



Australian Government

AURPTE103 Diagnose and repair outdoor power equipment engines

Release: 1

AURPTE103 Diagnose and repair 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 diagnose and repair faults in the spark ignition and compression ignition engines of outdoor power equipment. The unit involves preparing for the task, sourcing a diagnostic testing strategy, carrying out the diagnosis and the repair, performing post-repair testing, and completing workplace processes and documentation.

The unit applies to those working in the automotive service and repair industry. The engines include those in outdoor power equipment. This unit does not apply to light or heavy vehicles.

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 diagnose and repair outdoor power equipment engine	1.1 Identify job requirements from workplace instructions 1.2 Identify required information for diagnosis activity 1.3 Analyse diagnostic options and source testing strategy to identify cause of fault using workplace and manufacturer procedures 1.4 Identify hazards and environmental issues associated with diagnose and repair activity, assess potential risks and implement control measures in line with workplace policies and procedures

ELEMENTS	PERFORMANCE CRITERIA
	1.5 Identify tools and equipment required for testing strategy and establish serviceability according to workplace procedures
2. Diagnose engine	2.1 Implement diagnostic tests set out in testing strategy according to manufacturer and workplace procedures, and workplace health and safety requirements 2.2 Identify cause of fault through analysis of diagnostic test results 2.3 Confirm and report cause of fault according to workplace procedures 2.4 Develop and report recommendations for necessary repairs according to workplace procedures
3. Repair engine	3.1 Identify required information for repair activity 3.2 Identify tools, equipment and materials required for repair activity and establish serviceability according to workplace procedures 3.3 Carry out repairs according to workplace and manufacturer procedures, manufacturer specifications, workplace health and safety and environmental requirements 3.4 Carry out post-repair testing according to workplace procedures, workplace health and safety and environmental requirements
4. Complete work processes	4.1 Conduct final inspection according to workplace procedures and confirm equipment is ready for use 4.2 Clear work area and dispose of or recycle materials according to workplace procedures 4.3 Complete documentation according to workplace procedures

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance but are not explicit in the performance criteria.

SKILL	DESCRIPTION
Learning	• Locates required sources of information efficiently • Develops a sequenced plan for a specific task.
Numeracy	• Measures engine components and use mathematical operations • Calculates deviations and tolerances from manufacturer specifications • Operates specialised measurement and calibration equipment.

SKILL	DESCRIPTION
Oral communication	• Clarifies instructions • Obtains information from customers and supervisors.
Reading	• Interprets information from manufacturer and workshop literature when seeking outdoor power equipment engine specifications and procedures.
Planning and organising	• Plans own work requirements • Prioritises actions to achieve required outcomes • Ensures tasks are completed within workplace timeframes.
Technology	• Uses engine test and diagnosis equipment • Uses precision measuring equipment.

Unit Mapping Information

Supersedes and is equivalent to AURPTE003 Diagnose and repair 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 AURPTE103 Diagnose and repair 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

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:

- diagnose and repair a fault in at least two different outdoor power equipment engines, each one being a different engine type chosen from the following:
 - two-stroke spark ignition engine
 - four-stroke spark ignition engine
 - four-stroke compression ignition engine
- in the course of the above work remove, refit or replace each of the following:
 - cylinder head
 - camshaft
 - piston and connecting rod
 - crankshaft.

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 diagnose and repair outdoor power equipment engines, including:
 - information provided by customer and supervisors
 - manufacturer specifications and procedures or equivalent documentation
- workplace procedures required to diagnose and repair 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 diagnosing and repairing outdoor power equipment engines, including procedures for working with rotating and hot components
- environmental requirements, including procedures for trapping, storing and disposing of lubricants and fluids released from outdoor power equipment engines
- operating principles of the outdoor power equipment engines and associated components, including two and four-stroke spark ignition engines and four-stroke compression ignition engines, including:
 - combustion cycle
 - swept volume and engine volume
 - compression ratio
 - valve timing
 - engine efficiency, including volumetric efficiency, thermal efficiency and mechanical efficiency
 - torque and horsepower, including brake horsepower
 - engine measurement and performance, including:
 - swept volume and engine volume
 - compression ratio
 - valve timing
 - engine efficiency, including volumetric efficiency, thermal efficiency and mechanical efficiency
- types of lubricants, and associated application and methods of lubrication
- application, and key features of outdoor power equipment engines and components, including:
 - lubrication system, cylinder blocks, cylinders, pistons, cylinder heads, combustion chambers, inlet and exhaust manifolds, connecting rods, crankshafts, pistons, piston rings, gudgeon pins, camshafts, timing gears, vibration dampers and flywheels
- diagnostic testing procedures for outdoor power equipment engines, including:
 - engine compression tests
 - vacuum tests
 - checking for sources of fluid leak
 - checking abnormal engine noises
- dismantling procedures for outdoor power equipment engines, including procedures for:
 - measuring clearances and tolerances
 - inspecting components
- repair procedures for outdoor power equipment engines, including procedures for removing and replacing the:
 - cylinder head
 - piston and connecting rod

- crankshaft
- camshaft
- worn components
- assembly procedures for outdoor power equipment engines, including adjusting components
- post-repair testing and re-testing procedures for outdoor power equipment engines, including idle and governor adjustments, running engines to operating temperature.

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:

- automotive repair workplace or simulated workplace
- workplace instructions
- manufacturer outdoor power equipment engine specifications
- different types of outdoor power equipment engines specified in the performance evidence
- diagnostic equipment for outdoor power equipment engines
- tools, equipment and materials appropriate for diagnosing and repairing 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

Companion Volume Implementation Guide is found on VETNet -

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