

MODULE 10

FOR B1 & B2 CERTIFICATION

AVIATION LEGISLATION

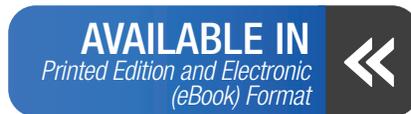
Aviation Maintenance Technician Certification Series



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AVIATION MAINTENANCE TECHNICIAN CERTIFICATION SERIES

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Version 3 - Effective Date 09.01.2019

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Printed in the United States of America



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WELCOME

The publishers of this Aviation Maintenance Technician Certification Series welcome you to the world of aviation maintenance. As you move towards EASA certification, you are required to gain suitable knowledge and experience in your chosen area. Qualification on basic subjects for each aircraft maintenance license category or subcategory is accomplished in accordance with the following matrix. Where applicable, subjects are indicated by an "X" in the column below the license heading.

For other educational tools created to prepare candidates for licensure, contact Aircraft Technical Book Company.

We wish you good luck and success in your studies and in your aviation career!

REVISION LOG

VERSION	EFFECTIVE DATE	DESCRIPTION OF CHANGE
001	2014 02	Module Creation and Release
002	2017 05	Format Update/Addition of Part-T, Sub-Module 06.
003	2019 08	Updated to current regulations, and reduction of Sub-Module 04 to appropriate level 1 requirements.

FORWARD

PART-66 and the Acceptable Means of Compliance (AMC) and Guidance Material (GM) of the European Aviation Safety Agency (EASA), Appendix 1 establishes the Basic Knowledge Requirements for those seeking an aircraft maintenance license. The information in this Module of the Aviation Maintenance Technical Certification Series published by Aircraft Technical Book Company meets or exceeds the breadth and depth of knowledge subject matter referenced in Appendix 1 of the Implementing Rules. However, the order of the material presented is at the discretion of the editor in an effort to convey the required knowledge in the most sequential and comprehensible manner. Knowledge levels required for Category A1, B1, B2, and B3 aircraft maintenance licenses remain unchanged from those listed in Appendix 1 Basic Knowledge Requirements. Tables from Appendix 1 Basic Knowledge Requirements are reproduced at the beginning of each module in the series and again at the beginning of each Sub-Module.

How numbers are written in this book:

This book uses the International Civil Aviation Organization (ICAO) standard of writing numbers. This method displays large numbers by adding a space between each group of 3 digits. This is opposed to the American method which uses commas and the European method which uses periods. For example, the number one million is expressed as so:

ICAO Standard	1 000 000
European Standard	1.000.000
American Standard	1,000,000

SI Units:

The International System of Units (SI) developed and maintained by the General Conference of Weights and Measures (CGPM) shall be used as the standard system of units of measurement for all aspects of international civil aviation air and ground operations.

Prefixes:

The prefixes and symbols listed in the table below shall be used to form names and symbols of the decimal multiples and submultiples of International System of Units (SI) units.

MULTIPLICATION FACTOR	PREFIX	SYMBOL
1 000 000 000 000 000 000 = 10 ¹⁸	exa	E
1 000 000 000 000 000 = 10 ¹⁵	peta	P
1 000 000 000 000 = 10 ¹²	tera	T
1 000 000 000 = 10 ⁹	giga	G
1 000 000 = 10 ⁶	mega	M
1 000 = 10 ³	kilo	k
100 = 10 ²	hecto	h
10 = 10 ¹	deca	da
0.1 = 10 ⁻¹	deci	d
0.01 = 10 ⁻²	centi	c
0.001 = 10 ⁻³	milli	m
0.000 001 = 10 ⁻⁶	micro	μ
0.000 000 001 = 10 ⁻⁹	nano	n
0.000 000 000 001 = 10 ⁻¹²	pico	p
0.000 000 000 000 001 = 10 ⁻¹⁵	femto	f
0.000 000 000 000 000 001 = 10 ⁻¹⁸	atto	a

