## Overhaul e-cycle system units and components

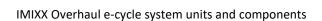


#### **Overview**

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



## Overhaul e-cycle system units and components



#### **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)

## Overhaul e-cycle system units and components



# 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

## Overhaul e-cycle system units and components



- 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

## Overhaul e-cycle system units and components



## 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

## Overhaul e-cycle system units and components



# 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**

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

# IMIBCxx Overhaul e-cycle system units and components



Developed by	IMI
Version number	1
Date approved	March 2022
Indicative review date	March 2025
Validity	Current
Status	Original
Originating organisation	IMI Ltd
Original URN	XX
Relevant occupations	E-cycle Technician
Suite	Cycle? Micro mobility?
Key words	xx