

# EUROPASS CERTIFICATE SUPPLEMENT

## TITLE OF THE DIPLOMA (ES)

*Técnico en Mantenimiento de Material Rodante Ferroviario*

## TRANSLATED TITLE OF THE DIPLOMA (EN)<sup>(1)</sup>

*Technician in Maintenance of Railway Rolling Stock*

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(1) This translation has no legal status.

## DIPLOMA DESCRIPTION

### The holder of this diploma will have acquired the General Competence with regard to:

Carrying out maintenance and assembly operations of components and accessories in those areas of the railway rolling stock related to the mechanics, pneumatics, electricity and electronics, sticking to the established procedures and schedules, according to the specific standards and complying with the quality, safety and environmental protection requirements established.

**Within this framework, the PROFESSIONAL MODULES and their respective LEARNING OUTCOMES acquired by the holder are listed below:**

### “Engines”

The holder:

- Characterises the functioning of two and three-stroke, interpreting the variation of their characteristic parameters and the functionality of the elements making them up.
- Characterizing the lubricating and cooling systems in thermal engines, identifying their elements and describing their function in the system.
- Locates failures in thermal engines and in their lubricating and cooling systems, relating the signs and the effects to the causes that produce them.
- Maintains thermal engines, interpreting the established repair procedures.
- Maintains lubricating and cooling systems in engines, interpreting the repair procedures established.
- Applies the rules on labour risk prevention and environmental protection, identifying the associated risks as well as the measures to prevent them.

### “Auxiliary Systems in Diesel Engine”

The holder:

- Characterizes the functioning of auxiliary systems in diesel cycle engine, interpreting the variation of their parameters and the functionality of their elements.
- Identifies failures in diesel cycle engine, relating the signs and effects to the causes producing them.
- Maintains auxiliary systems in diesel cycle engine, interpreting and applying established procedures, according to the technical specifications.
- Maintains overfeeding and anti-pollution systems in diesel cycle engine, interpreting the values obtained in the engine's function test.

### “Electric Traction”

The holder:

- Characterises the functioning of direct current traction electric engines and generators, interpreting the variations of their characteristic parameters and the functionality of their components.
- Characterises the functioning of alternating current electric engines and generators, asynchronous and synchronous, interpreting the variation of their characteristic parameters and the functionality of their components.
- Locates faults in electric engines and generators, relating their signs and effects to the causes producing them.
- Maintains direct current electric machines, interpreting the established procedures.
- Maintains alternating current electric machines, interpreting the established procedures.
- Performs tests in electric traction motors, describing the implementation procedures.
- Characterises the functioning of power electronic convertors, interpreting the functionality of their construction elements.
- Maintains power electronic convertors, interpreting the established work procedures.
- Maintains pantographs, interpreting the established work procedures.

### “Brakes Systems in Railway Rolling Stock”

The holder:

- Characterises the functionality of the elements and groups in pneumatic installations, applying the corresponding laws and rules.
- Assembles pneumatic circuits, relating the function of their elements to the operability of the system.
- Characterises the functionality of the elements making up the compressed air production and use system, interpreting the technical documentation.
- Maintains brake systems, relating the signs of the dysfunction to the causes producing them and applying the established work procedures.
- Characterises the functioning of the auxiliary pneumatic equipment, describing its effectiveness and interpreting its technical documentation.
- Maintains the auxiliary pneumatic equipment, interpreting the established work procedures.
- Characterises the functioning of the auxiliary pneumatic equipment, describing its operability and interpreting its technical documentation.
- Carries out the maintenance of the pneumatic auxiliary equipment, interpreting the working procedures established.

### **“Auxiliary Circuits”**

The holder:

- Characterises the functionality and constitution of the elements making up the auxiliary electrical circuits in railway rolling stock, describing their operation.
- Identifies breakdowns in auxiliary electrical systems of railway rolling stock, relating the signs and the effects to the causes behind them.
- Maintains auxiliary eclectic systems in railway rolling stock, interpreting and applying the procedures established and the technical specifications.
- Maintains the communication networks of existing data in railway rolling stock, interpreting and applying the established procedures and the technical specifications.
- Assembles new systems of railway rolling stock, selecting the procedures, the materials, the components and the necessary elements.
- Repairs elements and broken circuits of electrical and electronic auxiliary systems of railway rolling stock, interpreting and applying the procedures, the protocols and the established technical specifications.

