



Australian Government
Civil Aviation Safety Authority

I, WILLIAM BRUCE BYRON, Director of Aviation Safety, on behalf of CASA, make this instrument under regulation 33B and subregulations 42ZC (6) and 308 (1) of the *Civil Aviation Regulations 1988*.

Bruce Byron
Director of Aviation Safety and
Chief Executive Officer

January 2007

Civil Aviation Order 100.66 Instrument 2007

1 Name of instrument

This instrument is the *Civil Aviation Order 100.66 Instrument 2007*.

2 Commencement

This instrument commences on the day after it is registered.

3 Civil Aviation Order 100.66

Schedule 1 makes Civil Aviation Order 100.66.

Schedule 1 Civil Aviation Order 100.66

Maintenance authorities — EASA equivalents

1 Scope and application

- 1.1 This Order is intended to provide an equivalent of the EASA categories of aircraft maintenance licence A, B1 and B2 as a transitional arrangement pending introduction of these categories of licence into the *Civil Aviation Safety Regulations 1998*.
- 1.2 Civil Aviation Orders 100.23 and 100.24 do not apply to a person who makes an application under this Order.
- 1.3 Paragraph 1.2 only applies in respect of an application made under this Order.

2 Definitions

2.1 In this Order:

AAC means an Aviation Advisory Circular.

accountable manager means the person appointed under clause 7 of Appendix 5.

aircraft/engine combination means a particular type of engine in a particular type of aircraft.

airworthiness management requirement means a requirement that when met demonstrates that a person has a knowledge and understanding of the fundamental documentation and administrative processes for the preservation and enhancement of airworthiness.

AQTF means the Australian Quality Training Framework.

Aeroskills Training Package means the package of that name set out by CASA in an AAC Information Bulletin for this Order.

assessment, in relation to whether a person can properly perform a maintenance task:

- (a) means collecting, checking and evaluating evidence of the person's ability to perform the task to a predetermined standard, and deciding, on the basis of that evidence, whether the person can perform the task to that standard; and
- (b) includes assessment by means of knowledge examinations, practical tests, and consideration of experience acquired or competency demonstrated; and
- (c) may include RPL.

assessor has the meaning given to it in paragraph 2.2.

ATA means the Air Transport Association.

authority means an authority to carry out maintenance on aircraft issued under paragraph 33B (1) (a) of CAR 1988.

CAO means Civil Aviation Order.

CAR 1988 means the *Civil Aviation Regulations 1988*.

CAR 30 organisation means a person who holds a certificate of approval under regulation 30 of CAR 1988 covering aircraft maintenance within the privileges of an authority.

CASR 1998 means *Civil Aviation Safety Regulations 1998*.

certificate of release to service has the same meaning as certification of completion of maintenance issued under regulation 42ZE or 42ZN of CAR 1988.

complex aircraft means an aircraft that CASA lists as a complex aircraft in an AAC after consideration of aviation complexity factors including certificated maximum passenger seating capacity, multi-crew requirements, design philosophy and technology.

course plan means the detailed course teaching and assessment plan, including durations, for each training course to be delivered by a recognised organisation.

EASA means the European Aviation Safety Agency.

employee includes a person who performs duties under a contract for services.

Note An employee is employed under a contract of service. An independent contractor is retained under a contract for services.

examination means:

- (a) a process with all of the following elements:
 - (i) a formal assessment of a student under the supervision of an examiner, occurring after teaching in the student's course has been completed;
 - (ii) a set of questions or exercises to determine what the student knows or has learned from the course;
 - (iii) assessment:
 - (A) of written answers to essay questions; or
 - (B) of answers to questions with multi-choice answers of which only 1 answer can be correct; or
 - (C) of oral answers to written or oral questions; or
 - (D) using 1 or more of these methods;
 - (iv) a fixed duration under examination conditions; or
- (b) use of RPL where this is an appropriate method of determining what a student knows or has learned.

examiner means an employee of a recognised organisation who is appointed by the recognised organisation to do 1 or more of the following for the recognised organisation:

- (a) prepare examination questions;
- (b) conduct examinations;
- (c) mark examination answers;
- (d) approve examination results.

exposition means the document provided for under clause 14 of Appendix 5.

FAR means Federal Aviation Regulations of the United States of America.

hold a unit of competency means to hold such a unit in accordance with the Aeroskills Training Package, including by RPL.

Note The AQTF Aeroskills Training Package (the **Package**) may require prerequisites to be held before a unit of competency may be held in accordance with the Package.

in service for the definition of line maintenance means that the aircraft is in service and not in base maintenance.

key personnel means each person nominated under paragraph 7.2 of Appendix 5.

large aircraft means:

- (a) an aeroplane that:
 - (i) has a maximum take-off weight of more than 5 700 kg; or
 - (ii) has been type-certified under:
 - (A) SFAR 41 and FAR 23; or
 - (B) FAR 23 (commuter) class; or
- (b) a helicopter that:
 - (i) has a maximum take-off weight of more than 3 175 kg; or
 - (ii) is multi-engined.

line maintenance means minor or scheduled maintenance carried out on an aircraft:

- (a) that is in service; and
- (b) that is:
 - (i) preparing for its first flight in service after a period of being out of service; or
 - (ii) en route and stopped before its next flight; or
 - (iii) preparing for any other flight during a period of service; and
- (c) to ensure that the aircraft is fit for the flight.

maintenance training means a structured course of training:

- (a) in the maintenance of aircraft or aeronautical products; and
- (b) conducted in accordance with this Order; and
- (c) which a person requires to become qualified under this Order.

prerequisite for a unit of competency means each prerequisite unit of competency or other qualifications, required under the Aeroskills Training Package, before a unit of competency may be held in accordance with the Package.

quality management system, for a recognised organisation, means a management system that:

- (a) deals with policies, resources and procedures to achieve the required training standards for the organisation; and
- (b) is mentioned in the exposition.

rating means an endorsement on an authority that permits its holder to carry out maintenance on an aircraft/engine combination that is, or on an engine fitted to:

- (a) a large aircraft; or
- (b) a complex aircraft; or
- (c) another aircraft listed by CASA in an AAC for this subparagraph.

Note 1 For guidance only, see AAC 9-66 which lists large and complex aircraft.

Note 2 Under subparagraph (c), CASA may list an aircraft/engine combination or an engine if CASA considers that type training for such a rating would enhance safety. CASA may consider issues such as complexity, new technology, ATSB recommendations or other safety issues.

recognised organisation means a maintenance training organisation approved by CASA and operating in accordance with Appendix 5.

RPL means recognition of prior learning.

Note Under provisions of this Order, passing examinations, holding units of competency and holding prerequisite qualifications or prerequisite units of competency, may be by means of RPL.

SFAR means Special Federal Aviation Regulations of the United States of America.

student means a person who enrolls with a recognised organisation for a course to qualify for an authority or a rating.

supervision, for maintenance, means:

- (a) being physically present and observing the maintenance being carried out to the extent necessary to ensure that it is being carried out properly; and
- (b) being immediately available to give advice, or answer questions, about the maintenance.

Note **being immediately available** means being able, without delay, to:

- (a) react with advice to the maintenance being carried out; or
- (b) respond to a question from the person carrying it out.

type rating has the same meaning as rating.

undertaking means the undertaking mentioned in paragraph 2.2 (c) of Appendix 5.

unit of competency means an Aeroskills Training Package unit of competency.

2.2 For this Order:

assessor means a person who:

- (a) has the following competencies from the Training Package for Assessment and Workplace Training of the Commonwealth Department of Education, Science and Training or demonstrated equivalent competencies:
 - (i) TAAASS401A plan and organise assessment;
 - (ii) TAAASS402A assess competence;
 - (iii) TAAASS404A participate in assessment validation; and
- (b) has relevant vocational competencies, or equivalent competencies, at least to the level that is being assessed; and
- (c) is appointed by a recognised organisation to conduct assessments.

2.3 For paragraph 2.2, two or more people when assessing together are within the definition of assessor if:

- (a) 1 person has the competencies mentioned in subparagraph 2.2 (a); and
- (b) 1 or more other persons have the competencies mentioned in subparagraph 2.2 (b).

3 Authority categories

- 3.1 An authority may be issued for 1 or more of the following categories or 1 or more of the subcategories that comprise the category:
- (a) category A, comprising subcategory A1, A2, A3 and A4;
 - (b) category B1, comprising subcategory B1.1, B1.2, B1.3 and B1.4;
 - (c) category B2.
- 3.2 An authority for 1 of the following subcategories is limited to the aircraft specified for the subcategory:
- (a) A1 and B1.1 — turbine engined aeroplanes;
 - (b) A2 and B1.2 — piston engined aeroplanes;
 - (c) A3 and B1.3 — turbine engined helicopters;
 - (d) A4 and B1.4 — piston engined helicopters.

4 Application for an authority or rating

An application for an authority or a rating must:

- (a) be in writing; and
- (b) set out details of the applicant's training, attainments, qualifications and experience to the extent relevant to the authority or rating and required by this Order; and
- (c) be accompanied by a copy of any document that shows that the applicant has completed the training, holds the qualifications and has the experience mentioned in paragraph (b).

5 Eligibility for an authority or rating

An applicant for an authority must:

- (a) be at least 21; and
- (b) be able to read, write and communicate in English to a level which enables him or her to carry out safely the duties required to be carried out by the holder of the authority; and
- (c) if the applicant has not previously met an airworthiness management requirement listed by CASA in an AAC, meet such a requirement; and
- (d) not suffer from a disability that is likely to affect the exercise of the privileges of the authority; and
- (e) meet the requirements of subsection 13 or 15 of this Order that are relevant for the authority or rating.

6 Continued validity of an authority

Subject to subsection 7, an authority:

- (a) ceases to be valid 5 years after its last issue, amendment or endorsement by CASA; and
- (b) is not in effect while it is invalid under subsection 7.

7 Validity, invalidity and re-validation of an authority

- 7.1 An authority becomes invalid unless on, or within 1 month before, each fifth anniversary of the day on which the authority was last issued, amended or endorsed, its holder verifies the information about the authority in CASA's records.

Note Verification may be done in the way indicated by CASA in an AAC.

- 7.2 If a person's authority has become invalid under paragraph 7.1, the person is taken not to be the holder of the authority during the period that it is invalid.
- 7.3 To revalidate an authority that has become invalid under paragraph 7.1, the holder must respond to CASA about the authority, in the way indicated by CASA, to verify the information in CASA's records.
- 7.4 A revalidated authority is in effect only from the date of its revalidation by CASA.

8 Surrender, suspension or revocation of an authority

- 8.1 An authority stops having effect if it is suspended or revoked by CASA.
- 8.2 If the authority is revoked, the holder must return the authority to CASA within 14 days.
- 8.3 CASA may revoke or suspend an authority:

- (a) if CASA is satisfied that revocation or suspension is in the interests of the safety of air navigation; or

Note For example, if CASA considers that the holder is not competent to hold the authority.

- (b) if the holder breaches a condition of his or her authority; or
- (c) at the written request of the holder.

Note A maintenance authority is a civil aviation authorisation under the *Civil Aviation Act 1988* (the *Act*) and, therefore, suspension and revocation are enforceable under the serious and imminent risks to air safety provisions in Division 3A of Part III of the Act which provides for suspension or cancellation of civil aviation authorisations.

9 Condition of an authority

An authority is issued subject to the condition that the holder must:

- (a) comply with the requirements of this Order for holding the authority and exercising its privileges; and
- (b) comply with the requirements of this Order for the endorsement of a rating, if any, on the authority; and
- (c) if he or she is suffering from a disability that is likely to affect the exercise of the privileges of the authority — tell CASA in writing not later than 14 days after first learning of the disability.

10 Privileges of holder of an authority

- 10.1 Despite subparagraph 10.5 (b), the holder of an authority in subcategory A1, A2, A3 or A4 may issue a certificate of release to service:
- (a) only for:
 - (i) a class A aircraft; or
 - (ii) a class B aircraft maintained by a CAR 30 organisation, both of which are listed together for this subparagraph by CASA in an AAC; and
 - (b) following completion of maintenance mentioned in Appendix 1 that corresponds to the authority; and
 - (c) within the limits of the tasks:
 - (i) for which the holder has been trained; and
 - (ii) that are endorsed on an authorisation given to the holder by CASA, or an authorised person, under subregulation 42ZC (6) or (7) of CAR 1988; and
 - (d) for work that the holder has personally performed in an organisation approved under regulation 30 of CAR 1988 for the maintenance of aircraft.
- 10.2 For sub-subparagraph 10.1 (c) (i), the task training must include:
- (a) theoretical knowledge and practical training appropriate to the task; and
 - (b) assessment carried out by:
 - (i) a maintenance organisation that is authorised for subregulation 42ZC (3) (d) of CAR 1988; or
 - (ii) a recognised organisation.
- 10.3 The holder of an authority in subcategory B1.1, B1.2, B1.3 or B1.4 may issue a certificate of release to service after any, or all, of the following:
- (a) completion of a maintenance activity that falls within the scope of the ATA chapter designators mentioned in Appendix 2;
 - (b) in spite of subparagraph (a), completion of the replacement of an avionic line replaceable unit whose correct functioning and serviceability have been demonstrated by use of:
 - (i) an operational check; or
 - (ii) built-in test equipment; or
 - (iii) the aircraft's central maintenance system;
 - (c) completion of any work in a subcategory of category A that applies to the holder.
- 10.4 The holder of an authority in category B2 may issue a certificate of release to service following completion of a maintenance activity that falls within the scope of the ATA chapter designators mentioned in Appendix 3.
- 10.5 The holder of an authority may issue a certificate of release to service only:
- (a) subject to subsection 11, in accordance with the requirements of regulation 42ZE of CAR 1988 that apply to the holder; and

- (b) for an aircraft/engine combination or an engine referred to in the definition of rating — if the holder’s authority is endorsed with a rating for the aircraft/engine combination or engine; and
- (c) if, in the previous 2 years, the holder has:
 - (i) had at least 6 months’ experience in inspecting or maintaining aircraft structures, or powerplant, or mechanical, electrical or avionic systems; or
 - (ii) qualified for the issue of the authority; and
- (d) if the holder is not suffering from a disability that is likely to affect the exercise of the privileges of the authority.

