

# AIRCRAFT MAINTENANCE LICENCE OF CATEGORY B3

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This article includes Commission Regulation (EU) No. 1149/2011 of 21 October 2011 amending Commission Regulation (EC) No. 2042/2003 of 20 November 2003. Through the Commission Regulation (EU) No. 1149/2011 was introduced a new aviation personnel category - Category B3 (Piston engine non-pressurised aeroplanes of 2 000 kg MTOM and below). This article deals with the requirements for obtaining an aircraft maintenance licence of category B3, in terms of the theoretical elements (modules) and in terms of the practical elements (practical experience). Moreover, it contains the qualifications to the aircraft depending on the category of aircraft maintenance licence.

**K e y w o r d s:** aviation legislation, aircraft maintenance licence, basic knowledge and experience, category B3

## 1 INTRODUCTION

After the incident on September 11, 2001 it was necessary to increase the safety of civil aviation. Therefore, in the Member States was issued the Regulation of the European Parliament and Council (EC) No. 1592/2002 of 15 July 2002 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency (EASA) [3]. This document provides that products, persons and organizations in the community must be certified on the basis of common rules. Following Regulation (EC) No. 1592/2002 was adopted Commission Regulation (EC) No. 1702/2003 and Commission Regulation (EC) No. 2042/2003 [3]. With regard to the changes caused by the development of civil aviation in the European Union in 2008, was issued the Regulation of the European Parliament and of the Council (EC) No. 216/2008 of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Regulation (EC) No. 1592/2002. Following Regulation (EC) No. 216/2008 was adopted Commission Regulation (EU) No. 748/2012 and Commission Regulation (EU) No. 1149/2011 [4].

Commission Regulation (EU) No. 1149/2011 of 21 October 2011 contains the following Annex: Part M, Part 145, Part 147 and Part 66. With Commission Regulation (EU) No. 1149/2011 was issued document of the European Aviation Safety Agency, which includes Acceptable Means of Compliance (AMC) and Guidance Material (GM) on the continuing airworthiness of aircraft and aeronautical products, parts and appliances, and on the approval of organisations and personnel involved in these tasks [1]. The most significant changes occurred in the Part 66, which defines the requirements for the competence of maintenance of the aircraft and helicopters. The basic differences are in the categorization of the aircraft maintenance licence by introducing a new category B3 – „Piston engine non-pressurised aeroplanes of 2 000 kg MTOM and below“.

## 2 AIRCRAFT MAINTENANCE LICENCE

The certifying staff have to be qualified in accordance with Commission Regulation (EU) No. 1149/2011 of 21. October 2011 [1]. The aircraft maintenance licence may be issued just by the competent authority (Slovak Republic: Civil Aviation Authority of

the Slovak Republic [5]). In the following part will be described requirements for application and continued validity of the aircraft maintenance licence.

### 2.1 Application

An application for an aircraft maintenance licence or change to such licence shall be made on an EASA Form 19 in a manner established by the competent authority [1].

Application for the change of aircraft maintenance licence shall be made to the competent authority of the Member State that issued the licence. The applicant for additional basic categories or subcategories to an aircraft maintenance licence shall submit his current original licence to the competent authority together with the EASA Form 19 [5]. Each application shall be supported by documentation to demonstrate compliance with the applicable theoretical knowledge, practical training and experience requirements at the time of application. An applicant for an aircraft maintenance licence shall be at least 18 years of age [1], [2].

A category B3 aircraft maintenance licence shall permit the holder to issue certificates of release to service and to act as B3 support staff for [1]:

- maintenance performed on aeroplane structure, power plant and mechanical and electrical systems,
- work on avionic systems requiring only simple tests to prove their serviceability and not requiring troubleshooting.

