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## Overview

This standard is for people who work on, near or with light electric vehicles but do not work on the vehicle's electric transmission system. The standard covers safe working practices and essential knowledge of the hazards associated with light electric vehicles and the precautions to follow to avoid these.

For the purposes of this standard, a light electric vehicle vehicle is any small vehicle powered by an electric motor (e-system) with 1, 2, 3 or more wheels, for example electric bikes, electric scooters, quadrimobiles, etc.

**This standard does not deem someone competent to maintain, service or repair a light electric vehicle's e-systems and their components**

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## Performance criteria

### You must be able to:

P1 Identify the light electric vehicle type and collect relevant information about the vehicle and any specific hazards

P2 wear personal protective equipment (PPE) and use vehicle protection equipment (VPE) appropriate to the operations you are carrying out

P3 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

P4 work in a way that:

P4.1 minimises contact with, or damage to, light electric vehicle **e-system components**

P4.2 avoids damage to your working environment and injury to yourself and others

P5 refer any problems with the vehicle to the relevant person in your workplace

P6 follow workplace procedures to report the operations you have carried out on, near or with the vehicle

P7 safely charge the vehicle, as necessary.

## Knowledge and understanding

You need to know and understand:

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*Use of technical information*

**K1 how to identify a light electric vehicle and its type.**

**K2 how to find, interpret and use sources of information applicable to light electric vehicles as appropriate to your job role**

**K3 how to identify \*e-system components** in a light 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 light electric vehicles**

**K5 the classifications of light electric vehicles in the United Kingdom as appropriate to your job role**

**K6 the hazards associated with \*e-system components** and how to work safely in their proximity

**K7 your workplace procedures for:**

K7.1 confirming with the relevant person in your workplace that the vehicle has been made safe as appropriate to the work you are carrying out

K7.2 referring/reporting problems when working with light electric vehicles

K7.3 recording and reporting work carried out on light electric vehicles

K8 the implications of electrical conductivity through the human body

K9 the implications of strong magnetic fields and the effects on medical devices

K10 the precautions necessary when using plug-in charging equipment

K11 workplace procedures that must be followed in the event of electric shock and other emergencies, including fire and flood

K12 the hazards associated with electric vehicles when exposed to extreme temperatures, impact and other adverse conditions

### **Vehicle system operation**

K13 the difference between pedal-assist and power-on demand systems

K14 the different types of **batteries** used on light electric vehicles and how to handle them

K15 the advantages and disadvantages of the **batteries** used on light electric vehicles

K16 the storage and disposal methods for each of the **battery** types used on light electric vehicles

K17 the different motor locations used on an light electric vehicles

K18 what is meant by the terms brushed and brushless motors

K19 the advantages and disadvantages of a brushed and brushless motor when used on a light electric vehicle

K20 the different **voltages** used on light electric vehicles

K21 how the light electric vehicle can be safely charged using an external source

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K22 the hazards associated with charging the **batteries** on a light electric vehicle

K23 how to safely operate a light electric vehicle

K24 the charging systems associated with light electric vehicles and how to use them safely

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## Scope/range

### 1. **Batteries** are:

- 1.1 Sealed lead-acid (SLA)
- 1.2 Nickel-cadium (NiCad)
- 1.3 Nickel-metal hydride (NiMH)
- 1.4 Lithium-ion polymer (Li-ion)
- 1.5 Lithium-iron phosphate (LifeP04)
- 1.6 Lithium Manganese Cobalt (LiMnCo)

### 2. **Voltages** are:

- 2.1 12V
- 2.2 24V
- 2.3 36V
- 2.4 48v

### 3. **E-system components** include:

- 3.1 battery
- 3.2 controls
- 3.3 rider information
- 3.4 wiring loom
- 3.5 motor

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## Glossary

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

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***Hazards associated with light electric vehicle transmission battery voltage***

*These exist not only during work on light electric vehicle e-systems. Vehicle and equipment manufacturers' guidance should be followed at all times.*

***Light electric vehicle transmission battery voltage***

*Voltages less than 60v DC.*

***Operations on, near or with a light electric vehicle***

*Any activity which does not include working on the e-system and components.*

***Sources of information applicable to light electric vehicles \****

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

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Safely carry out operations on, near or with light electric vehicles



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