



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*.

This compilation was prepared on 22 December 2023 taking into account amendments up to *Part 66 Manual of Standards and Part 147 Manual of Standards Amendment Instrument 2023 (No. 1)*. It is a compilation of the Part 66 Manual of Standards (MOS), as amended and in force on 5 December 2023.

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Part 1 Preliminary

66.1A Name of instrument

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

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:

AMC/GM for CASR Part 66 means the CASA publication titled *Acceptable Means of Compliance (AMC) and Guidance Material (GM) CASR Part 66*, as existing from time to time.

AME licence means an aircraft maintenance engineer (**AME**) licence under regulation 31 of CAR 1988 as in force immediately before 27 June 2011.

APU means auxiliary power unit.

ATA means Air Transport Association of America.

Note ATA is a publication referencing standard, commonly used for all commercial aircraft documentation.

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.

avionic system means an aircraft system, as specified in Table 1 in section 66.A.20, which transfers, processes, displays or stores analogue or digital data, using data lines, data buses, coaxial cables, or wireless or other data transmission media, and includes the system's components and connectors.

Note The following are examples of avionic systems:

1. auto flight;
2. communication, radar 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 flight control systems (ATA27));
10. fibre-optic control systems.

CAR 1988, or **CAR**, means the *Civil Aviation Regulations 1988*.

CASR 1998, or **CASR**, means the *Civil Aviation Safety Regulations 1998*.

CAO means Civil Aviation Order.

category B1 modular licence means a category B1 licence granted:

- (a) under regulation 66.026 of CASR subject to the exclusion of at least 1 aircraft system or subset of an aircraft system; and
- (b) after the commencement of the *Part 66 Manual of Standards and Part 147 Manual of Standards Amendment Instrument 2023 (No. 1)*.

category B2 modular licence means a category B2 licence granted:

- (a) under regulation 66.026 of CASR subject to the exclusion of at least 1 aircraft system or subset of an aircraft system; and
- (b) after the commencement of the *Part 66 Manual of Standards and Part 147 Manual of Standards Amendment Instrument 2023 (No. 1)*.

cell, when mentioned for a table, means an individual, undivided unit (regardless of its size) into which a column of the table is subdivided.

COA holder means a person who holds a certificate of approval under regulation 30 of CAR 1988.

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 in section 66.A.20. 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.

large aircraft has the same meaning as in the CASR Dictionary.

lighting systems are part of the electrical system.

Logbook means the *CASA Part 66 Basic Practical Experience Logbook*, as it exists from time to time.

MEA means manufacturing and engineering assessment.

Note MEA is part of a code assigned to each nationally endorsed Australian training package to identify the particular industry the training package covers.

modular licence means a category B1 modular licence or a category B2 modular licence.

MTO means maintenance training organisation under Part 147 of CASR 1998.

non-rated aircraft has the same meaning as in paragraph (b) of the definition of **aircraft type** in regulation 66.010 of CASR 1998.

Part 66 licence means an aircraft engineer licence issued under Part 66 of CASR 1998.

Part 66 rating means a rating on an aircraft engineer licence, issued under Part 66 of CASR 1998.

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*.

recognition of prior learning (RPL) for licence category training, aircraft type training, category A aircraft task training and foreign or military qualifications under Part 66 of CASR 1998:

- (a) has the same meaning given by section 147.A.07 of the Part 147 Manual of Standards (as amended); and
- (b) may be prescribed by CASA, a Part 147 Maintenance Training Organisation (**MTO**) or a Part 145 Approved Maintenance Organisation (**AMO**).

regulation 31 means paragraphs 31 (4) (b), (c) and (e) of CAR 1988, as in force immediately before 27 June 2011, and includes:

1. regulation 31C of CAR 1988, as in force immediately before 27 June 2011; and
2. each of the following CAOs, as in force immediately before 27 June 2011:
 - (i) CAO 100.91;
 - (ii) CAO 100.92;
 - (iii) CAO 100.93;
 - (iv) CAO 100.94;
 - (v) CAO 100.95; and
3. each of the following Specification instruments for an associated CAO, as in force or existing immediately before 27 June 2015:
 - (i) CASA 202/14 for CAO 100.91;
 - (ii) CASA 203/14 for CAO 100.92;
 - (iii) CASA 204/14 for CAO 100.93;
 - (iv) CASA 205/14 for CAO 100.94;
 - (v) CASA 206/14 for CAO 100.95; and

4. each of the following Airworthiness Advisory Circulars (*AAC*) with which its associated CAO was expressed to be read, as it existed immediately before 27 June 2015:
 - (i) AAC Part 9-91 for CAO 100.91;
 - (ii) AAC Part 9-92 for CAO 100.92;
 - (iii) AAC Part 9-93 for CAO 100.93;
 - (iv) AAC part 9-94 for CAO 100.94;
 - (v) AAC Part 9-95 for CAO 100.95.

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.

small aircraft has the same meaning as in the CASR Dictionary.

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.

this MOS means the Part 66 Manual of Standards.

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.

66.6 Meaning of **hold**, or **obtain**, a unit of competency

A person is taken to hold, or have obtained, a unit of competency under this MOS if an MTO:

1. assesses the person as competent in the unit of competency; and
2. gives the person a statement of attainment, or similar document, stating the person holds the unit of competency.

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.

Part 2 Aircraft engineer licences for type-rated aircraft etc.

66.A.4 Certain type-rated aircraft types and endorsements etc.

- (a) Subject to paragraph (d), 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.
- (b) Subject to paragraph (d), 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.
- (c) Each mention of “Various” in a cell in column 2 of a table in Appendix IX is to be read as “A small/non-rated aircraft with the engine mentioned in the corresponding cell in column 4.”.
- (d) 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.

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 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 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 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 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 is 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 avionic systems that can be conducted as a simple test;

- (F) as a daily, or manufacturer's equivalent, inspection, or as an extended diversion time operation (EDTO) pre-flight inspection;
 - (G) scheduled routine inspection of fibre-reinforced plastic composite structures — but not including an inspection in which specialised equipment is used, or in which repairs to the composite structure are carried out;
 - (H) inspection using an NDT method — but only if limited to liquid penetrant inspection using aerosol-packed materials; and
- (iii) subject to subparagraph 4A, the maintenance is not of an aircraft system or subset that is excluded from the licence.
- 4A. For sub-sub-subparagraph 66.A.20 (a) 4. (ii) (F), despite any exclusions annotated on a licence, a daily or manufacturers' equivalent inspection also includes:
- (i) check of the condition and security of attachment of wiring, plumbing, parts and appliances; and
 - (ii) maintenance of instrument, or electrical, parts and appliances forming part of the powerplant, mechanical or structural system, limited to:
 - (A) external mechanical adjustments to facilitate correct operation of powerplant or mechanical or structural systems; and
 - (B) replacement of instrument, or electrical, parts and appliances, connected by simple twist or terminal connectors — excluding instrument, or electrical parts and appliances, where maintenance involves functional tests and adjustments requiring the use of external specialised test equipment.
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;
- 5A. A person who:
- (i) on or before 30 June 2021, satisfies the requirements of each of paragraphs 66.A.25 (i), 66.A.30 (f), and 66.A.45 (j) of this MOS; and
 - (ii) but for the repeal of regulation 31 would, thereby, have qualified for the issue of an aircraft maintenance engineer licence with the former engine category Group 1 or Group 2 rating, or the former airframe category Group 1, 2 or 19 rating; and
 - (iii) on this basis, is issued with a Category B1 licence;

may perform maintenance certifications and issue certificates of release to service for the following maintenance:
 - (iv) all electrical maintenance on an aircraft fitted with a single generator and approved for V.F.R. operations only;
 - (v) all instrument system maintenance for aircraft general instruments (but excluding RMI, inertial navigation and multi-axis autopilots) on an aircraft approved for V.F.R. operations only;
 - (vi) periodic inspections for aircraft radio systems on an aircraft approved for V.F.R. operations only.

Note 30 June 2021 is the date by which a person must satisfy the requirements mentioned in paragraphs 66.A.25 (i), 66.A.30 (f) and 66.A.45 (j) of this MOS to qualify for a Category B1 or B2 licence (see subregulation 202.345 (1A) of CASR 1998).

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) to replace an avionic line replaceable unit that only requires simple tests to prove its serviceability, unless the licence is specifically subject to an avionics LRU exclusion; or
 - (E) as a daily, or manufacturer's equivalent, inspection, or as an extended diversion time operation (EDTO) pre-flight inspection; and
 - (iii) subject to subparagraph 6A, the maintenance was not of an aircraft system or subset that is excluded from the licence.
- 6A. For sub-sub-subparagraph 66.A.20 (a) 6. (ii) (E), despite any exclusions annotated on a licence, a daily or manufacturers' equivalent inspection also includes:
 - (i) check of the condition and security of attachment of wiring, plumbing, parts and appliances; and
 - (ii) maintenance of instrument, or electrical, parts and appliances forming part of the powerplant, mechanical or structural system, limited to:
 - (A) external mechanical adjustments to facilitate correct operation of powerplant or mechanical or structural systems; and
 - (B) replacement of instrument, or electrical, parts and appliances, connected by simple twist or terminal connectors — excluding instrument, or electrical parts and appliances, where maintenance involves functional tests and adjustments requiring the use of external specialised test equipment.
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-by-wire (ATA27)	Avionic (B2)	For a Category B2 licence — limited to the avionic subsystem of the flight control system.
Fuel systems (ATA28)	Mechanical (B1)	

Aircraft system (and ATA chapter reference)	Designation of system	Conditions or limitations
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)	
Integrated modular avionics (ATA42)	Avionic (B2)	
Cabin systems (ATA44)	Avionic (B2)	
Central maintenance system (ATA45)	Avionic (B2)	

Aircraft system (and ATA chapter reference)	Designation of system	Conditions or limitations
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)	Structures — general, but excluding wooden structures and fabric surfaces unless: <ul style="list-style-type: none"> (a) for wooden structures — the holder has obtained the relevant optional units of competency mentioned in section 66.A.25 of this MOS; or <i>Note</i> These optional units of competency are marked W in Appendix IV. <ul style="list-style-type: none"> (b) for fabric surfaces — the holder 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 Z in Appendix IV. Structures — general <ul style="list-style-type: none"> (c) for a category B2 licence — closing of cowlings and refitment of quick access inspection panels.
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 (ATA61)	Powerplant (B1)	For a Category B1 licence, only if the holder has obtained the relevant optional units of

Aircraft system (and ATA chapter reference)	Designation of system	Conditions or limitations
		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, as in force immediately before	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	Approved V.F.R. aircraft	NA	

Person	Maintenance	Aircraft	Limitations	Condition
15 December 2015, applied (the <i>old licence</i>)	instruments (excluding RMI, inertial navigation and multi-axis autopilots) 2. Periodic inspections for aircraft radio systems	Approved V.F.R. aircraft		
B. A person who, in accordance with subregulation 202.343 (2) or 202.344 (2) of CASR 1998, as in force immediately before 15 December 2015, was 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>)	All electrical maintenance 1. All instrument system maintenance for aircraft general instruments (excluding RMI, inertial navigation and multi-axis autopilots) 2. Periodic inspections for aircraft radio systems	Approved V.F.R. aircraft fitted with a single generator	NA	The Proviso

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 (as an AME) 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 and retaining evidence of carrying out the maintenance; or
 2. the holder obtains a report from an MTO authorised for category training or aircraft type 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 — the assessment must include theory examination and practical assessment in a sampling of the range of maintenance activities that the holder is authorised by their licence and ratings to carry out; 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; or
 3. the holder is assessed by an AMO, or an organisation holding a certificate of approval to carry out maintenance activities issued under regulation 30 of CAR 1988, to determine that he or she continues to have the knowledge and skills necessary for the holder of an aircraft engineer licence with the ratings on the licence, and the assessment follows a process for requalifying individuals based on Australian competency-based training (CBT) standards and outlined in:
 - (i) for the AMO — the AMO’s exposition; or
 - (ii) for the organisation holding a certificate of approval under regulation 30 of CAR 1988 — the organisation’s system of quality control.
- (c) For paragraph 66.120 (2) (c) of CASR 1998, the requalification requirement for a Category C licence holder is that the 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 section sets out the basic knowledge and competency 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 other than a modular licence; or
 3. if the licence is a modular licence, the removal of at least 1 exclusion from the licence in order to obtain a category or subcategory on the licence, or an extension of licence privileges.

- (b) If the application is in relation to a Category A licence, or Category B1 or Category B2 licence other than a modular licence, or for the addition of a subcategory to a licence, the applicant must demonstrate, by examination conducted by CASA or an MTO:
 1. knowledge of each module, applicable for the category or subcategory, in accordance with Part 2 of Appendix I; and
 2. the level of knowledge for each sub-module, applicable for the category or subcategory, in accordance with Part 3 of Appendix I.
- (ba) If the application is in relation to a modular licence, or for the removal of at least 1 exclusion in order to obtain a category or subcategory on, or extension of privileges of, a modular licence, the applicant must demonstrate, by examination conducted by CASA or an MTO:
 1. knowledge of each module or sub-module, applicable for the category or subcategory, and any extension, in accordance with Part 2A of Appendix I; and
 2. the level of knowledge for each sub-module, applicable for the category or subcategory, in accordance with Part 3 of Appendix I.
- (c) The level of knowledge mentioned in subparagraphs (b) 2. and (ba) 2. must be demonstrated to the examination standard mentioned in Appendix II.
- (d) Subject to paragraph (db), paragraph (da) applies if:
 1. the applicant does not hold a Category B1 or B2 licence; and
 2. the application is for a Category C licence.
- (da) The applicant must demonstrate, by examination conducted by CASA or an MTO, the same matters mentioned in paragraph (b) and to the same examination standard mentioned in paragraph (c), as if the application is in relation to a Category B1 or B2 licence.
- (db) Paragraph (da) does not apply if the applicant holds an academic degree mentioned in subparagraph (h) 1.
- (e) The knowledge mentioned in paragraphs (b) and (ba) may be gained by:
 1. the training of the applicant by an MTO; or
 2. self-study by the applicant.
- (ea) The applicant must have undertaken the training or self-study mentioned in paragraph (e), and passed the examinations for the modules mentioned in paragraph (b), during the 10-year period before the date of the application.
- (eb) Subject to paragraph (ec), if the applicant was trained by an MTO, the applicant must hold each unit of competency listed and coded in Appendix IV that is marked “X”, or stated to be its alternative, for the relevant category or subcategory of aircraft engineer licence.
- (ec) If the application is for a modular licence and the applicant was trained by an MTO, the applicant must hold each unit of competency relevant to the modular licence, or stated to be its alternative, as approved by CASA in the MTO’s exposition, as existing from time to time.

Note CASA will publish in the AMC/GM for CASR Part 66 a list of the units of competency, and any alternative units of competency, that it has approved in an MTO’s exposition, immediately after their approval. The AMC/GM for CASR Part 66 is freely available on the CASA website at www.casa.gov.au.

- (f) Subject to paragraph (fa), 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 the privilege that includes wooden structures or fabric surfaces or propellers, who was trained by an MTO, 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.
- (fa) If an applicant who was trained by an MTO applies for the privilege that includes wooden structures or fabric surfaces or propellers, and the application relates to a subcategory B1.1 or B1.2 modular licence, the applicant must hold, in addition to the units of competency required under this section for the relevant subcategory of the modular licence, each relevant optional unit of competency, as approved by CASA in the MTO's exposition, 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 academic qualifications required to satisfy the basic knowledge requirements for grant of a category C licence are:
 1. an academic degree (as a minimum, a 3 year bachelor of technology degree) in an aeronautical, mechanical, structural, electrical, electronic or avionics discipline obtained from a university or other higher educational institution recognised by CASA.