The holder of an aircraft maintenance licence may not exercise its privileges unless [1]:

- in the preceding 2-year period he had 6 months of maintenance experience in accordance with the privileges granted by the aircraft maintenance licence,
- he has the adequate competence to certify maintenance on the corresponding aircraft,
- he is able to read, write and communicate to an understandable level in the language in which the technical documentation and procedures necessary to support the issue of the certificate of release to service are written.

## 2.2 Basic knowledge

An applicant for an aircraft maintenance licence, or the addition of a category or subcategory to such a licence, shall demonstrate by examination a level of knowledge in the appropriate subject modules. The examination shall be conducted either by a training organisation appropriately approved in accordance with Part – 147 (Slovak Republic: Technical University of Košice, Faculty of Aeronautics, etc. [4]) or by the competent authority [1].

The training courses and examinations shall be passed within 10 years prior to the application for an aircraft maintenance licence or the addition of a category or subcategory to such licence. Credits expire 10 years after they were granted to the applicant by the competent authority. The applicant may apply for new credits after expiration [1].

## 2.3 Basic experience

An applicant for an aircraft maintenance licence shall have acquired for category B3 [1]:

- 3 years of practical maintenance experience on operating aircraft, if the applicant has no previous relevant technical training,
- 2 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,
- 1 year of practical maintenance experience on operating aircraft and completion of a basic training course approved in accordance with Part-147.

An applicant for an extension to an aircraft maintenance licence shall have a minimum civil aircraft maintenance experience requirement appropriate to the additional category or subcategory of licence. The experience shall be practical and involve a representative cross section of maintenance tasks on aircraft. At least 1 year of the required experience shall be recent maintenance experience on aircraft of the category or subcategory for which the initial aircraft maintenance licence is sought. Experience shall have been acquired within the 10 years preceding the application for an aircraft maintenance licence or the addition of a category or subcategory to such a licence [1], [2].

## 2.4 Continued validity of the aircraft maintenance licence

The aircraft maintenance licence becomes invalid 5 years after its last issue or change, unless the holder submits his aircraft maintenance licence to the competent authority that issued it, in order to verify that the information contained in the licence is the same as that contained in the competent authority records. The aircraft maintenance licence is only valid when issued

and/or changed by the competent authority and when the holder has signed the document [1], [2].

## 2.5 Endorsement with aircraft ratings

In order to be entitled to exercise certification privileges on a specific aircraft type, the holder of an aircraft maintenance licence need to have his licence endorsed with the relevant aircraft ratings. For category B3, the relevant rating is „*Piston engine non-pressurised aeroplanes of 2 000 kg MTOM and below*“ [1]. The endorsement of the rating requires 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 shall be subject to the following limitations [1]:

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

These limitations shall be removed upon demonstration of appropriate experience or after a satisfactory practical assessment performed by the competent authority [1], [2].

## 3 BASIC KNOWLEDGE REQUIREMENTS

Basic knowledge requirements for each category are indicated by knowledge levels (1, 2 or 3) against each applicable subject (module) [1]:

Level 1: A familiarisation with the principal elements of the subject. The applicant should be able to:

- give a simple description of the whole subject, using common words and examples,
- use typical terms.

Level 2: A general knowledge of the theoretical and practical aspects of the subject and an ability to apply that knowledge. The applicant should be able to:

- understand the theoretical fundamentals of the subject,
- give a general description of the subject using, as appropriate, typical examples,
- use mathematical formulae in conjunction with physical laws describing the subject,
- read and understand sketches, drawings and schematics describing the subject,
- 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. The applicant should be able to:

- give a detailed description of the subject using theoretical fundamentals and specific examples,
- use mathematical formulae related to the subject,
- read, understand and prepare sketches, simple drawings and schematics describing the subject,
- apply his knowledge in a practical manner using manufacturer's instructions,
- interpret results from various sources and measurements and apply corrective action where appropriate.

