



Australian Government

AURTTE4005 Overhaul engines and associated engine components

Release 1

AURTTE4005 Overhaul engines and associated engine components

Modification History

Release	Comment
Release 1	<p>Replaces AURT401145A Overhaul engines and associated engine components</p> <p>Unit code updated to meet policy requirements</p> <p>Reference to OHS legislation replaced with new WHS legislation</p> <p>Licensing statement added to unit descriptor</p>

Unit Descriptor

Unit descriptor	<p>This unit covers the competence required to overhaul engines and associated engine components on an engine removed from its chassis.</p> <p>Licensing, legislative, regulatory or certification requirements may apply to this unit in some jurisdictions. Users are advised to check with the relevant regulatory authority.</p>
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Application of the Unit

Application of the unit	<p>The unit includes identification and confirmation of work requirement, preparation for work, dismantling of engines, repair, assembly and final checking of engines and completion of work finalisation processes, including clean-up and documentation.</p> <p>This unit of competence should be contextualised to the qualification it is being applied.</p> <p>For overhaul of outdoor power equipment engines and associated components see AURPTE4004 Overhaul engines and associated engine components (outdoor power equipment).</p> <p>Work requires individuals to demonstrate some judgement and problem-solving skills in managing own work activities and contributing to a productive team environment.</p>
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Employability skills	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 carry out engine overhaul	1.1.Nature and scope of work requirements are identified and confirmed 1.2.WHS requirements, including individual State/Territory regulatory requirements and personal protection needs are observed throughout the work 1.3.National Environmental Protection Measure for Diesel Vehicles (Guidelines) is sourced and observed throughout the work as applicable to tasks 1.4.Technical and tooling requirements for overhaul are identified and support equipment is identified and prepared 1.5.SWL rating of lifting devices, engine cradles, slings and shackles is confirmed against the load to be lifted
2. Dismantle engine and components	2.1.Engine is dismantled in a logical sequence 2.2.Dismantling of engine and relevant components is completed without causing damage to any component or system 2.3.Components are cleaned ready for inspection
3. Overhaul engine components	3.1.Information is accessed and interpreted from manufacturer/component supplier specifications and repair/reclaim methods 3.2.Components are measured and compared against manufacturer/component supplier specifications and tolerances 3.3.Decisions are made as to serviceability and repair method of each component 3.4.Replacement parts are sourced 3.5.Rebuild or replacement of engine and/or engine components is carried out in accordance with manufacturer/component supplier specifications and tolerances 3.6.Overhaul activities are carried out according to industry regulations/guidelines, WHS legislation and enterprise procedures/policies
4. Assemble engine and components	4.1.Engine is assembled following manufacturer/component supplier procedures 4.2.Running clearances are measured against manufacturer/component supplier specifications and necessary adjustments are made 4.3.Assembly of engine is are completed within

ELEMENT	PERFORMANCE CRITERIA
	<p>established industry guidelines and timeframes</p> <p>4.4.Assembly is completed without causing damage to any component or system</p>
<p>5. Check engine operation</p>	<p>5.1.Engine is securely mounted in preparation for starting</p> <p>5.2.Engine fluid levels, including lubrication and coolant are checked</p> <p>5.3.Gauges and warning devices are checked for operation prior to starting</p> <p>5.4.Engine is started and checked for leaks and abnormal noises</p>
<p>6. Prepare engine for delivery to customer or installation</p>	<p>6.1.Engine orifices are sealed against ingress of foreign matter</p> <p>6.2.Work completion documentation is finalised and processed to appropriate persons</p> <p>6.3.Final inspection is made to ensure protective features are in place</p> <p>6.4.Engine is cleaned to workplace expectations</p> <p>6.5.Job card is processed in accordance with workplace procedures</p>

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 required 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 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 calculate time, assess tolerances, apply accurate measurements, calculate material requirements and establish quality checks
- use workplace technology related to overhaul of engines, including use of specialist tooling and equipment, measuring equipment, computerised technology and communication devices and reporting/documenting of results

Required knowledge

A working knowledge of:

- WHS and environmental regulations/requirements, equipment, material and personal safety requirements
- types, characteristics and operating processes of engines
- types and layout of service/repair manuals (hard copy and electronic)
- engine overhaul procedures
- dismantling, assembling and adjustment methods
- measuring and testing procedures
- relevant technical information
- component safety requirements
- relevant enterprise policies

