



Australian Government

Civil Aviation Safety Authority

Part 66 Manual of Standards (MOS) (as amended)

made under regulation 66.015 of the *Civil Aviation Safety Regulations 1998*.

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66.1A Name of instrument

This instrument is the *Part 66 Manual of Standards (MOS)*.

66.1B Commencement

This instrument commences on 27 June 2011.

66.1 Scope

- (a) This is the MOS for Part 66 of the *Civil Aviation Safety Regulations 1998 (CASR 1998)*.
- (b) This MOS sets out the requirements for the issue of an aircraft engineer licence and other requirements or privileges associated with the licence.

66.5 Definitions

- (a) Unless otherwise defined in this MOS, words and phrases have the same meaning as in Part 66 of CASR 1998.
- (b) In this MOS:

avionic LRU, or **avionic line replaceable unit**, is an aircraft avionic part that satisfies all of the following requirements:

1. it must have no mechanical input from, or output to, another part or mechanism;
2. it must contain only electrical, electronic, instrument or radio parts, or software, or a combination of any such part or parts and software, designed to provide control, monitor or display functions, or a combination of such functions;
3. it must not require any of the following in order to be installed, secured or connected to the aircraft:
 - (i) specialist knowledge or techniques;
 - (ii) specialised equipment;
 - (iii) rigging, or functional testing or adjustment, using specialised equipment external to the aircraft or brought on board the aircraft, to ensure that it is functioning properly.

avionics system means an aircraft system as specified in Table 1. An avionics system transfers, processes, displays or stores analogue or digital data using data lines, wireless or other data transmission medium, and includes the system's components and connectors. Examples of avionics systems include the following:

1. autoflight;
2. communication and navigation;
3. instruments;
4. in-flight entertainment systems;
5. integrated modular avionics (IMA);
6. cabin systems;
7. on-board maintenance systems;
8. information systems;
9. fly-by-wire systems (related to Air Transport Association (*ATA*) 27 "Flight Controls");
10. fibre optic control systems.

electrical system means the aircraft electrical power supply source, plus the distribution system to the different components contained in the aircraft and relevant connectors. Electrical systems are specified in Table 1. When working on cables (including coaxial cables) and connectors which are part of these electrical systems, the following typical practices are included in the privileges:

1. continuity, insulation and bonding techniques and testing;
2. crimping and testing of crimped joints;
3. connector pin removal and insertion;
4. wiring protection techniques.

lighting systems are part of the electrical system.

powerplant means an aircraft engine.

practical consolidation training (PCT) means a practical training course:

1. conducted by a maintenance training organisation in accordance with section 66.A.50 and Appendix III; and
2. that is approved in writing by CASA.

Note In considering whether to approve a PCT course, CASA will take into account whether the course elements reflect the elements of a best practice PCT program as described in Advisory Circular 147-1 *Practical Consolidation Training*.

RPL has the same meaning as in section 147.A.07 of the Part 147 Manual of Standards (as amended).

simple test means a test described in maintenance data that meets all of the following criteria:

1. the serviceability of the system can be verified using aircraft controls, switches, built-in test equipment (**BITE**), central maintenance computer (**CMC**) or external test equipment not involving special training;
2. the outcome of the test is a unique go/no-go indication or parameter. No interpretation of the test result or interdependence of different values is allowed.

subsystem means a system which, while capable of functioning on its own, is part of a larger system and includes, for this MOS:

1. the electrical subsystem comprised of electrical parts, appliances and motors, within mechanical, powerplant and structural systems; or
2. the instrument subsystem comprised of avionic systems within mechanical, powerplant and structural systems.

troubleshooting means the published approved fault isolation maintenance procedures and actions outlined in maintenance data, used as necessary in order to identify the root cause of a defect or malfunction. It may include the use of BITE or external test equipment. Troubleshooting may involve avionic LRU changes, however, it does not involve multiple avionic LRU changes in pursuit of a system fault, unless the changes are made in accordance with a published approved fault isolation maintenance procedure (e.g. Troubleshooting Manual, Fault Isolation Manual procedure).

- (c) Unless the contrary intention appears, the term **carry out maintenance** includes, within its normal meaning, both the supervision of maintenance and carrying out the physical tasks of maintenance.

66.A.1 Aircraft engineer licence

- (a) This MOS specifies the requirements for the issue of an aircraft engineer licence in 1 or more of the following categories:
 1. Category A;
 2. Category B1;
 3. Category B2;
 4. Category C.
- (b) Categories A and B1 may be endorsed with the following subcategories for maintenance on combinations of aeroplanes, helicopters, turbine and piston engines:
 1. A1 and B1.1 aeroplanes turbine;
 2. A2 and B1.2 aeroplanes piston;
 3. A3 and B1.3 helicopters turbine;
 4. A4 and B1.4 helicopters piston.

- (c) Subject to paragraph (f), for paragraph 66.015 (2) (e) of CASR 1998, an aircraft type specified in a cell in column 2 of a table in Appendix IX, with a type certificate holder (if any) mentioned in the corresponding cell in column 1, and a commercial designation (if any) mentioned in the corresponding cell in column 3, is specified as a type rated aircraft type for an aircraft engineer licence in Category B1, B2 or C.
- (d) Subject to paragraph (f), for an aircraft type specified in a cell in column 2 of a table in Appendix IX, an aircraft engineer licence in Category B1, B2 or C may be endorsed with the type-rating endorsement mentioned in the corresponding cell in column 4.
- (e) Each mention of “Various” in a cell in column 2 of a table in Appendix IX is to be read as “A small or non-rated aircraft with the engine mentioned in the corresponding cell in column 4.”.
- (f) If a Note referred to in a cell in column 4 of a table in Appendix IX contains the statement: “This is a rule.”, the contents of the Note have legal effect for the cell in the table as if they were contained in a paragraph of this section.
- (g) For this section:
cell, for a column of a table in Appendix IX, means each individual, undivided unit (regardless of its size) into which the column is subdivided.
non-rated aircraft has the same meaning as in the definition of *aircraft type* in regulation 66.010 of CASR 1998.
small aircraft has the same meaning as in the CASR Dictionary.

66.A.10 Application — form

An application for an aircraft engineer licence, or an application for a variation of an aircraft engineer licence, must be made to CASA in the form approved by CASA.

66.A.20 Privileges

- (a) The maintenance certification and certificate of release to service privileges of each category of licence are as follows:
 1. A person who holds a Category A licence endorsed with a subcategory may perform maintenance certification for that subcategory maintenance if:
 - (i) the person carried out the maintenance; and
 - (ii) the maintenance is line maintenance of a kind mentioned in Appendix II of the Part 145 MOS;
 2. A person who holds a Category A licence endorsed with a subcategory may issue a certificate of release to service for line maintenance if:
 - (i) the maintenance was carried out by the person; or
 - (ii) the maintenance and its maintenance certification were carried out by another person who holds a Category A licence with the appropriate subcategory; and
 - (iii) the maintenance was line maintenance of a kind mentioned in Appendix II of the Part 145 MOS; and
 - (iv) the aircraft being maintained is covered by the subcategory of licence held;
 3. A reference to maintenance in subparagraphs (a) 1 or 2 does not include:
 - (i) supervision of maintenance; or
 - (ii) for a subcategory A1 licence, maintenance of a propeller-driven aeroplane unless the subcategory A1 licence holder:
 - (A) holds a B1.1 subcategory endorsement that permits the holder to perform maintenance certification on the propeller system of a propeller-driven aeroplane; or

- (B) is positively endorsed in the subcategory A1 to provide such maintenance.
4. Subject to Table 1 and paragraph 66.A.45 (b), a person who holds a Category B1 licence endorsed with a subcategory may perform maintenance certification for that subcategory maintenance if:
- (i) the person carried out the subcategory maintenance; and
 - (ii) the maintenance was any of the following:
 - (A) work on an aircraft system designated in Table 1, as structural, powerplant, mechanical or electrical;
 - (B) unless the licence is specifically subject to an avionics LRU exclusion, replacement of an avionic line replaceable unit that requires only simple tests to prove its serviceability;
 - (BA) updating the software in an avionic system, provided that:
 - (I) the system has a discrete test facility to confirm the success of the updating; and
 - (II) the serviceability of any other system affected by the updating is also confirmed; and
 - (III) only simple tests are necessary to verify the serviceability of the system and any other system affected by the updating;
 - (C) category A licence tasks of a kind mentioned in Appendix II of the Part 145 MOS for the aircraft type rating or ratings held
 - (D) functional checks of avionic systems that can be conducted as a simple test;
 - (E) troubleshooting of avionics systems that can be conducted using only simple tests.
5. A person who holds a Category B1 licence endorsed with a subcategory may issue a certificate of release to service for aircraft covered by a subcategory endorsed on the licence, after maintenance of the aircraft, if the maintenance was not base maintenance carried out on a large aircraft;
6. A person who holds a Category B2 licence may perform maintenance certification for Category B2 maintenance carried out on an aircraft if:
- (i) the person carried out the maintenance; and
 - (ii) the maintenance was carried out:
 - (A) on an aircraft system designated in Table 1 as avionic or electrical; or
 - (B) on an instrument or electrical sub system of an aircraft system designated in Table 1 as structural, powerplant or mechanical; or
 - (C) as a category A licence task of a kind mentioned in Appendix II of the Part 145 MOS within the limits of tasks specifically endorsed on the certification authorisation referred to in subparagraph 145.A.35 (b) 1 of the Part 145 MOS. This certification privilege is restricted to work that the licence holder has personally performed in the maintenance organisation which issued the certification authorisation and is limited to the type ratings for a large aircraft endorsed in the B2 licence; or
 - (D) unless the licence is specifically subject to an avionics LRU exclusion, replacement of an avionic line replaceable unit that only requires simple tests to prove its serviceability;

7. A person who holds a Category B2 licence may issue a certificate of release to service for aircraft covered by the licence if the maintenance was not base maintenance carried out on a large aircraft;
8. A person who holds a Category C licence may issue a certificate of release to service for base maintenance carried out on a large aircraft for the aircraft in its entirety, if:
 - (i) the maintenance was carried out on a large aircraft; and
 - (ii) the Category C holder's licence is endorsed with the type rating for the large aircraft.

Table 1

Aircraft systems, designations and conditions for Category B1 and Category B2 licences

Aircraft system (and ATA chapter reference)	Designation of system	Conditions or limitations
Pressurisation, air-conditioning and equipment cooling systems (ATA21)	Mechanical (B1)	For a Category B2 licence, pressurisation control systems.
Autopilot (ATA22)	Avionic (B2)	
Communications (ATA23), including ELT and underwater locating beacon (ATA25-60)	Avionic (B2)	
Generator and/or constant speed drive/IDG systems (ATA24)	Electrical (B1/B2) and Powerplant (B1)	
Electrical power supply systems, including a ram air turbine, if electrical (ATA24)	Electrical (B1 and B2)	
Equipment, furnishings and emergency equipment (ATA25)	Mechanical (B1)	Except ELT and underwater locating beacon (ATA 25-60) — see (ATA23).
Fire, smoke, overheat detecting and extinguishing systems (ATA26)	Mechanical (B1)	
Flight control systems (ATA27)	Mechanical (B1)	For a category B1 licence — except system operation – fly-by-wire.
Flight control systems – system operation – fly-	Avionic (B2)	For a Category B2 licence — limited to the avionic subsystem of the flight control

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Aircraft system (and ATA chapter reference)	Designation of system	Conditions or limitations
by-wire (ATA27)		system.
Fuel systems (ATA28)	Mechanical (B1)	
Hydraulic power systems, including ram air turbine (ATA29)	Mechanical (B1)	
Ice and rain protection systems (ATA30)	Mechanical (B1)	
Ice and rain protection systems (ATA30-20)	Mechanical and Powerplant (B1)	Powerplant — for powerplant cowling anti-icing.
Indicating and recording systems (ATA31)	Avionic (B2)	
Landing gear (ATA32)	Mechanical (B1)	
Wheels and brakes (ATA32-40)	Mechanical (B1)	
Lighting (ATA33)	Electrical (B1 and B2)	
Navigation systems: <ul style="list-style-type: none"> • General • Radio interface • ACARS, SELCAL, INS/IRS • Compass • Flight management system • Doppler systems (ATA34)	Avionic (B2)	For a Category B1 licence — compass swings, if endorsed on the licence.
Oxygen system (ATA35)	Mechanical (B1)	For a Category B2 licence, if endorsed on the licence.
Pneumatic system (ATA36)	Mechanical (B1)	
Vacuum (ATA37)	Mechanical (B1)	
Waste water (ATA38)	Mechanical (B1)	
Cabin intercom data and network systems (ATA42)	Avionic (B2)	
Cabin systems (ATA44)	Avionic (B2)	

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Aircraft system (and ATA chapter reference)	Designation of system	Conditions or limitations
Central maintenance system (ATA45)	Avionic (B2)	
Information systems <ul style="list-style-type: none"> • ATIMS • Network server (ATA46)	Avionic (B2)	
Nitrogen generation system or inert gas system (ATA47)	Mechanical (B1)	
APU (ATA49)	Powerplant (B1)	
Cargo and accessory compartments (ATA50)	Mechanical (B1)	
Structures — General (ATA51)	Structural (B1)	<p>Structures — general, but excluding wooden structures and fabric surfaces unless:</p> <p>(a) for wooden structures — the holder has obtained the relevant optional units of competency mentioned in section 66.A.25 of this MOS; or</p> <p><i>Note</i> These optional units of competency are marked W in Appendix IV.</p> <p>(b) for fabric surfaces — the holder has obtained the relevant optional units of competency mentioned in section 66.A.25 of this MOS.</p> <p><i>Note</i> These optional units of competency are marked Z in Appendix IV.</p> <p>Structures — general</p> <p>(c) for a category B2 licence — closing of cowlings and refitment of quick access inspection panels.</p>
Doors (ATA52)	Structural (B1)	
Fuselage (ATA53)	Structural (B1)	
Nacelles and pylons (ATA54)	Structural (B1)	
Stabilisers (ATA55)	Structural (B1)	
Windows (ATA56)	Structural (B1)	
Wings (ATA57)	Structural (B1)	
Propeller — rotor (ATA60)	Mechanical (B1)	
Propeller — propulsion	Powerplant (B1)	For a Category B1 licence, only if the holder

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Aircraft system (and ATA chapter reference)	Designation of system	Conditions or limitations
(ATA61)		has obtained the relevant optional units of competency mentioned in section 66.A.25 of this MOS. <i>Note</i> These optional units of competency are marked P in Appendix IV.
Rotor (ATA62)	Mechanical (B1)	
Rotor drives (ATA63)	Mechanical (B1)	
Tail rotor (ATA64)	Mechanical (B1)	
Tail rotor drive (ATA65)	Mechanical (B1)	
Folding blades and pylon (ATA66)	Mechanical (B1)	
Rotor flight control (ATA67)	Mechanical (B1)	
Powerplant (ATA71)	Powerplant (B1)	
Engine turbine/ turbo-prop and fans (ATA72)	Powerplant (B1)	
Engine-mounted accessories: gear boxes, gears, pumps and attached engine-mounted and driven components (ATA72-60)	Powerplant (B1)	
Engine fuel and control — carburation/injection system (ATA73)	Powerplant (B1)	
FADEC (ATA73A)	Avionic (B2)	
Ignition system (ATA74)	Powerplant (B1)	
Air systems and control (ATA75)	Powerplant (B1)	
Engine control system (ATA76)	Powerplant (B1)	
Engine indicating system (ATA77)	Powerplant (B1) and Avionic (B2)	
Exhaust — thrust reverser (ATA78)	Powerplant (B1)	

Aircraft system (and ATA chapter reference)	Designation of system	Conditions or limitations
Lubrication system (ATA79)	Powerplant (B1)	
Starting system (ATA80)	Powerplant (B1)	
Supercharging system (ATA81)	Powerplant (B1)	
Power augmentation (ATA82)	Powerplant (B1)	
Accessory drives (ATA83)	Powerplant (B1)	

66.A.21 Transitional privileges

Despite Table 1 in section 66.A.20 and the exclusions annotated on a licence issued under Part 66 of CASR 1998, a person mentioned in a cell in column 1 of Table 2, who holds a Category B1 licence, may perform maintenance certifications and issue certificates of release to service for the maintenance mentioned for the person in the corresponding cell or cells in column 2, but only:

1. for an aircraft mentioned in the corresponding cell in column 3; and
2. subject to the limitations (if any) mentioned in the corresponding cell in column 4; and
3. subject to the condition mentioned in column 5.