### 3.1 Modules

Qualification on basic subjects for each aircraft maintenance licence category or subcategory should be in accordance with Table 1:

**Table 1: Exams of the modules for different categories, [1]**

Subject - module	A, B1 Aeroplane with		A, B1 Helicopter with		B2 Avionics	B3
	Turbine engine(s) (B1.1)	Piston engine(s) (B1.2)	Turbine engine(s) (B1.3)	Piston engine(s) (B1.4)		
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
7A	X+	X+	X+	X+	X+	-
7B	-	-	-	-	-	X+
8	X	X	X	X	X	X
9A	X+	X+	X+	X+	X+	-
9B	-	-	-	-	-	X+
10	X+	X+	X+	X+	X+	X+
11A	X	-	-	-	-	-
11B	-	X	-	-	-	-
11C	-	-	-	-	-	X
12	-	-	X	X	-	-
13	-	-	-	-	X	-
14	-	-	-	-	X	-
15	X	-	X	-	-	-
16	-	X	-	X	-	X
17A	X	X	-	-	-	-
17B	-	-	-	-	-	X

#### Subject (module):

1 – Mathematics, 2 – Physics, 3 – Electrical fundamentals, 4 – Electronic fundamentals, 5 – Digital techniques/ Electronic instrument systems, 6 – Materials and hardware, 7A, 7B – Maintenance practices, 8 – Basic aerodynamics, 9A, 9B – Human factors, 10 – Aviation legislation, 11A, 11B, 11C – Aeroplane aerodynamics, structures and systems, 12 – Helicopter aerodynamics, structures and systems, 13 – Aircraft aerodynamics, structures and systems, 14 – Propulsion, 15 – Gas turbine engine, 16 – Piston engine, 17A, 17B – Propeller

„X“ – applicable subjects

„X+“ – multi-choice questions + essay questions

In the following part is a detailed description of the examinations of the modules which must be completed for an aircraft maintenance licence of category B3.

### 3.2 Levels for the category B3

To obtain an aircraft maintenance licence of category B3 is required to complete the following modules with the corresponding level (Table 2):

**Table 2: Levels of the modules of category B3, [1], [2]**

Subject module	Level
1) Mathematics	1, 2
2) Physics	1, 2
3) Electrical Fundamentals	1, 2
4) Electronic Fundamentals	1
5) Digital techniques / Electronic instrument systems	1
6) Materials and hardware	1, 2
7B) Maintenance practices	1, 2, 3
8) Basic aerodynamics	1
9B) Human factors	1, 2
10) Aviation legislation	1, 2
11C) Aeroplane aerodynamics, structures and systems	1, 2, 3
16) Piston engine	1, 2
17B) Propeller	2

## 4 EXAMINATIONS OF MODULES OF CATEGORY B3

All basic examinations shall be carried out using the multi-choice question format or essay question format. Each multi-choice question shall have three alternative answers of which only one shall be the correct answer. The candidate shall be allowed a time per module which is based upon a nominal average of 75 seconds per question. Each essay question requires the preparation of a written answer and the candidate shall be allowed 20 minutes to answer each such question [1], [3].

The pass mark for each module and sub-module multi-choice part of the examination and for each essay question is 75 %. If either the multi-choice part only or the essay part only is failed, then it is only necessary to retake the multi-choice or essay part, as appropriate [3].

A failed module may not be retaken for at least 90 days following the date of the failed module examination. In the case of a maintenance training organisation approved in accordance with Part-147, the failed module may be retaken after 30 days [1], [4].

The maximum number of consecutive attempts for each module is three. Further sets of three attempts are allowed with a 1 year waiting period between sets. The competent authority shall notify to the applicant in writing any credits granted together with the reference to the credit report used [1].

Candidates who are proven to be cheating shall be banned from taking any further examination within 12 months of the date of the examination in which they were found cheating [1].