International System of Units (SI) Prefixes

EASA LICENSE CATEGORY CHART

Module Number and Title		A1 Airplane Turbine	B1.1 Airplane Turbine	B1.2 Airplane Piston	B1.3 Helicopter Turbine	B1.4 Helicopter Piston	B2 Avionics
1	Mathematics	X	X	X	X	X	X
2	Physics	X	X	X	X	X	X
3	Electrical Fundamentals	X	X	X	X	X	X
4	Electronic Fundamentals		X	X	X	X	X
5	Digital Techniques / Electronic Instrument Systems	X	X	X	X	X	X
6	Materials and Hardware	X	X	X	X	X	X
7A	Maintenance Practices	X	X	X	X	X	X
8	Basic Aerodynamics	X	X	X	X	X	X
9A	Human Factors	X	X	X	X	X	X
10	Aviation Legislation	X	X	X	X	X	X
11A	Turbine Aeroplane Aerodynamics, Structures and Systems	X	X				
11B	Piston Aeroplane Aerodynamics, Structures and Systems			X			
12	Helicopter Aerodynamics, Structures and Systems				X	X	
13	Aircraft Aerodynamics, Structures and Systems						X
14	Propulsion						X
15	Gas Turbine Engine	X	X		X		
16	Piston Engine			X		X	
17A	Propeller	X	X	X			

GENERAL KNOWLEDGE REQUIREMENTS

MODULE 10 SYLLABUS AS OUTLINED IN PART-66, APPENDIX 1

Level 1

A familiarization with the principal elements of the subject.

Objectives:

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

Level 2

A general knowledge of the theoretical and practical aspects of the subject and an ability to apply that knowledge.

Objectives:

- The applicant should be able to understand the theoretical fundamentals of the subject.
- The applicant should be able to give a general description of the subject using, as appropriate, typical examples.
- The applicant should be able to use mathematical formula in conjunction with physical laws describing the subject.
- The applicant should be able to read and understand sketches, drawings and schematics describing the subject.
- The applicant should be able to apply his knowledge in a practical manner using detailed procedures.

Level 3

A detailed knowledge of the theoretical and practical aspects of the subject and a capacity to combine and apply the separate elements of knowledge in a logical and comprehensive manner.

Objectives:

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

PART-66 - APPENDIX I BASIC KNOWLEDGE REQUIREMENTS

LEVELS

B1 B2

Sub-Module 01 - Regulatory Framework

Role of the International Civil Aviation Organization;
 Role of the European Commission;
 Role of EASA;
 Role of the Member States and National Aviation Authorities;
 Regulation (EC) No 216/2008 and its implementing rules Regulations (EU) 748/2012 and (EU) 1321/2014;
 Relationship between the various Annexes (Parts) such as Part-21, Part-M, Part-145, Part-66, Part-147 and Regulation (EU) 965/2012.

1

1

Sub-Module 02 - Certifying Staff - Maintenance

Detailed understanding of Part-66.

2

2

Sub-Module 03 - Approved Maintenance Organizations

Detailed understanding of Part-145 and Part-M Subpart F.

2

2

Sub-Module 04 - Air Operations

General understanding of EU-OPS.
 Air Operators Certificates;
 Operator's responsibilities, in particular regarding continuing airworthiness and maintenance;
 Aircraft Maintenance Program;
 MEL//CDL;
 Documents to be carried on board;
 Aircraft placarding (markings).

1

1

Sub-Module 05 - Certification of aircraft, parts and appliances

(a) General understanding of Part-21 and EASA certification specifications CS-23, 25, 27, 29.

1

1

(b) Documents:

Certificate of Airworthiness; restricted certificates of airworthiness and permit to fly;
 Certificate of Registration;
 Noise Certificate;
 Weight Schedule;
 Radio Station License and Approval.

2

2

Sub-Module 06 - Continuing airworthiness

Detailed understanding of Part-21 provisions related to continuing airworthiness.
 Detailed understanding of Part-M.

2

2

PART-66 - APPENDIX I BASIC KNOWLEDGE REQUIREMENTS

LEVELS

B1 B2

Sub-Module 07 - Applicable National and International Requirements

(If not superseded by EU requirements)

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

2

2

1

1

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a safety performance that is the best of any world region, uniformly enjoyed across the whole Union, and continuing to improve over time. In doing so the EU will use, as a measurement of success, the rate of fatal accidents per 10 million flights per world region.

The strategy for aviation safety in the EU for the coming years was established by the European Commission in a Communication to the Council and the European Parliament called Setting up an Aviation Safety Management System for Europe.

In order to further improve the already good safety record that exists in the civil aviation industry, ICAO has promoted the principles of safety management. These principles revolve around the implementation of a Safety Management System (SMS) in industry organizations and a State Safety Program (SSP) in Contracting States.

