



Australian Government

AURPTE4004 Overhaul engines and engine components (outdoor power equipment)

Release 1

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Modification History

Release	Comment
Release 1	Replaces AURP401245B Overhaul engines and engine components (outdoor power equipment) Unit code updated to meet policy requirements Reference to OHS legislation replaced with new WHS legislation

Unit Descriptor

Unit descriptor	This unit of competency describes the skills and knowledge required to overhaul small engines and engine components appropriate to outdoor power equipment. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.
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Application of the Unit

Application of the unit	This unit applies to individuals who undertake the overhaul of outdoor power equipment engines, which may be stationary or mobile, air and liquid cooled, overhead and side valve, 2- and 4-stroke spark ignition and 4-stroke compression ignition engines. The work includes rebuilding or replacement of out-of-specification parts. For overhaul of light/heavy vehicle engines refer to AURTTE4005 Overhaul engines and associated engine components.
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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. 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 overhaul engine	1.1. Identify and confirm work to be carried out 1.2. Access and interpret repair procedures, workshop manuals and manufacturer's information 1.3. Identify and prepare tools, equipment and materials required for repair operations 1.4. Set up work area
2. Dismantle and inspect engine and components	2.1. Identify and observe applicable workplace health and safety (WHS) requirements, including state/territory regulatory requirements and personal protection needs 2.2. Dismantle engine in a logical sequence 2.3. Complete dismantling operation without causing damage to components or system 2.4. Clean and arrange components ready for inspection 2.5. Access and interpret relevant information from manufacturer/component supplier specifications and repair/reclaim methods 2.6. Measure components and compare against manufacturer/component supplier specifications and tolerances 2.7. Make decisions as to serviceability and repair method of each component 2.8. Source replacement parts, as required 2.9. Identify and arrange outsourcing of third-party repair
3. Overhaul and assemble engine and engine components	3.1. Perform repair, rebuild or replacement operations in accordance with workplace procedures and manufacturer/component supplier specifications and tolerances 3.2. Assemble engine following manufacturer/component supplier procedures 3.3. Measure running clearances against manufacturer/component supplier specifications and make necessary adjustments 3.4. Apply appropriate lubricants to engine 3.5. Complete assembly within timeframe and without causing damage to components or system
4. Check engine operation	4.1. Securely mount engine in preparation for starting 4.2. Check engine fluid levels, including lubrication and coolant

ELEMENT	PERFORMANCE CRITERIA
	4.3. Check gauges and warning devices for operation prior to starting 4.4. Start engine and run up to operating temperature and check for leaks, abnormal noises and pressures where applicable 4.5. Make any adjustments as required and re-test 4.6. Complete workplace documentation and update customer and warranty information as required
5. Complete work	5.1. Seal engine orifices against ingress of foreign matter 5.2. Inspect repaired unit to ensure protective guards, cowlings and safety features are in place 5.3. Clean and store engine to workplace expectations 5.4. Clean work area, dispose of waste, and store tools and equipment 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

Required skills include:

- technical skills to the level required to use workplace technology and tools, including specialist tooling, measuring equipment and computerised technology related to overhauling outdoor power equipment engines
- communication skills to the level required to confirm work requirements and specifications, to communicate effectively regarding work requirements with other workers and customers, to report work outcomes and problems, and to relate to people from a range of social, cultural and ethnic backgrounds and of varying physical and mental abilities
- literacy skills to the level required to research, interpret and apply manufacturer/component supplier information, procedures and specifications
- numeracy skills to the level required to correctly calculate time, assess tolerances, apply accurate measurements, calculate material requirements and establish quality checks
- problem-solving skills to the level required to plan and organise activities, to establish safe and effective work processes which anticipate and/or resolve problems and downtime, and to interpret test results and develop creative solutions
- team skills to the level required to work effectively and cooperatively with others to optimise workflow and productivity

Required knowledge

Required knowledge includes:

- construction and operating principles of 2- and 4-stroke spark ignition engines and 4-stroke compression ignition engines
- types and layout of service/repair manuals (hard copy and electronic)
- overhaul procedures and methodologies
- component evaluation methods
- different repair requirements for different engines
- testing and adjustment procedures
- types of lubricants, application and methods of lubrication
- selection, checking and use of tooling and equipment
- manufacturer and/or component supplier specifications and tolerances
- applicable commonwealth, state or territory legislation, regulations, standards and codes of practice, including WHS and environment, relevant to overhauling engines in outdoor power equipment
- organisational policies and procedures, including quality requirements, reporting and recording procedures, and work organisation and planning processes, related to

