



**Australian Government**

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

# **AURT301357A Rebuild engine components**

**Release: 1**

## AURT301357A Rebuild engine components

### Modification History

Not Applicable

### Unit Descriptor

|                        |                                                                                                                                                       |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Unit descriptor</b> | This unit covers the competence required to use industry accepted methods to apply metal spray, hard chrome and weld materials to rebuild components. |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|

### Application of the Unit

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Application of the unit</b> | <p>The unit includes identification and confirmation of work requirement, preparation for work, application of metal to engine components, finishing surfaces and completion of work finalisation processes, including clean-up and documentation.</p> <p>This unit of competence applies to engine reconditioning.</p> <p>Work requires individuals to demonstrate judgement and problem-solving skills in managing own work activities and contributing to a productive team environment.</p> <p>Work is carried out in accordance with award provisions.</p> |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Licensing/Regulatory Information

Not Applicable

### Pre-Requisites

|                           |  |  |
|---------------------------|--|--|
| <b>Prerequisite units</b> |  |  |
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|                           |  |  |

## Employability Skills Information

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|-----------------------------|------------------------------------------|
| <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. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide. |
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## Elements and Performance Criteria

| ELEMENT                                                     | PERFORMANCE CRITERIA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Prepare to undertake metal building procedures           | 1.1. Nature and scope of work requirements are identified and confirmed<br>1.2. OH&S requirements, including individual State/Territory regulatory requirements and personal protection needs are observed throughout the work<br>1.3. Procedures and information such as workshop manuals and specifications, and tooling, are sourced<br>1.4. Method options are analysed and those most appropriate to the circumstances are selected and prepared<br>1.5. Technical and/or calibration requirements for load testing are sourced and support equipment is identified and prepared |
| 2. Apply metal to engine components for rebuilding purposes | 2.1. Correct information is accessed and interpreted from manufacturer/component supplier specifications<br>2.2. Metal applying process is used to repair damaged component<br>2.3. Metal applying process is completed in readiness for further repair<br>2.4. Rebuilding work is completed without causing damage to any component or system<br>2.5. Operations are carried out according to industry regulations/guidelines, OH&S legislation, legislation and enterprise procedures/policies                                                                                      |
| 3. Finish surfaces of components                            | 3.1. Surfaces of component are finished to manufacturer/component supplier specifications<br>3.2. Operations are carried out according to industry regulations/guidelines, OH&S legislation, legislation and enterprise procedures/policies<br>3.3. Finishing work is completed without causing damage to the component<br>3.4. Surfaces are protected with a rust prevention solution<br>3.5. Job card is processed in accordance with workplace procedures                                                                                                                          |

## Required Skills and Knowledge

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required skills**

- apply research and interpretive skills sufficient to locate, interpret and apply manufacturer/component supplier procedures, workplace policies and procedures
- apply analytical skills for identification and analysis of technical information
- apply plain English literacy and communication skills in relation to dealing with customers and team members
- apply questioning and active listening skills for example when obtaining information from customers
- apply oral communication skills sufficient to convey information and concepts to customers
- apply planning and organising skills to own work activities, including making good use of time and resources, sorting out priorities and monitoring own performance
- interact effectively with other persons both on a one-to-one basis and in groups, including understanding and responding to the needs of a customer and working effectively as a member of a team to achieve a shared goal
- establish safe and effective work processes which anticipate and/or resolve problems and downtime, to systematically develop solutions to avoid or minimise reworking and avoid wastage
- use mathematical ideas and techniques to correctly calculate time, assess tolerances, apply accurate measurements, calculate material requirements and establish quality checks
- use workplace technology related to rebuilding engine components, including the use of welding and chroming systems, measuring equipment, computerised technology and communication devices and the documenting/recording of results

**Required knowledge**

A working knowledge of:

- OH&S regulations/requirements, equipment, material and personal safety requirements
- technical information
- engine and engine component structures
- effects of heat on various metals and heating procedures
- specific welding procedures (e.g. MMAW, GMAW, GTAW, flux core, metal spraying)
- hard chrome application
- work organisation and planning processes
- enterprise quality processes

## Evidence Guide

### EVIDENCE GUIDE

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.

