



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **AURB428202A Assess carbon fibre frames for repair**

**Release: 1**

## AURB428202A Assess carbon fibre frames for repair

### Modification History

Not Applicable

### Unit Descriptor

<b>Unit descriptor</b>	<p>This unit of competency describes the skills and knowledge required to determine the extent of damage to carbon fibre bicycle frames, carry out simple repairs and facilitate complex repairs.</p> <p>No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.</p>
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### Application of the Unit

<b>Application of the unit</b>	<p>This unit applies to individuals who undertake the repair of carbon fibre bicycle frames in a bicycle retail, service and repair environment.</p>
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### Licensing/Regulatory Information

Refer to Unit Descriptor

### Pre-Requisites

<b>Prerequisite units</b>		

## Employability Skills Information

<b>Employability skills</b>	This unit contains employability skills.
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## Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
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## Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Inspect bicycle frame	1.1. Gather bicycle history, including riding incidents and accidents, by discussion with customer 1.2. Inspect bicycle frame for faults, wear or damage using visual, aural and tactile inspections and measurements 1.3. Arrange for non-destructive testing, if required, and where available 1.4. Assess repair or replacement options for bicycle frame 1.5. Document and cost repair for customer approval in accordance with workplace procedures 1.6. Obtain customer approval for work to be undertaken
2. Prepare for repair of bicycle frame	2.1. Plan repair sequence, including post-repair testing and checking process 2.2. Prepare list of parts and materials and determine availability 2.3. Identify need for additional persons to assist in repair process and make arrangements 2.4. Select and check tooling and equipment to meet job requirements 2.5. Prepare work area and set up equipment and materials
3. Repair bicycle frame	3.1. Use personal safety equipment and take precautions to protect others in the workplace 3.2. Use and maintain tooling and equipment in accordance with occupational health and safety (OHS) requirements 3.3. Prepare surface for repair avoiding contamination 3.4. Perform repair operations for bicycle frame according to plan 3.5. Seal the repaired area 3.6. Check bicycle frame specifications and test integrity of repair in accordance with workplace procedures
4. Complete work and clean up	4.1. Clean bicycle frame and prepare unit for delivery 4.2. Clean and store portable tooling and equipment in approved designated areas 4.3. Complete workplace records, customer file and warranty information as required by enterprise

## Required Skills and Knowledge

### REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

#### Required skills

Required skills include:

- technical skills to the level required to use workplace technology, tools and equipment related to testing and repairing carbon fibre bicycle frames
- communication skills to the level required to confirm work requirements and specifications, to communicate effectively regarding work requirements with other workers and customers, to report work outcomes and problems, and to relate to people from a range of social, cultural and ethnic backgrounds and of varying physical and mental abilities
- literacy skills to the level required to research and interpret technical information and specifications, understand information related to work orders, plans and safety procedures, prepare reports and complete records
- numeracy skills to the level required to correctly read specifications and take measurements to determine bicycle frame condition
- problem-solving skills to the level required to plan and organise activities and establish diagnostic processes which identify methods of testing and repairing carbon fibre bicycle frames
- team skills to the level required to work effectively and cooperatively with others to optimise workflow and productivity

#### Required knowledge

Required knowledge includes:

- carbon fibre structure, properties and characteristics
- repair materials properties and applications
- purpose and requirements of bicycle frame systems and their relationship to braking, wheels, drivetrain and steering system
- classification of bicycle frames and identification of system components
- application of frame design principles
- manufacturing processes of carbon fibre frames
- causes and implications of damage to carbon fibre frames
- carbon fibre repair methods and procedures
- non-destructive testing methods and techniques
- selection, checking and use of tooling and equipment
- manufacturer and/or component supplier specifications
- applicable commonwealth, state or territory legislation, regulations, standards and

**REQUIRED SKILLS AND KNOWLEDGE**

codes of practice, including OHS, personal safety and environment, relevant to repairing carbon fibre bicycle frames

- organisational policies and procedures, including quality requirements, reporting and recording procedures, and work organisation and planning processes, related to repairing carbon fibre bicycle frames

## Evidence Guide

<b>EVIDENCE GUIDE</b>	
<p>The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.</p>	
<b>Overview of assessment</b>	
<b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b>	<p>Assessors must be satisfied that the candidate can competently and consistently:</p> <ul style="list-style-type: none"> <li>• observe safety procedures and requirements</li> <li>• communicate effectively with others involved in or affected by the work</li> <li>• select methods and techniques appropriate to the circumstances</li> <li>• inspect a range of damaged carbon fibre frames and accurately assess repair options</li> <li>• complete preparatory activity in a systematic manner</li> <li>• complete minor repairs to a carbon fibre bicycle frame, including a cracked top tube, seat tube and seat stay.</li> </ul>
<b>Context of, and specific resources for assessment</b>	<ul style="list-style-type: none"> <li>• The application of competency is to be assessed in the workplace or a simulated environment that reflects as far as possible the actual working environment.</li> <li>• Assessment is to occur using standard and authorised work practices, safety requirements and environmental constraints.</li> <li>• Assessment is to comply with relevant regulatory requirements, including specified Australian standards.</li> <li>• Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</li> <li>• The following resources should be made available: <ul style="list-style-type: none"> <li>• a range of damaged carbon fibre bicycle frames</li> <li>• material relevant to repairing carbon fibre bicycle frames</li> <li>• equipment and hand and power tooling appropriate to repairing carbon fibre bicycle frames</li> <li>• specifications and work instructions.</li> </ul> </li> </ul>
<b>Method of assessment</b>	<ul style="list-style-type: none"> <li>• Assessment must satisfy the endorsed Assessment Guidelines of this Training Package.</li> <li>• Assessment methods must confirm consistency and accuracy of performance (over time and in a range of</li> </ul>