REQUIRED SKILLS AND KNOWLEDGE

overhauling engines in outdoor power equipment
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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

Assessors must be satisfied that the candidate can competently and consistently:

- observe safety procedures and requirements
- communicate effectively with others involved in or affected by the work
- select overhaul methods and techniques appropriate to the circumstances
- complete preparatory activity in a systematic manner
- dismantle, evaluate, assemble, adjust, measure and test engines and components in accordance with workplace requirements and manufacturer/component supplier requirements
- complete overhaul of a range of engines and associated components within workplace guidelines and timeframes
- present repaired equipment to customer in compliance with workplace requirements
- complete workplace records.

Context of, and specific resources for assessment

- The application of competency is to be assessed in the workplace or a simulated environment that reflects as far as possible the actual working environment.
- Assessment is to occur using standard and authorised work practices, safety requirements and environmental constraints.
- Assessment is to comply with relevant regulatory requirements, including specified Australian standards.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- The following resources should be made available:
 - a range of outdoor power equipment engines and components
 - materials relevant to overhauling engines
 - equipment, hand and power tooling appropriate to overhauling of outdoor power equipment engines

EVIDENCE GUIDE	
	• specifications and work instructions.
Method of assessment	• Assessment must satisfy the endorsed Assessment Guidelines of this Training Package. • Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of Required Skills and Knowledge. • Assessment methods must be by direct observation of tasks and include questioning on Required Skills and Knowledge to ensure its correct interpretation and application. • Assessment may be applied under project-related conditions (real or simulated) and require evidence of process. • Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • 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	Assessment processes and techniques must be culturally sensitive and appropriate to the language and literacy capacity of the candidate and the work being performed.

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. 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.	
Outdoor power equipment engines	Outdoor power equipment engines may include: • stationary or mobile • air and liquid cooled • overhead and side valve • 2- and 4-stroke spark ignition

RANGE STATEMENT	
	• 4-stroke compression ignition
Engine faults	Engine faults may include: • component wear • bearing and piston clearances • ring gap • valve train wear • crankshaft end float • engine compression • cylinder leakage
Overhaul methods	Overhaul methods may include: • on- and off-site repairs • complete dismantling of component parts • replacement, repair, rebuild, or reconditioning of parts comparable to original parts • assembly of components • functional testing and adjustments • lubricating • communicating with customers • documenting and reporting on overhaul
Tooling and equipment	Tooling and equipment may include: • specialist and general workshop equipment and tooling • measuring equipment • tuning equipment • tensioning equipment • lubricating equipment
Materials	Materials may include: • spare parts • gaskets, sealant • lubricants • fluids • cleaning materials
Information/documents	Information/documents may include: • verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, memos, material safety data sheets (MSDS), diagrams or sketches • safe work procedures related to overhauling

RANGE STATEMENT	
	engines • regulatory/legislative requirements pertaining to overhauling engines • engineer's design specifications and instructions • organisation work specifications and requirements • instructions issued by authorised enterprise or external persons • Australian standards
WHS requirements	WHS requirements are to be in accordance with applicable commonwealth, state or territory legislation and regulations, and organisational safety policies and procedures, and may include: • personal protective equipment and clothing • safety equipment • first aid equipment • hazard and risk control • elimination of hazardous materials and substances • manual handling, including shifting, lifting and carrying • emergency procedures
Legislative requirements	Legislative requirements are to be in accordance with applicable commonwealth, state or territory legislation, regulations, certification requirements and codes of practice, and may include: • award and enterprise agreements • industrial relations • Australian standards • Australian Design Rules • confidentiality and privacy • WHS • the environment • equal opportunity • anti-discrimination • relevant industry codes of practice • duty of care
Environmental requirements	Environmental requirements may include: • waste management

RANGE STATEMENT	
	• pollution • noise • dust • clean-up management
Quality requirements	Quality requirements may include: • regulations, including Australian standards • internal organisational quality policies and procedures • enterprise operations and procedures
Organisational policies and procedures	Organisational policies and procedures may include: • quality policies and procedures, including Australian standards • WHS, sustainability, environment, equal opportunity and anti-discrimination • manufacturer specifications and industry codes of practice • safe work procedures • reporting and recording procedures

Unit Sector(s)

Unit sector	Outdoor Power Equipment
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Co-requisite units

Not applicable.

Competency field

Competency field	Technical - Engines
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