Proposal for a

COMMISSION REGULATION (EC) No …/…

of […]

amending Commission Regulation (EC) No 2042/2003 on the continuing airworthiness of aircraft and aeronautical products, parts and appliances, and on the approval of organisations and personnel involved in these tasks

(Text with EEA relevance)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

Having regard to Regulation (EC) No 216/2008 of the European Parliament and of the Council of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC[1] ("the Basic Regulation"), and in particular Articles 5 and 6 thereof,

Having regard to Commission Regulation (EC) No 2042/2003 of 20 November 2003 on the continuing airworthiness of aircraft and aeronautical products, parts and appliances, and on the approval of organisations and personnel involved in these tasks[2],

Whereas:

(1) Regulation (EC) No 2042/2003 already establishes in its Annex III (Part-66) a licensing system for certifying staff;

(2) During the revision of Part-M for aircraft not involved in commercial air transport (task M.017) and also as a result of the consultation performed through A-NPA 14/2006, a significant number of stakeholders expressed their concern about the fact that the current licensing system was not adapted to the lower complexity of General Aviation aircraft;

(3) The Agency has found that this can be solved by the introduction of aircraft maintenance licences with lower qualification requirements for the lower category of aircraft;

(4) The Agency has found that, at the same time, the creation of these licences will also standardise the licensing system for saiplanes, balloons and airships, which currently are covered under national rules;

(5) The Agency has found it necessary to introduce appropriate transitional measures and conversion provisions in order to ensure a smooth transition from the existing national systems;

(6) The measures provided for in this Regulation are based on the opinion issued by the Agency[3] in accordance with Articles 17(2)(b) and 19(1) of the Basic Regulation;

[1] OJ L 79, 19.03.2008, p.1.
[2] OJ L 315, 28.11.2003, p. 1. Regulation as last amended by Commission Regulation (EC) No 1056/2008 of 27 October 2008 (OJ L 283, 28.10.2008).
[3] Opinion 04/2009.

(7) The measures provided for in this Regulation are in accordance with the opinion[4] of the European Aviation Safety Agency Committee established by Article 65 of the Basic Regulation;

(8) The Commission Regulation (EC) No 2042/2003 should therefore be amended accordingly;

HAS ADOPTED THIS REGULATION:

Article 1

Commission Regulation (EC) No 2042/2003 is amended as follows:

1) In Article 7 the following paragraphs 7 and 8 are added:

7. Reserved.

8. By way of derogation from paragraph 1, for sailplanes, powered sailplanes and balloons, and for those airships covered by the L licence in accordance with 66.A.1(d), certifying staff may continue to be qualified in accordance with the relevant Member State regulation and exercise the corresponding privileges until **(INCLUDE DATE 3 YEARS AFTER ENTRY INTO FORCE OF THIS AMENDING REGULATION)**.

Article 2

Annexes II (Part-145), III (Part-66) and IV (Part-147) to Regulation (EC) No 2042/2003 are amended in accordance with the Annex to this Regulation:

Article 3
Entry into force

This Regulation shall enter into force on the day following that of its publication in the *Official Journal of the European Union.*

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels,

For the Commission

Member of the Commission

[4] (To be issued)

Annex

The Annexes to Regulation (EC) No 2042/2003 are amended as follows:

A) Annex II (Part-145) to Regulation (EC) No 2042/2003 is amended as follows:

1) In point 145.A.30, paragraphs (f), (g) and (h) are amended as follows:

145.A.30 Personnel requirements

…

(f) The organisation shall ensure that personnel who carry out and/or control a continued airworthiness non-destructive test of aircraft structures and/or components are appropriately qualified for the particular non-destructive test in accordance with the European or equivalent Standard recognised by the Agency. Personnel who carry out any other specialised task shall be appropriately qualified in accordance with officially recognised standards. By derogation to this paragraph those personnel specified in paragraph (g) and (h)(1) and (h)(2), qualified in Part-66 category B1 or B3 may carry out and/or control colour contrast dye penetrant tests.

(g) Any organisation maintaining aircraft, except where stated otherwise in paragraph (j), shall in the case of aircraft line maintenance, have appropriate aircraft ~~type~~ rated certifying staff qualified as category B1, ~~and~~ B2, B3 and/or L, as appropriate, in accordance with Part-66 and 145.A.35.

In addition such organisations may also use appropriately task trained certifying staff qualified as category A in accordance with Part-66 and 145.A.35 to carry out minor scheduled line maintenance and simple defect rectification. The availability of such category A certifying staff shall not replace the need for Part-66 category B1, ~~and~~ B2 and/or B3 certifying staff, as appropriate, to support the category A certifying staff. However, such Part-66 category B1, ~~and~~ B2 and/or B3 staff need not always be present at the line station during minor scheduled line maintenance or simple defect rectification.

(h) Any organisation maintaining aircraft, except where stated otherwise in paragraph (j) shall:

…

2. in the case of base maintenance of aircraft other than large aircraft have either:

(i) appropriate aircraft ~~type~~ rated certifying staff qualified as category B1, ~~and~~ B2, B3 and/or L, as appropriate, in accordance with Part-66 and 145.A.35 or,

(ii) appropriate aircraft ~~type~~ rated certifying staff qualified in category C assisted by B1, ~~and~~ B2, B3 and/or L support staff, as appropriate, as specified in paragraph (1).

…

2) Point 145.A.35 is amended as follows:

145.A.35 Certifying staff and category B1, ~~and~~ B2, B3 and L support staff

(a) In addition to the appropriate requirements of 145.A.30(g) and (h), the organisation shall ensure that certifying staff and category B1, ~~and~~ B2, B3 and L support staff have an adequate understanding of the relevant aircraft and/or components to be maintained together with the associated organisation procedures. In the case of certifying staff, this must be accomplished before the issue or re-issue of the certification authorisation.

'Category B1, ~~and~~ B2, B3 and L support staff' means those category B1, ~~and~~ B2, B3 and L staff in the base maintenance environment who do not hold necessarily certification privileges. 'Relevant aircraft and/or components', means those aircraft or components specified in the particular certification authorisation. 'Certification authorisation' means the authorisation issued to certifying staff by the organisation and which specifies the fact that they may sign certificates of release to service within the limitations stated in such authorisation on behalf of the approved organisation.

(b) …

(c) The organisation shall ensure that all certifying staff and category B1, ~~and~~ B2, B3 and L support staff are involved in at least six months of actual relevant aircraft or component maintenance experience in any consecutive two year period. For the purpose of this paragraph 'involved in actual relevant aircraft or component maintenance' means that the person has worked in an aircraft or component maintenance environment and has either exercised the privileges of the certification authorisation and/or has actually carried out maintenance on at least some of the aircraft type or aircraft group systems specified in the particular certification authorisation.

(d) The organisation shall ensure that all certifying staff and category B1, ~~and~~ B2, B3 and L support staff receive sufficient continuation training in each two year period to ensure that such staff has up-to-date knowledge of relevant technology, organisation procedures and human factor issues.

(e) The organisation shall establish a programme for continuation training for certifying staff and category B1, ~~and~~ B2, B3 and L support staff, including a procedure to ensure compliance with the relevant paragraphs of 145.A.35 as the basis for issuing certification authorisations under this Part to certifying staff, and a procedure to ensure compliance with Part 66.

(f) …

(g) …

(h) …

(i) …

(j) The organisation shall maintain a record of all certifying staff and category B1, ~~and~~ B2, B3 and L support staff.

The staff records shall contain:

1. details of any aircraft maintenance licence held under Part-66;

2. all relevant training completed

3. the scope of the certification authorisations issued, where relevant, and

4. particulars of staff with limited or one-off certification authorisations.

The organisation shall retain the record for at least two years after the certifying staff or B1,~~or~~ B2, B3 or L support staff has ceased employment with the organisation or as soon as the authorisation has been withdrawn. In addition, upon request, the maintenance organisation shall furnish certifying staff with a copy of their record on leaving the organisation.

The certifying staff shall be given access on request to their personal records as detailed above.

(k) …

(l) …

(m)The minimum age for certifying staff and category B1, ~~and~~ B2, B3 and L support staff is 21 years.

3) Point 145.A.70 is amended as follows:

145.A.70 Maintenance organisation exposition

(a) «Maintenance organisation exposition» means the document or documents …

…

6. a list of certifying staff and B1, ~~and~~ B2, B3 and L support staff;

…

B) Annex III (Part-66) to Regulation (EC) No 2042/2003 is amended as follows:

4) The title of Section A, Subpart A is amended as follows:

SECTION A

SUBPART A

AIRCRAFT MAINTENANCE LICENCE ~~AEROPLANES AND HELICOPTERS~~

5) Point 66.A.1 is amended as follows:

66.A.1 Scope

(a) This section establishes the requirements for the issue of an aircraft maintenance licence and conditions of its validity and use, within ~~for aeroplanes and helicopters of~~ the following categories:

— Category A

— Category B1

— Category B2

— Category B3

— Category C

— Category L

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

— A1 and B1.1 Aeroplanes Turbine

— A2 and B1.2 Aeroplanes Piston

— A3 and B1.3 Helicopters Turbine

— A4 and B1.4 Helicopters Piston

(c) Category B3 is applicable to piston-engine non-pressurized aeroplanes of 2000 Kg MTOM and below;

(d) Category L is applicable to any of the following aircraft:

- Aeroplanes with MTOM less than 1000 Kg, sailplanes and powered sailplanes
- Balloons
- Hot-air airships
- Manned gas airships meeting all the following elements:
  - (i) 3% maximum static heaviness
  - (ii) Non vectored thrust (except reverse thrust)
  - (iii) Conventional and simple design of:
    - Structure
    - Control system
    - Ballonet system
  - (iv) Non power-assisted controls

Category L is subdivided into the following levels:

— Limited-L

— Full-L

Each one of these levels is further divided in the following ratings:

— Ratings for the Limited-L licence:

- Wooden airframe
- Composite airframe
- Metal airframe
- Powerplant
- Hot air Balloons
- Gas Balloons
- Hot air Airships
- Gas Airships

— Ratings for the Full-L licence:

- Wooden aircraft
- Composite aircraft
- Metal aircraft
- Wooden sailplanes
- Composite sailplanes
- Metal sailplanes
- Hot air Balloons
- Gas Balloons
- Hot air Airships
- Gas Airships
- Radio-Comm/Transponder

"The ratings "wooden airframe", "wooden aircraft" and "wooden sailplane" also cover the combination of wooden structures with metal tube and fabric".

The levels and ratings described above shall be endorsed on the Part-66 aircraft maintenance licence, as applicable.

6) Point 66.A.20 is amended as follows:

66.A.20 Privileges

(a) Subject to compliance with paragraph (b), the following privileges shall apply:

1. …

2. ….

3. …

4. A category B3 aircraft maintenance licence shall permit the holder to issue certificates of release to service following maintenance, including aeroplane structure, powerplant and mechanical and electrical systems. Certification of work on avionic systems requiring only simple tests to prove their serviceability and not requiring troubleshooting shall also be included in the privileges.

5. A category L aircraft maintenance licence shall permit the holder the following:

- For the Limited-L licence:
  - For the "powerplant" rating: issue certificates of release to service following maintenance on the powerplant.
  - For all the other ratings: issue certificates of release to service following maintenance on aircraft structure, mechanical and electrical systems as well as maintenance on avionic systems requiring only simple tests to prove their serviceability and not requiring troubleshooting.
- For the Full-L licence:
  - For the "Radio-Comm/Transponder" rating: issue certificates of release to service following maintenance on radio, communication and transponder systems.
  - For all the other ratings: issue certificates of release to service following maintenance on aircraft structure, powerplant, mechanical and electrical systems as well as maintenance on avionic systems requiring only simple tests to prove their serviceability and not requiring troubleshooting.

The Limited-L aircraft maintenance licence does not allow the issuance of a certificate of release to service after inspections with an interval higher than 100 hours / annual or after implementation of major repairs and major modifications. These are privileges of the Full-L aircraft maintenance licence holder.

The Full-L licence shall automatically include the Limited-L licence.

~~4.~~ 6. …

(b) …

7) Point 66.A.25 is amended as follows:

66.A.25 Basic knowledge requirements

(a) An applicant for an aircraft maintenance licence, other than an L licence, or the addition of a category or subcategory to such an aircraft maintenance licence shall demonstrate, by examination, a level of knowledge in the appropriate subject modules in accordance with Appendix I to this Part.

The basic knowledge examinations shall be conducted by a training organisation appropriately approved under Part-147 or by the competent authority.

(b) An applicant for an L aircraft maintenance licence shall comply with the basic training and examination requirements described in Appendixes VII and VIII to this Part. Basic training courses shall be conducted by appropriately approved Part-147 maintenance training organisations or as approved by the competent authority. Examinations shall be conducted by appropriately approved Part-147 maintenance training organisations, by the competent authority or as approved by the competent authority.

