lycoming)

6. Group 3: Piston-Engine Aeroplanes (Other than those in Group 1)

TC Holder	Type of Structure	Type Rating Endorsement
TEXTRON AVIATION Inc.	Metal	Beech 58 Series (Continental)
CEAPR	Wood	CAP 10 (Lycoming)
Cessna Aircraft Company	Metal	Cessna/Reims-Cessna 152/F152 Series (Lycoming)
Cessna Aircraft Company	Metal	Cessna/Reims-Cessna 172/F172 Series (Lycoming)
Cessna Aircraft Company	Metal	Cessna/Reims-Cessna 182/F182 Series (Continental)
Cessna Aircraft Company	Metal	Cessna/Reims-Cessna 182/F182 Series (Lycoming)
Diamond Aircraft Industries	Composite	Diamond DA42 Series (Austro Engine)
EXTRA Flugzeugproduktions- Und Vertriebs-Gmbh	Composite	Extra EA-300 Series (Lycoming)
Slingsby Aviation	Composite	Slingsby T67B/T67C/T67M Series (Lycoming)
Zlin Aircraft (Moravan Aviation)	Metal	Zlin Z-242 L (Lycoming)

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Appendix II — Aircraft type practical experience and on-the-job training - list of tasks

Time limits/Maintenance checks

100 hour check (general aviation aircraft).

'B' or 'C' check (transport category aircraft).

Assist carrying out a scheduled maintenance check i.a.w. AMM.

Review Aircraft maintenance log for correct completion.

Review records for compliance with Airworthiness Directives.

Review records for compliance with component life limits.

Procedure for inspection following heavy landing.

Procedure for inspection following lightning strike.

Dimensions/Areas

Locate component(s) by zone/station number.

Perform symmetry check.

Lifting and Shoring

Assist in:

Jack aircraft nose or tail wheel.

Jack complete aircraft.

Sling or trestle major component.

Levelling / Weighing

Level aircraft.

Weigh aircraft.

Prepare weight and balance amendment.

Check aircraft against equipment list.

Towing and Taxiing

Prepare for aircraft towing.

Tow aircraft.

Be part of aircraft towing team.

Parking and Mooring

Tie down aircraft.

Park, secure and cover aircraft.

Position aircraft in dock.

Secure rotor blades.

Placards and Markings

Check aircraft for correct placards.

Check aircraft for correct markings.

Servicing

Refuel aircraft.

Defuel aircraft.

Carry out tank to tank fuel transfer.

Check/adjust tire pressures.

Check/replenish oil level.

Check/replenish hydraulic fluid level.

Check/replenish accumulator pressure.

Charge pneumatic system.

Grease aircraft.

Connect ground power.

Service toilet/water system

Perform pre-flight/daily check.

Vibration and Noise Analysis

Analyse helicopter vibration problem.

Analyse noise spectrum.

Analyse engine vibration.

Air Conditioning

Replace combustion heater.

Replace flow control valve.

Replace outflow valve.

Replace safety valve.

Replace vapour cycle unit.

Replace air cycle unit.

Replace cabin blower.

Replace heat exchanger.

Replace pressurisation controller.

Clean outflow valves.

Deactivate/reactivate cargo isolation valve.

Deactivate/reactivate avionics ventilation components.

Check operation of air conditioning/heating system.

Check operation of pressurisation system.

Troubleshoot faulty system.

Auto Flight

Install servos.

Rig bridle cables Replace controller.

Replace amplifier.

Replacement of the auto flight system LRUs in case of fly-by-wire aircraft.

Check operation of auto-pilot.

Check operation of auto-throttle/auto-thrust.

Check operation of yaw damper.

Check and adjust servo clutch.

Perform autopilot gain adjustments.

Perform mach trim functional check.

Troubleshoot faulty system.

Check autoland system.

Check flight management systems.

Check stability augmentation system.

Communications

Replace VHF com unit.

Replace HF com unit.

Replace existing antenna.

Replace static discharge wicks.

Check operation of radios.

Perform antenna VSWR check.

Perform Selcal operational check.

Perform operational check of passenger address system.

Functionally check audio integrating system.

Repair co-axial cable.

Troubleshoot faulty system.

Electrical Power

Charge lead/acid battery.

Charge Ni-Cad battery.

Check battery capacity.

Deep-cycle Ni-Cad battery.

Replace integrated drive/generator/alternator.

Replace switches.

Replace circuit breakers.

Adjust voltage regulator.