11 Privilege of supervising a person performing maintenance

- 11.1 Subject to this subsection, the holder of an authority in category B1 or B2 (the *holder*) may supervise a person (the *person under supervision*) who physically performs any maintenance in respect of which the holder may issue a certificate of release to service.

Note Under paragraph 2.1 of this Order, a certificate of release to service has the same meaning as a certification of completion of maintenance issued under regulation 42ZE or 42ZN of CAR 1988.

- 11.2 The holder, and the person under supervision, must be employed by, or working under an arrangement with, the same person who holds a certificate of approval under regulation 30 of CAR 1988 covering aircraft maintenance within the privileges of the authority of the holder.
- 11.3 A holder who supervises a person in accordance with paragraph 11.1 is exempt from the requirement to comply with paragraph 42ZE (1) (b) of CAR 1988 to the extent mentioned in paragraph 11.4.
- 11.4 The exemption in paragraph 11.3 only operates to the extent that compliance with paragraph 42ZE (1) (b) of CAR 1988 requires compliance with paragraph 2.2 of Schedule 6 of CAR 1988 under which only the person who performs the maintenance may certify for its completion.

12 Authorisation of a person under supervision

For paragraphs 42ZC (3) (d) and 42ZC (4) (e) of CAR 1988, and subsection 11 of this Order, a person under supervision is authorised to perform maintenance in accordance with subsection 11.

13 Requirements for a category

- 13.1 This subsection applies to a person who applies for:
- (a) an authority in a category or subcategory; or
 - (b) the addition of a category or subcategory to the person’s authority.
- 13.2 CASA must issue the authority or the addition if the person meets the requirements of this subsection.

- 13.3 The person must demonstrate by examination, knowledge:
- (a) of each subject module that is marked for the category or subcategory in accordance with Part 2 of Appendix 4; and
 - (b) to the level of knowledge for the module and its parts as indicated in Part 3 of Appendix 4 for the category or subcategory; and
 - (c) that is sufficient to attain a pass mark of 75%.
- 13.4 A level of knowledge for a module or its parts has the meaning given to it in Part 1 of Appendix 4.
- 13.5 The knowledge examination mentioned in paragraph 13.3 must be conducted by a recognised organisation.
- 13.6 An applicant for an authority must:
- (a) for a subcategory of category A:
 - (i) have accumulated at least 2 years of practical maintenance experience on operating aircraft relevant to the category or subcategory for which the authority is sought; and
 - (ii) hold each unit of competency listed and coded in Appendix 6 that is marked X for the subcategory; and
 - (iii) before holding a unit of competency mentioned in sub-subparagraph (ii), hold the qualifications or units of competency that are prerequisites for the unit; or
 - (b) for subcategories B1.2 and B1.4:
 - (i) have accumulated at least 3 years of practical maintenance experience on operating aircraft relevant to the category or subcategory for which the authority is sought; and
 - (ii) hold each unit of competency listed and coded in Appendix 6 that is marked X or indicated as its alternative for the subcategory; and
 - (iii) before holding a unit of competency mentioned in sub-subparagraph (ii), hold the qualifications or units of competency that are prerequisites for the unit; or
 - (c) for category B2 and subcategories B1.1 and B1.3:
 - (i) have accumulated at least 4 years of practical maintenance experience on operating aircraft relevant to the category or subcategory for which the authority is sought; and
 - (ii) hold each unit of competency listed and coded in Appendix 6 that is marked X or indicated as its alternative for the category or subcategory; and
 - (iii) before holding a unit of competency mentioned in sub-subparagraph (ii), hold the qualifications or units of competency that are prerequisites for the unit.
- 13.7 In addition to the units of competency that are required under this subsection for a subcategory B1.1, B1.2, B1.3 or B1.4 authority, an applicant for such an authority that includes repair and modification of aircraft composite material,

structures and components must hold each relevant optional unit of competency listed and coded in Appendix 6 that is marked Y for the subcategory.

- 13.8 In addition to the units of competency that are required under this subsection for a subcategory B1.1 or B1.2 authority, an applicant for such an authority that includes wooden structures or fabric surfaces must hold each relevant optional unit of competency listed and coded in Appendix 6 that is marked Z for the subcategory.
- 13.9 For this subsection, a person may be taken to hold the prerequisite qualifications or units of competency required under paragraph 13.6 by means of RPL.
- 13.10 At least 1 year of the practical maintenance experience required by this subsection for an initial authority must be:
- (a) maintenance experience on aircraft relevant to the category or subcategory for which the initial authority is sought; and
 - (b) accumulated immediately before making the application for the authority.
- 13.11 A person who holds an authority, and who applies to add a category or subcategory to it, must be certified by a recognised organisation as satisfying the following requirements for the category or subcategory to be added:
- (a) meet the knowledge and examination requirements mentioned in paragraph 13.3 of this Order;
 - (b) hold the units of competency required by paragraph 13.6 of this Order;
 - (c) meet the practical maintenance experience requirements mentioned in paragraph 13.6 of this Order.
- 13.12 Practical aircraft maintenance experience gained outside a civil aircraft maintenance environment may be taken to be the practical experience required by this subsection if a recognised organisation certifies to CASA that:
- (a) the experience is equivalent to the practical experience required by this subsection; and
 - (b) the applicant has sufficient additional experience of civil aircraft maintenance to ensure understanding of the civil aircraft maintenance environment.

14 Recognition of foreign qualifications for a category or subcategory

- 14.1 An applicant for a category or subcategory of an authority is taken to comply with subsection 13 for the category or subcategory if:
- (a) he or she holds a current authorisation, of a kind to which section 4.2 of Annex 1 to the Chicago Convention applies, that was issued by a State authority listed by CASA in an AAC as maintaining appropriate standards for the issue of authorities of that kind; and
 - (b) the authority is endorsed with a category or subcategory that corresponds to the category or subcategory applied for; and
 - (c) within the 2 years immediately before the application, the person exercised for at least 6 months privileges under the authorisation equivalent to those of a holder of the category or subcategory applied for; and

- (d) a recognised organisation certifies to CASA that the applicant meets the requirements of subsection 13.
- 14.2 A person described in subparagraph 14.1 (a) of this subsection who holds, or has held, a foreign company authorisation is taken to comply with subsection 13 for the category or subcategory if:
- (a) CASA is satisfied that within the 2 years immediately before the application, the person exercised for at least 6 months privileges under the authorisations equivalent to those of a holder of the category or subcategory; and
 - (b) if the person no longer holds the foreign company authorisation, CASA is satisfied that it was not cancelled or revoked for any reason involving fault by the person; and
 - (c) a recognised organisation certifies to CASA that the applicant meets the requirements of subsection 13.

15 Requirements for a rating

- 15.1 This subsection sets out the requirements for the endorsement of a rating on a subcategory B1.1, B1.2, B1.3, B1.4 authority or on a B2 authority.
- 15.2 The holder of the authority must satisfactorily complete the category or subcategory type training and assessment for the rating that is:
- (a) approved by CASA; and
 - (b) conducted by a recognised organisation.
- 15.3 For paragraph 15.2, the assessment must consist of:
- (a) for category B1 — a mechanical assessment; and
 - (b) for category B2 — an avionics assessment.
- 15.4 For paragraph 15.3, the assessment for the rating must:
- (a) be in accordance with Part 4 of Appendix 7; and
 - (b) for the aircraft type — be in the theoretical elements mentioned in Part 2 of Appendix 7 that are indicated for the category or subcategory by the numerical level of the type training; and
 - (c) assess the applicant in each theoretical element to the numerical level of the type training indicated for the element; and
 - (d) for the aircraft type — be in the practical elements mentioned in Part 3 of Appendix 7 that are:
 - (i) based on representative theoretical elements mentioned in Part 2 of Appendix 7; and
 - (ii) appropriate for the category or subcategory and the rating; and
 - (e) assess the applicant in each practical element to the numerical level of the theoretical element mentioned in Part 2 of Appendix 7 on which the practical element is based.
- 15.5 For paragraph 15.4, a numerical level of type training has the meaning given to it in Part 1 of Appendix 7.

- 15.6 For paragraph 15.2, the approved type training for a rating must:
- (a) for the aircraft type — include the theoretical elements mentioned in Part 2 of Appendix 7 that are indicated for the category or subcategory by the numerical level of the type training; and
 - (b) include the practical elements mentioned in Part 3 of Appendix 7 that are appropriate for the category or subcategory and the rating; and
 - (c) correspond with the privileges mentioned in subsection 10 for the authority on which the rating is to be endorsed.

16 Endorsement of a rating

If the holder of an authority applies in writing for a rating, CASA must endorse the rating on the holder's authority if:

- (a) he or she:
 - (i) holds an authority in the category B1 or B2 appropriate to the rating sought; and
 - (ii) within the 5 years immediately before he or she applied for the rating, successfully completed the theoretical elements of the aircraft type training and assessment for the rating mentioned in subsection 15; and
 - (iii) within the 2 years immediately before he or she applied for the rating, successfully completed the practical elements of the aircraft type training and assessment for the rating mentioned in subsection 15; or
- (b) he or she:
 - (i) holds a current authorisation of a kind to which section 4.2 of Annex 1 to the Chicago Convention applies, that was issued by a State authority mentioned in subparagraph 14.1 (a) of this Order; and
 - (ii) holds a rating endorsed on the authority that corresponds to the rating sought; and
 - (iii) within the 2 years immediately before the application to CASA, exercised for at least 6 months privileges under the rating equivalent to those exercised by the holder of an authority endorsed with the rating; or
- (c) he or she:
 - (i) holds a current authorisation, of a kind mentioned in sub-subparagraph (b) (i); and
 - (ii) holds or has held a foreign company authorisation corresponding to the rating sought; and
 - (iii) within the 2 years immediately before the application to CASA, exercised for at least 6 months privileges under the authorisations equivalent to those exercised by the holder of an authority endorsed with the rating; and
 - (iv) if the foreign company authorisation is no longer held — did not have it cancelled or revoked for any reason involving fault by the person.

17 Endorsement of an additional rating

If the holder of an authority applies in writing for an additional rating, CASA must endorse the rating on the holder's authority if he or she:

- (a) holds a B1 or B2 authority appropriate to the rating sought; and
- (b) within the 2 years immediately before the application to CASA, exercised for at least 6 months privileges under the rating or ratings that he or she already holds; and
- (c) either:
 - (i) successfully completes the aircraft type training and assessment for the additional rating mentioned in subsection 15 of this Order; or
 - (ii) meets the requirements of subparagraph 16 (b) or 16 (c) for the additional rating.

Appendix 1

Maintenance activities — authority in subcategory A1, A2, A3 or A4

- 1 Minor scheduled line maintenance, including a scheduled inspection or check, up to and including a weekly check:
 - (a) specified in the operator's approved aircraft maintenance program; or
 - (b) if not specified in the operator's approved aircraft maintenance program — listed by CASA in an AAC as equivalent to a weekly check.
- 2 Minor maintenance, including a pre-flight, transit or overnight check, ground handling, APU running, minimum equipment list (*MEL*) implementation as allowed by paragraph 3 (p) and replenishment.
- 3 After appropriate task training for issuing an aircraft certificate of release to service as part of minor scheduled line maintenance or simple defect rectification:
 - (a) replacement of wheel assemblies; and
 - (b) replacement of wheel brake units; and
 - (c) replacement of emergency equipment; and
 - (d) replacement of ovens, boilers and beverage makers; and
 - (e) replacement of internal and external lights, filaments and flash tubes; and
 - (f) replacement of windscreen wiper blades; and
 - (g) replacement of passenger or cabin crew seats, seat belts and harnesses; and
 - (h) closing of cowlings and refitment of quick access inspection panels; and
 - (i) replacement of toilet system components, other than gate valves; and
 - (j) simple repair and replacement of internal compartment doors and placards, other than doors forming part of a pressure structure; and
 - (k) simple repair and replacement of overhead storage compartment doors and cabin furnishing items; and
 - (l) replacement of static wicks; and
 - (m) replacement of aircraft main and APU batteries; and
 - (n) replacement of in-flight entertainment system components, other than public address; and
 - (o) routine lubrication and replenishment of system fluids and gases; and
 - (p) deactivation of subsystems and aircraft components as permitted by the operator's MEL, if the task is listed by CASA in an AAC as being a simple task; and
 - (q) replacement of any other component for an aircraft type if the task is listed by CASA in an AAC as being a simple task.

