

## Overview

This standard is about the bench-based overhaul of e-cycle 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.

In this standard the term 'e-cycle' includes vehicles with two, three or four wheels that are pedal-assisted:

- Road legal up to 15.5 mph with a motor with an output of up to 250w
- E-cycles used for other purposes

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## 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 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 e-cycle operating requirements, when necessary
  - P11 ensure the overhauled units and assemblies conform to the e-cycle 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 e-cycle mechanical units and assemblies overhauled (including road safety requirements)
- K2 the health and safety legislation, environmental requirements and workplace procedures relevant to workshop practices and personal and e-cycle 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)

You need to know and understand

**Equipment**

- K8 how to prepare and assess the accuracy and operation of all the overhauling and testing equipment required
- K9 how to use all the overhauling and testing equipment required

You need to know and understand:

**E-cycle system unit overhauling activities**

- K10 how to find, interpret and use sources of information on e-cycle system overhauling procedures and statutory requirements
- K11 how e-cycle system units and assemblies are constructed and their operation
- K12 how e-cycle system units and assemblies are dismantled and reassembled
- K13 the types and possible causes of faults in e-cycle system units and assemblies and how to identify them
- K14 e-cycle operating specification for limits, fits and tolerances and where this information can be sourced

- K15 how to assess the condition evident within e-cycle 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 e-cycle 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 e-cycle units and components

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**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
  
- 2. Units and components are:**
  - 2.1. Batteries
  - 2.2. motors
  - 2.3. controllers
  - 2.4. sensors
  - 2.5. actuators
  - 2.6. 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

**Additional information**

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

**Glossary**

**Adjustments**

What does this look like for this unit?

**Agreed timescales**

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

**Assessments**

What does this look like for this unit?

**E-cycles**

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**Relevant occupations** E-cycle Technician

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**Suite** Cycle? Micro mobility?

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**Key words** xx