CAR PART II

CHAPTER 7 - CAR 66
AIRCRAFT MAINTENANCE ENGINEER LICENSING

FORWORD

1. This is Issue 0 2 of CAR 66 dated November 2013. The changes incorporated in issue shall fully enter into force on 15 November 2014.
2. Entities and individuals regulated by this regulation may still comply with the requirements stipulated in the previous issue of CAR 66 until the date of fulll entry into force of this regulation.
3. This issue is based on NPA 13/2013. Further to the publication of the NPA, two comments have been received on the Comments Response Document (CRD). The proposals in the comments are not incorporated in this issue.
4.

5. Future development of the requirements of CAR 66 will be in accordance with Notice of Proposed Amendment (NPA) procedures, unless otherwise decided by the GCAA.

6. Conformity with the Acceptable Means of Compliance AMC of this Chapter is mandatory unless alternative means of compliance are acceptable to the GCAA.

HIGHLIGHTS OF CHANGE

Issue/ Rev	Affected section/para	Details
Issue 02 November 2013	Throughout the document	Editorial – formatting and numbering
	Section 1 Aircraft Maintenance Engineers Licence	This section has revised to align with EASA regulation 1149, and introduces the B3 licence, practical training, and a change to the privileges for the B2 licence holder. 66.25(b) introduces a 10 year period for completion of the modular examinations but the licence must also be gained in this period to meet the requirements of 66.30(f). Aircraft weight or size are not applicable to a CAR 66 licence except the Category B3 which is NOT subdivided but is restricted to aircraft of 2000Kg MTOM and below.
	Section 2 Appendices to CAR 66; Appendix I Basic Knowledge requirements	Three new subject areas have been added to Modules 11A, 12 and 13. Additionally 9 new subjects have been added to module 13 covering various mechanical privileges. Modules 7B, 9B, 11C and 17B have been added exclusively for the B3. All other modules have a "B3" column added for appropriate levels.
	Section 2 Appendices to CAR 66; Appendix II Basic Examination Standard	80% of Basic Examinations question counts have been changed to ensure clear pass/fail criteria. All examinations will contain a number of questions divisible by 4 to provide distinct 75% pass/fail criteria**.**
	Section 2 Appendices to CAR 66; Appendix III Aircraft Training and Examination Standard and OJE	Minimum timings have been introduced for all type training courses. The requirements for practical type training have been formalised with the introduction of specific requirements.
	Section 2 Appendices to CAR 66; Appendix IV Experience Requirements for Extending an AMEL	Introduction of the B3 licence
	Section 3 Appendices to AMC to CAR 66 Appendix 1 Aircraft type ratings	The current system of 13 sections of aircraft grouping is re-arranged to THREE Groups.
	Section 3 Appendices to AMC to CAR 66 Appendix II Aircraft type practical Experience and OJE Section 3 Appendices to AMC to	List of tasks introduced into the CAR, and appendix III introduces the evaluation of the competence assessment.

	CAR 66 Appendix III Evaluation of the competence assessment and Assessors	
	Section 4 Conversion Report	The licence conversion report has been introduced into section 4 of the CAR. This document details how a licence will be converted.

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1. GENERAL

Certifying staff holding licences issued in accordance with CAR 66 in a given category/subcategory are deemed to have the privileges described in point 66.20(a) of this CAR corresponding to such a category/subcategory. The basic knowledge requirements corresponding to the new privileges shall be deemed as met for the purpose of extending such licence to a new category/sub-category.

Certifying staff holding a licence including aircraft which do not require an individual type rating may continue to exercise his/her privileges until the first renewal or change, where the licence shall be converted to the ratings defined in point 66.45 of this CAR.

Basic training courses complying with the requirements applicable before this Regulation applies may still commence until 15 November 2014. Basic knowledge examinations conducted as part of these courses may comply with the requirements applicable before this Regulation applies.

Basic knowledge examinations complying with the requirements applicable before this Regulation applies and conducted by the GCAA or conducted by a maintenance training organisation approved in accordance with CAR 147 while not being part of a basic training course, may be conducted until 1 year after the date by which this Regulation applies.

Type training courses and type examinations complying with the requirements applicable before this Regulation applies shall be started and finished not later than 1 year after the date by which this Regulation applies.

For the purpose of time limits contained in points 66.25, 66.30 and Appendix III of CAR 66 related to basic knowledge examinations, basic experience, theoretical type training and examinations, practical training and assessment, type examinations and on the job experience completed before this Regulation applies, the origin of time shall be the date by which this Regulation applies.

The E-Services system which has now been fully adopted by the GCAA for the issue, renewal and type endorsement of an aircraft maintenance engineers licences as defined in point 66.10 must be used for all applications. All licence applications for conversion as described in point 66.70 and section 4 appendix I, must also be made using the E-Licensing system. For the removal of limitations as described in points 66.45 and 66.50 the E-Licensing system must also be used.

2. TECHNICAL REQUIREMENTS

Section 1 - Aircraft Maintenance Engineers Licence

CAR 66.1 - Scope

This section defines the Aircraft Maintenance Engineers Licence and establishes the requirements for application, issue and continuation of its validity.

CAR 66.3 - Licence categories

(a) Aircraft maintenance engineers licences include the following categories:

— Category A

— Category B1

— Category B2

— Category B3

— Category C

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

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

GM 66.3 - Licence categories

Individual Aircraft Maintenance Engineers Licence holders need not be restricted to a single category. Provided that each qualification requirement is satisfied, any combination of categories may be granted.

CAR 66.5 - Aircraft Groups

For the purpose of ratings on aircraft maintenance engineers 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 GCAA.

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

— sub-group 2a: single turbo-propeller engine aeroplanes

— sub-group 2b: single turbine engine helicopters

— sub-group 2c: single piston engine helicopters

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

CAR 66.10 - Application

(a) An application for an Aircraft Maintenance Engineers Licence or amendment to such licence shall be made using the AMEL E-Licensing services application and/or any other assigned form and in a manner established by the General Civil Aviation Authority (GCAA) and submitted thereto.

(b) 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.

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 year's maintenance experience completed" is not acceptable. A logbook of maintenance experience is desirable and the GCAA require such a logbook to be kept. It is acceptable to cross-refer in the E-Licensing system to other documents containing information on maintenance.

2. Applicants claiming the maximum reduction in 66.30(a) total experience based upon successful completion of CAR 147 approved basic training should include the CAR 147 certificate of recognition for approved basic training.

3. Applicants claiming reduction in 66.30(a) total experience based upon successful completion of technical training in an organisation or institute recognised by the GCAA as a competent organisation or institute should include the relevant certificate of successful completion of training.

CAR 66.15 - Eligibility

An applicant for an Aircraft Maintenance Engineers Licence shall be at least 18 years of age.

AMC 66.15 – Eligibility

Should either be

— A UAE/GCC (Gulf Co-Operation Council) national or
— A legal employee of UAE approved organisation with proper justification for a need to hold a UAE GCAA aircraft maintenance engineers licence or
— A graduate of a GCAA CAR 147 approved basic aircraft maintenance training organisation.

CAR 66.20 - Privileges

(a) The following privileges shall apply:

1. A category A aircraft maintenance engineers 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 point 145.35 of CAR-145. 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 engineers 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 engineers 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; and

   (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 point 145.35 of CAR-145. 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.

   The category B2 licence does not include any A subcategory.

4. A category B3 aircraft maintenance engineers 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 engineers 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.

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

1. in compliance with the applicable requirements of CAR M and CAR-145; and
2. in the preceding 2-year period he/she has, either had 6 months of maintenance experience in accordance with the privileges granted by the aircraft maintenance engineers licence or, met the provision for the issue of the appropriate privileges; and

3. he/she has the adequate competence to certify maintenance on the 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.

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 according to CAR M.801(b)2 or as a combination thereof.

When the licence holder maintains and releases aircraft in accordance with CAR M.801 (b) 2, in certain circumstances this number of days may even be reduced by 50% when agreed in advance by the GCAA. These circumstances consider the cases where the holder of a CAR 66 licence 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 utilisation, 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 Engineers 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 certifying staff, 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 and B3 for every aircraft type rating 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 or turboprop or turbofan or turbo shaft or jet-engine or push propellers); and
- Flight control systems (only mechanical controls or hydro-mechanically powered controls or electro-mechanically powered controls); and
- Avionic systems (analog systems or digital systems); and
- Structure (manufactured of metal or composite or wood).

For licences endorsed with (sub) group ratings;

- In the case of a B1 licence endorsed with sub group ratings (either manufacturer sub group or sub full group)as defined in CAR 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 licence endorsed with sub group ratings (either manufacturer sub group or full group) as defined in CAR 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 of 2 000 kg MTOM and below” as defined in 66.45, the holder should show experience on at least one aircraft type per aircraft structure (metal, composite or wood).

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;

— 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.

AMC66.20(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 Appendix I to AMC to CAR 66 "List of Type Ratings" after attending type training/on-the-job experience 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 320 (CFM56).

- Type ratings which have been endorsed on a licence in accordance with Appendix I to AMC to CAR 66 "List of Type Ratings" after a new variant has been added to the rating in 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 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 Appendix I to CAR 66 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 CAR 66 licence with limitations, obtained through conversion of qualifications (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.

GM 66.20(a) - Privileges

1. The following definitions apply:

   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.

   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 in the privileges of the B2 licence holders. However, maintenance on electromechanical and pitot-static components may also be released by a B1 licence holder.

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 to identify the root cause of a defect or malfunction using approved maintenance data. It may include the use of BITE or external test equipment.

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 the 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 GCAA will prescribe the conditions under which these tasks may be performed.

Base Maintenance means any task falling outside the criteria are given above 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.

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 of 2 000 kg MTOM and below, within the limitations contained in the B3 licence.

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 and B3 support staffs, 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 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 or B3 qualifications may perform both roles in base maintenance

GM 66.20(b) 2 - Privileges

The sentence *"met the provision for the issue of the appropriate privileges"* included in 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 CAR 66 Aircraft Maintenance Engineers Licence may only exercise certification privileges when 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.

CAR 66.25 Basic knowledge requirements

(a) An applicant for an aircraft maintenance engineers licence or the addition of a category or subcategory to such an aircraft maintenance engineers licence shall demonstrate, by examination, a level of knowledge in the appropriate subject modules in accordance with Appendix I to this CAR. The basic knowledge examinations shall be conducted by a training organisation appropriately approved under CAR 147 or by the GCAA.

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

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

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

2. Any other technical qualification considered by the GCAA to be equivalent to the knowledge standard of CAR 66.

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

AMC 66.25 - Basic knowledge requirements

1. For an applicant being a person qualified by holding an academic degree in a 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 Appendix I to CAR 66
2. Knowledge gained and examinations passed during previous experiences, for example, in military aviation and civilian apprenticeships will be credited where the GCAA is satisfied that such knowledge and examinations are equivalent to that required by Appendix I to CAR 66.

GM 66.25(a) - Basic knowledge requirements

The levels of knowledge for each licence (sub)category are directly related to the complexity of 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.

CAR 66.30 - Basic Experience requirements

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

1. for category A and 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 GCAA 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 CAR 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 GCAA 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 CAR 147

3. for category C with respect to large aircraft:

(i) 3 years of experience exercising category B1.1, B1.3 or B2 privileges on large aircraft or as CAR 145 B1.1, B1.3 or B2 support staff, or, a combination of both; or

(ii) 5 years of experience exercising category B1.2 or B1.4 privileges on large aircraft or as CAR 145 B1.2 or B1.4 support staff, or a combination of both; or

4. for category C with respect to other than large aircraft: 3 years of experience exercising category B1 or B2 privileges on other than large aircraft or as CAR 145 B1.1, B1.3 or B2 support staff, or, a combination of both; or

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 GCAA, three years of experience working in a civil aircraft maintenance environment on a representative selection of tasks directly associated with aircraft maintenance including six months of observation of base maintenance tasks.

(b) An applicant for an extension to an Aircraft Maintenance Engineers Licence shall have a minimum civil aircraft maintenance experience requirement appropriate to the additional category or subcategory of licence applied for as defined in Appendix IV to this CAR.

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

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

(e) Notwithstanding paragraph (a), aircraft maintenance experience gained outside a civil aircraft maintenance environment shall be accepted when such maintenance is equivalent to that required by this

CAR as established by the GCAA. 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 Engineers Licence or the addition of a category or subcategory to such a licence.

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 CAR 66 category C licence may be qualified by having 3 years' experience as category B1 or B2 certifying staff only in line maintenance, it is however recommended that any applicant to a category C holding a B1 or B2 licence demonstrate at least 12 months experience as a B1 or B2 support staff.

3. A skilled worker is a person who has successfully completed a course of training, acceptable to the GCAA, 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 (CAR 145, M.A. Subpart F, Part-145, FAR-145, etc.) or under the supervision of independent certifying staff;

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

AMC 66.30(d) - Basic experience requirements

To be considered as recent experience; at least 50% of the required 12 month experience should be gained within the 12 month period prior to the date of application for the Aircraft Maintenance Engineers Licence. The remainder of the 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 66.30 must be obtained within the 10 years prior to the application as required by 66.30(f).

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 can include aircraft maintenance experience gained in armed forces, coast guards, police etc. or in aircraft manufacturing.

CAR 66.40 - Continued validity of the Aircraft Maintenance Engineers Licence

(a) The Aircraft Maintenance Engineers Licence becomes invalid eight years after its last issue, unless the holder submits his/her Aircraft Maintenance Engineers Licence to the GCAA, in order to verify that the information contained in the licence is the same as that contained in the GCAA records.

(b) The holder of an Aircraft Maintenance Engineers Licence shall complete the relevant fields in the E-Licensing system and submit it with the holder's copy of the licence to the GCAA, unless the holder works in a maintenance organisation approved in accordance with CAR 145 that has a procedure in its exposition whereby such organisation may submit the necessary documentation on behalf of the Aircraft Maintenance Engineers Licence holder.

(c) Any certification privileges based upon an Aircraft Maintenance Engineers Licence becomes invalid as soon as the Aircraft Maintenance Engineers Licence is invalid.

(d) The Aircraft Maintenance Engineers Licence is only valid when issued and/or amended by the GCAA and when the holder has signed the document.

GM 66.40 - Continued validity of the Aircraft Maintenance Engineers Licence

Validity of the Aircraft Maintenance Engineers Licence is not affected by recency of maintenance experience whereas the validity of the CAR 66.20 privileges is affected by maintenance experience as specified in CAR 66.20(a).

GM 66.40(a) - Continued Validity of the Aircraft Maintenance Engineers Licence

For a licence that has remained expired for more than two years, the holder will be required to undergo examination in the current GCAA Air Legislation prior to renewal.

CAR 66.45 - Endorsement with aircraft ratings

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

— For category B1, B2 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 sub-group rating or full sub-group 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 of 2 000 kg MTOM and below'.

– For category A, no rating is required, subject to compliance with the requirements of point 145.35 of CAR-145.

(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 point (b), the endorsement of the first aircraft type rating within a given category/sub-category requires satisfactory completion of the corresponding On the Job Training, as described in Appendix III to CAR 66.

(d) By derogation from points (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 Appendix III to CAR 66, 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 66.30(a)(5), the first relevant aircraft type examination shall be at the category B1 or B2 level.

(e) For group 2 aircraft:

1. the endorsement of manufacturer sub-group 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 sub-group;

2. the endorsement of full sub-group 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 sub-group;

3. the endorsement of manufacturer sub-groups and full sub-group 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 sub-group.

(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:

— pressurised aeroplanes

— metal structure aeroplanes

— composite structure aeroplanes

— wooden structure aeroplanes

— aeroplanes with metal tubing structure covered with fabric.

(g) For the B3 licence:

1. the endorsement of the rating "piston-engine non-pressurised aeroplanes of 2 000 kg MTOM 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 point 1 shall be subject to the following limitations, which shall be endorsed on the licence:

— wooden structure aeroplanes

— aeroplanes with metal tubing structure covered with fabric

— metal structure aeroplanes

— composite structure aeroplanes.

AMC 66.45(a) - Endorsement with aircraft ratings

Aircraft type ratings will only be endorsed if the aircraft type is registered in the UAE.

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 all the technologies relevant to the manufacturer subgroup in the following areas:

— Flight control systems (mechanical controls/hydro mechanically powered controls/ electromechanically 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/ electromechanically 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 Appendix I to AMC to CAR 66.

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 66.45(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 Appendix II to AMC 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 Appendix II list. Other tasks than those in the 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 Appendix II to AMC 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 logbook showing the Appendix II tasks performed by the applicant. Typical data to be recorded are similar to those described in AMC 66.20(b)2.

GM 66.45(b) - Endorsement with aircraft ratings

An aircraft type rating includes all the aircraft models/variants listed in column 2 of Appendix 1 to AMC to CAR 66.

When a person already holds a type rating on the licence and such type rating is amended in the Appendix I to AMC to CAR 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 66.20(b)3, 145.35(a) and M.607(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 66.45 - Endorsement with aircraft ratings

The following table shows a summary of the aircraft rating requirements contained in 66.45, 66.50 and Appendix III to CAR 66.

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 nonpressurised aeroplanes of 2 000 kg MTOM and below), which are the possible limitations to be included in the licence if not sufficient experience can be demonstrated in those areas.

Note: OJE means “On-the-Job Experience” (Appendix III to CAR 66, Section 6) 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**
Group 1: • Complex motorpowered aircraft. • Multiple engine helicopters. • Aeroplanes certified above FL290. • Aircraft equipped with fly-by-wire. • Other aircraft when defined by the GCAA	**(For B1)** **Individual TYPE RATING** Type training: – Theory + examination – Practical + assessment **PLUS** OJE (for first aircraft in licence subcategory)	**Individual TYPE RATING** Type training: – Theory + examination – Practical + assessment **PLUS** OJE (for first aircraft in licence category)	**Individual TYPE RATING** Type training: – Theory + examination
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 + OJE) **or** (type examination + practical experience) **Full SUBGROUP RATING** (type training + OJE) **or** (type examination + practical experience) on at least 3 aircraft representative of that subgroup **Manufacturer SUBGROUP RATING** (type training + OJE) **or** (type examination + practical experience) on at least 2 aircraft representative of that manufacturer subgroup	**Individual TYPE RATING** (type training + OJE) **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
Group 3 **Piston-engine aeroplanes** (except those classified in Group 1)	**(For B1.2)** **Individual TYPE RATING** (type training + OJE) **or** (type examination + practical experience) **Full GROUP 3 RATING** based on demonstration of practical experience **Limitations:** • Pressurised aeroplanes • Metal aeroplanes • Composite aeroplanes • Wooden aeroplanes • Metal tubing & fabric aeroplanes	**Individual TYPE RATING** (type training + OJE) **or** (type examination + practical experience) **Full GROUP 3 RATING** based on demonstration of practical experience	**Individual TYPE RATING** type training **or** type examination **Full GROUP 3 RATING** based on demonstration of practical experience
Piston-engine nonpressurised Aeroplanes of 2 000 kg MTOM and below	**(For B3)** **FULL RATING "Piston engine non-pressurised aeroplanes of 2 000 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**

CAR 66.50 – Limitations

(a) Limitations introduced on an Aircraft Maintenance Engineers Licence are exclusions from the certification privileges and affect the aircraft in its entirety.

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

1. demonstration of appropriate experience; or

2. after a satisfactory practical assessment performed by the GCAA.

(c) For limitations referred to in point 66.70, limitations shall be removed upon satisfactory completion of examination on those modules/subjects defined in the applicable conversion report.

AMC 66.50(b) – Limitations

1. The appropriate experience required to remove the limitations referred to in 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 GCAA, 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 that 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.

CAR 66.55 - Evidence of qualification

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

CAR 66.70 - Conversion provisions

(a) The holder of a certifying staff qualification valid, prior to the date of entry into force of this CAR shall be issued an Aircraft Maintenance Engineers Licence by the GCAA without further examination subject to the conditions specified in the conversion report.

(b) A person undergoing a certifying staff qualification process valid, prior to the date of entry into force of this CAR may continue to be qualified. The holder of a certifying staff qualification gained following such qualification process shall be issued an Aircraft Maintenance Engineers Licence without further examination subject to the conditions specified in the conversion report.

(c) Where necessary, the Aircraft Maintenance Engineers Licence shall contain limitations in accordance with point 66.50 to reflect the differences between (i) the scope of the certifying staff qualification valid before the entry into force of this Regulation and (ii) the basic knowledge requirements and the basic examination standards laid down in Appendix I and II to this CAR.