Change voltage regulator.

Amend electrical load analysis report.

Repair/replace electrical feeder cable.

Troubleshoot faulty system.

Perform functional check of integrated drive/generator/alternator.

Perform functional check of voltage regulator.

Perform functional check of emergency generation system.

Equipment/Furnishings

Replace carpets

Replace crew seats.

Replace passenger seats.

Check inertia reels.

Check seats/belts for security.

Check emergency equipment.

Check ELT for compliance with regulations.

Repair toilet waste container.

Remove and install ceiling and sidewall panels.

Repair upholstery.

Change cabin configuration.

Replace cargo loading system actuator.

Test cargo loading system.

Replace escape slides/ropes.

Fire protection

Check fire bottle contents.

Check/test operation of fire/smoke detection and warning system.

Check cabin fire extinguisher contents.

Check lavatory smoke detector system.

Check cargo panel sealing.

Install new fire bottle.

Replace fire bottle squib.

Troubleshoot faulty system.

Inspect engine fire wire detection systems.

Flight Controls

Inspect primary flight controls and related components i.a.w. AMM.

Extending/retracting flaps & slats.

Replace horizontal stabiliser.

Replace spoiler/lift damper.

Replace elevator.

Deactivation/reactivation of aileron servo control.

Replace aileron.

Replace rudder.

Replace trim tabs.

Install control cable and fittings.

Replace slats.

Replace flaps.

Replace powered flying control unit.

Replace flat actuator.

Rig primary flight controls.

Adjust trim tab.

Adjust control cable tension.

Check control range and direction of movement.

Check for correct assembly and locking.

Troubleshoot faulty system.

Functional test of primary flight controls.

Functional test of flap system.

Operational test of the side stick assembly.

Operational test of the THS.

THS system wear check.

Fuel

Water drain system (operation).

Replace booster pump.

Replace fuel selector.

Replace fuel tank cells.

Replace/test fuel control valves.

Replace magnetic fuel level indicators.

Replace water drain valve.

Check / calculate fuel contents manually.

Check filters.

Flow check system.

Check calibration of fuel quantity gauges.

Check operation feed/selectors.

Check operation of fuel dump/jettison system.

Fuel transfer between tanks.

Pressure defuel.

Pressure refuel (manual control).

Deactivation/reactivation of the fuel valves (transfer defuel, X-feed, refuel).

Troubleshoot faulty system.

Hydraulics

Replace engine driven pump.

Check/replace case drain filter.

Replace standby pump.

Replace hydraulic motor pump/generator.

Replace accumulator.

Check operation of shut off valve.

Check filters/clog indicators.

Check indicating systems.

Perform functional checks.

Pressurisation/depressurisation of the hydraulic system.

Power Transfer Unit (PTU) operation.

Replacement of PTU.

Troubleshoot faulty system.

Ice and Rain Protection

Replace pump.

Replace timer.

Inspect repair propeller deice boot.

Test propeller de-icing system.

Inspect/test wing leading edge de-icer boot.

Replace anti-ice/deice valve.

Install wiper motor.

Check operation of systems.

Operational test of the pitot-probe ice protection.

Operational test of the TAT ice protection.

Operational test of the wing ice protection system.

Assistance to the operational test of the engine air-intake ice protection (with engines operating).

Troubleshoot faulty system.

Indicating / Recording Systems

Replace flight data recorder.

Replace cockpit voice recorder.

Replace clock.

Replace master caution unit.

Replace FDR.

Perform FDR data retrieval.

Troubleshoot faulty system.

Implement ESDS procedures.

Inspect for HIRF requirements.

Start/stop EIS procedure.

Bite test of the CFDIU.

Ground scanning of the central warning system.

Landing Gear

Build up wheel.

Replace main wheel.

Replace nose wheel.

Replace steering actuator.

Replace truck tilt actuator.

Replace gear retraction actuator.

Replace uplock/downlock assembly.

Replace shimmy damper.

Rig nose wheel steering.

Functional test of the nose wheel steering system.

Replace shock strut seals.

Replace brake unit.

Replace brake control valve.

Bleed brakes.

Replace brake fan.

Test anti-skid unit.

Test gear retraction.

Change bungees.

Adjust micro switches/sensors.

Charge struts with oil and air.

Troubleshoot faulty system.

Test auto-brake system.

Replace rotorcraft skids.

Replace rotorcraft skid shoes.

Pack and check floats.

Flotation equipment.