Table 2

Person	Maintenance	Aircraft	Limitations	Condition
A. A person who held an aircraft maintenance engineer (AME) licence under regulation 31 of the <i>Civil Aviation Regulations 1988</i> to which regulation 202.341 applies (the <i>old licence</i>)	All electrical maintenance	An aircraft approved for V.F.R. operations only (<i>approved V.F.R. aircraft</i>), and fitted with a single generator	Not applicable (NA)	Provided that the old licence and its ratings applied to the maintenance, or would have applied to the maintenance but for Part 66 of CASR 1998 (<i>The Proviso</i>)
	1. All instrument system maintenance for aircraft general instruments (excluding RMI, inertial navigation and multi-axis autopilots)	Approved V.F.R. aircraft	NA	

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Person	Maintenance	Aircraft	Limitations	Condition
	2. Periodic inspections for aircraft radio systems	Approved V.F.R. aircraft		
<p>B. A person who, in accordance with subregulation 202.343 (2) or 202.344 (2) of CASR 1998, is taken to be entitled to the issue of an AME licence by becoming qualified for, an engine category Group 1 or 2 rating, or an airframe category Group 1, 2 or 19 rating (the <i>old licence</i>)</p>	All electrical maintenance	Approved V.F.R. aircraft fitted with a single generator	NA	The Proviso
	<p>1. All instrument system maintenance for aircraft general instruments (excluding RMI, inertial navigation and multi-axis autopilots)</p> <p>2. Periodic inspections for aircraft radio systems</p>			
<p>C. A person who, in accordance with subregulation 202.341 (2) or 202.343 (2) or 202.344 (2) of CASR 1998, is taken to be entitled to the issue of an AME licence by previously holding, or becoming qualified for, an engine or airframe category rated licence (the <i>old licence</i>)</p>	<p>1. Daily or manufacturers' equivalent inspection</p> <p>2. Check of the condition of security of attachment of wiring, plumbing, parts and appliances</p> <p>3. Maintenance of instrument, or electrical, parts and appliances forming part of the powerplant, mechanical or structural systems,</p>	Aircraft covered by the licence	<p>For maintenance under No. 3 in column 2, the maintenance must:</p> <p>1. Be limited to external mechanical adjustments to facilitate correct operation of powerplant or mechanical or structural systems</p> <p>2. Be limited to replacement of instrument, or electrical, parts and appliances, connected by simple twist or terminal</p>	The Proviso

Person	Maintenance	Aircraft	Limitations	Condition
	where the limitations apply		connectors 3. Excludes instrument or electrical parts and appliances, where maintenance involves functional tests and adjustments requiring the use of external specialised test equipment	

66.A.23 Requalification requirements

- (a) For paragraph 66.120 (2) (b) of CASR 1998, a licensed aircraft maintenance engineer is taken to comply with the requirements of that paragraph if, in the immediately preceding 2 years:
 - 1. he or she has had a period or periods of continuous employment amounting to at least 6 months, exercising the privileges mentioned in the Part 66 Manual of Standards for his or her licence or for a rating endorsed on the licence; or
 - 2. within a period or periods of time amounting to 6 months, he or she has had at least 550 hours of experience in exercising those privileges.
- (b) For paragraph 66.120 (2) (c) of CASR 1998, the requalification requirements for an A, B1 or B2 aircraft engineer licence holder are:
 - 1. carrying out maintenance of the kind that would be covered by the privileges of any of the licences held, for no less than a total of 100 days; or
 - 2. the holder obtains a report from a Part 147 organisation (an **MTO**) authorised for category training which states:
 - (i) that the *holder* has been assessed within 28 days of the date of the report; and
 - (ii) how the *assessment* was conducted; and
 - (iii) that *the* MTO has certified that the holder continues to have the knowledge and skills necessary for the holder of an aircraft engineer licence with the ratings on the licence; and
 - 3. in relation to subparagraphs (b) 1 and 2, the holder retains either evidence of carrying out the maintenance, or the report from the MTO, as applicable; and
 - 4. for the purposes of subparagraph (b) 2, the assessment by the MTO must include theory examination and practical assessment in a sampling of the range of maintenance activities that the holder is authorised by their licence to carry out. The report must describe how the assessment by the MTO was performed.
- (c) For paragraph 66.120 (2) (c) of CASR 1998, the requalification requirement for a Category C licence holder is that the Part 145 organisation (an **AMO**) provides the holder with suitable continuing airworthiness experience to ensure that the holder has re-established their knowledge and skill.

66.A.25 Basic knowledge and competency requirements

- (a) This paragraph sets out the requirements that must be met by a person who applies for:
 - 1. an aircraft engineer licence in a category or subcategory; or
 - 2. the addition of a category or subcategory to the person’s licence.
- (b) The applicant must demonstrate by examination, conducted by an MTO, knowledge:
 - 1. of each subject module that is marked as applicable for the category or subcategory in accordance with Part 2 of Appendix I to this MOS; and
 - 2. to the level of knowledge for the module and its items as indicated in Part 3 of Appendix I to this MOS for the category or subcategory; and
 - 3. in accordance with Appendix II to this MOS or as otherwise approved by CASA.
- (c) An applicant for a subcategory A1 or B1.1 licence is not required to demonstrate, by examination, knowledge of propellers in accordance with item 17 in Part 2 of Appendix I to this MOS unless the rating is to include propellers.
- (d) An applicant for a subcategory A2 or B1.2 licence is not required to demonstrate, by examination, knowledge of high speed flight in accordance with subitem 11.1.2 of subject Module 11 in Part 3 of Appendix I to this MOS.
- (e) An applicant must hold each unit of competency listed and coded in Appendix IV to this MOS that is marked X or indicated as its alternative for the category or subcategory and, before holding a unit of competency, hold the qualifications or units of competency that are prerequisites for the unit.
- (f) In addition to the units of competency that are required under this section for a subcategory B1.1 or B1.2 licence, an applicant for such a rating that includes wooden structures or fabric surfaces or propellers must hold each relevant optional unit of competency listed and coded in Appendix IV to this MOS that is marked:
 - 1. W — for wooden structures for the subcategory; and
 - 2. Z — for fabric surfaces for the subcategory; and
 - 3. P — for propellers for the subcategory.
- (g) A person may be taken to hold the necessary qualifications or units of competency as set out above if an MTO has conducted a recognition of prior learning assessment in accordance with that MTO’s course plan and exposition.
- (h) The qualification (comprised of knowledge, competence and assessments) must have been gained within 5 years of making an application for an aircraft maintenance licence or the addition of a category or subcategory to an aircraft maintenance licence.

66.A.30 Basic practical experience requirements

- (a) An applicant for an aircraft engineer licence must have acquired the following practical experience:
 - 1. for a Category A and subcategories B1.2 and B1.4 licences — practical maintenance experience in carrying out maintenance on operating aircraft and in training as mentioned in the following table.

Licence category	Amount of practical experience
A licence	2 years
B1.2 or B1.4 licence	3 years

2. for Category B2 and subcategories B1.1 and B1.3 licences — practical maintenance experience in carrying out maintenance on operating aircraft and in training as mentioned in the following table.

Licence category	Amount of practical experience
B1.1 or B1.3 licence or B2 licence	4 years

3. for a Category C licence:
- (i) 3 years experience exercising Category B1.1, B1.3 or B2 privileges on large aircraft; or
 - (ii) 5 years experience exercising Category B1.2 or B1.4 privileges on large aircraft; or
 - (iii) for an applicant holding an academic degree in a technical discipline from a university or other higher educational institution recognised by CASA, 3 years experience carrying out maintenance on operating aircraft, including at least 6 months of observation of base maintenance tasks.
- (b) A person who holds a licence with a category or subcategory, who applies to CASA to add a category or subcategory to it, must provide evidence to CASA that he or she has been certified by an MTO as satisfying all of the following requirements for the category or subcategory to be added:
1. completion of the knowledge and examination requirements mentioned in Appendix I to this MOS; and
 2. holding the units of competency required by Appendix IV to this MOS; and
 3. having the practical maintenance experience on operating aircraft detailed in subparagraphs (a) 1 and 2.
- (c) In this section:
- practical maintenance experience*** on operating aircraft may include 1 year of category training maintenance experience, such as:
1. simulated maintenance experience using maintenance simulation technology; and
 2. practical maintenance experience on representative aeronautical products during maintenance training.
- (d) At least 1 year of the practical maintenance experience required for an initial issue of an aircraft engineer licence must be:
1. maintenance experience on aircraft relevant to the category or subcategory for which the licence was sought; and
 2. accumulated immediately before making the application for the licence.
- (e) Practical aircraft maintenance experience gained outside a civil aircraft maintenance environment can be treated as practical maintenance experience if an MTO certifies to CASA that:
1. the experience is equivalent to the practical experience required by this MOS; and
 2. the applicant has sufficient additional experience with civil aircraft maintenance to ensure he or she has an understanding of the civil aircraft maintenance environment.

66.A.45 Type/task training and ratings

- (a) The holder of a Category A licence may only exercise certification privileges on a specific aircraft type following the satisfactory completion of the relevant Category A

aircraft task training carried out by an appropriately approved AMO or MTO, which must include:

1. practical hands on training and theoretical training as appropriate for each task authorised; and
 2. satisfactory completion of training demonstrated by an examination and/or by workplace assessment carried out by an AMO or MTO authorised to conduct such training.
- (b) The holder of a subcategory B1.1, B1.2, B1.3, B1.4, or Category B2, licence may exercise his or her certification privileges on a non-type rated aircraft when the licence is endorsed with the appropriate category or subcategory for the maintenance required for that non-type rated aircraft.

Note The holder of a subcategory B1.1, B1.2, B1.3, B1.4, or Category B2, licence does not require a type rating to exercise his or her certification privileges on aircraft systems other than the powerplant systems of:

- (i) a large aircraft with a particular type of aircraft engine; or
 - (ii) a small aircraft with a particular type of aircraft engine.
- (ba) The holder of a subcategory B1.1, B1.2, B1.3, B1.4, or Category B2 or C, licence must only exercise his or her certification privileges on a particular type, or type and model, of a large aircraft with a particular type of aircraft engine when the licence is endorsed with the appropriate aircraft type rating by CASA.

Note These are aircraft referred to in paragraph (a) of regulation 66.010 of CASR 1998 definition of *aircraft type*.

- (bb) The holder of a subcategory B1.1, B1.2, B1.3 or B1.4 licence must only exercise his or her certification privileges on the powerplant systems of:
1. a large aircraft with a particular type of aircraft engine; or
 2. a small aircraft with a particular type of aircraft engine;
- when the licence is endorsed with the appropriate aircraft type rating by CASA.

Note These are aircraft referred to in paragraphs (b) and (c) of regulation 66.010 of CASR 1998 definition of *aircraft type*.

- (c) A type rating may only be issued by CASA:
1. following satisfactory completion of the relevant Category B1, B2 or C aircraft type training:
 - (i) approved by CASA; or
 - (ii) conducted by an appropriately approved MTO; or
 - (iii) conducted in accordance with paragraph (h); or
 2. if each of the following applies:
 - (i) the applicant is a category B2 licence holder (the **holder**) with a rating (a **type rating**) for a particular type, or type and model, of large aircraft with a particular type of aircraft engine (a **large aircraft type**);
 - (ii) the holder applies for a rating (the **different type rating**) for a large aircraft type, that is different from his or her type rating;
 - (iii) the large aircraft type to which the different type rating would apply has the same manufacturer as the large aircraft type to which the holder's type rating applies;
 - (iv) CASA carries out an RPL assessment that compares the differences between the large aircraft type to which the type rating applies and the large aircraft type to which the different type rating would apply;

- (v) CASA determines that the B2 systems differences between the 2 large aircraft types are not such as to require further training of the holder for the issue of the different type rating.

Note In subparagraph (c) 2, the meaning of **a large aircraft** is the same as the meaning of an aircraft type in paragraphs (a) and (b) of the definition of **aircraft type** in regulation 66.010 of CASR 1998.

- (d) An applicant for a Category B1 or B2 aircraft type rating must complete the applicable type training in relation to paragraph 66.A.20 (a) privileges, which consists of:
 - 1. theoretical training and examination; and
 - 2. practical training and assessment as specified in sections 66.A.50 and 66.A.55.
- (e) Category C approved type training must comply with the requirements for such training in Appendix III to this MOS. In the case of a Category C licence holder qualified by holding an academic degree as specified in sub-subparagraph 66.A.30 (a) 3 (iii), the first aircraft type theoretical training can only be at the Category B1 or B2 licence level. Practical training is not required.
- (f) Completion of approved aircraft type training, as required by paragraphs (b) to (c), must be demonstrated by an examination. The examination must comply with the requirements in Appendix III to this MOS.
- (g) The training and assessment for a restricted rating for an aircraft type may be in:
 - 1. a subset of the theoretical elements mentioned in Part 2 of Appendix III that are indicated for the category or subcategory by the numerical level of the type training; and
 - 2. the corresponding practical elements mentioned in Part 3 of Appendix III that are appropriate for the category or subcategory and the rating, only if the MTO provides in the course plan for the training a description of:
 - (i) the training and assessment in the subset of theoretical elements and its corresponding practical elements; and
 - (ii) the persons eligible to undertake the training and assessment; and
 - (iii) the restrictions for the rating to which the training and assessment relates; and
 - (iv) ensures that all documents required under this MOS in connection with the training and assessment, describe the rating as a restricted rating.
- (h) An AMO, in accordance with section 145.A.37 of the Part 145 MOS, may:
 - 1. deliver excluded system training and assessment for the excluded systems set out in Appendix VII; or
 - 2. for an aircraft type mentioned in column 2 of Table 2 in Appendix IX — deliver aircraft type training for a category or subcategory of licence for the aircraft, or a system or subsystem of the aircraft type; or
 - 3. for an aircraft type mentioned in column 2 of Table 2 in Appendix IX — arrange for the manufacturer of the aircraft or its engine to provide training and assessment.

- (i) A licensed aircraft maintenance engineer, seeking his or her first aircraft type rating in an alternate licence category or subcategory not currently held by that person, must have first completed category or subcategory basic knowledge and competency training as mentioned in section 66.A.25 for the issue of a licence in that category or subcategory for which he or she is seeking his or her first rating, as well as meeting the basic practical experience requirements specified in paragraph 66.A.30 (b).

66.A.50 Aircraft type practical training

- (a) Aircraft type practical training and assessment must include a representative cross-section of maintenance activities relevant to the category or subcategory.
- (b) Practical training must be of fixed content and duration and, except in the case of PCT, can be conducted by either an MTO or an appropriately approved AMO. In the case of PCT, only an MTO approved to conduct PCT may deliver and assess the training. Where practical training is conducted by an appropriately approved maintenance organisation, the practical training must be first approved by CASA. The practical training must be supported by a detailed syllabus or practical worksheets/logbook showing content and duration of training.
- (ba) The practical element of type training may be conducted simultaneously with the conduct of the theoretical element or provided separately as a stand-alone element.
- (bb) Options for practical training include:
 - 1. PCT; or
 - 2. practical on course (**POC**) training; or
 - 3. structured OJT performed according to a type-specific program.
- (c) Practical training can be performed by demonstrations using equipment, components, simulators, other training devices or aircraft. This training does not need to involve actual servicing or repair of aircraft.
- (d) Records of demonstration of practical training must be retained by the organisation conducting the practical training for at least 5 years following completion of the practical training.
- (e) Practical training must meet the requirements of Appendix III to this MOS.

66.A.55 On the Job aircraft type Training

- (a) In the case of a first type rating to be gained, PCT or POC alone is not acceptable for type rating endorsement. In addition to PCT or POC, an applicant must also complete on the job training (**OJT**).
- (aa) In the case of a rating in another licence category or subcategory to be obtained after the type rating referred to in paragraph (a):
 - 1. if using POC training, POC training must be supplemented by OJT; and
 - 2. if using PCT training, no supplementation by OJT is required.
- (b) OJT, other than that normally required as part of a PCT course, is not required in the case of a second or subsequent type rating if the practical training for the second or subsequent type rating (in the same or any other category or subcategory) is delivered using PCT.
- (c) OJT must only be conducted and managed by a maintenance organisation, or maintenance training organisation, approved by CASA to undertake such training activities. The OJT must be supported by a detailed syllabus showing its content and recorded within detailed worksheets/logbook.

- (ca) For paragraph (c), the maintenance organisation approved by CASA must be:
 - 1. an approved maintenance organisation (*AMO*) issued with an approval under regulation 145.030 of CASR 1998 to carry out maintenance activities; or
 - 2. an organisation holding a certificate of approval to carry out maintenance activities issued under regulation 30 of the *Civil Aviation Regulations 1988*.
- (d) OJT must be supervised and assessed by approved assessors.
- (e) OJT must comply with the requirements of Appendix III to this MOS.

66.A.60 Recognised States

For the purposes of regulation 66.030 of CASR 1998, recognised States are set out in Appendix V.

66.A.65 Excluded States

For the purposes of regulation 66.060 of CASR 1998, excluded States are set out in Appendix VI.

66.A.70 Limitations

- (a) Limitations introduced on an aircraft maintenance licence are exclusions from the certification privileges and apply to the aircraft in its entirety.
- (b) Exclusions annotated on a category can be removed by gaining the section 66.A.25 basic knowledge and competency requirements relevant to the exclusion removal.
- (c) Exclusions annotated on a rating can be removed by CASA after satisfactorily completing, as required:
 - 1. paragraph 66.A.45 (d) training and examination; with
 - 2. section 66.A.50 practical training and assessment; or
 - 3. section 66.A.55 on the job training and assessment.

The training, assessment and examination may be provided by an MTO or, if described in its Part 145 AMO exposition, by an AMO if the exclusion removal has been permitted under subparagraph 66.100 (b) (ii) of CASR 1998, using a training and assessment regime provided in accordance with paragraph 145.025 (3) (c) of CASR 1998.