Appendix 2

Air Transport Association chapter designators of maintenance — authority in subcategory B1.1, B1.2, B1.3, B1.4

- 07 Lifting and shoring
- 08 Levelling and weighing
- 09 Towing and taxiing
- 10 Parking, mooring, storage and return to service
- 21 Air-conditioning and cabin pressurisation
- 24 Electrical power
- 25 Equipment — furnishing
- 26 Fire protection
- 27 Flight controls
- 28 Fuel
- 29 Hydraulic power
- 30 Ice and rain protection
- 32 Landing gear
- 33 Lights
- 35 Oxygen
- 36 Pneumatics
- 37 Vacuum
- 38 Water and waste
- 45 Central maintenance system
- 49 Airborne auxiliary power
- 51 Structures — general, but excluding:
 - (a) wooden structures and fabric surfaces unless:
 - (i) for wooden structures — the holder has obtained the relevant optional units of competency mentioned in paragraph 13.7 of this Order; or
 - (ii) for fabric surfaces — the holder has obtained the relevant optional units of competency mentioned in paragraph 13.7 of this Order; and

Note These optional units of competency are marked Z in Appendix 6.
 - (b) repair and modification of aircraft composite material, structures and components unless the holder has obtained the relevant optional units of competency mentioned in paragraph 13.8 of this Order.

Note These optional units of competency are marked Y in Appendix 6.
- 52 Doors
- 53 Fuselage

54	Nacelles and pylons
55	Stabilisers
56	Windows
57	Wings
60	Propeller — rotor
61	Propeller — propulsion
62	Rotor
63	Rotor drive
64	Tail rotor
65	Tail rotor drive
66	Folding blades and pylon
67	Rotors flight control
71	Power plant
72	Engine
73	Engine fuel and control
74	Ignition
75	Air
76	Engine controls
77	Engine indicating
78	Exhaust
79	Oil
80	Starting

Note This list is derived from Air Transport Association chapter designations.

Appendix 3

Air Transport Association chapter designators of maintenance — authority in category B2

- 22 Auto flight
- 23 Communication
- 24 Electrical power
- 25 Equipment — furnishing (electronic emergency equipment and cabin entertainment equipment)
- 27 Flight controls (system operation, electrical and fly by wire aspects)
- 31 Indicating recording systems
- 33 Lights
- 34 Navigation
- 45 Central maintenance system
- 49 Airborne auxiliary power (electrical power generation aspects)
- 73 Engine fuel and control (EEC and FADEC — fuel metering)
- 74 Ignition
- 76 Engine controls (electrical control aspects)
- 77 Engine indicating
- 80 Starting (electrical control aspects)

Note This list is derived from Air Transport Association chapter designations.

Appendix 4

CASA knowledge syllabus

Part 1 — Levels of knowledge

Levels of knowledge

The level of knowledge for a module, or part of a module, for a category A, B1 or B2 authority is indicated in Part 3 of this Appendix by the allocation of a numerical indicator (1, 2 or 3) against the module or part. A level of knowledge has the meaning given to it below.

Level 1

A familiarisation with the principal elements of the subject such that the following objectives are met.

Objectives

- 1 The applicant must be familiar with the basic elements of the subject.
- 2 The applicant must be able to give a simple description of the whole subject, using common words and examples.
- 3 The applicant must be able to use typical terms.

Level 2

A general knowledge of the theoretical and practical aspects of the subject and an ability to apply that knowledge, such that the following objectives are met.

Objectives

- 1 The applicant must be able to understand the theoretical fundamentals of the subject.
- 2 The applicant must be able to give a general description of the subject using, as appropriate, typical examples.
- 3 The applicant must be able to use mathematical formulae in conjunction with physical laws describing the subject.
- 4 The applicant must be able to read and understand sketches, drawings and schematics describing the subject.
- 5 The applicant must be able to apply his or her 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, such that the following objectives are met.

Objectives

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

Part 2 — Knowledge module requirements

Qualification on basic subjects for each category or subcategory of authority must be in accordance with the following table. Applicable subjects are indicated by an X.

Subject modules	A or B1 aeroplane with:		A or B1 helicopter with:		B2
	Turbine engine(s)	Piston engine(s)	Turbine engine(s)	Piston engine(s)	Avionics
1 Mathematics	X	X	X	X	X
2 Physics	X	X	X	X	X
3 Electrical fundamentals	X	X	X	X	X
4 Electronic fundamentals	X	X	X	X	X
5 Digital techniques electronic instrument systems	X	X	X	X	X
6 Materials and hardware	X	X	X	X	X
7 Maintenance practices	X	X	X	X	X
8 Basic aerodynamics	X	X	X	X	X
9 Human factors	X	X	X	X	X
10 Aviation legislation	X	X	X	X	X

Subject modules	A or B1 aeroplane with:		A or B1 helicopter with:		B2
	Turbine engine(s)	Piston engine(s)	Turbine engine(s)	Piston engine(s)	Avionics
11 Aeroplane aerodynamics, structures and systems	X	X			
12 Helicopter aerodynamics, structures and systems			X	X	
13 Aircraft structures and systems					X
14 Propulsion – avionic systems					X
15 Gas turbine engine	X		X		
16 Piston engine		X		X	
17 Propeller	X	X			

Part 3 — Details of modules and levels of knowledge

Module 1 Mathematics

	Level of knowledge for the category		
	A	B1	B2
1.1 Arithmetic	1	2	2
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 Algebra			
(a) Evaluating simple algebraic expressions, addition, subtraction, multiplication and division, use of brackets, simple algebraic fractions;	1	2	2

	Level of knowledge for the category		
	A	B1	B2
(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
1.3 Geometry			
(a) Simple geometrical constructions;	—	1	1
(b) Graphical representation; nature and uses of graphs, graphs of equations and functions;	2	2	2
(c) Simple trigonometry; trigonometrical relationships, use of tables and rectangular and polar coordinates.	—	2	2

Module 2 Physics

	Level of knowledge for the category		
	A	B1	B2
2.1 Matter	1	1	1
Nature of matter: the chemical elements, structure of atoms, molecules; Chemical compounds; States: solid, liquid and gaseous; Changes between states.			

	Level of knowledge for the category		
	A	B1	B2
2.2 Mechanics			
<i>2.2.1 Statics</i>	1	2	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).			
<i>2.2.2 Kinetics</i>	1	2	1
Linear movement: uniform motion in a straight line, motion under constant acceleration (motion under gravity); Rotational movement: uniform circular motion (centrifugal and centripetal forces); Periodic motion: pendular movement; Simple theory of vibration, harmonics and resonance; Velocity ratio, mechanical advantage and efficiency.			
<i>2.2.3 Dynamics</i>			
(a) Mass; Force, inertia, work, power, energy (potential, kinetic and total energy), heat, efficiency;	1	2	1
(b) Momentum, conservation of momentum; Impulse; Gyroscopic principles; Friction: nature and effects, coefficient of friction (rolling resistance).	1	2	2

	Level of knowledge for the category		
	A	B1	B2
<i>2.2.4 Fluid dynamics</i>			
(a) Specific gravity and density;	2	2	2
(b) Viscosity, fluid resistance, effects of streamlining; Effects of compressibility on fluids; Static, dynamic and total pressure: Bernoulli's Theorem, venturi.	1	2	1
2.3 Thermodynamics			
(a) Temperature: thermometers and temperature scales: Celsius, Fahrenheit and Kelvin; heat definition.	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.	1	2	2
2.4 Optics (light)	—	2	2
Nature of light, speed of light; Laws of reflection and refraction: reflection at plane surfaces, reflection by spherical mirrors, refraction, lenses; Fiberoptics.			
2.5 Wave motion and sound	—	2	2
Wave motion: mechanical waves, sinusoidal wave motion, interference phenomena, standing waves;			

	Level of knowledge for the category		
	A	B1	B2
Sound: speed of sound, production of sound, intensity, pitch and quality, Doppler effect.			

Module 3 Electrical fundamentals

	Level of knowledge for the category		
	A	B1	B2
3.1 Electron theory	1	1	1
Structure and distribution of electrical charges within: atoms, molecules, ions, compounds; Molecular structure of conductors, semiconductors and insulators.			
3.2 Static electricity and conduction	1	2	2
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 vacuum.			
3.3 Electrical terminology	1	2	2
The following terms, their units and factors affecting them: potential difference, electromotive force, voltage, current, resistance, conductance, charge, conventional current flow, electron flow.			
3.4 Generation of electricity	1	1	1
Production of electricity by the following methods: light, heat, friction, pressure, chemical action, magnetism and motion.			
3.5 DC sources of electricity	1	2	2
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;			

	Level of knowledge for the category		
	A	B1	B2
Construction, materials and operation of thermocouples; Operation of photo-cells.			
3.6 DC circuits	—	2	2
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.			
3.7 Resistance and resistor			
(a) Resistance and affecting factors; Specific resistance; Resistor colour code, values and tolerances, preferred values, wattage ratings; Resistors in series and parallel; Calculation of total resistance using series parallel and series parallel combinations; Operation and use of potentiometers and rheostats; Operation of Wheatstone Bridge.	—	2	2
(b) Positive and negative temperature coefficient conductance; Fixed resistors, stability, tolerance and limitations, methods of construction; Variable resistors, thermistors, voltage dependent resistors; Construction of potentiometers and rheostats; Construction of Wheatstone Bridge.	—	1	1
3.8 Power	—	2	2
Power, work and energy (kinetic and potential); Dissipation of power by a resistor; Power formula; Calculations involving power, work and energy.			

	Level of knowledge for the category		
	A	B1	B2
3.9 Capacitance and capacitor	—	2	2
<p>Operation and function of a capacitor;</p> <p>Factors affecting capacitance area of plates, distance between plates, number of plates, dielectric and dielectric constant, working voltage, voltage rating;</p> <p>Capacitor types, construction and function;</p> <p>Capacitor colour coding;</p> <p>Calculations of capacitance and voltage in series and parallel circuits;</p> <p>Exponential charge and discharge of a capacitor, time constants;</p> <p>Testing of capacitors.</p>			
3.10 Magnetism			
<p>(a)</p> <p>Theory of magnetism;</p> <p>Properties of a magnet;</p> <p>Action of a magnet suspended in the Earth's magnetic field;</p> <p>Magnetisation and demagnetisation;</p> <p>Magnetic shielding;</p> <p>Various types of magnetic material;</p> <p>Electromagnets construction and principles of operation;</p> <p>Hand clasp rules to determine: magnetic field around current carrying conductor.</p>	—	2	2
<p>(b)</p> <p>Magneto-motive force, field strength, magnetic flux density, permeability, hysteresis loop, retentivity, reluctance, saturation point, eddy currents; coercive force;</p> <p>Precautions for care and storage of magnets.</p>	—	2	2
3.11 Inductance and inductor	—	2	2
<p>Faraday's Law;</p> <p>Action of inducing a voltage in a conductor moving in a magnetic field;</p>			

	Level of knowledge for the category		
	A	B1	B2
<p>Induction principles;</p> <p>Effects of the following on the magnitude of an induced voltage: magnetic field strength, rate of change of flux, number of conductor turns;</p> <p>Mutual induction;</p> <p>The effect the rate of change of primary current and mutual inductance has on induced voltage;</p> <p>Factors affecting mutual inductance: number of turns in coil, physical size of coil, permeability of coil, position of coils with respect to each other;</p> <p>Lenz's Law and polarity determining rules;</p> <p>Back emf, self induction;</p> <p>Saturation point;</p> <p>Principal uses of inductors.</p>			
3.12 DC motor and generator theory	—	2	2
<p>Basic motor and generator theory;</p> <p>Construction and purpose of components in DC generator;</p> <p>Operation of, and factors affecting output and direction of, current flow in DC generators;</p> <p>Operation of, and factors affecting output power, torque, speed and direction of rotation of DC motors;</p> <p>Series wound, shunt wound and compound motors;</p> <p>Starter generator construction.</p>			
3.13 C theory	1	2	2
<p>Sinusoidal waveform: phase, period, frequency, cycle;</p> <p>Instantaneous, average, root mean square, peak, peak to peak current values and calculations of these values, in relation to voltage, current and power;</p> <p>Triangular and square waves;</p> <p>Single and 3 phase principles.</p>			
3.14 Resistive (R), Capacitive (C) and Inductive (L) Circuits	—	2	2
Phase relationship of voltage and current in L, C and R circuits,			

	Level of knowledge for the category		
	A	B1	B2
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.			
3.15 Transformers	—	2	2
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 3 phase system; Primary and secondary current, voltage, turns ratio, power, efficiency; Autotransformers.			
3.16 Filters	—	1	1
Operation, application and uses of the following filters: low pass, high pass, band pass, band stop.			
3.17 AC generators	—	2	2
Rotation of loop in a magnetic field and waveform produced; Operation and construction of revolving armature and revolving field type AC generators; Single phase, 2 phase and 3 phase alternators; Three phase star and delta connections advantages and uses; Permanent magnet generators.			
3.18 AC motors	—	2	2
Construction, principles of operation and characteristics of: AC synchronous and induction motors both single and polyphase; Methods of speed control and direction of rotation; Methods of producing a rotating field: capacitor, inductor, shaded or split pole.			

