



**Australian Government**

# **AURPTE104 Overhaul outdoor power equipment engines**

**Release: 1**

# AURPTE104 Overhaul outdoor power equipment engines

## Modification History

| Release   | Comments                                                                                                |
|-----------|---------------------------------------------------------------------------------------------------------|
| Release 1 | This version first released with AUR Automotive Retail, Service and Repair Training Package Version 6.0 |

## Application

This unit describes the skills and knowledge required to return outdoor power equipment engines to original manufacturer tolerances and clearances. The unit involves preparing for the task, dismantling and evaluating the engine, carrying out the overhaul procedures, reassembling and testing the engine, and completing workplace processes and documentation.

The unit applies to those working in the outdoor power equipment and the engines may be two and four stroke spark ignition and four stroke compression ignition engines. The unit does not apply to light or heavy vehicle engines. This unit does not apply to light or heavy vehicle engines.

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

## Unit Sector

Outdoor Power Equipment Technical - Engines

## Elements and Performance Criteria

| ELEMENTS                                               | PERFORMANCE CRITERIA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Elements describe the essential outcomes.</i>       | <i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 1. Prepare to dismantle outdoor power equipment engine | 1.1 Identify job requirements from workplace instructions<br>1.2 Identify required information for overhaul activity<br>1.3 Analyse and select dismantling options appropriate to the circumstances<br>1.4 Identify hazards and environmental issues associated with overhaul activity, assess potential risks and implement control measures in line with workplace policies and procedures<br>1.5 Identify tools and equipment required for testing strategy and establish serviceability according to workplace procedures |

| ELEMENTS                                        | PERFORMANCE CRITERIA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2. Dismantle and evaluate engine and components | <p>2.1 Dismantle engine and relevant components in a logical sequence according to manufacturer and workplace procedures, and safety and environmental requirements, without causing unnecessary damage to components or systems</p> <p>2.2 Clean components and evaluate according to workplace procedures and safety and environmental requirements</p> <p>2.3 Measure components and compare with manufacturer specifications and serviceability is determined</p> <p>2.4 Determine component repair method</p> <p>2.5 Identify unserviceable parts and source replacement parts</p> <p>2.6 Obtain authorisation to proceed according to workplace procedures</p> |
| 3. Carry out overhaul                           | <p>3.1 Source and interpret overhaul information</p> <p>3.2 Analyse overhaul options and select most appropriate to the circumstances</p> <p>3.3 Select and check overhaul tools and equipment for serviceability</p> <p>3.4 Machine, repair and replace components, as required, and carry out adjustments according to manufacturer specifications, workplace procedures, and safety and environmental requirements, and without causing damage to components or systems</p>                                                                                                                                                                                       |
| 4. Assemble engine and components               | <p>4.1 Assemble engine according to manufacturer specifications, workplace procedures, and safety and environmental requirements</p> <p>4.2 Measure tolerances and clearances against manufacturer specifications and make necessary adjustments</p> <p>4.3 Complete assembly of engine within workplace timeframes and without causing damage to other components or systems</p> <p>4.4 Carry out post-assembly testing according to workplace procedures and safety and environmental requirements, and rectify any problems detected as having been introduced during the assembly process</p>                                                                    |
| 5. Complete work processes                      | <p>5.1 Conduct final inspection according to workplace procedures and confirm equipment is ready for use</p> <p>5.2 Clear work area and dispose of or recycle materials according to workplace procedures</p> <p>5.3 Complete documentation according to workplace procedures</p>                                                                                                                                                                                                                                                                                                                                                                                    |

## 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.*

| SKILL                   | DESCRIPTION                                                                                                                                                                                                                                                                                   |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning                | <ul style="list-style-type: none"><li>• Locates required sources of information efficiently</li><li>• Uses websites to download owner manuals, workshop literature and service bulletins.</li></ul>                                                                                           |
| Numeracy                | <ul style="list-style-type: none"><li>• Measures engine components and uses basic mathematical operations, including addition, subtraction, multiplication and division</li><li>• Calculates distances, areas, volumes, tolerances and deviations from manufacturer specifications.</li></ul> |
| Oral communication      | <ul style="list-style-type: none"><li>• Clarifies instructions, reports evaluation findings and makes overhaul recommendations.</li></ul>                                                                                                                                                     |
| Reading                 | <ul style="list-style-type: none"><li>• Interprets and assesses information from manufacturer and workshop literature when seeking engine specifications and procedures.</li></ul>                                                                                                            |
| Planning and organising | <ul style="list-style-type: none"><li>• Plans own work requirements</li><li>• Prioritises actions to achieve required outcomes</li><li>• Ensures tasks are completed within workplace timeframes.</li></ul>                                                                                   |
| Technology              | <ul style="list-style-type: none"><li>• Uses precision measuring equipment</li><li>• Uses specialised engine overhaul equipment.</li></ul>                                                                                                                                                    |