- (d) For the purposes of subregulation 66.095 (2), and Subpart 202.GG, of CASR 1998, exclusions on type ratings, that an AMO may be authorised to provide training, assessment and authorisations for, are set out in Appendix VII.
- (e) Units of competency are required as mentioned in Appendix VIII before the removal of an exclusion from a category or subcategory of licence in accordance with paragraph (b).

Appendix I

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 licence 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.

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- 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 licence 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
11 Aeroplane aerodynamics, structures and systems	X	X			
12 Helicopter aerodynamics, structures and systems			X	X	
13 Aircraft structures and systems					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
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
(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

	Level of knowledge for the category		
	A	B1	B2
(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.			
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;			

	Level of knowledge for the category		
	A	B1	B2
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
<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;	—	2	2

	Level of knowledge for the category		
	A	B1	B2
Latent heats of fusion and evaporation, thermal energy, heat of combustion.			
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; 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.			

	Level of knowledge for the category		
	A	B1	B2
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; 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

	Level of knowledge for the category		
	A	B1	B2
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.			
3.9 Capacitance and capacitor	—	2	2
Operation and function of a capacitor; Factors affecting capacitance area of plates, distance between plates, number of plates, dielectric and dielectric constant, working voltage, voltage rating; Capacitor types, construction and function; Capacitor colour coding; Calculations of capacitance and voltage in series and parallel circuits; Exponential charge and discharge of a capacitor, time constants; Testing of capacitors.			
3.10 Magnetism			
(a) Theory of magnetism; Properties of a magnet; Action of a magnet suspended in the Earth's magnetic field; Magnetisation and demagnetisation; Magnetic shielding; Various types of magnetic material; Electromagnets construction and principles of operation; Hand clasp rules to determine: magnetic field around current carrying conductor.	—	2	2

	Level of knowledge for the category		
	A	B1	B2
(b) Magneto-motive force, field strength, magnetic flux density, permeability, hysteresis loop, retentivity, reluctance, saturation point, eddy currents, coercive force; Precautions for care and storage of magnets.	—	2	2
3.11 Inductance and inductor	—	2	2
Faraday's Law; Action of inducing a voltage in a conductor moving in a magnetic field; Induction principles; Effects of the following on the magnitude of an induced voltage: magnetic field strength, rate of change of flux, number of conductor turns; Mutual induction; The effect the rate of change of primary current and mutual inductance has on induced voltage; Factors affecting mutual inductance: number of turns in coil, physical size of coil, permeability of coil, position of coils with respect to each other; Lenz's Law and polarity determining rules; Back emf, self-induction; Saturation point; Principal uses of inductors.			
3.12 DC motor and generator theory	—	2	2
Basic motor and generator theory; Construction and purpose of components in DC generator; Operation of, and factors affecting output and direction of, current flow in DC generators; Operation of, and factors affecting output power, torque, speed and direction of rotation of DC motors; Series wound, shunt wound and compound motors; Starter generator construction.			
3.13 AC theory	1	2	2
Sinusoidal waveform: phase, period, frequency, cycle; Instantaneous, average, root mean square, peak, peak to peak current values and calculations of these values, in relation to voltage, current and power;			

	Level of knowledge for the category		
	A	B1	B2
Triangular and square waves; Single and 3 phase principles.			
3.14 Resistive (R), Capacitive (C) and Inductive (L) Circuits	—	2	2
Phase relationship of voltage and current in L, C and R circuits, parallel, series and series parallel; Power dissipation in L, C and R circuits; Impedance, phase angle, power factor and current calculations; True power, apparent power and reactive power calculations.			
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.			

	Level of knowledge for the category		
	A	B1	B2
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;	—	—	2

	Level of knowledge for the category		
	A	B1	B2
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.			
<i>4.1.2 Transistors</i>			
(a) Transistor symbols; Component description and orientation; Transistor characteristics and properties;	—	1	2
(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
<i>4.1.3 Integrated circuits</i>			
(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.			

	Level of knowledge for the category		
	A	B1	B2
4.3 Servomechanisms			
(a) Understanding of the following terms: open and closed loop systems, feedback, follow up, analogue transducers; Principles of operation and use of the following synchro system components and features: resolvers, differential, control and torque, transformers, inductance and capacitance transmitters;	—	1	—
(b) Understanding of the following terms: open and closed loop, follow up, servomechanism, analogue, transducer, null, damping, feedback, 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.			

	Level of knowledge for the category		
	A	B1	B2
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.			
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

	Level of knowledge for the category		
	A	B1	B2
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.			
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 testing such as: <ul style="list-style-type: none"> • 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-fly-by-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

	Level of knowledge for the category		
	A	B1	B2
(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	—
<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.			

	Level of knowledge for the category		
	A	B1	B2
<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;			
<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.			

	Level of knowledge for the category		
	A	B1	B2
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	—	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; 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.			
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 ATA of America; Aeronautical and other applicable standards including ISO, AN, MS, NAS and MIL; Wiring diagrams and schematic diagrams.			

	Level of knowledge for the category		
	A	B1	B2
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	3	3
Continuity, insulation and bonding techniques and testing; Use of crimp tools: hand and hydraulic operated; Testing of crimp joints; Connector pin removal and insertion; Co-axial cables: testing and installation precautions; Wiring protection techniques: cable looming and loom support, cable clamps, protective sleeving techniques including heat shrink wrapping, shielding.			
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.			

	Level of knowledge for the category		
	A	B1	B2
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; 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

	Level of knowledge for the category		
	A	B1	B2
(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; 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

	Level of knowledge for the category		
	A	B1	B2
(b) Inspections following abnormal events such as heavy landings and flight through turbulence.	2	2	—
7.20 Maintenance procedures	1	2	2
Maintenance planning; Modification procedures; Stores procedures; Certification 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.			

	Level of knowledge for the category		
	A	B1	B2
8.3 Theory of flight	1	2	2
Relationship between lift, weight, thrust and drag; Glide ratio; Steady state flights, performance; Theory of the turn; Influence of load factor: stall, flight envelope and structural limitations; Lift augmentation.			
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; Culture issues;			

	Level of knowledge for the category		
	A	B1	B2
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; Implications of errors (i.e. accidents); Avoiding and managing errors.			

	Level of knowledge for the category		
	A	B1	B2
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 Parts 21, 42, 66, 145 and 147 of CASR 1998; Relationship with other aviation authorities.			
10.2 Part 66 Certifying Staff	2	2	2
Detailed understanding of Part 66 of CASR 1998.			
10.3 Part 145 – Approved maintenance organisations	2	2	2
Detailed understanding of Part 145 of CASR 1998.			
10.4 Air operations	1	1	1
Air Operators' Certificates; Operators' responsibilities, in particular regarding continuing airworthiness and maintenance; Aircraft maintenance program; MEL/CDL; Documents to be carried on board; Aircraft placarding (markings).			
10.5 Certification of aircraft, parts and appliances	—	2	2
(a) <i>General</i> General understanding of Parts 21, 23, 25, 27 and 29 of CASR 1998;			

	Level of knowledge for the category		
	A	B1	B2
<p><i>(b) Documents</i></p> <p>Certificates of Airworthiness; Restricted Certificates of Airworthiness; Special Flight Permits; Certificates of Registration; Noise Certificates; Weight Schedules; Radio Station Licences and Approvals.</p>			
10.6 Parts 21 and 42	2	2	2
<p><i>(a)</i></p> <p>Detailed understanding of Part 21 of CASR 1998 provisions relating to continuing airworthiness;</p> <p><i>(b)</i></p> <p>Detailed understanding of Part 42 of CASR 1998.</p>			
10.7 Applicable national and international requirements			
<p><i>(a)</i></p> <p>Management programs, maintenance checks and inspections; Master Minimum Equipment Lists, Minimum Equipment 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.</p>	1	2	2
<p><i>(b)</i></p> <p>Continuing airworthiness; Test flights; ETOPS, maintenance and despatch requirements; All weather operation: category 2 and 3 operations and minimum equipment requirements.</p>	—	1	1

Module 11 Aeroplane aerodynamics, structures and systems

	Level of knowledge for the category		
	A1 A2	B1.1 B1.2	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</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; Effects of sweepback on critical Mach number.			
11.2 Airframe structures — general concepts			
(a)	2	2	—
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;			

	Level of knowledge for the category		
	A1 A2	B1.1 B1.2	B2
Lightning strike protection provision; Aircraft bonding;			
(b) Construction methods of: stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, methods of skinning, anti-corrosive protection, wing, empennage and engine attachments; Structure assembly techniques: riveting, bolting, bonding; Methods of surface protection, such as chromating, anodising, painting; Surface cleaning; Airframe symmetry: methods of alignment and symmetry checks.	1	2	—
11.3 Airframe structures — aeroplanes			
<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; 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.			

	Level of knowledge for the category		
	A1 A2	B1.1 B1.2	B2
<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; Cabin pressure controllers; Heating systems.			
<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; Glass cockpit; Other aircraft system indication.			

	Level of knowledge for the category		
	A1 A2	B1.1 B1.2	B2
<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.			
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	—

	Level of knowledge for the category		
	A1 A2	B1.1 B1.2	B2
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	1	—
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; 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;			

	Level of knowledge for the category		
	A1 A2	B1.1 B1.2	B2
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; 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;			

	Level of knowledge for the category		
	A1 A2	B1.1 B1.2	B2
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; Printing; Structure monitoring (damage tolerance monitoring).			
11.19 Integrated modular avionics (ATA42)	1	2	—
Functions that may be typically integrated in the integrated modular avionics (IMA) modules include: bleed management, air pressure control, air ventilation and control, avionics and cockpit ventilation control, temperature control, air traffic communication, avionics communication router, electrical load management, circuit breaker monitoring, electrical system BITE, fuel management, braking control, steering control, landing gear extension and retraction, tyre pressure indication, oleo pressure indication, brake temperature monitoring, core system, network components.			
11.20 Cabin systems (ATA44)	1	2	—
The units and components which furnish a means of entertaining the passengers and providing communication within the aircraft (cabin intercommunication data system) and between the aircraft cabin and ground stations (cabin network service). These include voice, data, music and video transmissions. The cabin intercommunication data system provides an interface between cockpit/cabin crew and cabin systems. These systems support data exchange of the different related LRUs and they are typically operated via flight attendant panels. The cabin network service typically consists on a server, typically interfacing with, among others, the following systems: data/radio			

	Level of knowledge for the category		
	A1 A2	B1.1 B1.2	B2
<p>communication, in-flight entertainment system.</p> <p>The cabin network service may host functions such as:</p> <ul style="list-style-type: none"> • access to pre-departure/departure reports • e-mail/intranet/internet access • passenger database • cabin core system • in-flight entertainment system • external communication system • cabin monitoring system • cabin mass memory system • miscellaneous cabin system. 			
11.21 Information systems (ATA46)	1	2	—
<p>The units and components which furnish a means of storing, updating and retrieving digital information, traditionally provided on paper, microfilm or microfiche. Includes units that are dedicated to the information storage and retrieval function such as the electronic library mass storage and controller. These do not include units or components installed for other uses and shared with other systems, such as flight deck printer or general use display.</p> <p>Typical examples include: air traffic and information management systems; network server systems; aircraft general information system; flight deck information system; maintenance information system; passenger cabin information system; miscellaneous information system.</p>			

Module 12 Helicopter aerodynamics, structures and systems

		Level of knowledge for the category	
	A	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, overpitching; Auto-rotation; Ground effect.			
12.2 Flight control systems	2	3	—
Cyclic control; Collective control; Swashplate; Yaw control: Anti-torque control, tail rotor, bleed air; Main rotor head: design and operation features; Blade dampers: function and construction; Rotor blades: main and tail rotor blade construction and attachment; Trim control, fixed and adjustable stabilisers; System operation: manual, hydraulic, electrical and fly-by-wire; Artificial feel; Balancing and rigging.			
12.3 Blade tracking and vibration analysis	1	3	—
Rotor alignment; Main and tail rotor tracking; Static and dynamic balancing; Vibration types, vibration reduction methods; Ground resonance.			

		Level of knowledge for the category	
	A	B1.3 B1.4	B2
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; Doors: construction, mechanisms, operation and safety devices; Windows and windscreen construction; Fuel storage; Firewalls; Engine mounts; Structure assembly techniques: riveting, bolting, bonding; Methods of surface protection, such as chromating, anodising, painting; Surface cleaning; Airframe symmetry: methods of alignment and symmetry checks.	1	2	—

		Level of knowledge for the category	
	A	B1.3 B1.4	B2
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>			
Air-conditioning systems; Distribution systems; Flow and temperature control systems; Protection and warning devices.	1	3	—
12.7 Instruments and avionic systems			
<i>12.7.1 Instrument systems (ATA31)</i>	1	2	—
Pitot static: altimeter, air speed indicator, vertical speed indicator; Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator; Compasses: direct reading, remote reading; Vibration indicating systems — HUMS; Glass cockpit; Other aircraft system indication.			
<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.			

		Level of knowledge for the category	
	A	B1.3 B1.4	B2
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; 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.			

		Level of knowledge for the category	
	A	B1.3 B1.4	B2
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.			
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 Integrated modular avionics (ATA42)	1	2	—
Functions that may be typically integrated in the integrated modular avionic (IMA) modules include: bleed management, air pressure control, air ventilation and control, avionics and cockpit ventilation control, temperature control, air traffic communication, avionics communication router, electrical load management, circuit breaker monitoring, electrical system BITE, fuel management, braking control, steering control, landing gear extension and retraction, tyre pressure indication, oleo pressure indication, brake temperature monitoring; Core system; Network components.			

	Level of knowledge for the category		
	A	B1.3 B1.4	B2
12.18 On-board maintenance systems (ATA45)	1	2	—
Central maintenance computers; Data loading system; Electronic library system; Printing; Structure monitoring (damage tolerance monitoring).			
12.19 Information systems (ATA46)	1	2	—
The units and components which furnish a means of storing, updating and retrieving digital information, traditionally provided on paper, microfilm or microfiche. These include units that are dedicated to the information storage and retrieval function such as the electronic library mass storage and controller. These do not include units or components installed for other uses and shared with other systems, such as flight deck printer or general use display. Typical examples include: air traffic and information management systems; network server system; aircraft general information system; flight deck information system; maintenance information system; passenger cabin information system; miscellaneous information system.			

Module 13 Aircraft structures and systems

	Level of knowledge for the category		
	A	B1	B2
13.1 Theory of flight			
<i>(a) 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; • yaw control, rudder limiters; Control using elevons, ruddervators;	—	—	1

	Level of knowledge for the category		
	A	B1	B2
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; Autopilot navigation aids interface; Autothrottle systems; Automatic landing systems: principles and categories, modes of operation, approach, glide slope, land, go-around, system monitors and failure conditions.			