Module 4 Electronic fundamentals

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

	Level of knowledge for the category		
	A	B1	B2
Transistor characteristics and properties.			
(b) Construction and operation of PNP and NPN transistors; Base, collector and emitter configurations; Testing of transistors; Basic appreciation of other transistor types and their uses; Application of transistors: classes of amplifier (A, B, C); Simple circuits including: bias, decoupling, feedback and stabilisation; Multistage circuit principles: cascades, push-pull, oscillators, multivibrators, flip-flop circuits.	—	—	2
4.1.3 Integrated circuits			
(a) Description and operation of logic circuits and linear circuits and operational amplifiers.	—	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	—	1	2
Description and use of printed circuit boards.			
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	—	1	—

	Level of knowledge for the category		
	A	B1	B2
system components and features: resolvers, differential, control and torque, transformers, inductance and capacitance transmitters.			
(b) Understanding of the following terms: open and closed loop, follow up, servomechanism, analogue, transducer, null, damping, feedback, dead band; 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; Servo mechanism defects, reversal of synchro leads, hunting.	—	—	2

Module 5 Digital techniques electronic instrument systems

	Level of knowledge for the category		
	A	B1	B2
5.1 Electronic instrument systems	1	2	3
Typical systems arrangements and cockpit layout of electronic instrument systems.			
5.2 Numbering systems	—	1	2
Numbering systems: binary, octal and hexadecimal; Demonstration of conversions between the decimal and binary, octal and hexadecimal systems and vice versa.			
5.3 Data conversion	—	1	2
Analogue data, digital data; Operation and application of analogue to digital, and digital to analogue converters, inputs and outputs, limitations of various types.			

	Level of knowledge for the category		
	A	B1	B2
5.4 Data buses	—	2	2
Operation of data buses in aircraft systems, including knowledge of ARINC and other specifications.			
5.5 Logic circuits			
(a) Identification of common logic gate symbols, tables and equivalent circuits; Applications used for aircraft systems, schematic diagrams.	—	2	2
(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 microcomputer including their associated bus systems; Information contained in single and multi address instruction words; Memory associated terms; Operation of typical memory devices; Operation, advantages and disadvantages of the various data storage systems.	—	—	2
5.7 Microprocessors	—	—	2
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.			

	Level of knowledge for the category		
	A	B1	B2
5.8 Integrated circuits			2
Operation and use of encoders and decoders; Function of encoder types; Uses of medium, large and very large scale integration.			
5.9 Multiplexing	—	—	2
Operation, application and identification in logic diagrams of multiplexers and demultiplexers.			
5.10 Fibre optics	—	1	2
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.			
5.11 Electronic displays	—	2	2
Principles of operation of common types of displays used in modern aircraft, including cathode ray tubes, light emitting diodes and liquid crystal display.			
5.12 Electrostatic sensitive devices	1	2	2
Special handling of components sensitive to electrostatic discharges; Awareness of risks and possible damage, component and personnel anti-static protection devices.			
5.13 Software management control	—	2	2
Awareness of restrictions, airworthiness requirements and possible catastrophic effects of unapproved changes to software programs.			

	Level of knowledge for the category		
	A	B1	B2
5.14 Electromagnetic environment	—	2	2
Influence of the following phenomena on maintenance practices for electronic system: EMC-electromagnetic compatibility; EMI-electromagnetic interference; HIRF-high intensity radiated field; Lightning and lightning protection.			
5.15 Typical electronic and digital aircraft systems	—	2	2
General arrangement of typical electronic and digital aircraft systems and associated BITE (built-in test equipment) testing such as: ACARS-ARINC communication and addressing and reporting system; ECAM-electronic centralised aircraft monitoring; EFIS-electronic flight instrument system; EICAS-engine indication and crew alerting system; FBW-flyby wire; FMS-flight management system; GPS-global positioning system; IRS-inertial reference system; TCAS-traffic alert collision avoidance system.			

Module 6 Materials and hardware

	Level of knowledge for the category		
	A	B1	B2
6.1 Aircraft materials ferrous			
(a) Characteristics, properties and identification of common alloy steels used in aircraft; Heat treatment and application of alloy steels;	1	2	1
(b) Testing of ferrous materials for hardness, tensile strength, Fatigue strength and impact resistance.	—	1	1
6.2 Aircraft materials — non-ferrous			
(a) Characteristics, properties and identification of common non-ferrous materials used in aircraft; Heat treatment and application of non-ferrous materials;	1	2	1
(b) Testing of non-ferrous material for hardness, tensile strength, fatigue strength and impact resistance.	—	1	1
6.3 Aircraft materials — composite and non-metallic			
<i>6.3.1 Composite and non-metallic other than wood and fabric</i>			
(a) Characteristics, properties and identification of common composite and non-metallic materials, other than wood, used in aircraft; Sealant and bonding agents.	1	2	2
(b) The detection of defects and deterioration in composite and non-metallic material; Repair of composite and non-metallic material.	1	2	—

	Level of knowledge for the category		
	A	B1	B2
<i>6.3.2 Wooden structures</i>	1	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.			
<i>6.3.3 Fabric covering</i>	1	2	—
Characteristics, properties and types of fabrics used in aeroplanes; Inspections methods for fabric; Types of defects in fabric; Repair of fabric covering.			
6.4 Corrosion			
(a) Chemical fundamentals; Formation by galvanic action process, microbiological, stress;	1	1	1
(b) Types of corrosion and their identification; Causes of corrosion; Material types, susceptibility to corrosion.	2	3	2
6.5 Fasteners			
<i>6.5.1 Screw threads</i>	2	2	2
Screw nomenclature; Thread forms, dimensions and tolerances for standard threads used in aircraft; Measuring screw threads;			

	Level of knowledge for the category		
	A	B1	B2
<i>6.5.2 Bolts, studs and screws</i>	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.			
<i>6.5.3 Locking devices</i>	2	2	2
Tab and spring washers, locking plates, split pins, pal-nuts, wire locking, quick release fasteners, keys, circlips, cotter pins.			
<i>6.5.4 Aircraft rivets</i>	1	2	1
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
(b) Standard unions for aircraft hydraulic, fuel, oil, pneumatic and air system pipes.	2	2	1
6.7 Springs	1	2	1
Types of springs, materials, characteristics and applications.			
6.8 Bearings	1	2	2
Purpose of bearings, loads, material, construction; Types of bearings and their application.			
6.9 Transmissions	1	2	2
Gear types and their application; Gear ratios, reduction and multiplication gear systems, driven and driving gears, idler gears, mesh patterns;			

	Level of knowledge for the category		
	A	B1	B2
Belts and pulleys, chains and sprockets.			
6.10 Control cables	1	2	1
Types of cables; End fittings, turn buckles and compensation devices; Pulleys and cable system components; Bowden cables; Aircraft flexible control systems.			
6.11 Electrical cables and connectors	1	2	2
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.			

Module 7 Maintenance practices

	Level of knowledge for the category		
	A	B1	B2
7.1 Safety precautions — aircraft and workshop	3	3	3
Aspects of safe working practices including precautions to take when working with electricity, gases especially oxygen, oils and chemicals; 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	3	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.			

	Level of knowledge for the category		
	A	B1	B2
7.3 Tools	3	3	3
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.			
7.4 Avionic general test equipment	—	2	3
Operation, function and use of avionic general test equipment.			
7.5 Engineering drawings, diagrams and standards	1	2	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; Wiring diagrams and schematic diagrams.			
7.6 Fits and clearances	1	2	1
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.			
7.7 Electrical cables and connectors	1	2	2
Continuity, insulation and bonding techniques and testing; Use of crimp tools: hand and hydraulic operated;			

	Level of knowledge for the category		
	A	B1	B2
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.			
7.8 Riveting	1	2	—
Riveted joints, rivet spacing and pitch; Tools used for riveting and dimpling; Inspection of riveted joints.			
7.9 Pipes and hoses	1	2	—
Bending and belling and flaring aircraft pipes; Inspection and testing of aircraft pipes and hoses; Installation and clamping of pipes.			
7.10 Springs	1	2	—
Inspection and testing of springs.			
7.11 Bearings	1	2	—
Testing, cleaning and inspection of bearings; Lubrication requirements of bearings; Defects in bearings and their causes.			
7.12 Transmissions	1	2	—
Inspection of gears, backlash; Inspection of belts and pulleys, chains and sprockets; Inspection of screw jacks, lever devices, push-pull rod systems.			
7.13 Control cables	1	2	—
Swaging of end fittings; Inspection and testing of control cables;			

	Level of knowledge for the category		
	A	B1	B2
Bowden cables; Aircraft flexible control systems.			
7.14 Material handling			
<i>7.14.1 Sheet Metal</i>	—	2	—
Marking out, and calculation of, bend allowance; Sheet metal working including bending and forming; Inspection of sheet metal work.			
<i>7.14.2 Composite and non-metallic</i>	—	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; Inspection of welded and brazed joints; Bonding methods and inspection of bonded joints.	—	2	—
7.16 Aircraft weight and balance			
(a) Centre of gravity and balance limits calculation: use of relevant documents;	—	2	2
(b) Preparation of aircraft for weighing; Aircraft weighing.	—	2	—
7.17 Aircraft handling and storage	2	2	2
Aircraft taxiing and towing and associated safety precautions; Aircraft jacking, chocking, securing and associated safety precautions;			

	Level of knowledge for the category		
	A	B1	B2
Aircraft storage methods; Refuelling and defuelling procedures; De-icing and 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; Corrosion removal, assessment and re protection;	2	3	2
(b) General repair methods, Structural Repair Manual; Ageing, fatigue and corrosion control programs;	—	2	—
(c) Non destructive inspection techniques including: penetrant, radiographic, eddy current, ultrasonic and boroscope methods.	—	2	1
(d) Disassembly and re-assembly techniques;	2	2	2
(e) Trouble shooting techniques.	—	2	2
7.19 Abnormal events			
(a) Inspections following lightning strikes and HIRF penetration.	2	2	2
(b) Inspections following abnormal events such as heavy landings and flight through turbulence.	2	2	—
7.20 Maintenance procedures	1	2	2
Maintenance planning;			

	Level of knowledge for the category		
	A	B1	B2
Modification procedures; Stores procedures; Certification and release procedures; Interface with aircraft operation; Maintenance inspection, quality control and quality assurance; Additional maintenance procedures; Control of life limited components.			

Module 8 Basic aerodynamics

	Level of knowledge for the category		
	A	B1	B2
8.1 Physics of the atmosphere	1	2	2
International Standard Atmosphere (ISA), application aerodynamics.			
8.2 Aerodynamics	1	2	2
Air flow around a body; Boundary layer, laminar and turbulent flow, free stream flow, relative airflow, up wash 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 washout, 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.			
8.3 Theory of flight	1	2	2
Relationship between lift, weight, thrust and drag; Glide ratio;			

	Level of knowledge for the category		
	A	B1	B2
Steady state flights, performance; Theory of the turn; Influence of load factor: stall, flight envelope and structural limitations; Lift augmentation.			
8.4 Flight stability and dynamics	1	2	2
Longitudinal, lateral and directional stability (active and passive).			

Module 9 Human factors

	Level of knowledge for the category		
	A	B1	B2
9.1 General	1	2	2
The need to take human factors into account; Incidents attributable to human factors and 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;			

	Level of knowledge for the category		
	A	B1	B2
“Culture” issues; Team working; Management, supervision and leadership.			
9.4 Factors affecting performance	2	2	2
Fitness and 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; Working environment.			
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;			

	Level of knowledge for the category		
	A	B1	B2
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 10 Aviation legislation

	Level of knowledge for the category		
	A	B1	B2
10.1 Regulatory framework	1	1	1
Role of International Civil Aviation Organization; Role of CASA; Relationship between CAO 100.66, CASR 1998 and CAR 1988; Relationship with other aviation authorities.			
10.2 CAO 100.66 certifying staff maintenance	2	2	2
Detailed understanding of CAO 100.66.			
10.3 Reserved			
10.4 Commercial air transportation	1	1	1
Air Operators Certificates; Operators responsibilities; Documents to be carried; Aircraft placarding (markings).			

