



Australian Government

AURHTE103 Diagnose complex faults in heavy vehicle diesel 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 heavy vehicle diesel 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 who work in the automotive service and repair industry. The diesel engines include those of agricultural machinery, heavy commercial vehicles, marine vessels or mobile plant machinery.

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

Unit Sector

Mechanical – Heavy Vehicle Technical – Engines

Elements and Performance Criteria

ELEMENT	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

ELEMENT	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 - Applies diagnostic skills to different vehicles or machinery
Reading	Identifies, organises and interprets technical information from manufacturer and workshop literature when seeking engine management system specifications and procedures
Oral communication	- Clarifies instructions - Obtains information from customers and supervisors
Numeracy	Measures engine components and uses mathematical operations, to calculate tolerances and deviations from manufacturer specifications

SKILL	DESCRIPTION
	• Uses electrical measuring equipment and interpret units, such as amperes, ohms, and volts
Planning and organising	• Plans own work requirements • Prioritises 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 AURHTE003 Diagnose complex faults in heavy vehicle diesel 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 AURHTE103 Diagnose complex faults in heavy vehicle diesel 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 heavy vehicle diesel engines in which the work for at least two of the engines must involve a different type of complex fault selected 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 cause of the complex faults in the above engines.

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 heavy vehicle diesel engines, including heavy vehicle diesel engine manufacturer specifications
- workplace procedures required to diagnose complex faults in heavy vehicle diesel 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 heavy vehicle diesel engines, including procedures for working with:
 - hot engine components
 - rotating engine components
- environmental requirements, including procedures for trapping, storing and disposing of fluids released from diesel engines
- types of complex faults relating to heavy vehicle diesel engines, including:
 - intermittent
 - multi-system
 - introduced as a result of system repair
 - indirect, caused by the influence of external systems
- key features of heavy vehicle diesel engines, including:
 - intake, exhaust, lubrication, cooling and engine mounting systems and components
 - turbochargers
 - valve timing
- testing procedures for heavy vehicle diesel engines, including:
 - abnormal noise analysis
 - compression testing
 - cylinder leak-down testing
 - oil pressure testing
 - component failure analysis
- key features and limitations of diagnostic testing equipment required to diagnose complex faults in heavy vehicle diesel 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
 - freeze frame data
 - waveforms
 - vehicle continuous and non-continuous monitored systems.

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 heavy vehicle diesel 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 heavy vehicle diesel engine specifications
- three different heavy vehicle diesel engines with complex faults
- heavy vehicle diesel engine diagnostic equipment, including:
 - compression tester
 - cylinder leakage tester
 - oil pressure gauge
 - scan tool
- tools, equipment and materials appropriate for diagnosing complex faults in heavy vehicle diesel 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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