

# EUROPASS CERTIFICATE SUPPLEMENT

## TITLE OF THE DIPLOMA

*Técnico en Electromecánica de Maquinaria*

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

*Technician in Machine Electromechanics*

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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 maintaining, installation of accessories and transforming operations within the fields of hydraulic mechanics, pneumatics, electricity and electronics in the sector of agricultural extractive industry, and building and civil works machinery. He/she is subjected to set proceedings and times and must comply with the specifications on quality, safety and environmental preservation.

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

### "Engines"

The holder:

- Characterises the operation of two- and four-stroke engines, interpreting the variations of their characteristic parameters and the reliability of the elements which make them up.
- Characterises the lubrication and cooling systems of heat engines, identifying their elements and describing their function within the system.
- Localises breakdowns in heat engines and in their lubrication and cooling systems, relating their symptoms and effects to the causes originating them.
- Maintains heat engines, interpreting the repairing procedures set.
- Maintains engine lubrication and cooling systems, interpreting the repairing procedures set.
- Applies the rules on labour risk prevention and environmental protection, identifying the associated risks and the measures and the equipment to prevent them.

### "Diesel Engine Auxiliary Systems"

The holder:

- Characterises the operation of auxiliary systems in diesel stroke engines, interpreting the variations of their parameters and the reliability of the elements which make them up.
- Identifies breakdowns in auxiliary systems of diesel stroke engines, relating their symptoms and effects to the causes originating them.
- Maintains auxiliary systems of diesel stroke engines, interpreting and applying set proceedings according to technical specifications.
- Maintains forced induction and anti-pollution systems in diesel stroke engines, interpreting the values obtained in engine's working tests.

### "Suspension and Guiding Systems"

The holder:

- Determines the charges transmitted by actuator elements in hydraulic and pneumatic systems, analysing the physical laws governing them.
- Assembles fluid circuits, relating the function of their elements to the operation of the circuit.
- Assembles proportional hydraulic and pneumatic circuits on panels, relating the element operation to the electronic management governing them.
- Characterises the operation of suspension and guiding systems in machinery describing the placement and the operation of the elements which make them up.
- Identifies breakdowns in the machinery suspension and guiding systems, relating their symptoms and effects to the causes originating them.
- Maintains guiding systems in machinery, applying set procedures.
- Maintains suspension systems in machinery, applying set procedures.
- Complies with the rules on labour risk prevention and environmental protection, identifying the associated risks and the measures and the equipment to prevent them.

### **"Force and Braking Systems"**

The holder:

- Characterises the operation of the transmission system in agricultural, extractive industry, and building and civil works machinery, describing the location and the operation of the elements which make them up.
- Characterises the operation of machinery braking systems, describing the location and operation of the elements which make them up.
- Identifies breakdowns in the machinery transmission and braking systems, relating their symptoms and effects to the causes originating them.
- Maintains power transmission systems, interpreting and applying the procedures established according to the technical specifications.
- Maintains braking systems in machinery, interpreting and applying the established working procedures.

### **"Implement and Equipment Drive Systems"**

The holder:

- Characterises the operation of control and steering systems of implements and equipment in agricultural, extractive industry, and building and civil works machinery, interpreting the operation of the elements which make them up.
- Characterises the operation of implement and equipment drive systems, interpreting the operation of the elements which make them up.
- Diagnoses breakdowns in the equipment control and drive systems, relating their symptoms and effects to the causes originating them.
- Maintains control and steering systems of equipment and implements according to the procedures set.
- Maintains drive systems of equipment and implements applying the procedures set.
- Assembles optional control and steering systems of equipment and implements according to the procedures set and the current regulations.

### **"Equipment and Implements"**

The holder:

- Welds machinery elements by electric arc welding with electrode and by continuous wire arc welding with protection gas, relating welding techniques to the bonds to be made.
- Cuts elements by oxy-fuel and plasma cutting, relating the techniques to the characteristics of the elements.
- Characterises the operation of the equipment and the implements in agricultural, extractive industry, and building and civil works machinery, describing the location and the operation of the elements which make them up.
- Localises breakdowns in the machinery equipment and implements, relating their symptoms and effects to the causes originating them.
- Maintains equipment and implements in machinery, interpreting and applying set working procedures.
- Assembles new equipment and implements and carries out the prescribed changes, selecting the necessary procedures, materials and elements.
- Complies with the rules on labour risk prevention and environmental protection, identifying the associated risks and the measures and the equipment to prevent them.

