



Australian Government

Assessment Requirements for AURTTM011 Recondition engine cylinder heads

Release: 1

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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:

- recondition two of the following engine cylinder heads:
 - overhead valve (OHV) petrol cylinder head
 - overhead camshaft (OHC) petrol cylinder head
 - diesel cylinder head
- resurface a cylinder head.

Knowledge Evidence

Individuals must be able to demonstrate knowledge of:

- work health and safety (WHS) and occupational health and safety (OHS) requirements relating to reconditioning engine cylinder heads, including:
 - operational risk assessment and treatments associated with:
 - electrical safety of power tools
 - manual and mechanical lifting and shifting equipment
 - toxic cleaning substances
 - selecting and using personal protective equipment (PPE) for handling engine cylinder heads and using specialised equipment
- environmental requirements, including procedures for trapping, storing and disposing of cleaning fluids and machining waste released during reconditioning process
- procedures for removing cylinder head from engine block
- dismantling methods and procedures relating to cylinder heads
- cleaning methods and procedures relating to cylinder heads
- procedures for measuring, testing and evaluating cylinder heads, including:

- hardness of aluminium alloy cylinder heads and re-hardening aluminium alloy cylinder heads
- visual inspections
- cylinder head testing, including:
 - dye penetrant for alloy cylinder heads
 - wet and dry magnetic particle for cast iron cylinder heads
 - vacuum for valve leakage
 - pressure for porosity
 - inspecting valve guides and valve seats
- procedures for measuring, testing and evaluating associated parts, including inspecting camshafts, valves, valve springs, valve spring seats, valve spring retainers, collets and lash caps, rocker arms, rocker shafts and pushrods
- procedures for repairing cylinder heads and associated components, including:
 - heat treating aluminium alloy cylinder heads
 - straightening cylinder heads
 - repairing cracks in cylinder heads
 - welding aluminium alloy and cast iron cylinder heads
 - types of surface finishes for different cylinder head gaskets
 - surfacing cylinder heads, including manifold faces
 - repairing valve guides, valve seats, rocker arms and rocker shafts
 - replacing valve guides
 - cutting valve seats to required angles
 - re-facing valves in valve re-facer
 - setting valve stem protrusion
 - setting valve masking heights in diesel cylinder heads
 - fitting injector tubes and setting injector protrusion
 - cleaning cylinder heads of residue and swarf, including removing residue from bead cleaning
- procedures for assembling cylinder heads, including:
 - refitting welsh plugs and oil gallery plugs, valves, springs, spring seats, retainers, collets lash caps, camshafts, rocker gear, cam followers and associated components
 - reasons for setting valve timing before fitting cylinder head to block
 - evaluating and setting rocker arm geometry
 - preparing cylinder block to accept cylinder head
 - fitting head gaskets and cylinder heads to engine blocks
 - tightening procedures for cylinder head bolts
- 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 test procedures, including machined surface protection.

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 cylinder heads that they have reconditioned, 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
- 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
- precision measuring equipment relevant to the engine component and work process
- three different multi-cylinder engine cylinder heads as specified in the performance evidence
- fixed and portable hand, air and power tools, lifting equipment and material suitable for reconditioning cylinder heads.

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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