	Level of knowledge for the category		
	A	B1	B2
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 omnidirectional range (VOR); • Automatic direction finding (ADF); • Instrument landing system (ILS); • Microwave landing system (MLS); • Flight director systems; • Distance measuring equipment (DME); • Doppler navigation; • Area navigation, RNAV systems; • Flight management systems; • Global positioning system (GPS), Global navigation satellite systems (GNSS); • Inertial navigation system; • Air traffic control transponder, secondary surveillance radar; • Traffic alert and collision avoidance system (TCAS); • Weather avoidance radar; • Radio altimeter; • ARINC communication and reporting. 			
13.5 Electrical power (ATA24)	—	—	3
Batteries installation and operation; DC power generation; AC power generation; Emergency power generation; Voltage regulation; Power distribution; Inverters, transformers, rectifiers;			

	Level of knowledge for the category		
	A	B1	B2
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;	—	—	2
(b) System operation: electrical, fly-by-wire.	—	—	3
13.8 Instrument systems (ATA31)	—	—	3
Classification; Atmosphere; Terminology; Pressure measuring devices and systems; Pitot static systems; 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;			

	Level of knowledge for the category		
	A	B1	B2
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 On-board maintenance systems (ATA45)	—	—	3
Central maintenance computers; Data loading system; Electronic library system; Printing; Structure monitoring (damage tolerance monitoring).			
13.11 Air-conditioning and cabin pressurisation (ATA21)			
<i>13.11.1 Air supply</i>	—	—	2
Sources of air supply including engine bleed, APU and ground cart.			
<i>13.11.2 Air-conditioning</i>			
Air-conditioning systems;	—	—	2
Air cycle and vapour cycle machines;	—	—	3
Distribution systems;	—	—	1
Flow, temperature and humidity control system.	—	—	3

	Level of knowledge for the category		
	A	B1	B2
<i>13.11.3 Pressurisation</i>	—	—	3
Pressurisation systems; Control and indication including control and safety valves; Cabin pressure controllers.			
<i>13.11.4 Safety and warning devices</i>	—	—	3
Protection and warning devices.			
13.12 Fire protection (ATA26)			
(a) Fire and smoke detection and warning systems; Fire extinguishing systems; System tests;	—	—	3
(b) Portable fire extinguisher.	—	—	1
13.13 Fuel systems (ATA28)			
System layout;	—	—	1
Fuel tanks;	—	—	1
Supply systems;	—	—	1
Dumping, venting and draining;	—	—	1
Cross-feed and transfer;	—	—	2
Indications and warnings;	—	—	3
Refuelling and defuelling;	—	—	2
Longitudinal balance fuel systems.	—	—	3
13.14 Hydraulic power (ATA29)			
System layout;	—	—	1
Hydraulic fluids;	—	—	1
Hydraulic reservoirs and accumulators;	—	—	1
Pressure generation: electrical, mechanical, pneumatic;	—	—	3
Emergency pressure generation;	—	—	3
Filters;	—	—	1
Pressure control;	—	—	3
Power distribution;	—	—	1
Indication and warning systems;	—	—	3
Interface with other systems.	—	—	3

	Level of knowledge for the category		
	A	B1	B2
13.15 Ice and rain protection (ATA30)	—	—	—
Ice formation, classification and detection;	—	—	2
Anti-icing systems: electrical, hot air and chemical;	—	—	2
De-icing systems: electrical, hot air, pneumatic and chemical;	—	—	3
Rain repellent;	—	—	1
Probe and drain heating;	—	—	3
Wiper systems.	—	—	1
13.16 Landing gear (ATA32)			
Construction, shock absorbing;	—	—	1
Extension and retraction systems: normal and emergency;	—	—	3
Indications and warnings;	—	—	3
Wheels, brakes, antiskid and autobraking;	—	—	3
Tyres;	—	—	1
Steering;	—	—	3
Air-ground sensing.	—	—	3
13.17 Oxygen (ATA35)			
System layout: cockpit, cabin;	—	—	3
Sources, storage, charging and distribution;	—	—	3
Supply regulation;	—	—	3
Indications and warnings.	—	—	3
13.18 Pneumatic/vacuum (ATA36)			
System layout;	—	—	2
Sources: engine/APU, compressors, reservoirs, ground supply;	—	—	2
Pressure control;	—	—	3
Distribution;	—	—	1
Indications and warnings;	—	—	3
Interfaces with other systems.	—	—	3
13.19 Water/waste (ATA38)	—	—	2
Water system layout, supply, distribution, servicing and draining;			
Toilet system layout, flushing and servicing.			
13.20 Integrated modular avionics (ATA42)	—	—	3
Functions that may be typically integrated in the Integrated Modular Avionic (IMA) modules are, among others: bleed management, air pressure control, air ventilation and control,			

	Level of knowledge for the category		
	A	B1	B2
<p>avionics and cockpit ventilation control, temperature control, air traffic communication, avionics communication router, electrical load management, circuit breaker monitoring, electrical system BITE, fuel management, braking control, steering control, landing gear extension and retraction, tyre pressure indication, oleo pressure indication, brake temperature monitoring;</p> <p>Core system;</p> <p>Network components.</p>			
13.21 Cabin systems (ATA44)	—	—	3
<p>The units and components which furnish a means of entertaining the passengers and providing communication within the aircraft (cabin intercommunication data system) and between the aircraft cabin and ground stations (cabin network service). These include voice, data, music and video transmissions.</p> <p>The cabin intercommunication data system provides an interface between cockpit/cabin crew and cabin systems. These systems support data exchange of the different related LRUs and they are typically operated via flight attendant panels.</p> <p>The cabin network service typically consists on a server, typically interfacing with, among others, the following systems: data/radio communication, in-flight entertainment system.</p> <p>The cabin network service may host functions such as:</p> <ul style="list-style-type: none"> • access to pre-departure/departure reports • e-mail/intranet/internet access • passenger database • cabin core system • in-flight entertainment system • external communication system • cabin monitoring system • cabin mass memory system • miscellaneous cabin system. 			
13.22 Information systems (ATA46)	—	—	3
<p>The units and components which furnish a means of storing, updating and retrieving digital information traditionally provided on paper, microfilm or microfiche. These include units that are dedicated to the information storage and retrieval function such as the electronic library mass storage and controller. These do not include units or components installed for other uses and shared</p>			

	Level of knowledge for the category		
	A	B1	B2
<p>with other systems, such as flight deck printer or general use display.</p> <p>Typical examples include: air traffic and information management systems; network server systems; aircraft general information system; flight deck information system; maintenance information system; passenger cabin information system; miscellaneous information system.</p>			

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 turbopropeller engines;	—	—	1
(b) Electronic engine control and fuel metering systems (FADEC).	—	—	2
14.2 Engine indicating systems	—	—	2
<p>Exhaust gas temperature and interstage turbine temperature systems;</p> <p>Engine speed;</p> <p>Engine thrust indication: engine pressure ratio, engine turbine discharge pressure or jet pipe pressure systems;</p> <p>Oil pressure and temperature;</p> <p>Fuel pressure, temperature and flow;</p> <p>Manifold pressure;</p> <p>Engine torque;</p> <p>Propeller speed.</p>			

	Level of knowledge for the category		
	A	B1	B2
14.3 Starting and ignition systems	—	—	2
Operation of engine start systems and components; Ignition systems and components; Maintenance safety requirements.			

Module 15 Gas turbine engine

	Level 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.			

	Level of knowledge for the category		
	A	B1	B2
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.			
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.			

	Level of knowledge for the category		
	A	B1	B2
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 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.			

	Level of knowledge for the category		
	A	B1	B2
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.			
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 de preservation 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;			

	Level of knowledge for the category		
	A	B1	B2
Piston displacement and compression ratio; Engine configuration and firing order.			
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; Exhaust systems, engine cooling systems — air and liquid.			

	Level of knowledge for the category		
	A	B1	B2
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 Powerplant 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; Inspection of engine and components: criteria, tolerances and data specified by engine manufacturer.			

	Level of knowledge for the category		
	A	B1	B2
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; Overspeed protection.			
17.4 Propeller synchronising	—	2	—
Synchronising and synchrophasing equipment.			

	Level of knowledge for the category		
	A	B1	B2
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 de preservation.			

Appendix II

Basic knowledge examination standard

- 1 Standardisation basis for examinations
 - 1.1 Unless otherwise approved within the CASA approved exposition course syllabus, all basic examinations must be carried out using the multi-choice question format and essay questions as specified below. The incorrect alternatives must seem equally plausible to anyone ignorant of the subject. All of the alternatives should be clearly related to the question and of similar vocabulary, grammatical construction and length. In numerical questions, the incorrect answers should correspond to procedural errors such as corrections applied in the wrong sense or incorrect unit conversions: they must not be mere random numbers.
 - 1.2 Each multi-choice question must have 3 alternative answers of which only 1 must be the correct answer and the candidate must be allowed a time per module which is based upon a nominal average of 75 seconds per question.
 - 1.3 Each essay question requires the preparation of a written answer and the candidate must be allowed 20 minutes to answer each such question.
 - 1.4 Suitable essay questions must be drafted and evaluated using the knowledge syllabus in Part 66, Appendix I, Modules 7, 9 and 10.
 - 1.5 Each question will have a model answer drafted for it, which will also include any known alternative answers that may be relevant for other subdivisions.
 - 1.6 The model answer will also be broken down into a list of important points known as Key Points.
 - 1.7 The pass mark for each Part 66 module and sub-module multi-choice part of the examination is 75%. The number of consecutive attempts for each module is 3. Further sets of 3 attempts are allowed, with a minimum 1 year waiting period between sets.
 - 1.8 The pass mark for each essay question is 75% in that the candidate's answer must contain 75% of the required key points addressed by the question and no significant error related to any required key point.
 - 1.9 If either the multi-choice part or the essay part is failed, then it is only necessary to retake the multi-choice or essay part, as appropriate.
 - 1.10 Penalty marking systems must not be used to determine whether a candidate has passed.
 - 1.11 All Part 66 modules that make up a complete Part 66 aircraft maintenance licence category or subcategory must be passed within a 10 year time period of passing the first module except in the case specified in subclause 1.12. A failed module may not be retaken for at least 90 days following the date of the failed module examination, except in the case of an MTO which conducts a course of retraining tailored to the failed subjects in the particular module when the failed module may be retaken after 30 days.
 - 1.12 The 10 year time period mentioned in subclause 1.11 does not apply to those modules which are common to more than one Part 66 aircraft maintenance licence category or subcategory and which were previously passed as part of another such category or subcategory examination.
 - 1.13 Any variation to the examination standard must be approved by CASA.

2 Question numbers for the Part 66, Appendix I, Modules

2.1 *Subject Module 1, Mathematics:*

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

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

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

2.2 *Subject Module 2, Physics:*

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

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

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

2.3 *Subject Module 3, Electrical fundamentals:*

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

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

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

2.4 *Subject Module 4, Electronic fundamentals:*

Category A – None.

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

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

2.5 *Subject Module 5, Digital techniques/electronic instrument systems:*

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

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

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

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

2.6 *Subject Module 6, Materials and hardware:*

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

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

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

2.7 *Subject Module 7, Maintenance practices:*

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

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

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

2.8 *Subject Module 8, Basic aerodynamics:*

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

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

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

- 2.9 *Subject Module 9, Human factors:*
Category A – 20 multi-choice and 1 essay question. Time allowed 25 minutes plus 20 minutes.
Category B1 – 20 multi-choice and 1 essay question. Time allowed 25 minutes plus 20 minutes.
Category B2 – 20 multi-choice and 1 essay question. Time allowed 25 minutes plus 20 minutes.
- 2.10 *Subject Module 10, Aviation Legislation:*
Category A – 32 multi-choice and 1 essay question. Time allowed 40 minutes plus 20 minutes.
Category B1 – 40 multi-choice and 1 essay question. Time allowed 50 minutes plus 20 minutes.
Category B2 – 40 multi-choice and 1 essay question. Time allowed 50 minutes plus 20 minutes.
- 2.11 *Subject Module 11, Aeroplane aerodynamics, structures and systems:*
Category A – 108 multi-choice and 0 essay questions. Time allowed 135 minutes.
Category B1 – 140 multi-choice and 0 essay questions. Time allowed 175 minutes.
Category B2 – None.
- 2.12 *Not used*
- 2.13 *Subject Module 12, Helicopter aerodynamics, structures and systems:*
Category A – 100 multi-choice and 0 essay questions. Time allowed 125 minutes.
Category B1 – 128 multi-choice and 0 essay questions. Time allowed 160 minutes.
Category B2 – None.
- 2.14 *Subject Module 13, Aircraft aerodynamics, structures and systems:*
Category A – None.
Category B1 – None.
Category B2 – 180 multi-choice and 0 essay questions. Time allowed 225 minutes.
- 2.15 *Subject Module 14, Propulsion – avionic system:*
Category A – None.
Category B1 – None.
Category B2 – 24 multi-choice and 0 essay questions. Time allowed 30 minutes.
- 2.16 *Subject Module 15, Gas turbine engine:*
Category A – 60 multi-choice and 0 essay questions. Time allowed 75 minutes.
Category B1 – 92 multi-choice and 0 essay questions. Time allowed 115 minutes.
Category B2 – None.
- 2.17 *Subject Module 16, Piston engine:*
Category A – 52 multi-choice and 0 essay questions. Time allowed 65 minutes.
Category B1 – 72 multi-choice and 0 essay questions. Time allowed 90 minutes.
Category B2 – None.

2.18 *Subject Module 17, Propeller:*

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

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

Category B2 – None.

Appendix III

Type training and assessment standards

Part 1 — Type training levels

The 3 levels set out below describe the objectives, the depth of training, and the level of questions that the training is intended to achieve.

Level 1

A brief overview of the airframe, systems and powerplant, as outlined in the systems description section of the Aircraft Maintenance Manual/Instructions for Continued Airworthiness.

Course objectives:

On completion of the course, the student will be able to:

- (a) provide a simple description of the whole subject, using common words, examples, and typical terms, and identify safety precautions related to the airframe, its systems and powerplant; and
- (b) identify aircraft manuals, and maintenance practices important to the airframe, its systems and powerplant; and
- (c) define the general layout of the aircraft's major systems; and
- (d) define the general layout and characteristics of the powerplant; and
- (e) identify special tooling and test equipment used with the aircraft.

Level 2

Basic system overview of controls, indicators, principal components – including their location and purpose – servicing and minor troubleshooting, general knowledge of the theoretical and practical aspects of the subject.

Course objectives:

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

- (a) understand the theoretical fundamentals, and apply knowledge in a practical manner using detailed procedures; and
- (b) recall the safety precautions to be observed when working on or near the aircraft, powerplant and systems; and
- (c) describe systems and aircraft handling procedures, particularly access, power availability and sources; and
- (d) identify the locations of the principal components; and
- (e) explain the normal functioning of each major system, including terminology and nomenclature; and
- (f) perform the procedures for servicing associated with the aircraft for the following systems: fuel, powerplants, hydraulics, landing gear, water/waste and oxygen; and
- (g) demonstrate proficiency in the use of crew reports and on-board reporting systems (minor troubleshooting), and determine aircraft airworthiness as per the MEL/CDL; and

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

Level 3

Detailed description, operation, component location, removal and installation, and BITE and troubleshooting procedures to maintenance manual level.

Course objectives:

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

- (a) demonstrate a theoretical knowledge of aircraft systems and structures and interrelationships with other systems, provide a detailed description of the subject using theoretical fundamentals and specific examples, and interpret results from various sources and measurements, and apply corrective action where appropriate; and
- (b) perform system, powerplant, component, and functional checks as specified in the aircraft maintenance manual; and
- (c) demonstrate the use of, interpret, and apply appropriate documentation, including structural repair manual, and troubleshooting manual; and
- (d) correlate information for the purpose of making decisions in respect of fault diagnosis and rectification to maintenance manual level; and
- (e) describe procedures for replacement of components unique to aircraft type.

Part 2 — Type training theoretical elements

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

Theoretical element

1 Objective:

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

2 Level of training:

Training levels are those levels defined in Part 1 above. After the first type course for Category C certifying staff, all subsequent courses need only be to Level 1. During a Level 3 theoretical training, Level 1 and Level 2 training material may be used to teach the full scope of the chapter if required. However, during the training the majority of the course material and training time must be at the higher level.

3 Duration:

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

	Category	Hours
Aeroplanes with a maximum take-off mass above 30 000 kg	B1.1	150
	B1.2	120
	B2	100
	C	30
Aeroplanes with a maximum take-off mass equal to, or less than, 30 000 kg and above 5 700 kg	B1.1	120
	B1.2	100
	B2	100
	C	25
Large helicopters	B1.3	120
	B2	100
	C	25

- (a) For the purpose of the table above, **tuition hour** means 60 minutes of teaching and excludes any breaks, examination, revision, preparation and aircraft visits.
- (b) Hours prescribed in the table above apply only to theoretical courses for complete aircraft/engine combinations according to the type rating as defined by CASA.

Minimum participation time is at least 90% of the tuition hours of the theoretical training course. Additional training may be given by the training organisation in order to meet the minimum participation time. The number of tuition hours per day for the theoretical training must not exceed 8 hours, which must be performed during regular office hours; in exceptional cases, deviation from this standard may be envisaged when justified. This maximum number of hours is also applicable for the combination of theoretical and practical training, when they are performed at the same time.

4 Justification of course duration:

When applying for approval of a Part 147 course, or a course to be approved directly by CASA, the proposed hour duration must be justified and shown to cover the full syllabus by a training needs analysis based on:

- (a) the design of the aircraft type, its maintenance needs and the types of operation; and
- (b) detailed analysis of applicable chapters – see contents table below; and
- (c) detailed competency analysis showing that the objectives as stated in paragraph 2.1 (a) above are fully met; and
- (d) information based on approved type design, if necessary.

Tuition hours of differences courses, and other training course combinations, such as combined B1/B2 courses, must be justified to CASA by the training needs analysis as described above.

5 Content:

As a minimum, the elements in the syllabus below, that are specific to the aircraft type, must be covered. Additional elements introduced due to type variations,

technological changes etc. must also be included. The training syllabus should be focused on mechanical, powerplant, structural and electrical aspects for B1 personnel, and electrical and avionic aspects for B2.

