



**Australian Government**

# **Assessment Requirements for AURTTM003 Apply metal to rebuild engine components**

**Release: 1**

# Assessment Requirements for AURTTM003 Apply metal to rebuild engine components

## Modification History

Release	Comment
Release 1	New unit of competency.

## 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:

- repair a cast iron cylinder head
- repair a crack in an aluminium alloy cylinder head
- build up camshaft lobes or journals by welding, metal spraying and hard chroming, and machine to specifications
- build up crankshaft journals or thrust surfaces or bearing faces by welding, metal spraying and hard chroming, and machine to specifications.

## Knowledge Evidence

Individuals must be able to demonstrate knowledge of:

- work health and safety (WHS) and occupational health and safety (OHS) requirements relating to applying metal to rebuild engine components, including procedures for :
  - selecting and using personal protective equipment (PPE)
  - safely operating welding, metal spraying and hard chroming machinery
- environmental requirements, including procedures for trapping, storing and disposing of cooling and lubricating fluids released during the machining process
- procedures for identifying existing heat treatment processes, including nitriding, Tufftriding and induction hardening
- specific welding procedures, including:
  - manual metal arc welding (MMAW)
  - gas metal arc welding (GMAW)
  - gas tungsten arc welding (GTAW)
  - flux core

- metal spraying
- submerged arc
- procedures for hard chrome application
- repair operations for components, including:
  - crankshaft journals
  - camshaft journals and lobes
  - seal areas
  - crankshaft nose and keyway
  - pulley retaining thread damage
- crankshaft radius treatment, including:
  - shot peening
  - radius rolling
  - deep fillet radius rolling
- requirements of Australian standards relevant to engine reconditioning, including:
  - AS 4182 Automotive repairs – Code of practice for reconditioning reciprocating spark ignition engines
  - AS 4427 Automotive repairs – Code of practice for reconditioning reciprocating compression ignition engines
- post-repair operations, including rust protection of machined surfaces.

## 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 engine components that they have worked on, 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
- manufacturer engine specifications
- multi-cylinder crankshafts, camshafts, and engine cylinder heads specified in the performance evidence
- hand, air and power tools, welding equipment and materials for rebuilding engine components
- precision measuring equipment, including:
  - dial indicators

- inside and outside metric and imperial micrometers.

## **Links**

Companion Volume implementation guides are found in VETNet -

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

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