



Australian Government

AURPTR103 Service and repair outdoor power equipment engine management systems

Release: 1

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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 service and repair outdoor power equipment engine management systems (EMS) according to manufacturer specifications. The unit involves preparing for the task, determining the service and repair requirements, carrying out the service and repair, performing post-repair testing, and completing workplace processes and documentation.

The unit applies to those working in the outdoor power equipment service and repair industry. The EMS include electronic fuel injection and emission systems in hand-held or wheeled equipment. EMS may include those of two and four-stroke spark ignition engines.

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

Unit Sector

Outdoor Power Equipment Technical- Electrical and Electronic

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 service and repair EMS	1.1 Identify job requirements from workplace instructions 1.2 Source and interpret workplace inspection and service procedures 1.3 Identify and manage hazards associated with the tasks 1.4 Select tools and equipment and check for serviceability
2. Determine service and repair requirements of EMS	2.1 Inspect and test system according to manufacturer specifications, workplace procedures, and safety requirements

ELEMENTS	PERFORMANCE CRITERIA
	2.2 Identify faults through inspection and identify causes 2.3 Report inspection findings and test results according to workplace procedures, and include recommendations for necessary service, repair or adjustment 2.4 Obtain authorisation to proceed with service and repair in line with recommendations
3. Carry out service and repair activities	3.1 Select and check tools, equipment and materials required to conduct service and repair 3.2 Remove and inspect components for serviceability according to manufacturer specifications, workplace procedures, and safety and environmental requirements 3.3 Fit and adjust reusable, repaired and replacement components according to manufacturer specifications and workplace procedures
4. Check EMS for normal operation	4.1 Operate system and compare to manufacturer specifications 4.2 Make adjustments as required and adjust and re-test rotary cutting system
5. Complete work processes	5.1 Conduct final inspection according to workplace procedures and confirm equipment is ready for use 5.2 Clear work area and dispose of or recycle materials according to workplace procedures 5.3 Complete documentation according to workplace procedures

Foundation Skills

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

SKILL	DESCRIPTION
Learning	Locates required sources of information efficiently.
Numeracy	- Measures EMS components and uses basic mathematical operations, including addition and subtraction - Calculates deviations and tolerances from manufacturer specifications - Measures electrical components for comparison to manufacturer specifications.
Reading	Interprets information from manufacturer and workshop literature and seeks EMS specifications and procedures.

SKILL	DESCRIPTION
Planning and organising	- Plans own work requirements - Prioritises actions to achieve required outcomes - Ensures tasks are completed within workplace timeframes.
Technology	Uses diagnostic EMS equipment.

Unit Mapping Information

Supersedes and is equivalent to AURPTR003 Service and repair outdoor power equipment engine management systems.

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 AURPTR103 Service and repair outdoor power equipment engine management systems

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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:

- use diagnostic tools to perform checks on at least two different outdoor power equipment engine management systems (EMS), in which the work must involve validating error codes and downloading EMS software
- service and repair the above two outdoor power equipment EMS
- in the course of the above work service and repair the following components:
 - fuel injection pump
 - fuel injector or carburettor
 - spark plug
 - ignition coil pack
 - generator or compensator
 - electronic control unit
 - sensors, including:
 - crankshaft angle
 - engine speed sensor
 - crankcase temperature and pressure sensor
 - emission control systems
- on two occasions, carry out EMS diagnosis, calibration and adjustment using relevant manufacturer engine diagnosis device.

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 heavy vehicle compression ignition engines, including:
 - information provided by customer and supervisors

- manufacturer specifications and procedures or equivalent documentation
- workplace procedures required to diagnose and repair heavy vehicle compression ignition 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 servicing and repairing engine management systems, including procedures for:
 - selecting and using personal protective equipment (PPE)
 - working with electrical systems
 - operating engines safely
- environmental requirements, including procedures for trapping, storing and disposing of fuel released from the EMS
- operating principles of outdoor power equipment EMS, including:
 - air fuel ratios and chemistry of combustion
 - composition of petrol fuel, including octane rating
 - open and closed loop injection
 - engine emissions
- application and key features of EMS components, including:
 - fuel system components:
 - fuel injection pump
 - fuel injector
 - tank, cap and lines
 - electronic control system components:
 - electronic control unit
 - throttle position sensor
 - generator
 - crankshaft angle and engine speed
 - crankcase air temperature and pressure sensor
 - manifold absolute pressure (MAP) sensor
 - oxygen sensor
 - ignition system, including:
 - spark plug
 - high tension lead
 - coil

- engine emission control system, including:
 - emission standards
 - engine emission design technology
 - evaporative
 - exhaust
 - crankcase
- identification, selection and operation of EMS diagnostic tools relevant to the engine brand and system type
- procedures for system data retrieval in order to determine usage of product, fuel quality values, system parameters and service history
- service and repair procedures available from EMS manufacturer manuals, including removal, replacement, calibration and adjustment procedures for EMS, including:
 - fuel system
 - ignition system
 - electronic control system
 - emission control system
- post-repair testing procedures for EMS, including:
 - operating engine system through full operating range
 - verify manufacturer specifications
 - performance benchmarking product against specifications.

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 EMS that they have serviced and repaired, 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 specifications for EMS
- area and equipment, including PPE, required to safely test EMS
- two outdoor power equipment EMS requiring service and repair
- tools, equipment and materials appropriate for servicing and repairing EMS, including:
- industry relevant engine diagnosis devices, including computer and system software, communications adaptor and connecting cables
- multimeter tool.

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

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