

EUROPASS SUPPLEMENT TO THE MASTER'S DEGREE IN VOCATIONAL EDUCATION AND TRAINING

TITLE OF THE DECREE

Master's Degree in Maintenance and Safety of Hybrid and Electric Vehicle Systems

TITLE DESCRIPTION

The holder has acquired the general competence relating to:

The general competence of this specialization course consists of organizing, planning, diagnosing breakdowns and supervising the execution of maintenance operations and their logistics in the area of hybrid and electric vehicles, ensuring compliance with the technical specifications for safety and environmental protection established in the current regulations.

Within this framework, each PROFESSIONAL MODULE includes the following LEARNING OUTCOMES acquired by the holder.

"Safety in vehicles with high voltage systems".

The titleholder:

- Characterizes the dangerous situations and accidents that can occur in the maintenance processes of hybrid and electric vehicles with high voltage, relating them to safety regulations.
- Defines the individual and collective protection equipment to be used, identifying the effects of a high voltage electric shock in the handling of elements in hybrid and electric vehicles.
- Plans the cordoning off of the high voltage work area and carries out the reception of vehicles, in order to carry out the interventions safely, applying the protocols established in the regulations.
- Applies high-voltage electrical deactivation and activation procedures and defines the positioning of safety elements in hybrid or electric vehicles, according to established security measures and regulations.
- Determines the signaling of the elements that must not be manipulated in electric and hybrid vehicles, using the condemnation discs, according to the safety regulations in force.
- Supervises compliance with occupational risk prevention and environmental protection regulations, avoiding risks and hazards in the maintenance of electric and hybrid vehicles.

"Electric and hybrid drive in vehicles".

The titleholder:

- Determines the characteristics and operability of hybrid and electric propulsion systems and identifies the different types, analyzing the operating parameters and the elements that constitute them.
- Plans safety processes prior to performing maintenance work and performs high voltage electrical disconnection on electric and hybrid vehicles, complying with safety regulations.
- Diagnoses breakdowns and supervises maintenance processes in electric propulsion systems, complying with the established quality.
- Plans and follows up maintenance processes in pure hybrid and plug-in hybrid propulsion systems, applying the methods and techniques for the restoration of the functionality of the systems.
- Verifies the maintenance processes in fuel cell propulsion systems, following the technical specifications and ensuring compliance with safety and quality standards.
- Supervises compliance with occupational risk prevention and environmental protection standards, identifying risks in the maintenance processes of hybrid and electric propulsion systems.

"High voltage systems, electrical storage and recharging".

The titleholder:

- Analyzes the characteristics of the elements that make up the high voltage, storage and recharging systems in hybrid and electric vehicles, determining the operating parameters and their optimization.
- Determines the maintenance operations of high-voltage electrical systems, complying with the established safety and quality standards.
- Inspects the disassembly of the high voltage battery from its housing, in electric vehicles, supervising the application of the required safety regulations and techniques.
- Performs maintenance and/or repair of high voltage battery storage modules, applying the required techniques and complying with the established safety and quality standards.
- Reviews the maintenance and testing processes of the high voltage external battery recharging systems, complying with safety regulations.
- Verifies compliance with occupational risk prevention and environmental protection standards, identifying the risks associated with the maintenance processes of high voltage electrical systems, storage batteries and recharging.

"Transmission systems, regenerative braking and thermal control".

The titleholder:

- Defines the operability of the different transmission, regenerative braking and thermal control systems in hybrid and electric vehicles, relating their functionality with the maintenance processes.
- Plans the operations of fault diagnosis and maintenance of single gear automatic transmissions and dual clutch transmissions, supervising the processes established in the technical documentation.
- Determines the operations of fault diagnosis and maintenance of regenerative braking systems; electromagnetic, ABS and hydraulic, restoring the functionality of the equipment with the established quality and complying with safety regulations.
- Reviews the maintenance processes of the passenger compartment air conditioning systems, following technical specifications and complying with environmental impact and safety regulations.
- Plans the operations of fault diagnosis and maintenance in battery cooling systems and high voltage electrical elements, following the established procedures and protocols.
- Supervises compliance with environmental protection and occupational risk prevention regulations, identifying the risks associated with the maintenance of transmission, regenerative braking and thermal control systems.

"Workplace training".

The titleholder:

- Identifies the structure and organization of the company, relating them to the maintenance of hybrid and electric vehicles.
- Applies ethical and work habits in the development of his/her professional activity, in accordance with the procedures established by the company and the characteristics of the job position.
- Participates in the development of maintenance planning for electric and hybrid drive systems, interpreting technical specifications, following protocols and complying with established safety regulations.
- Participates in the determination of maintenance techniques for high voltage electrical systems, storage and recharging of hybrid and electric vehicles, applying the required techniques, performing fault diagnosis and complying with the established safety and quality standards.
- Determines the maintenance guidelines for transmission and regenerative braking systems, diagnosing the elements to be adjusted, repaired or replaced.
- Participates in the maintenance planning of the vehicle's thermal management systems and supervises the operations performed, in order to achieve the stipulated quality, complying with safety and environmental regulations.

JOBS THAT CAN BE PERFORMED WITH THIS TITLE

The most relevant occupations and jobs are as follows:

- Head of the hybrid and electric vehicle maintenance area.
- Responsible for safety in the vehicle maintenance area.
- Technical vehicle inspection manager.
- Responsible for vehicle reception.
- Head of the spare parts and diagnostic equipment area.
- Vehicle appraiser.
- Foreman in spare parts manufacturing companies.
- Responsible for the commercial area of equipment related to vehicles.
- Head of the bodywork area.

ISSUANCE, ACCREDITATION AND DEGREE LEVEL

Body that issues the diploma on behalf of the King: Ministry of Education and Vocational Training or the autonomous communities within the scope of their own competences. The title has academic and professional effects with validity throughout the State.

Official duration of the degree: 650 hours.

Degree level (national or international).

- NATIONAL: Non-university higher education.
- INTERNATIONAL:
 - Level P-5.5.4 of the International Standard Classification of Education (ISCED P-5.5.4).
 - Level 5C of the European Qualifications Framework (EQF 5C).

Access requirements:

To access the Specialization Course in Maintenance and Safety in Hybrid and Electric Vehicle Systems, it is necessary to hold one of the following degrees:

Access to the next level of education or training: Access to any university study is possible.

Legal Basis. Regulations establishing the title:

Minimum teaching requirements established by the State: Royal Decree 109/2022, of February 8, which establishes the Higher Degree Master's Degree in Maintenance and Safety in Hybrid and Electric Vehicle Systems and sets the corresponding minimum teaching requirements.

Explanatory note: This document is intended as additional information to the title in question, but has no legal validity whatsoever.

FORMATION OF THE OFFICIALLY RECOGNIZED MASTER'S DEGREE

PROFESSIONAL MODULES OF THE MASTER'S DEGREE ROYAL DECREE	ECTS CREDITS
Safety in vehicles with high voltage systems	5
Electric and hybrid drive in vehicles	10
High voltage systems, electrical storage and recharging	10
Transmission systems, regenerative braking and thermal control	7
Workplace training	8
	TOTAL CREDITS
	40
OFFICIAL DURATION OF THE MASTER'S DEGREE (HOURS)	650

* The minimum Master's degree courses shown in the table above, 55%, are official and valid in the entire national territory. The remaining 45% belongs to each Autonomous Region and may be reflected in the **Annex I** of this supplement.

INFORMATION ABOUT THE EDUCATION SYSTEM