<b>EVIDENCE GUIDE</b>	
	<p>workplace relevant contexts) together with application of Required Skills and Knowledge.</p> <ul style="list-style-type: none"> <li>• Assessment methods must be by direct observation of tasks and include questioning on Required Skills and Knowledge to ensure its correct interpretation and application.</li> <li>• Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.</li> <li>• Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.</li> <li>• Competence in this unit may be assessed in conjunction with other functional units which together form part of the holistic work role.</li> </ul>
<b>Guidance information for assessment</b>	Assessment processes and techniques must be culturally sensitive and appropriate to the language and literacy capacity of the candidate and the work being performed.

## Range Statement

<b>RANGE STATEMENT</b>	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
<b>Carbon fibre bicycle frames</b>	<p>Carbon fibre bicycle frames may include:</p> <ul style="list-style-type: none"> <li>• all-terrain, touring, racing, recumbent and BMX bicycles</li> <li>• one piece construction</li> <li>• tubes joined directly or with lugs</li> </ul>
<b>Repair assessment</b>	<p>Repair assessment may include:</p> <ul style="list-style-type: none"> <li>• bicycle history and cause of damage</li> <li>• structural importance of, and stresses borne by, damaged area</li> <li>• frame construction method</li> </ul>



<b>RANGE STATEMENT</b>	
	<ul style="list-style-type: none"> <li>• cracks, chips, dents, loose joins and misalignment</li> <li>• non-destructive testing (X-ray, ultrasonic and acoustic)</li> <li>• strength and integrity of repair</li> </ul>
<b>Tooling and equipment</b>	<p>Tooling and equipment may include:</p> <ul style="list-style-type: none"> <li>• specific repair and general workshop equipment and tooling</li> <li>• sanding tools</li> <li>• floor stands, workbench and frame jig</li> <li>• special purpose jigs and moulds</li> <li>• vacuum system</li> <li>• curing oven</li> </ul>
<b>Materials</b>	<p>Materials may include:</p> <ul style="list-style-type: none"> <li>• carbon fibre fabric and tapes of various grades and weights (FAW)</li> <li>• unidirectional and woven fabric and braided sock</li> <li>• epoxy resin of repair qualified type</li> <li>• shrink tape</li> <li>• vacuum bag consumables</li> <li>• suitable sandpaper (aluminium oxide)</li> <li>• cleaning materials</li> </ul>
<b>Information/documents</b>	<p>Information/documents may include:</p> <ul style="list-style-type: none"> <li>• verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, memos, material safety data sheets (MSDS), diagrams or sketches</li> <li>• safe work procedures related to bicycle frames</li> <li>• regulatory/legislative requirements pertaining to bicycle safety</li> <li>• manufacturer specifications and instructions</li> <li>• organisation work specifications and requirements</li> <li>• instructions issued by authorised enterprise or external persons</li> <li>• Australian standards</li> </ul>
<b>OHS requirements</b>	<p>OHS requirements are to be in accordance with applicable commonwealth, state or territory legislation and regulations, and organisational</p>

<b>RANGE STATEMENT</b>	
	<p>safety policies and procedures, and may include:</p> <ul style="list-style-type: none"> <li>• personal protective equipment and clothing</li> <li>• safety equipment</li> <li>• first aid equipment</li> <li>• hazard and risk control</li> <li>• elimination of hazardous materials and substances</li> <li>• manual handling, including shifting, lifting and carrying</li> <li>• emergency procedures</li> </ul>
<b>Legislative requirements</b>	<p>Legislative requirements are to be in accordance with applicable commonwealth, state or territory legislation, regulations, certification requirements and codes of practice, and may include:</p> <ul style="list-style-type: none"> <li>• award and enterprise agreements</li> <li>• industrial relations</li> <li>• Australian standards</li> <li>• Australian Design Rules</li> <li>• confidentiality and privacy</li> <li>• OHS</li> <li>• the environment</li> <li>• equal opportunity</li> <li>• anti-discrimination</li> <li>• relevant industry codes of practice</li> <li>• duty of care</li> </ul>
<b>Environmental requirements</b>	<p>Environmental requirements may include:</p> <ul style="list-style-type: none"> <li>• waste management</li> <li>• noise</li> <li>• dust</li> <li>• clean-up management</li> </ul>
<b>Quality requirements</b>	<p>Quality requirements may include:</p> <ul style="list-style-type: none"> <li>• regulations, including Australian standards</li> <li>• internal organisational quality policies and procedures</li> <li>• enterprise operations and procedures</li> </ul>
<b>Organisational policies and procedures</b>	<p>Organisational policies and procedures may include:</p> <ul style="list-style-type: none"> <li>• quality policies and procedures, including</li> </ul>

**RANGE STATEMENT**

	Australian standards <ul style="list-style-type: none"> <li>• OHS, sustainability, environment, equal opportunity and anti-discrimination</li> <li>• manufacturer specifications and industry codes of practice</li> <li>• safe work procedures</li> <li>• reporting and recording procedures</li> </ul>
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**Unit Sector(s)**

<b>Unit sector</b>	Bicycle
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**Co-requisite units**

<b>Co-requisite units</b>		

**Competency field**

<b>Competency field</b>	
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