(d) By derogation to paragraph (c) for aircraft not involved in commercial air transport other than large aircraft, the Aircraft Maintenance Engineers Licence shall contain limitations in accordance with point 66.50 to ensure that the certifying staff privileges valid before the entry into force of this Regulation and the privileges of the converted CAR 66 Aircraft Maintenance Engineers Licence remain the same.

GM 66.70 - Conversion provisions

1. As described in point 66.70, the conversion provisions apply to the holder of a certifying staff qualification valid in an ICAO State prior to the date of entry into force of CAR 66. The sentence the holder of a certifying staff qualification valid in an ICAO State, means any person who had a qualification valid in that ICAO State allowing that person the performance of activities identical to the privileges of "certifying staff" contained in CAR 66. This means that the signature of that person was sufficient to declare that the maintenance had been properly performed and the aircraft was ready for service and fit for flight in respect to such maintenance.

   This should not been mistaken for the responsibilities linked to the airworthiness review, which was performed at different periods (typically varying from 6 months to 3 years) in the national systems. This is an activity which is performed at very specific points of time and not after every maintenance activity. As an airworthiness review (or equivalent term used in the national systems) is not performed after every maintenance event before the aircraft takes flight, an airworthiness review cannot be considered as a maintenance release. This means that the conversion provisions described in 66.70 are not applicable to persons performing airworthiness review functions unless their signature was required after every maintenance event before the aircraft can take flight.

2. The conversion applies to "certifying staff qualifications" such as, for example:

   - Holding a national licence (or completed the process to obtain such a national licence);
   - Having completed a qualification process defined by the GCAA to become certifying staff;
   - Having completed the qualification requirements for certifying staff within a maintenance organisation, as defined in their procedures.

   This does not mean that in order to be entitled to a conversion process, the applicant has to be exercising certification privileges. A person may hold a "certifying staff qualification" while not having certification privileges (or while exercising very limited certification privileges below his/her qualification) for different reasons such as, for example, the following:

   - The person is working as "support staff" in the base maintenance environment;
   - The person has been authorised only for a very limited range of tasks (lower than what he/she would be entitled if his/her qualification is considered) since the person is working in a line station where the scope of tasks is very limited;
   - The person holds a licence with a wider scope than the scope of the organisation where he/she is employed;
   - The person is working outside the aviation industry or is temporarily on leave due to different reasons (medical, personal, etc.).

These persons are entitled to have the conversion performed in accordance with the full scope of their qualification and the full privileges that they would be entitled to hold on the basis of such qualification.

As described in point 66.70, certifying staff qualifications eligible for conversion are those valid prior to the date of entry into force of CAR 66, which means those qualifications valid before the 01 July 2011 for aircraft above and below 5 700 kg MTOM.

Nevertheless, since the B3 licence did not exist at those dates, certifying staff qualifications eligible for conversion to a B3 licence are those valid before 01 December 2013, which is the date when the GCAA has the obligation to start issuing such licences.

3. Although only those certifying staff qualifications gained prior to the dates indicated above are eligible for conversion, this does not mean that the application for conversion has to be submitted prior to those dates. The applicant is entitled to have the conversion performed irrespective of when he/she applies for conversion.

4. A certifying staff qualification can be subject to more than one conversion process and can also be converted to more than one licence (with any applicable limitations). This could be the case, for example, for a person who already had the certifying staff qualification converted to a B1.2 licence with limitations linked to some missing elements of the CAR 66 Appendix I and II standard (following 66.70(c)). This person would be entitled to apply and have his/her certifying staff qualification converted to a B1.2 or a B3 licence on the basis of 66.70(d), which would mean that there is no need to compare with the CAR 66 Appendix I and II standard, introducing only those limitations required to maintain the existing privileges.

GM 66.70(c) - Conversion provisions

For example, a limitation could be where a person holds a pre-existing certifying staff qualification which covered, to the standard of CAR 66 Appendix I and II, all the modules/subjects corresponding to the B1 licence except for electrical power systems. This person would receive a CAR 66 Aircraft Maintenance Engineers Licence in the B1 category with a limitation (exclusion) on electrical power systems.

For removal of limitations, refer to 66.50(c).

GM 66.70(d) - Conversion provisions

In the case of aircraft not involved in commercial air transport other than large aircraft, an example of limitations could be where a person holds a pre CAR 66 qualification which covered privileges to release work performed on aircraft structures, powerplant, mechanical and aircraft above 2000kg MTOM, pressurised aircraft and aircraft equipped with retractable landing gear. This person would receive a CAR 66 Aircraft Maintenance Engineers Licence in the B1.2 or B3 (sub) category with the following limitations (exclusions):

- Aircraft involved in commercial air transport (this limitation always exists);
- Aircraft above 2 000 kg MTOM;
- Pressurised aircraft;
- Aircraft equipped with retractable landing gear.

3. APPENDICES

Section 2 - to CAR 66

APPENDIX I: to CAR 66 - BASIC KNOWLEDGE REQUIREMENTS

1. Knowledge Levels — Category A, B1, B2 B3 and C Aircraft Maintenance Engineers Licence

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*.

Objectives:

(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. An ability to apply that knowledge.*

Objectives: The applicant should be able to understand the theoretical fundamentals of the subject.

(a) The applicant should be able to give a general description of the subject using, as appropriate, typical examples.

(b) The applicant should be able to use mathematical formulae in conjunction with physical laws describing the subject.

(c) The applicant should be able to read and understand sketches, drawings and schematics describing the subject.

(d) 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.*

Objectives:

(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

Qualification on basic subjects for each Aircraft Maintenance Engineers Licence category or subcategory should be in accordance with the following matrix,where applicable subjects are indicated by an 'X':

Subject modules	A or B1 aeroplane with:		A or B1 helicopter with:		B2	B3
	Turbine engine(s)	Piston engine(s)	Turbine engine(s)	Piston engine(s)	Avionics	Piston-engine non-pressurised aeroplanes 2 000 kg MTOM and below
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

	Level			
	A	**B1**	**B2**	**[B3]**
2.1 Matter	1	1	1	1
Nature of matter: the chemical elements, structure of atoms, molecules;				
Chemical compounds.				
States: solid, liquid and gaseous;				
Changes between states.				
2.2 Mechanics				
2.2.1 *Statics*	1	2	1	1
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).				
2.2.2 *Kinetics*	1	2	1	1
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.				
2.2.3 *Dynamics*				
(a) Mass:	1	2	1	1
Force, inertia, work, power, energy (potential, kinetic and total energy), heat, efficiency;				
(b) Momentum, conservation of momentum;	1	2	2	1
Impulse;				
Gyroscopic principles;				
Friction: nature and effects, coefficient of friction (rolling resistance).				
2.2.4 *Fluid dynamics*				
(a) Specific gravity and density;	2	2	2	2

	Level			
	A	**B1**	**B2**	**[B3]**
(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 and constant pressure, refrigerators and heat pumps; Latent heats of fusion and evaporation, thermal energy, heat of combustion.	-	2	2	1
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; Construction, materials and operation of thermocouples; Operation of photo-cells.	1	2	2	2
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

	Level			
	A	B1	B2	[B3]
3.7 Resistance/Resistor				
(a) Resistance and affecting factors;	-	2	2	1
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.				
	-	1	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;				
	-	2	2	1
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.				
3.10 Magnetism	-	2	2	1
(a) Theory of magnetism;				
Properties of a magnet;				
Action of a magnet suspended in the Earth's magnetic field;				

	Level			
	A	B1	B2	[B3]
Magnetisation and demagnetisation; Magnetic shielding; Various types of magnetic material; Electromagnets construction and principles of operation; 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 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; 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.	-	2	2	1
3.13 AC Theory Sinusoidal waveform: phase, period, frequency, cycle;	1	2	2	1

	Level			
	A	B1	B2	[B3]
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.				
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; Calculation of power in a three phase system; Primary and Secondary current, voltage, turns ratio, power, efficiency; Auto transformers.	-	2	2	1
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 rotation field, capacitor, inductor, shaded or split pole.	-	2	2	1

	Level			
	A	**B1**	**B2**	**[B3]**
4.1 Semiconductors				
4.1.1 *Diodes*				
(a) Diode symbols;	-	2	2	1
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.				
(b) Materials, electron configuration, electrical properties;	-	-	2	-
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, Shottky diode, photo conductive diode, varactor diode, varistor, rectifier diodes, and Zener diode.				
4.1.2 *Transistors*				
(a) Transistor symbols;	-	1	2	1
Component description and orientation;				
Transistor characteristics and properties.				
(b) Construction and operation of PNP and NPN transistors;	-	-	2	-
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.				

	Level			
	A	**B1**	**B2**	**[B3]**
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	-
4.2 Printed Circuit Boards Description and use of printed circuit boards.	-	1	2	-
4.3 Servomechanisms				
(a) Understanding of the following terms: 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.	-	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	-
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 micro computer 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. Memory associated terms;	-	-	-	2	-

	Level				
	A	**B1.1 B1.3**	**B1.2 B1.4**	**B2**	**[B3]**
Operation of typical memory devices; Operation, advantages and disadvantages of the various data storage systems.					
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	-
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 programmes.	-	2	1	2	1

	Level				
	A	**B1.1 B1.3**	**B1.2 B1.4**	**B2**	**B3**
5.14 Electromagnetic Environment	-	2	2	2	1
Influence of the following phenomena on maintenance practices for electronic system:					
MC-Electromagnetic Compatibility					
EMI-Electromagnetic Interference					
HIRF-High Intensity Radiated Field					
Lightning/lightning protection					
5.15 Typical Electronic/Digital Aircraft Systems	-	2	2	2	1
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					
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 alloy steels used in aircraft; common	1	2	1	2
Heat treatment and application of alloy steels;				
(b) Testing of ferrous materials for hardness, tensile strength, fatigue strength and impact resistance.	-	1	1	1
6.2 Aircraft Materials — Non-Ferrous	1	2	1	2
(a) Characteristics, properties and identification of common non-ferrous materials used in aircraft;				
Heat treatment and application of non-ferrous materials;				
(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;	1	2	2	2
Sealant and bonding agents.				
(b) The detection of defects/deterioration in composite and non-metallic material.	1	2	-	2
Repair of composite and non-metallic material.				
6.3.2 *Wooden structures*	1	2	-	2
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.				
6.3.3 *Fabric covering*	1	2	-	2
Characteristics, properties and types of fabrics used in aeroplanes;				
Inspections methods for fabric;				
Types of defects in fabric;				
Repair of fabric covering.				

	Level			
	A	**B1**	**B2**	**B3**
6.4 Corrosion				
(a) Chemical fundamentals;	1	1	1	1
Formation by, galvanic action process, microbiological, stress;				
(b) Types of corrosion and their identification;	2	3	2	2
Causes of corrosion;				
Material types, susceptibility to corrosion.				
6.5 Fasteners				
6.5.1 *Screw threads*	2	2	2	2
Screw nomenclature;				
Thread forms, dimensions and tolerances for standard threads used in aircraft;				
Measuring screw threads;				
6.5.2 *Bolts, studs and screws*	2	2	2	2
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.				
6.5.3 *Locking devices*	2	2	2	2
Tab and spring washers, locking plates, split pins, pal-nuts, wire locking, quick release fasteners, keys, circlips, cotter pins.				
6.5.4 *Aircraft rivets*	1	2	1	2
Types of solid and blind rivets: specifications and identification, heat treatment.				
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	-	2	1	1
Types of springs, materials, characteristics and applications.				
6.8 Bearings	1	2	2	1
Purpose of bearings, loads, material, construction;				

	Level			
	A	**B1**	**B2**	**B3**
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

Note: This module does not apply to category B3. Relevant subject matter for category B3 are defined in module 7B

	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; 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.	1	2	2
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

	Level		
	A	**B1**	**B2**
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; Wiring protection techniques: Cable looming and loom support, cable clamps, protective sleeving techniques including heat shrink wrapping, shielding. EWIS installations, inspections, repair and cleanliness standards.	1	3	3
7.8 Riveting Riveted joints, rivet spacing and pitch; Tools used for riveting and dimpling; Inspection of riveted joints.	1	2	-
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	-

	Level		
	A	**B1**	**B2**
7.14 Material handling	-	2	-
7.14.1 *Sheet Metal*			
Marking out and calculation of bend allowance;			
Sheet metal working, including bending and forming;			
Inspection of sheet metal work.			
7.14.2 *Composite and non-metallic*	-	2	-
Bonding practices;			
Environmental conditions			
Inspection methods			
7.15 Welding, Brazing, Soldering and Bonding			
(a) Soldering methods; inspection of soldered joints.	-	2	2
(b) Welding and brazing methods;	-	2	-
Inspection of welded and brazed joints;			
Bonding methods and inspection of bonded joints.			
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;	-	2	-
Aircraft weighing.			
7.17 Aircraft Handling and Storage	2	2	2
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.			
7.18 Disassembly, Inspection, Repair and Assembly Techniques			
(a) Types of defects and visual inspection techniques;	2	3	3
Corrosion removal, assessment reprotection;			
(b) General repair methods, Structural Repair Manual	-	2	-

	Level		
	A	**B1**	**B2**
(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 landing 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 operations;			
Maintenance Inspection/Quality Control/Quality Assurance;			
Additional maintenance procedures;			
Control of life limit components.			

MODULE 7B. MAINTENANCE PRACTICES

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

	LEVEL
	B3
7.1 Safety Precautions-Aircraft and Workshop	3
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.	
7.2 Workshop Practices	3
Care of tools, control of tools, use of workshop materials;	
Dimensions, allowances and tolerances, standards of workmanship;	
Calibration of tools and equipment, calibration standards.	
7.3 Tools	3
Common hand tool;	
Common power tool types;	
Operation and us of precision measuring tools;	
Lubrication, function and use of electrical general test equipment.	
7.4 Avionic General Test Equipment	-
Operation, function and use of avionic general test equipment.	
7.5 Engineering Drawings, Diagrams and Standards	2
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, NAS and MIL;	
Writing diagrams and schematic diagrams.	
7.6 Fits and Clearances	2
Drill size for bolt holes, classes of fits;	
Common system of fits and clearances;	
Schedule of fits and clearances for aircraft and engines;	
Limit for bow, twist and wear;	
Standard methods for checking shaft, bearings and other parts.	

	LEVEL
	B3
7.7 Electrical 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.	2
7.8 Riveting Riveted joints, rivets spacing and pitch; Tools use 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; Installation and clamping of pipes.	2
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 pullys, 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

	LEVEL
	B3
7.14 Material handling	
7.14.1 *Sheet Metal*	2
Marking out and calculation of bend allowance;	
Sheet metal working, including bending and forming;	
Inspection of sheet metal work.	
7.14.2 *Composite and non-metallic*	2
Bonding practices;	
Environmental conditions;	
Inspection methods.	
7.15 Welding, Brazing, Soldering and Bonding	
(a) Soldering methods; inspection of soldering joints;	2
(b) Welding and brazing methods;	2
Inspection of welded and brazed joints;	
Bonding methods and inspection of bonded joints.	
7.16 Aircraft Weight and Balance	
(a) Centre of Gravity/Balance limits calculation: use of relevant documents;	2
(b) Preparation of aircraft for weighing;	2
Aircraft weighing.	
7.17 Aircraft Handling and Storage	2
Aircraft taxiing/towing and associated safety precautions;	
Aircraft jacking, choking, 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 operations.	
7.18 Disassembly, Inspection, Repair and Assembly Techniques	
(a) Types of defects and visual inspection techniques;	3
Corrosion removal, assessment and reprotection;	
(b) General repair methods, Structural Repair Manual;	2
Ageing, fatigue and corrosion control programmes;	

	LEVEL
	B3
(c) Non-destructive inspection techniques including, penetrant, radiographic, eddy current, ultrasonic and boroscope methods;	2
(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 operations; Maintenance Inspections/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 matter for category B3 are defined in module 9B

	Level		
	A	**B1**	**B2**
9.1 General	1	2	2
The need to take human factors into account;			
Incidents attributable to human factors/human error;			
'Murphy's' law.			
9.2 Human Performance and Limitations	1	2	2
Vision;			
Hearing;			
Information processing;			
Attention and perception;			
Memory;			
Claustrophobia and physical access.			
9.3 Social Psychology	1	1	1
Responsibility: individual and group;			
Motivation and de-motivation;			
Peer pressure;			
'Culture' issues;			
Team working;			
Management, supervision and leadership.			
9.4 Factors Affecting Performance	2	2	2
Fitness/health;			
Stress: domestic and work related;			
Time pressure and deadlines;			
Workload: overload and underload;			
Sleep and fatigue, shiftwork;			
Alcohol, medication, drug abuse.			
9.5 Physical Environment	1	1	1
Noise and fumes;			
Illumination;			
Climate and temperature;			
Motion and vibration;			

	Level		
	A	**B1**	**B2**
9.6 Tasks	1	1	1
Physical work;			
Repetitive tasks;			
Visual inspection;			
Complex systems.			
9.7 Communication	2	2	2
Within and between teams;			
Work logging and recording;			
Keeping up to date, currency;			
Dissemination of information.			
9.8 Human Error	1	2	2
Error models and theories;			
Types of error in maintenance tasks;			
Implications of errors (i.e accidents)			
Avoiding and managing errors.			
9.9 Hazards in the Workplace	1	2	2
Recognising and avoiding hazards;			
Dealing with emergencies.			

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	2
The need to take human factors into account;	
Incidents attributable to human factors/human error;	
"Murphy's" law.	
9.2 Human Performance and Limitations	2
Vision;	
Hearing;	
Information processing;	
Attention and perception;	
Memory;	
Claustrophobia and physical access.	
9.3 Social Psychology	1
Responsibility: individual and group;	
Motivation and de-motivation;	
Peer pressure;	
"Culture" issues;	
Team work;	
Management, supervision and leadership.	
9.4 Factors Affecting Performance	2
Fitness/health;	
Stress: domestic and work related;	
Time pressure and deadlines;	
Workload: overload and underload;	
Sleep and fatigue, shiftwork;	
Alcohol, medication, drug abuse.	

	Level
	B3
9.5 Physical Environment	1
Noise and fumes;	
Illuminations;	
Climate and temperature	
Motion and vibration;	
Working environment.	
9.6 Tasks	1
Physical work;	
Repetitive tasks;	
Visual inspection;	
Complex systems.	
9.7 Communication	2
Within and between teams;	
Work logging and recording;	
Keeping up to date, currency;	
Dissemination of information.	
9.8 Human Error	2
Error models and theories;	
Types of error in maintenance tasks;	
Implications of errors (i.e. accidents);	
Avoiding and managing errors.	
9.9 Hazards in the Workplace	2
Recognising and avoiding hazards;	
Dealing with emergencies.	