### **"Loading and Starting Systems"**

The holder:

- Characterises the operation of basic electric and electronic arrays and elements in vehicles, applying the rules and the laws of electricity and magnetism.
- Assembles basic electric and electronic circuits, relating the function of their elements to the circuit operation.
- Characterises the operation of loading and starting systems, describing the localization and operation of the elements which make them up.
- Localises breakdowns in the loading and starting circuits, relating their symptoms and effects to the causes originating them.
- Maintains the loading system, interpreting and applying the proceedings set by the manufacturer and applying the technical specifications.
- Maintains the starting system in vehicles, interpreting the procedures set by the manufacturer and applying their technical specifications.

### **"Electric, Electronic and Comfort Circuits"**

The holder:

- Characterises the operation of the elements and arrays which make up lighting, manoeuvre, auxiliary and signalling electric circuits in machinery, describing the localization and the operation of the elements which make them up.
- Characterises the operation of machinery comfort systems, describing the localization and operation of the elements which make them up.
- Characterises the operation of the systems which make up sound, communication and information circuits in machinery, describing the localization and the operation of the elements which make them up.
- Identifies breakdowns in electric and electronic lighting, manoeuvre, auxiliary, signalling, sound, communication and

information, and comfort electric systems, relating their symptoms and effects to the causes originating them.

- Carries out the maintenance of electric lighting, manoeuvre, auxiliary and signalling systems in machinery, interpreting and applying set procedures and technical specifications.
- Carries out the maintenance of comfort systems, interpreting and applying set procedures and technical specifications.
- Maintains the installations of sound, communication and information systems in machinery and carries out the assemblage of new equipment, applying technical specifications.

### **“Basic Machining”**

The holder:

- Draws sketches of parts, interpreting the specific symbols and applying the relevant representation conventions.
- Draws parts to be further mechanized, relating the sketch and plan specifications to the precision of the measure equipment.
- Mechanizes parts by hand, relating measuring techniques to the measure tolerance limits set in the sketches and in the plans.
- Screws parts externally and internally, performing the required calculations and operations
- Carries out bonds on metallic elements by soft welding, describing the techniques used for 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 the risks derived from his/her activity, analysing the job conditions and the risk factors present in his/her labour setting.
- Participates in the development of a risk prevention plan for a small enterprise, identifying the responsibilities of all the agents involved.
- Applies protection and prevention measures, analysing the risk situations in the labour setting of the Technician in Machine Electromechanics

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

The holder:

- Recognises the 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 the implementation of a company, choosing its 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 company's structure and organization relating them to the production and marketing of the services delivered.
- Applies labour and ethic habits in his/her professional activity according to the characteristics of the job position and the procedures established by the company.
- Applies labour and ethic habits in his/her professional activity according to the characteristics of the job position and the procedures established by the company.
- Carries out the maintenance of the engines and their auxiliary systems, performing the diagnosis which allow for identification of elements to be adjusted, repaired or substituted.
- Carries out the maintenance of the electric, electronic and comfort systems in machinery, performing the diagnosis which allow for identification of elements to be adjusted, repaired or substituted.
- Carries out the maintenance of the force and braking systems in machinery, performing the diagnosis which allow for the identification of the elements to be adjusted, repaired or substituted.
- Carries out the maintenance of the guiding and suspension systems in machinery, performing the diagnosis which allow for the identification of the elements to be adjusted, repaired or substituted.
- Carries out the maintenance of the implement and equipment drive systems, performing the diagnosis which allow for identification of elements to be adjusted, repaired or substituted.

- Assembles new equipment and implements, performing the required changes, complying with the technical specifications and the legal regulations, and fulfilling the demands of the client .

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

The technician in Machine Electromechanics works in the sector of vehicle building and maintenance, and the subsectors of agricultural, extractive industry and building and civil works machinery.

- Companies dedicated to manufacturing agricultural machinery.
- Companies dedicated to manufacturing machinery for the extractive industry and building and civil works.
- Companies dedicated to repairing agricultural, extractive industry and building and civil works machinery.
- Companies dedicated to assembling and installing systems, equipment and implement in agricultural, extractive industry, and building and civil works machinery.
- Companies dedicated to transforming and adapting agricultural, extractive industry, and building and civil works machinery.
- Spare parts manufacturing and retailing
- Retailing of diagnosis equipment.

The most relevant occupations or jobs are the following:

- Technician in agricultural machinery electromechanics.
- Technician in extractive industry machinery electromechanics.
- Technician in building and civil works machinery electromechanics.
- Technician in adjusting diesel injection equipment electromechanics.
- Verifier of agricultural and industrial machinery.
- Repairer of pneumatic and hydraulic systems.
- Repairer of transmission and braking systems.
- Repairer of guiding and suspension systems.
- Accessories fitter.
- Seller/retailer of spare parts and diagnosis equipment.
- Operator at spare parts manufacturing companies.

### **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 255/2011, of 28 February, according to which the diploma of Technician in Machine Electromechanics 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