	Level of knowledge for the category		
	A	B1	B2
10.5 Aircraft certification			
(a) <i>General</i> Certification rules; Type certification; Supplemental type certification; Part 21 – Design and production organisation approvals.	—	1	1
(b) <i>Documents</i> Certificate of Airworthiness; Certificate of Registration; Noise Certificate; Weight Schedule; Radio Station Licence and Approval.	—	2	2
10.6 Reserved			
10.7 Applicable national and international requirements			
(a) Management programs, maintenance checks and inspections; Master Minimum Equipment Lists, Minimum Equipments List, Dispatch Deviation Lists; Airworthiness Directives; Service bulletins, manufacturers’ service information; Modification and repairs; Maintenance documentation: maintenance manuals, structural repair manuals, illustrated parts catalogue, etc;	1	2	2
(b) Continuing airworthiness; Test flights; ETOPS, maintenance and despatch requirements; All weather operation: category 2 and 3 operations and	—	1	1

	Level of knowledge for the category		
	A	B1	B2
minimum equipment requirements.			

Module 11 Aeroplane aerodynamics, structures and systems

Note Under this table, item 11.1.2 *High speed flight* is not applicable to piston aircraft

	Level of knowledge for the category		
	A	B1	B2
11.1 Theory of flight	1	2	—
<i>11.1.1 Aeroplane aerodynamics and flight controls</i>			
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, sawtooth leading edges; Boundary layer control using, vortex generators, stall wedges or leading edge devices; Operation and effect of trim tabs, balance and anti-balance (leading) tabs, servo tabs, spring tabs, mass balance, control surface bias, aerodynamic balance panels.			
<i>11.1.2 High speed flight (see note above)</i>	1	2	—
Speed of sound, subsonic flight, transonic flight, supersonic flight; Mach number, critical Mach number, compressibility buffet, shockwave, aerodynamic cheating, area rule; Factors affecting airflow in engine intakes of high speed aircraft;			

	Level of knowledge for the category		
	A	B1	B2
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	—
11.3 Airframe structures — aeroplanes			
<i>11.3.1 Fuselage (ATA52/53/56)</i>	1	2	—
Construction and pressurisation sealing; Wing, stabiliser, pylon and under carriage attachments; Seat installation and cargo loading system; Doors and emergency exits: construction, mechanisms, operation and safety devices;			

	Level of knowledge for the category		
	A	B1	B2
Windows and windscreen construction and mechanisms.			
<i>11.3.2 Wings (ATA57)</i>	1	2	—
Construction; Fuel storage; Landing gear, pylon, control surface and highlift and drag attachments.			
<i>11.3.3 Stabilisers (ATA55)</i>	1	2	—
Construction; Control surface attachment.			
<i>11.3.4 Flight control surface (ATA55/57)</i>	1	2	—
Construction and attachment; Balancing — mass and aerodynamic.			
<i>11.3.5 Nacelles and pylons (ATA54)</i>	1	2	—
Construction; Firewalls; Engine mounts.			
11.4 Air-conditioning and cabin pressurisation (ATA21)			
<i>11.4.1 Air supply</i>	1	2	—
Sources of air supply including engine bleed, APU and ground cart.			
<i>11.4.2 Air-conditioning</i>	1	3	—
Air-conditioning systems; Air cycle and vapour cycle machines; Distribution systems; Flow, temperature and humidity control system.			
<i>11.4.3 Pressurisation</i>	1	3	—
Pressurisation systems; Control and indication including control and safety valves;			

	Level of knowledge for the category		
	A	B1	B2
Cabin pressure controllers.			
<i>11.4.4 Safety and warning devices</i>	1	3	—
Protection and warning devices.			
11.5 Instruments and avionic systems			
<i>11.5.1 Instrument systems (ATA31)</i>	1	2	—
Pitot static: altimeter, airspeed 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; Other aircraft system indication.			
<i>11.5.2 Avionic systems</i>	1	1	—
Fundamentals of system layouts and operation of: Auto flight (ATA22); Communications (ATA23); Navigation systems (ATA34).			
11.6 Electrical power (ATA24)	1	3	—
Batteries installation and operation; DC power generation; AC power generation; Emergency power generation; Voltage regulation; Power distribution; Inverters, transformers, rectifiers; Circuit protection; External and ground power.			

	Level of knowledge for the category		
	A	B1	B2
11.7 Equipment and furnishings (ATA25)			
(a) Emergency equipment requirements; Seats, harnesses and belts.	2	2	—
(b) Cabin layout; Equipment layout; Cabin furnishing installation; Cabin entertainment equipment; Galley installation; Cargo handling and retention equipment; Airstairs.	1	1	—
11.8 Fire protection (ATA26)			
(a) Fire and smoke detection and warning systems; Fire extinguishing systems; System tests.	1	3	—
(b) Portable fire extinguisher.	1	3	—
11.9 Flight controls (ATA27)	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;			

	Level of knowledge for the category		
	A	B1	B2
Stall protection and warning system.			
11.10 Fuel systems (ATA28)	1	3	—
System layout; 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 (ATA29)	1	3	—
System layout; 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.			
11.12 Ice and rain protection (ATA30)	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 repellent; Probe and drain heating; Wiper systems.			
11.13 Landing gear (ATA32)	2	3	—
Construction, shock absorbing; Extension and retraction systems: normal and emergency;			

	Level of knowledge for the category		
	A	B1	B2
Indications and warning; Wheels, brakes, antiskid and auto braking; Tyres; Steering.			
11.14 Lights (ATA33)	2	3	—
External: navigation, anti-collision, landing, taxiing, ice; Internal: cabin, cockpit, cargo; emergency.			
11.15 Oxygen (ATA35)	1	3	—
System layout: cockpit, cabin; Sources, storage, charging and distribution; Supply regulation; Indications and warnings.			
11.16 Pneumatic and vacuum (ATA36)	1	3	—
System layout; Sources: engine and APU, compressors, reservoirs, ground supply; Pressure control; Distribution; Indications and warnings; Interfaces with other systems.			
11.17 Water and waste (ATA38)	2	3	—
Water system layout, supply, distribution, servicing and draining; Toilet system layout, flushing and servicing; Corrosion aspects.			
11.18 On board maintenance systems (ATA45)	1	2	—
Central maintenance computers; Data loading system; Electronic library system;			

	Level of knowledge for the category		
	A	B1	B2
Printing; Structure monitoring (damage tolerance monitoring).			

Module 12 Helicopter aerodynamics, structures and systems

	Level of knowledge for the category		
	A3 A4	B1.3 B1.4	B2
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, over pitching; 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			

	Level of knowledge for the category		
	A3 A4	B1.3 B1.4	B2
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	—
Gearboxes, main and tail rotors; Clutches, freewheel units and rotor brake.			
12.5 Airframe structures			
(a) Airworthiness requirements for structural strength; Structural classification, primary, secondary and tertiary; Fail safe, safe life, damage tolerance concepts; Zonal and station identification systems; Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue; Drains and ventilation provisions; System installation provisions; Lightning strike protection provision.	2	2	—
(b) Construction methods of: stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, methods of skinning and anti-corrosive protection; Pylon, stabiliser and undercarriage attachments; Seat installation;	1	2	—

	Level of knowledge for the category		
	A3 A4	B1.3 B1.4	B2
<p>Doors: construction, mechanisms, operation and safety devices;</p> <p>Windows and windscreen construction;</p> <p>Fuel storage;</p> <p>Firewalls;</p> <p>Engine mounts;</p> <p>Structure assembly techniques: riveting, bolting, bonding;</p> <p>Methods of surface protection, such as chromating, anodising, painting;</p> <p>Surface cleaning;</p> <p>Airframe symmetry: methods of alignment and symmetry checks.</p>			
12.6 Air-conditioning (ATA21)			
<i>12.6.1 Air supply</i>	1	2	—
Sources of air supply including engine bleed and ground cart.			
<i>12.6.2 Air-conditioning</i>			
<p>Air-conditioning systems;</p> <p>Distribution systems;</p> <p>Flow and temperature control systems;</p> <p>Protection and warning devices.</p>	1	3	—
12.7 Instruments and avionic systems			
<i>12.7.1 Instrument systems (ATA31)</i>	1	2	—
<p>Pitot static: altimeter, air speed indicator, vertical speed indicator;</p> <p>Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator;</p> <p>Compasses: direct reading, remote reading;</p> <p>Vibration indicating systems — HUMS;</p> <p>Other aircraft system indication.</p>			

	Level of knowledge for the category		
	A3 A4	B1.3 B1.4	B2
<i>12.7.2 Avionic systems</i>	1	1	—
Fundamentals of system layouts and operation of: Auto flight (ATA22); Communications (ATA23); Navigation Systems (ATA34).			
12.8 Electrical power (ATA24)	1	3	—
Batteries installation and operation; DC power generation, AC power generation; Emergency power generation; Voltage regulation, circuit protection; Power distribution; Inverters, transformers, rectifiers; External and ground power.			
12.9 Equipment and furnishings (ATA25)			
(a) Emergency equipment requirements; Seats, harnesses and belts; Lifting systems.	2	2	—
(b) Emergency flotation systems; Cabin layout, cargo retention; Equipment layout; Cabin furnishing installation.	1	1	—
12.10 Fire protection (ATA26)	1	3	—
Fire and smoke detection and warning systems; Fire extinguishing systems; System tests.			
12.11 Fuel systems (ATA28)	1	3	—
System layout;			

	Level of knowledge for the category		
	A3 A4	B1.3 B1.4	B2
Fuel tanks; Supply systems; Dumping, venting and draining; Cross-feed and transfer; Indications and warnings; Refuelling and defuelling.			
12.12 Hydraulic power (ATA29)	1	3	—
System layout; 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 (ATA30)	1	3	—
Ice formation, classification and detection; Anti-icing and de-icing systems: electrical, hot air and chemical; Rain repellent and removal; Probe and drain heating.			
12.14 Landing gear (ATA32)	2	3	—
Construction, shock absorbing; Extension and retraction systems: normal and emergency; Indications and warning; Wheels, tyres, brakes; Steering; Skids, floats.			

	Level of knowledge for the category		
	A3 A4	B1.3 B1.4	B2
12.15 Lights (ATA33)	2	3	—
External: navigation, landing, taxiing, ice; Internal: cabin, cockpit, cargo; emergency.			
12.16 Pneumatic and vacuum (ATA36)	1	3	—
System layout; Sources: engine, compressors, reservoirs, ground supply; Pressure control; Distribution; Indication and warnings; Interfaces with other systems.			
12.17 On board maintenance systems (ATA45)	1	2	—
Central maintenance computers; Data loading system; Electronic library system; Printing; Structure monitoring (damage tolerance monitoring).			

Module 13 Aircraft aerodynamics, structures and systems

	Level of knowledge for the category		
	A	B1	B2
13.1 Theory of flight			
(a) <i>Aeroplane aerodynamics and flight controls</i> Operation and effect of: <ul style="list-style-type: none"> • roll control: ailerons and spoilers; • pitch control: elevators, stabilators, variable incidence stabilisers and canards; 	—	—	1

	Level of knowledge for the category		
	A	B1	B2
<ul style="list-style-type: none"> yaw control, rudder limiters; Control using elevons, ruddervators; Highlift devices: slots, slats, flaps; Drag inducing devices: spoilers, lift dumpers, speed brakes; Operation and effect of trim tabs, servo tabs, control surface bias.			
<i>(b) High speed flight</i> Speed of sound, subsonic flight, transonic flight, supersonic flight, Mach number, critical Mach number.	—	—	1
<i>(c) Rotary wing aerodynamics</i> Terminology; Operation and effect of cyclic, collective and anti-torque controls.	—	—	1
13.2 Structures — general concepts			
<i>(a)</i> Fundamentals of structural systems.	—	—	1
<i>(b)</i> Zonal and station identification systems; electrical bonding; Lightning strike protection provision.	—	—	2
13.3 Autoflight (ATA22)	—	—	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; Auto pilot navigation aids interface;			

	Level of knowledge for the category		
	A	B1	B2
Auto throttle systems; Automatic landing systems: principles and categories, modes of operation, approach, glide slope, land, go-around, system monitors and failure conditions.			
13.4 Communication and navigation (ATA23/34)	—	—	3
Fundamentals of radio wave propagation, antennas, transmission lines, communication, receiver and transmitter.			
Working principles of following systems: <ul style="list-style-type: none"> • Very high frequency (VHF) communication; • High frequency (HF) communication; • Audio; • Emergency locator transmitters; • Cockpit voice recorder; • Very high frequency omni directional 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); • 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. 			

	Level of knowledge for the category		
	A	B1	B2
13.5 Electrical power (ATA24)	—	—	3
Batteries installation and operation; DC power generation; AC power generation; Emergency power generation; Voltage regulation; power distribution; Inverters, transformers, rectifiers; circuit protection; External and Ground power.			
13.6 Equipment and furnishings (ATA25)	—	—	3
Electronic emergency equipment requirements; Cabin entertainment equipment.			
13.7 Flight controls (ATA27)			
(a) Primary controls: aileron, elevator, rudder, spoiler; Trim control; Active load control; High lift devices; Lift dump, speed brakes; System operation: manual, hydraulic, pneumatic; Artificial feel, Yaw damper, Mach trim, rudder limiter, gust locks; Stall protection systems;	—	—	1
(b) System operation: electrical, fly by wire.	—	—	2
13.8 Instrument systems (ATA31)	—	—	2
Classification; Atmosphere; Terminology; Pressure measuring devices and systems; Pitot static systems;			

	Level of knowledge for the category		
	A	B1	B2
Altimeters; Vertical speed indicators; Airspeed indicators; Machmeters; Altitude reporting and 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.			
13.9 Lights (ATA33)	—	—	3
External: navigation, landing, taxiing, ice; Internal: cabin, cockpit, cargo; Emergency.			
13.10 Onboard maintenance systems (ATA45)	—	—	3
Central maintenance computers; Data loading system; Electronic library system;			

	Level of knowledge for the category		
	A	B1	B2
Printing; Structure monitoring (damage tolerance monitoring).			