### 4.1 Number and form of questions per module

Each module has a fixed number and form of questions. For category B3 is determined the number and form of the questions as follows [1], [2]:

**1) Mathematics**

28 multi-choice questions, time allowed 35 minutes,

**2) Physics**

28 multi-choice questions, time allowed 35 minutes,

**3) Electrical fundamentals**

24 multi-choice questions, time allowed 30 minutes,

**4) Electronic Fundamentals**

8 multi-choice questions, time allowed 10 minutes,

**5) Digital techniques / Electronic instrument systems**

16 multi-choice questions, time allowed 20 minutes,

**6) Materials and hardware**

60 multi-choice questions, time allowed 75 minutes,

**7B) Maintenance practices**

60 multi-choice questions, time allowed 75 minutes,

2 essay questions, time allowed 40 minutes,

**8) Basic aerodynamics**

20 multi-choice questions, time allowed 25 minutes,

**9B) Human factors**

16 multi-choice questions, time allowed 20 minutes,

1 essay question, time allowed 20 minutes,

**10) Aviation legislation**

32 multi-choice questions, time allowed 40 minutes,

1 essay question, time allowed 20 minutes,

**11C) Aeroplane aerodynamics, structures and systems**

60 multi-choice questions, time allowed 75 minutes,

**16) Piston engine**

68 multi-choice questions, time allowed 85 minutes,

**17B) Propeller**

28 multi-choice questions, time allowed 35 minutes.

## 5 AIRCRAFT TYPE TRAINING

Aircraft type training shall consist of theoretical training and examinations, practical training and assessment which shall be conducted by a maintenance training organisation appropriately approved in accordance with Part-147 or, when conducted by other organisations, as directly approved by the competent authority. Aircraft type training shall have been started and completed within the 3 years preceding the application for a type rating endorsement [1].

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

### 5.1 Theoretical training course

The objective of a theoretical training course is that the student shall be able to demonstrate the detailed theoretical knowledge of the aircraft's applicable systems, structure, operations, maintenance, repair and troubleshooting according to approved maintenance data. The student shall be able to demonstrate the use of manuals and approved procedures, including the knowledge of relevant inspections and limitations. The theoretical training minimum is contained in the following table 3.

**Table 3: Duration of the theoretical training course, [1]**

<i>Aeroplanes with a maximum take-off mass 5700 kg and below (*)</i>	
<i>Category</i>	<i>Hours</i>
<b><i>B1.1</i></b>	80
<b><i>B1.2</i></b>	60
<b><i>B2</i></b>	60
<b><i>C</i></b>	15

(\*) - For non-pressurised piston engine aeroplanes below 2000kg MTOM (category B3) the minimum duration can be reduced by 50%

Hours - means 60 minutes of teaching and exclude any breaks, examination, revision, preparation and aircraft visit

### 5.2 Practical training course

The objective of a practical training is to gain the required competence in performing safe maintenance, inspections and routine work according to the maintenance manual and other relevant instructions and tasks as appropriate for the type of aircraft, for example troubleshooting, repairs, adjustments, replacements, rigging and functional checks. It includes the awareness of the use of all technical literature and documentation for the aircraft, the use of specialist/special tooling and test equipment for performing removal and replacement of components and modules unique to type, including any on-wing maintenance activity [1].

It is necessary that the applicant has completed at least 50% of the work relevant to the particular aircraft type, as part of the practical training [1].

### 5.3 Type training examination and assessment standard

The theoretical portion of the aircraft type training has been completed a written examination shall be performed.

Format of the examination is of the multi-choice type. Each multi-choice question shall have 3 alternative answers (a, b, c) of which only one shall be the correct answer. The total time is based on the total number of questions and the time for answering is based upon a nominal average of 90 seconds per question. The minimum examination pass mark is 75 %. When the type training examination is split in several examinations, each examination shall be passed with at least a 75 % mark. In order to be possible to achieve exactly a 75 % pass mark, the number of questions in the examination shall be a multiple of 4 [1], [4].