Introductory elements of training — all aircraft										
ATA chapter	Theory elements	Aeroplane turbine		Aeroplane piston		Helicopter turbine		Helicopter piston		Avionics
		B1.1	C	B1.2	C	B1.3	C	B1.4	C	B2
05	Time limits and maintenance checks	1	1	1	1	1	1	1	1	1
06	Dimensions and areas, for example weights, maximum take-off weight (MTOW)	1	1	1	1	1	1	1	1	1
07	Lifting and shoring	1	1	1	1	1	1	1	1	1
08	Levelling and weighing	1	1	1	1	1	1	1	1	1
09	Towing and taxiing	1	1	1	1	1	1	1	1	1
10	Parking, mooring, storing and return to service	1	1	1	1	1	1	1	1	1
11	Placards and markings	1	1	1	1	1	1	1	1	1
12	Servicing	1	1	1	1	1	1	1	1	1
	Standard practices – only type particular	1	1	1	1	1	1	1	1	1

Introductory elements of training — all aircraft										
ATA chapter	Theory elements	Aeroplane turbine		Aeroplane piston		Helicopter turbine		Helicopter piston		Avionics B2
		B1.1	C	B1.2	C	B1.3	C	B1.4	C	
Helicopters										
18	Vibration and noise analysis (blade tracking)	—	—	—	—	3	1	3	1	—
25	Emergency flotation equipment	—	—	—	—	3	1	3	1	1
53	Airframe structure (helicopter)	—	—	—	—	3	1	3	1	—
60	Standard practices rotor	—	—	—	—	3	1	3	1	—
62	Rotor(s)	—	—	—	—	3	1	3	1	1
62A	Rotors – monitoring and indicating	—	—	—	—	3	1	3	1	3
63	Rotor drive(s)	—	—	—	—	3	1	3	1	1
63A	Rotor drive(s) – monitoring and indicating	—	—	—	—	3	1	3	1	3
64	Tail rotor	—	—	—	—	3	1	3	1	1
64A	Tail rotor – monitoring and indicating	—	—	—	—	3	1	3	1	3
65	Tail rotor drive	—	—	—	—	3	1	3	1	1
65A	Tail rotor drive monitoring and indicating	—	—	—	—	3	1	3	1	3

Introductory elements of training — all aircraft										
ATA chapter	Theory elements	Aeroplane turbine		Aeroplane piston		Helicopter turbine		Helicopter piston		Avionics B2
		B1.1	C	B1.2	C	B1.3	C	B1.4	C	
66	Folding blades and pylon	—	—	—	—	3	1	3	1	—
67	Rotors flight control	—	—	—	—	3	1	3	1	—
Aircraft structures										
27A	Flight control surfaces (all)	3	1	3	1	—	—	—	—	1
51	Standard practices and structures (damage classification, assessment and repair)	3	1	3	1	—	—	—	—	1
52	Doors	3	1	3	1	—	—	—	—	1
53	Fuselage	3	1	3	1	—	—	—	—	1
54	Nacelles and pylons	3	1	3	1	—	—	—	—	1
55	Stabilisers	3	1	3	1	—	—	—	—	1
56	Windows	3	1	3	1	—	—	—	—	1
57	Wings	3	1	3	1	—	—	—	—	1
	Zonal and station identification systems	1	1	1	1	1	1	1	1	1
Aircraft systems										
21	Air-conditioning	3	1	3	1	3	1	3	1	3
21-10/20	Air supply	3	1	3	1	3	1	3	1	2

Introductory elements of training — all aircraft										
ATA chapter	Theory elements	Aeroplane turbine		Aeroplane piston		Helicopter turbine		Helicopter piston		Avionics B2
		B1.1	C	B1.2	C	B1.3	C	B1.4	C	
21B	Pressurisation	3	1	3	1	3	1	3	1	3
21C	Safety and warning devices	3	1	3	1	3	1	3	1	3
22	Autoflight	2	1	2	1	2	1	2	1	3
23	Communications	2	1	2	1	2	1	2	1	3
24	Electrical power	3	1	3	1	3	1	3	1	3
25	Equipment and furnishings	3	1	3	1	3	1	3	1	1
25A	Electronic equipment including emergency equipment	1	1	1	1	1	1	1	1	3
26	Fire protection	3	1	3	1	3	1	3	1	3
27	Flight controls	3	1	3	1	3	1	3	1	2
27A	Systems operation: electrical and fly-by-wire	3	1	—	—	—	—	—	—	3
28	Fuel systems	3	1	3	1	3	1	3	1	2
28-40	Fuel systems – monitoring and indicating	3	1	3	1	3	1	3	1	3
29	Hydraulic power	3	1	3	1	3	1	3	1	2

Introductory elements of training — all aircraft										
ATA chapter	Theory elements	Aeroplane turbine		Aeroplane piston		Helicopter turbine		Helicopter piston		Avionics B2
		B1.1	C	B1.2	C	B1.3	C	B1.4	C	
29A	Hydraulic power – monitoring and indicating	3	1	3	1	3	1	3	1	3
30	Ice and rain protection	3	1	3	1	3	1	3	1	3
31	Indicating and recording systems	3	1	3	1	3	1	3	1	3
31A	Instrument systems	3	1	3	1	3	1	3	1	3
32	Landing gear	3	1	3	1	3	1	3	1	2
32A	Landing gear – monitoring and indicating	3	1	3	1	3	1	3	1	3
33	Lights	3	1	3	1	3	1	3	1	3
34	Navigation	2	1	2	1	2	1	2	1	3
35	Oxygen	3	1	3	1	—	—	—	—	2
36	Pneumatic	3	1	3	1	3	1	3	1	2
36A	Pneumatic – monitoring and indicating	3	1	3	1	3	1	3	1	3
37	Vacuum	3	1	3	1	3	1	3	1	2
38	Water and waste	3	1	3	1	—	—	—	—	2
41	Water ballast	3	1	3	1	—	—	—	—	1
42	Integrated modular avionics	2	1	2	1	2	1	2	1	3

Introductory elements of training — all aircraft										
ATA chapter	Theory elements	Aeroplane turbine		Aeroplane piston		Helicopter turbine		Helicopter piston		Avionics B2
		B1.1	C	B1.2	C	B1.3	C	B1.4	C	
44	Cabin systems	2	1	2	1	2	1	2	1	3
45	On-board maintenance systems (except if the element is covered in the element for ATA chapter 31)	3	1	3	1	3	1	—	—	3
46	Information systems	2	1	2	1	2	1	2	1	3
50	Cargo and accessory compartments	3	1	3	1	3	1	3	1	1
Turbine engines										
49	Airborne auxiliary power (APUs)	3	1	—	—	—	—	—	—	2
70	Standard practices – engines	3	1	—	—	3	1	—	—	1
70A	Constructional arrangement and operation (namely, installation, inlet, compressors, combustion section, turbine section, bearings and seals, lubrications systems)	3	1	—	—	3	1	—	—	1

Introductory elements of training — all aircraft										
ATA chapter	Theory elements	Aeroplane turbine		Aeroplane piston		Helicopter turbine		Helicopter piston		Avionics B2
		B1.1	C	B1.2	C	B1.3	C	B1.4	C	
70B	Engine performance	3	1	—	—	3	1	—	—	1
71	Powerplant	3	1	—	—	3	1	—	—	1
72	Engine turbine and turboprop and ducted fan and unducted fan	3	1	—	—	3	1	—	—	1
73	Engine fuel and control	3	1	—	—	3	1	—	—	1
73A	FADEC	3	1	—	—	3	1	—	—	3
74	Ignition	3	1	—	—	3	1	—	—	3
75	Air	3	1	—	—	3	1	—	—	1
76	Engine control	3	1	—	—	3	1	—	—	1
77	Engine indicating systems	3	1	—	—	3	1	—	—	3
78	Exhaust	3	1	—	—	3	1	—	—	1
79	Oil	3	1	—	—	3	1	—	—	1
80	Starting	3	1	—	—	3	1	—	—	1
82	Water injections	3	1	—	—	3	1	—	—	1
83	Accessory gearboxes	3	1	—	—	3	1	—	—	1
84	Propulsion augmentation	3	1	—	—	3	1	—	—	1
Piston engines										
70	Standard practices — engines	—	—	3	1	—	—	3	1	1

Introductory elements of training — all aircraft										
ATA chapter	Theory elements	Aeroplane turbine		Aeroplane piston		Helicopter turbine		Helicopter piston		Avionics B2
		B1.1	C	B1.2	C	B1.3	C	B1.4	C	
70A	Construc-tional arrangement and operation (carburettors, fuel injection systems, induction, exhaust and cooling systems, supercharging/ turbocharging, lubrication systems)	—	—	3	1	—	—	3	1	1
70B	Engine per- formance	—	—	3	1	—	—	3	1	1
71	Powerplant	—	—	3	1	—	—	3	1	1
73	Engine fuel and control	—	—	3	1	—	—	3	1	1
73A	FADEC	—	—	3	1	—	—	3	1	3
74	Ignition	—	—	3	1	—	—	3	1	3
76	Engine control	—	—	3	1	—	—	3	1	1
77	Engine indicating Systems	—	—	3	1	—	—	3	1	3
79	Oil	—	—	3	1	—	—	3	1	1
80	Starting	—	—	3	1	—	—	3	1	1
81	Turbines	—	—	3	1	—	—	3	1	1
82	Water injections	—	—	3	1	—	—	3	1	1
83	Accessory gearboxes	—	—	3	1	—	—	3	1	1
84	Propulsion augmen-tation	—	—	3	1	—	—	3	1	1

Introductory elements of training — all aircraft										
ATA chapter	Theory elements	Aeroplane turbine		Aeroplane piston		Helicopter turbine		Helicopter piston		Avionics
		B1.1	C	B1.2	C	B1.3	C	B1.4	C	
Aeroplane propellers										
60A	Standard practices – propeller	3	1	3	1	—	—	—	—	1
61	Propellers/ Propulsion	3	1	3	1	—	—	—	—	1
61A	Propeller construction	3	1	3	1	—	—	—	—	—
61B	Propeller pitch control	3	1	3	1	—	—	—	—	—
61C	Propeller synchronising	3	1	3	1	—	—	—	—	1
61D	Propeller electronic control	2	1	2	1	—	—	—	—	3
61E	Propeller ice protection	3	1	3	1	—	—	—	—	—
61F	Propeller maintenance	3	1	3	1	—	—	—	—	1

Part 3 — Practical elements

- 1 The representative cross-section of maintenance activities mentioned in section 66.A.50 may include training in maintenance of the aircraft, rigging, adjustments, replacement of line replaceable units, troubleshooting, rectification of minor defects and testing of systems covering each element of the course.
- 2 The structured OJT practical element of type training may include targeted experience recorded within a schedule of experience or competency-based assessment of a schedule of practical tasks.
- 3 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 and functional checks;

- (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:

- (a) Format of the examination is of the multiple-choice type. Each multi-choice question must have 3 alternative answers of which only 1 must be the correct answer. The time for answering is based upon a nominal average of 90 seconds per question.
- (b) Alternative answers must seem equally possible to anyone with no knowledge of the subject. All of the alternatives should be clearly related to the question and of similar vocabulary, grammatical construction and length.
- (c) In numerical questions, the incorrect answers must correspond to procedural errors such as the use of incorrect sense (+ versus -) or incorrect measurement units: they must not be mere random numbers.
- (d) Subject to paragraph (j), the level of each question should be the one defined in Part 2 “type training standard”.
- (e) The examination must be of the closed book type. No reference material is permitted. An exception will be made for the case of examining a B1 or B2 candidate’s ability to interpret technical documents.
- (f) The number of questions must be at least 1 question per hour of instruction, with a minimum of 1 question per chapter. CASA will assess number and level of questions on a sampling basis when approving the course. The number of questions for each level must be consistent with the effective training hours spent teaching at that level.
- (g) The minimum examination pass mark is 75%. When the type training examination is split into several examinations, each examination must be passed with at least a 75% pass mark. For it to be possible to achieve exactly a 75% pass mark, the number of questions in the examination must be a multiple of 4.
- (h) Penalty marking is not to be used to determine whether a candidate has passed.
- (i) End of module phase examinations cannot be used as part of the final examination unless they contain the correct number and level of questions required.
- (j) It is accepted that during a Level 3 examination, Level 1 and Level 2 questions may be used to examine the full scope of the course material. However, during the examination it is not acceptable to use more than 25% of questions at any lower level such that the intention of the higher examination level is reduced.

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

B Practical element — assessment standard

- 1 For assessment of practical elements of type training, the assessment must 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 AMO’s or MTO’s exposition.

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- 2 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.
- 3 A written report must be made by the assessor to explain why the candidate has passed or failed.
- 4 The assessment must ensure that the following objectives are met:
 - (a) accurately and confidently discuss the aircraft and its systems;
 - (b) 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;
 - (c) correctly use all technical literature and documentation for the aircraft;
 - (d) 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.

Appendix IV

Units of competency required for a category or subcategory of licence

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
MEA105C	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
MEA111C	Perform administrative processes to prepare for certification of civil aircraft maintenance					X	X	X	X	X
MEA112B	Plan and implement aircraft maintenance activities					X	X	X	X	X
MEA113C	Supervise civil maintenance activities and manage human resources in the workplace					X	X	X	X	X

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Competency units required	Title	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
MEA116B	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
MEA119B	Perform administrative processes to prepare for certification of civil aircraft A level line maintenance	X	X	X	X					
MEA142B	Manage self in the aviation maintenance environment					X	X	X	X	X
MEA201B	Remove and install miscellaneous aircraft electrical hardware/ components					X	X	X	X	X
MEA203C	Remove and install advanced aircraft electrical systems and components					X	X	X	X	X
MEA205C	Remove and install advanced aircraft instrument systems and components									X
MEA206C	Remove and install aircraft basic radio communication and navigation systems and components									X
MEA207C	Remove and install aircraft electronic systems and components									X

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Competency units required	Title	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
MEA208C	Remove and install pressurisation control systems and components					X	X			
MEA209C	Remove and install oxygen systems and components					X	X			X
MEA211C	Inspect, test and troubleshoot advanced aircraft electrical systems and components					X or MEA 223D and 227D	X or MEA 223D and 227D	X or MEA 223D and 227D	X or MEA 223D and 227D	
MEA219C	Inspect, test and troubleshoot aircraft pressurisation control systems and components					X	X			
MEA222C	Inspect, test and troubleshoot aircraft oxygen systems and components					X	X			
MEA223D	Inspect aircraft electrical systems and components					X or MEA 211C	X or MEA 211C	X or MEA 211C	X or MEA 211C	X
MEA224C	Inspect aircraft instrument systems and components									X
MEA225C	Inspect fixed wing aircraft automatic flight control systems and components									X
MEA226D	Inspect aircraft electronic systems and components									X
MEA227D	Test and troubleshoot aircraft electrical systems and components					X or MEA 211C	X or MEA 211C	X or MEA 211C	X or MEA 211C	X
MEA228D	Test and trouble-shoot aircraft instrument systems and components									X

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Competency units required	Title	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
MEA229D	Test and troubleshoot aircraft radio frequency navigation and communications systems and components									X
MEA230C	Test and troubleshoot fixed wing aircraft automatic flight control systems and components									X or MEA 231C
MEA231C	Test and troubleshoot rotary wing aircraft automatic flight control systems and components									X or MEA 230C
MEA232C	Test and troubleshoot aircraft pulse systems and components									X
MEA235B	Perform advanced troubleshooting in aircraft avionic maintenance									X
MEA240B	Use electrical test equipment to perform basic electrical tests	X	X	X	X					
MEA241C	Perform aircraft weight and balance calculations as a result of modifications									X
MEA246C	Fabricate and/or repair aircraft electrical hardware or parts					X	X	X	X	X
MEA260B	Use electrical test equipment					X	X	X	X	X

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Competency units required	Title	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
MEA264A	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					
MEA301C	Perform aircraft flight servicing					X	X	X	X	X
MEA302C	Remove and install aircraft hydro-mechanical and landing gear systems and components					X	X	X	X	
MEA303D	Remove and install aircraft pneumatic systems and components					X	X	X	X	
MEA304C	Remove and install non-pressurised aircraft structural and non-structural components							X or MEA 317C	X or MEA 317C	
MEA305C	Remove and install aircraft fixed wing flight control systems and components					X	X			
MEA306C	Remove and install engines and engine systems and components					X	X	X	X	
MEA307C	Remove and install propeller systems and components					P	X			
MEA308C	Remove and install rotary wing rotor and flight control system components							X	X	

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Competency units required	Title	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
MEA309C	Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components						X	X	X	
MEA310C	Inspect, test and troubleshoot aircraft pneumatic systems and components						X	X	X	
MEA312C	Inspect, test and troubleshoot aircraft fixed wing flight control systems and components						X			
MEA313C	Inspect, test and troubleshoot piston engine systems and components						X		X	
MEA315C	Inspect, test and troubleshoot propeller systems and components					P	X			
MEA316C	Inspect, test and troubleshoot rotary wing rotor and control systems and components							X	X	
MEA317C	Remove and install pressurised aircraft structural and non-structural components					X	X			
MEA318C	Inspect aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components					X				
MEA319C	Inspect gas turbine engine systems and components					X		X		

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Competency units required	Title	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
MEA320C	Test and troubleshoot aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components					X				
MEA321C	Test and troubleshoot aircraft fixed wing flight control systems and components					X				
MEA322C	Test and troubleshoot gas turbine engine systems and components					X		X		
MEA323C	Perform advanced troubleshooting in aircraft mechanical maintenance					X	X	X	X	
MEA325B	Weigh aircraft and perform aircraft weight and balance calculations as a result of modifications					X	X	X	X	
MEA328C	Maintain and/or repair aircraft mechanical components or parts					X	X	X	X	
MEA339C	Inspect, repair and maintain aircraft structures					X	X	X	X	
MEA343B	Remove and install avionic systems and components					X	X	X	X	

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Competency units required	Title	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
MEA344A	Remove and install aircraft hydro-mechanical components during line maintenance	X	X	X	X					
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					
MEA357A	Inspect, test and repair aircraft fabric surfaces					Z	Z			
MEA358A	Re-cover aircraft fabric surfaces					Z	Z			
MEA359A	Inspect and repair aircraft wooden structures					W	W			
MEA365A	Assess structural repair and modification requirements and evaluate structural repairs and modifications					X	X	X	X	
MEA418A	Basic repair of aircraft internal fittings during line maintenance	X	X	X	X					

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Competency units required	Title	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
MSAENV272B	Participate in environmentally sustainable work practices	X	X	X	X					
MSAENV472B	Implement and monitor environmentally sustainable work practices					X	X	X	X	X

Appendix V

Recognised States

Nil

Note New Zealand has a status under the Trans-Tasman Mutual Recognition Arrangement that is equivalent to that of a Recognised State.