Check/test emergency blowdown (emergency landing gear extension).

Operational test of the landing gear doors.

Lights

Repair/replace rotating beacon.

Repair/replace landing lights.

Repair/replace navigation lights.

Repair/replace interior lights.

Replace ice inspection lights.

Repair/replace logo lights.

Repair/replace emergency lighting system.

Perform emergency lighting system checks.

Troubleshoot faulty system

Navigation

Calibrate magnetic direction indicator.

Replace airspeed indicator.

Replace altimeter.

Replace air data computer.

Replace VOR unit.

Replace ADI.

Replace HSI.

Check pitot static system for leaks.

Check operation of directional gyro.

Functional check weather radar.

Functional check doppler.

Functional check TCAS.

Functional check DME.

Functional check ATC Transponder.

Functional check flight director system.

Functional check inertial nav system.

Complete quadrantal error correction of ADF system.

Update flight management system database.

Check calibration of pitot static instruments.

Check calibration of pressure altitude reporting system.

Troubleshoot faulty system.

Check marker systems.

Compass replacement direct/indirect.

Check Satcom.

Check GPS.

Test AVM.

Oxygen

Inspect on board oxygen equipment.

Purge and recharge oxygen system.

Replace regulator.

Replace oxygen generator.

Test crew oxygen system.

Perform auto oxygen system deployment check.

Troubleshoot faulty system.

Pneumatic systems

Replace filter.

Replace air shut off valve.

Replace pressure regulating valve.

Replace compressor.

Recharge dessicator.

Adjust regulator.

Check for leaks.

Troubleshoot faulty system.

Vacuum systems

Inspect the vacuum system i.a.w. AMM.

Replace vacuum pump.

Check/replace filters.

Adjust regulator.

Troubleshoot faulty system.

Water/Waste

Replace water pump.

Replace tap.

Replace toilet pump.

Perform water heater functional check.

Troubleshoot faulty system.

Inspect waste bin flap closure.

Central Maintenance System

Retrieve data from CMU.

Replace CMU.

Perform Bite check.

Troubleshoot faulty system.

Airborne Auxiliary power

Install APU.

Inspect hot section.

Troubleshoot faulty system.

Structures

Assessment of damage.

Sheet metal repair.

Fibre glass repair.

Wooden repair.

Fabric repair.

Recover fabric control surface.

Treat corrosion.

Apply protective treatment.

Doors

Inspect passenger door i.a.w. AMM.

Rig/adjust locking mechanism.

Adjust air stair system.

Check operation of emergency exits.

Test door warning system.

Troubleshoot faulty system.

Remove and install passenger door i.a.w. AMM.

Remove and install emergency exit i.a.w. AMM.

Inspect cargo door i.a.w. AMM.

Windows

Replace windshield.

Replace direct vision window.

Replace cabin window.

Repair transparency.

Wings

Skin repair.

Recover fabric wing.

Replace tip.

Replace rib.

Replace integral fuel tank panel.

Check incidence/rig.

Propeller

Assemble prop after transportation.

Replace propeller.

Replace governor.

Adjust governor.

Perform static functional checks.

Check operation during ground run.

Check track.

Check setting of micro switches.

Assessment of blade damage i.a.w. AMM.

Dynamically balance prop.

Troubleshoot faulty system.

Main Rotors

Install rotor assembly.

Replace blades.

Replace damper assembly.

Check track.

Check static balance.

Check dynamic balance.

Troubleshoot.

Rotor Drive

Replace mast.

Replace drive coupling.

Replace clutch/freewheel unit

Replace drive belt.

Install main gearbox.

Overhaul main gearbox.

Check gearbox chip detectors.

Tail Rotors

Install rotor assembly.

Replace blades.

Troubleshoot.

Tail Rotor Drive

Replace bevel gearbox.

Replace universal joints.

Overhaul bevel gearbox.

Install drive assembly.

Check chip detectors.

Check/install bearings and hangers.

Check/service/assemble flexible couplings.

Check alignment of drive shafts.

Install and rig drive shafts.

Rotorcraft flight controls

Install swash plate.

Install mixing box.

Adjust pitch links.

Rig collective system.

Rig cyclic system.

Rig anti-torque system.

Check controls for assembly and locking.

Check controls for operation and sense.

Troubleshoot faulty system.

Power Plant

Build up ECU.

Replace engine.

Repair cooling baffles.

Repair cowling.

Adjust cowl flaps.

Repair faulty wiring.