(c) By derogation to paragraph (b), an applicant for a Limited-L aircraft maintenance license may replace the training requirements of paragraph (b) by the experience requirements described in 66.A.30(a)6(ii). Examination in accordance with 66.A.25(b) is still required.

(d) The holder of a B1.2 or a B3 licence is considered to meet the basic knowledge requirements for a Full-L licence with the ratings "wooden aircraft", "composite aircraft" and "metal aircraft".

~~(b)~~ (e) …

8) Point 66.A.30 is amended as follows:

66.A.30 Experience requirements

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

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

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

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

   (iii) one year of practical maintenance experience on operating aircraft and completion of a Part-147 approved basic training course.

2. …

3. …

4. for category C with respect to ~~non large~~ other than large aircraft:

   three years of experience exercising category B1 or ~~B.2~~ B2 privileges on ~~non large~~ other than large aircraft or as Part-145 B1 or ~~B.2~~ B2 support staff, or a combination of both; or

5. …

6. for Limited-L, a sufficient period of time of practical maintenance experience being involved with a representative cross-section of maintenance activities relevant to the ratings applied for. This period shall not be less than:

   (i) six months for applicants qualified under 66.A.25(b).

   (ii) one year for applicants qualified under 66.A.25(c).

7. for Full-L, one year of practical maintenance experience exercising the Limited-L privileges covering a representative cross-section of maintenance activities in the corresponding rating, except that for the inclusion of an additional rating on an existing Full-L licence it is only required the completion of the corresponding training and examination in accordance with Appendixes VII and VIII and the practical experience required in paragraph 6(i) above.

8. The holder of a B1.2 or a B3 licence is considered to meet the experience requirements for a Full-L licence with the ratings "wooden aircraft", "composite aircraft" and "metal aircraft" as long as the B1.2 / B3 licence does not contain a limitation on the corresponding structure material.

b) …

(c) For category A, B1, ~~and~~ B2 and B3 the experience must be practical which means being involved with a representative cross section of maintenance tasks on aircraft.

(d) …

(e) …

9) In point 66.A.45 the following paragraphs (i) and (j) are added:

66.A.45 Type / task training, ~~and~~ ratings and rating limitations

…

(i) The holder of a category B3 aircraft maintenance licence may only exercise certification privileges when the aircraft maintenance licence has been endorsed with the rating *"piston-engine non-pressurized aeroplanes of 2000 Kg MTOM and below"*. This rating shall be granted following demonstration of practical experience which shall include a representative cross-section of maintenance activities relevant to the licence category.

Unless the applicant provides evidence of appropriate experience, the rating granted shall be subject to the following limitations, which shall be endorsed on the licence:

- wooden structure aeroplanes,
- aeroplanes with metal tubing structure covered with fabric,
- metal structure aeroplanes,
- composite structure aeroplanes.

These limitations are exclusions from the certification privileges and affect the aeroplane in its entirety. Nevertheless, the holder of a B3 licence is entitled to issue certificates of release to service for M.A.803(b) Pilot-owner maintenance tasks on piston-engine non-pressurized aeroplanes of 2000 Kg MTOM and below, regardless of the limitations endorsed on the licence.

Limitations shall be removed following demonstration of appropriate experience or after a satisfactory practical assessment performed by the competent authority. .

(j) The holder of a category L aircraft maintenance licence may only exercise certification privileges when the aircraft maintenance licence has been endorsed with the appropriate ratings described in 66.A.1(d).

10) Point 66.A.100 is amended as follows:

66.A.100 General

~~Until such time as this Part specifies a requirement for certifying staff of aircraft other than aeroplanes and helicopters, the relevant Member State regulation shall apply.~~

For those airships not covered by the L licence in accordance with 66.A.1(d), the relevant Member State regulation shall apply.

For aircraft other than aeroplanes and helicopters, work on avionic systems may be released under the relevant Member State regulation.

11) Point 66.B.100 is amended as follows:

66.B.100 Procedure for the issue of an aircraft maintenance licence by the competent authority

...

(b) The competent authority shall verify an applicant's examination status and/or confirm the validity of any credits to ensure that all required modules of applicable Appendix I or VII have been met as required by this Part.

...

12) Point 66.B.110 is amended as follows:

66.B.110 Procedure for the amendment of an aircraft maintenance licence to include an additional basic category or subcategory or level

(a) In addition to the documents required under 66.B.100 or 66.B.105, as appropriate, the applicant for additional basic categories or subcategories to an aircraft maintenance licence or for a change of level for an L licence, shall submit his/her current original aircraft maintenance licence to the competent authority together with EASA Form 19.

(b) At the completion of the procedure as specified in 66.B.100 or 66.B.105, the competent authority shall endorse the additional basic category or subcategory or level on the aircraft maintenance licence by stamp and signature or reissue the licence. The competent authority file shall be amended accordingly.

…

13) Point 66.B.115 is amended as follows:

66.B.115 Procedure for the amendment of an aircraft maintenance licence to include an aircraft ~~type or group~~ rating and to remove rating limitations

On receipt of a satisfactory EASA Form 19 and any supporting documentation demonstrating compliance with the requirements of the applicable ~~type~~ rating ~~and/or group rating requirements~~ ~~and~~ together with the accompanying aircraft maintenance licence, the competent authority shall either endorse the applicant's aircraft maintenance licence with the applicable aircraft ~~type or group~~ rating or reissue the said licence to include the applicable aircraft ~~type or group~~ rating or to remove the applicable limitations. The competent authority file shall be amended accordingly.

Limitations other than those coming from 66.A.70 conversions shall be removed following demonstration of appropriate experience or after a satisfactory practical assessment performed by the competent authority

14) Point 66.B.200 is amended as follows:

66.B.200 Examination by the competent authority

…

(c) Basic examinations shall follow the standard specified in Appendix I and II to this Part for category A, B1, B2, B3 and Appendix VII and VIII for category L.

…

15) Point 66.B.405 is amended as follows:

66.B.405 Examination credit report

(a) For each technical qualification concerned the report shall identify the subject matter and knowledge levels contained in the applicable Appendix I or VII to this Part relevant to the particular category being compared.

...

(c) Based upon paragraph (b) comparison, the report shall indicate for each technical qualification concerned the Appendix I or VII subject matters subject to examination credits.

…

16) Appendix I to Part-66 is amended as follows:

Appendix I
Basic knowledge requirements

1. KNOWLEDGE LEVELS – CATEGORY A, B1, B2, B3 AND C AIRCRAFT MAINTENANCE LICENCE

Basic knowledge for categories A, B1, ~~and~~ B2 and B3 are indicated by the allocation of knowledge levels indicators (1, 2 or 3) against each applicable subject. Category C applicants must meet either the category B1 or the category B2 basic knowledge levels.

…

2. MODULARISATION

Qualification on basic subjects for each Part-66 aircraft maintenance licence category or subcategory should be in accordance with the following matrix. Applicable subjects are indicated by an 'X':

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

MODULE 1. MATHEMATICS

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

MODULE 2. PHYSICS

	LEVEL			
	A	B1	B2	B3
2.1 Matter	1	1	1	1
Nature of matter: the chemical elements, structure of atoms, molecules; Chemical compounds. States: solid, liquid and gaseous; Changes between states.				
2.2 Mechanics				
2.2.1 Statics	1	2	1	1
Forces, moments and couples, representation as vectors; Centre of gravity; Elements of theory of stress, strain and elasticity: tension, compression, shear and torsion; Nature and properties of solid, fluid and gas; Pressure and buoyancy in liquids (barometers).				
2.2.2 Kinetics	1	2	1	1
Linear movement: uniform motion in a straight line, motion under constant acceleration (motion under gravity); Rotational movement: uniform circular motion (centrifugal/ centripetal forces); Periodic motion: pendular movement; Simple theory of vibration, harmonics and resonance; Velocity ratio, mechanical advantage and efficiency.				
2.2.3 Dynamics				
(a)	1	2	1	1
Mass Force, inertia, work, power, energy (potential, kinetic and total energy), heat, efficiency;				
(b)	1	2	2	1
Momentum, conservation of momentum; Impulse; Gyroscopic principles; Friction: nature and effects, coefficient of friction (rolling resistance).				
2.2.4 Fluid dynamics				
(a)	2	2	2	2
Specific gravity and density;				
(b)	1	2	1	1

	LEVEL			
	A	B1	B2	B3
Viscosity, fluid resistance, effects of streamlining; Effects of compressibility on fluids; Static, dynamic and total pressure: Bernoulli's Theorem, venturi.				
2.3 Thermodynamics				
(a) Temperature: thermometers and temperature scales: Celsius, Fahrenheit and Kelvin; Heat definition.	2	2	2	2
(b) Heat capacity, specific heat; Heat transfer: convection, radiation and conduction; Volumetric expansion; First and second law of thermodynamics; Gases: ideal gases laws; specific heat at constant volume and constant pressure, work done by expanding gas; Isothermal, adiabatic expansion and compression, engine cycles, constant volume and constant pressure, refrigerators and heat pumps; Latent heats of fusion and evaporation, thermal energy, heat of combustion.	-	2	2	1
2.4 Optics (Light) Nature of light; speed of light; Laws of reflection and refraction: reflection at plane surfaces, reflection by spherical mirrors, refraction, lenses; Fibre optics.	-	2	2	-
2.5 Wave Motion and Sound Wave motion: mechanical waves, sinusoidal wave motion, interference phenomena, standing waves; Sound: speed of sound, production of sound, intensity, pitch and quality, Doppler effect.	-	2	2	-

MODULE 3. ELECTRICAL FUNDAMENTALS

	LEVEL			
	A	B1	B2	B3
3.1 Electron Theory Structure and distribution of electrical charges within: atoms, molecules, ions, compounds; Molecular structure of conductors, semiconductors and insulators.	1	1	1	1

	LEVEL			
	A	B1	B2	B3
3.2 Static Electricity and Conduction	1	2	2	1
Static electricity and distribution of electrostatic charges; Electrostatic laws of attraction and repulsion; Units of charge, Coulomb's Law; Conduction of electricity in solids, liquids, gases and a vacuum.				
3.3 Electrical Terminology	1	2	2	1
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	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	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	1
Ohms Law, Kirchoff's Voltage and Current Laws; Calculations using the above laws to find resistance, voltage and current; Significance of the internal resistance of a supply.				
3.7 Resistance / Resistor				
(a)	-	2	2	1
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.				
(b)	-	1	1	-
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;				

	LEVEL			
	A	B1	B2	B3
Construction of Wheatstone Bridge;				
3.8 Power	-	2	2	1
Power, work and energy (kinetic and potential);				
Dissipation of power by a resistor;				
Power formula;				
Calculations involving power, work and energy.				
3.9 Capacitance / Capacitor	-	2	2	1
Operation and function of a capacitor;				
Factors affecting capacitance area of plates, distance between plates, number of plates, dielectric and dielectric;				
Constant, working voltage, voltage rating;				
Capacitor types, construction and function;				
Capacitor colour coding;				
Calculations of capacitance and voltage in series and parallel circuits;				
Exponential charge and discharge of a capacitor, time constants;				
Testing of capacitors.				
3.10 Magnetism				
(a)	-	2	2	1
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.				
(b)	-	2	2	1
Magnetomotive force, field strength, magnetic flux density, permeability, hysteresis loop, retentivity, coercive force reluctance, saturation point, eddy currents;				
Precautions for care and storage of magnets.				
3.11 Inductance / Inductor	-	2	2	1

	LEVEL			
	A	B1	B2	B3
Faraday's Law; Action of inducing a voltage in a conductor moving in a magnetic field; Induction principles; Effects of the following on the magnitude of an induced voltage: magnetic field strength, rate of change of flux, number of conductor turns; Mutual induction; The effect the rate of change of primary current and mutual inductance has on induced voltage; Factors affecting mutual inductance: number of turns in coil, physical size of coil, permeability of coil, position of coils with respect to each other; Lenz's Law and polarity determining rules; Back emf, self induction; Saturation point; Principle uses of inductors.				
3.12 DC Motor/Generator Theory	-	2	2	1
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	1
Sinusoidal waveform: phase, period, frequency, cycle; Instantaneous, average, root mean square, peak, peak to peak current values and calculations of these values, in relation to voltage, current and power; Triangular/Square waves; Single/3 phase principles.				
3.14 Resistive (R), Capacitive (C) and Inductive (L) Circuits	-	2	2	1
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	1