MODULE 10. AVIATION LEGISLATION

	Level			
	A	**B1**	**B2**	**B3**
10.1 Regulatory Framework Role of International Civil Aviation Organisation; Role of the General Civil Aviation Authority; Relationship between CAR 145, CAR 66, CAR 147 and CAR M; Relationship with other Aviation Authorities.	1	1	1	1
10.2 CAR 66 — Certifying Staff — Maintenance Detailed understanding of CAR 66.	2	2	2	2
10.3 CAR 145 — Approved Maintenance Organisations Detailed understanding of CAR 145.	2	2	2	2
10.4 CAR-OPS — Commercial & Private Air Transportation Air Operators Certificates; Operators Responsibilities; Documents to be Carried; Aircraft Placarding (Markings);	1	1	1	1
10.5 Aircraft Certification				
(a) General Certification rules Type Certification; Supplemental Type Certification; CAR 21 Design/Production Organisation Approvals.	-	1	1	1
(b) Documents Certificate of Airworthiness; Certificate of Registration; Noise Certificate; Weight Schedule; Radio Station Licence and Approval.	-	2	2	2
10.6 CAR M Detailed understanding of CAR M.	2	2	2	2

	Level			
	A	**B1**	**B2**	**B3**
10.7 Applicable National and International Requirements				
(a) Maintenance Programmes, Maintenance checks and inspections; Master Minimum Equipment Lists, Minimum Equipment List, Dispatch Deviation Lists; Airworthiness Directives; Service Bulletins, manufacturers service information; Modifications and repairs; Maintenance documentation: maintenance manuals, structural repair manual, illustrated parts catalogue, etc.;	1	2	2	2
(b) Continuing airworthiness; Test flights; ETOPS, maintenance and dispatch requirements; All Weather Operations, Category 2/3 operations and minimum equipment requirements.	-	1	1	1

MODULE 11A. TURBINE AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS

	Level	
	A1	**B1.1**
11.1 Theory of Flight	1	2
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;		
11.1.2 *High Speed Flight*	1	2
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.		
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; Drains and ventilation provisions; System installation provisions; Lightning strike protection provision. Aircraft bonding.	2	2
(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

	Level	
	A1	**B1.1**
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
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)* Nacelles/Pylons — 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
11.4.3 *Pressurisation* Pressurisation systems;	1	3

	Level	
	A1	**B1.1**
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; Emergency power generation; Voltage regulation; Power distribution; Inverters, transformers, rectifiers; Circuit protection. External/Ground power;	1	3
11.7 Equipment and Furnishings (ATA **25)** (a) Emergency equipment requirements;	2	2
Seats, harnesses and belts.	1	1
(b) Cabin lay-out; Equipment lay-out; Cabin Furnishing Installation; Cabin entertainment equipment; Galley installation; Cargo handling and retention equipment;		

	Level	
	A1	**B1.1**
11.8 Fire Protection (ATA 26)		
(a) Fire and smoke detection and warning systems;	1	3
Fire extinguishing systems;		
System tests.		
(b) Portable fire extinguisher	1	1
11.9 Flight Controls (ATA 27)	1	3
Primary controls: aileron, elevator, rudder, spoiler;		
Trim control;		
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 locks systems;		
Balancing and rigging;		
Stall protection/warning system.		
11.10 Fuel Systems (ATA 28)	1	3
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.		
11.11 Hydraulic Power (ATA 29)	1	3
System lay-out;		
Hydraulic fluids;		
Hydraulic reservoirs and accumulators;		
Pressure generation: electric, mechanical, pneumatic;		
Emergency pressure generation;		
Filters		
Pressure Control;		

	Level	
	A1	**B1.1**
11.12 Ice and Rain Protection (ATA 30)	1	3
Ice formation, classification and detection;		
Anti-icing systems: electrical, hot air and chemical;		
De-icing systems: electrical, hot air, pneumatic and chemical;		
Rain repellant;		
Probe and drain heating;		
Wiper systems.		
11.13 Landing Gear (ATA 32)	2	3
Construction, shock absorbing;		
Extension and retraction systems: normal and emergency;		
Indications and warning;		
Wheels, brakes, antiskid and autobraking;		
Tyres;		
Steering;		
Air-ground sensing		
11.14 Lights (ATA 33)	2	3
External: navigation, anti-collision, landing, taxiing, ice;		
Internal: cabin, cockpit, cargo;		
Emergency.		
11.15 Oxygen (ATA 35)	1	3
System lay-out: cockpit, cabin;		
Sources, storage, charging and distribution;		
Supply regulation;		
Indications and warnings.		
11.16 Pneumatic/Vacuum (ATA 36)	1	3
System lay-out;		
Sources: engine/APU, compressors, reservoirs, ground supply;		
Pressure control;		
Distribution;		
Indications and warnings;		
Interfaces with other systems.		

	Level	
	A1	**B1.1**
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 Control, Avionics and Cockpit Ventilation Control, Temperature Control, Air Traffic Communicat ion, Avionic 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
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, — Email/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**
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 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 should reflect the technology of aeroplanes pertinent to the A2 and B1.2 subcategory.

	Level	
	A2	**B1.2**
11.1 Theory of Flight	1	2
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;		
11.1.2 *High Speed Flight – N/A*	-	-
11.2 Airframe Structures — General Concepts		
(a) Airworthiness requirements for structural strength;	2	2
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.		
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;	1	2
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		

	Level	
	A2	**B1.2**
11.3 Airframe Structures — Aeroplanes		
11.3.1 *Fuselage (ATA 52/53/56)*	1	2
Construction and pressurisation sealing;		
Wing, tail-plane pylon and undercarriage attachments;		
Seat installation;		
Doors and emergency exits: construction and operation;		
Window and windscreen attachment.		
11.3.2 *Wings (ATA 57)*	1	2
Construction;		
Fuel storage;		
Landing gear, pylon, control surface and high lift/drag attachments.		
11.3.3 *Stabilisers (ATA 55)*	1	2
Construction;		
Control surface attachment.		
11.3.4 *Flight Control Surfaces (ATA 55/57)*	1	2
Construction and attachment;		
Balancing - mass and aerodynamic.		
11.3.5 *Nacelles/Pylons (ATA 54)*	1	2
Nacelles/Pylons:		
— Construction;		
— Firewalls;		
— Engine mounts.		
11.4 Air Conditioning and Cabin Pressurisation (ATA 21)	1	3
Pressurisation and air conditioning systems;		
Cabin pressure controllers, protection and warning devices;		
Heating Systems.		
11.5 Instruments/Avionic Systems	1	2
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;		

	Level	
	A2	**B1.2**
Glass cockpit Other aircraft system indication.		
11.5.2 *Avionic Systems*	1	1
Fundamentals of system lay-outs and operation of: — Auto Flight (ATA 22), — Communications (ATA 23), — Navigation Systems (ATA 34).		
11.6 Electrical Power (ATA 24)	1	3
Batteries Installation and Operation; DC power generation; Voltage regulation; Power distribution; Circuit protection; Inverters, transformers.		
11.7 Equipment and Furnishings (ATA 25)		
(a) Emergency equipment requirements;	2	2
Seats, harnesses and belts.		
(b) Cabin lay-out;	1	1
Equipment lay-out; Cabin Furnishing Installation; Cabin entertainment equipment; Galley installation; Cargo handling and retention equipment; Airstairs.		
11.8 Fire Protection (ATA 26)	1	3
(a) Fire and smoke detection and warning systems;		
Fire extinguishing systems;		
System tests.		
(b) Portable fire extinguisher.	1	3
11.9 Flight Controls (ATA 27)	1	3
Primary controls: aileron, elevator, rudder; Trim tabs; High lift devices;		

	Level	
	A2	**B1.2**
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.		
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.	1	3
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

	Level	
	A2	**B1.2**
11.14 Lights (ATA 33)	2	3
External: navigation, anti collision, landing, taxiing, ice;		
Internal: cabin, cockpit, cargo;		
Emergency.		
11.15 Oxygen (ATA 35)	1	3
System lay-out: cockpit, cabin;		
Sources, storage, charging and distribution;		
Supply regulation;		
Indications and warnings;		
11.16 Pneumatic/Vacuum (ATA 36)	1	3
System lay-out;		
Sources: engine/APU, compressors, reservoirs, ground supply;		
Pressure control;		
Distribution;		
Indications and warnings;		
Interfaces with other systems.		
	2	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.		

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	1
Aeroplane Aerodynamics and Flight Controls	
Operation and effect of:	
— roll control: ailerons; — 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, 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;	
11.2 Airframe Structures — General Concepts	
(a) Airworthiness requirements for structural strength;	2
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.	
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;	2
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.	
11.3 Airframe Structures — Aeroplanes	
11.3.1 *Fuselage (ATA 52/53/56)*	
Construction;	1
Wing, tail-plane pylon and undercarriage attachments;	
Seat installation;	

	Level
	B3
Doors and emergency exits: construction and operation; Window and windscreen attachment.	
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)* Construction; Control surface attachment.	1
11.3.4 *Flight Control Surfaces (ATA 55/57)* Construction and attachment; Balancing — mass and aerodynamic.	
11.3.5 *Nacelles/Pylons (ATA 54)* Nacelles/Pylons: — Construction; — Firewalls; — Engine mounts.	1
11.4 Air Conditioning (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.	1
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

	Level
	B3
11.6 Electrical Power (ATA 24)	2
Batteries Installation and Operation;	
DC power generation;	
Voltage regulation;	
Power distribution;	
Circuit protection;	
Inverters, transformers.	
11.7 Equipment and Furnishings (ATA 25)	2
Emergency equipment requirements;	
Seats, harnesses and belts.	
11.8 Fire Protection (ATA 26)	2
Portable fire extinguisher	
11.9 Flight Controls (ATA 27)	3
Primary controls: aileron, elevator, rudder;	
Trim tabs;	
High lift devices;	
System operation: manual;	
Gust locks;	
Balancing and rigging;	
Stall warning system.	
11.10 Fuel Systems (ATA 28)	2
System lay-out;	
Fuel tanks;	
Supply systems;	
Cross-feed and transfer;	
Indications and warnings;	
Refuelling and defuelling.	
11.11 Hydraulic Power (ATA 29)	2
System lay-out;	
Hydraulic fluids;	
Hydraulic reservoirs and accumulators;	
Pressure generation: electric, mechanical;	
Filters;	
Pressure Control;	
Power distribution;	
Indication and warning systems.	

	Level
	B3
11.12 Ice and Rain Protection (ATA 30)	1
Ice formation, classification and detection;	
De-icing systems: electrical, hot air, pneumatic and chemical;	
Probe and drain heating;	
Wiper systems.	
11.13 Landing Gear (ATA 32)	2
Construction, shock absorbing;	
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;	2
Internal: cabin, cockpit, cargo;	
Emergency.	
11.15 Oxygen (ATA 35)	
System lay-out: cockpit, cabin;	2
Sources, storage, charging and distribution;	
Supply regulation;	
Indications and warnings.	
11.16 Pneumatic/Vacuum (ATA 36)	
System lay-out;	2
Sources: engine/APU, compressors, reservoirs, ground supply;	
Pressure and vacuum pumps;	
Distribution;	
Indications and warnings;	
Interfaces with other systems.	

MODULE 12. HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS

	Level	
	A3 A4	**B1.3 B1.4**
12.1 Theory of Flight — Rotary Wing Aerodynamics	1	2
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.		
12.2 Flight Control Systems	2	3
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;		
Balancing and Rigging.		
12.3 Blade Tracking and Vibration Analysis	1	3
Rotor alignment;		
Main and tail rotor tracking;		
Static and dynamic balancing;		
Vibration types, vibration reduction methods;		
Ground resonance.		
12.4 Transmissions	1	3
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.		

	Level	
	A3 A4	**B1.3 B1.4**
12.5 Airframe Structures		
(a) Airworthiness requirements for structural strength;	2	2
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.		
(b) Construction methods of: stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, and methods of skinning and anti-corrosive protection.	1	2
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 (ATA21)		
12.6.1 *Air supply*	1	2
Sources of air supply including engine bleed and ground cart;		
12.6.2 *Air Conditioning* Air conditioning systems;		
Distribution systems;		
Flow and temperature control systems;		
Protection and warning devices.		
12.7 Instruments/Avionic Systems	1	3
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		

	Level	
	A3 **A4**	**B1.3** **B1.4**
12.7.2 *Avionic Systems*	1	2
Fundamentals of system layouts and operation of:		
Auto Flight (ATA 22);		
Communications (ATA 23);		
Navigation Systems (ATA 34).		
12.8 Electrical Power (ATA 24)	1	1
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.		
12.9 Equipment and Furnishings (ATA 25)		
(a) Emergency equipment requirements;	2	2
Seats, harnesses and belts;		
Lifting systems.		
(b) Emergency flotation systems;	1	1
Cabin lay-out, cargo retention;		
Equipment lay-out;		
Cabin Furnishing Installation.		
12.10 Fire Protection (ATA 26)	1	3
Fire and smoke detection and warning systems;		
Fire extinguishing systems;		
System tests.		
12.11 Fuel Systems (ATA 28)	1	3
System lay-out;		
Fuel tanks;		
Supply systems;		
Dumping, venting and draining;		
Cross-feed and transfer;		
Indications and warnings;		
Refuelling and defuelling.		

	Level	
	A3 A4	**B1.3 B1.4**
12.12 Hydraulic Power (ATA 29)	1	3
System lay-out;		
Hydraulic fluids;		
Hydraulic reservoirs and accumulators;		
Pressure generation: electric, mechanical, pneumatic;		
Emergency pressure generation;		
Pressure Control;		
Power distribution;		
Indication and warning systems;		
Interface with other systems.		
12.13 Ice and Rain Protection (ATA 30)	1	3
Ice formation, classification and detection;		
Anti-icing and de-icing systems: electrical, hot air and chemical;		
Rain repellant and removal;		
Probe and drain heating.		
Wiper system		
12.14 Landing Gear (ATA 32)	2	3
Construction, shock absorbing;		
Extension and retraction systems: normal and emergency;		
Indications and warning;		
Wheels, tyres, brakes;		
Steering;		
Skids, floats.		
12.15 Lights (ATA 33)	2	3
External: navigation, landing, taxiing, ice;		
Internal: cabin, cockpit, cargo;		
Emergency.		
	1	3
12.16 Pneumatic/Vacuum (ATA 36)		
System lay-out;		
Sources: engine, compressors, reservoirs, ground supply;		
Pressure control;		
Distribution;		
Indications and warnings;		
Interfaces with other systems.		

	Level	
	A3 A4	**B1.3 B1.4**
12.17 Integrated Modular Avionics (ATA 42)	1	2
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, Avionic Communication Router, Electrical Load Management, Circuit Breaker Monitoring, Electrical System BITE, Fuel Management, Braking Control, Steering Control, Landing Gear Extension and Retraction, Tyre Pressure Indicator, Oleo Pressure Indication, Brake Temperature Monitoring, etc.		
Core System;		
Network Components.		
12.18 On Board Maintenance Systems (ATA 45)	1	2
Central maintenance computers;		
Data loading system;		
Electronic library system;		
Printing;		
Structure monitoring (damage tolerance monitoring).		
12.19 Information Systems(ATA 46)	1	2
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 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;		

MODULE 13. AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS

	Level
	B2
13.1 Theory of Flight	
(a) Aeroplane Aerodynamics and Flight Controls	1
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.	
(b) High Speed Flight	1
Speed of sound, subsonic flight, transonic flight, supersonic flight,	
Mach number, critical Mach number.	
(c) Rotary Wing Aerodynamics	1
Terminology;	
Operation and effect of cyclic, collective and anti-torque controls.	
13.2 Structures — General Concepts	
(a) Fundamentals of structural systems.	1
(b) Zonal and station identification systems;	2
Electrical bonding;	
Lightning strike protection provision.	
13.3 Autoflight (ATA 22)	3
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.	

	Level
	B2
13.4 Communication/Navigation (ATA 23/34)	3
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); — 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)	3
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.	
13.6 Equipment and Furnishings (ATA 25)	3
Electronic emergency equipment requirements;	
Cabin entertainment equipment.	
13.7 Flight Controls (ATA 27)	
(a) Primary controls: aileron, elevator, rudder, spoiler;	2
Trim control;	
Active load control;	
High lift devices;	

	Level
	B2
System operation: manual, hydraulic, pneumatic; Artificial feel, Yaw damper, Mach trim, rudder limiter, gust locks. Stall protection systems.	
(b) System operation: electrical, fly-by-wire.	3
13.8 Instruments (ATA 31)	3
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; 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)	3
External: navigation, landing, taxiing, ice; Internal: cabin, cockpit, cargo; Emergency	

	Level
	B2
13.10 On board Maintenance Systems (ATA 45)	3
Central maintenance computers;	
Data loading system;	
Electronic library system;	
Printing;	
Structure monitoring (damage tolerance monitoring	
13.11 Air Conditioning and Cabin Pressurisation (ATA 21)	2
13.11.1. *Air supply*	
Sources of air supply including engine bleed, APU and ground cart;	
13.11.2. *Air Conditioning*	
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

	Level
	B2
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 system;	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 repellant;	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
Indications and warning;	3
Wheels, brakes, antiskid and autobraking;	3
Tyres;	

	Level
	B2
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 (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, Avionic Communication Router, Electrical Load Management, Circuit Breaker Monitoring, Electrical System BITE, Fuel Management, Braking Control, Steering Control, Landing Gear Extension and Retraction, Tyre Pressure Indicator, 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.	

	Level
	B2
The Cabin Network Service may host functions such as: — Access to pre-departure/departure reports, — Email/intranet/Internet access, — Passenger database; Cabin Core System; 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 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 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.	3

MODULE 14. PROPULSION

	Level
	B2
14.1 Turbine Engines	
(a) Constructional arrangement and operation of turbojet, turbofan, turboshaft and turbopropeller engines;	1
(b) Electronic Engine control and fuel metering systems (FADEC).	2
14.2 Engine Indicating Systems	2
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.	
14.3 Starting and Ignition Systems	2
Operation of engine start system and components;	
Ignition systems and components;	
Maintenance safety requirements.	

MODULE 15. GAS TURBINE ENGINE

	Level	
	A	**B1**
15.1 Fundamentals	1	2
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.		
15.2 Engine Performance	-	2
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.		
15.3 Inlet	2	2
Compressor inlet ducts		
Effects of various inlet configurations;		
Ice protection.		
15.4 Compressors	1	2
Axial and centrifugal types;		
Constructional features and operating principles and applications;		
Fan balancing;		
Operation:		
Causes and effects of compressor stall and surge;		
Methods of air flow control: bleed valves, variable inlet guide vanes, variable stator vanes, rotating stator blades;		
Compressor ratio.		
15.5 Combustion Section	1	2
Constructional features and principles of operation.		
15.6 Turbine Section	2	2
Operation and characteristics of different turbine blade types;		
Blade to disk attachment;		
Nozzle guide vanes;		
Causes and effects of turbine blade stress and creep.		

	Level	
	A	**B1**
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
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

	Level	
	A	**B1**
15.15 Power Augmentation Systems Operation and applications; Water injection, water methanol; Afterburner systems.	-	1
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
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	2	2
16.4 Engine Fuel Systems			
16.4.1 *Carburettors* Types, construction and principles of operation; Icing and heating.	1	2	2
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; Ignition harnesses, spark plugs; Low and high tension systems.	1	2	2

	Level		
	A	**B1**	**B3**
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; Safety precautions.	1	2	2
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

	Level		
	A	**B1**	**B3**
16.13 Engine Storage and Preservation Preservation and depreservation for the engine and accessories/systems.	-	2	1

MODULE 17A. PROPELLER

Note: This module does not apply to category B3. Relevant subject matter for category B3 is defined in module 17B

	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
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

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

	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
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

APPENDIX II : to CAR 66 – BASIC EXAMINATION STANDARD

1. **General**

1.1. All basic examinations must 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 must have three alternative answers of which only one must be the correct answer and the candidate must 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 must be allowed 20 minutes to answer each such question.

1.4. Suitable essay questions must be drafted and evaluated using the knowledge syllabus in Appendix I for Modules 7A, 7B, 9A, 9B and 10.

1.5. 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.

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

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

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

1.9. 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.

1.10. Penalty marking systems must not be used to determine whether a candidate has passed.

1.11. 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 CAR 147 approved maintenance training organisation 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.

1.12. The time periods required by point 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.

1.13. The maximum number of consecutive attempts for each module is three. Further sets of three attempts are allowed with a 1 year waiting period between sets.

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

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 40minutes.

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 & B1.3; 40 multi-choice and 0 essay questions. Time allowed 50 minutes.

Category B1.2 & 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 plus 40 minutes.

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

Category B2; 60 multi-choice and 2 essay questions. Time allowed 75 minutes plus 40 minutes

Module 7B- Maintenance Practices:

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

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. Subject Module 9A Human factors:

Category A; -20 multi-choice and 1 essay question. Time allowed 25 minutes plus 20 minutes.

Category B1; 20 multi-choice and 1 essay question. Time allowed 25 minutes plus 20 minutes.

Category B2; 20 multi-choice and 1 essay question. Time allowed 25 minutes plus 20 minutes.

Module 9B Human factors:

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

2.10. Module 10- Aviation Legislation:

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

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

Category B2; 40 multi-choice and 1 essay question. Time allowed 50 minutes plus 20 minutes.

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

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.

2.16. 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.

2.17. 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.

2.18. 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: to CAR 66 – AIRCRAFT TYPE TRAINING AND EXAMINATION STANDARD – ON THE JOB EXPERIENCE.

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 CAR 147 or, when conducted by other organisations, as directly approved by the GCAA.

(ii) Shall comply with the standard described in paragraph 3.1 and 4 of this Appendix III, except as permitted by the differences training described below.

(iii) In the case of a category C person qualified by holding an academic degree as specified in point 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. If the application exceeds the 3 year limit, the GCAA may consider an application if further training and examination is carried out, however the application will not be accepted if it exceeds 5 years.

(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 CAR 147 or, when conducted by other organisations, as directly approved by the GCAA.

(ii) Shall comply with the standard described in paragraph 3.2 and 4 of this Appendix III, except as permitted by the differences training described below.

(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 GCAA.

(ii) Differences training has to be defined on a case-to-case basis taking into account the requirements contained in this Appendix III 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 Appendix III syllabus, 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 point 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 30 000kg;	
B1.1	150
B1.2	120
B2	100
C	30
Aeroplanes with a maximum take-off mass equal or less than 30 000kg and above 5 700kg	
B1.1	120
B1.2	100
B2	100
C	25
Aeroplanes with a maximum take-off mass of 5 700kg and below (*)	
B1.1	80
B1.2	60
B2	60
C	15
Helicopters (**)	
B1.3	120
B1.4	100
B2	100
C	25
(*) For non pressurised piston engine aeroplanes below 2000kg MTOM the minimum duration can be reduced by 50% (**) For helicopters in group 2 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 GCAA.

