Australian Government

AURTTM011 Recondition engine cylinder heads

Release: 1

AURTTM011 Recondition engine cylinder heads

Modification History

Release	Comment
Release 1	New unit of competency.

Application

This unit describes the performance outcomes required to recondition engine cylinder heads as part of an engine reconditioning process. It involves preparing for the task, determining engine cylinder head damage and required repair action, preparing reconditioning machines, performing machining to specifications and workplace requirements, reassembling and testing the cylinder head, and completing workplace processes and documentation.

It applies to those working in the automotive service and repair industry. The engine cylinder heads include overhead valve or overhead camshaft design cylinder heads in vehicles from all sectors of the industry.

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

Competency Field

Mechanical Miscellaneous

Unit Sector

Technical - Manufacture

Elements and Performance Criteria

Elements Elements describe the essential outcomes.	**Performance Criteria** 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 undertake engine cylinder head reconditioning	1.1 Job requirements are determined from workplace instructions 1.2 Cylinder head dismantling procedures are sourced and interpreted 1.3 Tools and measuring equipment are selected and checked for

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	serviceability 1.4 Hazards associated with the work are identified and risks are managed 1.5 Cylinder head is cleaned according to ***safety and environmental requirements*** and relevant ***Australian standards***, and **positions of auxiliary** equipment are recorded, including photographic evidence
2. Dismantle engine cylinder head	2.1 Covers and ancillary components are removed, cleaned and stored according to workshop procedures 2.2 Cylinder head is dismantled according to safety requirements and laid out in a logical order using approved methods, tools and equipment 2.3 Component parts are cleaned using appropriate cleaning agents for the type of material and kept in a logical order in preparation for evaluation
3. Determine repair procedures	3.1 Cylinder head is hardness tested as required according to manufacturer specifications, workplace procedures and safety requirements 3.2 Cylinder head is pressure and/or crack tested according to manufacturer specifications, workplace procedures, and safety and environmental requirements 3.3 Cylinder head and component parts are ***inspected, measured and tested*** against manufacturer specifications and tolerances and according to workplace procedures and safety and environmental requirements
4. Recondition engine cylinder head and component parts	4.1 Components are adjusted and/or machined against manufacturer specifications and tolerances and according to workplace procedures, relevant Australian standards, and safety and environmental requirements 4.2 Adjustments and/or machining of components are achieved without causing damage to components or system 4.3 Cylinder head is thoroughly cleaned and oil and waterways are cleared using appropriate tools
5. Assemble engine cylinder head	5.1 Cylinder head is assembled in correct order and without damage, against manufacturer specifications and tolerances and according to workplace procedures, relevant Australian standards and safety requirements 5.2 Assembled components are measured according to manufacturer specifications and workplace procedures

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	5.3 Assembled component clearances and tolerances are adjusted to the tolerance required by manufacturer specifications according to workplace procedures 5.4 Assembled engine cylinder head is tested and adjusted against manufacturer specifications and tolerances and according to workplace procedures, relevant Australian standards and safety requirements 5.5 Bright surfaces are treated with rust prevention solution and cylinder head is prepared for further process or storage according to workplace procedures
6. Complete work processes	6.1 Final inspection is made to ensure finished work complies with workplace requirements and engine cylinder heads are presented ready for use or storage 6.2 Work area is cleaned, waste and non-recyclable materials are disposed of, and recyclable material is collected 6.3 Tools and equipment are checked and stored according to workplace procedures 6.4 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
Learning skills to:	• locate appropriate sources of information efficiently.
Reading skills to:	• identify and interpret engine cylinder head specifications from workshop literature • interpret engine cylinder head rebuild machinery safe operating procedures from operating manuals and signs.
Writing skills to:	• legibly and accurately fill out workplace documentation to record measurements.
Numeracy skills to:	• interpret numerical information in manufacturer specifications, workshop literature, and machinery dials, gauges and computer readouts • use basic mathematical operations, including addition and

Skills	Description
	subtraction, to: • convert metric dimensions to imperial, and imperial dimensions to metric • calculate tolerances and clearances.
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 metric and imperial measuring equipment.

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.

Safety and environmental requirements 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 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.

Australian standards must include:	• 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.
Inspecting, measuring and testing must include:	• checking for straightness of both sides of cylinder head and all manifold faces • checking camshaft tunnels for wear and pick-up • checking water jackets for corrosion • checking valve suitability for refacing, including stem condition • checking valve guide condition and material • resurfacing valves • sizing and fitting K lines

	• machining and fitting valve seats • establishing valve stem protrusion.

Unit Mapping Information

Equivalent to AURTTM3011 Recondition engine cylinder heads

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b4278d82-d487-4070-a8c4-78045ec695b1