The sharing of roles between the EU and the Member States, as described in the EASA Basic Regulation, makes it necessary for the Member States to work together with EASA to fully implement the SSP. Production of an EU equivalent of an SSP - an European Aviation Safety Program (EASP) - is a more efficient means of discharging this obligation and would support the EU Members and associated States in developing their own SSPs.

The key players and their role in the European Union Aviation Safety System are shown in *Figure 1-2*.

EUROPEAN UNION INSTITUTIONS

Figure 1-3 below shows the EU institutions and their interdependence in terms of aviation safety.

THE ROLE OF THE EUROPEAN COMMISSION (EC)

The European Commission is one of the institutions of the European Union (EU). (Figure 1-4) It is independent of the individual EU states and holds great powers. The European Commission represents and defends the European Union as a whole entity. It presents legislative proposals and oversees the application of policies and implementation of the EU budget.

The main roles of the European Commission are:

- Proposing new legislation - The Commission is the sole EU institution tabling laws for adoption by the Parliament and the Council that:
 - Protect the interests of the EU and its citizens on issues that can't be dealt with effectively at national level;
 - Get technical details right by consulting experts and the public.
- Implementing EU policies and the budget
 - Sets EU spending priorities, together with the Council and Parliament.
 - Draws up annual budgets for approval by the Parliament and Council.
 - Supervises how the money is spent, under scrutiny by the Court of Auditors.
- Enforcing European law



Figure 1-2. EU Aviation Safety System.



Figure 1-3. EU institutions.

- Together with the Court of Justice, ensures that EU law is properly applied in all the member countries.
- Representing the EU on the international stage
 - Speaks on behalf of all EU countries in international bodies, in particular in areas of trade policy and humanitarian aid.
 - Negotiates international agreements for the EU.

The European Commission's activities in civil aviation fall within the responsibility of the Directorate-General for Transport and the Environment (DG TREN). Specifically, within the organization of the Directorate of Air Transport, Unit F2 is responsible for Single European Sky & Modernization of Air Traffic Control, Unit F3 deals with Air Safety and Unit F4 is responsible for Infrastructures and Airports.

Since 1 November 2004, the European Commission has a commissioner for each Member State (27 28 total commissioners). The Commission has a president, a vice president, who is also the representative for foreign affairs and safety policy, and 25 members each in charge of an individual area of concern (for example, regional policy, business, action on climate, etc.) In November of 2014, the number of commissioners was reduced to two thirds of the number of Member States (18 total). (*Figure 1-4*)



Figure 1-4. European Commission headquarters in Brussels, Belgium.

The members of the Commission are chosen from Member State nationals following a fair rotation system between member countries. The Commission is responsible to the European Union parliament.

The Commission is assisted by a secretary general who prepares the work and ensures coordination between its branches and other institutions. The length of mandate of the Commission is five years as is the term of office of the European parliament. The commission meets at least once a week in Brussels, generally on a Wednesday, and during the monthly sessions of the European Parliament in Strasbourg. (*Figure 1-5*)

The European Commission promotes the general interests of the EU and takes appropriate initiatives to that end. It ensures external representation of the EU with international organizations in most areas. The EC



Figure 1-5. European Parliament in Strasbourg, France.

also provides delegations to third countries (non-EU states). European Commission responsibilities include:

1. **Initiation of Legislative Power** - most of the legislative acts of the Council (Council of Ministers of the European Union) require a proposal for such action from the Commission. The Council cannot amend a proposal without a unanimous ruling. The Commission can modify the proposal as long as the council has not ruled on it.
2. **Guardianship of Treaties** - the Commission ensures compliance with and enforcement of European law and secondary legislation (regulations, directives, decisions, etc.) under the control of the Court of Justice of the European Union (CJEU). It inquires, prevents and penalizes members for non-compliance with European treaties. It can appeal to the Court of Justice of the European Union if a state does not follow the opinion that the European Commission has previously sent.
3. **Execution Power** - the Commission is the body that executes policies and measures adopted by the Council of Ministers of the European Union. It administers the budget and manages common policies and funding. The Council monitors EC activities through various committees.

ROLE OF THE EUROPEAN AVIATION SAFETY AGENCY (EASA)

The European Aviation Safety Agency (EASA or the Agency) is the centerpiece of the European Union's strategy for aviation safety. Its mission is to promote and achieve the highest common standards of safety and environmental protection in civil aviation. EASA is the agency of the EU that looks after flight safety. It is based in Cologne (Germany) and became operational in

September 2003. The agency employs over 800 aviation experts and administrators from all European Union countries. (*Figure 1-6*).