REQUIRED SKILLS AND KNOWLEDGE

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| <ul style="list-style-type: none">• manual handling techniques |
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Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>It is essential that competence in this unit signifies ability to transfer competence to changing circumstances and to respond to unusual circumstances in the critical aspects of:</p> <ul style="list-style-type: none"> • 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 • dismantling, evaluating, assembling, adjustment, measuring and testing engines in accordance with workplace and manufacturer/component supplier requirements • completing overhaul of a range of engines and associated components within workplace guidelines and timeframes • engine presentation to customer in compliance with workplace requirements
Context of, and specific resources for assessment	<p>Application of competence is to be assessed in the workplace or simulated worksite</p> <p>Assessment is to occur using standard and authorised work practices, safety requirements and environmental constraints</p> <p>Assessment is to comply with regulatory requirements, including Australian Standards</p> <p>The following resources should be made available:</p> <ul style="list-style-type: none"> • workplace location or simulated workplace • materials relevant to the overhaul of engines • equipment, hand and power tooling appropriate to the overhaul of engines • activities covering mandatory task requirements • specifications and work instructions

EVIDENCE GUIDE**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 knowledge

Assessment must be by direct observation of tasks, with questioning on underpinning knowledge and it must also reinforce the integration of key competencies

Assessment may be applied under project related conditions (real or simulated) and require evidence of process

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

It is preferable 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 appropriate persons subject to agreed authentication arrangements

Competence in this unit may be assessed in conjunction with other functional units which together form part of the holistic work role

Guidance information for assessment**Range Statement****RANGE STATEMENT**

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.

RANGE STATEMENT	
Engines	Engines may be: <ul style="list-style-type: none"> • 4-stroke spark ignition engines for light vehicles, motorcycles and marine craft • 2-stroke spark ignition for motorcycles and marine craft • 4-stroke compression ignition engines for light vehicles, heavy vehicles, mobile plant and marine craft • 2-stroke compression ignition for heavy vehicles, mobile plant and marine craft
Overhaul methods and sequences	Overhaul methods and sequences are to include the complete dismantling of component parts, measuring and evaluation of wear, the replacement, repair, rebuilding or reconditioning of parts comparable to original parts, the assembly of parts, performance of functional testing and the completion of records
WHS	WHS 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 materials, use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances
Personal protective equipment	Personal protective equipment is to include that prescribed under legislation/regulations/codes of practice and workplace policies and practices
Safe operating procedures	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
Emergency procedures	Emergency procedures related to this unit are to include, but are not limited to emergency shutdown and stopping of equipment, extinguishing fires, enterprise first aid

RANGE STATEMENT	
	requirements and site evacuation
Environmental requirements	Environmental requirements are to include but are not limited to waste management, noise, dust and clean-up management
Quality requirements	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
Statutory/regulatory authorities	Statutory/regulatory authorities may include Federal, State/Territory and local authorities administering acts, regulations and codes of practice
Tooling and equipment	Tooling and equipment may include hand tooling, power tooling, lifting and jacking equipment, specialist tooling, measuring equipment and tensioning equipment
Materials	Materials may include engine oils, moving parts lubricants, replacement parts, gaskets, sealants and cleaning materials
Communications	Communications are to include, but are not limited to verbal and visual instructions and fault reporting and may include site specific instructions, written instructions, plans or instructions related to job/task, telephones and pagers
Information/documents	<p>Sources of information/documents may include:</p> <ul style="list-style-type: none"> • verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, memos, material safety data sheets, diagrams or sketches • safe work procedures related to the overhaul of engines • regulatory/legislative requirements pertaining to the automotive industry, including Australian Design Rules, Environment Protection Regulations (Diesel Fuels), National Environment Protection For Diesel Vehicle Guidelines

RANGE STATEMENT

	<ul style="list-style-type: none">• engineer's design specifications and instructions• organisation work specifications and requirements• instructions issued by authorised enterprise or external persons• Australian Standards
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Unit Sector(s)

Unit sector	Mechanical Miscellaneous
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Co-requisite units

Not applicable.

Competency field

Competency field	Technical - Engines
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