Module 14 Propulsion — avionic systems

	Level of knowledge for the category		
	A	B1	B2
14.1 Turbine engines			
(a) Constructional arrangement and operation of turbojet, turbofan, turbo shaft and turbo propeller engines;	—	—	1
(b) Electronic Engine control and fuel metering systems (FADEC).	—	—	2
14.2 Engine indicating systems	—	—	2
Exhaust gas temperature and Inter stage 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.			

Module 15 Gas turbine engine

	Level of knowledge for the category		
	A	B1	B2
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, turbo shaft, 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 airflow control: bleed valves, variable inlet guide vanes, variable stator vanes, rotating stator blades; Compressor ratio.			

	Level of knowledge for the category		
	A	B1	B2
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.			
15.7 Exhaust	1	2	—
Constructional features and principles of operation; Convergent, divergent and variable area nozzles; Engine noise reduction; Thrust reversers.			
15.8 Bearings and seals	—	2	—
Constructional features and principles of operation.			
15.9 Lubricants and fuels	1	2	—
Properties and specifications; Fuel additives; Safety precautions.			
15.10 Lubrication systems	1	2	—
System operation and layout and components.			
15.11 Fuel systems	1	2	—
Operation of engine control and fuel metering systems; Including electronic engine control (FADEC); Systems layout and components.			
15.12 Air systems	1	2	—
Operation of engine air distribution and anti-ice control systems, including internal cooling, sealing and external air			

	Level of knowledge for the category		
	A	B1	B2
services.			
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 and interstage turbine temperature; Engine thrust indication: engine pressure ratio, engine turbine discharge pressure or jet pipe pressure systems; Oil pressure and temperature; Fuel pressure and flow; Engine speed; Vibration measurement and indication; Torque; Power.	1	2	—
15.15 Power augmentation systems	—	1	—
Operation and applications; Water injection, water methanol; Afterburner systems.			
15.16 Turbo-prop engines	1	2	—
Gas coupled and free turbine and gear coupled turbines; Reduction gears; Integrated engine and propeller controls; Over speed safety devices.			
15.17 Turbo-shaft engines	1	2	—
Arrangements, drive systems, reduction gearing, couplings, control systems.			
15.18 Auxiliary power units (APUs)	1	2	—
Purpose, operation, protective systems.			

	Level of knowledge for the category		
	A	B1	B2
15.19 Powerplant installation	1	2	—
Configuration of fire walls, cowlings, acoustic panels engine mounts, anti-vibration mounts, hoses, pipes, feeders, connectors, wiring looms, control cables and rods, lifting points and drains.			
15.20 Fire protection systems	1	2	—
Operation of detection and extinguishing systems.			
15.21 Engine monitoring and ground operation	1	3	—
Procedures for starting and ground run-up; Interpretation of engine power output and parameters; Trend (including oil analysis, vibration and baroscope) monitoring; Inspection of engine and components to criteria, tolerances and data specified by engine manufacturer; Compressor washing and cleaning; Foreign object damage.			
15.22 Engine storage and preservation	—	2	—
Preservation and depreservation for the engine and accessories and systems.			

Module 16 Piston engine

	Level of knowledge for the category		
	A	B1	B2
16.1 Fundamentals	1	2	—
Mechanical, thermal and volumetric efficiencies; Operating principles: 2 stroke, 4 stroke, otto and diesel; Piston displacement and compression ratio; Engine configuration and firing order.			

	Level of knowledge for the category		
	A	B1	B2
16.2 Engine performance	1	2	—
Power calculation and measurement; Factors affecting engine power; Mixtures and leaning, pre-ignition.			
16.3 Engine construction	1	2	—
Crankcase, crankshaft, camshafts, sumps; Accessory gearbox; Cylinder and piston assemblies; Connecting rods, inlet and exhaust manifolds; Valve mechanisms; Propeller reduction gearboxes.			
16.4 Engine fuel systems			
<i>16.4.1 Carburettors</i>	1	2	
Types, construction and principles of operation; Icing and heating.			
<i>16.4.2 Fuel injection systems</i>	1	2	—
Types, construction and principles of operation.			
<i>16.4.3 Electronic engine control</i>	1	2	—
Operation of engine control and fuel metering systems including electronic engine control (FADEC); Systems layout and components.			
16.5 Starting and ignition systems	1	2	—
Starting systems, pre-heat systems; Magneto types, construction and principles of operation; Ignition harnesses, sparkplugs; Low and high-tension systems.			
16.6 Induction, exhaust and cooling systems	1	2	—
Construction and operation of induction systems, including alternate air systems;			

	Level of knowledge for the category		
	A	B1	B2
Exhaust systems, engine cooling systems — air and liquid.			
16.7 Supercharging and turbo charging	1	2	—
Principles and purpose of supercharging and its effects on engine parameters; Construction and operation of supercharging and turbo charging systems; System terminology; Control systems; System protection.			
16.8 Lubricants and fuels	1	2	—
Properties and specifications; Fuel additives; Safety precautions.			
16.9 Lubrication systems	1	2	—
System operation and layout and components.			
16.10 Engine indication systems	1	2	—
Engine speed; Cylinder head temperature; Coolant temperature; Oil pressure and temperature; Exhaust gas temperature; Fuel pressure and flow; Manifold pressure.			
16.11 Power plant installation	1	2	—
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.			
16.12 Engine monitoring and ground operation	1	3	—
Procedures for starting and ground run-up; Interpretation of engine power output and parameters;			

	Level of knowledge for the category		
	A	B1	B2
Inspection of engine and components: criteria, tolerances and data specified by engine manufacturer.			
16.13 Engine storage and preservation	—	2	—
Preservation and depreservation for the engine and accessories and systems.			

Module 17 Propeller

	Level of knowledge for the category		
	A	B1	B2
17.1 Fundamentals	1	2	—
Blade element theory; High and 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.			
17.2 Propeller construction	1	2	—
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 speed propeller; Propeller and spinner installation.			
17.3 Propeller pitch control	1	2	—
Speed control and pitch change methods, mechanical and electrical and electronic; Feathering and reverse pitch;			

	Level of knowledge for the category		
	A	B1	B2
Overspeed protection.			
17.4 Propeller synchronising	—	2	—
Synchronising and synchrophasing equipment.			
17.5 Propeller ice protection	1	2	—
Fluid and electrical de-icing equipment.			
17.6 Propeller maintenance	1	3	—
Static and dynamic balancing; Blade tracking; Assessment of blade damage, erosion, corrosion, impact damage, delamination; Propeller treatment and repair schemes; Propeller engine running.			
17.7 Propeller storage and preservation	1	2	—
Propeller preservation and depreservation.			

Appendix 5

Recognised organisations

1 Definitions

Definitions for this Appendix are set out in subsection 2 of this Order.

2 Scope

- 2.1 This Appendix deals with the circumstances in which the training and assessment conducted by a person will be recognised by CASA as satisfying the requirements of maintenance training.
- 2.2 CASA may only recognise training as maintenance training if it is conducted by a person who:
 - (a) is approved by CASA under this Appendix; and
 - (b) has an accountable manager approved by CASA; and
 - (c) gives an undertaking to operate, and operates, in accordance with this Appendix.

3 Application for approval

- 3.1 A person must apply in writing on the approved form for approval as a recognised organisation.
- 3.2 The application must:
 - (a) be made by the person who is, or proposes to be, the applicant's accountable manager for the purposes of the approval; and
 - (b) include:
 - (i) the applicant's name and address; and
 - (ii) if the applicant is a corporation, its ACN and the address of its registered office; and
 - (iii) the applicant's undertaking to comply with the requirements of this Appendix if approved as a recognised organisation; and
 - (c) be accompanied by a copy of:
 - (i) the applicant's exposition; and
 - (ii) as part of the exposition — the course plan for each training course that is proposed to be covered by the approval.

Note 1 The course plan must be specifically approved as part of the exposition.

Note 2 For information or documents already given to CASA, see subregulation 11.125 (2) of CASR 1998.

4 Conduct of training and assessments

A recognised organisation must conduct training and assessments:

- (a) in accordance with its exposition; and

- (b) in conformity with the relevant knowledge training, type training and assessment standards in Appendixes 4, 6 and 7 of this Order; and
- (c) for task training — in conformity with the requirements for task training and assessment mentioned in paragraph 10.2 of this Order.

5 Facility requirements

- 5.1 A recognised organisation must provide facilities that meet the criteria mentioned in this clause.
- 5.2 The facilities must provide for adequate weather protection and enable all planned training and assessment to occur.
- 5.3 Accommodation for the instruction of theory and the conduct of knowledge examinations must be fully enclosed and separate from other facilities.
- 5.4 The accommodation must be designed so that no student can read the paperwork or computer screen of another student from his or her position during an assessment.
- 5.5 The accommodation environment must enable students to concentrate on their studies or assessment without undue distraction or discomfort.
- 5.6 For a course:
 - (a) the organisation must provide a basic training workshop or maintenance facility separate from training classrooms for practical instruction appropriate to the planned training course; or
 - (b) if the organisation is unable to provide these facilities — the organisation must:
 - (i) arrange with another entity to provide the workshops or maintenance facilities; and
 - (ii) enter a written agreement with the entity specifying the conditions of access and use, including the right of CASA to have access to the facilities.
- 5.7 Office accommodation for instructors, knowledge examiners and assessors must be such as to enable each of them to prepare for his or her duties without undue distraction or discomfort.
- 5.8 There must be secure storage facilities for assessment papers and training records to ensure that documents remain in good condition for the retention period mentioned in clause 11 of this Appendix.
- 5.9 Storage facilities and office accommodation may be combined if there is adequate security.
- 5.10 There must be a library containing all technical material appropriate to the scope and level of training undertaken.

6 Student numbers

A recognised organisation must ensure that, during any training course, there are no more than:

- (a) for knowledge training — 28 students; or

- (b) for practical training — 15 students for each supervisor or assessor; or
- (c) for a session of practical consolidation training — the number mentioned in the course plan for the session.

7 Personnel requirements

- 7.1 A recognised organisation must appoint an accountable manager who has corporate authority for ensuring that all training commitments can be financed and carried out to the standard required by this Appendix.
- 7.2 The applicant must appoint 1 or more persons (*key personnel*) whose duties are to ensure that the organisation complies with this Appendix.
- 7.3 The accountable manager may be the key person, or 1 of the key personnel, mentioned in subclause 7.2.
- 7.4 Each of the key personnel who is not the accountable manager must be responsible to the accountable manager for the performance of his or her duties.
- 7.5 A recognised organisation must:
 - (a) employ sufficient staff to plan and perform knowledge and practical training and to conduct knowledge examinations and practical assessments in accordance with the approval; or
 - (b) if it uses another organisation to provide practical training and assessments — nominate the other organisation's staff to carry out practical training and assessments.
- 7.6 The applicant's exposition must set out the minimum qualifications and experience standards it requires for a training instructor, knowledge examiner, assessor, accountable manager and key personnel.
- 7.7 A recognised organisation must ensure that, at least every 24 months, each instructor, knowledge examiner and assessor undergoes professional development relevant to current technology, practical skills, human factors and the latest training techniques appropriate to the role of the person.
- 7.8 A recognised organisation must ensure that a person may only carry out the role of a training instructor, knowledge examiner or assessor if the person meets the standards mentioned in subclause 7.6 for the role.
- 7.9 A recognised organisation must ensure that each employee has ready access to the part of the exposition that relates to his or her duties.

8 Records of instructors, examiners and assessors

- 8.1 A recognised organisation must maintain a record of all instructors, knowledge examiners and assessors, including their experience and qualifications, training history and any subsequent training undertaken.
- 8.2 The organisation must prepare a statement of duties and responsibilities for each training instructor, knowledge examiner and assessor.
- 8.3 A record mentioned in subclause 8.1 must be kept by the recognised organisation for at least 5 years after the person for whom it is made ceases to be employed by the organisation.

9 Instructional equipment

- 9.1 A recognised organisation must ensure that each classroom used by the organisation has appropriate presentation equipment of a standard that allows students to easily read presentation text, drawings, diagrams and figures from any position in the classroom.
- 9.2 Each classroom used by a recognised organisation may have representative synthetic training devices if the organisation chooses to use them.
- 9.3 For subclause 5.6 of this Appendix, each of the organisation's basic training workshops or maintenance facilities must have:
- (a) the tools and equipment necessary for the training being given; and
 - (b) a selection of aircraft, engines, aircraft parts and avionic equipment appropriate to the training being given.
- 9.4 For a type or task training course, the organisation must have access to:
- (a) an example of the relevant aircraft/engine combination or engine type; or
 - (b) a synthetic training device that provides training at least equivalent to the training under paragraph 9.4 (a) for the type or task.
- 9.5 If a synthetic training device is used for subclause 9.4, its use must be described in the course plan.

