IMIBCxx Set up, maintain and diagnose complex cycle gear systems

Overview

This standard is about maintaining and repairing complex cycle gear systems. It is also about diagnosing and rectifying faults and performing custom system set ups and carrying out a quality check on the completed work before returning the cycle to the customer.

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

Performance criteria

You must be able to:

- P1 use suitable personal protective equipment throughout all cycle complex gear system maintenance and repair activities
- P2 ensure the cycle and the work area is safe prior to work commencing
- P3 support your maintenance and repair activities by reviewing:
  - P3.1 cycle technical data
  - P3.2 maintenance and repair procedures
  - P3.3 legal requirements
- P4 identify components relevant to cycle complex gear systems
- P5 prepare, check and use all the equipment required following manufacturer's instructions
- P6 carry out all cycle complex gear system maintenance, diagnosis and rectification 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 environment
  - P7.3 injury to self and others
- P8 use suitable testing methods to accurately evaluate the performance of the reassembled system
- P9 ensure the reassembled system performs to the cycle operating specification and meets any legal requirements prior to return to the customer
- P10 promptly report any problems or issues relating to the cycle's condition or conformity to the relevant person(s)
- P11 ensure your records are accurate, complete and promptly passed to the relevant person(s) in the format required
- P12 complete all complex cycle gear system maintenance and repair activities within the agreed timescale
- P13 promptly report any anticipated delays in completion to the relevant persons(s)

Knowledge and understanding

You need to know and understand:

Legislative and organisational requirements and procedures

K1 the legal requirements relating to the cycle (including road safety requirements)

K2 the health and safety legislation, environmental requirements and workplace procedures relevant to cycle complex gear system maintenance, diagnosis and rectification activities and personal and cycle protection

K3 your workplace procedures for:

- K3.1 recording maintenance and repair information
- K3.2 the referral of problems
- K3.3 reporting delays to the completion of work

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 complex gear system maintenance and repair 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 applicable to cycle complex gear system maintenance, diagnosis and rectification

K10 the importance of using the appropriate sources of technical information

Tools and equipment

K11 how to select, prepare, check and use all the maintenance, diagnosis and rectification equipment required

Cycle internal hub system maintenance and repair

K12 what is meant by a cycle internal hub system

K13 the basic principles of epicyclic gearing

K14 how to identify the components in a cycle internal hub system

K15 the purpose and operation of each component of a cycle internal hub system

K16 the advantages and disadvantages of a internal hub system compared to a derailleur system

K17 how to check a cycle internal hub system for correct operation

K18 how to clean and adjust a cycle internal hub system

K19 how to remove and strip an internal hub and check it for serviceability

K20 how to identify and rectify faults presented on a cycle internal hub system

K21 how to refit or replace cycle internal hub system components

K22 how to lubricate and adjust internal hub system components

Electronic gear change system diagnosis and rectification

K23 the main components of a cycle electronic gear change system

K24 the advantages and disadvantages of a cycle electronic gear change system compared with a conventional cable operated system

K25 the compatibility issues associated with electronic gear systems

K26 the process for correctly diagnosing faults on a cycle electronic gear change system

K27 the process for correctly calibrating the cycle electronic gear change system following the diagnostic or rectification activity

K28 the procedure for checking the battery charge state on a cycle electronic gear change system

K29 the correct procedure for inspecting the operation and condition of a cycle electronic gear change system

Quality check

K30 the quality check process and how to report any faults highlighted during the quality check

K31 how to assess the condition of complex cycle gear systems following maintenance, diagnosis and rectification activity, ensuring the cycle is returned to the customer in a roadworthy condition prior to returning the cycle to the customer.

Scope/range

1. Tools and equipment include:

1.1 hand tools

1.2 electrical tools

1.3 diagnostic equipment

1.4 measuring equipment

1.5 bench mounted equipment

1.6 cleaning and degreasing equipment

1.7 lubricants

2. Internal hub system components are:

2.1 planet wheel

2.2 sun wheel

2.3 hub shell

2.4 planet wheel carrier

2.5 annular gear

2.6 sprocket

2.7 free wheel device

2.8 control mechanism

3. Electronic gear change components are:

3.1 batteries

3.2 wiring loom

3.3 electronic shifter

3.4 electronic derailleur

4. Adjustments include:

4.1 System calibration

4.2 Custom system set up

Additional information

Glossary

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

Agreed timescales

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

Condition

Includes cleanliness, security of all component parts and calibration of electronic gear change system

Conformity

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

Cycles

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Quality check

What does that look like for this unit?

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