(d) Justification of course duration:

Training courses carried out in a maintenance training organisation approved in accordance with CAR 147 and courses directly approved by the GCAA 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 point 3.1(e) below,

— detailed competency analysis showing that the objectives as stated in point 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 point 3.1(c) above, these shall be justified to the GCAA 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.

Level / Chapters	Aeroplanes turbine		Aeroplanes piston		Helicopters turbine		Helicopters piston		Avionics
Licence category.	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 Stand 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	-
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 – Monitoring and indicating	-	-	-	-	3	1	3	1	3
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	-
53 Airframe Structure (Helicopter)	-	-	-	-	3	1	3	1	-
25 Emergency Flotation Equipment	-	-	-	-	3	1	3	1	1
Airframe structures:									
51 Standard practices and structures (damage classification, assessment	3	1	3	1	-	-	-	-	1
and repair)	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
27A Flight Control Surface (All)	3	1	3	1	-	-	-	-	1
52 Doors									
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

Level / Chapters	Aeroplanes turbine		Aeroplanes piston		Helicopters turbine		Helicopters		Avionics
Licence category.	B1	C	B1	C	B1	C	B1	C	B2
25 Equipment 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
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:									
70 Standard Practices – Engines,	3	1	-	-	3	1	-	-	1
70A constructional arrangement and operation (Installation Inlet,	3	1	-	-	3	1	-	-	1
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
75 Air	3	1	-	-	3	1	-	-	1
76 Engine Controls	3	1	-	-	3	1	-	-	1
78 Exhaust	3	1	-	-	3	1	-	-	1
79 Oil	3	1	-	-	3	1	-	-	1
80 Starting	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									

73A FADEC	3	1	-	-	3	1	-	-	3
74 Ignition	3	1	-	-	3	1	-	-	3
77 Engine Indication Systems	3	1	-	-	3	1	-	-	3
49 Auxiliary Power Units (APUs)	3	1	-	-	3	1	-	-	2

Level / Chapters	Aeroplanes		Aeroplanes		Helicopters turbine		Helicopters		Avionics
Licence category.	B1	C	B1	C	B1	C	B1	C	B2
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
76 Engine Control	-	-	3	1	-	-	3	1	1
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									
73A FADEC	-	-	3	1	-	-	3	1	3
74 Ignition	-	-	3	1	-	-	3	1	3
77 Engine Indication Systems	-	-	3	1	-	-	3	1	3
Propellers:									
60A Standard Practices – Propeller	3	1	3	1	-	-	-	-	1
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	3	1	3	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 elements either in the classroom or in a virtual controlled environment subject to the acceptance of the GCAA 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.

Chapters	B1/B2	B1					B2				
	LOC	FOT	SGH	R/I	MEL	TS	FOT	SGH	R/I	MEL	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	-	-	-	-	-
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 indicating	X/X	X	-	X	X	X	-	-	X	-	X
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/Pylons	X/-	X	X	-	-	X	-	-	-	-	-
67 Rotor Flight Control	X/-	X	X	-	X	X	-	-	-	-	-
53 Airframe Structure (Helicopter)											
Note: covered under Airframe structures											
Airframe Structures:											
51 Standard Practices and Structures (damage classification, assessment and repair)	X/-	-	-	-	-	X	-	-	-	-	-
53 Fuselage	X/-	-	-	-	-	-	-	-	-	-	-
54 Nacelles/Pylons	X/-	-	-	-	-	-	-	-	-	-	-
55 Stabilisers	X/-	-	-	-	-	X	-	-	-	-	-
56 Windows	X/-	-	-	-	-	-	-	-	-	-	-
57 Wings	X/-	-	-	-	-	X	-	-	-	-	-
27A Flight Control Surfaces	X/X	X	X	-	-	-	-	X	-	-	-
52 Doors											
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
23 Communications	X/X	-	X	-	X	-	X	X	X	X	X

Chapters	B1/B2	B1					B2				
	LOC	FOT	SGH	R/I	MEL	TS	FOT	SGH	R/I	MEL	TS
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

Chapters	B1/B2	B1					B2				
	LOC	FOT	SGH	R/I	MEL	TS	FOT	SGH	R/I	MEL	TS
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	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	-	-	-
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 Systems (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	-	-	-	-	-	-	-	-
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	-	-	-	-	-	-	-	-	-	-

Chapters	B1/B2	B1						B2				
	LOC	FOT	SGH	R/I	MEL	TS		FOT	SGH	R/I	MEL	TS
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		-	-	-	-	-
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	-	-	-
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		-	-	-	-	-
77 Engine Indicating	X/X	X	-	-	-	-		-	-	-	-	-
78 Exhaust	X/-	X	-	-	X	X		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	-	-	-	-		-	-	-	-	-

Chapters	B1/B2	B1					B2				
	LOC	FOT	SGH	R/I	MEL	TS	FOT	SGH	R/I	MEL	TS
Propellers:											
60A Standard Practices – Propeller	-	-	-	X	-	-	-	-	-	-	-
61 Propeller/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 examination standard*

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 multiple-choice type. Each multiple-choice question must have 3 alternative answers of which only one must 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 (*) shall be the one defined in point 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 GCAA 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.

(*) For the purpose of this point 4, a "chapter" means each one of the rows preceded by a number in the table contained in point 3.1(e).

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.**]**

5. Type examination standard

Type examination shall be conducted by training organisations appropriately approved under CAR 147 or by the GCAA. 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 multiple-choice questions.

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

(d) Examinations shall be on a sample of chapters (**) drawn from paragraph 3 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 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 1 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.

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

3. 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 Engineers Licence. If the application exceeds the 3 year limit, the GCAA may consider an application if further training and examination is carried out, however the application will not be accepted if it exceeds 5 years

4. 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.

(**) For the purpose of this point 5, a "chapter" means each one of the rows preceded by a number in the tables contained in points 3.1(e) and 3.2(b).

On the Job Experience

On the Job Experience (OJE) shall be approved by the GCAA.

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 OJE is to gain the required competence and experience in performing safe maintenance.

(b) Content:

OJE shall cover a cross section of tasks acceptable to the GCAA. The OJE 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 OJE is mandatory and shall be performed by a designated assessor appropriately qualified.

The following data shall be addressed on the OJE 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 GCAA, demonstration of the OJE shall consist of (i) detailed worksheets/logbook and (ii) a compliance report demonstrating how the OJE meets the requirement of this CAR.

AMC to Section 1 of Appendix III to CAR 66: Aircraft Type Training and Examination Standard

On-the-job-Experience

1. Aircraft type training may be subdivided 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 maintenance conditions, when 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 CAR 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 Paragraph 3.1 (d) of Appendix III to CAR 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 Appendix III to CAR 66, has been determined based on:

   - generic categories of aircraft and minimum standard equipment fit;
   - the estimated average duration of standard courses.

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 Appendix III to CAR 66.

   In the particular case of type training courses approved on the basis of the requirements valid before CAR 66 revision 01 was applicable (01 July 2013) and having a duration for the theoretical element equal to or above the minimum duration contained in paragraph 3.1(c) of Appendix III to CAR 66, it is acceptable that the TNA only covers the differences introduced by CAR 66 revision 01 in paragraph 3.1(e) "Content" and the criteria introduced in paragraph 3.1(d) "Justification of course duration" related to the minimum attendance and the maximum number of training hours per day. This TNA may result in a change in the duration of the theoretical element.

3. The content and the duration deriving from the 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 GCAA will 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 large transport category 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 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 CAR 66 Appendix III 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 CAR 66 Appendix III.

(d) For each Chapter described in the theoretical element table contained in paragraph 3.1 of CAR 66 Appendix III, the corresponding training time should be recorded.

(e) Typical documents to be used 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 CAR 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 Appendix III to CAR 66);
- Organise the training into modules in a logical sequence (adequate combination of chapters as defined in Appendix III of CAR 66);
- Determine the sequence of learning (within a lesson and for the whole syllabus);
- Identify the scope of information and level of detail with regard to 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 breakdown 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 to ensure the effectiveness of the training;
  - The maintenance training documentation/material to be delivered to the student;
  - Facilitated discussions, questioning session, additional practice-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 GCAA 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 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 1(b), 3.2 and 4.2 of Appendix III to CAR 66: Aircraft Type Training and Examination Standard, On-the-job-Experience

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 Appendix III to CAR 66.

3. The duration of the practical training should ensure that the content of training required by paragraph 3.2 of Appendix III to CAR 66 is completed.

   Nevertheless, for aeroplanes with a MTOM equal or above 30 000 kg, 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 GCAA.

4. The organisation providing the practical element of the type training should provide trainees with 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 Appendix III to CAR 66, 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 Appendix III to AMC to CAR 66.

6. The practical element (for powerplant and avionic systems) of the Type Rating Training may be subcontracted by the approved CAR 147 organisation under its quality system according to the provisions of 147.145(d)3 and the corresponding Guidance Material.

AMC to Paragraph 1(c), of Appendix III to CAR 66: Aircraft Type Training and Examination Standard, On-the-job-Experience

Differences training

Approved difference training is not required for different variants within the same aircraft type rating (as specified in Appendix I to AMC to CAR 66) for the purpose of type rating endorsement on the Aircraft Maintenance Engineers 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 section 5 of Appendix III to CAR 66: Aircraft Type Training and Examination Standard, On-the-job-Experience

This Section 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 section 6 of Appendix III to CAR 66: Aircraft Type Training and Examination Standard, On-the-job-Experience

On-the-job-Experience (OJE)

1. *"A maintenance organisation appropriately approved for the maintenance of the particular aircraft type"* means a CAR 145 or M.A. Subpart F approved maintenance organisation holding an A rating for such aircraft.

2. The OJE 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 OJE should not be allowed.

4. The OJE should cover at least 50 % of the tasks contained in Appendix II to AMC to CAR 66. Some tasks should be selected from each paragraph of the 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 Appendix II may be considered as a replacement when they are relevant. Typically, in addition to the variety and the complexity, the OJE tasks should be selected because of their frequency, safety, novelty, etc.

5. Up to 50 % of the required OJE may be undertaken before the aircraft theoretical type training starts, provided this is carried out within 90 days before the theoretical training starts.

6. The organisation providing the On-the-job-Experience should provide trainees with 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 OJE 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 OJE tasks is confirmed by the direct supervisor(s), without being necessary the direct evaluation of the assessor.

- During the day-to-day OJE 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 OJE 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 OJE 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 Section 6 of Appendix III to CAR 66, is to conduct the final assessment of the completed OJE. This assessment should include confirmation of the completion of the required diversity and quantity of OJE and should be based on the supervisor(s) reports and feedback.

   - In Section 6 of Appendix III to CAR 66, 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 to AMC to CAR 66.

9. The procedures for OJE should be included into the Exposition Manual of the approved maintenance organisation.

AMC to Appendix III to CAR 66: Aircraft Type Training and Examination Standard, On-the-job-Experience

Aircraft type training and On-the-job-Experience

The theoretical and practical training providers, as well as the OJE 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.

Appendix IV - Experience Requirements for Extending a CAR 66 Aircraft Maintenance Engineers Licence

The table below shows the experience requirements for adding a new category or subcategory to an existing CAR 66 licence.

The experience must 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 CAR 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	-

Appendix V - CAR 66 Aircraft Maintenance Licence

1. An example of the CAR 66 Aircraft Maintenance Engineers Licence can be found on the following pages (Appendix V).

2. The document must be printed in the standardised form shown but may be reduced in size to accommodate its computer generation if desired. When the size is reduced care should be exercised to ensure sufficient space is available in those places where official seals/stamps are required. Computer generated documents need not have all the boxes incorporated when any such box remains blank so long as the document can clearly be recognised as the CAR 66 Aircraft Maintenance Engineers Licence.

3. The document shall be printed in the English.

4. Each licence holder must have a unique licence number based upon a UAE identifier and an alpha-numeric designator.

5. The document may have the pages in any order and need not have some or any divider lines as long as the information contained is positioned such that each page layout can clearly be identified with the format of the example CAR 66 Aircraft Maintenance Engineers Licence contained herein. The aircraft type rating page need not be issued until the first type endorsement is included.

6. The document may be prepared by the GCAA or by any CAR 145 approved maintenance organisation in accordance with a procedure approved by the GCAA and contained in the CAR 145 maintenance organisation exposition except that in all cases the GCAA will issue the document.

7. The preparation of any variation to an existing CAR-66 Aircraft Maintenance Engineers Licence may be carried out by the GCAA or by any CAR 145 approved maintenance organisation in accordance with a procedure approved by the GCAA and contained in the CAR-145 maintenance organisation exposition except that in all cases the GCAA will issue the document with the variation.

8. The CAR 66 Aircraft Maintenance Engineers 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.

9. Failure to comply with paragraph 8 may invalidate the document and could lead to the holder not being permitted to hold any CAR 145 certification authorisation and may result in prosecution under UAE law.

10. With regard to the aircraft type rating page the GCAA may choose not to issue this page until the first aircraft type rating needs to be endorsed and will need to issue more than one aircraft type rating page when there are a number to be listed.

11. Notwithstanding 10 each page issued will be in this format and contain the specified information for that page.

12. If there are no limitations applicable, the LIMITATIONS page will be issued stating ‘No limitations’.

13. Where a pre-printed format is used, any category, subcategory or type rating box which does not contain a rating entry shall be marked to show that the rating is not held.

APPENDIX I: to AMC to CAR 66

AIRCRAFT TYPE RATINGS FOR CAR 66 AIRCRAFT MAINTENANCE ENGINEERS LICENCE

The following aircraft type ratings should be used to ensure a common standard.

The inclusion of an aircraft type in the list does not indicate that the aircraft type has been already granted a type certificate.

Notes:

- When a modification is introduced to an aircraft type rating or to an engine designation in the rating which affects licences already issued, the ratings on the AMEL licences may be modified at the next renewal or when the licence is reissued, unless there is an urgent reason to modify the licence.

In the following tables:

- The column *"TC Holder"* includes the TC holder as defined in the TCDS (EASA, FAA or other).
- Only the designations of ratings included in the column *"CAR 66 Type rating endorsement"* should be used for endorsing individual type ratings on a CAR 66 licences.

GROUP 1 AEROPLANES			
TC holder	**Model**	**Commercial Designation**	**CAR 66 Type rating endorsement**
328 Support Services	328-100 series		Dornier 328-100 (PWC PW119)
	328-300 series		Dornier 328-300 (PWC PW306)
AIR TRACTOR	AT-802 Series		Air Tractor AT-800 Series (PWC PT6)
AIRBUS	A300 B1 A300 B2-1A A300 B2-1C A300 B2-202 A300 B2-203 A300 B2K-3C A300 B4-102 A300 B4-103 A300 B4-203 A300 B4-2C A300 C4-203 A300 F4-203		Airbus A300 basic model (GE CF6)

TC holder	Model	Commercial Designation	CAR 66 Type rating endorsement
	A300 B2-320 A300 B4-120 A300 B4-220		Airbus A300 basic model (PW JT9D)
	A300 B4-601 A300 B4-603 A300 B4-605 R A300 C4-605 R - Variant F A300 F4-605 R		Airbus A300-600 (GE CF6)
	A300 B4-622 A300 B4-622 R A300 F4-622 R		Airbus A300-600 (PW 4000)
	A300 B4-620 A300 C4-620		Airbus A300-600 (PW JT9D)
	A300F4-608ST	Beluga	Airbus A300-600ST (GE CF6)
	A310-203 A310-203 C A310-221 A310-304 A310-308		Airbus A310 (GE CF6)
	A310-324 A310-325		Airbus A310 (PW 4000)
	A310-204 A310-222 A310-322		Airbus A310 (PW JT9D)
	A318-120 series		Airbus A318 (PW 6000)
	A318-110 series A319-110 series A320-111 A320-210 series A321-110 series A321-210 series		Airbus A318/A319/A320/A321 (CFM56)
	A319-130 series A320-230 series A321-130 series A321-230 series		Airbus A319/A320/A321 (IAE V2500)
	A330-200 series A330-300 series		Airbus A330 (GE CF6)
	A330-220 series A330-320 series		Airbus A330 (RPW 4000)
	A330-240 series A330-340 series		Airbus A330 (RR RB 211 Trent 700)
	A340-210 series A340-310 series		Airbus A340 (CFM56)

TC holder	Model	Commercial Designation	CAR 66 Type rating endorsement
	A340-540 series A340-640 series		Airbus A340 (RR RB 211 Trent 500)
	A350-900 series		Airbus A350 (RR Trent XWB)
	A380-860 series		Airbus A380 (EA GP7200)
	A380-840 series		Airbus A380 (RR RB 211 Trent 900)
Airbus Military Sociedad Limitada (AMSL)	A400M-180		Airbus A400M (EPI TP400)
AIRCRAFT INDUSTRIES	L-410 M/UVP L-410 UVP-E L-410 UVP-E20 L-410 UVP-E20 CARGO L-410 UVP-E9 L-410 UVP-E- LW L-410 UVP-LW	Turbolet Turbolet Turbolet Turbolet Turbolet Turbolet Turbolet	Let L-410 (Walter M601)
	L-420		Let L-420 (Walter M601)
ALENIA AERMACCHI	C-27J		Alenia C-27 (Allison/RR AE2100)
ANTONOV	AN-26 AN-26B		Antonov AN26 (Ivchenko AI-24)
ATR-GIE Avions de Transport Régional	ATR 42-200 ATR 42-300 ATR 42-320		ATR 42-200/300 series (PWC PW120)
	ATR 42-400 ATR 42-500 ATR 42-500 ATR 72-212 A ATR 72-212 A	 42-500 42-600 72-500 72-600	ATR 42-400/500/72-212A (PWC PW120)
	ATR 72-101 ATR 72-102 ATR 72-201 ATR 72-202 ATR 72-211 ATR 72-212		ATR 72-100/200 series (PWC PW120)

TC holder	Model	Commercial Designation	CAR 66 Type rating endorsement
BAE SYSTEMS	BAe ATP		ATP (PWC PW120)
	AVRO 146- RJ100 AVRO 146- RJ115 AVRO 146-RJ70 AVRO 146-RJ85 BAe 146 Series 100 BAe 146 Series 200 BAe 146 Series 300		BAe 146/ AVRO 146-RJ (Honeywell ALF500 Series)
	HP.137 Jetstream Mk.1 HP.137 Jetstream Mk.1	Jetstream 1 Jetstream 2	HP.137 (Turbomeca Astazou)
	HS 748 Series 2A HS 748 Series 2B HS.748 Series 1 HS.748 Series 2		HS748 (RRD Dart)
	Jetstream 200		Jetstream 200 (Turbomeca Astazou)
	Jetstream 3100 Jetstream 3200	Jetstream 31 Jetstream32/ 32EP	Jetstream 31/32 (Honeywell TPE331)
	Jetstream 4100		Jetstream 41 (Honeywell TPE331)
BERIEV Aircraft Company	Be-200ES-E		Beriev 200 (Ivchenko D-436TP)
B-N GROUP Ltd. (Britten-Norman)	BN2T/-2/-2R/-4R/-4S	Turbine Islander	Britten-Norman BN2T Series (RR Corp 250)
BOEING COMPANY	B707-200 B707-200B B707-300 Series		Boeing 707 (PW JT4)
	B707-400 Series		Boeing 707 (RR Conway)
	B707-100 B707-100B B707 -100B B707-300B Series B707-300C Series B720 B720B	Long Body Long Body Short Body	Boeing 707/720 (PW JT3D)

TC holder	Model	Commercial Designation	CAR 66 Type rating endorsement
	B727 Series B727-100 Series B727-100C Series B727-200 Series B727C Series		Boeing 727 (PW JT8D)
	B737-100 B737-200 B737-200C		Boeing 737-100/200 (PW JT8D)
	B737-300 B737-400 B737-500		Boeing 737-300/400/500 (CFM56)
	B737-600 B737-700 B737-800 B737-900 B737-900ER		Boeing 737-600/700/800/900 (CFM56)
	B747-100		Boeing 747-100 (PW JT9D)
	B747-200B B747-200C B747-200F B747 300		Boeing 747-200/300 (GE CF6)
	B747-200B B747-200C B747-200F B747-300		Boeing 747-200/300 (PW JT9D)
	B747-200B B747-200C B747-200F B747-300		Boeing 747-200/300 (RR RB211)
	B747-400 B747- 400F/SF(BCF)		Boeing 747-400 (GE CF6)
	B747-400 B747-400F/SF(BCF)		Boeing 747-400 (PW 4000)
	B747-400 B747-400F/SF(BCF)		Boeing 747-400 (RR RB211)