Appendix VI

Excluded States

Nil

Appendix VII

Excluded systems – exclusions on type ratings – suitable for provision of training, assessment and authorisation within an AMO – if approved for the AMO exposition

Note Eligibility for removal of an exclusion from an aircraft type rating is only established by first having the affiliated exclusion removed from the category (e.g., a B1.1 with a propeller exclusion would first need to gain the appropriate category training from an MTO before an AMO could provide rating exclusion removal training for the propeller system).

- E6 Excluding avionic LRUs
- E11 Excluding audio CVR systems
- E12 Excluding propellers
- E13 Excluding hydraulics — ATA29
- E14 Excluding vapour cycle air-conditioning aspects of ATA21
- E15 Excluding air-conditioning aspects of ATA21
- E16 Excluding pressurisation aspects of ATA21
- E18 Excluding ADF systems
- E19 Excluding VOR systems
- E20 Excluding ILS systems
- E21 Excluding weather radar systems
- E22 Excluding ATC transponder systems
- E23 Excluding radio altimeter systems
- E24 Excluding DME systems
- E25 Excluding doppler systems
- E26 Excluding satellite navigation systems
- E27 Excluding autopilots
- E28 Excluding multi-axis autopilots
- E29 Excluding remote indicating compass systems
- E30 Excluding inertial navigation and reference systems
- E31 Excluding pressurisation systems
- E32 Excluding electrical systems in aircraft equipped with multi-generator powered systems
- E33 Excluding supercharging
- E34 Excluding digital systems
- E35 Excluding pressurised structures
- E36 Excluding carburettor systems
- E37 Excluding fuel injection systems
- E38 Excluding turbo supercharging systems
- E39 Excluding airframe ice protection systems
- E40 Excluding airframe fire protection systems
- E41 Excluding oxygen systems
- E42 Excluding landing gear retraction systems
- E43 Excluding fabric other than flight controls
- E44 Excluding wiring repairs

Appendix VIII

Units of competency required for removal of an exclusion from a category or subcategory of licence

Competency Unit(s) required	Title of Exclusion		B1.1	B1.2	B1.3	B1.4	B2
MEA201B MEA203C MEA223D MEA227D MEA246C MEA260B	E1	Excluding electrical systems	X				
MEA201B MEA203C MEA211C MEA246C MEA260B	E1	Excluding electrical systems		X	X	X	
MEA203C MEA223C MEA227D	E1	Excluding electrical systems					X
MEA302C MEA303D MEA305C MEA317C MEA318C MEA320C MEA321C MEA323B MEA325B MEA328C MEA339C MEA365A	E2	Excluding mechanical or structural	X				
MEA302C MEA304C MEA305C MEA309C MEA312C MEA325B MEA328C MEA339C MEA354A MEA365A	E2	Excluding mechanical or structural		X			
MEA302C MEA303D MEA304C MEA308C MEA309C MEA310C MEA316C	E2	Excluding mechanical or structural			X	X	

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Competency Unit(s) required	Title of Exclusion		B1.1	B1.2	B1.3	B1.4	B2
MEA323B MEA325B MEA328C MEA339C MEA365A							
MEA306C MEA307C MEA315C MEA319C MEA322C MEA323B	E3	Excluding powerplant systems	X				
MEA306C MEA313C	E3	Excluding powerplant systems		X		X	
MEA306C MEA319C MEA322C MEA323B	E3	Excluding powerplant systems			X		
MEA201B MEA203C MEA223D MEA227D MEA246C MEA260B	E4	Excluding electrical subsystem of mechanical, powerplant or structural systems	X				
MEA201B MEA203C MEA211C MEA246C MEA260B	E4	Excluding electrical subsystem of mechanical, powerplant or structural systems		X	X	X	
MEA203C MEA223D MEA227D	E4	Excluding electrical subsystems of mechanical, powerplant or structural systems					X
MEA201B MEA203C MEA211C MEA246C MEA260B MEA343B	E5	Excluding instrument subsystems of mechanical, powerplant or structural systems	X	X	X	X	
MEA205C MEA207C MEA224C MEA225C MEA226D MEA228D MEA230C MEA231C MEA235B	E5	Excluding instrument subsystems of mechanical, powerplant or structural systems					X
MEA201B	E6	Excluding avionics LRUs	X	X	X	X	

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Competency Unit(s) required	Title of Exclusion		B1.1	B1.2	B1.3	B1.4	B2
MEA203C MEA211C MEA246C MEA260B MEA343B							
MEA205C MEA206C MEA207C MEA224C MEA225C MEA226D MEA228D MEA229D MEA230C MEA231C – may be taken instead of MEA225C and MEA230C where ratings sought are entirely helicopter. MEA232C MEA235B	E6	Excluding avionics LRUs					X
MEA201B MEA203C MEA211C MEA246C MEA260B MEA343B	E7	Excluding instrument aspects of avionic systems – ATA22, 27, 31, 34 and 42	X	X	X	X	
MEA205C MEA207C MEA224C MEA225C MEA226D MEA228D MEA230C MEA231C MEA235B	E7	Excluding instrument aspects of avionic systems – ATA22, 27, 31, 34 and 42					X
MEA201B MEA203C MEA211C MEA246C MEA260B MEA343B	E8	Excluding radio aspects of avionic systems – ATA23, 34, 42 and 44	X	X	X	X	
MEA206C MEA207C MEA226D MEA229D MEA232C	E8	Excluding radio aspects of avionic systems – ATA23, 34, 42 and 44					X

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Competency Unit(s) required	Title of Exclusion	B1.1	B1.2	B1.3	B1.4	B2
MEA235B						
MEA357A	E9 Excluding fabric surfaces	X	X	X	X	
MEA359A	E10 Excluding wooden structures	X	X	X	X	
MEA206C MEA215C	E11 Excluding audio CVR systems					X
MEA307C MEA315C	E12 Excluding propellers	X	X			
MEA302C MEA309C	E13 Excluding hydraulics – ATA29	X	X	X	X	
MEA201B MEA246C MEA260B MEA362A	E14 Excluding vapour cycle air-conditioning aspects of ATA21	X	X	X	X	
MEA201B MEA203C MEA211C MEA246C MEA260B MEA303D MEA310C	E15 Excluding air-conditioning aspects of ATA21 (for pressurised aircraft)	X				
MEA201B MEA246C MEA260B MEA355A	E15 Excluding air-conditioning aspects of ATA21 (for unpressurised aircraft and helicopters)	X		X		
MEA201B MEA203C MEA208C MEA211C MEA219C MEA246C MEA260B MEA303D MEA310C MEA317C MEA323B	E16 Excluding pressurisation aspects of ATA21	X				
MEA201B MEA246C MEA356A	E16 Excluding pressurisation aspects of ATA21		X			
	E17 Not allocated					
MEA206C MEA214C	E18 Excluding ADF systems					X
MEA206C MEA214C – or the following 2 units in lieu of MEA214C MEA226D	E19 Excluding VOR systems					X

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Competency Unit(s) required	Title of Exclusion	B1.1	B1.2	B1.3	B1.4	B2
MEA229D						
MEA206C MEA207C MEA216C	E20	Excluding ILS systems				X
MEA207C MEA220C	E21	Excluding weather radar systems				X
MEA207C MEA221C	E22	Excluding ATC transponder systems				X
MEA207C MEA221C	E23	Excluding radio altimeter systems				X
MEA207C MEA221C	E24	Excluding DME systems				X
MEA207C MEA221C	E25	Excluding Doppler systems				X
MEA206C MEA207C MEA234C	E26	Excluding satellite navigation systems				X
MEA207C MEA291A	E27	Excluding autopilots				X
MEA207C MEA217C, or MEA218C (if helicopter systems are being maintained)	E28	Excluding multi-axis autopilots				X
MEA205C MEA213C	E29	Excluding remote indicating compass systems				X
MEA207C MEA233C	E30	Excluding inertial navigation and reference systems				X
MEA208C MEA219C	E31	Excluding pressurisation systems				X
MEA202C MEA210C MEA277A	E32	Excluding electrical systems in aircraft equipped with multi-generator powered systems				X
MEA306C MEA313C	E33	Excluding supercharging		X		X
MEA207C and any one of MEA227D MEA228D MEA229D MEA230C MEA231C MEA232C MEA278A	E34	Excluding digital systems				X

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Competency Unit(s) required	Title of Exclusion		B1.1	B1.2	B1.3	B1.4	B2
MEA317C MEA339C	E35	Excluding pressurised structures	X	X			
MEA306C MEA313C	E36	Excluding carburettor systems		X		X	
MEA306C MEA313C	E37	Excluding fuel injection systems		X		X	
MEA306C MEA313C	E38	Excluding turbo supercharging systems		X		X	
MEA303D MEA310C	E39	Excluding airframe ice protection systems	X		X		
MEA303D MEA310C	E40	Excluding airframe fire protection systems	X	X	X	X	
MEA209C MEA222C	E41	Excluding oxygen systems	X	X	X	X	
MEA201B MEA202C MEA210C MEA246C MEA260B MEA302C MEA309C	E42	Excluding landing gear retraction systems	X	X	X	X	
MEA357A	E43	Excluding fabric other than flight controls	X	X	X	X	
MEA201B MEA246C MEA260B	E44	Excluding wiring repairs	X	X	X	X	

Appendix IX

See paragraphs 66.A.1 (c) and (d)

Type rated aircraft types and type rating endorsements for Category B1, B2 or C licences

Note Large aircraft (aeroplanes over 5 700 kg maximum take-off weight (MTOW), multi-engine helicopters, and aircraft (including, where appropriate, a particular engine type) that CASA has designated as requiring a type rating, generally form the basis of the type rated aircraft types listed in Appendix IX. CASA has also designated certain small aircraft and specific engines as requiring a type rating on the basis that, taking into account issues such as complexity, new technology, ATSB recommendations or other safety issues, type training will enhance aviation safety.

Table 1

Note These aeroplanes are large or designated as large - requiring type training and individual type rating
See paragraph 66.A.1 (e) for the meaning of “Various” in column 2.

Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type - engine in brackets)
328 Support Services	328-100 Series		Dornier 328-100 (PWC PW119)
AIRBUS	A300 B1 A300 B2-1A A300 B2-1C A300 B2K-3C A300 B2-202 A300 B2-203 A300 B4-2C A300 B4-102 A300 B4-103 A300 B4-203 A300 C4-203 A300 F4-203		Airbus A300 basic model (GE CF6)
	A300 B4-601 A300 B4-603 A300 B4-605 R A300 F4-605 R A300 C4-605 R Variant F		Airbus A300-600 (GE CF6)
	A300 B4-622 A300 B4-622 R A300 F4-622 R		Airbus A300-600 (PW 4000)
	A310-203 A310-221 A310-203 C A310-304 A310-308		Airbus A310 (GE CF6)
	A310-324		Airbus A310 (PW 4000)

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Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type - engine in brackets)
AIRBUS	A310-325		Airbus A310 (PW 4000)
	A318-110 Series A319-110 Series A320-111 A320-210 Series A321-110 Series A321-210 Series		Airbus A318/A319/A320/A321 (CFM56)
	A319-130 Series A320-230 Series A321-130 Series A321-230 Series		Airbus A319/A320/A321 (IAE V2500)
	A330-200 Series A330-300 Series		Airbus A330 (GE CF6)
	A330-220 Series A330-320 Series		Airbus A330 (PW 4000)
	A330-240 Series A330-340 Series		Airbus A330 (RR RB 211 Trent 700)
	A380-840 Series		Airbus A380 (RR RB211 Trent 900)
	AIRCRAFT INDUSTRIES	L-420	
ATR-GIE Avions de Transport Régional	ATR 42-200 ATR 42-300		ATR 42-200/300 Series (PWC PW120)
	ATR 42-400		ATR 42-400/500/72-212A (PWC PW120)
	ATR 42-500	42-500	ATR 42-400/500/72-212A (PWC PW120)
	ATR 42-500	42-600	ATR 42-400/500/72-212A (PWC PW120)
	ATR 72-212 A	72-500	ATR 42-400/500/72-212A (PWC PW120)
	ATR 72-212 A	72-600	ATR 42-400/500/72-212A (PWC PW120)
BAE SYSTEMS	BAe 146 Series 100 BAe 146 Series 200 BAe 146 Series 300 AVRO 146-RJ70 AVRO 146-RJ85 AVRO 146-RJ100 AVRO 146-RJ115		BAe 146/AVRO 146-RJ (Honeywell ALF500 Series)

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Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type - engine in brackets)
BAE SYSTEMS	HS.748 Series 1 HS.748 Series 2 HS 748 Series 2A HS 748 Series 2B		HS748 (RRD Dart)
	Jetstream 3100	Jetstream 31	Jetstream 31/32 (Honeywell TPE331)
	Jetstream 3200	Jetstream 32/32EP	Jetstream 31/32 (Honeywell TPE331)
	Jetstream 4100		Jetstream 41 (Honeywell TPE331)
THE BOEING COMPANY	B707-100	Long Body	Boeing 707/720 (PW JT3)
	B707-100B	Long Body	Boeing 707/720 (PW JT3)
	B707-100B	Short Body	Boeing 707/720 (PW JT3)
	B707-300B Series B707-300C Series B720 B720B		Boeing 707/720 (PW JT3)
	B717-200		MD-717-200 (RRD BR700-715)
	B727 Series B727-100 Series B727C Series B727-100C Series B727-200 Series		Boeing 727 (PW JT8D)
	B737-100 B737-200 B737-200C		Boeing 737-100/200 (PW JT8D)
	B737-300 B737-400 B737-500		Boeing 737-300/400/500 (CFM56)
	B737-600 B737-700 B737-800 B737-900 B737-900ER		Boeing 737-600/700/800/900 (CFM56)
	B747-200B B747-200C B747-200F B747-300		Boeing 747-200/300 (PW JT9D)

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Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type - engine in brackets)
THE BOEING COMPANY	B747-200B B747-200C B747-200F B747-300		Boeing 747-200/300 (RR RB211)
	B747-400 B747-400D B747-400F/SF/BCF		Boeing 747-400 (GE CF6)
	B747-400 B747-400F/SF/BCF		Boeing 747-400 (RR RB211)
	B747SP		Boeing 747SP (PW JT9D)
	B747SP		Boeing 747SP (RR RB211)
	B757-200 B757-200PF B757-300		Boeing 757-200/300 (RR RB211)
	B767-200 B767-300		Boeing 767-200/300 (PW 4000)
	B767-200 B767-300		Boeing 767-200/300 (PW JT9D)
	B767-200 B767-300 B767-300F B767-400ER		Boeing 767-200/300/400 (GE CF6)
	B777-200 B777-200LR B777-300ER		Boeing 777-200/300 (GE 90)
	B777F	Freighter	Boeing 777-200/300 (GE 90)
	B787-8	Dreamliner	Boeing 787 (GENx-1B)
	DC3-G102 DC3-G102A DC3-G103A DC3-G202A		McD DC3 (Wright R1820) ^{Note 2}
	DC3A-SCG DC3A-SC3G DC3A-S1CG DC3A-S1C3G DC3A-S4C4G DC3C-SC3G DC3C-S1C3G-S4C4G		McD DC3 (PW R1830)

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Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type - engine in brackets)
THE BOEING COMPANY	DC3C-R-1830-90C DC3D-R-1830-90C		McD DC3 (PW R1830)
	DC-4		McD DC4 (PW R2000)
BOMBARDIER	CL-215-1A10		Canadair CL-215 (PW R2800)
	BD-100-1A10	Challenger 300	Bombardier BD-100-1A10 (Honeywell AS907)
	BD-700-1A10	Global Express	Bombardier BD-700 Series (RRD BR710)
	BD-700-1A10	Global 6000	Bombardier BD-700 Series (RRD BR710)
	BD-700-1A11	Global 5000	Bombardier BD-700 Series (RRD BR710)
	BD-700-1A11	Global 5000 GVFD	Bombardier BD-700 Series (RRD BR710)
	CL-600-1A11	Challenger 600	Bombardier CL-600-1A11 (Honeywell ALF502)
	CL600-2A12 (601 Variant)	Challenger 601	Bombardier CL-600 -2A12/-2B16 (Variant CL 601/601-3A/3R) (GE CF34)
	CL600-2B16 (601-3A Variant)	Challenger 601-3A	Bombardier CL-600 -2A12/-2B16 (Variant CL 601/601-3A/3R) (GE CF34)
	CL600-2B16 (601-3R Variant)	Challenger 601-3R	Bombardier CL-600 -2A12/-2B16 (Variant CL 601/601-3A/3R) (GE CF34)
	CL600-2B16 (604 Variant)	Challenger 604 (MSN < 5701)	Bombardier CL-600 -2B16 (Variant CL 604) (GE CF34)
	CL600-2B16 (604 Variant)	Challenger 605 (MSN > 5701)	Bombardier CL-600 -2B16 (Variant CL 604) (GE CF34)
	CL600-2B19	Regional Jet Series 100	Bombardier CL-600-2B19 (GE CF34)
	DHC-8-101 DHC-8-102 DHC-8-103 DHC-8-106	DHC-8 Series 100	Bombardier DHC-8-100/200/300 (PWC PW 120)
	DHC-8-201 DHC-8-202	DHC-8 Series 200	Bombardier DHC-8-100/200/300 (PWC PW 120)

