

Overview

This standard is for people who work on, near or with electric vehicles but **do not work** on the vehicle's high voltage system. Examples of relevant job roles include technicians, MOT testers, sales/reception staff, cleaners/valeters, delivery drivers or automotive managers. The standard covers safe working practices and essential knowledge of the hazards associated with electric vehicles and the precautions to follow to avoid these.

For the purposes of this standard, an electric vehicle is any vehicle that is in part or wholly electrically propelled. This would include:

- Hybrid (HEV) - to include mild/micro hybrid vehicles where the voltage is considered dangerous.
- Plug-in Hybrid (PHEV)
- Extended Range Electric Vehicle (ER-EV) or Range Extended Electric Vehicle (RE-EV)
- Battery Electric Vehicle (BEV) or Pure Electric Vehicle (PEV)
- Fuel Cell Electric Vehicle (FCEV).

This standard does not deem someone competent to maintain, service or repair an electric vehicle's high voltage systems and their components.

**Performance
criteria**

- You must be able to:
- P1 Identify the electric **vehicle** type and collect relevant information about the **vehicle** and any specific hazards
 - P2 Confirm with the relevant person in your workplace that the correct workplace procedure has been followed to make the vehicle safe prior to starting any work
 - P3 Operate in a way that:
 - P3.1 avoids contact with, or damage to, high voltage electrical systems and their components
 - P3.2 avoids damage to your working environment and injury to yourself and others
 - P4 Refer any concerns about the **vehicle** to the relevant person in your workplace
 - P5 Follow workplace procedures to report the operations you have carried out on, near or with the **vehicle**

Knowledge and understanding

You need to know and understand:

Use of technical information

- K1 How to identify an electric **vehicle** and its type.
- K2 How to find, interpret and use sources of information applicable to electric vehicles as appropriate to your job role
- K3 How to identify high voltage electrical components in an electric vehicle

Legislative and organisational requirements and procedures

- K4 The health and safety legislation, industry codes of practice or guidelines and workplace procedures relevant to working on, near or with electric vehicles, including the safety of the working environment
- K5 The hazards associated with high voltage electric vehicle components and how to work safely in their proximity
- K6 Your workplace procedures for:
 - K6.1 confirming with the relevant person in your workplace that the **vehicle** has been made safe as appropriate to the work you are carrying out
 - K6.2 referring/reporting concerns when operating with/around electric vehicles
 - K6.3 recording and reporting work carried out on electric vehicles
- K7 The implications and effects of electricity through the human body
- K8 The implications of strong magnetic fields and the effects on medical devices
- K9 The precautions necessary when using plug-in charging equipment
- K10 Workplace procedures that must be followed in the event of electric shock and other emergencies, including fire and flood
- K11 The hazards associated with electric vehicles when exposed to extreme temperatures, impact and other adverse conditions
- K12 Why an electric vehicle might be cordoned off

Vehicle system operation

- K13 The main differences between an electric and non-electric vehicle
- K14 How to safely operate an electric **vehicle**
- K15 How to safely charge an electric **vehicle**
- K16 The implications of remote vehicle control
- K17 When vehicle systems might self-operate

K18 How to identify different operational modes in an electric **vehicle**

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Scope/range

1. **Vehicle** - any vehicle that is in part or wholly electrically propelled. This would include
 - 1.1. Hybrid (HEV) - to include mild/micro hybrid vehicles where the voltage is considered dangerous.
 - 1.2. Plug-in Hybrid (PHEV)
 - 1.3. Extended Range Electric Vehicle (ER-EV) or Range Extended Electric Vehicle (RE-EV)
 - 1.4. Battery Electric Vehicle (BEV) or Pure Electric Vehicle (PEV)
 - 1.5. Fuel Cell Electric Vehicle (FCEV)

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**Additional
Information****Glossary**

This section contains examples and explanations of some of the terms used but does not form part of the standard.

Hazards associated with high voltage electrical vehicle components - exist not only during work on high voltage systems, as specified above, but also on all other high-power electrical drive systems and high-pressure storage systems. Vehicle and equipment manufacturers' guidance should be followed at all times.

High voltage – Regulation No 100 of the Economic Commission for Europe of the United Nations (UNECE) — Uniform provisions concerning the approval of vehicles with regard to specific requirements for the electric power train, states that: 'High Voltage' means the classification of an electric component or circuit, if its working voltage is $> 60 \text{ V}$ and $\leq 1\,500 \text{ V DC}$ or $> 30 \text{ V}$ and $\leq 1\,000 \text{ V AC}$ root mean square (rms). Electricity at Work Regulations (1989), and associated HSE guidance should be followed at all times.

N.B. Some electric vehicles may operate at voltages below or above industry recognised standards.

Operations on, near or with an electric vehicle

Any activity which does not include working on the high voltage systems and components.

Sources of information applicable to electric vehicles

Examples include hard copy manuals, data on computer and data obtained from on-board diagnostic displays.

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Status	Original
Originating organisation	IMI Ltd
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Relevant occupations	Sales Executive (Automotive); Sales Controller (Automotive); Vehicle Fitting Operations (Automotive); Vehicle Valet (Automotive); Specialist Tyre Fitting Operations (Automotive); Hire and Rental Delivery and Collection Operations; Hire and Rental Operations; Hire and Rental Counter Operations; Rental and Leasing Customer Service Advisor (Automotive); Rental and Leasing Maintenance Advisors (Automotive); Rental and Leasing Technical Service Advisor (Automotive); Body Repair Technician (Automotive); Body Repair and Alignment Technician (Automotive); Cosmetic Refinishing Technician (Automotive); Cosmetic Senior Refinishing Technician (Automotive); PDR Senior Technician (Automotive); PDR Technician (Automotive); Body Builder (Automotive); Body Builder Workshop Controller (Automotive); Vehicle Damage Assessment Operators; Vehicle Damage Assessor (Automotive); Vehicle Fitters; Insurance Engineer (Automotive); Autoglazing Technician; Auto Electrical Technician (Automotive);

Automotive Aftermarket Electrical Enhancement Technician (Automotive); Auto and Mobile Installation Technicians; Automotive Paint Technician; Automotive Paint Supervisor; Customer Service Advisor (Automotive); Vehicle Delivery Driver; Bus and Coach Mechanic (semi-skilled); Bus and Coach Mechanic; Bus and Coach Electrician; Bus and Coach Mechelec; Bus and Coach Master Technician; Bus and Coach Body Repairer; Coachbuilder

Suite Electric and Hybrid Vehicles

Key words Electric Vehicle; safety, hazard awareness.

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