TC holder	Model	Commercial Designation	CAR 66 Type rating endorsement
	B747-8F B747-8I	Freighter Intercontinental	Boeing 747-8 (GE GEnx)
	B747SP		Boeing 747SP (PW JT9D)
	B747SP		Boeing 747SP (RR RB211)
	B757-200 B757-200PF B757-300		Boeing 757-200/300 (PW 2000)
	B757-200 B757-200PF B757-300		Boeing 757-200/300 (RR RB211)
	B767-200 B767-300		Boeing 767-200/300 (PW 4000)
	B767-200 B767-300		Boeing 767-200/300 (PW JT9D)
	B767-200 B767-300 B767-300F B767-400ER		Boeing 767-200/300/400 (GE CF6)
	B767-300		Boeing 767-300 (RR RB211)
	B777-200 B777-200LR B777-300ER B777F	Freighter	Boeing 777-200/300 (GE 90)
	B777-200 B777-300		Boeing 777-200/300 (PW 4000)
	B777-200 B777-300		Boeing 777-200/300 (RR RB211 Trent 800)
	B787-8	Dreamliner	Boeing 787-8 (GE GEnx)
	B787-8	Dreamliner	Boeing 787-8 (RR RB 211 Trent 1000)
BOMBARDIER	BD-100-1A10	Challenger 300	Bombardier BD-100-1A10 (Honeywell AS907)
	BD-700-1A10 BD-700-1A11	Global Express Global 6000 Global 5000 Global 5000 GVFD	Bombardier BD-700 Series (RRD BR710)
	CL600-1A11	Challenger 600	Bombardier CL-600-1A11 (Honeywell ALF502)
	CL-600-2A12 (601 Variant) CL-600-2B16 (601-3A Variant) CL-600-2B16 (601-3R Variant)	Challenger 601 Challenger 601-3A Challenger 601-3R	Bombardier CL-600-2A12/-2B16 (variant CL 601/601-3A/3R) (GE CF34)

TC holder	Model	Commercial Designation	CAR 66 Type rating endorsement
	CL-600-2B16 (CL 604 Variant) CL-600-2B16 (CL 604 Variant)	Challenger-604 (MSN < 5701) Challenger-605 (MSN > 5701)	Bombardier CL-600-2B16 (variant CL 604) (GE CF34)
	CL-600-2B19	Regional Jet Series 100	Bombardier CL-600-2B19 (GE CF34)
	CL-600-2C10 CL-600-2D15 CL-600-2D24 CL-600-2E25	Regional Jet Series 700/701/702 Regional Jet Series 705 Regional Jet Series 900 Regional Jet Series 1000	Bombardier CL-600-2C10/-2D15/-2D24/- 2E25 (GE CF34)
	DHC-8-101 DHC-8-102 DHC-8-103 DHC-8-106 DHC-8-201 DHC-8-202 DHC-8-301 DHC-8-311 DHC-8-314 DHC-8-315	DHC-8 Series 100 DHC-8 Series 100 DHC-8 Series 100 DHC-8 Series 100 DHC-8 Series 200 DHC-8 Series 200 DHC-8 Series 300	Bombardier DHC-8-100/200/300 (PWC PW 120)
	DHC-8-400 DHC-8-401 DHC-8-402	DHC-8 Series 400 DHC-8 Series 400 DHC-8 Series 400	Bombardier DHC-8-400 (PWC PW150)
	CL-215-1A10		Canadair CL-215 (PW R2800)
	CL-215-6B11 (CL-215T Variant)		Canadair CL-215 (PWC PW120)
	CL-215-6B11 (CL-415 Variant)		Canadair CL-415 (PWC PW123)

TC holder	Model	Commercial Designation	CAR 66 Type rating endorsement
CESSNA AIRCRAFT Company	401/402		Cessna 401/402 (Continental)
	404		Cessna 404 (Continental)
	411		Cessna 411 (Continental)
	414		Cessna 414 (Continental)
	421		Cessna 421 (Continental)
	425	Corsair/ Conquest I	Cessna 425 (PWC PT6)
	441		Cessna 441 (Honeywell TPE331)
	500 501	Citation/ Citation I Citation I	Cessna 500/ 501/551 (PWC JT15D)
	510		Cessna 510 (PWC PW615)
	525 525A	Citation Jet CJ1 Citation Jet CJ2	Cessna 525/525A (Williams FJ 44)
	525B	Citation Jet CJ3	Cessna 525B (Williams FJ 44)
	525C	Citation Jet CJ4	Cessna 525C (Williams FJ44)
	550 560 560 S550 551	Citation II Citation V Citation Ultra Citation S/II Citation II	Cessna 550/560 (PWC JT15D)
	550 560 560	Citation Bravo Citation Encore Citation Encore +	Cessna 550/560 (PWC PW530/535)
	560 XLS 560 XLS+ 560 XL	Citation XLS Citation XLS+ Citation Excel	Cessna 560XL/XLS (PWC PW545)
	650 650	Citation III, VI Citation VII	Cessna 650 (Honeywell TFE731)
	680	Sovereign	Cessna 680 (PWC PW306)
	750	Citation X	Cessna 750 (RR Corp AE3007C)
DASSAULT AVIATION	Falcon 10		Falcon 10 (Honeywell TFE731)
	Fan Jet Falcon Fan Jet Falcon Series C Fan Jet Falcon Series D Fan Jet Falcon Series E Fan Jet Falcon Series F	(Basic) Fan Jet Falcon	Falcon 20 (GE CF700)

TC holder	Model	Commercial Designation	CAR 66 Type rating endorsement
	Fan Jet Falcon Series G Mystère Falcon 200 Mystère Falcon 20GF		Falcon 200 (Honeywell ATF 3-6)
	Falcon 2000		Falcon 2000 (CFE 738)
	Falcon 2000EX		Falcon 2000EX (PWC PW308)
	Falcon 2000EX Falcon 2000EX Falcon 2000EX	F2000EX EASy F2000DX F2000LX	Falcon 2000EX EASy (PWC PW308)
	Mystère Falcon 20-C5 Mystère Falcon 20-D5 Mystère Falcon 20-E5 Mystère Falcon 20-F5		Falcon 20-5 (Honeywell TFE731)
	Mystère Falcon 50		Falcon 50 (Honeywell TFE731)
	Mystère Falcon 50	F50EX	Falcon 50EX (Honeywell TFE731)
	Falcon 7X		Falcon 7X (PWC PW307A)
	Mystère Falcon 900 Mystère Falcon 900	 F900B	Falcon 900 (Honeywell TFE731)
	Mystère Falcon 900	F900C	Falcon 900C (Honeywell TFE731)
	Falcon 900EX		Falcon 900EX (Honeywell TFE731)
	Falcon 900EX Falcon 900EX Falcon 900EX	F900EX EASy F900DX F900LX	Falcon 900EX EASy (Honeywell TFE731)
DORNIER Seastar	Seastar CD2		Dornier Seastar CD2 (PWC PT6)
EADS CASA	C-212-CB C-212-CC C-212-CD C-212-CE C-212-CF C-212-DD C-212-DF C-212-EE C-212-VA	Aviocar Aviocar Aviocar Aviocar Aviocar Aviocar Aviocar Aviocar Aviocar	CASA C-212 (Honeywell TPE331)

TC holder	Model	Commercial Designation	CAR 66 Type rating endorsement
	C-212-DE	Aviocar	CASA C-212 (PWC PT6)
	C-295		CASA C-295 (PWC PW127)
	CN-235 CN-235-100 CN-235-200 CN-235-300		CASA CN-235 (GE CT7)
ECLIPSE AEROSPACE Inc.	EA500		Eclipse EA500 (PWC PW610)
EMBRAER	EMB-110P1 EMB-110P2	Bandeirante Bandeirante	Embraer EMB-110 (PWC PT6)
	EMB-121A EMB-121A1	Xingu I Xingu II	Embraer EMB-121 (PWC PT6)
	EMB-120 EMB-120ER EMB-120RT	Brasilia Brasilia Brasilia	Embraer EMB-120 (PWC PW110 Series)
	EMB-135BJ EMB-135ER EMB-135LR EMB-145 EMB-145EP EMB-145ER EMB-145EU EMB-145LR EMB-145LU EMB-145MK EMB-145MP	Legacy 600 Legacy 650	Embraer EMB-135/145 (RR Corp AE3007A)
	EMB-500	Phenom 100	Embraer EMB-500 (PWC PW617)
	EMB-505	Phenom 300	Embraer EMB-505 (PWC PW535)
	ERJ 170-100 LR ERJ 170-100 STD ERJ 170-200 LR ERJ 170-200 STD	ERJ-170 ERJ-170 ERJ-175 ERJ-175	Embraer ERJ-170 Series (GE CF34)
	ERJ 190-100 ECJ ERJ 190-100 IGW ERJ 190-100 LR ERJ 190-100 SR ERJ 190-100 STD ERJ 190-200 IGW ERJ 190-200 LR ERJ 190-200 STD	Lineage 1000 ERJ-190 AR ERJ-190 ERJ-190 ERJ-190 ERJ-195 AR ERJ-195 ERJ-195	Embraer ERJ-190 Series (GE CF34)

TC holder	Model	Commercial Designation	CAR 66 Type rating endorsement
MARYLAND AIR INDUSTRIES (FOKKER-FAIRCHILD)	F-27A to -M FH-227 FH-227B FH-227C FH-227D FH-227E		Fokker F27/Fairchild F-27/FH-227 Series (RRD Dart)
FOKKER SERVICES	F27 Mark 100 F27 Mark 200 F27 Mark 300 F27 Mark 400 F27 Mark 500 F27 Mark 600 F27 Mark 700	Friendship Friendship Friendship Friendship Friendship Friendship Friendship	
FOKKER SERVICES	F27 Mark 050 F27 Mark 0502 F27 Mark 0604	Fokker 50 Fokker 50 Fokker 60	Fokker 50/60 Series (PWC PW 125/127)
	F28 Mark 0070 F28 Mark 0100	Fokker 70 Fokker 100	Fokker 70/100 (RRD Tay)
	F28 Mark 1000 F28 Mark 1000C F28 Mark 2000 F28 Mark 3000 F28 Mark 3000C F28 Mark 3000R F28 Mark 3000RC F28 Mark 4000	Fellowship Fellowship Fellowship Fellowship Fellowship Fellowship Fellowship Fellowship	Fokker F28 Series (RRD Spey)
GOMOLZIG			Dornier Do 28 (Walter M601)
GOVERNMENT AIRCRAFT FACTORIES (ASTA)	N22/N22A to N22S N24/N24A		Nomad N22/24 Series (RR Corp 250)
GROB Luft- und Raumfahrt			Grob G 520 Series (Honeywell TPE331)

TC holder	Model	Commercial Designation	CAR 66 Type rating endorsement
GULFSTREAM AEROSPACE Corporation	G-1159 G-1159A G-1159B	Gulfstream II Gulfstream IIB Gulfstream III	Gulfstream G-1159 Series (RRD Spey)
	G-159	Gulfstream I	Gulfstream G-159 (RRD Dart)
	GIV (G300) GIV (G400) G-IV/GIV-SP	Gulfstream G300 Gulfstream G400 Gulfstream G-IV/ GIV-SP	Gulfstream G-IV Series (RRD Tay)
	GIV-X (G350) GIV-X (G450)	Gulfstream G350 Gulfstream G450	Gulfstream GIV-X Series (RRD Tay)
	GV	Gulfstream GV	Gulfstream GV basic model (RRD BR710)
	GV-SP (G500) GV-SP (G550)	Gulfstream G500 Gulfstream G550	Gulfstream GV-SP Series (RRD BR710)
	GVI	G650	Gulfstream GVI (RRD BR725)
GULFSTREAM AEROSPACE LP (GALP) c/o Israel Aircraft Industries	1125 Westwind Astra Astra SPX G100	Gulfstream 100	Gulfstream (IAI) 100/1125/Astra SPX (Honeywell TFE731)
GULFSTREAM AEROSPACE LP (GALP) c/o Israel Aircraft Industries	Gulfstream 200 / IAI Galaxy	Galaxy 200	Gulfstream (IAI) 200/Galaxy (PWC PW306)
	Gulfstream G150	Gulfstream G150	Gulfstream (IAI) G150 (Honeywell TFE731)
	Gulfstream G280	Gulfstream G280	Gulfstream (IAI) G280 (Honeywell AS907)
HAWKER BEECHCRAFT Corporation	65-90 65-A90 65-A90-1 65-A90-2 65-A90-4 B90 C90 C90A C90GT C90GTi E90 F90 H90	King Air	Beech 90 Series (PWC PT6)

TC holder	Model	Commercial Designation	CAR 66 Type rating endorsement
	200/A200 200C/A200C 200CT/A200CT 200T B200 B200C B200CGT B200CT B200GT B200T		Beech 200 Series (PWC PT6)
	390	Premier 1, 1A	Beech 390 (Williams FJ44)
	99 100 99A A100 A100A/C A99 A99A B99 C99	 King Air King Air King Air Airliner Airliner Airliner Airliner Airliner	Beech 99/100 Series (PWC PT6)
	B100		Beech B100 (Honeywell TPE331)
	1900 1900C 1900D	Airliner Airliner Airliner	Beech 1900 (PWC PT6)
	300 300LW B300 B300C	Super King Air Super King Air Super King Air 350 Super King Air 350 C	Beech 300 Series (PWC PT6)
	400 400A 400T MU-300 MU-300-10	Beechjet Beechjet (Hawker 400XP) Beechjet Diamond I/IA Diamond II	Beech 400/Mitsubishi MU-300 (PWC JT15)

TC holder	Model	Commercial Designation	CAR 66 Type rating endorsement
	BH.125 series 400	"Beechcraft Hawker"	BAe 125 Series (RR Viper)
	BH.125 series 600	"Beechcraft Hawker"	
	DH.125 series 1	"Hawker Siddeley"	
	DH.125 series 3	"Hawker Siddeley"	
	DH.125 series 400	"Hawker Siddeley"	
	HS.125 series 1	"Hawker Siddeley"	
	HS.125 series 3	"Hawker Siddeley"	
	HS.125 series 400	"Hawker Siddeley"	
	HS.125 series 600	"Hawker Siddeley"	
	HS.125 series F3	"Hawker Siddeley"	
	HS.125 series F400	"Hawker Siddeley"	
	HS.125 series F600	"Hawker Siddeley"	
	BAe.125 series 800	"Beechcraft Hawker"	BAe 125 Series /700/800 (Honeywell TFE731)
	BH.125 series 400	"Beechcraft Hawker"	
	BH.125 series 600	"Hawker Siddeley"	
	DH.125 series 1	"Hawker Siddeley"	
	DH.125 series 3	"Hawker Siddeley"	
	DH.125 series 400	"Hawker Siddeley"	
	Hawker 800	"Hawker Siddeley"	
	HS.125 series 3	"Hawker Siddeley"	
	HS.125 series 600	"Hawker Siddeley"	
	HS.125 series 700	"Hawker Siddeley"	
	HS.125 series F3	"Hawker Siddeley"	
	HS.125 series F400	"Hawker Siddeley"	
	HS.125 series	"Hawker Siddeley"	
	F600	"Hawker Siddeley"	
	BAe.125 series		BAe 125 Series 1000 (PWC PW305)
	1000A/B Hawker 1000		
	Hawker 750	Hawker 750	BAe 125 Series 750/800XP/850XP/900XP (Honeywell TFE731)
	Hawker 800XP Hawker	Hawker 800XP	
	850XP	Hawker 850XP	

TC holder	Model	Commercial Designation	CAR 66 Type rating endorsement
	Hawker 900XP	Hawker 900XP	
	4000	Hawker 4000	Hawker 4000 (PWC PW308)
ISRAEL AIRCRAFT INDUSTRIES	IAI 1121 IAI 1121A IAI 1121B IAI 1123	Jetcommander Jetcommander Jetcommander Commodore Jet	IAI 1121/1123 (GE CJ610)F
	IAI 1124 IAI 1124A	Westwind Westwind	IAI 1124 (Honeywell TFE731)
KELOWNA (Convair)	440		Convair 580 (RR Corp 501)
LEARJET	LJ 23		Learjet 23 (GE CJ610)
	24 /24A 24B / 24B-A 24C 24D / 24D-A 24E 24F / 24F-A 25 25A 25B 25C 25D 25F		Learjet 24/25 (GE CJ610)
	31 / 31A		Learjet 31 (Honeywell TFE731)
	35 / 35A 36 / 36A		Learjet 35/36 (Honeywell TFE731)
	55 / 55B / 55C		Learjet 55 (Honeywell TFE731)
	Learjet 60	LJ60 LJ60XR	Learjet 60 (PWC PW305)
	Learjet 40 Learjet 45	LJ45 LJ40XR LJ45 LJ 45XR	Learjet Model 45 (Honeywell TFE731)
LOCKHEED MARTIN Corporation	1329-25	JetStar II	Lockheed 1329 (Honeywell TFE731)
	1329-23D	JetStar	Lockheed 1329 PW (PW JT12)
	Model 188C Model L188A	Electra Electra	Lockheed 188 (RR Corp 501)

TC holder	Model	Commercial Designation	CAR 66 Type rating endorsement
	382G	Hercules	Lockheed 382 (RR Corp 501)
	L-1011-385-1 L-1011-385-1- 15 L-1011-385-3	TriStar TriStar TriStar	Lockheed L-1011 (RR RB211)
M7 AEROSPACE	SA-26-T		Fairchild SA26-T (PWC PT6)
	SA26AT		Fairchild SA26 AT (Honeywell TPE331)
	SA226-AT SA226-T SA226-T(B) SA226-TC		Fairchild SA226 Series (Honeywell TPE331)
	SA227-AC SA227-AT SA227-BC SA227-CC SA227-DC SA227-TT	Swearingen Metro	Fairchild SA227 Series (Honeywell TPE331)
	SA227-PC	Swearingen Metro	Fairchild SA227 Series (PWC PT6)
McDonnell DOUGLAS Corporation	DC-10-10 DC-10-30 DC-10-30F		DC-10/MD-10 (GE CF6)
	DC-8 Series 70 DC-8 Series 70F		DC-8 (CFM56)
	DC-8 Series 50 DC-8 Series 60 DC-8 Series 60F DC-8F		DC-8 (PW JT3D)
	DC-8 Series 40		DC-8 (RR Conway)
	DC-9-10 Series DC-9-20 Series DC-9-30 Series DC-9-40 Series DC-9-50 Series		DC-9 (PW JT8D)
	717-200		MD 717-200 (RRD BR700-715)
	MD-11 MD-11F		MD-11 (GE CF6)

TC holder	Model	Commercial Designation	CAR 66 Type rating endorsement
	MD-11		MD-11 (PW 4000)
	DC-9-81 (MD-81) Series DC-9-82 (MD-82) Series DC-9-83 (MD-83) Series DC-9-87 (MD-87) Series MD-88	MD-81 MD-82 MD-83 MD-87	MD-80 Series (PW JT8D)
	MD-90 Series		MD-90 (IAE V2500)
MITSUBISHI Heavy Industries	MU-2B-26A MU-2B-36A MU-2B-40 MU-2B-60		Mitsubishi MU-2B (Honeywell TPE331)
PIAGGIO Aero Industries	P.166 DP1		Piaggio P166 (PWC PT6)
	P180 P180	Avanti Avanti II	Piaggio P180 Avanti/Avanti II (PWC PT6)
PILATUS AIRCRAFT	PC-12 PC-12/45 PC-12/47 PC-12/47E		Pilatus PC-12 (PWC PT6)
PIPER AIRCRAFT	PA31T to T3	Cheyenne	Piper PA-31T Series (PWC PT6)
	PA-42-1000	Cheyenne 400LS	Piper PA-42 (Honeywell TPE-331)
	PA-42 PA-42-720 PA-42-720R	Cheyenne III Cheyenne IIIA	Piper PA-42 (PWC PT6)
	PA-46-500TP	Malibu Meridian	Piper PA-46-500TP (PWC PT6)
POLSKIE ZAKLADY LOTNICZE	PZL M28 00 PZL M28 02 PZL M28 05		PZL M 28 (PWC PT6)
REIMS AVIATION	F 406	Caravan II	Reims-Cessna F 406 (PWC PT6)
RUAG Aerospace Services GmbH	DO 28 D-6 Dornier 128-6		Dornier Do 28 Series (PWC PT6)
	228-100 series 228-200 series		Dornier 228 (Honeywell TPE331)
SAAB AB, SAAB Aerosystems	340A(SF340A) 340B	Saab-Fairchild 340A	Saab (SF) 340 (GE CT7)
	2000		Saab 2000 (RR Corp AE2100)