10 Maintenance training material

A recognised organisation must provide each of its students with:

- (a) maintenance training course material that covers:
 - (i) the basic knowledge syllabus mentioned in this Order for the category or subcategory of authority that the students seeks; and
 - (ii) the type course content required by this Order for the aircraft type for which the student seeks a type rating; and
- (b) access to examples of maintenance documentation and technical information in its library.

11 Student records

- 11.1 A recognised organisation must keep all student training and assessment records for at least 5 years after the last entry was made for the student to whom it applies.
- 11.2 For the period during which it must keep a student's course record, the organisation must supply to the student on request a document that summarises:
- (a) his or her student course record; and
 - (b) any permanent record kept by the organisation about any qualification granted to, or course completed by, the student.
- 11.3 The organisation must have a system, or other arrangement for the retention of any record or report made, kept or maintained for the purposes of this Appendix for at least 5 years after the organisation ceases to be a recognised organisation.

12 Quality management system

A recognised organisation must establish a quality management system that includes:

- (a) procedures to ensure compliance with this Appendix; and
- (b) an independent audit function to monitor the following:
 - (i) training standards;
 - (ii) the integrity of knowledge examinations and practical assessments;
 - (iii) compliance with, and adequacy of, the procedures mentioned in paragraph (a); and
- (c) a remedial, corrective and preventative action scheme, including a feedback system of audit findings to each person mentioned in subclauses 7.1 and 7.2, to ensure that any necessary corrective action is taken; and
- (d) a system for regular review of the quality management system:
 - (i) to ensure its continuing suitability, adequacy and effectiveness; and
 - (ii) to identify and assess the need for improvement in, or changes to, the quality management system.

13 Cheating or misconduct in assessments

13.1 A recognised organisation must:

- (a) secure all assessment questions; and
- (b) have systems and procedures under which its assessors and examiners ensure the security of all assessment questions.

13.2 If a student is found during an assessment to be cheating, or in possession of material about the assessment subject other than the assessment papers and associated authorised documentation, the organisation must:

- (a) disqualify the student from taking, or continuing with, the assessment; and
- (b) as soon as practicable, but within 72 hours of the incident, notify CASA in writing about the incident; and
- (c) provide any additional information requested by CASA about the incident.

13.3 If an assessor or examiner is found during any assessment to be providing question answers to any student being assessed, the organisation must:

- (a) disqualify the assessor or examiner from acting, or continuing to act, as an assessor or examiner; and
- (b) declare the assessment void; and
- (c) as soon as practicable but within 72 hours of the incident, notify CASA in writing about the incident; and
- (d) provide any additional information requested by CASA about the incident.

- 13.4 If a student, assessor or examiner is found after any assessment to have engaged in conduct that would have been within paragraph 13.2 or 13.3 if it had occurred during the assessment, the organisation must:
- (a) if the finding concerns misconduct by an assessor or examiner:
 - (i) disqualify the assessor or examiner from acting as an assessor or examiner; and
 - (ii) declare the assessment void; and
 - (b) if the finding concerns cheating by a student — disqualify the student from taking, or continuing with, further assessments; and
 - (c) as soon as practicable but within 72 hours of the finding, notify CASA in writing about the incident; and
 - (d) provide any additional information requested by CASA about the incident.

14 Exposition of a recognised organisation

- 14.1 A recognised organisation must have an exposition, approved by CASA, that describes the organisation and its procedures and contains the following information:
- (a) a statement signed by the accountable manager that the exposition and any associated manuals demonstrate that the organisation will comply with this Appendix;
 - (b) the names and organisational titles of the persons mentioned in subclauses 7.1 and 7.2, and the selection criteria used for their appointment;
 - (c) the duties and responsibilities of the persons mentioned in paragraph (b) including matters on which they may deal directly with CASA on behalf of the organisation;
 - (d) a chart showing chains of responsibility for the persons mentioned in paragraph (b);
 - (e) the organisation's quality management system;
 - (f) details of the system for recording selection criteria for, and information about, the training instructors, assessors and examiners;
 - (g) a description of the training and examination facilities at each location mentioned in clause 5;
 - (h) a list of the maintenance training courses that the organisation proposes to deliver, their course plans and student-instructor ratios;
 - (i) the durations of assessments and examinations and the periods of time over which training is to be conducted;
 - (j) the organisation's exposition amendment procedure, including the procedure for introducing new courses, modifying existing courses and amending course plans;
 - (k) the organisation's control procedure, if any, mentioned in paragraph 15.2 (b) of this Appendix;
 - (l) the organisation's procedure for producing material for clause 10;

- (m) the organisation's procedure for producing reliable and verifiable certifications for paragraph 13.12 and subparagraphs 14.1 (d) and 14.2 (c) of this Order;
 - (n) if the organisation does not own a facility that it proposes to use for maintenance training — a statement explaining in detail the arrangements under which it occupies or uses the facility;
 - (o) if an applicant does not own the equipment or data that it proposes to use for maintenance training — a statement explaining in detail the arrangements under which it uses the equipment or data.
- 14.2 An exposition need not set out the procedures mentioned in paragraph 14.1 (e) to the extent that they are set out in another manual kept and used by the organisation under a law of the Commonwealth, a State or a Territory if the organisation:
- (a) gives CASA a document that shows where, in the other manual, the procedures are located; or
 - (b) adequately cross-refers to those procedures in its exposition.

Example for subclause 14.2

An equal employment opportunity management plan that is required under State legislation to be kept for the organisation's maintenance training personnel.

- 14.3 A recognised organisation may only amend its exposition if the amendment is:
- (a) approved by CASA; or
 - (b) for a minor amendment that does not alter the sense intended by the exposition or a part of it — made in accordance with the procedure set out in the exposition.

15 Maintenance training privileges of a recognised organisation

- 15.1 A recognised organisation may carry out the following maintenance training in accordance with its exposition:
- (a) if the organisation is also a registered training organisation under the AQTF — training for the knowledge syllabus mentioned in Appendix 4 of this Order;
 - (b) training for aircraft types, engine types or tasks in accordance with this Order.
- 15.2 A recognised organisation may conduct training, knowledge examinations and practical assessments at:
- (a) each location for which CASA has given approval; or
 - (b) other locations in accordance with a control procedure mentioned in the organisation's exposition.

16 Qualifications

- 16.1 A recognised organisation must give a student a notification of training outcomes in accordance with the approved form:
- (a) at the end of the course for which the student enrolled; and

- (b) whether or not the student completed or passed the course.
- 16.2 A recognised organisation must also issue a formal statement to each student after his or her successful completion of a course of training mentioned in paragraphs 15.1 (a) and 15.1 (b).

Note The notification will be used by CASA in deciding whether to issue an authority. The formal statement is the recognised organisation's certificate or record for the student.

17 Changes to the recognised organisation

- 17.1 A recognised organisation must notify CASA of any proposed change to the organisation that, had it been in place before CASA approved the organisation, would reasonably have affected CASA's consideration of the application for the approval.
- 17.2 If the organisation does not tell CASA about a change mentioned in subclause 17.1, CASA may suspend or revoke the organisation's approval with effect from the date of the change.
- 17.3 If CASA considers that a change mentioned in subclause 17.1 may affect the organisation's continued compliance with this Appendix, it may place conditions on the organisation's approval that may or may not permit the change.
- 17.4 Approval of an applicant as a recognised organisation is subject to the condition that the organisation must comply with any conditions placed on its approval under this clause.

18 Directions by CASA

Approval of an applicant as a recognised organisation is subject to the condition that the organisation must comply with any direction given to it by CASA about the following:

- (a) its exposition, or assessments or examination material;
- (b) the way in which it conducts maintenance training;
- (c) any of the criteria that the organisation uses to decide whether students who have undertaken maintenance training are competent.

19 Surrender, suspension or revocation of approval

- 19.1 Approval of an organisation as a recognised organisation stops having effect if:
 - (a) it is suspended or revoked by CASA; or
 - (b) the organisation tells CASA in writing that the organisation wants to surrender the approval.
- 19.2 If the approval is revoked or surrendered, the organisation must return the approval certificate to CASA within 14 days.
- 19.3 CASA may revoke or suspend an approval if:
 - (a) the organisation fails to comply with its undertaking; or
 - (b) the organisation does not comply with this Appendix, including any conditions or directions mentioned in clause 17 or 18 of this Appendix; or

- (c) CASA is refused access to the organisation to assess its continued compliance with this Appendix.

Appendix 6

Units of competency required for a category or subcategory of authority

Competency Units Required	Title	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
MEA101B	Interpret occupational health and safety practices in aviation maintenance	X	X	X	X	X	X	X	X	X
MEA103B	Plan and organise aviation maintenance work activities	X	X	X	X	X	X	X	X	X
MEA105B	Apply quality standard applicable to aviation maintenance processes	X	X	X	X	X	X	X	X	X
MEA107B	Interpret and use aviation maintenance industry manuals and specifications	X	X	X	X	X	X	X	X	X
MEA108B	Complete aviation maintenance industry documentation	X	X	X	X	X	X	X	X	X
MEA109B	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	X	X	X	X	X	X	X	X	X
MEA111B	Perform administrative processes to prepare for certification of civil aircraft maintenance					X	X	X	X	X

Competency Units Required	Title	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
MEA112B	Plan and implement aircraft maintenance activities					X	X	X	X	X
MEA113B	Supervise maintenance activities and manage human resources in the workplace					X	X	X	X	X
MEA116A	Apply occupational health and safety procedures at supervisor level in aviation maintenance					X	X	X	X	X
MEA117A	Apply self in the aviation maintenance environment	X	X	X	X					
MEA118A	Conduct self in the aviation maintenance environment					X	X	X	X	X
MEA119A	Perform administrative processes to prepare for certification of civil aircraft A level line maintenance	X	X	X	X					
MEA142A	Manage self in the aviation maintenance environment					X	X	X	X	X
MEA201B	Remove and install miscellaneous aircraft electrical hardware and components					X	X	X	X	X

Competency Units Required	Title	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
MEA203B	Remove and install advanced aircraft electrical systems and components					X	X	X	X	X
MEA205B	Remove and install advanced aircraft instrument systems and components									X
MEA206B	Remove and install aircraft basic radio communication and navigation systems and components									X
MEA207B	Remove and install aircraft electronic systems and components									X
MEA208B	Remove and install pressurisation control systems and components					X	X			
MEA209B	Remove and install oxygen systems and components					X	X			
MEA211B	Inspect, test and troubleshoot advanced aircraft electrical systems and components					X	X	X	X	
MEA219B	Inspect, test and troubleshoot aircraft pressurisation control systems and components					X	X			
MEA222B	Inspect, test and troubleshoot aircraft oxygen systems and components					X	X			

Competency Units Required	Title	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
MEA223B	Inspect aircraft electrical systems and components									X
MEA224B	Inspect aircraft instrument systems and components									X
MEA225B	Inspect fixed wing aircraft automatic flight control systems and components									X
MEA226B	Inspect aircraft electronic systems and components									X
MEA227B	Test and troubleshoot aircraft electrical systems and components									X
MEA228B	Test and troubleshoot aircraft instrument systems and components									X
MEA229B	Test and troubleshoot aircraft radio frequency navigation and communications systems and components									X
MEA230B	Test and troubleshoot fixed wing aircraft automatic flight control systems and components									X or MEA 231B
MEA231B	Test and troubleshoot rotary wing aircraft automatic flight control systems and components									X or MEA 230B

Competency Units Required	Title	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
MEA232B	Test and troubleshoot aircraft pulse systems and components									X
MEA235B	Perform advanced troubleshooting in aircraft avionic maintenance									X
MEA237B	Perform mechanical preventative maintenance									X
MEA240B	Use electrical test equipment to perform basic electrical tests	X	X	X	X					
MEA241B	Perform aircraft weight and balance calculations as a result of modifications									X
MEA246B	Fabricate and/or repair aircraft electrical hardware or parts					X	X	X	X	X
MEA260B	Use electrical test equipment					X	X	X	X	X
MEA264B	Remove and install aircraft electrical/avionic components during line maintenance	X	X	X	X					
MEA265A	Remove and install general aircraft electrical hardware	X	X	X	X					
MEA301B	Perform aircraft flight servicing					X	X	X	X	X

Competency Units Required	Title	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
MEA302B	Remove and install aircraft hydro-mechanical and landing gear systems and components					X	X	X	X	
MEA303B	Remove and install aircraft pneumatic systems and components					X	X	X	X	
MEA304B	Remove and install non-pressurised aircraft structural and non-structural components							X or MEA 317B	X or MEA 317B	
MEA305B	Remove and install aircraft fixed wing flight control systems and components					X	X			
MEA306B	Remove and install engines and engine systems and components					X	X	X	X	
MEA307B	Remove and install propeller systems and components					X	X			
MEA308B	Remove and install rotary wing rotor and flight control systems and components							X	X	
MEA309B	Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components						X	X	X	