### **“Logic Systems of Railway Rolling Stock”**

The holder:

- Characterises the functionality of basic electric elements and sets, using electricity and magnetism rules and laws.
- Assembles basic electric and electronic circuits, relating the function of their elements to the circuit’s efficiency.
- Characterises the functionality of the logic cabling system, describing the functioning of the elements making it up.
- Locates faults in logic cabling systems, relating the signs and the effects to the causes producing them.
- Maintains logic cabling systems, interpreting and applying the procedures established, according to the technical specifications.
- Characterises the functionality of programmable logic systems, describing the features and the characteristics of the elements making them up.
- Locates faults in the programmable logic system, relating the signs and the effects to the causes producing them.
- Maintains programmable logic systems, interpreting and applying the procedures established according to the technical specifications.

### **“Comfort and Conditioning”**

The holder:

- Characterises the functioning of rolling stock conditioning systems, relating the sets and the elements making them up to the function they perform.
- Locates faults in the conditioning systems of rolling stock vehicles, relating their signs and effects to the causes producing them.
- Maintains air conditioning systems of rolling stock, interpreting the established work procedures.
- Carries out the maintenance of public address, video-information and fire security systems in rolling stock vehicles, interpreting the work procedures established.
- Carries out the maintenance of the WC system in rolling stock vehicles, interpreting the procedures established and the technical specifications.
- Carries out the maintenance of the automatic system in the doors of the rolling stock vehicles, interpreting and applying the work procedures established.
- Applies labour risk prevention and environmental protection, identifying the associated risks and the measures and equipment to prevent them.

### **“Bogie, Buffing and Traction”**

The holder:

- Characterises the functioning of the sets making up a bogie, describing the function of each one of them and the elements making it up.

- Locates breakdowns in the systems making up the bogie, relating the signs and the effects to the causes that produce them.
- Carries out the maintenance of the systems making up the bogie, interpreting and applying the procedures established.
- Characterises the function and the setting-up of the elements making up the traction and buffing system, describing their function in the whole they belong to.
- Locates breakdowns in the buffing and traction system, relating the signs and effects to the causes that produce them.
- Carries out the maintenance making up the buffing and traction system, interpreting the associated repair procedures.
- Applies the legislation on labour risk prevention and environmental protection, identifying the risks associated and the measures and equipment to prevent them.

### **“Basic Machining”**

The holder:

- Makes sketches of pieces, interpreting the specific symbolism and applying the corresponding representation conventionalisms.
- Draws pieces for their subsequent machining, relating the specifications of the sketch and the plan with the accuracy of measurement equipment.
- Manually mechanises parts, relating the measurement techniques to the tolerance ranges of the measurements given for sketches and drawings.
- Threads parts exteriorly and interiorly, performing the necessary calculations and operations.
- Joins metallic elements by means of soft solder, describing the techniques applied in each case.

### **“Professional Training and Guidance”**

The holder:

- Selects job opportunities, identifying the different possibilities of labour integration, and the alternatives of lifelong learning.
- Applies teamwork strategies, assessing their effectiveness and efficiency on the achievement of the company's goals.
- Exercises rights and complies with the duties derived from labour relationships, recognising them in the different job contracts.
- Determines the protective action of the Spanish Health Service in view of the different covered eventualities, identifying the different types of assistance.
- Assesses risks derived from his/her activity, analysing job conditions and risk factors present in his/her labour setting.
- Participates in the development of a risk prevention plan in a small enterprise, identifying the responsibilities of all agents involved.
- Applies protection and prevention measures, analysing risk situations in the labour setting of the Technician in Maintenance of Railway Rolling Stock.

