Electric Vehicle Technician

The EV Technician is responsible for performing diagnostics, maintenance, and repairs on electric and hybrid vehicles. The role includes handling safety-critical operations such as high-voltage disconnection, system testing, and troubleshooting electrical and electronic subsystems, including 12V and HV architecture. The technician must understand vehicle electrical systems, battery management systems (BMS), inverters, drive units, and charging technologies, ensuring compliance with both manufacturer and regulatory safety protocols.

Key responsibilities include evaluating onboard and charging components, interpreting fault codes and data logs, conducting precise measurements of voltage and insulation, and applying systematic diagnostic procedures. The technician also engages in clear customer communication and ensures high standards of workplace safety, including awareness of hazards associated with high-voltage systems.

In the context of the automotive sector, this role is at the forefront of the Green and Sustainable Transition, supporting electromobility, circular economy, and battery reuse/regeneration. It also contributes to Digitalisation, by using diagnostic tools and ECU communication systems, and to Resilience of Value Chains, by ensuring vehicle uptime and safety. EV Technicians are key players in supporting the scaling of electric vehicle adoption and infrastructure.

ESCO Mapping

https://esco.ec.europa.eu/select-language?destination=/node/1

ID	NAME	Concept URI
7231.10	Vehicle technician	http://data.europa.eu/esco/occupation/4ad4024e-d1d3-4dea-b6d1-2c7948111dce

Context

EQF Level	4/5
Departments	Production and Maintenance

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Green Competences

ID	Name	Type	Description	Level	ESCO
C036	Battery and energy systems	Knowledge	Describe lithium battery structure, regeneration methods and BMS operation. ▪ Explain battery pack architecture and cell types. ▪ Identify battery regeneration techniques. ▪ Describe how BMS communicates with vehicle systems. ▪ Explain the safety concerns of battery operation.	2	Link
C037	Hybrid vehicle configuration	Knowledge	Identify different hybrid vehicle architectures and their environmental impact. ▪ Describe series, parallel and plug-in hybrid configurations. ▪ Explain how each affects emissions and energy efficiency. ▪ Compare impact of hybrid solutions on sustainability goals. ▪ Discuss relevance to CO_2 targets.	2	Link

Digital Competences

ID	Name	Type	Description	Level	ESCO
C096	Analyse diagnostic parameters	Skill	Use diagnostic tools to analyse onboard systems such as chargers and inverters. ▪ Read parameter values for PTC heaters, inverters and chargers. ▪ Evaluate sensor feedback in real time. ▪ Operate scan tools to identify irregular patterns. ▪ Generate diagnostic reports.	3	Link
C097	Fault code interpretation	Knowledge	Explain and interpret diagnostic fault codes and live data. ▪ Identify failure causes based on DTCs. ▪ Interpret freeze-frame data. ▪ Compare fault codes across systems.	3	Link

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ID	Name	Type	Description	Level	ESCO
			▪ Recommend repair strategies from fault analysis.		
C098	Diagnose communication protocols	Skill	Diagnose communication issues between ECUs and charging systems. ▪ Interpret CAN, LIN and ISO 15118 protocols. ▪ Isolate communication breakdowns. ▪ Perform end-to-end continuity tests. ▪ Advise on reprogramming or network repair.	3	Link

Soft Skills

ID	Name	Type	Description	Level	ESCO
C149	Solve problems systematically	Skill	Apply structured diagnostic logic to vehicle electrical systems. ▪ Follow step-by-step procedures to isolate faults. ▪ Document each test and result. ▪ Eliminate potential causes iteratively. ▪ Combine OEM and custom diagnostics.	3	Link
C150	Electrical safety	Knowledge	Demonstrate awareness of safety procedures and hazards in HV systems. ▪ Recognise electrical risks in maintenance work. ▪ Identify necessary PPE and tools. ▪ Follow lockout/tagout protocols. ▪ Communicate safety needs clearly.	3	Link
C151	Interact with customers	Skill	Communicate clearly and professionally with customers. ▪ Explain issues in non-technical terms. ▪ Give safety advice after repairs. ▪ Provide usage recommendations. ▪ Handle complaints respectfully.	2	Link

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Transversal Competences

ID	Name	Type	Description	Level	ESCO
C190	Perform high-voltage disconnection	Skill	Perform HV isolation and reconnection using safety procedures. ▪ Use PPE and insulated tools for HV tasks. ▪ Perform safe disconnection before maintenance. ▪ Verify de-energised systems. ▪ Restore systems in line with OEM protocols.	3	Link
C191	Standards and regulations	Knowledge	Apply relevant safety and compliance standards in EV repair work. ▪ Describe EN60900 requirements. ▪ Identify manufacturer-specific safety rules. ▪ Explain implications for workshop layout. ▪ Ensure audit-readiness for inspections.	3	Link

Sector Specific

ID	Name	Type	Description	Level	ESCO
C256	Perform high-voltage measurements	Skill	Perform voltage, resistance, and insulation tests. ▪ Use multimeter and insulation tester. ▪ Confirm system grounding. ▪ Evaluate readings against specs. ▪ Identify faulty HV components.	3	Link
C267	EV system architecture	Knowledge	Explain electric drivetrain layout and energy flow. ▪ Describe components of battery, inverter, drive unit. ▪ Map energy flow in different drive cycles. ▪ Compare hybrid types. ▪ Explain safety integration in layout.	3	Link
C268	Balance battery modules	Skill	Assess and correct voltage imbalances in battery modules. ▪ Check cell voltage and state of charge. ▪ Identify imbalances. ▪ Rebalance with OEM equipment.	3	Link

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ID	Name	Type	Description	Level	ESCO
			▪ Replace faulty modules.		

Other

ID	Name	Type	Description	Level	ESCO
C319	First aid in electrical incidents	Knowledge	Understand emergency procedures related to electrical accidents. ▪ Identify electric shock symptoms. ▪ Apply CPR in HV scenarios. ▪ Use extinguishers for battery fires. ▪ Communicate with emergency responders.	2	Link

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