	LEVEL			
	A	B1	B2	B3
Transformer construction principles and operation; Transformer losses and methods for overcoming them; Transformer action under load and no-load conditions; Power transfer, efficiency, polarity markings; Calculation of line and phase voltages and currents; Calculation of power in a three phase system; Primary and Secondary current, voltage, turns ratio, power, efficiency; Auto transformers.				
3.16 Filters Operation, application and uses of the following filters: low pass, high pass, band pass, band stop.	-	1	1	-
3.17 AC Generators Rotation of loop in a magnetic field and waveform produced; Operation and construction of revolving armature and revolving field type AC generators; Single phase, two phase and three phase alternators; Three phase star and delta connections advantages and uses; Permanent Magnet Generators.	-	2	2	1
3.18 AC Motors Construction, principles of operation and characteristics of: AC synchronous and induction motors both single and polyphase; Methods of speed control and direction of rotation; Methods of producing a rotating field: capacitor, inductor, shaded or split pole.	-	2	2	1

MODULE 4. ELECTRONIC FUNDAMENTALS

	LEVEL			
	A	B1	B2	B3
4.1 Semiconductors 4.1.1 Diodes (a) Diode symbols; Diode characteristics and properties; Diodes in series and parallel; Main characteristics and use of silicon controlled rectifiers (thyristors), light emitting diode, photo conductive diode, varistor, rectifier diodes; Functional testing of diodes.	-	2	2	1

	LEVEL			
	A	B1	B2	B3
(b)	-	-	2	-
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, Shottky diode, photo conductive diode, varactor diode, varistor, rectifier diodes, Zener diode.				
4.1.2 Transistors				
(a)	-	1	2	1
Transistor symbols; Component description and orientation; Transistor characteristics and properties.				
(b)	-	-	2	-
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.				
4.1.3 Integrated Circuits				
(a)	-	1	-	1
Description and operation of logic circuits and linear circuits/operational amplifiers.				
(b)	-	-	2	-
Description and operation of logic circuits and linear circuits; Introduction to operation and function of an operational amplifier used as: integrator, differentiator, voltage follower, comparator; Operation and amplifier stages connecting methods: resistive capacitive, inductive (transformer), inductive resistive (IR), direct; Advantages and disadvantages of positive and negative feedback.				
4.2 Printed Circuit Boards	-	1	2	-
Description and use of printed circuit boards.				

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

MODULE 5. DIGITAL TECHNIQUES / ELECTRONIC INSTRUMENT SYSTEMS

	LEVEL				
	A	B1-1 B1-3	B1-2 B1-4	B2	B3
5.1 Electronic Instrument Systems	1	2	2	3	1
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.					
5.5 Logic Circuits					
(a)	-	2	-	2	1

	LEVEL				
	A	B1-1 B1-3	B1-2 B1-4	B2	B3
Identification of common logic gate symbols, tables and equivalent circuits; Applications used for aircraft systems, schematic diagrams.					
(b)	-	-	-	2	-
Interpretation of logic diagrams.					
5.6 Basic Computer Structure					
(a)	1	2	-	-	-
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).					
(b)	-	-	-	2	-
Computer related terminology; Operation, layout and interface of the major components in a micro computer including their associated bus systems; Information contained in single and multiaddress instruction words; Memory associated terms; Operation of typical memory devices; Operation, advantages and disadvantages of the various data storage systems.					
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;					

	LEVEL				
	A	B1-1 B1-3	B1-2 B1-4	B2	B3
Application of fibre optics in aircraft systems.					
5.11 Electronic Displays Principles of operation of common types of displays used in modern aircraft, including Cathode Ray Tubes, Light Emitting Diodes and Liquid Crystal Display.	-	2	1	2	1
5.12 Electrostatic Sensitive Devices Special handling of components sensitive to electrostatic discharges; Awareness of risks and possible damage, component and personnel anti-static protection devices.	1	2	2	2	1
5.13 Software Management Control Awareness of restrictions, airworthiness requirements and possible catastrophic effects of unapproved changes to software programmes.	-	2	1	2	1
5.14 Electromagnetic Environment Influence of the following phenomena on maintenance practices for electronic system: EMC-Electromagnetic Compatibility EMI-Electromagnetic Interference HIRF-High Intensity Radiated Field Lightning/lightning protection	-	2	2	2	1
5.15 Typical Electronic / Digital Aircraft Systems General arrangement of typical electronic/digital aircraft systems and associated BITE (Built In Test Equipment) such as: *For B1 and B2 only:* (ACARS-ARINC Communication and Addressing and Reporting System EICAS-Engine Indication and Crew Alerting System FBW-Fly by Wire FMS-Flight Management System IRS-Inertial Reference System *For B1, B2 and B3:* ECAM-Electronic Centralised Aircraft Monitoring EFIS-Electronic Flight Instrument System GPS-Global Positioning System TCAS-Traffic Alert Collision Avoidance System	-	2	2	2	1

MODULE 6. MATERIALS AND HARDWARE

	LEVEL			
	A	B1	B2	B3
6.1 Aircraft Materials — Ferrous				
(a)	1	2	1	2
Characteristics, properties and identification of common alloy steels used in aircraft; Heat treatment and application of alloy steels.				
(b)	-	1	1	1
Testing of ferrous materials for hardness, tensile strength, fatigue strength and impact resistance.				
6.2 Aircraft Materials — Non-Ferrous				
(a)	1	2	1	2
Characteristics, properties and identification of common non-ferrous materials used in aircraft; Heat treatment and application of non-ferrous materials;				
(b)	-	1	1	1
Testing of non-ferrous material for hardness, tensile strength, fatigue strength and impact resistance.				
6.3 Aircraft Materials — Composite and Non-Metallic				
6.3.1 Composite and non-metallic other than wood and fabric				
(a)	1	2	2	2
Characteristics, properties and identification of common composite and non-metallic materials, other than wood, used in aircraft; Sealant and bonding agents.				
(b)	1	2	-	2
The detection of defects/deterioration in composite and non-metallic material. Repair of composite and non-metallic material.				
6.3.2 Wooden structures	1	2	-	2
Construction methods of wooden airframe structures; Characteristics, properties and types of wood and glue used in aeroplanes; Preservation and maintenance of wooden structure; Types of defects in wood material and wooden structures;				

	LEVEL			
	A	B1	B2	B3
The detection of defects in wooden structure; Repair of wooden structure.				
6.3.3 Fabric covering	1	2	-	2
Characteristics, properties and types of fabrics used in aeroplanes; Inspections methods for fabric; Types of defects in fabric; Repair of fabric covering.				
6.4 Corrosion				
(a)	1	1	1	1
Chemical fundamentals; Formation by, galvanic action process, microbiological, stress;				
(b)	2	3	2	2
Types of corrosion and their identification; Causes of corrosion; Material types, susceptibility to corrosion.				
6.5 Fasteners				
6.5.1 Screw threads	2	2	2	2
Screw nomenclature; Thread forms, dimensions and tolerances for standard threads used in aircraft; Measuring screw threads.				
6.5.2 Bolts, studs and screws	2	2	2	2
Bolt types: specification, identification and marking of aircraft bolts, international standards; Nuts: self locking, anchor, standard types; Machine screws: aircraft specifications; Studs: types and uses, insertion and removal; Self tapping screws, dowels.				
6.5.3 Locking devices	2	2	2	2
Tab and spring washers, locking plates, split pins, pal-nuts, wire locking, quick release fasteners, keys, circlips, cotter pins.				
6.5.4 Aircraft rivets	1	2	1	2
Types of solid and blind rivets: specifications and identification, heat treatment.				

	LEVEL			
	A	B1	B2	B3
6.6 Pipes and Unions				
(a)	2	2	2	2
Identification of, and types of rigid and flexible pipes and their connectors used in aircraft;				
(b)	2	2	1	2
Standard unions for aircraft hydraulic, fuel, oil, pneumatic and air system pipes.				
6.7 Springs	-	2	1	1
Types of springs, materials, characteristics and applications.				
6.8 Bearings	1	2	2	1
Purpose of bearings, loads, material, construction; Types of bearings and their application.				
6.9 Transmissions	1	2	2	1
Gear types and their application; Gear ratios, reduction and multiplication gear systems, driven and driving gears, idler gears, mesh patterns; Belts and pulleys, chains and sprockets.				
6.10 Control Cables	1	2	1	2
Types of cables; End fittings, turnbuckles and compensation devices; Pulleys and cable system components; Bowden cables; Aircraft flexible control systems.				
6.11 Electrical Cables and Connectors	1	2	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 7A. MAINTENANCE PRACTICES (except for B3 licence)

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MODULE 7B. MAINTENANCE PRACTICES (for B3 licence)

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

	LEVEL			
	A	B1	B2	B3
7.1 Safety Precautions-Aircraft and Workshop	-	-	-	3
Aspects of safe working practices including precautions to take when working with electricity, gases especially oxygen, oils and chemicals. Also, instruction in the remedial action to be taken in the event of a fire or another accident with one or more of these hazards including knowledge on extinguishing agents.				
7.2 Workshop Practices	-	-	-	3
Care of tools, control of tools, use of workshop materials;				
Dimensions, allowances and tolerances, standards of workmanship;				
Calibration of tools and equipment, calibration standards.				
7.3 Tools	-	-	-	3
Common hand tool 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	-	-	-	-
Operation, function and use of avionic general test equipment.				
7.5 Engineering Drawings, Diagrams and Standards	-	-	-	2
Drawing types and diagrams, their symbols, dimensions, tolerances and projections;				
Identifying title block information;				
Microfilm, microfiche and computerised presentations;				
Specification 100 of the Air Transport Association (ATA) of America;				
Aeronautical and other applicable standards including ISO, AN, MS, NAS and MIL;				
Wiring diagrams and schematic diagrams.				
7.6 Fits and Clearances	-	-	-	2
Drill sizes for bolt holes, classes of fits;				
Common system of fits and clearances;				
Schedule of fits and clearances for aircraft and engines;				
Limits for bow, twist and wear;				
Standard methods for checking shafts, bearings and other parts.				
7.7 Electrical Cables and Connectors	-	-	-	2
Continuity, insulation and bonding techniques and testing;				
Use of crimp tools: hand and hydraulic operated;				
Testing of crimp joints;				
Connector pin removal and insertion;				

	LEVEL			
	A	B1	B2	B3
Co-axial cables: testing and installation precautions; Wiring protection techniques: Cable looming and loom support, cable clamps, protective sleeving techniques including heat shrink wrapping, shielding.				
7.8 Riveting	-	-	-	2
Riveted joints, rivet spacing and pitch; Tools used for riveting and dimpling; Inspection of riveted joints.				
7.9 Pipes and Hoses	-	-	-	2
Bending and belling/flaring aircraft pipes; Inspection and testing of aircraft pipes and hoses; Installation and clamping of pipes.				
7.10 Springs	-	-	-	1
Inspection and testing of springs.				
7.11 Bearings	-	-	-	2
Testing, cleaning and inspection of bearings; Lubrication requirements of bearings; Defects in bearings and their causes.				
7.12 Transmissions	-	-	-	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	-	-	-	2
Swaging of end fittings; Inspection and testing of control cables; Bowden cables; aircraft flexible control systems.				
7.14 Material handling				
7.14.1 Sheet Metal	-	-	-	2
Marking out and calculation of bend allowance; Sheet metal working, including bending and forming; Inspection of sheet metal work.				
7.14.2 Composite and non-metallic	-	-	-	2
Bonding practices; Environmental conditions; Inspection methods.				

	LEVEL			
	A	B1	B2	B3
7.15 Welding, Brazing, Soldering and Bonding				
(a)	-	-	-	2
Soldering methods; inspection of soldered joints.				
(b)	-	-	-	2
Welding and brazing methods; Inspection of welded and brazed joints; Bonding methods and inspection of bonded joints.				
7.16 Aircraft Weight and Balance				
(a)	-	-	-	2
Centre of Gravity/Balance limits calculation: use of relevant documents;				
(b)	-	-	-	2
Preparation of aircraft for weighing; Aircraft weighing				
7.17 Aircraft Handling and Storage	-	-	-	2
Aircraft taxiing/towing and associated safety precautions; Aircraft jacking, chocking, securing and associated safety precautions; Aircraft storage methods; Refuelling/defuelling procedures; De-icing/anti-icing procedures; Electrical, hydraulic and pneumatic ground supplies. Effects of environmental conditions on aircraft handling and operation.				
7.18 Disassembly, Inspection, Repair and Assembly Techniques				
(a)	-	-	-	3
Types of defects and visual inspection techniques. Corrosion removal, assessment and reprotection.				
(b)	-	-	-	2
General repair methods, Structural Repair Manual; Ageing, fatigue and corrosion control programmes;				
(c)	-	-	-	2
Non destructive inspection techniques including, penetrant, radiographic, eddy current, ultrasonic and boroscope methods.				
(d)	-	-	-	2

	LEVEL			
	A	B1	B2	B3
Disassembly and re-assembly techniques.				
(e)	-	-	-	2
Trouble shooting techniques				
7.19 Abnormal Events				
(a)	-	-	-	2
Inspections following lightning strikes and HIRF penetration.				
(b)	-	-	-	2
Inspections following abnormal events such as heavy landings and flight through turbulence.				
7.20 Maintenance Procedures	-	-	-	2
Maintenance planning;				
Modification procedures;				
Stores procedures;				
Certification/release procedures;				
Interface with aircraft operation;				
Maintenance Inspection/Quality Control/Quality Assurance;				
Additional maintenance procedures.				
Control of life limited components				

MODULE 8. BASIC AERODYNAMICS

	LEVEL			
	A	B1	B2	B3
8.1 Physics of the Atmosphere	1	2	2	1
International Standard Atmosphere (ISA), application to aerodynamics.				
8.2 Aerodynamics	1	2	2	1
Airflow around a body;				
Boundary layer, laminar and turbulent flow, free stream flow, relative airflow, upwash and downwash, vortices, stagnation;				
The terms: camber, chord, mean aerodynamic chord, profile (parasite) drag, induced drag, centre of pressure, angle of attack, wash in and wash out, fineness ratio, wing shape and aspect ratio;				
Thrust, Weight, Aerodynamic Resultant;				
Generation of Lift and Drag: Angle of Attack, Lift coefficient, Drag coefficient, polar curve, stall;				
Aerofoil contamination including ice, snow, frost.				

