



Australian Government

AURLTE104 Diagnose complex faults in light vehicle petrol engines

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 diagnose complex faults in light vehicle petrol engines and determine the repair action necessary to restore system performance. It involves confirming the existence of a fault, developing a diagnostic testing strategy, diagnosing the cause of the fault, reporting conclusions and making repair recommendations. Complex faults are outside the normal scope of a technician's diagnosis and repair work. They include intermittent faults, multi-system faults, faults introduced as a result of system repairs, and indirect faults caused by the influence of external systems, requiring the application of complex diagnostic processes to resolve.

The unit applies to those working in the automotive service and repair industry. The petrol engines include those of light vehicles or light commercial vehicles.

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

Unit Sector

Mechanical Light Vehicle 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. Identify and confirm the work requirement	1.1 Identify job requirements from workplace instructions 1.2 Confirm nature of fault according to workplace procedures 1.3 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
2. Prepare to diagnose complex faults	2.1 Identify required information for diagnosis activity 2.2 Analyse diagnostic options and develop testing strategy, including, diagnostic method sequence, tests and testing processes 2.3 Identify tools and equipment required for testing strategy and establish serviceability according to workplace procedures
3. Apply diagnostic procedures	3.1 Implement diagnostic tests set out in testing strategy according to manufacturer and workplace procedures, and workplace health and safety requirements 3.2 Verify and report diagnostic findings using reliable alternative process according to manufacturer specifications and workplace procedures 3.3 Develop and report recommendations for necessary repairs according to workplace procedures 3.4 Communicate findings to workplace supervisor and customer and confirm next steps
4. Complete work processes	4.1 Conduct final inspection according to workplace procedures and confirm vehicle is ready for repair process or return to customer 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 not explicit in the performance criteria.

SKILL	DESCRIPTION
Learning	• Locates required sources of information efficiently • Develops own approach to a task, including steps to confirm findings.
Reading	• Interprets workplace instructions such as job cards • Identifies, organises and interprets technical information from manufacturer and workshop literature when seeking petrol engine system specifications and procedures.
Oral communication	• Clarifies instructions • Obtains information from customers and supervisors.

SKILL	DESCRIPTION
Numeracy	- Measures petrol engine system components and uses mathematical operations to calculate tolerances and deviations from manufacturer specifications - Uses electrical measuring equipment and interprets units, such as amperes, ohms, and volts.
Planning and organising	- Plans own work requirements - Prioritises and sequences actions to achieve required outcomes - Ensures tasks are completed within workplace timeframes.
Technology	- Uses precision measuring equipment - Uses specialised diagnostic equipment.

Unit Mapping Information

Supersedes and is equivalent to AURLTE004 Diagnose complex faults in light vehicle petrol 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 AURLTE104 Diagnose complex faults in light vehicle petrol engines

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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:

- diagnose a complex fault in three different light vehicle petrol engines, in which the work for at least two of the engines must involve a different complex fault chosen from the following:
 - an intermittent fault
 - a fault that affects more than one system
 - a fault introduced as a result of a system repair
 - an indirect fault caused by the influence of external systems
- develop a testing strategy to diagnose the cause of the complex fault in each of the three petrol engines above.

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 complex faults in light vehicle petrol engines, including:
 - light vehicle petrol engine manufacturer specifications
- workplace procedures required to diagnose complex faults in light vehicle petrol engines, including:
 - establishing the 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
 - safe disposal of materials

- recycling procedures
- workplace health and safety (WHS) requirements relating to diagnosing complex faults in light vehicle petrol engines, including procedures for:
 - working with hot engine components and rotating engine components
 - controlling hazards associated with hazardous substances, including engine oil and coolants
- environmental requirements, including procedures for trapping, storing and disposing of fluids released from petrol engines
- types of complex faults relating to light vehicle petrol engines, including:
 - intermittent
 - multi-system
 - introduced as a result of system repair
 - indirect, caused by the influence of external systems
- types, function and operation of light vehicle petrol engines, including:
 - intake, exhaust, lubrication, cooling and engine mounting systems and components
 - valve timing and variable valve timing
- testing procedures for light vehicle petrol engines, including:
 - abnormal noise analysis
 - compression testing
 - cylinder leak-down testing
 - oil pressure testing
 - component failure analysis
- types, functions, operation and limitations of diagnostic testing equipment required to diagnose complex faults in light vehicle petrol engines
- procedures for accessing and interpreting scan tool system data, including:
 - diagnostic trouble codes (DTCs), including:
 - conditions that set the DTCs
 - conditions for running DTCs
 - live data
 - waveforms.

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 light vehicle petrol 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 light vehicle petrol engine specifications
- three different light vehicles with complex faults in their petrol engines
- engine diagnostic equipment, including:
 - compression gauge
 - vacuum gauge
 - cylinder leak-down gauge
 - oil pressure gauge
- tools, equipment and materials appropriate for diagnosing complex faults in light vehicle petrol 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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