TC holder	Model	Commercial Designation	CAR 66 Type rating endorsement
SABRELINER Corporation	NA-265-65		Sabreliner NA-265 (Honeywell TFE731)
	NA-265-65		Sabreliner NA-265 (PW JT12)
SHORT BROTHERS	SC7 Series 3	Skyvan	Shorts SC7 (Honeywell TPE331)
	SD3-30 SD3-60 SD3-60 SHERPA SD3-SHERPA	Variant 200 Variant 200 Variant 200 Variant 200	Shorts SD3 Series-30/SD3-60 (PWC PT6)
SOCATA	TBM 700 A TBM 700 B TBM 700 C1 TBM 700 C2 TBM 700 N	TBM 850	Socata TBM 700/850 (PWC PT6)
TUPOLEV PSC	TU 204-120CE		Tupolev TU 204 (RR RB211)
TWIN COMMANDER AIRCRAFT Corporation	681 690 695 680-T 680-V 680-W 690A 690B 690C 690D 695A 695B		Twin Commander 680/681/690/695 Series (Honeywell TPE331)
VIKING AIR (Bombardier)(De Havilland)	DHC-6-1 DHC-6-100/110 DHC-6-200/210 DHC-6-300/310/320 DHC-6-400	Twin Otter	De Havilland DHC-6 (PWC PT6)
	DHC-7-100 DHC-7-101 DHC-7-102 DHC-7-103 DHC-7-110 DHC-7-111		De Havilland DHC-7 (PWC PT6)
VULCANAIR	AP68TP300	Spartacus	Vulcanair AP68TP Series (RR Corp 250)

TC holder	Model	Commercial Designation	CAR 66 Type rating endorsement
	AP68TP600	Viator	
	SF600 SF600A SF600TP		Vulcanair SF600 (RR Corp 250)

GROUP 1 HELICOPTERS			
TC holder	**Model**	**Commercial Designation**	CAR 66 Type rating endorsement
AGUSTA WESTLAND	A109E A109N A109S AW109SP		Agusta A109 Series (PWC PW206/207)
	A109 A109A A109AII A109C		Agusta A109 Series (RR Corp 250)
	A109K2		Agusta A109 (Turbomeca Arriel 1)
	A109E A109LUH		Agusta A109 Series (Turbomeca Arrius 2)
	AB139 AW139		Agusta AB139/AW139 (PWC PT6)
	EH101-500 Series EH101-510 Series EH101-300		Agusta/Westland EH-101 (GE CT7)
	Aw189		AW189 (GE CT7)
	AB 212		Bell 212/Agusta AB212 (PWC PT6)
BELL HELICOPTER TEXTRON, INC.	212		
AGUSTA	AB 204 B Series AB 205 A1		Agusta AB204, AB205/Bell 204, 205 (Honeywell T53)
BELL HELICOPTER TEXTRON, INC.	204B 205A-1		
BELL HELICOPTER TEXTRON, INC	412 412EP 412CF		Bell 412/Agusta AB412 (PWC PT6)
AGUSTA	AB 412 AB 412 EP		
BELL HELICOPTER TEXTRON	214B 214B-1		Bell 214 (Honeywell T5508)
	214ST		Bell 214ST(GE CT7)
BELL HELICOPTER CANADA	222 222B 222U		Bell 222 (Honeywell LTS 101)
	230 230 230	230 Executive 230 Utility 230 EMS	Bell 230 (RR Corp 250)

TC holder	**Model**	**Commercial Designation**	CAR 66 Type rating endorsement
	427		Bell 427 (PWC PW207D)
	429		Bell 429 (PWC PW207D)
	430		Bell 430 (RR Corp 250)
ERICKSON AIR-CRANE	EAC S-64F		Erickson S-64 (PW JFTD 12)
EUROCOPTER	SA 330 J		Eurocopter SA 330 (Turbomeca Turmo)
	AS 332 C AS 332 L AS 332 C1 AS 332 L1		Eurocopter AS 332 (Turbomeca Makila 1A/1A1)
	AS 332 L2		Eurocopter AS 332 L2 (Turbomeca Makila 1A2)
	AS 355 E AS 355 F AS 355 F1 AS 355 F2		Eurocopter AS 355 (RR Corp 250)
	AS 355 N AS 355 NP		Eurocopter AS 355 (Turbomeca Arrius 1)
	SA 365 N	Dauphin	Eurocopter SA 365 N (Turbomeca Arriel 1)
	SA 365 N1 AS 365 N2	Dauphin Dauphin	Eurocopter SA 365 N/N1, AS 365 N2 (Turbomeca Arriel 1)
	AS 365 N3	Dauphin	Eurocopter AS 365 N3 (Turbomeca Arriel 2C)
	EC 155 B EC 155 B1		Eurocopter EC 155 (Turbomeca Arriel 2)
	EC 225 LP		Eurocopter EC 225 (Turbomeca Makila 2A)
	SA 365 C SA 365 C1 SA 365 C2 SA 365 C3	Dauphin Dauphin Dauphin Dauphin	Eurocopter SA 365 C Series (Turbomeca Arriel 1)
	SA 366 G1	Dauphin	Eurocopter SA 366 G1 Series (Lycoming LTS101)
Philippine Aerospace Development Corp	P-BO 105 C P-BO 105 S		
EUROCOPTER DEUTSCHLAND GmbH	BO 105 A BO 105 C BO 105 D Series		BO 105 series (RR Corp 250)
	BO 105 LS A-1 BO 105 LS A-3 BO 105 S		
	EC 135 P1 Series EC 135 P2 Series EC 635 P2+		Eurocopter EC 135 (PWC PW206)

TC holder	**Model**	**Commercial Designation**	CAR 66 Type rating endorsement
	EC 135 T1 Series EC 135 T2 Series EC 635 T1 Series EC 635 T2 Series		Eurocopter EC 135 (Turbomeca Arrius 2B)
	MBB-BK 117 A Series MBB-BK 117 B Series		Eurocopter MBB-BK 117 A/B (Honeywell LTS 101)
	MBB-BK 117 C1		Eurocopter MBB-BK 117 C1 (Turbomeca Arriel 1)
	MBB-BK 117 C2	EC145	Eurocopter MBB-BK 117 C2 (Turbomeca Arriel 1)
KAMAN AEROSPACE CORPORATION	K-1200		Kaman K-1200 (Honeywell T5317)
KAMOV	Ka-32A11BC		Kamov Ka 32 (Klimov)
MD HELICOPTERS,	MD900		MD Helicopters MD900 (PWC PW206/207)
PZL-ŚWIDNIK	W-3A W-3AS		PZL-Swidnik W-3A/W-3AS (Rzeszow PZL-10W)
AGUSTA	AS61N AS61NI		Agusta AS61N/Sikorsky S-61N (GE CT58)
SIKORSKY AIRCRAFT	S-61N S-61NM		
SIKORSKY AIRCRAFT	S-58 BT to JT		Sikorsky S-58 (PWC PT6T)
	S-76A		Sikorsky S-76A (RR Corp 250)
	S-76A S-76A	S-76A+ S-76A++	Sikorsky S-76 (Turbomeca Arriel 1)
	S-76B	S-76B	Sikorsky S-76B (PWC PT6)
	S-76C		Sikorsky S-76C (Turbomeca Arriel 1)
	S-76C S-76C	S-76C+ S-76C++	Sikorsky S-76C (Turbomeca Arriel 2)
	S-92A		Sikorsky S-92A (GE CT7-8)

SUB-GROUP 2a: SINGLE TURBO-PROPELLER ENGINE AEROPLANES (Other than those in Group 1)	
TC holder	**CAR 66 Type rating endorsement**
AERO VODOCHODY	Aero Ae-270 (PWC PT6)
AIR TRACTOR	Air Tractor AT-302 (Lycoming LTP-101) Air Tractor AT-400/500/600 Series (PWC PT6)
ALENIA AERMACCHI	Aermacchi SF260 (RR Corp 250)
ALLIED AG CAT Productions	Grumman G-164 (PWC PT6)
CESSNA AIRCRAFT Company	Cessna (Soloy) 206/207 (RR Corp 250) Cessna 208 Series (PWC PT6) Cessna 210 (RR Corp 250)
EADS PZL "WARSZAWA-OKECIE"	EADS PZL PZL-106 BT (Walter M601) EADS PZL PZL-106 BTU (PWC PT6)
EXTRA Flugzeugproduktions - und Vertriebs-GmbH	Extra EA-400-500 (RR Corp 250)
MAULE AEROSPACE TECHNOLOGY	Maule MX-7 (RR Corp 250)
PACIFIC AEROSPACE Corporation	PAC 750XL (PWC PT6)
PILATUS AIRCRAFT	Pilatus PC-6 Series (Turbomeca Astazou) Pilatus PC-6 (PWC PT6) Pilatus PC-6 Series (Honeywell TPE 331)
THRUSH AIRCRAFT	Ayres S2R Series (PWC PT6)
VIKING AIR (Bombardier) (De Havilland)	De Havilland DHC-2 (PWC PT6)
ZLIN AIRCRAFT	Zlin Z-37 T Series (Walter M601)

SUB-GROUP 2b: SINGLE TURBINE ENGINE HELICOPTERS (Other than those in Group 1)			
TC holder	**Model**	**Commercial Designation**	**CAR 66 Type rating endorsement**
AGUSTA	A119 AW119 MkII	Koala Koala	Agusta A119/ Agusta AW119MkII (PWC PT6)
BELL HELICOPTER CANADA	407		Bell 407 (RR Corp 250)
AGUSTA	AB 206A AB 206B		Agusta AB206 / Bell 206 (RR Corp 250)
BELL HELICOPTER TEXTRON CANADA	206 Series from A to L		
THE ENSTROM HELICOPTER	480		Enstrom 480 (RR Corp 250)
EUROCOPTER	AS 350 B AS 350 B1 AS 350 B2 AS 350 BA AS 350 BB	Écureuil	Eurocopter AS 350 (Turbomeca Arriel 1)
	AS 350 B3		Eurocopter AS 350 (Turbomeca Arriel 2)
	AS 350 D		Eurocopter AS 350 (Honeywell LTS 101)
	EC 120 B	Colibri	Eurocopter EC 120 (Turbomeca Arrius 2F)
	EC 130 B4 EC 130 T2		Eurocopter EC 130 (Turbomeca Arriel 2)
	SA 315 B	Lama	Eurocopter SA 315B (Turbomeca Artouste)
	SA 3180 SA 318 B SA 318 C	Alouette- Astazou	Eurocopter SA 318 (Turbomeca Astazou)
	SA 319 B	Alouette III	Eurocopter SA 319 (Turbomeca Astazou XIV)
	SA 341 G	Gazelle	Eurocopter SA 341 (Turbomeca Astazou)
	SA 342 J	Gazelle	Eurocopter SA 342 J (Turbomeca Astazou XIV)
	SE 3160 SA 316 B SA 316 C	Alouette III	Eurocopter SA 316 B/SA 316 C (Turbomeca Artouste)
MD HELICOPTERS INC. (MDHI)	369 H series 369 D, E and FF NH-500D		MD Helicopters 369 Series/SEI NH-500D (RR Corp 250)
MD HELICOPTERS INC. (MDHI)	500N 600N		MD Helicopters 500N/600N AMD500N (RR Corp 250)

TC holder	Model	Commercial Designation	CAR 66 Type rating endorsement
Mecaer Aviation	AMD-500N		
PZL-ŚWIDNIK	SW-4		PZL SW-4 (RR Corp 250)
ROBINSON HELICOPTER COMPANY	R66		Robinson R66 (RR Corp 250)
SCHWEIZER AIRCRAFT CORPORATIO	269D		Schweizer 269D (RR Corp 250)

SUB-GROUP 2c: SINGLE PISTON-ENGINE HELICOPTERS (Other than those in Group 1)			
TC holder	**Model**	**Commercial Designation**	**CAR 66 Type rating endorsement**
ANTARES INTERNATIONAL	SH-4		Silvercraft SH-4 (Franklin)
BRANTLY INTERNATIONAL, INC.	B-2		Brantly B2 (Lycoming)
HELICOPTÈRES GUIMBAL	G2	Cabri	Cabri G2 (Lycoming)
THE ENSTROM HELICOPTER CORPORATION	F-28 series 280 series		Enstrom F-28/280 (Lycoming) Enstrom F-28/280 (Lycoming)
Mecaer Aviation Group	NH 300C	Model 300C	Schweizer/Breda Nardi 269/300 (Lycoming)
SCHWEIZER AIRCRAFT CORPORATION	269A 269B 269C 269C-1	Model 300C Model 300C Model 300C Model 300C	
ROBINSON HELICOPTER COMPANY	R22 R22 ALPHA R22 BETA R22 MARINER R44 R44 II		Robinson R22/R44 Series (Lycoming)
SIKORSKY AIRCRAFT	S-58 A to J		Sikorsky S-58 (Wright Cyclone)

GROUP 3: PISTON-ENGINE AEROPLANES (Other than those in Group 1)		
TC holder	**CAR 66 Type rating endorsement**	**Type of structure**
AERO Sp.z.o.o	Aero AT-3 (Rotax)	Metal
AEROSTAR AIRCRAFT Corporation	Piper PA-60/61 Series (Lycoming)	Metal 601P/602P/700P Metal/ pressurised
AIR TRACTOR	Air Tractor AT-250/300 (PW R985) Air Tractor AT-301/401/501 (PW R1340) Air Tractor AT-401 (PZL-3S)	Metal Metal Metal
Air Transport Group Holdings, Inc.	Lake C/LA Series (Lycoming)	Metal
AIRCRAFT Design and Certification	(WD) D4 Fascination (Rotax)	Composite
AIRCRAFT INDUSTRIES	Let L 200 (LOM) Let Z-37 Series (LOM)	Metal Metal tubing Fabric
ALENIA AERMACCHI	Aermacchi F260 Series (Lycoming) SIAI-Marchetti S.205 (Franklin) SIAI-Marchetti S.205/S.208 (Lycoming)	Metal Metal Metal
ALEXANDRIA Aircraft LLC	Bellanca 14-19 Series (Continental) Bellanca 17-30/17-31 Series (Continental)	Wood/Metal tubing Fabric Wood/Metal tubing Fabric
ALLIED AG CAT Productions	Grumman G-164 (Continental) Grumman G-164 (Jacobs) Grumman G-164 (PW R Series)	Metal Metal Metal
ALPHA AVIATION	Robin HR 200/ R 2000 series (Lycoming)	Metal
AMERICAN CHAMPION	Champion 7 (Superior) Champion 7 (Lycoming) Champion 8 Series (Lycoming)	Wood/Metal tubing Fabric Wood/Metal tubing Fabric Wood/Metal tubing Fabric
AQUILA Aviation by Excellence AG	Aquila AT01 (Rotax)	Composite
AUGUSTAIR	VARGA 2150/2180 (Lycoming)	Metal
B-N GROUP Ltd. (Britten- Norman)	Britten-Norman BN.2A Mark III (Lycoming) Britten-Norman BN2A Series (Lycoming) Britten-Norman BN2B Series (Lycoming)	Metal Metal Metal
CEAPR	Robin ATL / ATL S (JPX 4T60) Robin ATL L (Limbach L2000) Robin DR 220 series (Continental) Robin DR 221 series (Lycoming) Robin DR 250 series (Lycoming) Robin DR 300 series (Lycoming) Robin DR 400 series (Lycoming) Robin DR 400 Series (Thielert) Robin DR 400RP (Porsche) Robin HR 100 series (Continental) Robin HR 100 series (Lycoming) Robin R 1180 series (Lycoming) Robin R 3000 series (Lycoming)	Wood/Composite Wood/Composite Wood/Metal tubing Fabric Wood/Metal tubing Fabric Wood/Metal tubing Fabric Wood/Metal tubing Fabric Wood/Metal tubing Fabric Wood/Metal tubing Fabric Wood/Metal tubing Fabric Wood/Metal tubing Fabric Wood/Metal tubing Fabric Metal Metal

TC holder	CAR 66 Type rating endorsement	Type of structure
CESSNA AIRCRAFT Company	Cessna 150 Series (Rotax)	Metal
	Cessna 175 Series (Continental)	Metal
	Cessna 175 Series (Lycoming)	Metal
	Cessna 177 Series (Lycoming)	Metal
	Cessna 180 Series (Continental)	Metal
	Cessna 185 Series (Continental)	Metal
	Cessna 188 (Continental)	Metal
	Cessna 206 Series (Continental)	Metal
	Cessna 206 Series (Lycoming)	Metal
	Cessna 206 Series (Thielert)	Metal
	Cessna 207 Series (Continental)	Metal
	Cessna 210 Series (Continental)	Metal/P210: Metal/Pressurised
	Cessna 310/320 Series (Continental)	Metal
	Cessna 335 (Continental)	Metal/Pressurised
	Cessna 336 (Continental)	Metal
	Cessna 340 (Continental)	Metal/Pressurised
	Cessna T303 (Continental)	Metal
	Cessna/Reims-Cessna 150/F150 Series (Continental)	Metal
	Cessna/Reims-Cessna 152/F152 Series (Lycoming)	Metal
	Cessna/Reims-Cessna 172/F172 Series (Continental)	Metal
	Cessna/Reims-Cessna 172/F172 Series (Lycoming)	Metal
	Cessna/Reims-Cessna 172/F172 Series (Thielert)	Metal
	Cessna/Reims-Cessna 182/F182 Series (Continental)	Metal
	Cessna/Reims-Cessna 182/F182 Series (Lycoming)	Metal
	Cessna/Reims-Cessna 182/F182 Series (SMA)	Metal
	Cessna/Reims-Cessna 337 Series (Continental) (not pressurised)	Metal
	Cessna/Reims-Cessna 337 Series (Continental) (pressurised)	Metal/Pressurised
	Cessna C300/C350/C400 (Continental)	Composite

TC holder	CAR 66 Type rating endorsement	Type of structure
CIRRUS Design Corporation	Cirrus SR20/SR22/SR22T Series (Continental) Cirrus SR22 Series (Thielert)	Composite Composite
COMMANDER PREMIER AIRCRAFT CO.	Commander 112 (Lycoming) Commander 114 (Lycoming)	Metal Metal
Czech Sport Aircraft a.s.	Czech Sport PS-28 (Rotax)	Metal
DE HAVILLAND Support	Beagle B.121 series 1 (Continental) Beagle B.121 series 2/3 (Lycoming)	Metal Metal
DIAMOND AIRCRAFT Industries	Diamond DA20 (Continental) Diamond DA20/DV20 (Rotax) Diamond DA40 (Austro Engine) Diamond DA40 (Lycoming) Diamond DA40 D (Thielert) Diamond DA42 Series (Austro Engine) Diamond DA42 Series (Thielert)	Composite Composite Composite Composite Composite Composite Composite
DYNAC AEROSPACE Corporation	Aerocommander 100 (Lycoming)	Metal
Dyn'aviation	CAP 10 (Lycoming) CAP 20/21 (Lycoming) CAP 230 Series (Lycoming)	Wood Wood Composite/Wood
EADS Deutschland Military Air Syst	Bölkow BO 208 (Continental) Bölkow BO 209 (Lycoming) Bölkow F.207 (Continental) Bölkow F.207 (Lycoming) SIAT 223 (Lycoming)	Metal Metal Wood/Metal tubing Fabric Wood/Metal tubing Fabric Metal
EADS PZL "WARSZAWA- OKECIE"	PZL-104 Wilga (Lycoming) PZL-104 Wilga Series (PZL) PZL-104A Wilga (Ivchenko) PZL-110 Koliber (Franklin) PZL – Koliber 150 series (Lycoming) PZL – Koliber 160 (Lycoming)	Metal Metal Metal Metal Metal Metal
EIS GmbH	RS 180 (Lycoming)	Wood/Metal tubing Fabric
EVEKTOR	Evektor EV-97 (Rotax) Sportstar RTC (Rotax)	Metal Metal
EXTRA Flugzeugproduktions- und Vertriebs-GmbH	Extra EA-200/300 Series (Lycoming) Extra EA-400 (Continental)	Composite Composite/Pressurised
FFA ALTENRHEIN	AS202 Series (Lycoming)	Metal
FFT GYROFLUG	SC01 Series (Lycoming)	Composite
Flight Design GmbH	CTLS-ELA (Rotax)	Composite
FLS AEROSPACE	Club Sprint/Sprint 160 (Lycoming) OA7 Optica Series (Lycoming)	Metal Metal