Troubleshoot.

Assist in dry motoring check.

Assist in wet motoring check.

Assist in engine start (manual mode).

Piston Engines

Remove/install reduction gear.

Check crankshaft run-out.

Check tappet clearance.

Check compression.

Extract broken stud.

Install helicoil.

Perform ground run.

Establish / check reference RPM.

Troubleshoot.

Turbine Engines

Replace module.

Replace fan blade.

Hot section inspection / boroscope check.

Carry out engine/compressor wash.

Carry out engine dry cycle.

Engine ground run.

Establish reference power.

Trend monitoring/gas path analysis.

Troubleshoot.

Fuel and control, piston

Replace engine driven pump.

Adjust AMC.

Adjust ABC.

Install carburettor/injector.

Adjust carburettor/injector.

Clean injector nozzles.

Replace primer line.

Check carburettor float setting.

Troubleshoot faulty system.

Fuel and control, turbine

Replace FCU.

Replace Engine Electronic Control Unit (FADEC).

Replace Fuel Metering Unit (FADEC).

Replace engine driven pump.

Clean/test fuel nozzles.

Clean/replace filters.

Adjust FCU.

Troubleshoot faulty system.

Functional test of FADEC.

Ignition systems, piston

Change magneto.

Change ignition vibrator.

Change plugs.

Test plugs.

Check H.T. leads.

Install new leads.

Check timing.

Check system bonding.

Troubleshoot faulty system.

Ignition systems, turbine

Perform functional test of the ignition system.

Check glow plugs/ignitors.

Check H.T. leads.

Check ignition unit.

Replace ignition unit.

Troubleshoot faulty system.

Engine Controls

Rig thrust lever.

Rig RPM control.

Rig mixture HP cock lever.

Rig power lever.

Check control sync (multi-eng).

Check controls for correct assembly and locking.

Check controls for range and direction of movement.

Adjust pedestal micro-switches.

Troubleshoot faulty system.

Engine Indicating

Replace engine instruments(s).

Replace oil temperature bulb.

Replace thermocouples.

Check calibration.

Troubleshoot faulty system.

Exhaust, piston

Replace exhaust gasket.

Inspect welded repair.

Pressure check cabin heater muff.

Troubleshoot faulty system.

Exhaust, turbine

Change jet pipe.

Change shroud assembly.

Install trimmers.

Inspect/replace thrust reverser.

Replace thrust reverser component.

Deactivate/reactivate thrust reverser.

Operational test of the thrust reverser system.

Oil

Change oil.

Check filter(s).

Adjust pressure relief valve.

Replace oil tank.

Replace oil pump.

Replace oil cooler.

Replace firewall shut off valve.

Perform oil dilution test.

Troubleshoot faulty system.

Starting

Replace starter.

Replace start relay.

Replace start control valve.

Check cranking speed.

Troubleshoot faulty system.

Turbines, piston engines

Replace PRT.

Replace turbo-blower.

Replace heat shields.

Replace waste gate.

Adjust density controller.

Engine water injection

Replace water/methanol pump.

Flow check water/methanol system.

Adjust water/methanol control unit.

Check fluid for quality.

Troubleshoot faulty system

Accessory gear boxes

Replace gearbox.

Replace drive shaft.

Inspect magnetic chip detector.

APU

Removal/installation of the APU.

Removal/installation of the inlet guide-vane actuator.

Operational test of the APU emergency shut-down test.

Operational test of the APU.

Appendix III — Evaluation of the competence: assessment and assessors

This Appendix applies to the competence assessment performed by the designated assessors (and their qualifications).

1. What does 'competence' mean and areas of focus for assessment

The assessment should aim at measuring the competence by evaluating three major factors associated to the learning objectives:
- Knowledge;
- Skills;
- Attitude.

Generally, knowledge is evaluated by examination. The purpose of this document is not to describe the examination process: this material mainly addresses the evaluation of 'skills' and 'attitude' after training containing practical elements. Nevertheless, the trainee needs to demonstrate to have sufficient knowledge to perform the required tasks. 'Attitude' is indivisible from the 'skill' as this greatly contributes to the safe performance of the tasks.