Use of CAR 31 to obtain the equivalent of an AME licence on or after 27 June 2015

- (i) Despite anything in paragraphs (b) to (g) of this section, for subregulation 202.345 (1) of CASR 1998, a person who, if regulation 31 were still in force, would meet the requirements of regulation 31 for the issue of an AME licence in a category mentioned in paragraph (j) is taken to meet the requirements of paragraphs (b) to (g) for the issue of the Part 66 licence that is equivalent to the licence that would have been issued for the category if regulation 31 were still in force.
- (j) The licence categories mentioned in paragraph (i) are as follows:
 1. a licence in category airframes;
 2. a licence in category engines;
 3. a licence in category radio;
 4. a licence in category electrical;
 5. a licence in category instruments.

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, or subcategory B1.2 or B1.4, licence:

- (i) 3 years' practical maintenance experience on operating aircraft, if the applicant has not undertaken any relevant technical training; or
Note See AMC/GM for CASR Part 66 for information about what is relevant technical training for this sub-subparagraph.
 - (ii) 2 years' practical maintenance experience on operating aircraft, and completion of relevant training as a skilled worker in a technical trade; or
Note See AMC/GM for CASR Part 66 for information about what is relevant training for this sub-subparagraph.
 - (iii) 1 year's practical maintenance experience on operating aircraft, and completion of a category training course conducted by an MTO.
2. for a Category B2, or subcategory B1.1 or B1.3, licence:
- (i) 5 years' practical maintenance experience on operating aircraft, if the applicant has not undertaken any relevant technical training; or
Note See AMC/GM for CASR Part 66 for information about what is relevant technical training for this sub-subparagraph.
 - (ii) 3 years' practical maintenance experience on operating aircraft, and completion of relevant training as a skilled worker in a technical trade; or
Note See AMC/GM for CASR Part 66 for information about what is relevant training for this sub-subparagraph.
 - (iii) 2 years' practical maintenance experience on operating aircraft, and completion of a category training course conducted by an MTO.
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 mentioned in subparagraph 66.A.25 (h) 1. — 3 years' experience working in a civil aircraft maintenance environment on a representative selection of tasks directly associated with aircraft maintenance, including at least 6 months of observation of base maintenance tasks.
Note See AMC/GM for CASR Part 66 for information about what is a representative selection of tasks for this sub-subparagraph.
4. for an initial modular licence:
- (i) 2 years' practical maintenance experience on operating aircraft; and
 - (ii) completion of category training, conducted by an MTO, that is relevant to the initial modular licence, or completion of the knowledge applicable for the category or subcategory of licence, in accordance with Part 2A of Appendix I, via self-study, in which case evidence of the practical maintenance experience must be recorded in the Logbook.

Note 1 Subparagraphs 1. to 3. do not apply to applications for modular licences.

Note 2 The Logbook and the *Part 66 Basic Practical Experience Logbook User Guide (User Guide)* are available on the CASA website at www.casa.gov.au. As at commencement of this subparagraph:

- the Logbook was available at: [casa.gov.au/sites/default/files/2021-09/part-66-basic-practical-experience-logbook.pdf](https://www.casa.gov.au/sites/default/files/2021-09/part-66-basic-practical-experience-logbook.pdf); and
 - the User Guide was available at: <http://www.casa.gov.au/sites/default/files/2021-09/part-66-basic-practical-experience-logbook-user-guide.pdf>.
- (b) Subject to paragraph (d), if a person who holds an aircraft engineer licence (other than a modular licence) applies to CASA to add a category (other than Category C), or subcategory, to the licence, the person must have gained the minimum period of practical maintenance experience, for the category or subcategory, on operating aircraft in accordance with Table 3.

Table 3

Practical maintenance experience requirements for adding a category, or subcategory, to an aircraft engineer licence

To	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
From									
A1	–	6 months	6 months	6 months	2 years	6 months	2 years	1 year	2 years
A2	6 months	–	6 months	6 months	2 years	6 months	2 years	1 year	2 years
A3	6 months	6 months	–	6 months	2 years	1 year	2 years	6 months	2 years
A4	6 months	6 months	6 months	–	2 years	1 year	2 years	6 months	2 years
B1.1	None	6 months	6 months	6 months	–	6 months	6 months	6 months	1 year
B1.2	6 months	None	6 months	6 months	2 years	–	2 years	6 months	2 years
B1.3	6 months	6 months	None	6 months	6 months	6 months	–	6 months	1 year
B1.4	6 months	6 months	6 months	None	2 years	6 months	2 years	–	2 years
B2	6 months	6 months	6 months	6 months	1 year	1 year	1 year	1 year	–

- (ba) For regulation 11.068 of CASR, it is a condition of an aircraft engineer licence that, if the licence is a modular licence and the licence holder applies to CASA for removal of at least 1 exclusion of an aircraft system or subset from the licence in order to obtain a category or subcategory on the licence, or an extension of licence privileges, the person must have, in accordance with Table 3A:
1. gained the minimum period of practical maintenance experience, applicable for the category or subcategory, or extension, on operating aircraft; or
 2. if the applicant is completing the knowledge applicable for the category or subcategory via self-study — completed the task list if no minimum period of practical maintenance experience, applicable for the category or subcategory, or extension, is specified.

Note As at the commencement of this paragraph, CASA must also receive evidence from an MTO that the holder has successfully completed the training and assessment that is required for

the aircraft system or subset under section 66.A.25 for the exclusion to be removed — see section 66.072 of CASR.

Table 3A

Practical maintenance experience requirements to obtain a category or subcategory on a modular licence

To	B1.1, B1.2 Aeroplane (Airframe)	B1.3, B1.4 Helicopter (Airframe)	B1.1, B1.3 Power plant (Turbine)	B1.2, B1.4 Power plant (Piston)	B1 Propeller	B1 Electrical and Instrument systems Extension	B2 Electrical systems	B2 Instrument systems	B2 Radio systems
From									
B1.1, B1.2 Aeroplane (Airframe)	—	Task list (see Note 1)	1 year	1 year (see Note 3)	—	1 year (see Note 3)	1 year	1 year	1 year
B1.3, B1.4 Helicopter (Airframe)	Task List (see Note 1)	—	1 year	1 year (see Note 3)	—	1 year (see Note 3)	1 year	1 year	1 year
B1.1, B1.3 Power plant (Turbine)	1 year	1 year	—	task list (see Note 2)	task list (see Note 4)	1 year	1 year	1 year	1 year
B1.2, B1.4 Powerplant (Piston)	1 year	1 year	task list (see Note 2)	—	—	1 year	1 year	1 year	1 year
B2 Electrical systems	1 year	1 year	1 year	1 year	—	—	—	1 year	1 year
B2 Instrument systems	1 year	1 year	1 year	1 year	—	—	1 year	—	1 year
B2 Radio systems	1 year	1 year	1 year	1 year	—	—	1 year	1 year	—

In Table 3A:

task list means the sections of the Logbook that set out maintenance tasks relevant to the aircraft system or subset for which the category or subcategory is to be obtained.

Note 1 This is a rule. If one airframe licence is held, the addition of the second airframe licence only requires completion of the task list.

Note 2 This is a rule. If one engine licence is held, addition of the second engine licence only requires completion of the task list.

Note 3 The one-year period of electrical and instrument systems experience and piston engine experience may be accumulated concurrently.

Note 4 This is a rule. **Propeller** is an option for a B1.1 licence only. Completion of the task list is required for maintenance of turbopropeller aeroplanes.

- (c) The experience mentioned in paragraphs (b) and (ba) must have been gained from a representative cross-section of maintenance tasks on operating aircraft relevant to the category or subcategory.

Note See AMC/GM for CASR Part 66 for information about what is a representative cross-section of maintenance tasks for this paragraph.

- (d) The minimum period of experience mentioned in paragraph (b) is reduced by 50% if the applicant has completed a training course, relevant to the category or subcategory, conducted by an MTO.
- (e) At least 1 year of the experience mentioned in paragraph (a) must be recent experience gained on aircraft relevant to the category, or subcategory, of the initial licence applied for.

Note See AMC/GM for CASR Part 66 for information about what is recent experience for this paragraph.

- (ea) Subject to paragraph (d):
 1. at least 3 months of the experience mentioned in paragraph (b) must be recent experience gained on aircraft relevant to the category, or subcategory, of licence sought to be added; and
 2. at least 3 months of the experience mentioned in paragraph (ba) must be recent experience gained on aircraft relevant to the category or subcategory, or extension of privileges, of licence sought to be obtained.

Note See AMC/GM for CASR Part 66 for information about what is recent experience for this paragraph.

- (eb) Aircraft maintenance experience gained outside a civil aircraft maintenance environment is taken to be practical maintenance experience for paragraph (a) if an MTO certifies, in writing, to CASA that:
 1. the experience gained is equivalent to the practical maintenance experience; and
 2. the applicant has adequate additional practical maintenance experience on civil aircraft to ensure an adequate understanding of the civil aircraft maintenance environment.

- (ec) The experience mentioned in:
 1. subparagraphs (a) 1., 2. or 3., or paragraph (b) must have been gained by the applicant during the 10-year period before the date of the application for the licence or the addition of the category, or subcategory, to the licence; and
 2. subparagraph (a) 4. or paragraph (ba) must have been gained during the 10-year period before the date of application for the initial modular licence or the removal of an exclusion to obtain the category or subcategory on the modular licence, or extension of privileges.

Use of CAR 31 to obtain the equivalent of an AME licence on or after 27 June 2015

- (f) Despite anything in paragraphs (a) to (ec) of this section, for subregulation 202.345 (1) of CASR 1998, a person who, if regulation 31 were still in force, would meet the requirements of regulation 31 for the issue of an AME licence in a category mentioned in paragraph (g) is taken to meet the requirements of paragraphs (a) to (ec) for the issue of the Part 66 licence that is equivalent to the licence that would have been issued for the category if regulation 31 were still in force.
- (g) The licence categories mentioned in paragraph (f) are as follows:
 1. a licence in category airframes;

2. a licence in category engines;
3. a licence in category radio;
4. a licence in category electrical;
5. a licence in category instruments.

66.A.35 Exclusions to which a category B1 or category B2 licence may be subject

For paragraph 66.026 (1) (d) of CASR:

1. an aircraft system or subset mentioned in column 1 of an item in the Table in Appendix VII, with the related exclusion identifier mentioned in column 2 and title mentioned in column 3 of the item, is specified as a system or subset that may be excluded from the scope of a category B1 licence if an 'X' is included in column 4 of the item; and
2. an aircraft system or subset mentioned in column 1 of an item in the Table in Appendix VII, with the related exclusion identifier mentioned in column 2 and title mentioned in column 3 of the item, is specified as a system or subset that may be excluded from the scope of a category B2 licence if an 'X' is included in column 5 of the item.

Note This section applies to a modular licence as a modular licence is a kind of category B1 or category B2 licence.

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-rated aircraft when the licence is endorsed with the appropriate category or subcategory for the maintenance required for that non-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.
 3. if each of the following applies:
 - (i) the applicant is a category B1 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 B1 engine (powerplant) interface 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 subparagraphs (c) 2 and (c) 3, a **large aircraft type** means, in accordance with paragraphs (a) and (b) of the definition of **aircraft type** in regulation 66.010 of CASR 1998:

- (a) a particular type, or type and model, of large aircraft with a particular type of aircraft engine; or
 - (b) a large aircraft with a particular type of aircraft engine.
- (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 mentioned in subparagraph 66.A.25 (h) 1., the first aircraft type theoretical training must 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, or a COA holder in accordance with Civil Aviation Order 104.0 (Certificates of approval — application, grant and conditions) (a **CAR 30 organisation**), 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 practical maintenance experience requirements specified in paragraph 66.A.30 (b).

Use of CAR 31 to obtain the equivalent of a Group rating on an AME licence on or after 27 June 2015

- (j) Despite anything in paragraphs (a) to (i) of this section, for subregulation 202.345 (1) of CASR 1998, a person who, if regulation 31 were still in force, would meet the requirements of regulation 31 for the issue of a Group rating for a category of AME licence mentioned in paragraph (k) is taken to meet the requirements of paragraphs (a) to (i) of this section for the issue of the Part 66 rating that is equivalent to the Group rating that would have been issued for the category if regulation 31 were still in force.
- (k) The licence categories and Group ratings mentioned in paragraph (j) are as follows:
 - 1. a licence in category airframes, with a Group 1, 2, 3, 4, 5, 6, 10 or 19 rating, provided that, for Groups 1, 2 and 19, the airframe is not a type rated aircraft type;
 - 2. a licence in category engines, with a Group 1, 2, 3, 21 or 22 rating, provided that, for Group 21 and Group 22, the engine is fitted to a small aircraft;
Note **Small aircraft** is defined in Part 3 of the Dictionary in CASR 1998. Part 3 contains definitions for Part 66 of CASR 1998. Under paragraph 66.5 (a) of this MOS, words and phrases generally have the same meaning as in Part 66.
 - 3. a licence in category radio, with a Group 1, 2, 3, 4, 5, 6, 7, 9, 10 or 12 rating, provided that the airframe is not a type rated aircraft type;
 - 4. a licence in category electrical, with a Group 1 or 2 rating, provided that the airframe is not a type rated aircraft type;
 - 5. a licence in category instruments, with a Group 1, 3, 5, 7, 8, 9 or 10 rating, provided that the airframe is not a type rated aircraft type.

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:
 1. may only be conducted and managed by a maintenance organisation, or a maintenance training organisation, approved by CASA to undertake such training activities; and
 2. must be supported by a detailed syllabus of OJT content which includes provision for completion of the OJT to be recorded in detailed worksheets or logbooks; and
 3. must be assessed and approved by CASA.

Note CASA's assessment and approval are guided by Appendix II of AMC/GM for CASR Part 66 and the CASA publication titled *Advisory Circular AC 66-07 – Practical training options for aircraft type training and recording of recent work experience*, as existing from time to time.
- (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.56 Use of CAR 31 for removal of exclusion from a Part 66 licence on or after 27 June 2015

- (a) This section applies to a person (the **Part 66 licence holder**) who holds a Part 66 licence that is subject to the exclusion of a particular aircraft system or a subset of an aircraft system (a **particular exclusion**).

Note **Part 66 licence holder** includes a person who holds a Part 66 licence subject to a particular exclusion, as a result of the operation of paragraphs 66.A.25 (i) and 66.A.30 (f) of this MOS.

- (b) If the Part 66 licence holder would meet the requirements of regulation 31 for the issue of a category of AME licence mentioned in paragraph 66.A.25 (i) or 66.A.30 (f) without a particular exclusion, were regulation 31 still in force, then the holder is taken to meet the requirements of sections 66.A.25 and 66.A.30 of this MOS for the issue of the Part 66 licence without the particular exclusion.

66.A.57 Use of CAR 31 for removal of exclusion from a Part 66 rating on or after 27 June 2015

- (a) This section applies to a person (the **Part 66 rating holder**) who holds a Part 66 rating that is subject to the exclusion of a particular aircraft system or a subset of an aircraft system (a **particular exclusion**).

Note **Part 66 rating holder** includes a person who holds a Part 66 rating subject to a particular exclusion, as a result of the operation of paragraph 66.A.45 (j) of this MOS.

- (b) If the Part 66 rating holder would meet the requirements of regulation 31 for the issue of a Group rating on a category of AME licence without the particular exclusion, were regulation 31 still in force, then the holder is taken to meet the requirements of section 66.A.45 of this MOS for the issue of the Part 66 rating without the particular exclusion.