TC holder	CAR 66 Type rating endorsement	Type of structure
Fournier, René	RF 47 (Limbach)	Wood/Metal tubing Fabric
	RF 6B(Continental)	Wood/Metal tubing Fabric
	RF 6B (Lycoming)	Wood/Metal tubing Fabric
FUJI Heavy Industries	Fuji FA-200 Series (Lycoming)	Metal
GA8 Airvan Pty Ltd	Gippsland GA8 (Lycoming)	Metal
GARDAN	Gardan GY 80 (Lycoming)	Metal
GENERAL AVIA Costruzioni Aeronautiche	General Avia F.22 (Lycoming)	Metal
	General Avia F20 Series (Lycoming)	Metal
GOMOLZIG	Ruschmeyer R90-230RG (Lycoming)	Composite
GROB Luft- und Raumfahrt	Grob G115/120 Series (Lycoming)	Composite
HAWKER BEECHCRAFT Corporation	Beech 23 Series (Lycoming)	Metal
	Beech 24 Series (Lycoming)	Metal
	Beech 33 Series (Continental)	Metal
	Beech 35 Series (Continental)	Metal
	Beech 36 Series (Continental)	Metal
	Beech 50 Series (Lycoming)	Metal
	Beech 55 Series (Continental)	Metal
	Beech 56 Series (Lycoming)	Metal
	Beech 58 Series (Continental)	Metal
	Beech 58P (Continental)	Metal/Pressurised
	Beech 58TC (Continental)	Metal
	Beech 60 Series (Lycoming)	Metal
	Beech 65-80 Series (Lycoming)	Metal
	Beech 76 (Lycoming)	Metal
	Beech 77 (Lycoming)	Metal
	Beech 95 Series (Lycoming)	Metal
	Beech A23 (Continental)	Metal
Hoffmann GmbH & Co. KG	H 40 (Lycoming)	Wood/Metal tubing Fabric
INIZIATIVE INDUSTRIALI ITALIANE	III Sky Arrow 650/710 (Rotax)	Composite
INSTYTUT LOTNICTWA	Instytut Lotnictwa I-23 Manager (Lycoming)	Composite
INTERCEPTOR AIRCRAFT Corporation	Aerocommander 200 (Continental)	Metal
ISSOIRE AVIATION	Issoire APM 20/30 (Rotax)	Composite
	Issoire APM 40 (Continental)	Composite
LAVIA ARGENTINA S.A. (LAVIASA)	Piper PA-25 Series (Lycoming)	Metal
LIBERTY AEROSPACE Incorporated	Liberty XL-2 (Continental)	Composite
MAULE AEROSPACE TECHNOLOGY	Maule M4 (Continental)	Metal
	Maule M4 (Franklin)	Metal
	Maule M5 (Continental)	Metal
	Maule M5 (Franklin)	Metal
	Maule M5 (Lycoming)	Metal
	Maule M6 (Lycoming)	Metal
	Maule M7 Series (Lycoming)	Metal
	Maule MX-7 (Lycoming)	Metal

TC holder	CAR 66 Type rating endorsement	
MOONEY AIRPLANE Company	Mooney M18L (Continental)	Wood/Metal tubing Fabric
	Mooney M20 (Continental)	Metal
	Mooney M20/M20A (Lycoming)	Wood/Metal tubing Fabric
	Mooney M20B to M20S/M22 (Lycoming)	Metal
NIPPER	Nipper T-66 (Stark)	Wood/Metal tubing Fabric
OMA SUD SPA Sky Technologies	SKYCAR (Lycoming)	Metal
PIAGGIO Aero Industries	Piaggio P166 (Lycoming)	Metal
PILATUS AIRCRAFT	Pilatus PC-6 Series (Lycoming)	Metal
PIPER AIRCRAFT	Piper PA-23 Aztec (Lycoming)	Metal
	Piper PA-24 Series (Lycoming)	Metal
	Piper PA-28 Series (Continental)	Metal
	Piper PA-28 Series (Lycoming)	Metal
	Piper PA-28 Series (Thielert)	Metal
	Piper PA-30 Series (Lycoming)	Metal
	Piper PA-31 Series (Lycoming)	Metal
	Piper PA-31P (Lycoming)	Metal/Pressurised
	Piper PA-32 Series (Lycoming)	Metal
	Piper PA-34 Series (Continental)	Metal
	Piper PA-34 Series (Lycoming)	Metal
	Piper PA-36 Series (Continental)	Metal
	Piper PA-36 Series (Lycoming)	Metal
	Piper PA-38 Series (Lycoming)	Metal
	Piper PA-39/40 Series (Lycoming)	Metal
	Piper PA-44 Series (Lycoming)	Metal
	Piper PA-46 Series (Continental)	Metal PA-46-310P: Metal/Pressurised
	Piper PA-46 Series (Lycoming)	Metal PA-46-350P: Metal/Pressurised
Polskie Zakłady Lotnicze Sp. z o. o.	PZL M 18 (PZL)	Metal
	PZL M 26 (Lycoming)	Metal
PZL MIELEC	PZL-M20 (PZL)	Metal
REGAL AIR, INC	REGAL AIR 305 Series (Continental)	Metal
REVO, Inc	REVO C/LA-4 Series (Lycoming)	Metal
RUAG AEROSPACE Services GmbH	Do 28 Series (Lycoming)	Metal
S.C.Constructii Aeronautice S.A	IAR-46 (Rotax)	Metal
SCHEIBE Flugzeugbau	SF 23 Series (Continental)	Wood/Metal tubing Fabric
SEASTAR CORP	TSC Series (Lycoming)	Composite
SKY INTERNATIONAL	Aviat Husky A (Lycoming)	Metal
	Pitts S-1 Series (Lycoming)	Wood/Metal tubing Fabric
	Pitts S-2 Series (Lycoming)	Wood/Metal tubing Fabric
Skyfox Aviation Ltd	CA25 Series (Rotax)	Wood/Metal tubing Fabric
SLINGSBY Aviation	Slingsby T67 (Lycoming)	Wood/Metal tubing Fabric
	Slingsby T67A/T67B/T67C/T67M Series (Lycoming)	Composite
SOCATA	Grumman GA-7 (Lycoming)	Metal
	SOCATA MS 881 (Potez)	Metal
	SOCATA MS 894/PZL Koliber (Franklin)	Metal
	SOCATA Rallye Series (Continental)	Metal
	SOCATA Rallye Series (Lycoming)	Metal
	SOCATA TB Series (Lycoming)	Metal/Pressurised

TC holder	CAR 66 Type rating endorsement	Type of structure
STOL AIRCRAFT Corporation	Republic UC-1 (Lycoming)	Metal
SUKHOI	Sukhoi SU-29 (Vedeneyev)	Composite
	Sukhoi Su-29/31 (MGA)	Composite
	Sukhoi SU-31 (Vedeneyev)	Composite
NAFTAA	Symphony OMF-100-160 (Lycoming)	Metal
TAYLORCRAFT 2000	Taylorcraft 19 Series (Continental)	Wood/Metal tubing Fabric
	Taylorcraft F21/F22 Series (Lycoming)	Wood/Metal tubing Fabric
TECNAM Costruzioni Aeronautiche	Tecnam P2006T (Rotax)	Metal
	Tecnam P92 (Rotax)	Metal
	Tecnam P96/P2002/P2004 (Rotax)	Metal
THRUSH Aircraft	Ayres S2R (PW R-985)	Metal
TRUE FLIGHT Holdings	Grumman/American AA-1 Series (Lycoming)	Metal
	Grumman/American AA-5 Series (Lycoming)	Metal
TWIN COMMANDER AIRCRAFT Corporation	Commander 500 Series/680 Series (Lycoming)	Metal 680FP/680FL(P): Metal/Pressurised
	Commander 685 (Continental)	Metal/Pressurised
	Rockwell 700 (Lycoming)	Metal/Pressurised
	Commander 720 (Lycoming)	Metal/Pressurised
VULCANAIR	Partenavia P.64 (Lycoming)	Metal
	Partenavia P.66 (Lycoming)	Metal
	Partenavia P57 (Lycoming)	Wood/Metal tubing Fabric
	Vulcanair F600A (Lycoming)	Metal
	Vulcanair P.68 Series (Lycoming)	Metal
WACO Aircraft Company	Waco YMF (Jacobs)	Wood/Metal tubing Fabric
WACO Classic Aircraft Corp	Waco 2T Series (Lycoming)	Wood/Metal tubing Fabric
WASSMER	CERVA CE43 (Lycoming)	Metal
	CERVA CE44 (Continental)	Metal
	WA4/21 Series (Lycoming)	Wood/Metal tubing Fabric
	WA40 Series (Lycoming)	Wood/Metal tubing Fabric
	WA41 (Lycoming)	Wood/Metal tubing Fabric
XtremeAir GmbH	XtremeAir XA42 (Lycoming)	Composite
YAKOVLEV	Yakovlev YAK-18T (Vedeneyev)	Metal
ZAKLADY LOTNICZE	EM-11 (Lycoming)	Composite
ZLIN AIRCRAFT (MORAVAN AVIATION)	Zlin Z-143 L (Lycoming)	Metal
	Zlin Z-242 L (Lycoming)	Metal
	Zlin Z-26 Series (Walter Minor/AVIA)	Metal
	Zlin Z-42 Series (LOM)	Metal
	Zlin Z-43 Series (LOM)	Metal
	Zlin Z-50 Series (LOM)	Metal
	Zlin Z-50L Series (Lycoming)	Metal
	Zlin Z-526 L (Lycoming)	Metal

APPENDIX II: to AMC to CAR 66

AIRCRAFT TYPE PRACTICAL EXPERIENCE AND ON-JOB-EXPERIENCE– 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 maintenance 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/potable water system.

Perform preflight/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 for 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 coaxial 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.

Servicing of shock strut.

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.

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: to AMC to CAR 66

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 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 including, but not limited to:

- Environmental 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 CAR 66 Appendix I, 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 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 the 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 (reorientate 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/herself, 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.

APPENDIX 1: to CAR66.70 - CONVERSION REPORT

1. Conversion of Existing GCAA Licences

a. This report provides guidelines on the procedure for conversion of existing UAE GCAA licences (issued in accordance with Chapter 7, CAR Part II) into a CAR66–Aircraft Maintenance Engineer Licence (CAR66–AMEL).

b. All existing licence will be converted into either full or restricted CAR66–AMEL depending upon privileges held.

c. To ensure that existing licence holders retain their entitlement to certification privileges that they hold by virtue of their existing licences/authorisations, applicants are requested to provide full details of certification privileges held by them on the application form along with acceptable documentary evidences.

d. Categories/ratings held on the existing licences as well as all properly issued maintenance authorisations which do not exceed the basic scope of applicants' UAE licences will be considered and will be reflected on the converted CAR66– AMEL.

e. Where all combined qualifications/authorisations do not meet requirements of a full CAR66–AMEL, limitations as given in the following paragraph will apply. In case of maintenance authorisations that exceed the scope of basic UAE licence and the applicant cannot provide verifiable evidence that he had ever held or holds similar privileges on his other ICAO signatory state licences, appropriate limitations will be applied on his/her converted CAR 66 licence.

f. With these limitations on the converted licence, the holder may continue to exercise the privileges of the maintenance authorisations as long as he/she continues to work with the organisation that issued the authorisation. However, the holder will lose the right to exercise the privileges upon leaving the organisation.

g. Cut off date for conversion of the existing licences is **01st July 2015.** All existing licence holders will continue to exercise the privileges of old licences until this cutoff date after which they will cease to hold the privileges unless converted onto a CAR66-AMEL in accordance with CAR 66. Applications received after this date for conversion of licences issued in accordance with the previous Chapter 7, CAR Part II into a CAR 66 licence will not be processed.

h. There is no time limit for removal of limitations on converted licences. Once a licence is converted into a CAR66-AMEL and the ratings, limitations and privileges on the new licences are accepted by the holder, previous licence can no longer be used for certifying purposes. All converted licences will be considered accepted by their holders if no written objection is received by GCAA.

i. Status of certification authorisations issued by CAR 145 organisations on the basis of existing UAE licences that exceeded the basic scope of the licence will become frozen as on 1st July 2011. However, privileges granted by CAR145 organisations prior to this date can be exercised. Further authorisations that exceed the basic scope of the licence cannot be granted on the basis of unconverted licences.

The following table lists the codes for limitation that may be applied on a converted CAR66– AMEL.

Limitation Code	Translation of the code
1	Excluding electrical power generation & distribution systems.
2	Excluding instrument systems, INS/IRS and Flight Directors systems
3	Excluding autopilot systems on aeroplanes
4	Excluding autopilot systems on helicopters
5	Excluding automatic landing and auto throttle systems on aeroplanes
6	Excluding radio communication/navigation and radar systems
7	Excluding radio radar systems
8	Reserved.
9	Excluding avionic LRUs
10	Excluding airframe
11	Excluding engine
12	Excluding all pressurised aeroplanes
13	Reserved
14	Excluding pressurised aeroplanes above 5700 Kg MTOM
15	Excluding supercharged piston engines in aeroplanes
16	Excluding navigational and electronic instrument systems, FDR, GPWS and vibration monitoring systems
17	Excluding radio-coupled autopilot systems in aeroplanes
18	Excluding radio-coupled autopilot systems in helicopters
19	Excluding all tasks with the exception of Compass Compensation and adjustment
20	Excluding propeller-turbine engines
21	Excluding all tasks with the exception of minor scheduled line maintenance up to and including Daily Inspections
22	Excluding all tasks with the exception of Cabin Maintenance tasks
23	Excluding all tasks with the exception of DC electrical components in mechanical
24	Excluding all systems with the exception of LRUs within In-flight Entertainment
25	Excluding electrical power generation and distribution systems on aircraft above 5700 kg MTOM
26	Excluding Avionic LRU replacement and BITE checks on aircraft above 5700 Kg
27	Excluding Antenna and Antenna Feeder Systems relating to radio and radar systems
28	Excluding maintenance tasks on Wooden Structures and Fabric Coverings
29	Excluding compass compensation and adjustments.
30	Excluding all tasks with the exception of tasks included in pre-flight check

2. Conversion of a basic Aircraft Maintenance Engineering Licence (LWTR)

a. Basic ratings held on the existing UAE licences will be considered and will be reflected on the converted CAR66–AMEL. Where all combined ratings/authorisations do not meet requirements of a full relevant CAR66–AMEL category, applicable limitations as appropriate will be applied.

b. All applications for basic UAE licences that are currently under process will be dealt in accordance with CAR66. If an applicant has partially completed requirements for any category under the previous system, he/she will be allowed to complete the process in accordance with this conversion report and will be issued a CAR66-AMEL with applicable limitations as defined in this report, unless modules/part modules required for removal of limitation are completed before issue of licence in the appropriate category.

c. If the licence holder qualifies for a B1 sub-category AMEL, the corresponding A sub-category AMEL will also be granted unless the licence carries limitation 10 or 11.

d. Part/full conversion examinations as appropriate to remove limitations may be taken after the conversion process of the licence is complete. Additional experience may also be needed to be provided before qualifying for the full category or sub-category of a CAR66-AMEL.

e. A table covering the most common existing GCAA licences (Issued under Chapter 7, CAR Part II) to CAR-66 licence conversion scenarios can be found in Para 10.

3. Conversion of GCAA Type Endorsements to a CAR-66 Licence.

a. Aircraft types endorsed on the current copy of an applicant's existing GCAA licence will be transferred directly to a CAR-66 licence at the time of conversion. Only aircraft types held by the candidate on GCAA licence will be endorsed.

b. A & C (Mechanical) & Avionics X/R Type Ratings: Type ratings for individual aeroplanes or helicopters will be transferred as type ratings in Category B1 and B2 with any appropriate limitations.

c. Group ratings held on existing GCAA licence or individual type ratings qualifying for award of group rating according to CAR 66 provisions, at the time of conversion will be transferred to the replacement licence in the form of a full group ratings or manufacturer group ratings iaw AMC to CAR 66 appendix 1.

d. Category C type rated licences will be endorsed on the replacement/converted CAR66-AMEL if the existing GCAA type rated licences have either full set mechanical (Airframe and engine categories) or full set Avionics (X and R categories) type ratings endorsed on them for more than three years and the applicant can provide evidence that he/she is holding a valid company authorisation for Scheduled Maintenance Inspection Certificate of Release to Service (SMI CRS) for the types of aircraft. To simplify these requirements, an applicant who desires to have category C type ratings transferred on to replacement licence has to provide evidence in support of the following:

e. Type ratings endorsements on GCAA licence and maintenance authorisations for at least three years in Either A + C Categories Or X + R categories And Company authorisation for Scheduled Maintenance Inspection Certificate of Release to Service (SMI CRS)

4. Application For a GCAA CAR66 Licence On The Basis Of a Foreign Licence

a. GCAA may consider grant of exemptions on examination and/or experience requirements for a UAE CAR 66 AMEL on the basis of another ICAO contracting state's aircraft maintenance engineer licence of the applicant if he/she meets the eligibility criteria.

b. The reviewing licensing inspector will thoroughly evaluate the application and workout equivalence of the foreign licence with appropriate category of CAR66–AMEL. If such an application for grant of licence is approved, the candidate will be required to successfully qualify GCAA Air Legislation modular examination comprising of multiple choice and essay examination and other full/part modular examinations considered necessary by GCAA to convert the foreign licence to an unrestricted GCAA CAR66–AMEL.

c. Requests for a licence on the basis of a foreign licence with unreasonably large number of limitations or with limitations that severely restricts the corresponding CAR 66 privileges will not be accepted.

d. It is the responsibility of the applicant to provide all supporting evidence in support of the application that the original licence was issued against equivalent/comparable standards and requirements. The GCAA would need to conduct a detailed assessment of the standards and requirements against which the original licence was issued, which will require co-operation of the regulatory authority concerned.

e. In cases where GCAA finds it difficult to assess the standards of the issuing authority, the application will be rejected and the applicant will be requested to raise a fresh application IAW CAR 66. Because of the detailed evaluation and assessment of applications involving foreign licences,

f. Upon successful completion of the applicable examinations, the candidate will be required to apply for issue of a CAR 66 licence. Generally, ratings held by the individual on his foreign licence will be endorsed on the licence. For licences that are not equivalent to CAR 66 licences, limitation similar to those given in the common conversion scenarios in Para 10 will be applied.

g. For a licence conversion from a foreign licence, the above exam retake restriction does not apply for examination conducted in the GCAA, a failed modular examination may be retaken at any time, however only one re-sit attempt will be allowed, after this the applicant must attend the modular course and examination at a CAR 147 approved training organisation.

h. pre-requisites and eligibility criteria for the conversion of a foreign licence:

The following prerequisites for issuing the licence shall be met;

a. Candidates must hold a valid type rated Aircraft Maintenance Engineer Licence from an ICAO contracting state or, in case of ICAO contracting states that do not issue type rated Aircraft Maintenance Engineer Licences, a valid basic Aircraft Maintenance Engineer Licence comparable and equivalent to the appropriate CAR 66 AMEL B1 or B2 category.

b. Had the privileges to issue Certificate of Release to Service (CRS) under a maintenance/certification authorisation granted by his previous organisation.

c. The foreign licence shall be verified by the issuing authority, and if applicable, the maintenance/certification authorisation shall also be verified by the regulatory authority of the company that issued the maintenance authorisation to verify/attest that the authorisation issued by the company complies with ICAO Aircraft Maintenance Personal Licencing standards.

(Note: the above mentioned maintenance/certification authorisation verification is needed from candidates who hold basic licences which are issued from ICAO contracting states that do not issue type rated Aircraft Maintenance Engineer Licences)

d. Furnish training course certificates related to the certification qualification.

e. Must successfully complete the GCAA Air Legislation examination (module 10).

i. Among other applicable responsibilities, the employers have the following responsibilities:

(a) Ensure that all documents submitted to GCAA for the purpose of a licence conversion are genuine, up to date, valid and free from any kind of falsification.

(b) Ensure the applicant is fully knowledgeable in all aspects of GCAA rules and regulations related to aircraft airworthiness and maintenance.

(c) Ensure that original licence and ratings on the basis of which GCAA had granted the conversion remains valid during the conversion period.

(d) Ensure that the applicant is legally allowed to work in the UAE or country of deployment.

(e) Ensure that in the preceding two years period, the applicant has had either six months of maintenance experience in accordance with the privileges granted by the original licence or met the provision for the issue of the appropriate privileges.

(f) Ensure that the applicant is duly assessed and authorised as competent to exercise the privileges of the converted licence in accordance with the companies approved procedures.

