



Australian Government

AURTTW003 Carry out machining operations

Release: 1

AURTTW003 Carry out machining operations

Modification History

Release	Comment
Release 1	New unit of competency.

Application

This unit describes the performance outcomes required to carry out machining operations on a range of automotive components to specific tolerances. It involves preparing for the task, selecting the correct machining operation, setting up and machining components to specifications, and completing workplace processes and documentation. It also involves restoring surface finishes and tolerances, and aligning components.

It applies to those working in the automotive service and repair industry. The machining operations apply to those using lathes, and milling or surface grinding machines.

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

Competency Field

Mechanical Miscellaneous

Unit Sector

Technical - Welding, Grinding, Machining and Soldering

Elements and Performance Criteria

Elements	Performance Criteria
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold and italicised text is used, further information is detailed in the range of conditions section.
1. Prepare to machine material	1.1 Job requirements are determined from workplace instructions 1.2 Machine and material information is sourced and interpreted 1.3 Machining procedures and methods are analysed, and those most appropriate to the circumstances are selected

Elements	Performance Criteria
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold and italicised text is used, further information is detailed in the range of conditions section.
	1.4 Hazards associated with work are identified and risks managed 1.5 Tools and equipment are selected and prepared for operation according to manufacturer specifications and workplace procedures
2. Set up machinery prior to machining	2.1 Components to be machined are positioned and clamped according to manufacturer specifications, workplace procedures and safety requirements 2.2 Speed and feed that suit component materials are selected according to manufacturer specifications and workplace procedures 2.3 Machine and components are set up according to industry standards and manufacturer current specifications for methods, equipment used and tolerances relative to component
3. Machine components	3.1 Components are machined according to workplace procedures and safety requirements, and following machinery safe operating procedures 3.2 Component is measured for size and finish according to manufacturer specifications and workplace procedures 3.3 Size and finish are compared with specifications 3.4 Machining is completed to required specifications according to workplace procedures and safety requirements, and following machinery safe operating procedures
4. Complete work processes	4.1 Final inspection is made to ensure work is to workplace expectations and component is presented ready for use 4.2 Work area is cleaned, waste and non-recyclable materials are disposed of, and recyclable material is collected 4.3 Tools and equipment are checked and stored according to workplace procedures 4.4 Workplace documentation is processed according to workplace procedures

Foundation Skills

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

Skills	Description
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Skills	Description
Learning skills to:	locate appropriate sources of information efficiently.
Reading skills to:	interpret machinery safe operating procedures from workshop literature and signs.
Writing skills to:	legibly and accurately fill out workplace documentation when recording parts and material used.
Numeracy skills to:	- interpret numerical information in manufacturer specifications, workshop manuals, and machinery dials and gauges - convert metric dimensions to imperial, and imperial dimensions to metric - use basic mathematical operations, including addition and subtraction, to calculate distances, tolerances and deviations from manufacturer specifications.
Planning and organising skills to:	select best tooling option for the work and sequence procedure to reduce time and material wastage.
Technology skills to:	use precision measuring equipment, including inside and outside metric and imperial micrometers.

Range of Conditions

This section specifies work environments and conditions that may affect performance.

Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Bold italicised wording, if used in the performance criteria, is detailed below.

<i>Tools and equipment</i> must include:	- two of the following machines: - lathe - mill - surface grinder - measuring equipment, including micrometers and vernier gauges.
<i>Safety requirements</i> must include:	- work health and safety (WHS) and occupational health and safety (OHS) requirements, including operational risk assessment and treatments associated with: - electrical safety of machinery - machinery movement and operation.
<i>Materials</i> must include:	- ferrous metal - non-ferrous metal.

Unit Mapping Information

Equivalent to AURTTW3003 Carry out machining operations

Links

Companion Volume implementation guides are found in VETNet -

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

Assessment Requirements for AURTTW003 Carry out machining operations

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Performance Evidence

Before competency can be determined, individuals must demonstrate they can perform the following according to the standards defined in this unit's elements, performance criteria, range of conditions and foundation skills:

- carry out machining operations on both ferrous and non-ferrous materials, using two of the following machines:
 - lathe
 - mill
 - surface grinder.

Knowledge Evidence

Individuals must be able to demonstrate knowledge of:

- work health and safety (WHS) and occupational health and safety (OHS) requirements relating to carrying out machining operations, including operational risk assessment and treatments associated with:
 - electrical safety of machinery
 - machinery movement and operation
- basic machining procedures, including:
 - sharpening and shaping tools
 - identifying worn and damaged cutting tools
 - mounting and positioning cutting tools
 - setting machining parameters to achieve job requirements and maximise tool life, including speeds and feeds
 - types and application of coolants and lubricants
 - measuring to specified tolerances and dimensions
- procedures for machining using a lathe, mill and surface grinder, including:

- clamping and mounting work pieces
- setting speeds and feeds
- machining ferrous and non-ferrous materials
- requirements of Australian standards relevant to engine reconditioning, including:
 - AS4182 Automotive repairs – Code of practice for reconditioning reciprocating spark ignition engines
 - AS4427 Automotive repairs – Code of practice for reconditioning reciprocating compression ignition engines.

Assessment Conditions

Assessors must satisfy NVR/AQTF assessor requirements.

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 machining operations that they have carried out, e.g. repair 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:

- automotive repair workplace or simulated workplace
- workplace instructions detailing work requirements, including work specifications
- AS4182 Automotive repairs – Code of practice for reconditioning reciprocating spark ignition engines
- AS4427 Automotive repairs – Code of practice for reconditioning reciprocating compression ignition engines
- machinery as specified in the performance evidence
- precision measuring equipment, including inside and outside metric and imperial micrometers
- ferrous and non-ferrous material relevant to carrying out machining operations.

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