#### Overview of assessment

#### Critical aspects for assessment and evidence required to demonstrate competency in this unit

It is essential that competence is fully observed and there is ability to transfer competence to changing circumstances and to respond to unusual situations in the critical aspects of:

- observing safety procedures and requirements
- communicating effectively with others involved in or affected by the work
- selecting methods and techniques appropriate to the circumstances
- completing preparatory activity in a systematic manner
- rebuilding a range of engine components in accordance with workplace and manufacturer/component supplier requirements
- completing work to manufacturer/component supplier requirements
- completing work without damage to tooling and equipment or injury to persons

#### Context of, and specific resources for assessment

Application of competence is to be assessed in the workplace or simulated worksite

Assessment is to occur using standard and authorised work practices, safety requirements and environmental constraints

Assessment is to comply with regulatory requirements, including Australian Standards

The following resources should be made available:

- workplace location or simulated workplace
- material relevant to rebuilding engine components
- equipment, hand and power tooling appropriate to rebuilding engine components
- activities covering mandatory task requirements
- specifications and work instructions

#### Method of assessment

Assessment must satisfy the endorsed assessment guidelines of the automotive industry's RS&R Training Package

Assessment methods must confirm consistency and accuracy of performance together with application of underpinning

| <b>EVIDENCE GUIDE</b>                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                            | <p>knowledge</p> <p>Assessment must be by direct observation of tasks, with questioning on underpinning knowledge and it must also reinforce the integration of key competencies</p> <p>Assessment may be applied under project related conditions and require evidence of process</p> <p>Assessment must confirm a reasonable inference that competence is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances</p> <p>It is preferable that assessment reflects a process rather than an event and occurs over a period of time to cover varying quality circumstances. Evidence of performance may be provided by customers, team leaders/members or other persons subject to agreed authentication arrangements</p> <p>Competence in this unit may be assessed in conjunction with other functional units which together form part of the holistic work role</p> |
| <b>Guidance information for assessment</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## Range Statement

| <b>RANGE STATEMENT</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                      |
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| <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. Bold italicised wording, if used in the performance criteria, is detailed below. 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>Engine components</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <p>Engine components include camshaft lobes/journals, crankshaft journals/thrust surfaces, cylinder heads (alloy and cast iron), piston and connecting rod assemblies, and crankshaft and camshaft bearing faces</p> |
| <b>Rebuild methods</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p>Methods are to include:</p> <ul style="list-style-type: none"> <li>building up of lobes/journals by welding,</li> </ul>                                                                                           |

| <b>RANGE STATEMENT</b>                  |                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                         | metal spraying, hard chroming <ul style="list-style-type: none"> <li>• repairing cracks in alloy cylinder heads, repairing cast iron cylinder heads</li> </ul>                                                                                                                                                                                                                                |
| <b>OH&amp;S</b>                         | OH&S requirements are to be in accordance with legislation/regulations/codes of practice and enterprise safety policies and procedures. This may include protective clothing and equipment, use of tooling and equipment, workplace environment and safety, handling of material, use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances |
| <b>Personal protective equipment</b>    | Personal protective equipment is to include that prescribed under legislation/regulation/codes of practice and workplace policies and practices                                                                                                                                                                                                                                               |
| <b>Safe operating procedures</b>        | Safe operating procedures are to include, but are not limited to operational risk assessment and treatments associated with vehicular movement, toxic substances, electrical safety, machinery movement and operation, manual and mechanical lifting and shifting, working in proximity to others and site visitors                                                                           |
| <b>Emergency procedures</b>             | Emergency procedures related to this unit are to include but may not be limited to emergency shutdown and stopping of equipment, extinguishing fires, enterprise first aid requirements and site evacuation                                                                                                                                                                                   |
| <b>Environmental requirements</b>       | Environmental requirements are to include but are not limited to waste management, noise, dust and clean-up management                                                                                                                                                                                                                                                                        |
| <b>Quality requirements</b>             | Quality requirements are to include, but are not limited to regulations, including Australian Standards, internal company quality policy and standards and enterprise operations and procedures                                                                                                                                                                                               |
| <b>Statutory/regulatory authorities</b> | Statutory/regulatory authorities may include Federal, State/Territory and local authorities administering acts, regulations and codes of practice                                                                                                                                                                                                                                             |

| <b>RANGE STATEMENT</b>       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Tooling and equipment</b> | Tooling and equipment are to include hand tooling, power tooling, lifting equipment, measuring equipment, finishing equipment, and may include roll welders, short arc welding equipment, gas metal arc welders, gas tungsten arc welders, metal spraying equipment and hard chroming equipment                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Materials</b>             | Materials may include metal treatments, welding consumables and cleaning materials                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Communications</b>        | Communications are to include, but are not limited to verbal and visual instructions and fault documenting and may include site specific instructions, written instructions, plans or instructions related to job/task, telephones and pagers                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Information/documents</b> | <p>Sources of 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, diagrams or sketches</li> <li>• safe work procedures related to rebuilding engine components</li> <li>• regulatory/legislative requirements pertaining to automotive industry, including Australian Design Rules</li> <li>• engineer's design 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> |

## Unit Sector(s)

|                    |           |
|--------------------|-----------|
| <b>Unit sector</b> | Technical |
|--------------------|-----------|

## Co-requisite units

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| Co-requisite units |  |  |
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|                    |  |  |

## Competency field

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|------------------|--|
| Competency field |  |
|------------------|--|