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Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type - engine in brackets)
BOMBARDIER	DHC-8-301 DHC-8-311 DHC-8-314 DHC-8-315	DHC-8 Series 300	Bombardier DHC-8-100/200/300 (PWC PW 120)
	DHC-8-400 DHC-8-401 DHC-8-402	DHC-8 Series 400	Bombardier DHC-8-400 (PWC PW150)
CESSNA AIRCRAFT COMPANY	510		Cessna 510 (PWC PW615)
	525	Citation Jet CJ1	Cessna 525/525A (Williams FJ44)
	525A	Citation Jet CJ2	Cessna 525/525A (Williams FJ44)
	525B	Citation Jet CJ3	Cessna 525B (Williams FJ44)
	525C	Citation Jet CJ4	Cessna 525C (Williams FJ44)
	550	Citation Bravo	Cessna 550/560 (PWC PW530/535)
	560	Citation Encore	Cessna 550/560 (PWC PW530/535)
	560	Citation Encore+	Cessna 550/560 (PWC PW530/535)
	550	Citation II	Cessna 550/560 (PWC JT15D)
	S550	Citation S/II	Cessna 550/560 (PWC JT15D)
	560	Citation V	Cessna 550/560 (PWC JT15D)
	560	Citation Ultra	Cessna 550/560 (PWC JT15D)
	560 XL	Citation Excel	Cessna 560XL/XLS (PWC PW545)
	560 XLS	Citation XLS	Cessna 560XL/XLS (PWC PW545)
	560 XLS+	Citation XLS+	Cessna 560XL/XLS (PWC PW545)
	650	Citation III – VI	Cessna 650 (Honeywell TFE731)
	650	Citation VII	Cessna 650 (Honeywell TFE731)
	680	Sovereign	Cessna 680 (PWC PW306)

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Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type - engine in brackets)
CESSNA AIRCRAFT COMPANY	750	Citation X	Cessna 750 (RR Corp AE3007C)
DASSAULT AVIATION	Fan Jet Falcon Series C Series D Series E Series F	(Basic) Fan Jet Falcon	Falcon 20 (GE CF700)
	Mystère Falcon 20-C5 Mystère Falcon 20-D5 Mystère Falcon 20-E5 Mystère Falcon 20-F5		Falcon 20-5 (Honeywell TFE731)
	Fan Jet Falcon Series G Mystère Falcon 200 Mystère Falcon 20GF		Falcon 200 (Honeywell ATF 3-6) Falcon 200 (Honeywell ATF 3-6)
	Mystère Falcon 50	50	Falcon 50 (Honeywell TFE731)
	Mystère Falcon 50	50EX	Falcon 50EX (Honeywell TFE731)
	Mystère Falcon 900	Falcon 900C	Falcon 900C (Honeywell TFE731)
	Falcon 2000		Falcon 2000 (CFE 738)
	Falcon 2000EX		Falcon 2000 (PWC PW308)
	Falcon 7X		Falcon 7X (PWC PW307A)
	EADS CASA	C-212-CB C-212-CC C-212-CD C-212-CE C-212-CF C-212-DD C-212-DF C-212-EE C-212-VA	Aviocar
CN-235 CN-235-100			CN-235 (GE CT7)

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Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type - engine in brackets)
EADS CASA	CN-235-200 CN-235-300		CN-235 (GE CT7)
EMBRAER Empresa Brasileira de Aeronautica	EMB-120 EMB-120RT EMB-120ER	Brasilia	Embraer EMB-120 (PWC PW110 Series)
	EMB-135BJ	Legacy 600	Embraer EMB-135/145 (RR Corp AE3007A)
	EMB-135BJ	Legacy 650	Embraer EMB-135/145 (RR Corp AE3007A)
	EMB-135ER EMB-135LR EMB-145 EMB-145ER EMB-145EU EMB-145EP EMB-145LR EMB-145LU EMB-145MP EMB-145MK		Embraer EMB-135/145 (RR Corp AE3007A)
	EMB-500	Phenom 100	Embraer EMB-500 (PWC PW617)
	ERJ-170-100 STD	ERJ-170	Embraer ERJ-170 Series (GE CF34)
	ERJ 170-100 LR	ERJ-170	Embraer ERJ-170 Series (GE CF34)
	ERJ 170-200 STD	ERJ-175	Embraer ERJ-170 Series (GE CF34)
	ERJ 170-200 LR	ERJ-175	Embraer ERJ-170 Series (GE CF34)
	ERJ 190-100 ECJ	Lineage 1000	Embraer ERJ-190 Series (GE CF34)
	ERJ 190-100 LR	ERJ-190	Embraer ERJ-190 Series (GE CF34)
	ERJ 190-100 STD	ERJ-190	Embraer ERJ-190 Series (GE CF34)
	ERJ 190-100 SR	ERJ-190	Embraer ERJ-190 Series (GE CF34)
ERJ 190-200 STD	ERJ-195	Embraer ERJ-190 Series (GE CF34)	
ERJ 190-100 IGW	ERJ-190 AR	Embraer ERJ-190 Series (GE CF34)	

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Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type - engine in brackets)
EMBRAER Empresa Brasileira de Aeronautica	ERJ 190-200 IGW	ERJ-195 AR	Embraer ERJ-190 Series (GE CF34)
	ERJ 190-200 LR	ERJ-195	Embraer ERJ-190 Series (GE CF34)
FOKKER Services	F27 Mark 050	Fokker 50	Fokker 50/60 Series (PWC PW 125/127)
	F27 Mark 0502	Fokker 50	Fokker 50/60 Series (PWC PW 125/127)
	F27 Mark 0604	Fokker 60	Fokker 50/60 Series (PWC PW 125/127)
	F28 Mark 1000 F28 Mark 1000C F28 Mark 2000 F28 Mark 3000	Fellowship Fellowship	Fokker F28 Series (RRD Spey) Fokker F28 Series (RRD Spey)
	F28 Mark 3000C F28 Mark 3000R F28 Mark 3000RC F28 Mark 4000	Hawker Siddeley	Fokker F28 Series (RRD Spey)
	F28 Mark 0070	Fokker 70	Fokker 70/100 (RRD Tay)
	F28 Mark 0100	Fokker 100	Fokker 70/100 (RRD Tay)
GULFSTREAM AEROSPACE LP (GALP), c/o Israel Aircraft Industries	Gulfstream G150	Gulfstream G150	Gulfstream (IAI) G150 (Honeywell TFE731)
	Gulfstream 200/Galaxy	Galaxy 200	Gulfstream (IAI) 200/Galaxy (PWC PW306)
GULFSTREAM AEROSPACE Corporation	GIV (G300)	Gulfstream G300	Gulfstream G-IV Series (RRD Tay)
	GIV (G400)	Gulfstream G400	Gulfstream G-IV Series (RRD Tay)
	G-IV/GIV-SP	Gulfstream G-IV/GIV-SP	Gulfstream G-IV Series (RRD Tay)
	GIV-X (G350)	Gulfstream G350	Gulfstream GIV-X Series (RRD Tay)
	GIV-X (G450)	Gulfstream G450	Gulfstream GIV-X Series (RRD Tay)
	GV	Gulfstream GV	Gulfstream GV basic model (RRD BR710)
	GV-SP (G500)	Gulfstream G500	Gulfstream GV-SP Series (RRD BR710)
GV-SP (G550)	Gulfstream G550	Gulfstream GV-SP Series (RRD BR710)	

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Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type - engine in brackets)
HAWKER BEECHCRAFT Corporation	DH.125 Series 1 DH.125 Series 3 DH.125 Series 400 HS.125 Series 3 HS.125 Series F3 HS.125 Series F400 HS.125 Series 600 HS.125 Series 700 HS.125 Series F600	Hawker Siddeley	BAe 125/Series 700/800 (Honeywell TFE731)
	BH.125 Series 400 BH.125 Series 600	Beechcraft Hawker	BAe 125/Series 700/800 (Honeywell TFE731)
	BAe.125 Series 800		BAe 125/Series 700/800 (Honeywell TFE731)
	Hawker 750	Hawker 750	BAe 125/Series 750/800XP/850XP/900XP (Honeywell TFE731)
	Hawker 800XP	Hawker 800XP	BAe 125/Series 750/800XP/850XP/900XP (Honeywell TFE731)
	Hawker 850XP	Hawker 850XP	BAe 125/Series 750/800XP/850XP/900XP (Honeywell TFE731)
	Hawker 900XP	Hawker 900XP	BAe 125/Series 750/800XP/850XP/900XP (Honeywell TFE731)
	BAe 125 Series Hawker 1000A/B Hawker 1000		BAe 125 Series 1000 (PWC PW305)
	300 300LW	Super King Air	Beech 300 Series (PWC PT6)
	B300	Super King Air 350	Beech 300 Series (PWC PT6)
	B300C	Super King Air 350 C	Beech 300 Series (PWC PT6)
	390	Premier I, 1A	Beech 390 (Williams FJ44)
	400	Beechjet	Beech 400/Mitsubishi MU-300 (Williams FJ44)
	400	Beechjet	Beech 400/Mitsubishi MU-300 (PWC JT15)
	400A	Beechjet (Hawker XP)	Beech 400/Mitsubishi MU-300 (PWC JT15)

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Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type - engine in brackets)
HAWKER BEECHCRAFT Corporation	400T	Beechjet	Beech 400/Mitsubishi MU-300 (PWC JT15)
	MU-300	Diamond I/IA	Beech 400/Mitsubishi MU-300 (PWC JT15)
	MU-300-10	Diamond II	Beech 400/Mitsubishi MU-300 (PWC JT15)
	1900 1900C 1900D	Airliner	Beech 1900 (PWC PT6)
ISRAEL AIRCRAFT INDUSTRIES	IAI 1124 IAI 1124A	Westwind	IAI 1124 (Honeywell TFE731)
KELOWNA (Convair)	240 340 440		Convair 240/340/440 (PW R2800)
	580		Convair 580 (RR Corp 501)
LEARJET	31/31A		Learjet 31 (Honeywell TFE731)
	35/35A 36/36A		Learjet 35/36 (Honeywell TFE731)
	Learjet 40	LJ40 or LJ40XR	Learjet Model 45 (Honeywell TFE731)
	Learjet 45	LJ45 or LJ45XR	Learjet Model 45 (Honeywell TFE731)
	Learjet 60	LJ60 or LJ60XR	Learjet 60 (PWC PW305)
M7 AEROSPACE	SA226-T SA226-TC SA226-AT SA226-T(B)		Fairchild SA226 Series (Honeywell TPE331)
	SA227-AT SA227-TT SA227-CC SA227-DC		Fairchild 227 Series (Honeywell TPE331)
	SA227-AC	Swearingen	
	SA227-BC	Metro	
SAAB AB, SAAB Aerosystems	340A(SF340A) 340B	Saab-Fairchild 340A	Saab (SF) 340 (GE CT7)
SOCOTA	G73		Grumman G73 (PT6)

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Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type - engine in brackets)
SHORT BROTHERS	SD3-30 SD3-60 SD3-SHERPA SD3-60 SHERPA	Variant 200	Shorts SD3 Series-30/SD3-60 (PWC PT6) Shorts SD3 Series-30/SD3-60 (PWC PT6)
NA	Various		Small or non-rated aircraft (Avco Lycoming T53) ^{Note 1}
NA	Various		Small or non-rated aircraft (Bristol Centaurus) ^{Note 1}
NA	Various		Small or non-rated aircraft (Bristol Siddeley Viper B/S) ^{Note 1}
NA	Various		Small or non-rated aircraft (De Havilland Goblin 35) ^{Note 1}
NA	Various		Small/non rated aircraft (Gen Electric J85-GE-17A) ^{Note 1}
NA	Various		Small or non-rated aircraft (Honeywell TPE331) ^{Note 1}
NA	Various		Small or non-rated aircraft (PWC PT6) ^{Note 1}
NA	Various		Small or non-rated aircraft (PWC JT15D) ^{Note 1}
NA	Various		Small or non-rated aircraft (PW R1830/R2000) ^{Note 1}
NA	Various		Small or non-rated aircraft (PW R2800) ^{Note 1}
NA	Various		Small or non-rated aircraft (Rolls Royce Avon) ^{Note 1}
NA	Various		Small or non-rated aircraft (Rolls Royce/Packard Merlin) ^{Note 1}
NA	Various	Allison 250	Small or non-rated aircraft (RR Corp 250) ^{Note 1}
NA	Various		Small or non-rated aircraft (Williams FJ44) ^{Note 1}
NA	Various		Small or non-rated aircraft (Wright R1820) ^{Note 1, Note 2}
NA	Various		Small or non-rated aircraft (WSK PZL (Kalisz) Asz 62IR-M18) ^{Note 1}
NA	Various		Small or non-rated aircraft (Wright R2600) ^{Note 1}

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Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type - engine in brackets)
NA	Various		Small or non-rated aircraft (Wright R3350) ^{Note 1}
NA	Various		Small or non-rated aircraft (Walter M601) ^{Note 1, Note 3}
<p><i>Note 1 This is a rule.</i> For an aircraft type mentioned in a cell in a row of column 2, the type rating endorsement mentioned in a cell in the same row in column 4 that is annotated “Note 1” (the endorsement) has no applicability to Category B2 and Category C. However, an aircraft engineer licence in Category B1.1 or B1.2 (as relevant) must be endorsed with the endorsement before the holder may perform maintenance certifications for the engine of the aircraft.</p> <p><i>Note 2 This is a rule.</i> For an aircraft type mentioned in a cell in a row of column 2, the type rating endorsement mentioned in a cell in the same row in column 4 that is identified by the label “Note 2” also applies for all engine derivatives manufactured as part of the Wright 1820 Series e.g. Wright PZL M-18 and Lycoming Variants.</p> <p><i>Note 3 This is a rule.</i> For an aircraft type mentioned in a cell in a row of column 2, the type rating endorsement mentioned in a cell in the same row in column 4 that is annotated “Note 3” (that is the Walter M601 engine rating) also applies for the M601H-80 engine now designated by the manufacturer as the GE Aviation Czech H80.</p>			

Table 2

Note These are aircraft for which an AMO may select or control type training (theory and practical) for AMO 6 month authorisation and subsequent CASA issue of individual type rating.

Part 1 — Aeroplanes eligible for AMO controlled or delivered type training

Note Aeroplanes in this table were previously covered by regulation 31 of the Civil Aviation Regulations 1988 lower group ratings or are considered eligible for AMO selected manufacturer training.

TC holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
BAE SYSTEMS	Jetstream 3100	Jetstream 31	Jetstream 31/32 (Honeywell TPE331) ^{Note 1}
	Jetstream 3200	Jetstream 32/32EP	Jetstream 31/32 (Honeywell TPE331) ^{Note 1}
HAWKER BEECHCRAFT Corporation	300 300LW	Super King Air	Beech 300 Series (PWC PT6) ^{Note 1}
	B300	Super King Air 350	Beech 300 Series (PWC PT6) ^{Note 1}
	B300C	Super King Air 350 C	Beech 300 Series (PWC PT6) ^{Note 1}
	1900 1900C 1900D	Airliner	Beech 1900 (PWC PT6) ^{Note 1}
M7 AEROSPACE	SA226-T SA226-TC SA226-AT SA226-T(B)		Fairchild SA226 Series (Honeywell TPE331) ^{Note 1}
	SA227-AT SA227-TT SA227-CC SA227-DC		Fairchild 227 Series (Honeywell TPE331) ^{Note 1}
	SA227-AC SA227-BC	Swearingen Metro	Fairchild 227 Series (Honeywell TPE331) ^{Note 1}
THE BOEING COMPANY	DC3-G102 DC3-G102A DC3-G103A DC3-G202A		McD DC3 (Wright R1820)
	DC3A-SCG DC3A-SC3G DC3A-S1CG DC3A-S1C3G DC3A-S4C4G		McD DC3 (PW R1830)

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TC holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
THE BOEING COMPANY	DC3C-SC3G DC3C-S1C3G-S4C4G DC3C-R-1830-90C DC3D-R-1830-90C		McD DC3 (PW R1830)
	DC-4		McD DC4 (PW R2000)
PILATUS AIRCRAFT	PC-12 PC-12/45 PC-12/47 PC-12/47E		Pilatus PC-12 (PWC PT6) ^{Note 1}
SOCOTA	G73		Grumman G73 (PWC PT6) ^{Note 1}
<p><i>Note 1 This is a rule.</i> For an aircraft type mentioned in a cell in a row of column 2, the engine type rating endorsement mentioned in a cell in the same row in column 4 that is annotated “Note 1” requires CASA approved type training.</p>			

Table 2

Note These are aircraft for which an AMO may select or control type training (theory and practical) for AMO 6 month authorisation and subsequent CASA issue of individual type rating.