	LEVEL			
	A	B1	B2	B3
8.3 Theory of Flight Relationship between lift, weight, thrust and drag; Glide ratio; Steady state flights, performance; Theory of the turn; Influence of load factor: stall, flight envelope and structural limitations; Lift augmentation.	1	2	2	1
8.4 Flight Stability and Dynamics Longitudinal, lateral and directional stability (active and passive).	1	2	2	1

MODULE 9A. HUMAN FACTORS (except for B3 licence)

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MODULE 9B. HUMAN FACTORS (for B3 licence)

Note: The scope of this Module shall reflect the less demanding environment of maintenance where B3 license holders work.

	LEVEL			
	A	B1	B2	B3
9.1 General The need to take human factors into account; Incidents attributable to human factors/human error; 'Murphy's' law.	-	-	-	2
9.2 Human Performance and Limitations Vision; Hearing; Information processing; Attention and perception; Memory; Claustrophobia and physical access.	-	-	-	2
9.3 Social Psychology	-	-	-	1

	LEVEL			
	A	B1	B2	B3
Responsibility: individual and group; Motivation and de-motivation; Peer pressure; 'Culture' issues; Team working; Management, supervision and leadership.				
9.4 Factors Affecting Performance	-	-	-	2
Fitness/health; Stress: domestic and work related; Time pressure and deadlines; Workload: overload and underload; Sleep and fatigue, shiftwork; Alcohol, medication, drug abuse.				
9.5 Physical Environment	-	-	-	1
Noise and fumes; Illumination; Climate and temperature; Motion and vibration; Working environment.				
9.6 Tasks	-	-	-	1
Physical work; Repetitive tasks; Visual inspection; Complex systems.				
9.7 Communication	-	-	-	2
Within and between teams; Work logging and recording; Keeping up to date, currency; Dissemination of information.				
9.8 Human Error	-	-	-	2
Error models and theories; Types of error in maintenance tasks; Implications of errors (i.e accidents); Avoiding and managing errors.				
9.9 Hazards in the Workplace	-	-	-	2
Recognising and avoiding hazards; Dealing with emergencies.				

MODULE 10. AVIATION LEGISLATION

	LEVEL			
	A	B1	B2	B3
10.1 Regulatory Framework	1	1	1	1
Role of International Civil Aviation Organisation; Role of EASA; Role of the Member States; Relationship between Part-145, Part-66, Part-147 and Part-M; Relationship with other Aviation Authorities.				
10.2 Part-66 — Certifying Staff — Maintenance	2	2	2	2
Detailed understanding of Part-66.				
10.3 Part-145 - Part-M Subpart F — Approved Maintenance Organisations	2	2	2	2
Detailed understanding of Part-145 and Part-M Subpart F.				
10.4 JAR-OPS — Commercial Air Transportation	1	1	1	-
Air Operators Certificates; Operators Responsibilities; Documents to be Carried; Aircraft Placarding (Markings);				
10.5 Aircraft Certification				
(a) General	-	1	1	1
Certification rules: such as EACS 23/25/27/29; Type Certification; Supplemental Type Certification; Part-21 Design/Production Organisation Approvals.				
(b) Documents	-	2	2	2
Certificate of Airworthiness; Certificate of Registration; Noise Certificate; Weight Schedule; Radio Station Licence and Approval.				
10.6 Part-M	2	2	2	2
Detailed understanding of Part-M.				
10.7 Applicable National and International Requirements for (if not superseded by EU requirements).				

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

MODULE 11A. TURBINE AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS

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MODULE 11B. PISTON AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS (except for B3 licence)

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

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11.4 Air Conditioning and Cabin Pressurisation (ATA 21) Pressurisation and air conditioning systems; Cabin pressure controllers, protection and warning devices. Heating systems	1	3	-

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MODULE 11C. PISTON AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS (for B3 licence)

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

	LEVEL			
	A2	B1.2	B2	B3
11.1 Theory of Flight				
Aeroplane Aerodynamics and Flight Controls	-	-	-	1
Operation and effect of:				
— roll control: ailerons; — pitch control: elevators, stabilators, variable incidence stabilisers and canards; — yaw control, rudder limiters;				
Control using elevons, ruddervators;				
High lift devices, slots, slats, flaps, flaperons;				
Drag inducing devices, lift dumpers, speed brakes;				
Effects of wing fences, saw tooth leading edges;				
Boundary layer control using, vortex generators, stall wedges or leading edge devices;				
Operation and effect of trim tabs, balance and anti-balance (leading) tabs, servo tabs, spring tabs, mass balance, control surface bias, aerodynamic balance panels;				
11.2 Airframe Structures — General Concepts				
(a)	-	-	-	2
Airworthiness requirements for structural strength;				
Structural classification, primary, secondary and tertiary;				
Fail safe, safe life, damage tolerance concepts;				
Zonal and station identification systems;				
Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue;				
Drains and ventilation provisions;				
System installation provisions;				
Lightning strike protection provision;				
Aircraft bonding.				
(b)	-	-	-	2
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.				
11.3 Airframe Structures — Aeroplanes				

	LEVEL			
	A2	B1.2	B2	B3
11.3.1 Fuselage (ATA 52/53/56)	-	-	-	1
Construction; Wing, tail-plane pylon and undercarriage attachments; Seat installation; Doors and emergency exits: construction and operation; Window and windscreen attachment.				
11.3.2 Wings (ATA 57)	-	-	-	1
Construction; Fuel storage; Landing gear, pylon, control surface and high lift/drag attachments.				
11.3.3 Stabilisers (ATA 55)	-	-	-	1
Construction; Control surface attachment.				
11.3.4 Flight Control Surfaces (ATA 55/57)	-	-	-	1
Construction and attachment; Balancing — mass and aerodynamic.				
11.3.5 Nacelles/Pylons (ATA 54)				
(a)	-	-	-	1
Nacelles/Pylons: — Construction; — Firewalls; — Engine mounts.				
11.4 Air Conditioning (ATA 21)				
Heating and ventilation systems	-	-	-	1
11.5 Instruments/Avionic Systems				
11.5.1 Instrument Systems (ATA 31)	-	-	-	1
Pitot static: altimeter, air speed indicator, vertical speed indicator; Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator; Compasses: direct reading, remote reading; Angle of attack indication, stall warning systems. Other aircraft system indication.				
11.5.2 Avionic Systems	-	-	-	1
Fundamentals of system lay-outs and operation of: — Auto Flight (ATA 22); — Communications (ATA 23); — Navigation Systems (ATA 34).				

	LEVEL			
	A2	B1.2	B2	B3
11.6 Electrical Power (ATA 24)	-	-	-	2
Batteries Installation and Operation; DC power generation; Voltage regulation; Power distribution; Circuit protection; Inverters, transformers.				
11.7 Equipment and Furnishings (ATA 25)	-	-	-	2
Emergency equipment requirements; Seats, harnesses and belts.				
11.8 Fire Protection (ATA 26)	-	-	-	2
Portable fire extinguisher.				
11.9 Flight Controls (ATA 27)	-	-	-	3
Primary controls: aileron, elevator, rudder; Trim tabs; High lift devices; System operation: manual; Gust locks; Balancing and rigging; Stall warning system.				
11.10 Fuel Systems (ATA 28)	-	-	-	2
System lay-out; Fuel tanks; Supply systems; Cross-feed and transfer; Indications and warnings; Refuelling and defuelling.				
11.11 Hydraulic Power (ATA 29)	-	-	-	2
System lay-out; Hydraulic fluids; Hydraulic reservoirs and accumulators; Pressure generation: electric, mechanical; Pressure Control; Power distribution; Indication and warning systems.				
11.12 Ice and Rain Protection (ATA 30)	-	-	-	1

	LEVEL			
	A2	B1.2	B2	B3
Ice formation, classification and detection;				
De-icing systems: electrical, hot air, pneumatic and chemical;				
Probe and drain heating;				
Wiper systems.				
11.13 Landing Gear (ATA 32)	-	-	-	2
Construction, shock absorbing;				
Extension and retraction systems: normal and emergency;				
Indications and warning;				
Wheels, brakes, antiskid and autobraking;				
Tyres;				
Steering.				
11.14 Lights (ATA 33)	-	-	-	2
External: navigation, anti collision, landing, taxiing, ice;				
Internal: cabin, cockpit, cargo;				
Emergency.				
11.15 Oxygen (ATA 35)	-	-	-	2
System lay-out: cockpit, cabin;				
Sources, storage, charging and distribution;				
Supply regulation;				
Indications and warnings;				
11.16 Pneumatic/Vacuum (ATA 36)	-	-	-	2
System lay-out;				
Sources: engine/APU, compressors, reservoirs, ground supply;				
Pressure and vacuum pumps				
Pressure control;				
Distribution;				
Indications and warnings;				
Interfaces with other systems.				

MODULE 12. HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS

.....

MODULE 13. AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS

.....

MODULE 14. PROPULSION

.....

MODULE 15. GAS TURBINE ENGINE

.....

MODULE 16. PISTON ENGINE

	LEVEL			
	A	B1	B2	B3
16.1 Fundamentals	1	2	-	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	-	2
Power calculation and measurement; Factors affecting engine power; Mixtures/leaning, pre-ignition.				
16.3 Engine Construction	1	2	-	2
Crank case, crank shaft, cam shafts, sumps; Accessory gearbox; Cylinder and piston assemblies; Connecting rods, inlet and exhaust manifolds; Valve mechanisms; Propeller reduction gearboxes.				
16.4 Engine Fuel Systems				
16.4.1 Carburettors	1	2	-	2
Types, construction and principles of operation; Icing and heating.				
16.4.2 Fuel injection systems	1	2	-	2
Types, construction and principles of operation.				
16.4.3 Electronic engine control	1	2	-	2
Operation of engine control and fuel metering systems including electronic engine control (FADEC); Systems lay-out and components.				
16.5 Starting and Ignition Systems	1	2	-	2
Starting systems, pre-heat systems; Magneto types, construction and principles of operation; Ignition harnesses, spark plugs; Low and high tension systems.				
16.6 Induction, Exhaust and Cooling Systems	1	2	-	2

	LEVEL			
	A	B1	B2	B3
Construction and operation of: induction systems including alternate air systems; Exhaust systems, engine cooling systems — air and liquid.				
16.7 Supercharging/Turbocharging	1	2	-	2
Principles and purpose of supercharging and its effects on engine parameters; Construction and operation of supercharging/turbocharging systems; System terminology; Control systems; System protection.				
16.8 Lubricants and Fuels	1	2	-	2
Properties and specifications; Fuel additives; Safety precautions.				
16.9 Lubrication Systems	1	2	-	2
System operation/lay-out and components.				
16.10 Engine Indication Systems	1	2	-	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	-	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	-	2
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.				
16.13 Engine Storage and Preservation	-	2	-	1
Preservation and depreservation for the engine and accessories/systems.				