## Unit Mapping Information

Supersedes and is equivalent to AURPTE004 Overhaul outdoor power equipment engines.

## Links

Companion Volume Implementation Guide is found on VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b4278d82-d487-4070-a8c4-78045ec695b1>

# Assessment Requirements for AURPTE104 Overhaul outdoor power equipment engines

## Modification History

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## Performance Evidence

The candidate must demonstrate the ability to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including evidence of the ability to:

- overhaul at least two different outdoor power equipment engines, including:
  - at least one four-stroke spark ignition engine
  - at least one of the following:
    - two-stroke spark ignition engine
    - four-stroke compression ignition engine.

## Knowledge Evidence

The candidate must be able to demonstrate knowledge to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including knowledge of:

- methods to locate and interpret information required to overhaul outdoor power equipment engines, including:
  - information provided by customer and supervisors
  - manufacturer specifications and procedures or equivalent documentation
- workplace procedures required to overhaul outdoor power equipment engines, including:
  - establishing serviceability of tools and equipment
  - documentation procedures
  - housekeeping procedures, including:
    - examination of tools and equipment
    - storage of equipment
    - identification, tagging and isolation of faulty equipment
    - disposal of excess materials
    - recycling procedures
- work health and safety (WHS) requirements relating to overhauling engines and associated engine components, including procedures for:

- operating specialised engine overhaul tools, equipment and machinery
- using cleaning chemicals and toxic substances
- environmental requirements, including procedures for trapping, storing and disposing of lubricants and fluids released from engines
- types, characteristics and operating principles of outdoor power equipment engines and associated engine components
- outdoor power equipment engine overhaul procedures, including:
  - methods for cleaning and preparing an engine for overhaul
  - engine dismantling procedures
  - engine component inspection, measuring and evaluation procedures, including methods for measuring and calculating tolerances and clearances
- engine and engine component repair and adjustment procedures, including:
  - engine cylinder head and cylinder block
  - engine crankshaft and camshaft
  - engine cylinder and engine sleeve fitting, boring and honing
- engine bearing tunnel and connecting rod repair
- engine assembly and adjustment procedures for achieving component tolerances, including:
  - piston to connecting rod big-end alignment
  - big-end bearing to crankshaft journal clearance
  - big-end bearing crush with bearing blue
  - piston ring end gap, back clearance and side clearance
  - main bearing to crankshaft journal clearance
  - cylinder head, valves, guides and seats
  - camshafts and cam followers
  - camshaft end float
  - crankshaft end float
  - gear backlash
  - governors
  - oil pump sealing and pick-up oil piping
- component assembly procedures and processes, including:
  - welch plugs and oil gallery plugs
  - piston and connecting rod assemblies
  - big-end bearings
  - piston rings to pistons
  - main bearings and thrust washers
  - crankshafts, including protection measures for crankshaft journals, bearings, rings and bores
  - finished camshaft bearings
  - cylinder head and components
  - camshafts and cam followers

- timing gears
- oil pumps, oil squirters, oil splashers, and oil pump pick-ups
- governors
- balance shafts
- fitting ancillary components, including covers and cowlings, seals, housings, crankshaft pulleys and flywheels
- post-overhaul testing procedures for engines, including:
  - fuel system adjustments
  - governor speed adjustments
  - engine protection devices.

## Assessment Conditions

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 outdoor power equipment engines that they have worked on, 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:

- outdoor power equipment repair workplace or simulated workplace
- workplace instructions
- manufacturer outdoor power equipment engine specifications
- two different outdoor power equipment engines requiring overhaul
- tools, equipment and materials appropriate for overhauling and adjusting outdoor power equipment engines.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

## Links

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