Part 2

Note Helicopters in this table were previously covered by regulation 31 of the *Civil Aviation Regulations 1988* lower group ratings or are considered eligible for AMO selected manufacturer training. An AMO may provide B1, or B2, or B1 and B2, aircraft type training for the listed helicopters (but only as annotated in the table).

TC holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
BELL HELICOPTER TEXTRON Inc.	222SP		Bell 222 (RR Corp 250) <small>Note 1, Note 2</small>
	222 222B 222U		Bell 222 (Honeywell LTS 101) <small>Note 1, Note 2</small>
BELL HELICOPTER CANADA	230	Executive/Utility/ EMS	Bell 230 (RR Corp 250) <small>Note 1, Note 2</small>
	427		Bell 427 (PWC PW207D) <small>Note 2</small>
BELL HELICOPTER TEXTRON Inc.	430		Bell 430 (RR Corp 250) <small>Note 1 Note 2</small>
EUROCOPTER DEUTSCHLAND GMBH	BO 105 A BO 105 C/CBS- 4/-5 BO 105 D/DB BO 105 DB-4 BO 105 DBS Series BO 105 LS A-1/A-3 BO 105 S		BO 105 Series (RR Corp 250) <small>Note 3</small>
	EC 135 P1 Series EC 135 P2 Series EC 635 P2+		Eurocopter EC 135 (PWC PW206) <small>Note 3</small>
	EC 135 T1 Series EC 135 T2 Series EC 635 T1 EC 635 T2 Series		Eurocopter EC 135 (Turbomeca Arrius 2B) <small>Note 3</small>

TC holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
EUROCOPTER DEUTSCHLAND GMBH AND KAWASAKI HEAVY INDUSTRIES	MBB-BK 117 A Series MBB-BK 117 B Series		Eurocopter MBB-BK 117 A/B (Honeywell LTS 101) <small>Note 3</small>
	MBB-BK 117 C1		Eurocopter MBB-BK 117 C1 (Turbomeca Arriel 1) <small>Note 3</small>
	MBB-BK 117 C2	EC145	Eurocopter MBB-BK 117 C2 (Turbomeca Arriel 1) <small>Note 3</small>
MD HELICOPTERS Inc.	MD900		MD Helicopters MD900 (PWC PW206/207) <small>Note 3</small>
SIKORSKY AIRCRAFT	S-58 BT to JT		Sikorsky S-58 (PWC PT6T) <small>Note 3</small>

Note 1 This is a rule. For an aircraft type mentioned in a cell in a row of column 2, the engine type rating endorsement mentioned in a cell in the same row in column 4 that is annotated “Note 1” requires CASA approved type training.

Note 2 This is a rule. For an aircraft type mentioned in a cell in a row of column 2, B2 training for the type rating endorsement mentioned in a cell in the same row in column 4 that is annotated “Note 2”, may only be provided by an AMO that is approved in writing by CASA to provide the training.

Note 3 This is a rule. For an aircraft type mentioned in a cell in a row of column 2, B1 training, or B2 training, or B1 and B2 training, for the type rating endorsement mentioned in a cell in the same row in column 4 that is annotated “Note 3”, may only be provided or arranged by an AMO that is approved in writing by CASA to provide, or arrange, the training.

Table 3

Note These are large turbine-powered aircraft excluded from Part 66 of CASR 1998 type rating and, therefore, eligible to have the engines maintained by a B1.1 category holder with the small or non-rated aircraft (engine) rating. B2 category holder may maintain these aircraft without a type rating endorsement.

TC holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
Air Tractor	400 500 800	Air Tractor	Small/non-rated Aircraft (PWC PT6) ^{Note 1}
(DORNIER) RUAG Aerospace	228-100 Series 228-200 Series		Small/non-rated Aircraft (Honeywell TPE331) ^{Note 1}
De Havilland Canada	DHC – 4	Caribou	Small/non rated Aircraft (PWC PT6) ^{Note 1}
<p><i>Note 1</i> This is a rule. For an aircraft type mentioned in a cell in a row of column 2, the type rating endorsement mentioned in a cell in the same row in column 4 that is annotated “Note 1” (<i>the endorsement</i>) has no applicability to Category B2 and Category C. However, an aircraft engineer licence in Category B1.1 or B1.2 (as relevant) must be endorsed with the endorsement before the holder may perform maintenance certifications for the engine of the aircraft.</p>			

Table 4

Note These are piston-powered aircraft excluded from Part 66 of CASR 1998 type rating and, therefore, eligible to have the engines maintained by a B1.2 category holder with the small or non-rated aircraft (engine) rating. B2 category holder may maintain these aircraft without a rating endorsement.

TC holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
Consolidated Aeronautics Inc.	PBY-6	Catalina	Small or non-rated aircraft (PW R1830) ^{Note 1}
Lockheed Aviation Corp	414-MKIII	Hudson	Small or non-rated aircraft (Wright R1820) ^{Note 1}
Grumman	G-111	Albatross	Small or non-rated aircraft (Wright R1820) ^{Note 1}
Lockheed Aviation Corp	C-121C	Super Constellation	Small or non-rated aircraft (Wright R3350) ^{Note 1}
Scottish Aviation	Pioneer	Twin Pioneer Ser 3	Small or non-rated aircraft (Leonides 531) ^{Note 1}

Note 1 **This is a rule.** For an aircraft type mentioned in a cell in a row of column 2, the type rating endorsement mentioned in a cell in the same row in column 4 that is annotated “Note 1” (*the endorsement*) has no applicability to Category B2 and Category C. However, an aircraft engineer licence in Category B1.1 or B1.2 (as relevant) must be endorsed with the endorsement before the holder may perform maintenance certifications for the engine of the aircraft.

Table 5

Note These are multi-engine helicopters (turbine powered) requiring type training and individual type rating and turbines that can be fitted to those helicopters. The small or non-rated aircraft ratings (engine ratings) are applicable to non-rated multi-engined and single engined helicopters (turbine powered).

See paragraph 66.A.1 (e) for the meaning of “Various” in column 2.

TC holder	Aircraft type (helicopters)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
AGUSTAWESTLAND	A109E A109N A109S AW109SP		Agusta A109 Series (PWC PW206/207)
	A109 A109A A109AII A109C		Agusta A109 Series (RR Corp 250)
	A109K2		Agusta A109 (Turbomeca Arriel 1)
	A109E A109LUH		Agusta A109 Series (Turbomeca Arrius 2)
	AB139 AW139		Agusta AB139/AW139 (PWC PT6)
	AB 212		Bell 212/Agusta AB212 (PWC PT6)
	BELL HELICOPTER TEXTRON Inc.	212	
214ST			Bell 214ST (GE CT7)
412 412EP 412CF			Bell 412/Agusta AB412 (PWC PT6)
AGUSTA	AB412 AB412 EP		Bell 412/Agusta AB412 (PWC PT6)
BELL HELICOPTER CANADA	222SP		Bell 222 (RR Corp 250)
	222 222B 222U		Bell 222 (Honeywell LTS 101)
	230	Executive/Utility/EMS	Bell 230 (RR Corp 250)

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TC holder	Aircraft type (helicopters)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
BELL HELICOPTER CANADA	427		Bell 427 (PWC PW207D)
	429		Bell 429 (PWC PW207D)
	430		Bell 430 (RR Corp 250)
EUROCOPTER	SA330 F SA330 G SA330 J		Eurocopter SA 330 (Turbomeca Turmo)
	AS332 C AS332 L AS332 C1 AS332 L1		Eurocopter AS 332 (Turbomeca Makila 1A/1A1)
	AS355 E AS355 F AS355 F1 AS355 F2		Eurocopter AS 355 (RR Corp 250)
	AS355 N AS355 NP		Eurocopter AS 355 (Turbomeca Arrius 1)
	SA 365 N SA 365 N1 AS 365 N2	Dauphin	Eurocopter SA 365 N/N1, AS 365 N2 (Turbomeca Arriel 1)
	AS 365 N3	Dauphin	Eurocopter AS 365 N3 (Turbomeca Arriel 2C)
	EC 225 LP		Eurocopter EC 225 (Turbomeca Makila 2A)
	EUROCOPTER DEUTSCHLAND GMBH	BO 105 A BO 105 C/CBS- 4/-5 BO 105 D/DB BO 105 DB-4 BO 105 DBS Series BO 105 LS	

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TC holder	Aircraft type (helicopters)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
EUROCOPTER DEUTSCHLAND GMBH	A-1/A-3 BO 105 S		BO 105 Series (RR Corp 250)
	EC 135 P1 Series EC 135 P2 Series EC 635 P2+		Eurocopter EC 135 (PWC PW206)
	EC 135 T1 Series EC 135 T2 Series EC 635 T1 EC 635 T2 Series		Eurocopter EC 135 (Turbomeca Arrius 2B)
EUROCOPTER DEUTSCHLAND GMBH AND KAWASAKI HEAVY INDUSTRIES	MBB-BK 117 A Series MBB-BK 117 B Series		Eurocopter MBB- BK 117 A/B (Honeywell LTS 101)
	MBB-BK 117 C1		Eurocopter MBB- BK 117 C1 (Turbomeca Arriel 1) ^{Note 2}
	MBB-BK 117 C2	EC145	Eurocopter MBB- BK 117 C2 (Turbomeca Arriel 1) ^{Note 2}
MD HELICOPTERS Inc.	MD900		MD Helicopters MD900 (PWC PW206/207)
SIKORSKY AIRCRAFT	S-58 BT to JT		Sikorsky S-58 (PWC PT6T)
AGUSTA	AS61N AS61NI		Agusta AS61N/Sikorsky S-61N (GE CT58)
SIKORSKY AIRCRAFT	S-61N S-61NM		Agusta AS61N/Sikorsky S-61N (GE CT58)
	S-76A		Sikorsky S-76A (RR Corp 250)
	S-76A	S-76A+	Sikorsky S-76A (Turbomeca Arriel 1)
	S-76A	S-76A++	Sikorsky S-76A (Turbomeca Arriel 1)

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TC holder	Aircraft type (helicopters)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
SIKORSKY AIRCRAFT	S-76B	S-76B	Sikorsky S-76B (PWC PT6)
	S-76C		Sikorsky S-76C (Turbomeca Arriel 1)
	S-76C	S-76C+	Sikorsky S-76C (Turbomeca Arriel 2)
	S-76C	S-76C++	Sikorsky S-76C (Turbomeca Arriel 2)
	S-92A		Sikorsky S-92A (GE CT7-8)
NA	Various		Small or non-rated aircraft (Avco Lycoming T53) <small>Note 1</small>
NA	Various		Small or non-rated aircraft (GE CT58) <small>Note 1</small>
NA	Various		Small or non-rated aircraft (Honeywell TPE331) <small>Note 1</small>
NA	Various		Small or non-rated aircraft (Honeywell LTS 101) <small>Note 1</small>
NA	Various		Small or non-rated aircraft (Lycoming T5508) <small>Note 1</small>
NA	Various		Small or non-rated aircraft (PWC PT6) <small>Note 1</small>
NA	Various	Allison 250	Small or non-rated aircraft (RR Corp 250) <small>Note 1, Note 3</small>

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TC holder	Aircraft type (helicopters)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
NA	Various		Small or non-rated aircraft (Turbomeca Arrius) ^{Note 1}
NA	Various		Small or non-rated aircraft (Turbomeca Arriel) ^{Note 1}
NA	Various		Small or non-rated aircraft (Turbomeca Artouste) ^{Note 1}
NA	Various		Small or non-rated aircraft (Turbomeca Astazou) ^{Note 1}

Note 1 This is a rule. For an aircraft type mentioned in a cell in a row of column 2, the type rating endorsement mentioned in a cell in the same row in column 4 that is annotated “Note 1” (*the endorsement*) has no applicability to Category B2 and Category C. However, an aircraft engineer licence in Category B1.3 must be endorsed with the endorsement before the holder may perform maintenance certifications for the engine of the aircraft.

Note 2 This is a rule. For an aircraft type mentioned in a cell in a row of column 2, the type rating endorsement mentioned in a cell in the same row in column 4 that is annotated “Note 2” (that is the Eurocopter MBB-BK117 engine ratings) also applies for Kawasaki BKK117 helicopter models with the same engine as the Eurocopter MBB-BK117 model.

Note 3 This is a rule. For an aircraft type mentioned in a cell in a row of column 2, the type rating endorsement mentioned in a cell in the same row in column 4 that is annotated “Note 3” (that is the RR Corp 250 engine rating) also applies for the RR250-C300/A1 engine, sometimes referred to as the RR300.

Note to Part 66 Manual of Standards (MOS)

The Part 66 Manual of Standards (MOS) (in force under the *Civil Aviation Safety Regulations 1998*) as shown in this compilation comprises Part 66 Manual of Standards amended as indicated in the Tables below.

Table of Manual of Standards and Amendments

Year and number	Date of registration on FRLI	Date of commencement	Application, saving or transitional provisions
MOS 66	18 February 2011 (see F2011L00280)	27 June 2011	—
Amendment of MOS 66 2011	2 June 2011 (see F2011L00910)	3 June 2011	—
MOS 66 2011 Amendment No. 2	22 June 2011 (see F2011L01170)	27 June 2011	—
MOS 66 2012 Amendment No. 1	10 April 2012 (see F2012L00803)	11 April 2012	—
MOS 66 2012 Amendment No. 2	25 June 2012 (see F2012L01328)	26 June 2012	—
MOS 66 2013 Amendment No. 1	17 July 2013 (see F2013L01399)	18 July 2013	Ss. 4 and 5 (see Table A)
MOS 66 2014 Amendment No. 1	2 May 2014 (see F2014L00492)	3 May 2014	—

Table of Amendments

ad. = added or inserted am. = amended rep. = repealed rs. = repealed and substituted

Provision affected	How affected
Power to make.....	am. MOS 66 2011 No. 1
s. 1..... (Now numbered 66.1A)	rs. MOS 66 2011 No. 2
s. 2 Renumbered s. 66.1B	MOS 66 2011 No. 2
s. 3	rep. MOS 66 2011 No. 2
Schedule heading	rep. MOS 66 2011 No. 2
MOS title.....	rep. MOS 66 2011 No. 2
s. 66.5.....	am. MOS 66 2011 No. 2, MOS 66 2012 No. 2, MOS 66 2013 No. 1, MOS 66 2014 No. 1
s. 66.A.1	am. MOS 66 2014 No. 1
s. 66.A.20	am. MOS 66 2011 No. 2, MOS 66 2012 No. 1, MOS 66 2012 No. 2, MOS 66 2013 No. 1, MOS 66 2014 No. 1
s. 66.A.21	ad. MOS 66 2014 No. 1
s. 66.A.23	am. MOS 66 2014 No. 1
s. 66.A.25	am. MOS 66 2011 No. 2, MOS 66 2012 No. 2, MOS 66 2013 No. 1, MOS 66 2014 No. 1
s. 66.A.30	am. MOS 66 2012 No. 2, MOS 66 2013 No. 1, MOS 66 2014 No. 1
s. 66.A.45	am. MOS 66 2011 No. 2, MOS 66 2012 No. 2, MOS 66 2013 No. 1, MOS 66 2014 No. 1
s. 66.A.50	am. MOS 66 2012 No. 2, MOS 66 2013 No. 1

Table of Amendments

ad. = added or inserted am. = amended rep. = repealed rs. = repealed and substituted

Provision affected	How affected
s. 66.A.55	am. MOS 66 2012 No. 2, MOS 66 2013 No. 1, MOS 66 2014 No. 1
s. 66.A.70	rs. MOS 66 2012 No. 2, MOS 66 2013 No. 1
Appendix I.....	am. MOS 66 2011 No. 2, MOS 66 2012 No. 2, MOS 66 2013 No. 1
Appendix II.....	am. MOS 66 2011 No. 2, MOS 66 2012 No. 2
Appendix III.....	am. MOS 66 2011 No. 2, MOS 66 2012 No. 2, MOS 66 2013 No. 1
Appendix IV	am. MOS 66 2012 No. 1, MOS 66 2013 No. 1, MOS 66 2014 No. 1
Appendix V	rs. MOS 66 2011 No. 2
Appendix VI	rs. MOS 66 2011 No. 2
Appendix VII	am. MOS 66 2011 No. 2
Appendix VIII	ad. MOS 66 2013 No. 1
Appendix IX	ad. MOS 66 2014 No. 1

Table A Application, saving or transitional provisions

Part 66 Manual of Standards Amendment Instrument 2013 (No. 1)

4 Interpretation

A reference in Schedule 1 to Appendix IV, followed by a reference to a unit of competency, is a reference to the row in Appendix IV that refers to that unit in the first column (Competency units required).

Example: Appendix IV (MEA211C).

5 Transitional

- (1) If an applicant to whom paragraph 66.A.25 (a) or 66.A.30 (b) of the MOS refers was entitled to the issue of a unit of competency (the **unit**) immediately before the commencement day, and the unit is replaced on the commencement day by a subsequent version of that unit of competency, the applicant is entitled to the new unit of competency.
- (2) In subsection (1):
commencement day means the day on which this instrument comes into effect.