66.A.58 Exemptions to facilitate the operation of certain provisions

- (a) A person to whom paragraph 66.A.25 (i), paragraph 66.A.30 (f) or section 66.A.56 of this MOS applies is exempt from subregulation 66.072 (3) of CASR 1998.
- (b) A person to whom paragraph 66.A.45 (j) or section 66.A.57 of this MOS applies is exempt from each of the following provisions of CASR 1998:
 1. paragraph 66.080 (1) (b);
 2. subregulations 66.080 (2) and (3);
 3. paragraphs 66.095 (1) (c) and (2) (d);
 4. regulation 66.100; and
 5. paragraph 66.110 (2) (a).
- (c) Each exemption mentioned in paragraphs (a) and (b) expires at the end of 30 June 2021.

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 a Part 66 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 (a) (ii) of CASR 1998, using a training and assessment regime provided in accordance with paragraph 145.025 (3) (c) of CASR 1998.
- (d) For subregulation 66.095 (2), and Subpart 202.CG, of CASR, the exclusion of an aircraft system or subset of an aircraft system mentioned in column 1 of an item in the Table in Appendix VII, with the related exclusion identifier mentioned in column 2 and title mentioned in column 3 of the item, is specified as an exclusion on a type rating for which an AMO may be authorised to provide training, assessment and authorisations.
- (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).

Part 3 Transitional provisions

66.A.100 Transitional provision for *Part 66 Manual of Standards Amendment Instrument 2018 (No. 1)*

- (1) If:
 - (a) immediately before the commencement day, a person held a unit of competency (the *previous unit*) mentioned in the table in Appendix IV of this MOS; and
 - (b) the relevant instrument replaces the previous unit with a new version of the unit of competency (the *new unit*);

the person is taken to hold the new unit.

- (2) In this section:

commencement day means the day on which the relevant instrument commences.

relevant instrument means the *Part 66 Manual of Standards Amendment Instrument 2018 (No. 1)*.

Appendix I

Basic knowledge requirements

Part 1 — Levels of knowledge for Category A, B1, B2 or C licence

The basic knowledge requirements for a Category A, B1 or B2 licence, or subcategory to an aircraft engineer licence, are indicated by the level of knowledge (1, 2 or 3), for each applicable sub-module, under Part 3 of this appendix. The basic knowledge requirements for a Category C licence are the same as that for a Category B1 or B2 licence. The levels of knowledge are defined as follows:

Level 1

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

Objectives:

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

Level 2

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

Objectives:

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

Level 3

A detailed knowledge of the theoretical and practical aspects of the subject, and a capacity to combine and apply the separate elements of knowledge in a logical and comprehensive manner, such that the following objectives are met.

Objectives:

- 1 The applicant must know the theory of the subject and interrelationships with other subjects.
- 2 The applicant must be able to give a detailed description of the subject using theoretical fundamentals and specific examples.
- 3 The applicant must understand and be able to use mathematical formulae related to the subject.

- 4 The applicant must be able to read, understand and prepare sketches, simple drawings and schematics describing the subject.
- 5 The applicant must be able to apply his or her knowledge in a practical manner using manufacturer's instructions.
- 6 The applicant must be able to interpret results from various sources and measurements and apply corrective action where appropriate.

Part 2 — Knowledge module requirements

Qualification on basic subjects for each category or subcategory of 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 Avionics
	Turbine engine(s)	Piston engine(s)	Turbine engine(s)	Piston engine(s)	
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
11A Turbine aeroplane aerodynamics, structures and systems	X				
11B Piston aeroplane aerodynamics, structures and systems		X			
12 Helicopter aerodynamics, structures and systems			X	X	
13 Aircraft aerodynamics, structures and systems					X
14 Propulsion					X
15 Gas turbine engine	X		X		
16 Piston engine		X		X	

Subject modules	A or B1 aeroplane with:		A or B1 helicopter with:		B2
	Turbine engine(s)	Piston engine(s)	Turbine engine(s)	Piston engine(s)	Avionics
17 Propeller	X	X			

Part 2A — Knowledge module requirements for modular licences

Qualification on basic subjects for each category B1 modular licence or category B2 modular licence, including with any extension of privileges, must be in accordance with the following table. Applicable subject modules for each modular licence and any extension are indicated by an X.

Subject modules/sub-modules		Category B1 modular licences				Extension of category B1 modular licence	Category B2 modular licences		
		B1.1, B1.2 Aeroplane (Airframe)	B1.3, B1.4 Helicopter (Airframe)	B1.2, B1.4 Powerplant (Piston)	B1.1, B1.3 Powerplant (Turbine)		Electrical and instrument systems	Electrical systems	Instrument systems
1.	Mathematics	X	X	X	X		X	X	X
2.	Physics	X	X	X	X		X	X	X
3.	Electrical fundamentals					X	X	X	X
4.	Electronic fundamentals					X	X	X	X
5.	Digital techniques electronic instrument systems					X	X	X	X
6.	Materials and hardware	X	X	X	X		X	X	X
7.	Maintenance practices	X	X	X	X		X	X	X
8.	Basic aerodynamics	X	X				X	X	X
9.	Human factors	X	X	X	X		X	X	X
10.	Aviation legislation	X	X	X	X		X	X	X
11A. Turbine aeroplane aerodynamics, structures and systems		X (B1.1) (see Note 1)							
11B. Piston aeroplane aerodynamics, structures, and systems		X (B1.2) (see Note 1)							
12. Helicopter aerodynamics, structures, and systems			X						
13. Aircraft	Topic 13.1 Theory of flight						X	X	X

Subject modules/sub-modules		Category B1 modular licences				Extension of category B1 modular licence	Category B2 modular licences		
		B1.1, B1.2 Aeroplane (Airframe)	B1.3, B1.4 Helicopter (Airframe)	B1.2, B1.4 Powerplant (Piston)	B1.1, B1.3 Powerplant (Turbine)		Electrical and instrument systems	Electrical systems	Instrument systems
structures and systems	Topic 13.2 Structures — general concepts						X	X	X
	Topic 13.3 Autopilots (ATA22)							X	
	Topic 13.4 Communication and navigation (ATA23/34)							X	X
	Topic 13.5 Electrical power (ATA24)						X		
	Topic.13.6 Equipment and furnishings (ATA25)						X		
	Topic 13.7 Flight controls (ATA27)						X	X	
	Topic 13.8 Instruments (ATA31)							X	

Subject modules/sub-modules		Category B1 modular licences				Extension of category B1 modular licence	Category B2 modular licences		
		B1.1, B1.2 Aeroplane (Airframe)	B1.3, B1.4 Helicopter (Airframe)	B1.2, B1.4 Powerplant (Piston)	B1.1, B1.3 Powerplant (Turbine)		Electrical and instrument systems	Electrical systems	Instrument systems
	Topic 13.9 Lights (ATA33)						X		
	Topic 13.10 On-board maintenance systems (ATA45)						X		
	Topic 13.11 Air-conditioning and cabin pressurisation (ATA21)						X		
	Topic 13.12 Fire protection (ATA26)						X		
	Topic 13.13 Fuel systems (ATA28)						X		
	Topic 13.14 Hydraulic power (ATA29)						X		
	Topic 13.15 Ice and rain						X		

Subject modules/sub-modules		Category B1 modular licences				Extension of category B1 modular licence	Category B2 modular licences		
		B1.1, B1.2 Aeroplane (Airframe)	B1.3, B1.4 Helicopter (Airframe)	B1.2, B1.4 Powerplant (Piston)	B1.1, B1.3 Powerplant (Turbine)		Electrical and instrument systems	Electrical systems	Instrument systems
	protection (ATA30)								
	Topic 13.16 Landing gear (ATA32)						X		
	Topic 13.17 Oxygen (ATA35)							X	
	Topic 13.18 Pneumatic/ vacuum (ATA36)						X		
	Topic 13.19 Water/waste (ATA38)						X		
	Topic 13.20 Integrated modular avionics (ATA42)							X	X
	Topic 13.21 Cabin systems (ATA44)							X	X
	Topic 13.22 Information systems (ATA46)							X	X

Subject modules/sub-modules	Category B1 modular licences				Extension of category B1 modular licence	Category B2 modular licences		
	B1.1, B1.2 Aeroplane (Airframe)	B1.3, B1.4 Helicopter (Airframe)	B1.2, B1.4 Powerplant (Piston)	B1.1, B1.3 Powerplant (Turbine)		Electrical and instrument systems	Electrical systems	Instrument systems
14. Propulsion — avionic systems							X	
15. Gas turbine engines				X				
16. Piston engines			X					
17. Propeller			X (B1.2 only)	X (B1.1 – turbopropeller only)				

Note 1 This is a rule. Module 11A is required for maintenance of turbine powered aeroplanes. Module 11B is required for maintenance of piston powered aeroplanes.

Note 2 See regulation 66.018 of CASR for the subcategories of category B1 licences and the kind of aircraft in relation to which category B1 licences and category B2 licences may be granted.

Note 3 Category B1 modular licence subcategories are identified in this table by kind of aircraft (aeroplane, helicopter), relevant category B1 licence subcategories and relevant aircraft system. The words ‘Airframe’, ‘Piston’ or ‘Turbine’ included in brackets in a heading regarding a subcategory of B1 licence means that the licence would be granted subject to exclusions so that it is limited to privileges relating to those aircraft systems. Category B2 modular licences are identified in the table by the aircraft system to which privileges are similarly limited. The table headings signify the nature of the modular licence to be issued. However, a modular licence is issued as a category B1 licence with exclusions or a category B2 licence with exclusions and will not have expressed on it the kind of aircraft and relevant aircraft system.

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
(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; Velocity ratio, mechanical advantage and efficiency.			
<i>2.2.3 Dynamics</i>			
(a) Mass; Force, inertia, work, power, energy (potential, kinetic and total energy), heat, efficiency;	1	2	1
(b) Momentum, conservation of momentum; Impulse; Gyroscopic principles; Friction: nature and effects, coefficient of friction (rolling resistance).	1	2	2

	Level of knowledge for the category		
	A	B1	B2
2.2.4 Fluid dynamics			
(a) Specific gravity and density;	2	2	2
(b) Viscosity, fluid resistance, effects of streamlining; Effects of compressibility on fluids; Static, dynamic and total pressure: Bernoulli's Theorem, venturi.	1	2	1
2.3 Thermodynamics			
(a) Temperature: thermometers and temperature scales: Celsius, Fahrenheit and Kelvin, heat definition;	2	2	2
(b) Heat capacity, specific heat; Heat transfer: convection, radiation and conduction; Volumetric expansion; First and second law of thermodynamics; Gases: ideal gases laws, specific heat at constant volume and constant pressure, work done by expanding gas; Isothermal, adiabatic expansion and compression, engine cycles, constant volume and constant pressure, refrigerators and heat pumps; Latent heats of fusion and evaporation, thermal energy, heat of combustion.	—	2	2
2.4 Optics (light)	—	2	2
Nature of light, speed of light; Laws of reflection and refraction: reflection at plane surfaces, reflection by spherical mirrors, refraction, lenses; Fiberoptics.			
2.5 Wave motion and sound	—	2	2
Wave motion: mechanical waves, sinusoidal wave motion, interference phenomena, standing waves; Sound: speed of sound, production of sound, intensity, pitch and quality, Doppler effect.			

Module 3 Electrical fundamentals

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

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

	Level of knowledge for the category		
	A	B1	B2
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
(b) Magneto-motive force, field strength, magnetic flux density, permeability, hysteresis loop, retentivity, coercive force reluctance, saturation point, eddy currents; Precautions for care and storage of magnets.	—	2	2
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.			

	Level of knowledge for the category		
	A	B1	B2
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; 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.			

	Level of knowledge for the category		
	A	B1	B2
3.17 AC generators	—	2	2
Rotation of loop in a magnetic field and waveform produced; Operation and construction of revolving armature and revolving field type AC generators; Single phase, 2 phase and 3 phase alternators; Three phase star and delta connections advantages and uses; Permanent magnet generators.			
3.18 AC motors	—	2	2
Construction, principles of operation and characteristics of: AC synchronous and induction motors both single and polyphase; Methods of speed control and direction of rotation; Methods of producing a rotating field: capacitor, inductor, shaded or split pole.			

Module 4 Electronic fundamentals

	Level of knowledge for the category		
	A	B1	B2
4.1 Semiconductors			
<i>4.1.1 Diodes</i>			
(a) Diode symbols; Diode characteristics and properties; Diodes in series and parallel; Main characteristics and use of silicon controlled rectifiers (thyristors), light emitting diode, photo conductive diode, varistor, rectifier diodes; Functional testing of diodes;	—	2	2

	Level of knowledge for the category		
	A	B1	B2
<p>(b)</p> <p>Materials, electron configuration, electrical properties; P and N type materials: effects of impurities on conduction, majority and minority characters; PN junction in a semiconductor, development of a potential across a PN junction in unbiased, forward biased and reverse biased conditions; Diode parameters: peak inverse voltage, maximum forward current, temperature, frequency, leakage current, power dissipation; Operation and function of diodes in the following circuits: clippers, clampers, full and half wave rectifiers, bridge rectifiers, voltage doublers and triplers; Detailed operation and characteristics of the following devices: silicon controlled rectifier (thyristor), light emitting diode, Schottky diode, photoconductive diode, varactor diode, varistor, rectifier diodes, Zener diode.</p>	—	—	2
<i>4.1.2 Transistors</i>			
<p>(a)</p> <p>Transistor symbols; Component description and orientation; Transistor characteristics and properties;</p>	—	1	2
<p>(b)</p> <p>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.</p>	—	—	2
<i>4.1.3 Integrated circuits</i>			
<p>(a)</p> <p>Description and operation of logic circuits and linear circuits and operational amplifiers;</p>	—	1	—

Module 5 Digital techniques/electronic instrument systems

	Level of knowledge for the category			
	A	B1.1 B1.3	B1.2 B1.4	B2
5.1 Electronic instrument systems	1	2	2	3
Typical systems arrangements and cockpit layout of electronic instrument systems.				
5.2 Numbering systems	—	1	—	2
Numbering systems: binary, octal and hexadecimal; Demonstration of conversions between the decimal and binary, octal and hexadecimal systems, and vice versa.				
5.3 Data conversion	—	1	—	2
Analogue data, digital data; Operation and application of analogue to digital, and digital to analogue converters, inputs and outputs, limitations of various types.				
5.4 Data buses	—	2	—	2
Operation of data buses in aircraft systems, including knowledge of ARINC and other specifications; Aircraft network/ethernet.				
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	—	—

	Level of knowledge for the category			
	A	B1.1 B1.3	B1.2 B1.4	B2
(b) Computer-related terminology; Operation, layout and interface of the major components in a microcomputer, including their associated bus systems; Information contained in single and multi-address instruction words; Memory-associated terms; Operation of typical memory devices; Operation, advantages and disadvantages of the various data storage systems.	—	—	—	2
5.7 Microprocessors	—	—	—	2
Functions performed and overall operation of a microprocessor; Basic operation of each of the following microprocessor elements: control and processing unit, clock, register, arithmetic logic unit.				
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	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	1	2
Principles of operation of common types of displays used in modern aircraft, including cathode ray tubes, light emitting diodes and liquid crystal display.				