MODULE 17A. PROPELLER (except for B3 licence)

……

MODULE 17B. PROPELLER (for B3 licence)

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

	LEVEL			
	A	B1	B2	B3
17.1 Fundamentals Blade element theory; High/low blade angle, reverse angle, angle of attack, rotational speed; Propeller slip; Aerodynamic, centrifugal, and thrust forces; Torque; Relative airflow on blade angle of attack; Vibration and resonance.	-	-	-	2
17.2 Propeller Construction Composite and metal propellers; Blade station, blade face, blade shank, blade back and hub assembly; Fixed pitch, controllable pitch, constant speeding propeller; Propeller/spinner installation.	-	-	-	2
17.3 Propeller Pitch Control Speed control and pitch change methods, mechanical and electrical/electronic; Feathering and reverse pitch; Overspeed protection.	-	-	-	2
17.4 Propeller Synchronising Synchronising and synchrophasing equipment.	-	-	-	2
17.5 Propeller Ice Protection Fluid and electrical de-icing equipment.	-	-	-	2
17.6 Propeller Maintenance Static and dynamic balancing; Blade tracking; Assessment of blade damage, erosion, corrosion, impact damage, delamination; Propeller treatment/repair schemes; Propeller engine running.	-	-	-	2
17.7 Propeller Storage and Preservation	-	-	-	2

	LEVEL			
	A	B1	B2	B3
Propeller preservation and depreservation.				

17)Appendix II to Part-66 is amended as follows:

Appendix II

Basic Examination Standard

1. *Standardisation Basis For Examinations*

……

2. *Question Numbers for the Part-66 Appendix I Modules*

2.1. Subject Module 1 Mathematics:
Category A-16 multi-choice and 0 essay questions. Time allowed 20 minutes.
Category B1-30 multi-choice and 0 essay questions. Time allowed 40 minutes.
Category B2-30 multi-choice and 0 essay questions. Time allowed 40 minutes.
Category B3-28 multi-choice and 0 essay questions. Time allowed 35 minutes.

2.2. Subject Module 2 Physics:
Category A-30 multi-choice and 0 essay questions. Time allowed 40 minutes.
Category B1-50 multi-choice and 0 essay questions. Time allowed 65 minutes.
Category B2-50 multi-choice and 0 essay questions. Time allowed 65 minutes.
Category B3-28 multi-choice and 0 essay questions. Time allowed 35 minutes.

2.3. Subject Module 3 Electrical Fundamentals:
Category A- 20 multi-choice and 0 essay questions. Time allowed 25 minutes.
Category B1-50 multi-choice and 0 essay questions. Time allowed 65 minutes.
Category B2-50 multi-choice and 0 essay questions. Time allowed 65 minutes.
Category B3-24 multi-choice and 0 essay questions. Time allowed 30 minutes.

2.4. Subject Module 4 Electronic Fundamentals:
Category A-None.
Category B1-20 multi-choice and 0 essay questions. Time allowed 25 minutes.
Category B2-40 multi-choice and 0 essay questions. Time allowed 50 minutes.
Category B3-8 multi-choice and 0 essay questions. Time allowed 10 minutes.

2.5. Subject Module 5 Digital Techniques/Electronic Instrument Systems:
Category A-16 multi-choice and 0 essay questions. Time allowed 20 minutes.
Category B1.1 & B1.3-40 multi-choice and 0 essay questions. Time allowed 50 minutes.
Category B1.2 & B1.4-20 multi-choice and 0 essay questions. Time allowed 25 minutes.
Category B2-70 multi-choice and 0 essay questions. Time allowed 90 minutes.
Category B3-16 multi-choice and 0 essay questions. Time allowed 20 minutes.

2.6. Subject Module 6 Materials and Hardware:
Category A-50 multi-choice and 0 essay questions. Time allowed 65 minutes.
Category B1-70 multi-choice and 0 essay questions. Time allowed 90 minutes.
Category B2-60 multi-choice and 0 essay questions. Time allowed 75 minutes.
Category B3-60 multi-choice and 0 essay questions. Time allowed 75 minutes.

2.7. Subject Module 7A Maintenance Practices (except for B3 licence):
Category A-70 multi-choice and 2 essay questions. Time allowed 90 minutes plus 40 minutes.
Category B1-80 multi-choice and 2 essay questions. Time allowed 100 minutes plus 40 minutes.
Category B2-60 multi-choice and 2 essay questions. Time allowed 75 minutes plus 40 minutes.

2.8. Subject Module 7B Maintenance Practices (for B3 licence):
Category B3-60 multi-choice and 2 essay questions. Time allowed 75 minutes plus 40 minutes.

~~2.8.~~ 2.9. Subject Module 8 Basic Aerodynamics:

Category A-20 multi-choice and 0 essay questions. Time allowed 25 minutes.
Category B1-20 multi-choice and 0 essay questions. Time allowed 25 minutes.
Category B2-20 multi-choice and 0 essay questions. Time allowed 25 minutes.
Category B3-20 multi-choice and 0 essay questions. Time allowed 25 minutes.

~~2.9.~~ 2.10. Subject Module 9A Human factors (except for B3 licence):
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.

2.11. Subject Module 9B Human factors (for B3 licence):
Category B3-16 multi-choice and 1 essay questions. Time allowed 20 minutes plus 20 minutes.

~~2.10.~~ 2.12. Subject Module 10 Aviation Legislation:
Category A-30 multi-choice and 1 essay question. Time allowed 40 minutes plus 20 minutes.
Category B1-40 multi-choice and 1 essay question. Time allowed 50 minutes plus 20 minutes.
Category B2-40 multi-choice and 1 essay question. Time allowed 50 minutes plus 20 minutes.
Category B3-32 multi-choice and 1 essay questions. Time allowed 40 minutes plus 20 minutes.

~~2.11.~~ 2.13. Subject Module 11A Turbine Aeroplane Aerodynamics, Structures and Systems:
……

~~2.12.~~ 2.14. Subject Module 11B Piston Aeroplane Aerodynamics, Structures and Systems (except for B3 licence):
…….

2.15. Subject Module 11C Piston Aeroplane Aerodynamics, Structures and Systems (for B3 licence):
Category B3-60 multi-choice and 0 essay questions. Time allowed 75 minutes.

~~2.13.~~ 2.16. Subject Module 12 Helicopter Aerodynamics, Structures and Systems:
……

~~2.14.~~ 2.17. Subject Module 13 Aircraft Aerodynamics, Structures and Systems:
……

~~2.15.~~ 2.18. Subject Module 14 Propulsion:
……

~~2.16.~~ 2.19. Subject Module 15 Gas Turbine Engine:
……

~~2.17.~~ 2.20. Subject Module 16 Piston Engine:
Category A-52 ~~0~~ multi-choice and 0 essay questions. Time allowed 65 minutes.
Category B1-72 ~~0~~ multi-choice and 0 essay questions. Time allowed 90 minutes.
Category B2-None.
Category B3-68 multi-choice and 0 essay questions. Time allowed 85 minutes.

~~2.18.~~ 2.21. Subject Module 17A Propeller (except for B3 licence):
Category A-20 multi-choice and 0 essay questions. Time allowed 25 minutes.
Category B1-30 multi-choice and 0 essay questions. Time allowed 40 minutes.
Category B2-None.

2.22. Subject Module 17B Propeller (for B3 licence):
Category B3-28 multi-choice and 0 essay questions. Time allowed 35 minutes.

18) Appendix IV to Part-66 is amended as follows:

Appendix IV

Experience requirements for extending a Part-66 Aircraft Maintenance Licence

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

The experience must be practical maintenance experience on operating aircraft in the subcategory relevant to the application.

The experience requirement will be reduced by 50 % if the applicant has completed an approved Part-147 course relevant to the subcategory.

To From	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2	B3
A1		6 months	6 months	6 months	2 years	6 months	2 years	1 year	2 years	6 months
A2	6 months		6 months	6 months	2 years	6 months	2 years	1 year	2 years	6 months
A3	6 months	6 months		6 months	2 years	1 year	2 years	6 months	2 years	1 year
A4	6 months	6 months	6 months		2 years	1 year	2 years	6 months	2 years	1 year
B1.1	None	6 months	6 months	6 months		6 months	6 months	6 months	1 year	6 months
B1.2	6 months	None	6 months	6 months	2 years		2 years	6 months	2 years	None
B1.3	6 months	6 months	None	6 months	6 months	6 months		6 months	1 year	6 months
B1.4	6 months	6 months	6 months	None	2 years	6 months	2 years		2 years	6 months
B2	6 months	6 months	6 months	6 months	1 year	1 year	1 year	1 year		1 year
B3	6 months	None	6 months	6 months	2 years	6 months	2 years	1 year	2 years	

NOTE 1: If a holder of a category L licence wishes to obtain any of the categories/sub-categories listed above, the full basic knowledge and experience requirements for the corresponding category/sub-category must be met and a new licence must be obtained.

NOTE 2: The holder of a B1.2 or a B3 licence is also entitled to be issued, without further requirements, a Full-L licence with the ratings "wooden aircraft", "composite aircraft" and "metal aircraft", as long as the B1.2 / B3 licence does not contain a limitation on the corresponding structure material.

19) Appendix V to Part-66 is amended as follows:

Appendix V

Application Form and Example of Licence Format

This appendix contains an example of the Part-66 aircraft maintenance licence and the relevant application form for such licence.

The competent authority of the Member State may modify the EASA Form 19 to include additional information necessary to support the case where the National requirements permit or require the Part-66 aircraft maintenance licence to be used outside the Part-145 requirement for non-commercial air transport purposes.

APPLICATION FOR INITIAL / AMENDMENT / RENEWAL OF PART-66 AIRCRAFT MAINTENANCE LICENCE (AML)	EASA FORM 19

APPLICANTS DETAILS:

Name: .....
Address: .....
.....

Nationality: . . . . Date and Place of Birth:. . . . . .

Part-66 AML DETAILS (if applicable):

Licence No: . . . . . Date of Issue: . . . . . .

EMPLOYERS DETAILS:

Name: .....
Address: .....
.....
AMO Approval Reference: .....
. . . . . Fax:. . . . . .

APPLICATION FOR: (Tick (V) relevant box(es))

Initial AML ☐ Amendment of AML ☐ Renewal of AML ☐

Rating	A	B1	B2	B3	C	Limited-L	Full-L
Aeroplane Turbine	☐	☐					
Aeroplane Piston	☐	☐					
Helicopter Turbine	☐	☐					
Helicopter Piston	☐	☐					
Piston engine non-pressurised Aeroplanes of MTOM of 2T and below				☐			
Aircraft listed in 66.A.1(d)						☐	☐
Avionics			☐				
Large Aircraft					☐		
Aircraft other than large					☐		

Type endorsements / Ratings endorsements (including L ratings as per 66.A.1(d)) / Limitation removal (if applicable):
. . . . . .
. . . . . .
. . . . . .

. . . . .
I wish to apply for initial / amendment / renewal of Part-66 AML, as indicated and confirm that the information contained in this form was correct at the time of application. I hereby confirm that: 1. I am not holding any Part-66 AML, issued in another Member State, 2. I have not applied for any Part-66 AML in another Member State and 3. I never had a Part-66 AML issued in another Member State which was revoked or suspended in any other Member State. I also understand that any incorrect information could disqualify me from holding a Part-66 AML. Signed: …… Name: …… Date: ……
I wish to claim the following credits (if applicable): Experience credit due Part-147 training Examination credit due equivalent exam certificates Enclose relevant certificates
Recommendation (if applicable): It is hereby certified that the applicant has met the relevant maintenance knowledge and experience requirements of Part-66 and it is recommended that the competent authority grants or endorses the Part-66 AML. Signed: …… Name: …… Position: …… …… Date: ……

PART-66 AIRCRAFT MAINTENANCE LICENCE

1. An example of the Part-66 aircraft maintenance licence for categories A, B1, B2, B3 and C (EASA Form 26A) and an example of the Part-66 aircraft maintenance licence for category L (Form 26B) can be found on the following pages.

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

3. The document may be printed in the English or the official language of the Member State concerned, except that if the official language of the Member State concerned is used, a second English copy must be attached for any licence holder that works outside that Member State to ensure understanding for the purpose of mutual recognition.

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

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

6. The document may be prepared by the competent authority of the Member State or by any Part-145 approved maintenance organisation in accordance with a procedure approved by the Member State and contained in the Part-145 maintenance organisation exposition except that in all cases the competent authority of the Member State will issue the document.

7. The preparation of any variation to an existing Part-66 aircraft maintenance licence may be carried out by the competent authority of the Member State or by any Part-145 approved maintenance organisation in accordance with a procedure approved by the competent authority of the Member State and contained in the Part-145 maintenance organisation exposition except that in all cases the competent authority of the Member State will issue the document with the variation.

8. The Part-66 aircraft maintenance licence once issued is required to be kept by the person to whom it applies in good condition and who shall remain accountable for ensuring that no unauthorised entries are made.

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

10. The Part-66 aircraft maintenance licence is recognised in all Member States and it is not necessary to exchange the document when working in another Member State.

11. The annex to EASA Form 26A/B is optional and may only be used to include National Privileges not covered by Part-66, where such privileges were covered by the national regulation in force prior to the implementation of Part-66.

12. For information the actual Part-66 aircraft maintenance licence issued by the competent authority of the Member State may have the pages in a different order and may not have the divider lines.