The evaluation of the competence should be based on the learning objectives of the training, in particular:

- the (observable) desired performance. This covers what the trainee is expected to be able to do and how the trainee is expected to behave at the end of the training;

- the (measurable) performance standard that must be attained to confirm the trainee's level of competence in the form of tolerances, constraints, limits, performance rates or qualitative statements; and

- the conditions under which the trainee will demonstrate competence. Conditions consist of the training methods, the environmental, situational and regulatory factors;

The assessment should focus on the competencies relevant to the aircraft type and its maintenance such as, but not limited to:

- Environment awareness (act safely, apply safety precautions and prevent dangerous situations);

- Systems integration (demonstrate understanding of aircraft systems interaction – identify, describe, explain, plan, execute);

- Knowledge and understanding of areas requiring special emphasis or novelty (areas peculiar to the aircraft type, domains not covered by Section 4 Appendix I *Basic knowledge requirements*, practical training elements that cannot be imparted through simulation devices, etc.);

- Using reports and indications (the ability to read and interpret);

- Aircraft documentation finding and handling (identify the appropriate aircraft documentation, navigate, execute and obey the prescribed maintenance procedures);

- Perform maintenance actions (demonstrate safe handling of aircraft, engines, components and tools);

- Aircraft final/close-up and report (apply close up, initiate appropriate actions/follow-up/records of testing, establish and sign maintenance records/logbooks).

2. How to assess

As far as feasible, the objectives of the assessment should be associated with the learning objectives and the passing level; it means that observable criteria should be set in order to measure the performance and should remain as objective as possible.

The general characteristics of effective assessment are: objective, flexible, acceptable, comprehensive, constructive, organised and thoughtful. At the conclusion, the trainee should have no doubt about what he/she did well, what he/she did poorly and how he/she can improve.

The following is a non-exhaustive list of questions that may be posed to assist assessment:

- What are the success factors for the job?

- What are typical characteristics of a correct behaviour for the task?

- What criteria should be observed?

- What level of expertise is expected?

- Is there any standard available?

- What is the pass mark? For example:

  - ‘Go-no go’ situation;
  - How to allocate points? Minimum amount to succeed;
  - ‘Must know or execute’ versus ‘Good to know or execute’ versus ‘Don’t expect the candidate to be an expert’.

- Minimum or maximum time to achieve? Use time effectively and efficiently.

- What if the trainee fails? How many times is the trainee allowed to fail?

- When and how should the trainee be prepared for the assessment?

- What proportion of judgment by the instructor out of collaboration with the trainee is needed during the evaluation stage?

The assessment may be:

- diagnostic (prior to a course), formative (re-orientate the course on areas where there is a need to reinforce) or summative (partial or final evaluation);

- performed task-by-task, as a group of tasks or as a final assessment;

One method might be an initial assessment to be performed by the trainee himself, then discussing areas where the perceptions of the trainee's performance by the assessors differ in order to:

- develop the self-assessment habits;

- make the assessment more acceptable and understandable to both parties.

A 'box-ticking' exercise would be pointless. Experience has shown that assessment sheets have largely evolved over time into assessment of groups of 'skills' because in practice such things eventually detracted from the training and assessment that it was intended to serve: evaluate at a point of time, encourage and orientate the training needs, improve safety and ultimately qualify people for their duties.

In addition, many other aspects should be appropriately considered during the assessment process such as stress and environmental conditions, difficulty of the test, history of evaluation (such as tangible progresses or sudden and unexpected poor performance made by the trainee), amount of time necessary to build competence, etc.

All these reasons place more emphasis on the assessor and highlight the function of the organisation's approval.

3. Who should assess

In order to qualify, the assessor should:

- Be proficient and have sufficient experience or knowledge in:

  - human performance and safety culture;

  - the aircraft type (necessary to have the certifying staff privileges in case of CRS issuances);

  - training/coaching/testing skills;

- instructional tools to use;

- Understand the objective and the content of the practical elements of the training that is being assessed;

- Have interpersonal skills to manage the assessment process (professionalism, sincerity, objectivity and neutrality, analysis skills, sense of judgement, flexibility, capability of evaluating the supervisor's or instructor's reports, handling of trainee's reactions to failing assessment with the cultural environment, being constructive, etc.);

- Be ultimately designated by the organisation to carry out the assessment.

The roles may be combined for:

- the assessor and the instructor for the practical elements of the Type Rating Training; or

- the assessor and the supervisor for the On-the-Job Training.

provided that the objectives associated to each role are clearly understood and that the competence and qualification criteria according to the company's procedures are met for both functions. Whenever possible (depending on the size of the organisation), it is recommended to split the roles (two different persons) in order to avoid any conflicts of interests.

When the functions are not combined, the role of each function should be clearly understood.