	Level of knowledge for the category			
	A	B1.1 B1.3	B1.2 B1.4	B2
5.12 Electrostatic sensitive devices	1	2	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	1	2
Awareness of restrictions, airworthiness requirements and possible catastrophic effects of unapproved changes to software programs.				
5.14 Electromagnetic environment	—	2	2	2
Influence of the following phenomena on maintenance practices for electronic system: <ul style="list-style-type: none"> • EMC – electromagnetic compatibility • EMI – electromagnetic interference • HIRF – high-intensity radiated field • Lightning and lightning protection. 				
5.15 Typical electronic/digital aircraft systems	—	2	2	2
General arrangement of typical electronic/digital aircraft systems and associated built-in test equipment (BITE), such as the following: <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
(b) Testing of ferrous materials for hardness, tensile strength, fatigue strength and impact resistance.	—	1	1
6.2 Aircraft materials — non-ferrous			
(a) Characteristics, properties and identification of common non-ferrous materials used in aircraft; Heat treatment and application of non-ferrous materials;	1	2	1
(b) Testing of non-ferrous material for hardness, tensile strength, fatigue strength and impact resistance.	—	1	1
6.3 Aircraft materials — composite and non-metallic			
<i>6.3.1 Composite and non-metallic other than wood and fabric</i>			
(a) Characteristics, properties and identification of common composite and non-metallic materials, other than wood, used in aircraft; Sealant and bonding agents;	1	2	2
(b) The detection of defects and deterioration in composite and non-metallic material; Repair of composite and non-metallic material.	1	2	—

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

	Level of knowledge for the category		
	A	B1	B2
<i>6.5.2 Bolts, studs and screws</i>	2	2	2
Bolt types: specification, identification and marking of aircraft bolts, international standards; Nuts: self-locking, anchor, standard types; Machine screws: aircraft specifications; Studs: types and uses, insertion and removal; Self tapping screws, dowels.			
<i>6.5.3 Locking devices</i>	2	2	2
Tab and spring washers, locking plates, split pins, pal-nuts, wire locking, quick release fasteners, keys, circlips, cotter pins.			
<i>6.5.4 Aircraft rivets</i>	1	2	1
Types of solid and blind rivets: specifications and identification, heat treatment.			
6.6 Pipes and unions			
(a) Identification of, and types of, rigid and flexible pipes and their connectors used in aircraft;	2	2	2
(b) Standard unions for aircraft hydraulic, fuel, oil, pneumatic and air system pipes.	2	2	1
6.7 Springs	—	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.			

	Level of knowledge for the category		
	A	B1	B2
6.10 Control cables	1	2	1
Types of cables; End fittings, turn buckles and compensation devices; Pulleys and cable system components; Bowden cables; Aircraft flexible control systems.			
6.11 Electrical cables and connectors	1	2	2
Cable types, construction and characteristics; High tension and co-axial cables; Crimping; Connector types, pins, plugs, sockets, insulators, current and voltage rating, coupling, identification codes.			

Module 7 Maintenance practices

	Level of knowledge for the category		
	A	B1	B2
7.1 Safety precautions — aircraft and workshop	3	3	3
Aspects of safe working practices including precautions to take when working with electricity, gases especially oxygen, oils and chemicals; Instruction in the remedial action to be taken in the event of a fire or another accident with one or more of these hazards including knowledge on extinguishing agents.			
7.2 Workshop practices	3	3	3
Care of tools, control of tools, use of workshop materials; Dimensions, allowances and tolerances, standards of workmanship; Calibration of tools and equipment, calibration standards.			

	Level of knowledge for the category		
	A	B1	B2
7.3 Tools	3	3	3
Common hand tool types; Common power tool types; Operation and use of precision measuring tools; Lubrication equipment and methods; Operation, function and use of electrical general test equipment.			
7.4 Avionic general test equipment	—	2	3
Operation, function and use of avionic general test equipment.			
7.5 Engineering drawings, diagrams and standards	1	2	2
Drawing types and diagrams, their symbols, dimensions, tolerances and projections; Identifying title block information; Microfilm, microfiche and computerised presentations; Specification 100 of the ATA; Aeronautical and other applicable standards including ISO, AN, MS, NAS and MIL; Wiring diagrams and schematic diagrams.			
7.6 Fits and clearances	1	2	1
Drill sizes for bolt holes, classes of fits; Common system of fits and clearances; Schedule of fits and clearances for aircraft and engines; Limits for bow, twist and wear; Standard methods for checking shafts, bearings and other parts.			
7.7 Electrical wiring interconnection system (EWIS)	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; Identification of wire types, their inspection criteria and damage tolerance; Wiring-protection techniques: cable looming and loom support, cable clamps, protective sleeving techniques, including heat shrink wrapping, shielding; EWIS installations, inspection, repair, maintenance and cleanliness standards.			

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

	Level of knowledge for the category		
	A	B1	B2
7.15 Welding, brazing, soldering and bonding			
(a) Soldering methods, inspection of soldered joints;	—	2	2
(b) Welding and brazing methods; Inspection of welded and brazed joints; Bonding methods and inspection of bonded joints.	—	2	—
7.16 Aircraft weight and balance			
(a) Centre of gravity and balance limits calculation: use of relevant documents;	—	2	2
(b) Preparation of aircraft for weighing; Aircraft weighing.	—	2	—
7.17 Aircraft handling and storage	2	2	2
Aircraft taxiing and towing and associated safety precautions; Aircraft jacking, chocking, securing and associated safety precautions; 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 borescope methods;	—	2	1

	Level of knowledge for the category		
	A	B1	B2
(d) Disassembly and re-assembly techniques;	2	2	2
(e) Trouble shooting techniques.	—	2	2
7.19 Abnormal events			
(a) Inspections following lightning strikes and HIRF penetration.	2	2	2
(b) Inspections following abnormal events such as heavy landings and flight through turbulence.	2	2	—
7.20 Maintenance procedures	1	2	2
Maintenance planning; Modification procedures; Stores procedures; Certification 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.			

	Level of knowledge for the category		
	A	B1	B2
8.2 Aerodynamics	1	2	2
Air flow around a body; Boundary layer, laminar and turbulent flow, free stream flow, relative airflow, up wash and downwash, vortices, stagnation; The terms: camber, chord, mean aerodynamic chord, profile (parasite) drag, induced drag, centre of pressure, angle of attack, wash in and washout, fineness ratio, wing shape and aspect ratio; Thrust, weight, aerodynamic resultant; Generation of lift and drag: angle of attack, lift coefficient, drag coefficient, polar curve, stall; Aerofoil contamination including ice, snow, frost.			
8.3 Theory of flight	1	2	2
Relationship between lift, weight, thrust and drag; Glide ratio; 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.			

	Level of knowledge for the category		
	A	B1	B2
9.2 Human performance and limitations	1	2	2
Vision; Hearing; Information processing; Attention and perception; Memory; Claustrophobia and physical access.			
9.3 Social psychology	1	1	1
Responsibility: individual and group; Motivation and de-motivation; Peer pressure; Culture issues; Team working; Management, supervision and leadership.			
9.4 Factors affecting performance	2	2	2
Fitness 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.			

	Level of knowledge for the category		
	A	B1	B2
9.7 Communication	2	2	2
Within and between teams; Work logging and recording; Keeping up-to-date, currency; Dissemination of information.			
9.8 Human error	1	2	2
Error models and theories; Types of error in maintenance tasks; Implications of errors (i.e. accidents); Avoiding and managing errors.			
9.9 Hazards in the workplace	1	2	2
Recognising and avoiding hazards; Dealing with emergencies.			

Module 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.			

	Level of knowledge for the category		
	A	B1	B2
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;			
(b) <i>Documents</i> Certificates of Airworthiness; Restricted Certificates of Airworthiness; Special Flight Permits; Certificates of Registration; Noise Certificates; Weight Schedules; Radio Station Licences and Approvals.			
10.6 Continuing airworthiness	2	2	2
(a) Detailed understanding of Part 21 of CASR 1998 provisions relating to continuing airworthiness;			
(b) Detailed understanding of Part 42 of CASR 1998.			
10.7 Applicable national and international requirements			
(a) 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;	1	2	2

	Level of knowledge for the category		
	A	B1	B2
Maintenance documentation: maintenance manuals, structural repair manuals, illustrated parts catalogue, etc.			
(b) Continuing airworthiness; Minimum equipment requirements — test flights; ETOPS, maintenance and dispatch requirements; All weather operations: categories 2 and 3 operations.	—	1	1

Module 11A Turbine aeroplane aerodynamics, structures and systems

	Level of knowledge for the category		
	A1	B1.1	B2
11.1 Theory of flight			—
<i>11.1.1 Aeroplane aerodynamics and flight controls</i>	1	2	
Operation, and effect, of the following: <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; 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 heating, area rule; Factors affecting airflow in engine intakes of high-speed aircraft; Effects of sweepback on critical Mach number.			

	Level of knowledge for the category		
	A1	B1.1	B2
11.2 Airframe structures — general concepts			
(a) Airworthiness requirements for structural strength; Structural classification, primary, secondary and tertiary; Fail-safe, safe-life and damage-tolerance concepts; Zonal and station identification systems; Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue; Drains and ventilation provisions; System installation provisions; Lightning-strike protection provision; Aircraft bonding;	2	2	—
(b) Construction methods of stressed-skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, methods of skinning, anti-corrosive protection, wing, empennage and engine attachments; Structure assembly techniques: riveting, bolting, bonding; Methods of surface protection, such as chromating, anodising, painting; Surface cleaning; Airframe symmetry: methods of alignment and symmetry checks.	1	2	—
11.3 Airframe structures — aeroplanes			
<i>11.3.1 Fuselage (ATA52/53/56)</i>	1	2	—
Construction and pressurisation sealing; Wing, stabiliser, pylon and undercarriage 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;			

	Level of knowledge for the category		
	A1	B1.1	B2
Landing gear, pylon, control surface and high-lift/drag attachments.			
<i>11.3.3 Stabilisers (ATA55)</i>	1	2	—
Construction; Control surface attachment.			
<i>11.3.4 Flight control surfaces (ATA55/57)</i>	1	2	—
Construction and attachment; Balancing — mass and aerodynamic.			
<i>11.3.5 Nacelles and pylons (ATA54)</i>	1	2	—
Construction; Firewalls; Engine mounts.			
11.4 Air-conditioning and cabin pressurisation (ATA21)			
<i>11.4.1 Air supply</i>	1	2	—
Sources of air supply, including engine bleed, APU and ground cart.			
<i>11.4.2 Air-conditioning</i>	1	3	—
Air-conditioning systems; Air cycle and vapour cycle machines; Distribution systems; Flow, temperature and humidity control system.			
<i>11.4.3 Pressurisation</i>	1	3	—
Pressurisation systems; Control and indication, including control and safety valves; Cabin pressure controllers.			
<i>11.4.4 Safety and warning devices</i>	1	3	—
Protection and warning devices.			
11.5 Instruments and avionic systems			
<i>11.5.1 Instrument systems (ATA31)</i>	1	2	—
Pitot static: altimeter, airspeed indicator, vertical speed indicator; Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator; Compasses: direct reading, remote reading;			

	Level of knowledge for the category		
	A1	B1.1	B2
Angle of attack indication, stall warning systems; Glass cockpit; Other aircraft system indication.			
<i>11.5.2 Avionic systems</i>	1	1	—
Fundamentals of system layouts, and operation of the following: <ul style="list-style-type: none"> • 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/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	B1.1	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	2	—
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/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.			

	Level of knowledge for the category		
	A1	B1.1	B2
11.11 Hydraulic power (ATA29)	1	3	—
System layout; Hydraulic fluids; Hydraulic reservoirs and accumulators; Pressure generation: electric, mechanical, pneumatic; Emergency pressure generation; Filters; 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 autobraking; Tyres; Steering; Air-ground sensing.			
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.			

	Level of knowledge for the category		
	A1	B1.1	B2
11.16 Pneumatic/vacuum (ATA36)	1	3	—
System layout; Sources: engine/APU, compressors, reservoirs, ground supply; Pressure and vacuum pumps; Pressure control; Distribution; Indications and warnings; Interfaces with other systems.			
11.17 Water/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 built-in test equipment (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 (<i>CIDS</i>)), and between the aircraft cabin and ground stations (cabin network service (<i>CNS</i>)). These include voice, data, music and video transmissions.			

	Level of knowledge for the category		
	A1	B1.1	B2
<p>The CIDS provides an interface between cockpit/cabin crew and cabin systems. These systems support data exchange of the different related Line Replaceable Units (LRUs) and they are typically operated via Flight Attendant Panels (FAPs).</p> <p>The CNS is typically on a server, interfacing with systems, including the following:</p> <ul style="list-style-type: none"> • data/radio communication • cabin core system (CCS) • in-flight entertainment system (IFES) • external communication system (ECS) • cabin mass memory system (CMMS) • cabin monitoring system (CMS) • miscellaneous cabin systems (MCSs). <p>The CNS may host functions such as the following:</p> <ul style="list-style-type: none"> • access to pre-departure/departure reports • email/intranet/internet access • passenger database. 			
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. These include units that are dedicated to the information storage and retrieval function, such as the electronic library mass storage and controller. But they 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 the following:</p> <ul style="list-style-type: none"> • 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. 			

Module 11B Piston aeroplane aerodynamics, structures and systems

Note The scope of this module must reflect the technology of aeroplanes relevant to a subcategory A2, or B1.2, aircraft engineer licence.

	Level of knowledge for the category		
	A2	B1.2	B2
11.1 Theory of flight			—
<i>11.1.1 Aeroplane aerodynamics and flight controls</i>	1	2	
Operation and effect of the following: <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; 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 – N/A</i>	—	—	—
11.2 Airframe structures — general concepts			
(a) <ul style="list-style-type: none"> Airworthiness requirements for structural strength; Structural classification, primary, secondary and tertiary; Fail-safe, safe-life and damage-tolerance concepts; Zonal and station identification systems; Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue; Drains and ventilation provisions; System installation provisions; Lightning-strike protection provision; Aircraft bonding; 	2	2	—

	Level of knowledge for the category		
	A2	B1.2	B2
(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, tailplane, pylon and undercarriage attachments; Seat installation; Doors and emergency exits: construction and operation; Windows and windscreen attachment.			
<i>11.3.2 Wings (ATA57)</i>	1	2	—
Construction; Fuel storage; Landing gear, pylon, control surface and high-lift/drag attachments.			
<i>11.3.3 Stabilisers (ATA55)</i>	1	2	—
Construction; Control surface attachment.			
<i>11.3.4 Flight control surfaces (ATA55/57)</i>	1	2	—
Construction and attachment; Balancing — mass and aerodynamic.			
<i>11.3.5 Nacelles and pylons (ATA54)</i>	1	2	—
Construction; Firewalls Engine mounts.			

	Level of knowledge for the category		
	A2	B1.2	B2
11.4 Air-conditioning and cabin pressurisation (ATA21)	1	3	—
Pressurisation and air-conditioning systems; Cabin pressure controllers; Protection and warning devices; Heating systems.			
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.			
<i>11.5.2 Avionic systems</i>	1	1	—
Fundamentals of system layouts, and operation of the following: <ul style="list-style-type: none"> • auto flight (ATA22) • communications (ATA23) • navigation systems (ATA34). 			
11.6 Electrical power (ATA24)	1	3	—
Batteries installation and operation; DC-power generation; Voltage regulation; Power distribution; Circuit protection; Inverters, transformers.			
11.7 Equipment and furnishings (ATA25)			
(a) Emergency equipment requirements; Seats, harnesses and belts;	2	2	—

	Level of knowledge for the category		
	A2	B1.2	B2
(b) Cabin layout; Equipment layout; Cabin furnishing installation; Cabin entertainment equipment; Galley installation; Cargo handling and retention equipment; Airstairs.	1	1	—
11.8 Fire protection (ATA26)			
(a) Fire and smoke detection and warning systems; Fire extinguishing systems; System tests;	1	3	—
(b) Portable fire extinguisher.	1	2	—
11.9 Flight controls (ATA27)	1	3	—
Primary controls: aileron, elevator, rudder; Trim tabs; High-lift devices; System operation: manual; Gust locks; Balancing and rigging; Stall warning system.			
11.10 Fuel systems (ATA28)	1	3	—
System layout; Fuel tanks; Supply systems; Cross-feed and transfer; Indications and warnings; Refuelling and defuelling.			