13. For licences category A, B and C, with regard to the aircraft type rating page the competent authority of the Member State may choose not to issue this page until the first aircraft type rating needs to be endorsed and will need to issue more than one aircraft type rating page when there are a number to be listed.

14. Notwithstanding 13, each page issued will be in this format and contain the specified information for that page.

15. The limitations endorsed on the licence are exclusions from the certification privileges If there are no limitations applicable, the LIMITATIONS page will be issued stating 'No limitations'.

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

EUROPEAN UNION
STATE
AUTHORITY NAME & LOGO

Part-66

AIRCRAFT MAINTENANCE LICENCE

.

THIS LICENCE IS RECOGNISED BY ALL EU MEMBERS

EASA FORM 26A

Conditions:

1. This licence must be signed by the holder and be accompanied by an identity document containing a photograph of the licence holder.
2. Endorsement of any (sub)categories on the page(s) entitled Part-66 (SUB)CATEGORIES **only**, does **not** permit the holder to issue a certificate of release to service for an aircraft.
3. This licence when endorsed with an aircraft ~~type~~ rating meets the intent of ICAO annex 1.
4. The privileges of the holder of this licence are prescribed by Part-66 and the applicable requirements of Part-M and Part-145.
5. This licence remains valid until the date specified on the limitation page unless previously suspended or revoked.
6. The privileges of this licence may not be exercised unless in the preceding two year period the holder has had either six months of maintenance experience in accordance with the privileges granted by the licence, or met the provision for the issue of the appropriate privileges.

1. State of issue
2. Licence number
3. Full name of holder
4.Date and place of birth
5. Address of holder
6.Nationality
7. Signature of holder
8. Signature of issuing officer & date:
9. Seal and stamp of issuing Authority

Part-66 (SUB) CATEGORIES

	A	B1	B2	B3	C
Aeroplanes Turbine			n/a	n/a	n/a
Aeroplanes Piston			n/a	n/a	n/a
Helicopters Turbine			n/a	n/a	n/a
Helicopters Piston			n/a	n/a	n/a
Avionics	n/a	n/a		n/a	n/a
Large Aircraft	n/a	n/a	n/a	n/a	
Aircraft other than large	n/a	n/a	n/a	n/a	
Piston-engine non-pressurised aeroplanes 2000 Kg MTOM and below	n/a	n/a	n/a		n/a

LIC NO:

Part-66 AIRCRAFT TYPE RATINGS		
A/C Type or Group	Category	Official Stamp & Date
LIC NO:		

Part-66 LIMITATIONS (exclusions)
Valid until:
LIC NO:

Annex to EASA FORM 26 National privileges outside the scope of Part-66, in accordance with [National Legislation] (Valid only in [Member State])
Official Stamp & Date
LIC NO:

INTENTIONALLY LEFT BLANK

EUROPEAN UNION
STATE
AUTHORITY NAME & LOGO

Part-66

AIRCRAFT MAINTENANCE LICENCE - Category L

.

THIS LICENCE IS RECOGNISED BY ALL EU MEMBERS

EASA FORM 26B

Conditions:

1. This licence must be signed by the holder and be accompanied by an identity document containing a photograph of the licence holder.
2. Endorsement of any category/rating on the pages entitled "Part-66 Category L level" / "Part-66 RATINGS" **only**, does **not** permit the holder to issue a certificate of release to service for an aircraft.
3. This licence meets the intent of ICAO annex 1.
4. The privileges of the holder of this licence are prescribed by Part-66 and the applicable requirements of Part-M and Part-145.
5. This licence remains valid until the date specified on the limitation page unless previously suspended or revoked.
6. The privileges of this licence may not be exercised unless in the preceding two year period the holder has had either six months of maintenance experience in accordance with the privileges granted by the licence, or met the provision for the issue of the appropriate privileges.
7. Any rating endorsed on the licence is further limited by the aircraft categories covered by the L licence (66.A.1(d)).

1. State of issue
2. Licence number
3. Full name of holder
4.Date and place of birth
5. Address of holder
6.Nationality
7. Signature of holder
8. Signature of issuing officer & date:
9. Seal and stamp of issuing Authority

Part-66 Category L level
☐ Limited ☐ Full
LIC NO:

Part-66 RATINGS		
Rating	Level	Official Stamp & Date

Part-66 LIMITATIONS (exclusions)

LIC NO:

Valid until:

LIC NO:

Annex to EASA FORM 26

National privileges outside the scope of Part-66, in accordance with [National Legislation] (Valid only in [Member State])

Official Stamp & Date

LIC NO:

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20)A new Appendix VI to Part-66 is added as follows:

Appendix VI

(Reserved)

21)A new Appendix VII to Part-66 is added as follows:

Appendix VII

Category L training requirements

Each level of L licence may be endorsed with one or with a combination of ratings.

The ratings "Wooden aircraft", "Composite aircraft" and "Metal aircraft" for Full-L licence require training in the corresponding combination of "Airframe" and "Powerplant" courses.

The table below shows the modules of training required for each rating corresponding to the Limited-L and Full-L licences. The content of each particular module is described in the syllabus further below.

The definition of the different levels of knowledge required in this Appendix are described in Appendix I to this Part.

Licence Level	RATINGS	Training codes (used in the syllabus table below)	Modules required for each rating (from the syllabus table below)
Limited-L	Wooden airframe	L.W	L1, L2, L3, L4, L7, L9
	Composite airframe	L.C	L1, L2, L3, L5, L7, L9
	Metal airframe	L.M	L1, L2, L3, L6, L7, L9
	Powerplant	L.P	L1, L2, L3, L8, L9
	Hot air balloons	L.BA + L.BAHA,	L1, L2, L3, L9, L10
	Gas balloons	L.BA + L.BAG	L1, L2, L3, L9, L11
	Hot air airships	L.BA + L.BAHA + L.A	L1, L2, L3, L9, L10, L12
	Gas airships	L.BA + L.BAG + L.A	L1, L2, L3, L9, L11, L12
Full-L	Wooden aircraft	F.W + F.P	L1, L2, L3, L4, L7, L8, L9
	Composite aircraft	F.C + F.P	L1, L2, L3, L5, L7, L8, L9
	Metal aircraft	F.M + F.P	L1, L2, L3, L6, L7, L8, L9
	Wooden sailplanes	F.W	L1, L2, L3, L4, L7, L9
	Composite sailplanes	F.C	L1, L2, L3, L5, L7, L9
	Metal sailplanes	F.M	L1, L2, L3, L6, L7, L9
	Hot air balloons	F.BA + F.BAHA	L1, L2, L3, L9, L10
	Gas balloons	F.BA + F.BAG	L1, L2, L3, L9, L11
	Hot air airships	F.BA + F.BAHA + F.A	L1, L2, L3, L9, L10, L12
	Gas airships	F.BA + F.BAG + F.A	L1, L2, L3, L9, L11, L12
	Radio-Comm / Transponder *	RCT	L13

- This rating can only be obtained by Full-L licence holders, and only in combination with another rating.

Training codes:

L.W:	**L**imited L - **W**ooden / Metal tube and fabric airframe
F.W:	**F**ull L - **W**ooden / Metal tube and fabric airframe
L.C:	**L**imited L - **C**omposite airframe
F.C:	**F**ull L - **C**omposite airframe
L.M:	**L**imited L - **M**etal airframe
F.M:	**F**ull L - **M**etal airframe
L.P:	**L**imited L - **P**owerplant
F.P:	**F**ull L - **P**owerplant
L.BA:	**L**imited L – **B**alloons/**A**irships
F.BA:	**F**ull L – **B**alloons/**A**irships
L.BAHA:	**L**imited L – **B**alloons/**A**irships **H**ot **A**ir
F.BAHA:	**F**ull L – **B**alloons/**A**irships **H**ot **A**ir
L.BAG:	**L**imited L – **B**alloons/**A**irships **G**as
F.BAG:	**F**ull L – **B**alloons/**A**irships **G**as
L.A:	**L**imited L - **A**irship
F.A:	**F**ull L – **A**irship
RCT:	**R**adio-**C**omm/**T**ransponder

DURATION OF TRAINING:

Limited-L licence:

Module L1 "Basic Knowledge"	10 hours
Module L2 "Human Factors"	7 hours
Module L3 "Legislation"	14 hours
Module L4 "Airframe-Wooden / Metal tube and fabric"	20 hours
Module L5 "Airframe-Composite"	20 hours
Module L6 "Airframe-Metal"	20 hours
Module L7 "Airframe-General"	37 hours
Module L8 "Powerplant"	30 hours
Module L9 "Procedures of Physical Inspection"	10 hours
Module L10 "Balloon/Airship–Hot air"	15 hours
Module L11 "Balloon/Airship-Gas (free/tethered)"	15 hours
Module L12 "Airships-Hot air/Gas"	15 hours

Full-L licence (additional hours to those required for the same module for Limited-L):

Module L3 "Legislation"	5 hours
Module L4 "Airframe-Wooden / Metal tube and fabric"	10 hours
Module L5 "Airframe-Composite"	10 hours
Module L6 "Airframe-Metal"	10 hours
Module L7 "Airframe-General"	17 hours
Module L8 "Powerplant-Advanced"	15 hours
Module L10 "Balloon/Airship–Hot air"	17 hours
Module L11 "Balloon/Airship-Gas (free/tethered)"	17 hours
Module L12 "Airships-Hot air/Gas"	15 hours
Module L13 "Radio-Comm/Transponder"	15 hours

	Level of training									
	L.W	F.W	L.C	F.C	L.M	F.M	L.P		L.BA	F.BA
L1 Basic Knowledge	1	1	1	1	1	1	1		1	1
L1.1 Mathematics Arithmetic Algebra Geometry										
L1.2 Physics Matter Mechanics Temperature: thermometers and temperature scales										
L1.3.Electrics DC Circuits Resistance/Resistor										
L1.4 Physics of the Atmosphere Aerodynamics Theory of Flight Flight Stability and Dynamics										

	Level of training									
	L.W	F.W	L.C	F.C	L.M	F.M	L.P		L.BA	F.BA
L2 Human Factors	1	1	1	1	1	1	1		1	1
L2.1 General **L2.2.Human Performance and Limitations** **L2.3 Social Psychology** **L2.4 Factors Affecting Performance** **L2.5 Physical Environment** **L2.6 Tasks** **L2.7 Communication** **L2.8 Human Error** **L2.9 Safety in the Workplace**										

	Level of training									
	L.W	F.W	L.C	F.C	L.M	F.M	L.P		L.BA	F.BA
L3 Legislation										
L3.1 Part-M, Section A, Subpart B to F Part-66, Section A	2	2	2	2	2	2	2		2	2
L3.2 Part M, Section A, Subpart G + I (additional to 3.1)		2		2		2				2
L3.3 Part 21, Section A, Subparts D, E, M	2	2	2	2	2	2	2		2	2
L3.4 Certification Specifications and Industry Standards: Applicable topics		1		1		1				1
L3.5 Execution of repair measures Assessment Work organisation Execution of repairs (→ DOA, Agency → approved repairs) Checks during and after repairs	3	3	3	3	3	3	3		3	3
L3.6 Maintenance data Equipment specifications, airworthiness directives (AD), Instructions for Continuing Airworthiness (ICA) Other maintenance records, trade literature Aircraft inspection and repair FAA AC 43.13-1A (for reference)	3	3	3	3	3	3	3		3	3
L3.7 Subpart F Organisation The maintenance organisation manual Legal status and organization Scope of approval Content of responsibilities Responsibilities and tasks of technical personnel Content and nature of maintenance programs Organisation management	3	3	3	3	3	3	3		3	3
L3.8 Safety in the workplace General requirements Construction and equipment General information Floors, walkways Exits Crushing hazards on windows, doors, gates Electrical installations and operating materials Hoisting and support devices Inflation of tires	2	2	2	2	2	2	2		2	2

	Level of training									
	L.W	F.W	L.C	F.C	L.M	F.M	L.P		L.BA	F.BA
Structural safety of stationary and mobile docking systems Ventilation of work areas Maintenance work on non purged non ventilated tanks and containers Labeling of work areas Lighting features Safekeeping of substances hazardous to health Labeling of containers and pipe lines First-aid material Fire extinguishers Operation General information Job restrictions, user manuals, instruction Personal protective gear, work clothes; skin protection, skin care and skin cleaning agents Walkways, escape routes, emergency exits Fall protection Flammable, poisonous and health hazardous gases, vapors or suspended matter Maintenance work on tanks for flammable liquids Work involving flammable processes Hygienie measures Smoking ban Measures for the prevention of explosions and fire precautions Handling of fire extinguishers First-aid Parking picketing and chocking aircraft Oxygen system precautions										
L3.9 Environmental protection Hazardous materials and hazard designation Dangerous Materials and Substances Environmental hazards Substance-related safety information (chemical physical, toxicological and hydrological properties. Personal protective equipment, medical first aid after accidents) Labeling and storage of hazardous materials Protective measures and precautions Correct disposal of hazardous materials	1	1	1	1	1	1	1		1	1