The maximum number of consecutive attempts is three. Further sets of three attempts are allowed with a 1 year waiting period between sets. A waiting period of 30 days is required after the first failed attempt within one set, and a waiting period of 60 days is required after the second failed attempt [1], [4].

## 5.4 On the Job training

On the Job Training (OJT) shall be approved by the competent authority who has issued the licence. It shall be conducted at and under the control of a maintenance organisation appropriately approved for the maintenance of the particular aircraft type and shall be assessed by designated assessors appropriately qualified. It shall have been started and completed within the 3 years preceding the application for a type rating endorsement [1].

The objective of OJT is to gain the required competence and experience in performing safe maintenance. OJT shall cover a cross section of tasks acceptable to the competent authority. The OJT tasks to be completed shall be representative of the aircraft and systems both in complexity and in the technical input required to complete that task. While relatively simple tasks may be included, other more complex maintenance tasks shall also be incorporated and undertaken as appropriate to the aircraft type [1].

The final assessment of the completed OJT is mandatory and shall be performed by a designated assessor appropriately qualified. In order to facilitate the verification by the competent authority, demonstration of the OJT shall consist of detailed worksheets/logbook. The following data shall be addressed on the OJT worksheets/logbook [1], [2]:

- name of trainee, date of birth,
- approved maintenance organisation,
- location, name of supervisor(s) and assessor,
- description of task and job card/work order/tech log, etc.,
- aircraft type and aircraft registration.

## 6 EXPERIENCE REQUIREMENTS

The experience requirements for adding a new category or subcategory to an existing Part-66 licence are shown in table 4.

**Table 4: Experience requirements, [1]**

From To:	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2	B3
A1	-	6m	6m	6m	2y	6m	2y	1y	2y	6m
A2	6m	-	6m	6m	2y	6m	2y	1y	2y	6m
A3	6m	6m	-	6m	2y	1y	2y	6m	2y	1y
A4	6m	6m	6m	-	2y	1y	2y	6m	2y	1y
B1.1	0	6m	6m	6m	-	6m	6m	6m	1y	6m
B1.2	6m	0	6m	6m	2y	-	2y	6m	2y	0
B1.3	6m	6m	0	6m	6m	6m	-	6m	1y	6m
B1.4	6m	6m	6m	0	2y	6m	2y	-	2y	6m
B2	6m	6m	6m	6m	1y	1y	1y	1y	-	1y
B3	6m	0	6m	6m	2y	6m	2y	1y	2y	-

„m“ - month

„y“ - year

The experience shall 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 [1].

## 7 CONCLUSIONS

For an aircraft maintenance licence of category B3 - Piston engine non-pressurised aeroplanes of 2 000 kg MTOM and below (according to Commission Regulation (EU) No. 1149/2011 ) shall be completed 13 modules with the various levels by the competent authority, or maintenance training organization approved in accordance with Part 147. 4 modules (7B, 9B, 11C, 17B) are directly focused on the category B3.

The examination for an aircraft maintenance licence of category B3 shall be carried out using the multi-choice questions format for 13 modules and essay questions for 3 modules (7B, 9B, 10).

## BIBLIOGRAPHY

- [1] Commission regulation (EU) No 1149/2011. Official Journal of the European Union [online]. Dostupné na internete: < <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:298:0001:0124:EN:PDF> >.
- [2] NAŘÍZENÍ KOMISE (ES) č. 2042/2003: Pracovní dokument ÚCL.
- [3] HOCKO, Marián: Letecká legislativa pre personál údržby. Košice: elfa, 2007. ISBN 978-80-8086-065-3.
- [4] HOCKO, Marián: Výcvik personálu údržby z hľadiska novej európskej leteckej legislatívy. In: Aeronautika 2013: Medzinárodná vedecká konferencia: 25. - 26. apríla 2013, Herľany. s. 74-77. ISBN 978-80-553-1416-7.
- [5] Letecký úrad: [online]. Dostupné na internete: < <http://www.caa.sk/index-old.htm> >.

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