	Level of knowledge for the category		
	A2	B1.2	B2
11.11 Hydraulic power (ATA29)	1	3	—
System layout; Hydraulic fluids; Hydraulic reservoirs and accumulators; Pressure generation: electric, mechanical; Filters; Pressure control; Power distribution; Indication and warning systems.			
11.12 Ice and rain protection (ATA30)	1	3	—
Ice formation, classification and detection; De-icing systems: electrical, hot air, pneumatic and chemical; 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 autobraking; Tyres; Steering; Air-ground sensing.			
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.			

	Level of knowledge for the category		
	A2	B1.2	B2
11.16 Pneumatic and vacuum (ATA36)	1	3	—
System layout; Sources: engine/APU, compressors, reservoirs, ground supply; Pressure and vacuum pumps; Pressure control; Distribution; Indications and warnings; Interfaces with other systems.			
11.17 Water and waste (ATA38)	2	3	—
Water system layout, supply, distribution, servicing and draining; Toilet system layout, flushing and servicing; Corrosion aspects.			

Module 12 Helicopter aerodynamics, structures and systems

		Level of knowledge for the category	
	A3	B1.3	B2
	A4	B1.4	
12.1 Theory of flight — rotary wing aerodynamics	1	2	—
Terminology; Effects of gyroscopic precession; Torque reaction and directional control; Dissymmetry of lift, blade tip stall; Translating tendency and its correction; Coriolis effect and compensation; Vortex ring state, power settling, overpitching; Auto-rotation; Ground effect.			
12.2 Flight control systems	2	3	—
Cyclic control; Collective control; Swashplate;			

		Level of knowledge for the category	
	A3 A4	B1.3 B1.4	B2
Yaw control: Anti-torque control, tail rotor, bleed air; Main rotor head: design and operation features; Blade dampers: function and construction; Rotor blades: main and tail rotor blade construction and attachment; Trim control, fixed and adjustable stabilisers; System operation: manual, hydraulic, electrical and fly-by-wire; Artificial feel; Balancing and rigging.			
12.3 Blade tracking and vibration analysis	1	3	—
Rotor alignment; Main and tail rotor tracking; Static and dynamic balancing; Vibration types, vibration reduction methods; Ground resonance.			
12.4 Transmission	1	3	—
Gearboxes, main and tail rotors; Clutches, freewheel units and rotor brake; Tail rotor drive shafts, flexible couplings, bearings, vibration dampers and bearing hangers.			
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	—

		Level of knowledge for the category	
	A3 A4	B1.3 B1.4	B2
(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	—
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;			

		Level of knowledge for the category	
	A3 A4	B1.3 B1.4	B2
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.			
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.			

		Level of knowledge for the category	
	A3	B1.3	B2
	A4	B1.4	
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; Filters; Pressure control; Power distribution; Indication and warning systems; Interface with other systems.			
12.13 Ice and rain protection (ATA30)	1	3	—
Ice formation, classification and detection; Anti-icing and de-icing systems: electrical, hot air and chemical; Rain repellent and removal; Probe and drain heating; Wiper system.			
12.14 Landing gear (ATA32)	2	3	—
Construction, shock absorbing; Extension and retraction systems: normal and emergency; Indications and warning; Wheels, tyres, brakes; Steering; Air-ground sensing; Skids, floats.			

		Level of knowledge for the category	
	A3 A4	B1.3 B1.4	B2
12.15 Lights (ATA33)	2	3	—
External: navigation, landing, taxiing, ice; Internal: cabin, cockpit, cargo; emergency.			
12.16 Pneumatic and vacuum (ATA36)	1	3	—
System layout; Sources: engine, compressors, reservoirs, ground supply; Pressure control; Distribution; Indication and warnings; Interfaces with other systems.			
12.17 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.			
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			

		Level of knowledge for the category	
	A3	B1.3	B2
	A4	B1.4	
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 aerodynamics, 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; Highlift devices: slots, slats, flaps; Drag inducing devices: spoilers, lift dumpers, speed brakes; Operation and effect of trim tabs, servo tabs, control surface bias;	—	—	1
<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

	Level of knowledge for the category		
	A	B1	B2
13.2 Structures — general concepts			
(a) Fundamentals of structural systems;	—	—	1
(b) Zonal and station identification systems; electrical bonding; Lightning strike protection provision.	—	—	2
13.3 Autoflight (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.			
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); 			

	Level of knowledge for the category		
	A	B1	B2
<ul style="list-style-type: none"> • 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; 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;	—	—	2

	Level of knowledge for the category		
	A	B1	B2
Stall protection systems;			
(b) System operation: electrical, fly-by-wire.	—	—	3
13.8 Instruments (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; Gyroscopic principles; Artificial horizons; Slip indicators; Directional gyros; Ground proximity warning systems; Compass systems; Flight data recording systems; Electronic flight instrument systems; Instrument warning systems including master warning systems and centralised warning panels; Stall warning systems and angle of attack indicating systems; Vibration measurement and indication; Glass cockpit.			
13.9 Lights (ATA33)	—	—	3
External: navigation, landing, taxiing, ice; Internal: cabin, cockpit, cargo;			

	Level of knowledge for the category		
	A	B1	B2
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
<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

	Level of knowledge for the category		
	A	B1	B2
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
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

	Level of knowledge for the category		
	A	B1	B2
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 avionics (IMA) modules are, among others: bleed management, air pressure control, air ventilation and control, avionics and cockpit ventilation control, temperature control, air traffic communication, avionics communication router, electrical load management, circuit breaker monitoring, electrical system BITE, fuel management, braking control, steering control, landing gear extension and retraction, tyre pressure indication, oleo pressure indication, brake temperature monitoring; Core system; Network components.			
13.21 Cabin systems (ATA44)	—	—	3
The units and components which furnish a means of entertaining the passengers and providing communication within the aircraft (cabin intercommunication data system) and between the aircraft cabin and ground stations (cabin network service). 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 communication, in-flight entertainment system.			

	Level of knowledge for the category		
	A	B1	B2
<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 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

	Level of knowledge for the category		
	A	B1	B2
14.1 Turbine engines			
<p>(a)</p> <p>Constructional arrangement and operation of turbojet, turbofan, turbo shaft and turbopropeller engines;</p>	—	—	1

	Level of knowledge for the category		
	A	B1	B2
(b) Electronic engine control and fuel metering systems (FADEC).	—	—	2
14.2 Engine indicating systems	—	—	2
Exhaust gas temperature and interstage turbine temperature systems; Engine speed; Engine thrust indication: engine pressure ratio, engine turbine discharge pressure or jet pipe pressure systems; Oil pressure and temperature; Fuel pressure, temperature and flow; Manifold pressure; Engine torque; Propeller speed.			
14.3 Starting and ignition systems	—	—	2
Operation of engine start 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.			

	Level of knowledge for the category		
	A	B1	B2
15.2 Engine performance	—	2	—
Gross thrust, net thrust, choked nozzle thrust, thrust distribution, resultant thrust, thrust horsepower, equivalent shaft horsepower, specific fuel consumption; Engine efficiencies; By-pass ratio and engine pressure ratio; Pressure, temperature and velocity of the gas flow; Engine ratings, static thrust, influence of speed, altitude and hot climate, flat rating, limitations.			
15.3 Inlet	2	2	—
Compressor inlet ducts; Effects of various inlet configurations; Ice protection.			
15.4 Compressors	1	2	—
Axial and centrifugal types; Constructional features and operating principles and applications; Fan balancing; Operation; Causes and effects of compressor stall and surge; Methods of airflow control: bleed valves, variable inlet guide vanes, variable stator vanes, rotating stator blades; Compressor ratio.			
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;			

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

	Level of knowledge for the category		
	A	B1	B2
15.15 Power augmentation systems	—	1	—
Operation and applications; Water injection, water methanol; Afterburner systems.			
15.16 Turbo-prop engines	1	2	—
Gas coupled and free turbine and gear coupled turbines; Reduction gears; Integrated engine and propeller controls; Over speed safety devices.			
15.17 Turbo-shaft engines	1	2	—
Arrangements drive systems, reduction gearing, couplings, control systems.			
15.18 Auxiliary power units (APUs)	1	2	—
Purpose, operation, protective systems.			
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 borescope) monitoring; Inspection of engine and components to criteria, tolerances and data specified by engine manufacturer; Compressor washing and cleaning; Foreign object damage.			
15.22 Engine storage and preservation	—	2	—
Preservation and depreservation for the engine and accessories and systems.			

Module 16 Piston engine

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

	Level of knowledge for the category		
	A	B1	B2
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.			
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 depreservation.			

Appendix II

Basic knowledge examination standard

1 General

- 1.1 All basic examinations must be carried out using the multi-choice question format and essay questions as specified below. The incorrect alternatives 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 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 module, or sub-module, multi-choice part of the examination is 75%.
- 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 A failed module examination may not be retaken by a candidate for at least 90 days after the date of the examination. However, if the candidate undergoes a course of retraining, tailored to the failed subjects of a module, conducted by an MTO, the examination may be retaken after 30 days.
- 1.12 The period mentioned in paragraph 66.A.25 (ea) for the passing of a module examination does not apply if the examination has been passed by a candidate in relation to another category, or subcategory, of aircraft engineer licence held by the candidate.
- 1.13 After a set of 3 failed attempts by a candidate of a module examination, the candidate must wait 1 year after the date of the third failed attempt before attempting the examination again. The candidate must give written notice to the body (an MTO or CASA) the candidate applies to to sit the examination again, after the third failed attempt, of the following:
 - (a) the number, and dates, of attempts by the candidate of the examination;
 - (b) for each examination attempt notified by the candidate — details of the body (an MTO or CASA) that conducted the examination.

Note The MTO or CASA, as applicable, is responsible for verifying the number, and dates, of attempts by the candidate of the examination.

2 Number of questions for each module

2.1 *Module 1, Mathematics:*

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

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

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

2.2 *Module 2, Physics:*

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

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

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

2.3 *Module 3, Electrical fundamentals:*

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

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

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

2.4 *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 *Module 5, Digital techniques/electronic instrument systems:*

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

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

Subcategories 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 *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 *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 *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 *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 *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 *Module 11A, Turbine aeroplane aerodynamics, structures and systems:*

Category A – 108 multi-choice and 0 essay questions. Time allowed 135 minutes.

Category B1 – 140 multi-choice and 0 essay questions. Time allowed 175 minutes.

Category B2 – None.

Module 11B, Piston aeroplane aerodynamics, structures and systems:

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

Category B1 – 100 multi-choice and 0 essay questions. Time allowed 125 minutes.

Category B2 – None.

2.12 *Module 12, Helicopter aerodynamics, structures and systems:*

Category A – 100 multi-choice and 0 essay questions. Time allowed 125 minutes.

Category B1 – 128 multi-choice and 0 essay questions. Time allowed 160 minutes.

Category B2 – None.

2.13 *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.

Questions and time allowed may be split into 2 examinations, as appropriate.

Category B2 modular – for a category B2 modular licence mentioned in column 1 of an item in the following table, the number of multi-choice questions mentioned in column 2 of the item and the time allowed mentioned in column 3 of the item.

Table

Item	Column 1 Category B2 modular licence	Column 2 Number of multi-choice questions	Column 3 Time allowed (minutes)
1	ELECTRICAL SYSTEMS (sub-modules 13.1, 13.2, 13.5 to 13.7, 13.9 to 13.16, 13.18, and 13.19).	100	125
2	INSTRUMENT SYSTEMS (sub-modules 13.1 to 13.4, 13.7, 13.8, 13.17, 13.20 to 13.22).	120	150
3	RADIO SYSTEMS (sub-modules 13.1, 13.2, 13.4, 13.20 to 13.22).	60	75

2.14 *Module 14, Propulsion:*

Category A – None.

Category B1 – None.

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

2.15 *Module 15, Gas turbine engine:*

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

Category B1 – 92 multi-choice and 0 essay questions. Time allowed 115 minutes.

Category B2 – None.

2.16 *Module 16, Piston engine:*

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

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

Category B2 – None.

2.17 *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

	Category	Hours
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:

- the design of the aircraft type, its maintenance needs and the types of operation; and
- detailed analysis of applicable chapters – see contents table below; and
- detailed competency analysis showing that the objectives as stated in paragraph 2.1 (a) above are fully met; and
- 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 B2
		B1.1	C	B1.2	C	B1.3	C	B1.4	C	
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
20	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
		B1.1	C	B1.2	C	B1.3	C	B1.4	C	B2
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
		B1.1	C	B1.2	C	B1.3	C	B1.4	C	B2
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 B2
		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.

- 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 other than a modular licence**

Competency units required	Title	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
MEA107	Interpret and use aviation maintenance industry manuals and specifications	X	X	X	X	X	X	X	X	X
MEA111	Perform administrative processes to prepare for certification of civil aircraft maintenance					X	X	X	X	X
MEA112	Plan and implement civil aircraft maintenance activities					X	X	X	X	X
MEA113	Supervise civil maintenance activities and manage human resources in the workplace					X	X	X	X	X
MEA116	Apply work health and safety procedures at supervisor level in aviation maintenance					X	X	X	X	X
MEA117	Apply self in the aviation maintenance environment	X	X	X	X					
MEA118	Conduct self in the aviation maintenance environment					X	X	X	X	X
MEA119	Perform administrative processes to prepare for certification of civil aircraft A level line maintenance	X	X	X	X					
MEA142	Manage self in the aviation maintenance environment					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
MEA148	Apply mathematics and physics in aviation maintenance					X	X	X	X	X
MEA154	Apply work health and safety practices in aviation maintenance	X	X	X	X	X	X	X	X	X
MEA155	Plan and organise aviation maintenance work activities	X	X	X	X	X	X	X	X	X
MEA156	Apply quality standards during aviation maintenance activities	X	X	X	X	X	X	X	X	X
MEA157	Complete aviation maintenance industry documentation	X	X	X	X	X	X	X	X	X
MEA158	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	X	X	X	X	X	X	X	X	X
MEA201	Remove and install miscellaneous aircraft electrical hardware/ components					X	X	X	X	X
MEA203	Remove and install advanced aircraft electrical system components					X	X	X	X	X
MEA206	Remove and install aircraft basic radio communication and navigation system components									X
MEA208	Remove and install pressurisation control system components					X	X			
MEA209	Remove and install oxygen 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
MEA219	Inspect, test and troubleshoot aircraft pressurisation control systems and components					X	X			
MEA222	Inspect, test and troubleshoot aircraft oxygen systems and components					X	X			
MEA223	Inspect aircraft electrical systems and components					X	X or MEA 294	X or MEA 294	X or MEA 294	X
MEA224	Inspect aircraft instrument systems and components									X
MEA225	Inspect fixed wing aircraft automatic flight control systems and components									X
MEA226	Inspect aircraft electronic systems and components									X
MEA227	Test and troubleshoot aircraft electrical systems and components					X	X or MEA 294	X or MEA 294	X or MEA 294	X
MEA228	Test and troubleshoot aircraft instrument systems and components									X
MEA229	Test and troubleshoot aircraft radio frequency navigation and communications systems and components									X
MEA230	Test and troubleshoot fixed wing aircraft automatic flight control systems and components									X or MEA 231

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Competency units required	Title	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
MEA231	Inspect, test and troubleshoot rotary-wing aircraft automatic flight control systems and components									X or MEA 230
MEA232	Test and troubleshoot aircraft pulse systems and components									X
MEA235	Perform advanced troubleshooting in aircraft avionic maintenance									X
MEA241	Perform aircraft weight and balance calculations as a result of modifications									X
MEA246	Fabricate and/or repair aircraft electrical hardware or parts					X	X	X	X	X
MEA264	Remove and install aircraft electrical/ avionic components during line maintenance	X	X	X	X					
MEA265	Remove and install general aircraft electrical hardware	X	X	X	X					
MEA292	Remove and install advanced aircraft instrument system components									X
MEA293	Remove and install aircraft electronic system components									X
MEA294	Inspect, test and troubleshoot advanced aircraft electrical systems and components						X or MEA 223 and 227	X or MEA 223 and 227	X or MEA 223 and 227	