	Level of training									
	L.W	F.W								
L4. Airframe – Wooden / Metal tube and fabric										
L4.1 Airframe - Wooden/Combination metal tube and fabric Timber, plywood, adhesives, preservation, power line, properties, machining Covering (covering materials, adhesives and finishes, natural and synthetic covering materials and adhesives) Paint assembly and repair processes Recognition of damages from overstressing of wooden / metal tube and fabric structures Deterioration of wood components and coverings Crack test (optical procedure, e.g., magnifying glass) of metal components. Corrosion and preventive methods Health and fire safety protections	2	2								
L4.2 Material science (material capability specification sheets LN, DIN) Types of wood, stability, and machining properties Steel and light alloy tubes and fittings, fracture inspections, of welded seams Plastics (overview, understanding of the properties) Colors and paints Glues, adhesives Covering materials and technologies (natural and synthetic polymers)	2	2								
L4.3 Identifying damage Overstress of wood / metal tubing and fabric structures Load transfers Fatigue strength and crack testing	2	3								
L4.4 Occupational safety and fire protection Handing of flammable and health hazardous materials Shop regulations Precautionary measures Handing of solvents, fuels and lubricants Face masks and respiratory protective devices, skin protection	2	2								
L4.5 Performance of practical activities Locking of pin, screws, castellated nuts, turnbuckles	3	3								

	Level of training									
	L.W	F.W								
Thimble splice Nicopress and Talurit cable splice Canopy and transparencies repairs Repair of coverings Performance of 100-hours / annual inspections on a wood or combination metal tube and fabric airframe Execution of skin repair; splicing of plywood/stringers										
L4.6 Performance of practical activities Repair exercises (plywood, stringer, handrails, skins) Thimble splice Clamp repairs (Nicopress, Talurit) Transparency repairs Coverings components Weight and balance Aircraft Rigging. Calculation of control surface mass balance and range of movement of the control surfaces, measurement of operating forces		3								

	Level of training									
			L.C	F.C						
L5. Airframe - Composite										
L5.1 Airframe - Fiber-reinforced plastic (FRP) Basic principles of FRP construction Resins (EP, polyester, phenolic resins, vinyl ester resins) Reinforcement materials glass, aramide and carbon fibers, features Fillers Supporting cores (balsa, honeycombs, foamed plastics) Constructions, load transfers (solid FRP shell, sandwiches) Identification of damage during overstressing of components Procedure for FRP projects (according to MOM) including storage conditions for material Health and fire protection			2	2						
L5.2 Material Thermosetting plastics, thermoplastic polymers, catalysts			2	2						

	Level of training									
			L.C	F.C						
Understanding, properties, machining technologies, detaching, bonding, welding Resins for FRP: epoxy resins, polyester resins, vinyl ester resins, phenolic resins Reinforcement materials From elementary fiber to filaments (release agent, finish), , patterns of weaving Properties of individual reinforcement materials (E-glass fiber, aramide-fibre, carbon-fibre) Problem with multiple-material systems, matrix Adhesion/cohesion various behaviors of fibre materials Filling materials and pigments Technical requirements for filling materials Property change of the resin composition through the use of E-glass, micro balloon, aerosols, cotton, minerals, metal powder, organic substances Paint assembly and repair technologies Support materials Honeycombs (paper, FRP, metal), balsa wood, Divinycell (Contizell), development trends										
L5.3 Assembly of airframes in Fibre reinforced composite structure (FRP) Solid shell Sandwiches Assembly of airfoils, fuselages, control surfaces				2						
L5.4 Identifying damage Behavior of FRP components in the event of overstressing Identifying of delaminations, loose bonds Bending vibration frequency in airfoils Load transfer Frictional connection and positive locking Fatigue strength and corrosion of metal parts Metal bonding, surface finishing of steel and aluminum components during bonding with FRP			2	3						
L5.5 Mold making Plaster molds, mold ceramics GFK molds, Gel-coat, reinforcement materials, rigidity problems Metal molds Male and female molds				3						
L5.6 Health protection and work safety Handling of various resins/temper types			2	2						

	Level of training									
			L.C	F.C						
Handing of solvents Utilities, auxiliary materials Face guard and respiratory protective device, skin protection										
L5.7 Performance of practical activities Safeguarding of pin, screws, castellated nuts, turnbuckles Thimble splice Nicopress and Talurit clamping joint Repair of transparency Repair of coverings Performance of 100-hours / annual inspections on an FRP airframe Performance of a repair on a sandwich shell (minor repair ≤ 20 cm)			3	3						
L5.8 Performance of practical activities Repair of solid FRP shells Mold fabrication/moulding of a component (e.g. fuselage nose, landing gear fairing, wing tip and winglet) Repair of sandwich shell where interior and exterior layer are damaged Repair of sandwich shell by pressing with a vacuum bag Centre of gravity calculations Aircraft Rigging. Calculation of control surface mass balance and range of movement of the control surfaces, measurement of operating forces Transparency repair (PMMA) with one- and two-component adhesive Bonding of transparency with the canopy frame Tempering of transparencys and other components				3						

	Level of training									
					L.M	F.M				
L6. Airframe – Metal										
L6.1 Airframe – Pure Metal Metallic materials and semi-finished products, machining methods Fatigue strength and crack test Assembly of components of metal construction, riveted joints, adhesive joints Identification of damage in overstressed					2	2				

	Level of training									
					L.M	F.M				
components, effects of corrosion Health and fire protection										
L6.2 Material science (material capability specification sheets LN, DIN) Steel and its alloys Light metals and their light alloys Rivet materials Plastics (overview) Colours and paints Metal adhesives Types of corrosion Covering materials and technologies (natural and synthetic)					2	2				
L6.3 Identifying damage Overstressed metal airframes, leveling, measurement of symmetry Load transfers Fatigue strength and crack test Identifying loose riveted joints					2	3				
L6.4 Assembly of airframes in metal and composite construction Skins Frames Stringers and longerons Frame construction Problems in multiple-material systems					2	2				
L6.5 Fasteners Classifications of fits and clearances Metric and imperial measuring systems Oversize bolt					2	2				
L6.6 Work safety Fuels and lubricants Handling of magnesium alloys Handling of solvents, colours and paints Handling of metal adhesives Machining tools					2	2				
L6.7 Performance of practical activities Wirelocking and split pinning of screws, castellated nuts, turnbuckles Thimble splice					3	3				

	Level of training									
					L.M	F.M				
Nicopress and Talurit clamping joint Transparency (windows canopies) repair Repair of coverings, surface damage, stop drilling cracks Performance of 100-hours / annual inspections on a metal airframe Riveting procedures (small repair according to manufacturer instructions)										
L6.8 Performance of practical activities Cutting out sheet metals (aluminums and light alloys, steel and alloys) Folding bending, edging, welding, beating, smoothening, beading Repair riveting of metal airframes according to repair instruction or drawings Evaluation of rivet errors Thimble splice Clamp repairs (Nicopress, Talurit) Transparency repairs Weight & Balance Aircraft Rigging. Calculation of control surface mass balance and range of movement of the control surfaces, measurement of operating forces						3				

	Level of training									
	L.W	F.W	L.C	F.C	L.M	F.M				
L7 Airframe General										
L7.1 Flight control system Inspection of control surfaces, control surface bearings, trimming, valve gear with guide bearing Inspection of control cables including guides, connections and turnbuckles	2	3	2	3	2	3				
L7.2 Airframe Characteristics of landing gears and damping systems Recognizing Overstessing Inspection of the condition of tyres Permissible maintenance measures Towing/lifting equipment Surfaces out of fabric material	2	3	2	3	2	3				
L7.3. Fasteners	2	3	2	3	2	3				

	Level of training									
	L.W	F.W	L.C	F.C	L.M	F.M				
Reliability of pins, rivets, screws Control cables, turnbuckles Quick-release couplings (L'Hotellier, SZD - Poland)										
L7.4 Locking equipment Admissibility of locking methods, locking pins, spring steel pins, locking wire, stop nuts, paint Quick-release couplings	2	3	2	3	2	3				
L7.5 Weight and Balance	2	3	2	3	2	3				
L7.6 Rescue Systems	2	3	2	3	2	3				
L7.7 On-board modules Flight instruments: airspeed indicator, altimeter, vertical speed indicator, connection and functioning Gyroscopes, other indicating instruments; testing of function Magnetic compass: installation and compensation Sailplanes: acoustic vertical speed indicator, flight recorders, aid to anti-collision	2	3	2	3	2	3				
L7.8 On-board modules installation and connections Flight instruments, mounting requirements (emergency landing conditions as per CS 22) Electric wiring, power sources, types of storage batteries, electrical parameters, electric generator, circuit breaker, energy balance, earth / ground		2		2		2				
L7.9 Electrical propulsion Battery system Propulsion interface Retraction system	2	3	2	3	2	3				
L7.10 Jet propulsion Fuel system Propulsion interface Retraction system	2	3	2	3	2	3				

	Level of training									
							L.P	F.P		
L8 Powerplant										
L8.1 Noise limits Explanation of the concept of "noise level" Noise certificate							1	1		

	Level of training									
							L.P	F.P		
Enhanced sound-proofing Possible reduction of sound emissions										
L8.2 Piston engines Design, modules, interplay of components and modules Four-stroke spark ignition engine, air-cooled, fluid cooling Two-stroke engine Rotary piston engine Efficiency and influencing factors (pressure-volume diagram, power curve) Noise control devices							2	2		
L8.3 Propeller Operation and technical details of propellers and their construction Variable pitch propellers, ground and in-flight adjustable propellers, mechanically, electrically and hydraulically Balancing (static, dynamic) Noise problems							2	2		
L8.4 Engine control devices Mechanical control devices Electrical control devices Tank displays Functions, characteristics, typical errors and error indications							2	2		
L8.5 Hose pipes Material and machining of fuel and oil hoses Control of life limit							2	2		
L8.6 Accessories Operation of magneto ignition Control of maintenance limits Operation of carburetors Maintenance instructions on characteristic features Electric fuel pumps Operation of propeller controls Electrically operated propeller control Hydraulically operated propeller control							2	2		
L8.7 Ignition system Constructions: coil ignition, magneto ignition, and thyristor ignition							2	2		

	Level of training									
							L.P	F.P		
Efficiency of the ignition and pre-heat system Modules of the ignition and pre-heat system Inspection and testing of a spark plug										
L8.8 FADEC							2	2		
L8.9 Exhaust systems Operation and assembly Silencers and heater installations Inspection and test CO emission test							2	2		
L8.10 Fuels and lubricants Fuel characteristics Labeling, environmentally friendly storage Lubricating oils mineral, synthetic and their parameters: labeling and characteristics, application Environmentally friendly storage and proper disposal of used oil							2	2		
L8.11 Documentation Manufacturer documents for the engine and propeller, Instructions for continuing airworthiness Maintenance manuals TBO Airworthiness Directives, technical notes and service bulletins							2	2		
L8.12 Health protection Handling of fuels and lubricants Startup of engines, features of ignition system Handling of cleansing agents and solvents							2	2		
L8.13 Illustrative material Cylinder unit with valve Carburetor High-tension magneto Differential compression tester for cylinders Overheated/damaged pistons Spark plugs of engines that were operated differently							2	2		
L8.14 Practical experience Work safety/accident prevention (handing of fuels and lubricants, startup of engines) Rigging engine control rods and Bowden cables							3	3		

	Level of training									
							L.P	F.P		
Setting of no-load speed Checking and setting the ignition point Operational test of magnetos Checking the ignition system Testing and cleaning of spark plugs Performance of the engine tasks contained in an aeroplane 100 hours / annual inspection. Carryout a cylinder compression test Carry out a static test and evaluation of the engine run Documentation of maintenance work including replacement of components										
Powerplant - Advanced								2		
L8.15 Gas exchange in internal-combustion engines 4-stroke reciprocating engine and control units Energy losses Ignition timing Direct flow behavior of control units Wankel engine and control units 2-stroke engine and control units Scavenging Energy losses Scavenging blower **L8.16 Ignition, combustion and carburetion** Ignition Spark plug Ignition system Combustion process Normal combustion Efficiency and medium pressure Engine knock and octane rating Combustion chamber shapes Fuel/air mix in the carburetor Carburetor principle, carburetor equation The simple carburetor Problems of the simple carburetor and their solutions Carburetor models Fuel/air mix during injection Mechanically controlled injection										