EASA gathers 32 member states, 28 of them being European Union states and the remaining 4 are EFTA states (Switzerland, Norway, Iceland and Lichtenstein). It has 4 permanent international representations: Washington (USA), Montreal (Canada), Beijing (China) and Singapore.

The creation of EASA paved the way for a new EU legislation on safety and the environmental compatibility of civil aviation. EASA was established in 2002 by Regulation (EC) No 1592/2002 (repealed by Regulation (EC) No 216/2008) of the European Parliament and the Council in order to ensure a high and uniform level of safety in civil aviation, by the implementation of common safety rules and measures. The new Basic Regulation (EU) No 2018/1139 entered into force on 22 August 2018 and sets out the tasks of the Agency. In addition to the tasks previously established, the so-called new Basic Regulation formalizes EASA's role in the domain of drones and urban air mobility, enabling the Agency to prepare rules for all sizes of civil drones and harmonize standards for the commercial market across Europe. The regulation enlarges the Agency's role in areas such as in environmental protection, research and development, or international cooperation. The new mandate also gives EASA a coordinating role in cyber security in aviation.

EASA's mission is to promote the highest possible level of safety and environmental protection in civil aviation. It facilitates the free movement of goods, persons and services, promotes cases for regulatory and certification



Figure 1-6. EASA headquarters in Cologne, Germany.

processes and assists Member States in meeting their obligations under ICAO. At the global level, EASA promotes and defends its views on the safety standards to be applied in civil aviation.

EASA RESPONSIBILITIES

At first, EU regulations merely established EASA on the basis for action in the field of certification of aeronautical products, organizations and persons involved in the design, production and maintenance of aircraft. EASA has taken over the responsibilities of the former Joint Aviation Authorities (JAA) system which ceased on 30 June 2009. The agency's responsibilities are being acquired progressively. In 2008, through the implementation of a new EASA Regulation (EC) No 216/2008, EASA's role was extended beyond its previous scope to cover Flight Operations and Flight Crew Licensing.

In autumn 2009, as part of an aviation package also including the second package of measures for Single European Sky (SES II), the European Community adopted Regulation (EC) No 1108/2009 amending Regulation (EC) No 216/2008 and extending EASA's remit to encompass the field of aerodromes, air traffic management and air navigation services. As previously, however, aircraft used for military, customs and police services, and persons and organizations involved in such activities, remain outside the remit of EASA.

EASA has currently the following responsibilities:

- Draft implementing rules in all fields pertinent to the EASA mission and provide technical expertise to the EU
- Certify & approve products and organizations, in fields where EASA has exclusive competence (e.g. airworthiness)
- Provide oversight and support to Member States in fields where EASA has shared competence (e.g. Air Operations, Air Traffic Management)
- Promote the use of European and worldwide standards
- Cooperate with international actors in order to achieve the highest safety level for EU citizens globally (e.g. EU safety list, Third Country Operators authorizations)
- Perform safety research and analysis including publication of an Annual Safety Review.

The Agency may adopt various types of acts (*Figure 1-7*). It may:

- Take binding individual decisions by granting aircraft type certificates and by conducting inspections and investigations;
- Issue non-binding documents containing certification specifications (CS), acceptable means of compliance (AMC) and guidance material (GM) (for use in the certification process) and present opinions to the European Commission on the essential requirements and implementing rules to be adopted.

The Agency also has the power to conduct certain tasks for which collective action is more effective than action by individual Member States. In particular, EASA is responsible for the certification of aeronautical products. It also helps the Commission monitor the implementation of rules and safeguards that may be required. EASA provides technical assistance to aeronautical authorities of third countries and international organizations for safety and environmental compatibility of civil aviation. Finally, the Agency supports the European Union and its Member States in their cooperation with and assistance to third countries. (*Figure 1-8*)

INDEPENDENCE AND SUPERVISION

To protect from political interference, decisions of safety must be undertaken by a neutral and independent authority with the necessary skills. EASA and its Executive Director are under the supervision of an independent Management Board of the Agency, which is responsible for the definition of the Agency's priorities, the establishment of the budget and for monitoring the Agency's operation. It adopts EASA

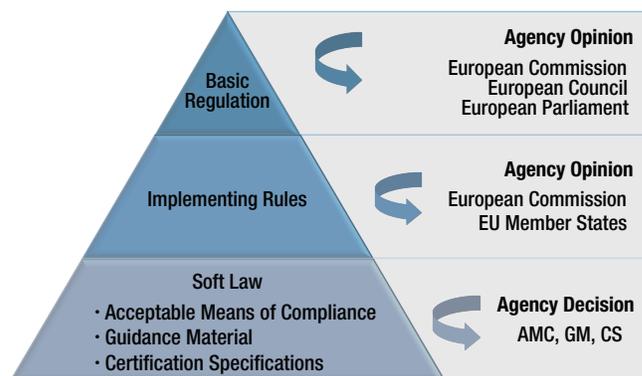


Figure 1-7. EASA Regulatory Structure.