(g) Ensure that the scope and validity of the validation/authorisation are adhered to.

5. <u>Temporary Validation of a Foreign Licence</u>

(a) To permit a foreign licence holder to exercise the privileges of their licence in the U.A.E. a foreign licence can be validated by issuance of a letter of validation, with initial validity of ninety (90) days and may be further extended for another 90 days under extenuating circumstances.

(b) Only those foreign aircraft maintenance licences that meet the intent of ICAO Annex 1 and whose scope of privileges are considered commensurate with B1 or B2 licences under CAR 66, will be considered for further evaluation for grant of temporary validation. Validation for grant of privileges of Category A licence under CAR 66 will not be considered. Licences issued by ICAO signatory states that have not furnished any response to ICAO for compliance with Annex 1 or who have filed major differences on the requirements of Annex 1 will also not be considered for grant of temporary validation. This also applies to states that have major findings against them in the latest ICAO audit of their national civil aviation authorities.

(c) The pre-requisites and eligibility criteria for the issue of a temporary validation are detailed in paragraph 4 (Application For a GCAA CAR66 Licence On The Basis Of a Foreign Licence) above.

6. List of ICAO Licences Eligible for Conversion

The following list identifies which licences are acceptable for conversion, the list is split into two categories.

(a) Category 1 licences are acceptable for conversion following an air legislation or module 10 pass,

(b) Category 2 licences will be accepted following an air legislation or module 10 and a module 9 examination pass.

(c) Basic airframe/powerplant foreign licences issued by an ICAO contracting states (listed overleaf in the table) without type rating and certification privileges may be eligible for a conversion to a GCAA category A licence following completion of a GCAA Air Legislation exam (module 10) and Human Factor exam (module 9) as applicable. Further extension of GCAA category A licence issued under the provision of this paragraph shall comply with GCAA CAR 66 knowledge and experience requirements.

(d) Candidates applying for foreign licence conversion may be required to sit additional CAR 66 full/part modular examination that are considered necessary by the GCAA to convert the foreign licence to an un-restricted GCAA CAR 66 AMEL.

	Category - 1	Category - 2
Definition	**Licences issued by EASA NAAs or whose standard is known and found acceptable to the GCAA is considered equivalent to GCAA CAR 66 standard.**	**Licences issued by non EASA NAA whose standard is known and found acceptable to the GCAA by previous experience is considered equivalent to GCAA CAR 66 standard. GCAA may impose additional requirement/examination if deemed necessary.**
1	Austria	Brunei
2	Belgium	Canada
3	Bulgaria	Morocco
4	Cyprus	Bahamas
5	Czech Republic	Tunisia
6	Denmark	India
7	Estonia	Pakistan
8	Finland	Sri Lanka
9	France	Macau
10	Germany	Sudan
11	Greece	Jamaica
12	Hungary	Yemen
13	Iceland	Egypt
14	Ireland	Indonesia
15	Italy	South Africa
16	Latvia	Saudi Arabia A&P & IA
17	Liechtenstein	Oman
18	Lithuania	Jordan A&P
19	Luxemburg	FAA A& P & IA
20	Malta	Lebanon
21	Norway	Mauritius
22	Poland	
23	Portugal	
24	Romania	
25	Slovak Republic	
26	Slovenia	
27	Spain	
28	Sweden	
29	Switzerland	
30	The Netherland	
31	United Kingdom	
32	Australia	
33	Algeria	
34	Kuwait	
35	Bahrain	
36	Malaysia	
37	Singapore	
38	New Zealand	
39	Qatar	
40	Hong Kong	
41	Turkey	

5. **Issue of a Category A Licence to a Previously Unlicensed Maintenance Staff of a CAR-145 Approved Organisation**.

A. Only Maintenance authorisations that have been properly issued and held for at least **two (02) years** by 1st July 2011 will be considered for grant of an equivalent category 'A' licence. Applicants applying for a Category 'A' licence on the basis of maintenance authorisations issued by a CAR-145 approved organisation must provide evidence of the authorisation and copies of relevant training and experience certificates on the basis of which the authorisation was granted.

B. Appropriate limitations, most common of which are listed below, will apply.

Company Authorisation issued prior to 1st July 2009	**Applicable CAR-66 Limitation(s)**	**Limitation means**
Unrestricted	Nil	Nil
Daily Check/Inspections	21	Excluding all tasks with the exception of minor scheduled line maintenance up to and including Daily Inspections
Cabin Maintenance	22	Excluding all tasks with the exception of Cabin Maintenance tasks
Replacement of IFE system	24	Excluding all systems with the exception of LRUs within In-flight Entertainment (IFE) Systems

C. Holders of the above authorisations will only be eligible to hold a Category 'A' licence with the appropriate limitations. To remove the limitations, the holder needs to fulfil the complete requirements of the applicable category 'A' licence. Similarly, for extension of these licences to include other categories, holders will be required to complete full examination and experience requirements of the desired CAR 66 AMEL category.

6. **Removing Limitations From a Basic Licence**

Limitations on a converted/ replacement B1/B2 CAR 66-AMEL licence may be removed by undertaking conversion examinations in appropriate Modules/part modules. There is no cut off date for removal of limitations on converted licences. Existing licence holders are advised to apply for conversion of their licences into CAR 66 AMELs prior to applying for full/part modular examinations for removal of anticipated limitations on the converted licences. Once holders receive their converted licence, they can apply to GCAA for removal of limitations accordingly.

Also, licence holders are advised to apply for removal of all limitations in a single application. Applications for removal of partial limitations will be rejected and the applicants will be advised to apply once ready for undertaking all applicable examinations for removing all limitations on the licence. Additionally, the applicants will be required to furnish evidence of experience related to additional examinations passed. After evaluation of the application
for removal of the limitations, the applicant may be advised to appear in the additional examinations conducted either by GCAA or its designated organisation.

Refer to Para 10 for applicable Modules/part module examinations required for removal of limitations.

Experience including detailed evidence of competence in the relevant basic skills is required in the areas appropriate to the basic category/sub-category, which are not covered by previous qualifications/privileges. However, the GCAA may accept shorter period of experience, provided the applicant can demonstrate sufficient verified experience/tasks in the relevant basic skills to the basic category/sub-category.

7. Removing Limitations From a Type Rating

Where the limitation applies only to the type rating, it can be removed by completing either an approved conversion course covering the differences or a full B1 or B2 type course as appropriate. This training must be conducted by an approved CAR-147 maintenance training organisation. The additional experience submitted should include all areas not covered due to the limitation.

8. Basic Knowledge/Examination Requirements

The CAR-66 syllabus normally requires different levels of knowledge for different licence categories (A, B1 and B2) within a module; therefore, appropriate conversion examinations applicable to certain modules for licence holders wishing to include another category, have to be completed. The most common cases of category conversion are given in Para 9.

Applicants are advised to apply for extension to include another category after removing maximum possible limitations from their existing categories as this would enable the GCAA to work out the additional differences modular requirements for the applicant expeditiously and accurately.

Applications to include further categories to an existing licence should be made in the same way as for initial application to GCAA Licensing section. GCAA will assess the application and advise the applicant of the modules/part modules, date and venue of the examination.

The GCAA, or its approved designated CAR 147 organisation on its behalf, will conduct module/part module examinations for extension of an existing CAR-66 licence to have further categories.

9. Common Scenarios for the Extension To a Licence

Extension of a CAR66 – B2 licence to include Mechanical Category A

Note: Module 7 is common to all Category 'A' sub-categories. Modules 11 to 17 must be taken as shown according to the sub-category required.

Examples: Requirements for conversion of full B2 to include Category A1 are:

Modules 7.8 – 7.13 and 7.19b (Required for any applied Category A in addition to the particular requirements of the category applied) – 35 Questions

+

Modules 11.2 – 11.4, 11.7, 11.8, 11.10 – 11.13, 11.15 – 11.17 – 70 Questions

+

Full Modules 15 – 50 Questions

+

Full Module 17 – 20 Questions

Category/Limitation Held	Applied Category	Modules or part modules required	No of questions
Full B2 or **B2 with limitation 3 (excluding autopilot systems on aeroplanes)or 4(excluding autopilot systems on helicopters)**	Any category A	**Mod 7.8** to **7.13** , 7.19b	**35**
Full B2 or **B2 with limitation** 4 **(excluding autopilot systems on helicopters)**	A1,A2	**Mod 11.2** to **11.4** , 11.7, 11.8, 11.10 to 11.13, 11.15 to 11.17	**70**
Full B2 or **B2 with limitation 3 (excluding autopilot systems on aeroplanes)**	A3, A4	**Mod 12.1** to **12.6, 12.9** to 12.14 , 12.16	**70**
Full B2 or **B2 with limitation 3 (excluding autopilot systems on aeroplanes)or 4(excluding autopilot systems on helicopters)**	A1,A3	15	**60**
Full B2 or **B2 with limitation 3 (excluding autopilot systems on aeroplanes)or 4(excluding autopilot systems on helicopters)**	A2,A4	16	**50**
Full B2 or **B2 with limitation** 4 **(excluding autopilot systems on helicopters)**	A1,A2	17	**20**

Extension of Category B1 to include Category B2

The following table normally applies to full Category B1 AMEL holders. If the licence holder has only one limitation that excludes Avionics LRUs only, full B2 level Module 5 examination will be required instead of the Module 5 conversion examination as shown below. Successful qualification of Module5 in this case will qualify the holder for removal of the Avionics LRU limitation from B1 category.

If B1 licence holder previously held X Electrical Basic GCAA licence, Module 4 will not be required and the applicant must apply for exemption on application for B2 and a copy of the old licence should be attached with the application.

Modular requirements for extension of B1 to include B2 category

Category Held	Modules	Modules or part modules required	No of Questions
B1.1 or B1.2 or B1.3 or B1.4	4	Module 4.1.1b, 4.1.2, 4.1.3b, 4.2, 4.3b	**20**
	5	Module 5.1 to 5.3,5.6b, 5.7 to 5.10, Module 7.4	**40**
	13	Module 13.1c, 13.3 & 13.4, 13.6, 13.8	**100**

Extension of Category B2 to include Category B1

The following table is applicable only to Category B2 AMEL holders without any limitations. Licence holders with any limitations should apply for removal of the limitation first.

To Category	Module	Modules or part module required	No of Questions
B1.1	2	Module 2.2.1, 2.2.2, 2.2.3, 2.2.4 b	**18**
	6	Module 6.3.b , 6.4 b , 6.5.4 , 6.6.b , 6.7 , 6.10	**20**
	7	Module 7.6 , 7.8 , 7.9 to 7.15 , 7.16 b , 7.18 b & c, 7.19 b	**40**
	11	Module 11.1 to 11.4, 11.7 to 11.13, 11.15 to 11.17	**90**
	15	Module 15.1 to 15.13, 15.15 to 15.22	**70**
	17	Module 17	**30**
B1.2	2	Module 2.2.1, 2.2.2, 2.2.3, 2.2.4 b	**18**
	6	Module 6.3.b, 6.4 b, 6.5.4, 6.6.b, 6.7, 6.10	**20**
	7	Module 7.6 , 7.8 , 7.9 to 7.15, 7.16 b , 7.18 b & c, 7.19 b	**40**
	11	Module 11.1 to 11.4 , 11.7 to 11.13, 11.15 to 11.17	**90**
	16	Module 16.1 to 16.9, 16.11 to 16.13	**55**
	17	Module 17	**30**
B1.3	2	Module 2.2.1, 2.2.2, 2.2.3, 2.2.4 b	**18**
	6	Module 6.3.b, 6.4 b, 6.5.4, 6.6.b, 6.7, 6.10	**20**
	7	Module 7.6, 7.8, 7.9 to 7.15, 7.16 b, 7.18 b & c , 7.19 b	**40**
	12	Module 12.1 to 12.6 , 12.9 to 12.14 , 12.16	**80**
	15	Module 15.1 to 15.13, 15.15 to 15.22	**70**
B1.4	2	Module 2.2.1, 2.2.2, 2.2.3, 2.2.4 b	**18**
	6	Module 6.3.b, 6.4 b, 6.5.4, 6.6.b, 6.7, 6.10	**20**
	7	Module 7.6, 7.8, 7.9 to 7.15, 7.16 b, 7.18 b & c , 7.19 b	**40**
	12	Module 12.1 to 12.6, 12.9 to 12.14, 12.16.	**80**
	16	Module 16.1 to 16.9, 16.11 to 16.13	**55**

Extension of any Category A to include Category B1 or B2

Full examination applicable to the relevant category B1 or B2 will apply.

10. Common CAR-66 Conversion Scenarios

The following tables give most common licence conversion scenarios. Applicants, whose applications do not fall into any of the common scenario as given, need to personally take up their case with the GCAA licensing section by requesting personal interview.

Holders of a B1 sub category will automatically be issued with a Category A licence in the same sub category except where the applicant receives Limitation 10 or 11 on the B1 licence.

GCAA will determine CAR 66 licence category and sub-category into which the present licence will be converted on the basis of ratings already held by the applicant on his precious/present licence.

GCAA Mechanical Licences

GCAA Licence Excludes	Applicable CAR-66 Limitation(s)	Limitation means
Airframe	10	Excluding airframe
Engine	11	Excluding engine
Electrical	1	Excluding electrical power generation & distribution systems
Electrical	25	Excluding electrical power generation and distribution systems on aircraft above 5700 kg MTOW
Avionic Extension	9	Excluding avionic LRUs
Avionic Extension	26	Excluding Avionic LRU replacement and BITE checks on aircraft above 5700 kg MTOM

GCAA Avionics Licence

Existing Licence Excludes	Applicable CAR-66 Limitation(s)	Limitation means
Electrical	1	Excluding electrical power generation and distribution systems
Instrument Systems	2	Excluding instrument systems, INS/IRS and Flight Directors systems
Autopilot Systems (Aeroplanes)	3	Excluding autopilot systems on aeroplanes
Autopilot Systems (Helicopters)	4	Excluding autopilot systems on helicopters
Combined Category	5	Excluding automatic landing and auto throttle systems on aeroplanes
Radio Communication/Navigation & Radar Systems	6	Excluding radio communication/navigation and radar systems
Radio Radar (only)	7	Excluding radio radar systems

If Limitation 3 is applied Limitation 5 is also applicable.
Use either limitation 6 or 7.

11. Removal Of Limitations From a CAR 66 Category B1 Licence

B1 Licence

Ratings held on Existing GCAA LICENCE	B1 Sub-cat	CAR-66 Limitation to be applied		CAR 66 Modules and/or Part-Modules Required (F = Full Modules)									
			3	4	5	6	7	8	11	12	15	16	17
Aeroplanes 2 + Turb-Eng (Aeros) + Av Ext	B1.1	1	3.9 to 3.18	F			7.7		11.5 11.6 11.14				
Aeroplanes 2 + Turb-Eng (Aeros) + Electrical	B1.1	9			F								
Aeroplanes 2 + Turb-Eng (Aeros)	B1.1	1,9	3.9 to 3.18	F	F		7.7		11.5 11.6 11.14				
Aeroplanes 2 Jet/Turb-Eng (Aeros)	B1.1	1,9,20	3.9 to 3.18	F	F		7.7		11.5 11.6 11.14				F
Aeroplanes 2	B1.1	1,9,11, 20	3.9 to 3.18	F	F		7.7	F	11.5 11.6 11.8 11.101 11.14		F		F
Turb-Eng (Aeros)	B1.1	1,9,10	3.9 to 3.18	F	F		7.4 7.7 7.8 7.14 7.16 to 7.19	F	F				
Aeroplanes 1 + Pist-Eng (Aeros) + Av Ext	B1.2	1	3.9 to 3.18	F			7.7		11.5 11.6 11.14				
Aeroplanes 1 + Pist-Eng (Aeros) + Electrical	B1.2	9			F								
Aeroplanes 1 + Pist-Eng (Aeros)	B1.2	1,9	3.9 to 3.18	F	F		7.7		11.5 11.6 11.14				
Pist Eng (Aeros)	B1.2	1,9,10	3.9 to 3.18	F	F		7.4 7.7 7.8 7.14	F	F(11B)				

							7.16 to 7.19						
Aeroplanes 1	B1.2	1,9,11	3.9 to 3.18	F	F		7.7		11.5 11.6 11.8 11.101 11.14			F	F
A&C (Heli): Turb-Eng Av Ext	B1.3	1	3.9 to 3.18	F		6.3.2 6.3.3	7.7			12.8 12.15			
A &C (Heli): Turb-Eng Electrical	B1.3	9			F	6.3.2 6.3.3							
A & C (Heli): Turb-Eng	B1.3	1,9	3.9 to 3.18	F	F	6.3.2 6.3.3	7.7			12.8 12.15			
A & C (Heli): Pist-Eng Av Ext	B1.4	1	3.9 to 3.18	F		6.3.2 6.3.3	7.7			12.8 12.15			
A&C (Heli): Pist-Eng Electrical	B1.4	9			F	6.3.2 6.3.3							
A & C (Heli): Pist-Eng	B1.4	1,9	3.9 to 3.18	F	F	6.3.2 6.3.3	7.7			12.8 12.15			

12. Removal of Limitations from a CAR-66 Category B2 Licence

Existing GCAA Licences	CAR-66 Limitations	CAR 66 Modules and/or Part-Modules Required (F = Full Modules)						
		4	5	8	9	10	13	14
Radio Comm/Nav Radio Radar	1,2,3,4,5,29			F			13.1 13.3 to 13.5 13.7 to 13.9	F
Combined Cat (Inst/Autopilots)	1,2,3,4,6,29						13.1 13.3 to 13.6 13.8,13.9	
Radio Comm/Nav	1,2,3,4,5,7,29			F			13.1 13.3 to 13.9	F
Autopilots (Heli)	1,2,3,5,6,29						13.1 13.3 to 13.8	F
Autopilots (Aeros) Radio Comm/Nav Radio Radar	1,2,4,5,29						13.1 13.3 to 13.6 13.8 13.9	F
Autopilots (Aeros)	1,2,4,5,6,29						13.1 13.3 to 13.9	F
Instruments	1,3,4,5,6,29			F			13.1 13.3 to 13.9	
Instruments Radio Comm/Nav Radio Radar	1,3,4,5,29			F			13.1 13.3 13.5 to 13.9	
Instruments Autopilots (Heli)	1,3,5,6,29						13.1 13.3 13.4 to 13.9	
Instruments Autopilots (Aeros) Radio Comm/Nav Radio Radar	1,4,5,29						13.1 13.3 13.5 13.6 13.8 13.9	
Instruments Autopilots (Aeros)	1,4,5,6,29						13.1 13.3 13.4 to 13.6 13.8 13.9	
Electrical	2,3,4,5,29			F			13.1	F

Radio Comm/Nav Radio Radar							13. 3 13. 4	
Electrical	2,3,4,5,6,29		F	F			13.1 13.3 13.4 13.6 to 13.8	F
Electrical Autopilots (Heli)	2,3,5,6,29						13.1 13.3 13.4 13.6 to 13.8	F
Electrical Autopilots (Aeros) Radio Comm/Nav Radio Radar	2,4,5,29						13.1 13.3 13.8	F
Electrical Autopilots (Aeros)	2,4,5,6,29						133.1 13.3 13.4 13.6 13.8	F
Electrical Instruments Radio Comm/Nav Radio Radar	3,4,5,29			F			13.1 13.3 13.7 13.8	
Electrical Instruments	3,4,5,6,29			F			13.1 13.3 13.4 13.6 13.7 13.8	
Electrical Instruments Autopilots (Heli) Radio Comm/Nav Radio Radar	3,5,29						13.1 13.3 13.7 13.8	
Electrical Instruments Autopilots (Heli)	3,5,6,29						13.1 13.3 13.4 13.6,13.7 13.8	
Electrical Instruments	4,29						13.1 13.3	

Combined Cat (inst/autopilots) Radio Comm/Nav							13.8	
Electrical Instruments Autopilots (Aeros) Radio Comm/Nav Radio Radar	4,5,29						13.1 13.3 13.8	
Electrical Instruments Autopilots (Aeros)	4,5,6,29						13.1 13.3 13.4 13.6 13.8	
Electrical Combined Cat (inst/autopilots)	4,6,29						13.1 13.3 13.4 13.6 13.8	
Electrical Instruments Autopilots (Aeros) Autopilots (Heli)	5,6,29						13.3 13.4 13.6 13.8	
Electrical Combined Cat (inst/autopilots) Autopilots (Heli)	6,29						13.4 13.6 13.8	
Electrical Combined Cat (inst/autopilots) Autopilots (Heli) Radio Comm/Nav	7,29						13.4 13.8	