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Competency units required	Title	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
MEA295	Use electrical test equipment to perform basic electrical tests on aircraft and components	X	X	X	X					
MEA296	Use electrical test equipment in aviation maintenance activities					X	X	X	X	X
MEA301	Perform aircraft flight servicing					X	X	X	X	X
MEA303	Remove and install aircraft pneumatic system components					X	X	X	X	
MEA304	Remove and install non-pressurised aircraft structural and non-structural components							X or MEA 317	X or MEA 317	
MEA305	Remove and install aircraft fixed wing flight control system components					X	X			
MEA306	Remove and install engines and engine system components					X	X	X	X	
MEA307	Remove and install propeller systems and components					P	X			
MEA308	Remove and install rotary wing rotor and flight control system components							X	X	
MEA309	Inspect, test and troubleshoot aircraft hydromechanical and landing gear systems and components						X	X	X	
MEA310	Inspect, test and troubleshoot aircraft pneumatic systems and components						X	X	X	

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Competency units required	Title	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
MEA312	Inspect, test and troubleshoot aircraft fixed-wing flight control systems and components						X			
MEA313	Inspect, test and troubleshoot piston engine systems and components						X		X	
MEA315	Inspect, test and troubleshoot propeller systems and components					P	X			
MEA316	Inspect, test and troubleshoot rotary-wing rotor and control systems and components							X	X	
MEA317	Remove and install pressurised aircraft structural and non-structural components					X	X			
MEA318	Inspect aircraft hydromechanical, mechanical, gaseous and landing gear systems and components					X				
MEA319	Inspect gas turbine engine systems and components					X		X		
MEA320	Test and troubleshoot aircraft hydro-mechanical, gaseous and landing gear systems and components					X				
MEA321	Test and troubleshoot aircraft fixed wing flight control 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
MEA322	Test and troubleshoot gas turbine engine systems and components					X		X		
MEA323	Perform advanced troubleshooting in aircraft mechanical maintenance					X	X	X	X	
MEA325	Weigh aircraft and perform aircraft weight and balance calculations as a result of modifications					X	X	X	X	
MEA328	Maintain and/or repair aircraft mechanical components or parts					X	X	X	X	
MEA339	Inspect, repair and maintain aircraft structures					X	X	X	X	
MEA343	Remove and install avionics system components					X	X	X	X	
MEA344	Remove and install aircraft components	X	X	X	X					
MEA345	Perform scheduled line maintenance activities on gas turbine engine fixed wing aircraft	X								
MEA346	Perform scheduled line maintenance activities on gas turbine engine rotary-wing aircraft			X						
MEA347	Perform scheduled line maintenance activities on piston engine fixed wing aircraft		X							

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Competency units required	Title	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
MEA348	Perform scheduled line maintenance activities on piston engine rotary-wing aircraft				X					
MEA357	Inspect, test and repair aircraft fabric surfaces					Z	Z			
MEA358	Re-cover aircraft fabric surfaces					Z	Z			
MEA359	Inspect and repair aircraft wooden structures						W			
MEA362	Maintain aircraft vapour cycle air-conditioning systems						X		X	
MEA365	Assess structural repair/modification requirements and evaluate structural repairs and modifications					X	X	X	X	
MEA398	Remove and install aircraft hydro-mechanical and landing gear system components					X	X	X	X	
MEA418	Perform basic repair of aircraft internal fittings during line maintenance	X	X	X	X					
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

Aircraft systems or subsets that may be excluded from category B1 or category B2 licences and aircraft type ratings

(section 66.A.35, para 66.A.45 (h) and 66.A.70 (d))

Note 1 An AMO in accordance with section 145.A.37 of the Part 145 MOS, or a COA holder in accordance with Civil Aviation Order 104.0 (Certificates of approval — application, grant and conditions) (a **CAR 30 organisation**), may deliver excluded system training and assessment for the excluded systems set out in this Appendix — see paragraph 66.A.45 (h).

Note 2 See regulation 66.110 of CASR and subsection 66.A.70 (c) of this MOS for requirements for removal of these exclusions on type ratings.

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).

Table

Exclusions

Item	Column 1 Aircraft system or subset	Column 2 Exclusion identifier	Column 3 Title of exclusion	Column 4 Applicable to category B1 licences	Column 5 Applicable to category B2 licences
1	Electrical systems	E1	Excluding electrical systems	X	X
2	Mechanical or structural systems	E2	Excluding mechanical or structural systems	X	
3	Powerplant systems	E3	Excluding powerplant systems	X	
4	Electrical subsystem of mechanical, powerplant or structural systems	E4	Excluding electrical subsystem of mechanical, powerplant or structural systems	X	X
5	Instrument subsystems of mechanical, powerplant or structural systems	E5	Excluding instrument subsystems of mechanical, powerplant or structural systems	X	X

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Item	Column 1 Aircraft system or subset	Column 2 Exclusion identifier	Column 3 Title of exclusion	Column 4 Applicable to category B1 licences	Column 5 Applicable to category B2 licences
6	Avionic line replaceable units	E6 (see Note 1)	Excluding avionics LRUs	X	X
7	Instrument aspects of avionic systems — Autopilot (ATA22), flight control systems (ATA27), indicating and recording systems (ATA31), navigation systems (ATA34) and integrated modular avionics (ATA42)	E7	Excluding instrument aspects of avionics systems — ATA22, 27, 31, 34 and 42		X
8	Radio aspects of avionics systems — communications (ATA23), navigation systems (ATA34), integrated modular avionics (ATA42), cabin systems (ATA44)	E8	Excluding radio aspects of avionics systems — ATA23, 34, 42 and 44		X
9	Fabric surfaces	E9	Excluding fabric surfaces	X	
10	Wooden structures	E10	Excluding wooden structures	X	
11	Audio CVR systems	E11	Excluding audio CVR systems		X
12	Propellers	E12 (see Note 2)	Excluding propellers	X	

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Item	Column 1 Aircraft system or subset	Column 2 Exclusion identifier	Column 3 Title of exclusion	Column 4 Applicable to category B1 licences	Column 5 Applicable to category B2 licences
13	Hydraulics — ATA29	E13	Excluding hydraulics — ATA29	X	
14	Vapor cycle air- conditioning aspects of ATA21	E14	Excluding vapor cycle air- conditioning aspects of ATA21	X	
15	Air-conditioning aspects of ATA21	E15	Excluding air- conditioning aspects of ATA21	X	
16	Pressurisation aspects of ATA21	E16	Excluding pressurisation aspects of ATA21	X	
17		E17 (see Note 3)			
18	ADF systems	E18	Excluding ADF systems		X
19	VOR systems	E19	Excluding VOR systems		X
20	ILS systems	E20	Excluding ILS systems		X
21	Weather radar systems	E21	Excluding weather radar systems		X
22	ATC transponder systems	E22	Excluding ATC transponder systems		X
23	Radio altimeter systems	E23	Excluding radio altimeter systems		X
24	DME systems	E24	Excluding DME systems		X
25	Doppler systems	E25	Excluding doppler systems		X
26	Satellite navigation systems	E26	Excluding satellite		X

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Item	Column 1 Aircraft system or subset	Column 2 Exclusion identifier	Column 3 Title of exclusion	Column 4 Applicable to category B1 licences	Column 5 Applicable to category B2 licences
			navigation systems		
27	Autopilot systems	E27	Excluding autopilot systems		X
28	Multi-axis autopilot systems	E28	Excluding multi-axis autopilot systems		X
29	Remote indicating compass systems	E29	Excluding remote indicating compass systems		X
30	Inertial navigation and reference systems	E30	Excluding inertial navigation and reference systems		X
31	Pressurisation systems	E31	Excluding pressurisation systems		X
32	Electrical systems in aircraft equipped with multi-generator power systems	E32	Excluding electrical systems in aircraft equipped with multi-generator power systems	X	X
33	Supercharging systems	E33	Excluding all supercharging systems	X	
34	Digital systems	E34	Excluding digital systems	X	X
35	Pressurised structures	E35	Excluding pressurised structures	X	
36	Carburettor systems	E36	Excluding carburettor systems	X	

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Item	Column 1 Aircraft system or subset	Column 2 Exclusion identifier	Column 3 Title of exclusion	Column 4 Applicable to category B1 licences	Column 5 Applicable to category B2 licences
37	Fuel injection systems	E37	Excluding fuel injection systems	X	
38	Turbo supercharging systems	E38	Excluding turbo supercharging systems	X	
39	Airframe ice protection systems	E39	Excluding airframe ice protection systems	X	
40	Airframe fire protection systems	E40	Excluding airframe fire protection systems	X	
41	Oxygen systems	E41	Excluding oxygen systems	X	
42	Landing gear retraction systems	E42	Excluding landing gear retraction systems	X	
43	Fabric other than flight controls	E43	Excluding fabric other than flight controls	X	
44	Wiring repairs	E44	Excluding wiring repairs	X	X

Note 1 Exclusion E6 is removable from a licence if the licence is not also subject to exclusion E1, E4 or E5.

Note 2 Exclusion E12 is removable from a licence if the licence is not also subject to exclusion E3.

Note 3 Exclusion identifier E17 has not been allocated.

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
MEA201 MEA203 MEA223 MEA227 MEA246 MEA296	E1	Excluding electrical systems	X				
MEA201 MEA203 MEA246 MEA294 MEA296	E1	Excluding electrical systems		X	X	X	
MEA203 MEA223 MEA227	E1	Excluding electrical systems					X
MEA303 MEA305 MEA317 MEA318 MEA320 MEA321 MEA323 MEA325 MEA328 MEA339 MEA365 MEA398	E2	Excluding mechanical or structural systems	X				
MEA304 MEA305 MEA309 MEA312 MEA325 MEA328 MEA339 MEA354 MEA365 MEA398	E2	Excluding mechanical or structural systems		X			

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Competency Unit(s) required	Title of exclusion		B1.1	B1.2	B1.3	B1.4	B2
MEA303 MEA304 MEA308 MEA309 MEA310 MEA316 MEA323 MEA325 MEA328 MEA339 MEA365 MEA398	E2	Excluding mechanical or structural systems			X	X	
MEA306 MEA307 MEA315 MEA319 MEA322 MEA323	E3	Excluding powerplant systems	X				
MEA306 MEA307 MEA313 MEA315	E3	Excluding powerplant systems		X			
MEA306 MEA319 MEA322 MEA323	E3	Excluding powerplant systems			X		
MEA306 MEA313	E3	Excluding powerplant systems				X	
MEA201 MEA203 MEA223 MEA227 MEA246 MEA296	E4	Excluding electrical subsystem of mechanical, powerplant or structural systems	X				
MEA201 MEA203 MEA246 MEA294 MEA296	E4	Excluding electrical subsystem of mechanical, powerplant or structural systems		X	X	X	
MEA203 MEA223 MEA227	E4	Excluding electrical subsystems of mechanical, powerplant or structural systems					X
MEA201 MEA203 MEA246 MEA294 MEA296 MEA343	E5	Excluding instrument subsystems of mechanical, powerplant or structural systems	X	X	X	X	

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Competency Unit(s) required	Title of exclusion		B1.1	B1.2	B1.3	B1.4	B2
MEA224 MEA225 MEA226 MEA228 MEA230 MEA231 MEA235 MEA292 MEA293	E5	Excluding instrument subsystems of mechanical, powerplant or structural systems					X
MEA201 MEA203 MEA246 MEA294 MEA296 MEA343	E6	Excluding avionics LRUs	X	X	X	X	
MEA206 MEA224 MEA225 MEA226 MEA228 MEA229 MEA230 MEA231 – may be taken instead of MEA225 and MEA230 where ratings sought are entirely helicopter MEA232 MEA235 MEA292 MEA293	E6	Excluding avionics LRUs					X
MEA224 MEA225 MEA226 MEA228 MEA230 MEA231 MEA235 MEA292 MEA293	E7	Excluding instrument aspects of avionic systems — ATA22, 27, 31, 34 and 42					X
MEA206 MEA226 MEA229 MEA232 MEA235 MEA293	E8	Excluding radio aspects of avionic systems — ATA23, 34, 42 and 44					X
MEA357	E9	Excluding fabric surfaces	X	X	X	X	
MEA359	E10	Excluding wooden structures		X	X	X	

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Competency Unit(s) required	Title of exclusion		B1.1	B1.2	B1.3	B1.4	B2
MEA206 MEA215	E11	Excluding audio CVR systems					X
MEA307 MEA315	E12	Excluding propellers	X	X			
MEA309 MEA398	E13	Excluding hydraulics — ATA29	X	X	X	X	
MEA201 MEA246 MEA296 MEA362	E14	Excluding vapour cycle airconditioning aspects of ATA21	X	X	X	X	
MEA201 MEA203 MEA246 MEA294 MEA296 MEA303 MEA310	E15	Excluding airconditioning aspects of ATA21 (for pressurised aircraft)	X				
MEA201 MEA246 MEA296 MEA355	E15	Excluding airconditioning aspects of ATA21 (for unpressurised aircraft and helicopters)	X	X	X	X	
MEA201 MEA203 MEA208 MEA219 MEA246 MEA294 MEA296 MEA303 MEA310 MEA317 MEA323	E16	Excluding pressurisation aspects of ATA21	X				
MEA201 MEA246 MEA3000	E16	Excluding pressurisation aspects of ATA21		X			
	E17	Not allocated					
MEA206 MEA214	E18	Excluding ADF systems					X
MEA206 MEA214 – or the following 2 units in lieu of MEA214 MEA226 MEA229	E19	Excluding VOR systems					X
MEA206 MEA216 MEA293	E20	Excluding ILS systems					X

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Competency Unit(s) required	Title of exclusion		B1.1	B1.2	B1.3	B1.4	B2
MEA220 MEA293	E21	Excluding weather radar systems					X
MEA221 MEA293	E22	Excluding ATC transponder systems					X
MEA221 MEA293	E23	Excluding radio altimeter systems					X
MEA221 MEA293	E24	Excluding DME systems					X
MEA221 MEA293	E25	Excluding Doppler systems					X
MEA206 MEA234 MEA293	E26	Excluding satellite navigation systems					X
MEA291 MEA293	E27	Excluding autopilot systems					X
MEA293 MEA217 or MEA218 (if helicopter systems are being maintained)	E28	Excluding multi-axis autopilot systems					X
MEA213 MEA292	E29	Excluding remote indicating compass systems					X
MEA233 MEA293	E30	Excluding inertial navigation and reference systems					X
MEA208 MEA219	E31	Excluding pressurisation systems					X
MEA202 MEA210 MEA277	E32	Excluding electrical systems in aircraft equipped with multi-generator powered systems					X
MEA306 MEA313	E33	Excluding all supercharging systems		X		X	
MEA293 and any one of MEA227 MEA228 MEA229 MEA230 MEA231 MEA232 MEA278	E34	Excluding digital systems					X
MEA317 MEA339	E35	Excluding pressurised structures	X	X			
MEA306 MEA313	E36	Excluding carburettor systems		X		X	
MEA306 MEA313	E37	Excluding fuel injection systems		X		X	

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Competency Unit(s) required	Title of exclusion		B1.1	B1.2	B1.3	B1.4	B2
MEA306 MEA313	E38	Excluding turbo supercharging systems		X		X	
MEA303 MEA310	E39	Excluding airframe ice protection systems	X		X		
MEA303 MEA310	E40	Excluding airframe fire protection systems	X	X	X	X	
MEA209 MEA222	E41	Excluding oxygen systems	X	X	X	X	
MEA201 MEA202 MEA210 MEA246 MEA296 MEA309 MEA398	E42	Excluding landing gear retraction systems	X	X	X	X	
MEA357	E43	Excluding fabric other than flight controls	X	X	X	X	
MEA201 MEA246 MEA296	E44	Excluding wiring repairs	X	X	X	X	

Appendix IX

See subsection 66.A.4 and paragraph 66.A.45 (h)

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 endorsement of type rating on the relevant licence category.