### **“Business and Entrepreneurial Initiative”**

The holder:

- Recognises skills related to entrepreneurial initiative, analysing the requirements derived from job positions and business activities.
- Defines the opportunity of creating a small enterprise, assessing the impact on the performance setting and incorporating ethic values.
- Carries out the activities for the setting-up and implementation of a company, choosing the legal structure and identifying the associated legal obligations.
- Carries out basic administrative and financial management activities of an SME, identifying the main accounting and tax obligations and filling in documentation.

### **“On the Job training”**

The holder:

- Identifies the structure and organization of the company, relating both to the production and commercialisation of the products obtained.
- Applies ethical and labour habits in the development of his/her professional activity, according to the features of the job and to the procedures established in the company.
- Carries out the maintenance of diesel engines and their auxiliary systems, making diagnosis that allow the identification of the elements to adjust, repair or replace.
- Carries out the preventive maintenance of comfort and conditioning equipment, following the maintenance and collaboration plans in the diagnosis and reparation of their breakdowns.
- Carries out the maintenance of the bogie unit and of the traction and crash systems, making the diagnosis that allow the identification of the elements to adjust, repair or replace.
- Carries out the preventive maintenance of rotating electrical machines, following the technical specifications.

- Carries out the preventive and corrective maintenance of the pneumatic and brake systems of the railway rolling stock, following the plans of the maintenance mentioned.

### **RANGE OF OCCUPATIONS ACCESSIBLE TO THE HOLDER OF THE DIPLOMA**

The Technician in Maintenance of Railway Rolling Stock works in the building sector and also in the sector devoted to the maintenance of railway rolling stock, in the sectors of Railway Administrations and Private Railway Operator such as local companies of light tram and suburban

The most relevant occupations or jobs are the following:

- Technician in maintenance of pneumatic and brake systems of railway rolling stock.
- Technician in maintenance of diesel engines
- Technician un maintenance of electrical systems of railway rolling stock
- Repairer of electric systems of railway rolling stock
- Technician in maintenance of electronic systems of railway rolling stock
- Technician in software uploads and downloads diagnosis analysis and internal communication network.
- Technician in maintenance of comfort, security and communication systems of railway rolling stock.
- Repairer of security and communication systems of railway rolling stock.
- Technician in maintenance of bogies, pulling and buffing.
- Officer for train backing
- Sealer and distributor of replacement parts and equipments for railway rolling stock.
- Operator and assembler of sub-systems of railway rolling stock.
- Operator at companies devoted to the production, assembly and selling of equipment and replacement parts for rolling stock
- Accessories installer of railway rolling stock
- Repairer of mechanical and pneumatic systems of railway rolling stock

### **AWARD, ACCREDITATION AND LEVEL OF THE DIPLOMA**

**Name of the body awarding the diploma on behalf of the King of Spain:** Spanish Ministry of Education or the different Autonomous Communities according to their areas of competence. The title has academic and professional validity throughout Spain.

**Official duration of the education/ training leading to the diploma:** 2000 hours.

#### **Level of the diploma (national or international)**

- NATIONAL: Post-Compulsory Secondary Education
- INTERNATIONAL:
  - Level 3 of the International Standard Classification of Education (ISCED3).
  - Level \_\_\_\_\_ of the European Qualifications Framework (EQF\_\_).

**Entry requirements:** Holding the Certificate in Compulsory Secondary Education or holding the corresponding access test.

**Access to next level of education/training:** This diploma may provide access to Higher Technical Cycles provided that an entrance exam is passed.

#### **Legal basis:**

Basic regulation according to which the diploma is established:

- Minimum teaching requirements established by the State: Royal Decree 1145/2012 of 27 July according to which the diploma of Technician in Maintenance of Railway Rolling Stock and its corresponding minimum teaching requirements are established.

**Explanatory note:** This document is designed to provide additional information about the specified diploma and does not have any legal status in itself. An Annex I may be added and will be filled in by the corresponding Autonomous Community

## INFORMATION ON THE EDUCATION SYSTEM