	Level of training									
							L.P	F.P		
Electronically controlled injection										
Continuous injection										
Carburettor-injection comparison										
L8.17 Super Charging										
Super Charging process										
Gradation of the super charging process										
Embodiments										
Increase of output through super charging										
Air application and output										
Medium pressure and cylinder reloading										
Mechanical super charging										
Actual super charge										
Operating behavior of the mechanically super charged engine										
Exhaust gas turbo charging										
Exhaust gas turbo charger										
Interplay with engine (accumulation mode)										
Use of exhaust gas energy										
Impulse charging										
Performance limits										
Charging with a dynamic pressure machine (Comprex charging)										
L8.18 Flight instruments in aircraft with injection engines										
Special instruments of flight instruments (injection engine)										
Interpretation of indications in a static test										
Interpretation of indications in flight on various flight levels										
L8.19 Flight instruments in aircraft with supercharged engines										
Special instruments of flight instruments (supercharged engine)										
Interpretation of indications in a static test										
Interpretation of indications in flight on various flight levels										
L8.20 Maintenance of aircraft engines with injection system										
Documentation, manufacturer's documents, etc.										
General maintenance instructions (hourly inspections)										

	Level of training									
							L.P	F.P		
Functional tests Ground test run Test flight Troubleshooting in the event of faults in the injection system and their correction **L8.21 Maintenance of aircraft engines with charger systems** Documentation, manufacturer's documents, etc. General maintenance instructions (hourly inspections) Functional tests Ground test run Test flight Troubleshooting in the event of faults in the charger system and their correction **L8.22 Work safety and safety provisions** Work safety and safety provisions for work on injection systems Work safety and safety provisions for work on charger systems **L8.23 Visual aids:** Carburetor Components of injection system Components of charger system Airplane with injection engine Airplane with supercharged engine Tool for work on injection systems Tool for work on charger systems **L8.24 FADEC**										

	Level of training									
	L.W	F.W	L.C	F.C	L.M	F.M	L.P		L.BA	F.BA
L9 Procedures of Physical Inspection	3	3	3	3	3	3	3		3	3
Measurement tools Measure of controls deflection Screw torque										

	Level of training									
	L.W	F.W	L.C	F.C	L.M	F.M	L.P		L.BA	F.BA
Wear of slide bearings etc. Procedures for testing of flight instruments Test flight: programme and evaluation										

	Level of training					
	L.BA HA	F.BA HA				
L10 Balloon/Airship – hot air						
L10.1 Basic principles and assembly of hot-air balloons/airships Assembly and individual parts Cladding material, belts, cables Envelopes, ripping panel, valve (parachute), turning vent, scoop/skirt Burner, burner frame and burner frame stanchions Compressed-gas tanks and compressed-gas hoses Basket and alternative devices (seats) Rigging accessories Maintenance and servicing jobs Annual inspection Flight papers Flight- and Maintenance Manuals Rigging and launch preparation Launch	2	3				
L10.2 Practical training Operating controls, maintenance and servicing jobs (according to flight manual)	3	3				
L10.3 Envelope Fabrics Load tapes, rip stoppers Load cables Parachute Ripping panel Turning valve Rollers, pulleys Control and shroud lines Temperature control strip, envelope thermometer Flying wires	2	3				
L10.4 Burner and fuel system Burner coils	2	3				

	Level of training					
	L.BAHA	F.BAHA				
Blast-, liquid- and pilot-valves Burners/nozzles Pilot burners/nozzles Burner frame Fuel lines/hoses Fuel cylinders or tanks and valves and fittings						
L10.5 Basket and basket suspension (incl. alternative devices) Kinds of baskets (incl. alternative devices) Basket cables Carabineer, shackle and pins Burner support rods Fuel cylinder straps Accessories and packing diagrams	2	3				
L10.6 Equipment Fire extinguisher, fire blanket Instruments (single or combined)	2	3				
L10.7 Minor repairs Stitching Bonding	2	3				

	Level of training					
			L.BAG	F.BAG		
L11 Balloon/Airship-Gas (free/tethered)						
L11.1 Basic principles and assembly of gas balloons/airships Assembly of individual parts Envelope and netting material Envelope, ripping panel, emergency opening, cords and belts Rigid gas valve Flexible gas valve (parachute) Netting Load ring Basket and accessories (incl. and alternative devices) Electrostatic discharge paths Mooring line and drag rope Maintenance and servicing Annual inspection Flight papers			2	3		

	Level of training					
			LBAG	FBAG		
Flight- and Maintenance Manuals Rigging and launch preparation Launch						
L11.2 Practical training Operating controls, maintenance and servicing jobs (according to flight manual), safety rules when using hydrogen as lifting gas			2	3		
L11.3 Envelope Fabrics Poles and reinforcement of pole Ripping panel and cord Parachute and shroud lines Valves and cords Filler neck, Paschal-ring and cords Electrostatic discharge paths			2	3		
L11.4 Valve Springs Gaskets Screwed joints Control lines Electrostatic discharge paths			2	3		
L11.5 Netting or rigging (netless) Kinds of net and other lines Mesh sizes and angles Net ring Knotting methods Electrostatic discharge paths			2	3		
L11.6 Load ring			2	3		
L11.7 Basket (incl. alternative devices) Kinds of baskets (incl. alternative devices) Strops and toggles Ballast system (bags and supports) Electrostatic discharge paths			2	3		
L11.8 Ripping cord and valve cords			2	3		
L11.9 Mooring line and drag rope			2	3		
L11.10 Minor repairs Bonding Splicing hemp ropes			2	3		
L11.11 Equipment Instruments (single or combined)			2	3		

	Level of training					
			LBAG	FBAG		
L11.12 Tether cable (TGB only) Kinds of cables Acceptable damage of cable Cable swivel Cable clamps			2	3		
L11.13 Winch (TGB only) Kinds of winches Mechanical system Electrical system Emergency system Grounding/ballasting of winch			2	3		

	Level of training					
					LA	FA
L12 AIRSHIPS-Hot Air/Gas						
L12.1 Basic principles and assembly of small airships Envelope, ballonets Valves, openings Gondola Propulsion Flight- and Maintenance Manuals Rigging and launch preparation					2	3
L12.2 Practical training Operating controls, maintenance and servicing jobs (according to flight manual)					2	3
L12.3 Envelope Fabrics Ripping panel and cords Valves Catenary system					2	3
L12.4 Gondola (incl. alternative devices) Kinds of gondolas (incl. alternative devices) Airframe according to 4.1-3., 5.1-4 or 6.1-3					2	3
L12.5 Electrical system Basics about on-board electrical circuits Electrical sources (accumulators, fixation, ventilation, corrosion) Lead-, NiCd- or other accumulators, dry batteries Generators Wiring, electrical connections					2	3

	Level of training					
					LA	FA
Fuses External power source Energy balance						
L12.6 Propulsion **Engine** Main principles of piston engines (two/four stroke, rotary, carburettor, injection electrical, etc.) Performance Main parts (casing, pistons, cylinders, crankshaft, gear) Other parts (lubrication, ignition, filters, exhaust, controls etc.) Troubles Demounting of parts at installed engines **Fuel and lubrication** Basics about fuel Basics about lubricants Fire extinguishing means **Propeller** Main principles of propellers Kinds of propellers (fixed/adjustable) Performance Acceptable repairs Evaluation of damages **Propulsion instruments** Basics about measuring and instruments Revolution measuring Pressure measuring Temperature measuring Available fuel/power measuring					2	3
L12.7 Equipment Fire extinguisher, fire blanket Instruments (single or combined)					2	3

	Level of training
	RCT
L13 Radio-Comm/Transponder	3

	Level of training
	RCT
L13.1 Radio/ELT Channel spacing Length of antenna required – counterweight Coax cable Radio shielding – interference with ignition system	
L13.2 Transponder **Basic operation** Typical installation Installation requirements power, inputs, antennas Explanation of Mode A, C, S. **Practical Testing** Safety precautions Self test Test equipment Use of test equipment Typical test. Typical defects.	

22)A new Appendix VIII to Part-66 is added as follows:

Appendix VIII

Licence Category L Examination Standard

1. *Standardisation Basis for Examinations*

1.1. All examinations must be carried out using the multi-choice question format 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 three alternative answers of which only one must be the correct answer and the candidate must be allowed a time per module which is based upon a nominal average of 75 seconds per question.

1.3. The pass mark for each module is 75 %.

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

1.5 The level of knowledge required in the questions must be proportionate to the level of technology of ELA1 aircraft.

2. *Number of questions:*

Limited-L:

Module L1 "Basic Knowledge":	12 questions
Module L2 "Human Factors":	8 questions
Module L3 "Legislation":	16 questions
Module L4 "Airframe-Wooden" / Metal tube and fabric:	20 questions
Module L5 "Airframe-Composite":	20 questions
Module L6 "Airframe-Metal":	20 questions
Module L7 "Airframe-General":	40 questions
Module L8 "Powerplant":	32 questions
Module L9 "Procedures of Physical Inspection"	12 questions
Module L10 "Balloon/Airship-Hot air"	16 questions
Module L11 "Balloon/Airship-Gas (free/tethered)"	16 questions
Module L12 "Airships-Hot air/Gas"	16 questions

Full-L (additional questions to those required for the same module for Limited-L):

Module L3 "Legislation":	8 questions
Module L4 "Airframe-Wooden":	12 questions
Module L5 "Airframe-Composite":	12 questions
Module L6 "Airframe-Metal":	12 questions
Module L7 "Airframe-General":	20 questions
Module L8 "Powerplant-Advanced":	16 questions
Module L10 "Balloon/Airship-Hot air"	20 questions

Module L11 “Balloon/Airship-Gas (free/tethered)”	20 questions
Module L12 “Airships-Hot air/Gas”	16 questions
Module L13 “Radio-Comm/Transponder”	16 questions

C) Annex IV (Part-147) to Regulation (EC) No 2042/2003 is amended as follows:

23) In point 147.A.145, paragraph (d) is amended as follows:

147.A.145 Privileges of the maintenance training organisation

…

(d)

1. The maintenance training organisation may subcontract the conduct of basic theoretical training, type training and related examinations to a non maintenance training organisation only when under the control of the maintenance training organisation quality system.
2. The subcontracting of basic theoretical training and examination is limited to Part-66, Appendix I, Modules 1, 2, 3, 4, 5, 6, 8, 9 and 10 and to Part-66, Appendix VII, Modules L1, L2 and L3.
3. The subcontracting of type training and examination is limited to powerplant and avionic systems.

…

24) Point 147.A.200 is amended as follows:

147.A.200 The approved basic training course

…

(b) The knowledge training element shall cover the subject matter for a category or subcategory A, B1, ~~or~~ B2, B3 or L aircraft maintenance licence as specified in Part-66.

…

25)Appendix I to Part-147 is amended as follows:

Appendix I

Basic Training Course Duration

Minimum duration of complete basic courses

Basic Course	Duration (in hours)	Theoretical training ratio (in %)
A1	800	30 to 35
A2	650	30 to 35
A3	800	30 to 35
A4	800	30 to 35
B1.1	2400	50 to 60
B1.2	2000	50 to 60
B1.3	2400	50 to 60
B1.4	2400	50 to 60
B2	2400	50 to 60
B3	1000	50 to 60

Category L basic courses shall have the duration specified in Part-66 Appendix VII. This duration will depend on the modules taken for the envisaged ratings.

26) Appendix II to Part-147 is amended as follows:

Appendix II

Approval Certificate

...

TRAINING / EXAMINATION APPROVAL SCHEDULE Organisation: ……. Approval Referente: ……..			
CLASS	~~RATING~~ LICENCE CATEGORY	RATING	LIMITATIONS
BASIC	-B1	TB1.1 TB1.2 TB1.3 TB1.4	AEROPLANES TURBINE AEROPLANES PISTON HELICOPTERS TURBINE HELICOPTERS PISTON
	-B2	TB2	AVIONICS
	-B3	TB3	PISTON-ENGINE NON-PRESSURISED AEROPLANES 2000 KG MTOM AND BELOW
	-A	TA.1 TA.2 TA.3 TA.4	AEROPLANES TURBINE AEROPLANES PISTON HELICOPTERS TURBINE HELICOPTERS PISTON
	-L	TL	QUOTE THE SPECIFIC AIRCRAFT CATEGORY WITHIN 66.A.1(d) AND THE LEVEL OF LICENCE
TYPE / TASKS	-B1	T1	QUOTE AIRCRAFT TYPE
	-B2	T2	QUOTE AIRCRAFT TYPE
	A	T3	QUOTE AIRCRAFT TYPE
	C	T4	QUOTE AIRCRAFT TYPE
This training / examination approval schedule is valid when working in accordance with Part-147 approved maintenance training organisation exposition: ……. Date of issue: …… Signed: …….. For the Member State / EASA EASA Form 11			