

Maintain cycle wheel and tyre systems

Overview

This standard is about maintaining cycle wheel and tyre systems, including building a wheel, identifying tyre wear/defects, tyre sizing and tread patterns, repairing a puncture and removing and replacing tyres, so that the cycle is reinstated to a safe and roadworthy condition.

In this standard the term 'cycle' includes pedal-propelled vehicles with two, three or four wheels. It may also include pedal-assisted e-bikes:

- 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 cycle wheel and tyre maintenance activities

P2 ensure the cycle and the work area are safe prior to work commencing

P3 support your removal and replacement activities by reviewing:

- P3.1 cycle technical data

- P3.2 cycle tyre maintenance procedures

- P3.3 legal requirements

P4 identify **components** relevant to cycle wheels

P5 prepare, check and use all the equipment required following manufacturer's instructions

P6 carry out all cycle wheel and tyre maintenance activities following:

- P6.1 manufacturer's instructions

- P6.2 industry recognised methods

- P6.3 your workplace procedures

- P6.4 health, safety and environmental requirements

P7 work in a way which minimises the risk of:

- P7.1 damage to the cycle, its systems and **components**

- P7.2 damage to your working premises or the environment

- P7.3 injury to self and others

P8 identify punctures, defects and sizing of cycle tyres

P9 identify valve types, correct use and pressures

P10 remove and replace cycle tyres, valves and associated **components**

P11 use suitable **testing methods** to accurately evaluate the performance of the wheel and tyre

P12 ensure the reassembled system performs to the cycle operating specification and meets any legal requirements prior to return to the customer

P13 promptly report any problems or issues relating to the cycle's condition or conformity to the relevant person(s)

P14 ensure your records are accurate, complete and promptly passed to the relevant person(s) in the format required

P15 complete all cycle maintenance activities within the agreed timescale

P16 promptly report any anticipated delays in completion to the relevant persons(s)

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Knowledge and understanding

You need to know and understand:

Legislative and organisational requirements and procedures

K1 the health and safety legislation, environmental requirements and workplace procedures relevant to cycle wheel and tyre maintenance activities and personal and cycle protection

K2 your workplace procedures for:

K2.1 recording cycle wheel and tyre maintenance information

K2.2 the referral of problems

K2.3 reporting delays to the completion of work

K2.4 personal protection

K3 how to isolate scrapped tyres and dispose of waste materials in your workplace following environmental requirements

K4 how to work safely avoiding damage to other cycle systems, components and units and injury to self and others

K5 the importance of documenting cycle wheel and tyre maintenance information

K6 the importance of working to agreed timescales and keeping others informed of progress

K7 the relationship between time and cost

K8 the importance of promptly reporting anticipated delays to the relevant person(s)

Use of technical information

K9 how to find, interpret and use sources of current technical information for cycle wheel and tyre maintenance activities

K10 the importance of using the appropriate sources of technical information

K11 the standard sizes set by ETRTO (European Tyre and Rim Technical Organisation) and how to interpret other sizing methods

Tools and equipment

K12 how to select, prepare, check and use all the cycle wheel and tyre maintenance **tools and equipment** required

Cycle wheel building and hub maintenance

K13 how to identify the **components** in cycle wheels

K14 how to determine correct spoke lengths in cycle wheels

K15 how to identify appropriate and compatible hub for wheel building

K16 how to lace and tension a cycle wheel

K17 how to establish radial and lateral trueness and dish to agreed standards

K18 the features of stress relieving spokes

K19 how to compare spoke tension against recommendations

K20 how to remove and replace cycle hub bearing **components** for the types of cycle on which you work

K21 how to test and evaluate the performance of the wheel against the cycle operating specifications and any legal requirements, including **hub assessments**

K22 the manufacturer's specification for the type and quality of **components** to be used

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Cycle tyre maintenance

K23 how to identify the major **components** relevant to the removal and replacement of cycle wheels, tyres and inner tubes and the repair of punctures.

K24 the common sizes of relevant **components**

K25 the function of relevant **components** *

K26 how to locate a puncture and identify its cause

K27 the advantages and disadvantages of different cycle *tyre systems

K28 how to remove and replace cycle tyres for the types of **tyre systems** on which you work

K29 how the **rim type** affects the tyre fitting method

K30 how to test and evaluate the performance of replacement cycle **tyre system components** and the reassembled system against the cycle operating specifications and any legal requirements

K31 the manufacturer's specification for the type and quality of **components** to be used

K32 the relationship between rims, tyres and associated inflation pressures

K33 cycle manufacturer's data regarding maximum tyre size

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Scope/range

1. ****Testing methods**** are:

- 1.1 sensory
- 1.2 functional
- 1.3 measurement

2. **Components** are:

- 2.1 wheels
- 2.2 tyres
- 2.3 inner tubes
- 2.4 fasteners
- 2.5 repair patches
- 2.6 valves
- 2.7 rim tapes

3. **Wheel building tools and equipment** include:

- 3.1 wheel jig
- 3.2 dial test indicators
- 3.3 wheel building tools
- 3.4 spoke calculation software
- 3.5 measuring equipment
- 3.6 hand tools
- 3.7 spokes, hubs and rims

4. **Tyre repair tools and equipment** include:

- 4.1 cycle stand
- 4.2 inflation equipment
- 4.3 pressure gauge
- 4.4 wheel removal equipment
- 4.5 tyre removal equipment
- 4.6 puncture repair equipment
- 4.7 sealants

5. Hub **assessments** for:

- 5.1 seal damage
- 5.2 bearing wear and faults
- 5.3 axle trueness
- 5.4 free hub body

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6. Cycle **tyre systems** are:

6.1 clincher and inner tube

6.2 tubular

6.3 tubeless

7. **Rim type*s*** are:

7.1 aluminium

7.2 carbon fibre

7.3 steel

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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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Agreed timescales

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

Conformity

Examples include conformity to approvals and specifications, UK and European legal requirements where applicable

Cycles

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- Road legal up to 15.5 mph with a motor with an output of up to 250w
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Fasteners

To include, nuts, bolts, locking devices, clips, quick release skewers, thru-axle types

Sizing

To include European Tyre and Rim Technical Organisation (ETRTO)

Sources of technical information

Manufacturer manuals and data

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