
Overview

This standard is about the bench-based overhaul of light electric vehicle e- system units, involving dismantling, assessment, repair, replacement or adjustment of internal components together with re-assembly and testing. Units and components include motors, controllers, sensors and wiring.

For the purposes of this standard, a light electric 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.

Performance criteria

You must be able to:

P1 use suitable personal protective equipment throughout all **overhauling activities**

P2 use suitable sources of technical information to support your **overhauling activities**

P3 assess and prepare all the **tools and equipment** required, following manufacturer's instructions, prior to use

P4 use the **tools and equipment** required correctly and safely throughout all overhauling activities

P5 carry out all **overhauling activities** following:

P5.1 manufacturer's instructions

P5.2 your workplace procedures

P5.3 health and safety requirements

P6 work in a way which minimises the risk of:

P6.1 damage to other vehicle systems, units and components

P6.2 contact with leakage, hazardous substances and high voltage systems

P6.3 damage to your working environment

P6.4 injury to yourself and others

P7 ensure your assessment of the dismantled unit accurately identifies its condition and suitability for overhaul

P8 promptly inform the relevant person(s) where an overhaul is uneconomic or unsatisfactory to perform

P9 use **testing methods** which comply with the manufacturer's requirements

P10 correctly adjust the mechanical unit's components correctly to ensure that they operate to meet the light electric vehicle e-system operating requirements, when necessary

P11 ensure the overhauled units and assemblies conform to the light electric vehicle operating specification and any legal requirements

P12 ensure your overhaul records are accurate, complete and promptly passed to the relevant person(s) in the format required

P13 complete all **overhauling activities** within the agreed timescale

P14 promptly report any anticipated delays in completion to the relevant person(s)

Knowledge and understanding

You need to know and understand:

Legislative and organisational requirements and procedures

K1 the legal requirements applicable to the light electric vehicle mechanical units and e-system assemblies overhauled (including road safety requirements)

K2 the health and safety legislation, environmental requirements and workplace procedures relevant to workshop practices and personal and light electric vehicle protection

K3 your workplace procedures for:

K3.1 recording **overhauling activities**

K3.2 the referral of problems

K3.3 reporting delays to the completion of work

K4 the importance of documenting repair information

K5 the importance of working to agreed timescales and keeping others informed of progress

K6 the cost-benefit relationship between the reconditioning, repair and replacement of components

K7 the importance of promptly reporting any anticipated delays to the relevant person(s)

Equipment

K8 how to prepare and assess the accuracy and operation of all the overhauling and testing **tools and equipment** required

K9 how to use all the overhauling and testing **tools and equipment** required

E-system unit overhauling activities

K10 how to find, interpret and use sources of information on e-system overhauling procedures and statutory requirements

K11 how **e-system units and assemblies** are constructed and their operation

K12 how **e-system units and assemblies** are dismantled and reassembled

K13 the types and possible causes of faults in **e-system units and assemblies*** and how to identify them

K14 light electric vehicle e-system operating specification for limits, fits and tolerances and where this information can be sourced

K15 how to assess the condition evident within e-system sub-assemblies and components

K16 the cost-benefit relationship between the reconditioning, repair and replacement of components within units and assemblies

K17 how to carry out **overhauling activities** for the type(s) of light electric vehicle e-system unit on which you work

K18 the relationship between test methodology and the faults rectified – the use of appropriate testing methods

K19 how to test and evaluate the performance of overhauled units against the

operating specification

K20 how to interpret test results and make recommendations

K21 how to make suitable adjustments to light electric vehicle **e-system units and assemblies**

Scope/range

1. **Overhauling activities** are:

- 1.1. dismantling
- 1.2. assessment
- 1.3. repair
- 1.4. replacement
- 1.5. adjustment of internal components
- 1.6. reassembly
- 1.7. functional testing
- 1.8. software updates

2. **Units and components** are:

- 2.1. batteries
- 2.2. motors
- 2.3. controllers
- 2.4. sensors
- 2.5. actuators
- 2.6. electronic control unit (ECU)
- 2.7. wiring
- 2.8. chargers
- 2.9. displays

3. **Testing methods** are:

- 3.1. sensory
- 3.2. functional
- 3.3. measurement

4. **Tools and equipment** include:

- 4.1. hand tools
- 4.2. special workshop tools
- 4.3. general workshop equipment
- 4.4. electrical and electronic testing equipment

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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Agreed timescales

Examples include manufacturer's recommended work times, job times set by your company or a job time agreed with a specific customer

Light electric vehicle

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*Sensory diagnostic methods**

These may include looking, listening, smelling and touching for heat

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