Competency Units Required	Title	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
MEA310B	Inspect, test and troubleshoot aircraft pneumatic systems and components						X	X	X	
MEA312B	Inspect, test and troubleshoot aircraft fixed wing flight control systems and components						X			
MEA313B	Inspect, test and troubleshoot piston engine systems and components						X		X	
MEA315B	Inspect, test and troubleshoot propeller systems and components					X	X			
MEA316B	Inspect, test and troubleshoot rotary wing rotor and control systems and components							X	X	
MEA317B	Remove and install pressurised aircraft structural and non-structural components					X	X			
MEA319B	Inspect gas turbine engine systems and components					X		X		
MEA320B	Test and troubleshoot aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components					X				

Competency Units Required	Title	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
MEA321B	Test and troubleshoot aircraft fixed wing flight control systems and components					X				
MEA322B	Test and troubleshoot gas turbine engine systems and components					X		X		
MEA323B	Perform advanced troubleshooting in aircraft mechanical maintenance					X	X	X	X	
MEA324B	Perform structural repair and modification assessment and evaluation					X	X	X	X	
MEA325B	Weigh aircraft and perform aircraft weight and balance calculations as a result of modifications					X	X	X	X	
MEA328B	Maintain and/or repair aircraft mechanical components or parts					X	X	X	X	
MEA339A	Inspect, repair and maintain aircraft structures					X	X	X	X	
MEA343A	Remove and install avionic systems and components					X	X	X	X	
MEA344A	Remove and install aircraft hydro-mechanical components during line maintenance	X	X	X	X					

Competency Units Required	Title	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
MEA345A	Perform scheduled line maintenance activities on gas turbine engine fixed wing aircraft	X								
MEA346A	Perform scheduled line maintenance activities on gas turbine engine rotary wing aircraft			X						
MEA347A	Perform scheduled line maintenance activities on piston engine fixed wing aircraft		X							
MEA348A	Perform scheduled line maintenance activities on piston engine rotary wing aircraft				X					
MEA 405B	Repair and modification of aircraft composite material, structures and components					Y	Y	Y	Y	
MEA408B	Inspect and repair aircraft wooden structures					Z	Z			
MEA409B	Inspect, test, repair and re-cover aircraft fabric surfaces					Z	Z			
MEA418A	Basic repair of aircraft internal fittings during line maintenance	X	X	X	X					

Appendix 7

Type training and assessment standards

Part 1

Type training levels

The 3 levels set out below describe the objectives that a particular level of training is to achieve.

Level 1 General familiarisation

A brief overview of the airframe, systems and powerplants as outlined in the Systems Description section of the aircraft maintenance manual.

Course objectives: on completion of the course, the student will be able to do the following:

- 1 identify safety precautions related to the airframe, its systems and powerplant;
- 2 identify maintenance practices important to the airframe, its systems and powerplant;
- 3 define the general layout of the aircraft's major systems;
- 4 define the general layout and characteristics of the powerplant;
- 5 identify special tooling and test equipment used with the aircraft.

Level 2 Ramp and transit

Basic system overview of controls, indicators, principal components including their location and purpose, servicing and minor troubleshooting.

Course objectives: in addition to the information contained in the Level 1 General Familiarisation course, at the completion of this Level 2 Ramp and Transit training, the student will be able to do the following:

- 1 recall the safety precautions to be observed when working on or near the aircraft, powerplant and systems;
- 2 demonstrate knowledge of the main ramp and transit (through-flight) activities of the following:
 - (a) doors, windows and hatches;
 - (b) electrical power supplies;
 - (c) fuel;
 - (d) auxiliary power unit;
 - (e) powerplant;
 - (f) fire protection;

- (g) environmental control systems;
 - (h) hydraulic power;
 - (i) landing gear;
 - (j) flight controls;
 - (k) water and waste;
 - (l) oxygen;
 - (m) flight and service interphone;
 - (n) avionics;
 - (o) cabin equipment and furnishings;
- 3 describe systems and aircraft handling, particularly access, power availability and sources;
 - 4 identify the locations of the principal components;
 - 5 explain the normal functioning of each major system, including terminology and nomenclature;
 - 6 perform the procedures for ramp and transit servicing associated with the aircraft for the following systems: fuel, powerplants, hydraulics, landing gear, water and waste, and oxygen;
 - 7 demonstrate proficiency in use of crew reports and on-board reporting systems (minor troubleshooting) and determine aircraft airworthiness in accordance with the MEL/CDL;
 - 8 identify and use appropriate documentation;
 - 9 locate the procedures for replacement of components for ramp and transit activities identified that are in item 2 above.

Level 3 Line and base maintenance training

Detailed description, operation, component location, removal and installation and built-in test equipment (*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 line and base maintenance training, the student will be able to do the following:

- (a) perform system, engine, component and functional checks as specified in the maintenance manual;
- (b) correlate information for the purpose of making decisions in respect of fault diagnosis and rectification to maintenance manual level;
- (c) describe procedures for replacement of components unique to aircraft type.

Part 2

Type training theoretical elements

The elements in the syllabus below that are specific to the aircraft type must be covered. Additional elements arising from technological changes must also be covered.

In the table, the numbers 1, 2 and 3 indicate the theoretical elements to be covered for the category or subcategory and the training level required for the element.

Introductory training must include the following:

- 1 general aircraft features including dimensions, weights, MTOW etc;
- 2 time limits and maintenance checks;
- 3 levelling and weighing;
- 4 towing and taxiing;
- 5 parking and mooring;
- 6 servicing;
- 7 standard practices-only type particular;
- 8 for B2 modules — safety items and mechanical interface;
- 9 for B1 module — safety items and avionics interface.

Theoretical elements	Aeroplane turbine	Aeroplane piston	Helicopter turbine	Helicopter piston	Avionics
	B1.1	B1.2	B1.3	B1.4	B2
Blade tracking and vibration analysis	—	—	3	3	—
Transmissions	—	—	3	3	—
Airframe structure	—	—	3	3	1
Main rotor	—	—	3	3	—
Tail rotor and rotor drive	—	—	3	3	—
Rotor flight control	—	—	3	3	—
Airframe structure	3	3	—	—	1
Fuselage doors	3	3	—	—	—
Fuselage	3	3	—	—	—
Fuselage windows	3	3	—	—	—
Wings	3	3	—	—	—

Theoretical elements	Aeroplane turbine	Aeroplane piston	Helicopter turbine	Helicopter piston	Avionics
	B1.1	B1.2	B1.3	B1.4	B2
Stabilisers	3	3	—	—	—
Flight control surfaces	3	3	—	—	—
Nacelles and pylons	3	3	—	—	—
Zonal and station identification systems	1	1	1	1	1
Air supply	3	3	3	3	1
Air-conditioning	3	3	3	3	1
Pressurisation	3	—	—	—	1
Safety and warning devices	3	—	—	—	1
Instrument systems	3	3	3	3	3
Avionics systems	2	2	2	2	3
Electrical power	3	3	3	3	3
Equipment and furnishings	3	3	3	3	—
Electronic emergency equipment requirements and cabin entertainment equipment	—	—	—	—	3
Fire protection	3	3	3	3	1
Flight controls	3	3	3	3	2
Systems operation: electrical and fly-by-wire	3	—	—	—	3
Fuel systems	3	3	3	3	1
Hydraulic power	3	3	3	3	1
Ice and rain protection	3	3	3	3	1
Landing gear	3	3	3	3	1
Lights	3	3	3	3	3
Oxygen	3	3	—	—	1

Theoretical elements	Aeroplane turbine	Aeroplane piston	Helicopter turbine	Helicopter piston	Avionics
	B1.1	B1.2	B1.3	B1.4	B2
Pneumatic and vacuum	3	3	3	3	1
Water and waste	3	3	—	—	1
On-board maintenance systems	3	3	—	—	3

Turbine engines					
Theoretical elements	Aeroplane turbine	Aeroplane piston	Helicopter turbine	Helicopter piston	Avionics
	B1.1	B1.2	B1.3	B1.4	B2
Constructional arrangement and operation	—	—	—	—	1
Engine performance	3	—	3	—	1
Inlet	3	—	3	—	—
Compressors	3	—	3	—	—
Combustion section	3	—	3	—	—
Turbine section	3	—	3	—	—
Exhaust	3	—	3	—	—
Bearings and seals	3	—	3	—	—
Lubricants and fuels	3	—	3	—	—
Lubrication systems	3	—	3	—	—
Fuel systems	3	—	3	—	1
Engine controls	3	—	3	—	1
FADEC	2	—	2	—	3
Air systems	3	—	3	—	—
Starting and ignition systems	3	—	3	—	—
Engine indicating systems	3	—	3	—	3

Turbine engines					
Theoretical elements	Aeroplane turbine	Aeroplane piston	Helicopter turbine	Helicopter piston	Avionics
	B1.1	B1.2	B1.3	B1.4	B2
Power augmentation systems	3	—	—	—	—
Turbo-prop engines	3	—	—	—	—
Turbo-shaft engines	3	—	—	—	—
Auxiliary power units (APUs)	3	—	—	—	1
Powerplant installation	3	—	3	—	—
Fire protection systems	3	—	3	—	1
Engine monitoring and ground Operation	3	—	3	—	—
Engine Storage and Preservation	3	—	3	—	—

Piston engines					
Theoretical elements	Aeroplanes turbine	Aeroplanes piston	Helicopters turbine	Helicopters piston	Avionics
	B1.1	B1.2	B1.3	B1.4	B2
Engine performance	—	3	—	3	1
Engine construction	—	3	—	3	1
Engine fuel systems	—	3	—	3	1
Carburettors	—	3	—	3	—
Fuel injection systems	—	3	—	3	—
Engine controls	—	3	—	3	1
FADEC	—	2	—	2	3
Starting and	—	3	—	3	—

Piston engines					
Theoretical elements	Aeroplanes turbine	Aeroplanes piston	Helicopters turbine	Helicopters piston	Avionics
	B1.1	B1.2	B1.3	B1.4	B2
ignition systems					
Induction, exhaust and cooling systems	—	3	—	3	—
Supercharging and turbocharging	—	3	—	3	—
Lubricants and fuels	—	3	—	3	—
Lubrication systems	—	3	—	3	—
Engine indication systems	—	3	—	3	3
Powerplant installation	—	3	—	3	—
Engine monitoring and ground operation	—	3	—	3	—
Engine storage and preservation	—	3	—	3	—
Propeller — general	3	3	—	—	1
Propeller construction	3	3	—	—	—
Propeller pitch control	3	3	—	—	—
Propeller synchronising	3	3	—	—	—
Propeller electronic control	2	2	—	—	3
Propeller ice protection	3	3	—	—	—
Propeller maintenance	3	3	—	—	—

Part 3

Practical elements

The practical element of the type training may be conducted simultaneously with the conduct of the theoretical element or provided separately as a stand-alone element.

Options for the practical element include structured on-the-job-training (*OJT*) performed according to a type-specific program. Such OJT would include training in maintenance of the aircraft, rigging, adjustments, replacement of line replaceable units, trouble shooting, rectification of minor defects and testing of systems covering each element of the course e.g. practical consolidation training (*PCT*).

Other options for the practical element training include targeted experience to be recorded within a Schedule of Experience or competency-based assessment of a Schedule of Practical Tasks.

Irrespective of how the practical training element is conducted, it must consist of the performance of representative maintenance tasks drawn from the type training and examination syllabus, at the indicated level, and their assessment in order to meet the following objectives:

- (a) 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;
- (b) correctly use all technical literature and documentation for the aircraft;
- (c) correctly use specialist and special tooling and test equipment, perform removal and replacement of components and modules unique to type, including any on-wing maintenance activity.

Part 4

A Theory element — examination standard

Where aircraft type training is required, the examination must be written and comply with the following:

- 1 Format of the examination is usually of the multiple-choice type, however, a recognised organisation may propose a written paper. If multi-choice is adopted, each multiple-choice question must have 3 alternative answers of which only 1 can be the correct answer. The time for answering is based upon a nominal average of 120 seconds per level 3 question and 75 seconds per level 1 or 2 question.
- 2 The examination is usually of the closed book type with no reference material permitted. An exception will be made for the case of examining a B1 or B2 candidate's ability to interpret technical documents.

- 3 The number of questions must be at least 1 question per hour of instruction subject to a minimum of 2 questions per syllabus subject.
- 4 No examination may exceed 180 minutes in duration.
- 5 The examination pass mark is 75 %.
- 6 Penalty marking may not be used to determine whether a candidate has passed.

Note **Penalty marking** means deducting marks for an incorrect answer.

B Practical element — assessment standard

For assessment of practical elements of type training, the assessment may be oral, written or practical assessment based, or a combination of all of these. Conduct of the assessment method must be in accordance with the recognised organisation's exposition.

Practical assessment must determine a person's competence to perform a task based on a sample of subjects drawn from the type training and examination syllabus, at the indicated level.

A written report must be made by the assessor to explain why the candidate has passed or failed.

The assessment must ensure that the following objectives are met:

- 1 accurately and confidently discuss 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 and special tooling and test equipment, perform removal and replacement of components and modules unique to type, including any on-wing maintenance activity.