



Australian Government

AURBTJ103 Design and build bicycle wheels

Release: 1

AURBTJ103 Design and build bicycle wheels

Modification History

Release	Comments
Release 1	This version first released with AUR Automotive Retail, Service and Repair Training Package Version 6.0

Application

This unit describes the skills and knowledge required to design and build bicycle wheels with different hub, spoke and rim configurations. The unit involves preparing for the work, selecting and using specialist tools and equipment to design and carry out the building and testing of bicycle wheels, and completing workplace processes and documentation.

The unit applies to those working in the bicycle retail, service and repair industry.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Unit Sector

Bicycle Technical - Wheels and Tyres

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Prepare to design and build bicycle wheels	1.1 Determine job requirements from workplace instructions, including wheel materials, components and spoke patterns 1.2 Research and interpret bicycle wheel design requirements and manufacturer specifications 1.3 Confirm bicycle wheel design and specifications with customer
2. Prepare to build bicycle wheels	2.1 Check wheel components against specifications and inspect for quality prior to build 2.2 Plan bicycle build to use time efficiently 2.3 Identify hazards associated with the work and manage risks 2.4 Select and check tools and equipment for serviceability

ELEMENTS	PERFORMANCE CRITERIA
	2.5 Prepare work area, wheels, components and materials
3. Build and test bicycle wheels	3.1 Build bicycle wheels according to job and customer requirements, work plan, and safety and environmental requirements 3.2 Select bicycle wheel hubs and rims and calculate spoke lengths 3.3 Lace and tension bicycle wheel spokes according to manufacturer specifications and workplace instructions 3.4 Check built bicycle wheels for symmetry and test for trueness against specifications 3.5 Report results and quality issues to authorised personnel as required
4. Complete work processes	4.1 Conduct final inspection according to workplace procedures and confirm bicycle is ready for use 4.2 Clear work area and dispose of or recycle materials according to workplace procedures 4.3 Complete documentation according to workplace procedures

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance but not explicit in the performance criteria.

SKILL	DESCRIPTION
Learning	Locates required sources of information efficiently.
Numeracy	- Interprets stock codes - Identifies wheel and hub sizes and spoke numbers - Uses basic mathematical operations to calculate: - spoke lengths - settings and adjustments to wheel and hub components.
Oral communication	Asks questions to clarify instructions and requirements, including with customers and suppliers.
Problem solving	- Identifies: - potential faults in wheel design - technical and procedural problems to avoid waste.
Technology	Uses specialist bicycle tools and equipment in line with workplace procedures.

Unit Mapping Information

Supersedes and is equivalent to AURBTJ003 Design and build bicycle wheels.

Links

Companion Volume Implementation Guide is found on VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b4278d82-d487-4070-a8c4-78045ec695b1>

Assessment Requirements for AURBTJ103 Design and build bicycle wheels

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Performance Evidence

The candidate must demonstrate the ability to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including evidence of the ability to:

- design and build at least three different bicycle wheels to specification, with each wheel including the following:
 - lacing a 32 hole three-cross spoke pattern
 - disc and non-disc brake specific patterns.

Knowledge Evidence

The candidate must be able to demonstrate knowledge to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including knowledge of:

- methods to locate and interpret information required to design and build bicycle wheels, including:
 - information provided by customers and supervisors
 - manufacturer specifications and procedures or equivalent documentation
- workplace procedures required to design and build bicycle wheels, including:
 - establishing serviceability of tools and equipment
 - documentation procedures
 - housekeeping procedures, including:
 - examination of tools and equipment
 - storage of equipment
 - identification, tagging and isolation of faulty equipment
 - disposal of excess materials
 - recycling procedures
- work health and safety (WHS) requirements relating to designing and building bicycle wheels, including procedures for:
 - manually handling bicycle wheels
 - identifying workplace hazards

- using tools and equipment, including personal protective equipment (PPE)
- environmental requirements, including procedures for disposing of waste materials
- job requirements for spoke patterns, wheel components and wheel materials
- key bicycle terminology relating to wheel build for different bicycle types
- key features to be considered in wheel design:
 - hubs, spoke and rim selection
 - 32 hole three-cross spoke pattern
 - disc and non-disc brake specific patterns
 - symmetrical and asymmetrical patterns
 - wheel dynamics and loading
- wheel and hub mechanical principles
- bicycle wheel components and their specifications, including:
 - steel, aluminium and composite material rims
 - high flange, low flange and integrated brake hubs
 - metal and composite hub material
 - steel, aluminium and composite spoke material
 - straight gauge, double butted and bladed spokes
 - spoke nipples
 - spoke lacing patterns
- types and use of tools and equipment used to design and build bicycle wheels
- techniques for designing and building bicycle wheels, including:
 - material used in bicycle wheels
 - selecting and checking of personal protective equipment
 - planning time efficient build sequence and post-build testing
 - lacing and tensioning spoke pattern
 - calculating spoke lengths
 - assembly, truing and tensioning of wheels
 - symmetrical and asymmetrical patterns of wheels
 - wheel dynamics and loading
 - torque measurement and adjustment of wheels
 - wheel and hub testing procedures.

Assessment Conditions

Competency is to be assessed in the workplace or a simulated environment that accurately reflects performance in a real workplace setting.

Assessment must include direct observation of tasks.

Where assessment of competency includes third-party evidence, individuals must provide evidence that links them to the bicycle wheels they have designed and built, e.g. build orders.

Assessors must verify performance evidence through questioning on skills and knowledge to ensure correct interpretation and application.

The following resources must be made available:

- bicycle workplace or simulated workplace
- workplace instructions detailing job requirements
- manufacturer and technical bicycle wheel specifications
- PPE required to design and build bicycle wheels
- wheel components specified in the range of conditions
- three different bicycle wheels as specified in the performance evidence requiring a complete build
- tools and equipment appropriate for designing and building bicycle wheels.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

Links

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