Figure 1-8. EASA Core Activities.

annual report and work program (after approval by the European Commission) and the working procedures to be followed by the Agency. The Executive Director is appointed by the Management Board that is composed of representatives from Member States and one representative of the Commission. The EASA Advisory Board assists the Management Board in its work. It comprises organizations representing aviation personnel, manufacturers, commercial and general aviation operators, maintenance industry, training organizations and air sports (*Figure 1-9*). The Agency's budget is financed by a contribution from the European Community, fees (paid for certificates issued by the Agency) and charges for publications and training provided by the Agency.

Note to the image above: The Rulemaking Advisory Group and the Thematic Advisory Groups have been replaced by the Member States' Advisory Body (MAB) and the Member States' Technical Bodies (TeBs). The Safety Standards Consultative Committee (SSCC) and its Subcommittees have been replaced by the Stakeholders Advisory Body (SAB).

WORKING METHODS

The Agency applies transparent procedures for the adoption of opinions, acceptable means of compliance and guidance material. These procedures ensure the use of the relevant expertise, wide consultation of all interested parties and the right of each Member State to be associated with the adoption process. Special procedures allow the Agency to take immediate action in case of safety problems. Similar transparent procedures apply in the case of individual decisions.

The Agency and the qualified entities acting on its behalf may undertake the inspections and investigations necessary in order to perform the tasks assigned to them. The Agency conducts inspections in the Member States to verify that safety regulations and the implementing rules are applied correctly at national level.

EASA is authorized to conduct the investigations required in order to issue the relevant certificates and ensure continued safety oversight.

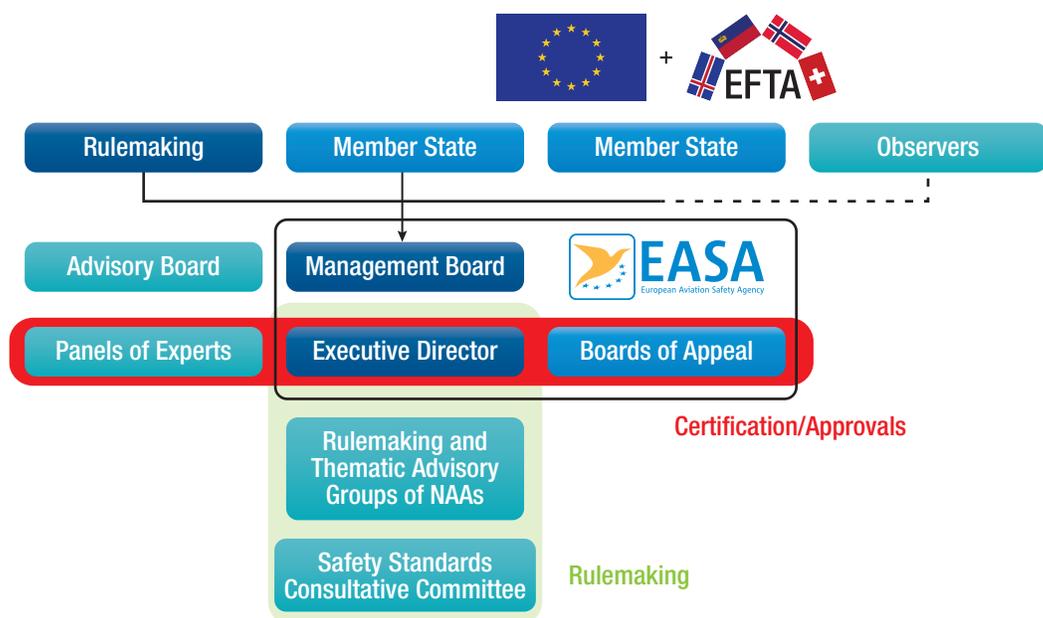


Figure 1-9. EASA Governance.