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	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)
	A319-150 Series A320-250 Series A321-250 Series		Airbus A319/A320/A321 (CFM LEAP-1A)
	A319-170 Series A320-270 Series A321-270 Series		Airbus A319/A320/A321 (IAE PW1100G)
	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)
	A350-900 Series		Airbus A350 (RR Trent XWB)
	A380-840 Series		Airbus A380 (RR RB211 Trent 900)

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Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
AIRBUS CANADA LIMITED PARTNERSHIP	BD-500-1A10 BD-500-1A11	A220-100 A220-300	Bombardier BD-500 Series (PW PW1500G)
AIRCRAFT INDUSTRIES	L-420		Let L-420 (Walter M601) ^{Note 2}
ATR-GIE Avions de Transport Régional	ATR 42-200		ATR 42-200/300 Series (PWC PW120)
	ATR 42-300		ATR 42-200/300 Series (PWC PW120)
	ATR 42-320		ATR 42-200/300 Series (PWC PW120)
	ATR 42-400		ATR 42-400/500/72-212A (PWC PW120)
	ATR 42-500	42-500 42-600	ATR 42-400/500/72-212A (PWC PW120)
	ATR 72-101		ATR 72-100/200 Series (PWC PW120)
	ATR 72-102		ATR 72-100/200 Series (PWC PW120)
	ATR 72-201		ATR 72-100/200 Series (PWC PW120)
	ATR 72-202		ATR 72-100/200 Series (PWC PW120)
	ATR 72-211		ATR 72-100/200 Series (PWC PW120)
	ATR 72-212		ATR 72-100/200 Series (PWC PW120)
	ATR 72-212 A	72-500 72-600	ATR 42-400/500/72-212A (PWC PW120)
BAE SYSTEMS (OPERATIONS) LTD	BAe 146 Series 100 BAe 146 Series 200 BAe 146 Series 300 AVRO 146-RJ70 AVRO 146-RJ85 AVRO 146-RJ100		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 (OPERATIONS) LTD	AVRO 146-RJ115		
	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)
	BOEING COMPANY (THE)	B707-100	Long Body
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)
B737-300		B737 Classic	Boeing 737-300/400/500 (CFM56)
B737-400		B737 Classic	Boeing 737-300/400/500 (CFM56)
B737-500		B737 Classic	Boeing 737-300/400/500 (CFM56)
B737-600		B737 Next Generation	Boeing 737-600/700/800/900 (CFM56)
B737-700		B737 Next Generation	Boeing 737-600/700/800/900 (CFM56)

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Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
BOEING COMPANY (THE)	B737-800	B737 Next Generation	Boeing 737-600/700/800/900 (CFM56)
	B737-900	B737 Next Generation	Boeing 737-600/700/800/900 (CFM56)
	B737-900ER	B737 Next Generation	Boeing 737-600/700/800/900 (CFM56)
	B737-7	B737 MAX	Boeing 737-7/8/9/10 (CFM LEAP-1B)
	B737-8	B737 MAX	Boeing 737-7/8/9/10 (CFM LEAP-1B)
	B737-8200	B737 MAX	Boeing 737-7/8/9/10 (CFM LEAP-1B)
	B737-9	B737 MAX	Boeing 737-7/8/9/10 (CFM LEAP-1B)
	B737-10	B737 MAX	Boeing 737-7/8/9/10 (CFM LEAP-1B)
	B747-400 B747-400D B747-400F/SF/BCF		Boeing 747-400 (GE CF6)
	B747-400 B747-400F/SF/BCF		Boeing 747-400 (PW 4000)
	B747-400 B747-400F/SF/BCF		Boeing 747-400 (RR RB211)
	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)

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Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
BOEING COMPANY (THE)	B777-200 B777-200LR B777-300ER	B777	Boeing 777-200/300 (GE 90)
	B777F	Freighter	Boeing 777-200/300 (GE 90)
	B777-200 B777-300	B777	Boeing 777-200/300 (RR RB211 Trent 800)
	B787-8 B787-9 B787-10	Dreamliner	Boeing 787-8/9/10 (GENx)
	B787-8 B787-9 B787-10	Dreamliner	Boeing 787-8/9/10 (RR RB211 Trent 1000)
BOMBARDIER	BD-100-1A10	Challenger 300 Challenger 350	Bombardier BD-100-1A10 (Honeywell AS907)
	BD-700-1A10	Global Express Global 6000 Global 6500	Bombardier BD-700 Series (RRD BR710)
	BD-700-1A11	Global 5000 Global 5000 GVFD Global 5500	Bombardier BD-700 Series (RRD BR710)
	BD-700-2A12	Global 7500	Bombardier BD-700-2A12 (GE Passport 20)
	CL-600-1A11	Challenger 600	Bombardier CL-600-1A11 (Honeywell ALF502)
	CL-600-2A12 (601 Variant)	Challenger 601	Bombardier CL-600-2A12/2B16 (601/601-3A/3R Variant) (GE CF34)
	CL-600-2B16 (601-3A Variant)	Challenger 601-3A	Bombardier CL-600-2A12/2B16 (601/601-3A/3R Variant) (GE CF34)
	CL-600-2B16 (601-3R Variant)	Challenger 601-3R	Bombardier CL-600-2A12/2B16 (601/601-3A/3R Variant) (GE CF34)

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Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
BOMBARDIER	CL-600-2B16 (604 Variant)	Challenger 604 (MSN < 5701) Challenger 605 (5701 ≤ MSN ≤ 5990) Challenger 650 (MSN ≥ 6050)	Bombardier CL-600-2B16 (604 Variant) (GE CF34)
	CL-600-2B19 (RJ Series 100)	Regional Jet Series 100/200/440/ Challenger 850/CRJ SE	Bombardier CL-600-2B19/2C10/2D15/2D24/2E25 (GE CF34)
	CL-600-2C10 (RJ 700/701/702)	Regional Jet Series 700/701/702	Bombardier CL-600-2B19/2C10/2D15/2D24/2E25 (GE CF34)
	CL-600-2D15 (RJ Series 705)	Regional Jet Series 705	Bombardier CL-600-2B19/2C10/2D15/2D24/2E25 (GE CF34)
	CL-600-2D24 (RJ Series 900)	Regional Jet Series 900	Bombardier CL-600-2B19/2C10/2D15/2D24/2E25 (GE CF34)
	CL-600-2E25 (RJ Series 1000)	Regional Jet Series 1000	Bombardier CL-600-2B19/2C10/2D15/2D24/2E25 (GE CF34)
	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)
	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-8-401 DHC-8-402	DHC-8 Series 400	Bombardier DHC-8-400 (PWC PW150)

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Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
CESSNA AIRCRAFT COMPANY	510	Citation Mustang	Cessna 510 (PWC PW615)
	525	Citation Jet (CJ) Citation Jet1 (CJ1) Citation Jet1+ (CJ1+) Citation (M2)	Cessna 525/525A/525B (Williams FJ44)
	525A	Citation Jet CJ2	Cessna 525/525A/525B (Williams FJ44)
	525B	Citation Jet CJ3	Cessna 525/525A/525B (Williams FJ44)
	525C	Citation Jet CJ4	Cessna 525C (Williams FJ44)
	550	Citation Bravo	Cessna 550/560 (PWC PW530/535)
	550	Citation II	Cessna 550/551/560 (PWC JT15D)
	S550	Citation S/II	Cessna 550/551/560 (PWC JT15D)
	551	Citation II	Cessna 550/551/560 (PWC JT15D)
	560	Citation Encore	Cessna 550/560 (PWC PW530/535)
	560	Citation Encore+	Cessna 550/560 (PWC PW530/535)
	560	Citation V	Cessna 550/551/560 (PWC JT15D)
	560	Citation Ultra	Cessna 550/551/560 (PWC JT15D)
	560 XL	Citation Excel Citation XLS Citation XLS+	Cessna 560XL/XLS (PWC PW545)
	650	Citation III Citation VI Citation VII	Cessna 650 (Honeywell TFE731)
	680	Sovereign 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	680A	Latitude	Cessna 680 (PWC PW306)
	750	Citation X	Cessna 750 (RR Corp AE3007C)
CIRRUS Design Corporation	SF50 single engine jet	Vision Jet	CIRRUS SF50 (Williams FJ33)
DASSAULT AVIATION	Falcon 10		Falcon 10 (Honeywell TFE731)
	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)
	Mystère Falcon 50	50	Falcon 50 (Honeywell TFE731)
	Mystère Falcon 50	50EX	Falcon 50EX (Honeywell TFE731)
	Mystère Falcon 900	Falcon 900 Falcon 900B	Falcon 900 (Honeywell TFE731)
	Mystère Falcon 900	F900C	Falcon 900C/EX (Honeywell TFE731)
	Falcon 900EX		Falcon 900C/EX (Honeywell TFE731)
	Falcon 2000		Falcon 2000 (CFE 738)

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Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
DASSAULT AVIATION	Falcon 2000EX		Falcon 2000EX (PWC PW308)
	Falcon 7X	Falcon 7X Falcon 8X	Falcon 7X (PW307)
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	CASA C-212 (Honeywell TPE331)
	CN-235 CN-235-100 CN-235-200 CN-235-300		CASA CN-235 (GE CT7)
EMBRAER	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)
	EMB-505	Phenom 300	Embraer EMB-505 (PWC PW535)

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Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
EMBRAER	EMB-545	Legacy 450	Embraer EMB-545/550 (Honeywell AS907)
	EMB-550	Legacy 500	Embraer EMB-545/550 (Honeywell AS907)
	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)
	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)
	ERJ 190-300	ERJ-190	Embraer ERJ-190 Series (PWC PW1900G)
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	Fellowship	Fokker F28 Series (RRD Spey)

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Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
FOKKER SERVICES	F28 Mark 3000 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	1125 Westwind Astra Astra SPX G100	Gulfstream 100	Gulfstream (IAI) 100/1125/Astra SPX (Honeywell TFE731)
	Gulfstream G150	Gulfstream G150	Gulfstream (IAI) G150 (Honeywell TFE731)
	Gulfstream G280	Gulfstream G280	Gulfstream (IAI) G280 (Honeywell AS907)
	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)
	GVI	G650	Gulfstream GVI (RRD BR725)

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Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
HAWKER BEECHCRAFT	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)

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Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
HAWKER BEECHCRAFT	390	Premier I, 1A	Beech 390 (Williams FJ44)
	400	Beechjet	Beech 400/Mitsubishi MU-300 (PWC JT15)
	400A	Beechjet (Hawker XP)	Beech 400/Mitsubishi MU-300 (PWC JT15)
	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)	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)
	55/55B/55C		Learjet 55 (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		Fairchild SA227 Series (Honeywell TPE331)

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Type Certificate (TC) holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
M7 AEROSPACE	SA227-CC SA227-DC		
	SA227-AC SA227-BC	Swearingen Metro	
NEXTANT AEROSPACE L.L.C. (STC)	400XT 400XTi	NEXTANT 400XT	Beech 400XT Nextant (Williams FJ44)
PILATUS AIRCRAFT	PC-12 PC-12/45 PC-12/47 PC-12/47E		Pilatus PC-12 (PWC PT6)
	PC-24		Pilatus PC-24 (Williams FJ44)
SAAB AB, SAAB Aerosystems	340A(SF340A) 340B	Saab-Fairchild 340A	Saab (SF) 340 (GE CT7)
SHORT BROTHERS	SD3-30 SD3-60 SD3-SHERPA SD3-60 SHERPA	Variant 200	Shorts SD3 Series-30/SD3-60 (PWC PT6)
VIKING AIR	CL-215-6B11 (CL-215T Variant)		Canadair CL-215 (PWC PW120)
NA	Various		Small/non-rated aircraft (Avco Lycoming T53) ^{Note 1}
NA	Various		Small/non-rated aircraft (Bristol Siddeley Viper B/S) ^{Note 1}
NA	Various		Small/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/non-rated aircraft (Honeywell TPE331) ^{Note 1}
NA	Various		Small/non-rated aircraft (PWC JT15D) ^{Note 1}
NA	Various		Small/non-rated aircraft (PWC PT6) ^{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/non-rated aircraft (Rolls Royce Avon) ^{Note 1}
NA	Various	Allison 250	Small/non-rated aircraft (RR Corp 250) ^{Note 1}
NA	Various	General Electric H80	Small/non-rated aircraft (Walter M601) ^{Note 1, Note 2}
NA	Various		Small/non-rated aircraft (Williams FJ44) ^{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.

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 Walter M601 engine rating) also applies for the M601H-80 engine now designated by the manufacturer as the GE Aviation Czech H80.

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 grant of type rating on the relevant licence category.

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}
BOEING COMPANY (THE)	B757-200 B757-200PF B757-300	B757	Boeing 757-200/300 (RR RB211) ^{Note 4}
CESSNA AIRCRAFT COMPANY	510	Citation Mustang	Cessna 510 (PWC PW615) ^{Note 4}
	525	Citation Jet (CJ) Citation Jet1 (CJ1) Citation Jet1+ (CJ1+) Citation (M2)	Cessna 525/525A/525B (Williams FJ44) ^{Note 3}
	525A	Citation Jet CJ2	Cessna 525/525A/525B (Williams FJ44) ^{Note 3}
	525B	Citation Jet CJ3	Cessna 525/525A/525B (Williams FJ44) ^{Note 3}
	650	Citation III Citation VI Citation VII	Cessna 650 (Honeywell TFE731) ^{Note 3}
CIRRUS Design Corporation	SF50 single engine jet	Vision Jet	CIRRUS SF50 (Williams FJ33)
EMBRAER	EMB-120 EMB-120RT EMB-120ER	Brasilia	Embraer EMB-120 (PWC PW110 Series) ^{Note 1, Note 3}
	EMB-135ER EMB-135LR		Embraer EMB-135/145 (RR Corp AE3007A) ^{Note 4}
	EMB-145ER EMB-145LR		Embraer EMB-135/145 (RR Corp AE3007A) ^{Note 4}

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TC holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
EMBRAER	EMB-505	Phenom 300	Embraer EMB-505 (PWC PW535) ^{Note 4}
	ERJ 170-100 LR	ERJ-170	Embraer ERJ-170 Series (GE CF34) ^{Note 4}
Hawker Beechcraft	1900 1900C 1900D	Airliner	Beech 1900 (PWC PT6)
	B300	Super King Air 350	Beech 300 Series (PWC PT6) ^{Note 4}
M7 AEROSPACE	SA226-T SA226-TC SA226-AT SA226-T(B)		Fairchild SA226 Series (Honeywell TPE331) ^{Note 1}
NA	Various		Small/non-rated aircraft (Bristol Siddeley Viper B/S) ^{Note 2}
NA	Various		Small/non-rated aircraft (De Havilland Goblin 35) ^{Note 2}
NA NA	Various	Allison 250	Small/non-rated aircraft (RR Corp 250)
NA	Various		Small/non-rated aircraft (Rolls Royce Avon) ^{Note 2}
<p>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</p> <p>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” (the <i>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> <p>Note 3 This is a rule. AMO training for an aircraft type that is identified in column 4 by the label “Note 3” is approved for practical training only.</p> <p>Note 4 This is a rule. AMO training for an aircraft type that is identified in column 4 by the label “Note 4” is approved for OJT training only.</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 grant of type rating on the relevant licence category.

Part 2 — Helicopters eligible for AMO controlled or delivered type training

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)
AGUSTA WESTLAND	A109E A109N A109S AW109SP		Agusta A109 Series (PWC PW206/207) Note 7
	AB139 AW139		Agusta AB139/AW139 (PWC PT6) Note 7
	AW189		AW189 (GE CT7) Note 7
AIRBUS HELICOPTERS	AS355 E AS355 F AS355 F1 AS355 F2		Eurocopter AS 355 (RR Corp 250) Note 1
AIRBUS HELICOPTERS 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) Note 3
	EC 135 P1 EC 135 P2 EC 135 P2 + EC 135 P3 EC 635 P2+ EC 635 P3		Eurocopter EC 135 (PWC PW206) Note 3
	EC 135 T1 EC 135 T2 EC 135 T2+		Eurocopter EC 135 (Turbomeca Arrius 2B) Note 3, Note 6

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TC holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
AIRBUS HELICOPTERS DEUTSCHLAND GmbH	EC 135 T3 EC 635 T1 EC 635 T2+ EC 635 T3		
	MBB-BK 117 A Series MBB-BK 117 B Series		Eurocopter MBB-BK 117 A/B (Honeywell LTS 101) Note 1, Note 3
	MBB-BK 117 C1		Eurocopter MBB-BK 117 C1 (Turbomeca Arriel 1) Note 1, Note 3
	MBB-BK 117 C2	EC145	Eurocopter MBB-BK 117 C2 (Turbomeca Arriel 1) Note 1, Note 3, Note 6
	MBB-BK 117 D2 MBB-BK 117 D3	EC145 T2 H145	Eurocopter MBB-BK 117 D2 (Turbomeca Arriel 2) Note 1, Note 3
BELL HELICOPTER CANADA	222 222B 222U		Bell 222 (Honeywell LTS 101) Note 1, Note 2
	230	Executive/Utility/ EMS	Bell 230 (RR Corp 250) Note 2
	427		Bell 427 (PWC PW207D) Note 1, Note 2, Note 6
	430		Bell 430 (RR Corp 250) Note 2, Note 6
	429		Bell 429 (PWC PW207D) Note 1, Note 3
BELL HELICOPTER TEXTRON, INC	222SP		Bell 222 (RR Corp 250) Note 2
ERICKSON INCORPORATED,	S-64		Erickson S-64 (PW JFTD 12) Note 1, Note 3

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TC holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
DBA Erickson Air-Crane			
MD HELICOPTERS INC	MD900		MD Helicopters MD900 (PWC PW206/207) Note 1, Note 2, Note 3
PICKERING AVIATION INC	EH-60A UH-60A	GE T700(CT7)	S-70 Series EH-60A/UH-60A (T700-GE-700 Series)
SIKORSKY AIRCRAFT	S-58 BT to JT		Sikorsky S-58 (PWC PT6T) Note 1, Note 3
SIKORSKY AIRCRAFT	S-70A S-70B S-70C	GE T700(CT7)	S-70 Series EH-60A/UH-60A (T700-GE-700 Series)
	S-92A		Sikorsky S-92A (GE CT7-8) Note 7
NA	Various		Small/non-rated aircraft (Avco Lycoming T5508)
NA	Various	Allison 250	Small/non-rated aircraft (RR Corp 250) Note 4, Note 5
NA	Various		Small/non-rated aircraft (Honeywell LTS101) Note 4
NA	Various		small/non-rated aircraft (Honeywell TPE331) Note 1

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TC holder	Aircraft type (aeroplanes)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
<p><i>Note 1</i> 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.</p> <p><i>Note 2</i> 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.</p> <p><i>Note 3</i> 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.</p> <p><i>Note 4</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 4” (the <i>endorsement</i>) 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.</p> <p><i>Note 5</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 5” (that is the RR Corp 250 engine rating) also applies for the RR250-C300/A1 engine, sometimes referred to as the RR300.</p> <p><i>Note 6</i> For information regarding category B2 theory/practical training, please consult CASA Maintenance Personnel Licensing (MPL) section.</p> <p><i>Note 7</i> This is a rule. AMO training for an aircraft type that is identified in column 4 by the label “Note 7” is approved for OJT training only.</p>			

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 category B1.1 licence holder with the small/non-rated aircraft (engine) rating. A category B2 licence 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}
DE HAVILLAND CANADA	DHC-4	Caribou	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}
<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 <i>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 5

Note These are multi-engine helicopters (turbine powered), requiring type training and endorsement of type rating on the relevant licence category, and turbine engines that can be fitted to those helicopters. The small/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)
AGUSTA	AS61N AS61NI		Agusta AS61N/Sikorsky S-61N (GE CT58)
AGUSTAWESTLAND	A109E A109N A109S AW109SP		Agusta A109 Series (PWC PW206/207)
	A109 A109A A109AII A109C		Agusta A109 Series (RR Corp 250)

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TC holder	Aircraft type (helicopters)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
AGUSTAWESTLAND	A109K2		Agusta A109 (Turbomeca Arriel 1)
	A109E A109LUH		Agusta A109 Series (Turbomeca Arrius 2)
	AB139 AW139		Agusta AB139/ AW139 (PWC PT6)
	AW169		AW169 (PWC 210)
	AW189		AW189 (GE CT7)
	AB 212		Bell 212/ Agusta AB212 (PWC PT6)
BELL HELICOPTER TEXTRON, INC	212		Bell 212/ Agusta AB212 (PWC PT6)
	214ST		Bell 214ST (GE CT7)
	412 412EP 412CF		Bell 412/ Agusta AB412 (PWC PT6)
AGUSTA	AB412 AB412 EP		
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)
	427		Bell 427 (PWC PW207D)
	429		Bell 429 (PWC PW207D)
	430		Bell 430 (RR Corp 250)

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TC holder	Aircraft type (helicopters)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
AIRBUS HELICOPTERS	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 175B		Eurocopter EC 175 (PWC PT6C)
	EC 225 LP		Eurocopter EC 225 (Turbomeca Makila 2A)
	AIRBUS HELICOPTERS 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	

TC holder	Aircraft type (helicopters)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
AIRBUS HELICOPTERS DEUTSCHLAND GmbH	EC 135 P1 EC 135 P2 EC 135 P2+ EC 135 P3 EC 635 P2+ EC 635 P3		Eurocopter EC 135 (PWC PW206)
	EC 135 T1 EC 135 T2 EC 135 T2+ EC 135 T3 EC 635 T1 EC 635 T2+ EC 635 T3		Eurocopter EC 135 (Turbomeca Arrius 2B)
	EC 135 P3H		AIRBUS HELICOPTERS EC135 P3H (PWC PW206)
	MBB-BK 117 A Series MBB-BK 117 B Series		Eurocopter MBB-BK 117 A/B (Honeywell LTS 101) ^{Note 2}
	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}
	MBB-BK 117 D2 MBB-BK 117 D3	EC145 T2 H145	Eurocopter MBB-BK 117 D2 (Turbomeca Arriel 2) ^{Note 2}
ERICKSON INCORPORATED, DBA Erickson Air-Crane	S-64		Erickson S-64 (PW JFTD 12) ^{Note 1, Note 3}
MD HELICOPTERS INC	MD900		MD Helicopters MD900 (PWC PW206/207)

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TC holder	Aircraft type (helicopters)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
PICKERING AVIATION INC	EH-60A UH-60A	GE T700(CT7)	S-70 Series EH-60A/UH-60A (T700-GE-700 Series)
SIKORSKY AIRCRAFT	S-58 BT to JT		Sikorsky S-58 (PWC PT6T)
	S-61N S-61NM		Agusta AS61N/Sikorsky S-61N (GE CT58)
	S-70A S-70B S-70C	GE T700(CT7)	S-70 Series EH-60A/UH-60A (T700-GE-700 Series)
	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)
	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)

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TC holder	Aircraft type (helicopters)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
NA	Various		Small/non-rated aircraft (Avco Lycoming T53) ^{Note 1}
NA	Various		Small/non-rated aircraft (GE CT58) ^{Note 1}
NA	Various		Small/non-rated aircraft (Honeywell LTS 101) ^{Note 1}
NA	Various		Small/non-rated aircraft (Honeywell TPE331) ^{Note 1}
NA	Various		Small/non-rated aircraft (Lycoming T5508) ^{Note 1}
NA	Various		Small/non-rated aircraft (PWC PT6) ^{Note 1}
NA	Various	Allison 250	Small/non-rated aircraft (RR Corp 250) ^{Note 1, Note 3}
NA	Various		Small/non-rated aircraft (Turbomeca Arriel) ^{Note 1}
NA	Various		Small/non-rated aircraft (Turbomeca Arrius) ^{Note 1}
NA	Various		Small/non-rated aircraft (Turbomeca Artouste) ^{Note 1}

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TC holder	Aircraft type (helicopters)	Commercial designation	Type rating endorsement (aircraft type – engine in brackets)
NA	Various		Small/non-rated aircraft (Turbomeca Astazou) ^{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 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.</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 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.</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 RR Corp 250 engine rating) also applies for the RR250-C300/A1 engine, sometimes referred to as the RR300.</p>			

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	—
MOS 66 2015 Amendment No. 1	26 June 2015 (see F2015L00945)	27 June 2015	—
MOS 66 2016 Amendment No. 1	22 January 2016 (see F2016L00066)	23 January 2016	—
MOS 66 2016 Amendment No. 2	29 March 2016 (see F2016L00390)	30 March 2016	—
MOS 66 2016 Amendment No. 4	2 May 2016 (see F2016L00612)	2 May 2016	—
MOS 66 2016 Amendment No. 5	29 August 2016 (see F2016L01357)	29 August 2016	S. 3 (see Table A)
MOS 66 2017 Amendment No. 1	26 June 2017 (see F2017L00750)	26 June 2017	—
MOS 66 2017 Amendment No. 2	3 October 2017 (see F2017L01313)	4 October 2017	—
MOS 66 2017 Amendment No. 3	3 November 2017 (see F2017L01421)	4 November 2017	—
MOS 66 2018 Amendment No. 1	21 May 2018 (see F2018L00640)	22 May 2018	S. 66.A.100
MOS 66 2018 Amendment No. 2	16 November 2018 (see F2018L01577)	17 November 2018	—
MOS 66 2019 Amendment No. 2	1 November 2019 (see F2019L01413)	2 November 2019	—
MOS 66 2020 Amendment No. 1	3 July 2020 (see F2020L00874)	4 July 2020	—
MOS 66 2020 Amendment No. 2	14 July 2020 (see F2020L00908)	15 July 2020	—
MOS 66 2020 Amendment No. 3	24 December 2020 (see F2020L01710)	25 December 2020	—
MOS 66 2021 Amendment No. 1	13 May 2021 (see F2021L00568)	14 May 2021	—

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Year and number	Date of registration on FRLI	Date of commencement	Application, saving or transitional provisions
MOS 66 2021 Amendment No. 2	4 January 2022 (see F2022L00007)	5 January 2022	—
MOS 66 Amendment Instrument 2023	6 July 2023 (see F2023L00985)	7 July 2023	—
Part 66 Manual of Standards and Part 147 Manual of Standards Amendment Instrument 2023 (No. 1)	4 December 2023 (see F2023L01613)	5 December 2023	—

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
Part 1 heading	ad. MOS 66 2016 No. 5
MOS title.....	rep. MOS 66 2011 No. 2
Part 2 heading	ad. MOS 66 2016 No. 5
s. 66.1B	rep. <i>Legislation Act 2003</i> , s. 48D
s. 66.5.....	am. MOS 66 2011 No. 2, MOS 66 2012 No. 2, MOS 66 2013 No. 1, MOS 66 2014 No. 1, MOS 66 2015 No. 1, MOS 66 2016 No. 1, MOS 66 2016 No. 5, F2021L00568, F2023L01613
s. 66.6.....	ad. F2021L00568
s. 66.A.1	am. MOS 66 2014 No. 1, MOS 66 2016 No. 1
s. 66.A.4	am. MOS 66 2016 No. 5, F2020L01710
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, MOS 66 2016 No. 1, MOS 66 2016 No. 5, MOS 66 2017 No. 3, F2020L00874, F2021L00568, F2023L01613
s. 66.A.21	ad. MOS 66 2014 No. 1, MOS 66 2016 No. 1, MOS 66 2016 No. 5
s. 66.A.23	am. MOS 66 2014 No. 1, MOS 66 2016 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, MOS 66 2015 No. 1, MOS 66 2016 No. 1, MOS 66 2016 No. 5, F2020L00874, F2021L00568, F2022L00007, F2023L01613
s. 66.A.30	am. MOS 66 2012 No. 2, MOS 66 2013 No. 1, MOS 66 2014 No. 1, MOS 66 2015 No. 1, MOS 66 2016 No. 1, F2020L00874, F2021L00568, F2023L01613
s. 66.A.35	ad. F2023L01613
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, MOS 66 2015 No. 1, MOS 66 2016 No. 1, MOS 66 2016 No. 5, F2020L00874, F2021L00568

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Table of Amendments

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

Provision affected	How affected
s. 66.A.50	am. MOS 66 2012 No. 2, MOS 66 2013 No. 1
s. 66.A.55	am. MOS 66 2012 No. 2, MOS 66 2013 No. 1, MOS 66 2014 No. 1, MOS 66 2016 No. 5, F2021L00568
s. 66.A.56	ad. MOS 66 2015 No. 1
s. 66.A.57	ad. MOS 66 2015 No. 1
s. 66.A.58	ad. MOS 66 2015 No. 1 am. MOS 66 2017 No. 1, F2020L00874
s. 66.A.70	am. MOS 66 2016 No. 1, F2023L01613
s. 66.A.100	ad. MOS 66 2018 No. 1
Appendix I.....	am. MOS 66 2011 No. 2, MOS 66 2012 No. 2, MOS 66 2013 No. 1, MOS 66 2016 No. 1, MOS 66 2018 No. 2, F2021L00568, F2023L01613
Appendix II.....	am. MOS 66 2011 No. 2, MOS 66 2012 No. 2, F2021L00568, F2023L01613
Appendix III.....	am. MOS 66 2011 No. 2, MOS 66 2012 No. 2, MOS 66 2013 No. 1, MOS 66 2016 No. 1
Appendix IV	am. MOS 66 2012 No. 1, MOS 66 2013 No. 1, MOS 66 2014 No. 1, MOS 66 2016 No. 1, MOS 66 2018 No. 1, MOS 66 2018 No. 2, MOS 66 2019 No. 1, F2023L01613 rs. MOS 66 2016 No. 5
Appendix V	rs. MOS 66 2011 No. 2
Appendix VI	rs. MOS 66 2011 No. 2
Appendix VII	am. MOS 66 2011 No. 2, MOS 66 2016 No. 1, MOS 66 2016 No. 5 rs. F2023L01613
Appendix VIII	ad. MOS 66 2013 No. 1 am. MOS 66 2016 No. 1 rs. MOS 66 2016 No. 5 am. MOS 66 2018 No. 2, F2020L00908, F2023L01613
Appendix IX	ad. MOS 66 2014 No. 1 am. MOS 66 2016 No. 1, MOS 66 2016 No. 2, MOS 66 2016 No. 4, MOS 66 2016 No. 5, MOS 66 2017 No. 1, MOS 66 2017 No. 2, MOS 66 2017 No. 3, MOS 66 2018 No. 1, MOS 66 2018 No. 2, MOS 66 2019 No. 1, F2020L00908, F2020L01710, F2022L00007, F2023L00985

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.

Part 66 Manual of Standards Amendment Instrument 2015 (No. 5)

3 Transitional

If:

- (a) immediately before the commencement day, a person was entitled to a unit of competency mentioned in Appendix IV or VIII of the Part 66 Manual of Standards; and
- (b) on the commencement day this instrument replaces the unit with a new version of the unit;

then the applicant is entitled to the new unit.