



Australian Government

AURHTF002 Diagnose and repair heavy vehicle diesel fuel injection systems

Release: 1

AURHTF002 Diagnose and repair heavy vehicle diesel fuel injection systems

Modification History

Release	Comment
Release 1	New unit of competency.

Application

This unit describes the performance outcomes required to diagnose and repair faults in the diesel fuel injection systems of heavy vehicles and machinery. It involves preparing for the task, selecting the correct diagnostic procedure, carrying out the diagnosis and the repair, performing post-repair testing, and completing workplace processes and documentation.

It applies to those working in the automotive service and repair industry. The diesel fuel injection systems include those in agricultural machinery, heavy commercial vehicles, marine vessels or mobile plant machinery. The unit does not apply to electronic compression ignition engine management systems.

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

Competency Field

Mechanical - Heavy Vehicle

Unit Sector

Technical - Fuel Systems

Elements and Performance Criteria

Elements	Performance Criteria
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold and italicised text is used, further information is detailed in the range of conditions section.
1. Prepare to diagnose and repair diesel fuel	1.1 Job requirements are determined from workplace instructions 1.2 Diagnostic information is sourced and interpreted

Elements Elements describe the essential outcomes.	Performance Criteria Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold and italicised text is used, further information is detailed in the range of conditions section.
injection system	1.3 Diagnostic options are analysed and those most appropriate to the circumstances are selected 1.4 Hazards associated with the work are identified and risks are managed 1.5 Diagnostic tools and equipment are selected and checked for serviceability
2. Diagnose diesel fuel injection system	2.1 Engine tune adjustments are checked and rectified as required according to manufacturer specifications and workplace procedures 2.2 Diagnostic tests are carried out according to manufacturer specifications, workplace procedures, and environmental and safety requirements 2.3 Faults are identified from diagnostic test results and causes of faults are determined 2.4 Diagnosis findings, including recommendations for necessary repairs or adjustments, are reported according to workplace procedures
3. Repair diesel fuel injection system	3.1 Repair information is sourced and interpreted 3.2 Repair options are analysed and those most appropriate to the circumstances are selected 3.3 Repair tools, equipment and materials are selected and checked according to manufacturer procedures 3.4 Repairs and component replacements and adjustments are carried out according to manufacturer specifications, workplace procedures, and safety and environmental requirements , and without causing damage to components or systems 3.5 Post-repair testing is carried out according to workplace procedures to confirm fault rectification, and any further problems detected as having been introduced during the repair process are rectified
4. Complete work processes	4.1 Final inspection is made to ensure work is to workplace expectations and system or vehicle is presented ready for use 4.2 Work area is cleaned, waste and non-recyclable materials are disposed of, and recyclable material is collected 4.3 Tools and equipment are checked and stored according to workplace procedures 4.4 Workplace documentation is processed according to workplace procedures

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.

Skills	Description
Learning skills to:	locate appropriate sources of information efficiently.
Reading skills to:	interpret information from manufacturer and workshop literature when seeking fuel injection system specifications and procedures.
Writing skills to:	legibly and accurately fill out workplace documentation when reporting diagnostic findings, making repair recommendations, and recording parts and material used.
Oral communication skills to:	- clarify instructions - report diagnostic findings and make repair recommendations.
Numeracy skills to:	measure diesel fuel injection system components and use basic mathematical operations, including addition and subtraction, to calculate distances, tolerances and deviations from manufacturer specifications.
Planning and organising skills to:	plan own work requirements and prioritise actions to achieve required outcomes and ensure tasks are completed within workplace timeframes.
Technology skills to:	- use test and diagnosis equipment such as: - vacuum and pressure gauges - laptop/scan tool diagnostic equipment - temperature gauge - use precision measuring equipment, such as micrometers and dial indicator gauges.

Range of Conditions

This section specifies work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included. Bold italicised wording, if used in the performance criteria, is detailed below.

<i>Safety requirements</i> must include:	- work health and safety (WHS) and occupational health and safety (OHS) requirements, including procedures for: - working with:
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	• high fuel pressures • stored fuel pressures • high voltage diesel fuel injectors • engine start-up and shut-down.
<i>Environmental requirements</i> must include:	• procedures for trapping, storing and disposing of diesel fuel released from injection systems.

Unit Mapping Information

No equivalent unit.

Links

Companion Volume implementation guides are found in VETNet -

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

Assessment Requirements for AURHTF002 Diagnose and repair heavy vehicle diesel fuel injection systems

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Performance Evidence

Before competency can be determined, individuals must demonstrate they can perform the following according to the standards defined in this unit's elements, performance criteria, range of conditions and foundation skills:

- diagnose and repair a fault in two different heavy vehicle diesel fuel injection systems, completing the following with each system:
 - testing the low pressure fuel supply
 - removing and refitting a low pressure fuel pump
 - removing, refitting and timing a diesel high pressure pump
 - removing, refitting and testing injectors
 - bleeding a diesel fuel injection system.

Knowledge Evidence

Individuals must be able to demonstrate knowledge of:

- work health and safety (WHS) and occupational health and safety (OHS) requirements relating to diagnosing and repairing vehicle diesel fuel injection systems, including procedures for:
 - working with:
 - high fuel pressures
 - stored fuel pressures
 - high voltage diesel fuel injectors
 - engine start-up and shut-down
- environmental requirements, including procedures for trapping, storing and disposing of diesel fuel released from injection systems
- operating principles of diesel fuel injection systems and associated components, including:
 - phases of combustion

- composition of diesel fuel
- application, purpose and operation of diesel fuel injection systems and components, including:
 - low pressure fuel supply systems, including:
 - fuel pumps
 - filters and separators
 - high pressure diesel fuel injection systems, including:
 - distributor type injection pumps
 - in-line injection pumps
 - electronic unit injection (EUI)
 - hydraulic electronic unit injection (HEUI)
 - high pressure injection (HPI)
 - injectors
- diagnostic testing procedures for diesel fuel injection systems, including:
 - assessing exhaust smoke
 - testing low pressure fuel systems
 - testing injector opening pressure, back leakage, nozzle leakage and spray pattern
 - assessing air induction systems
 - measuring individual cylinder exhaust temperature to determine underperforming cylinders
- repair procedures for diesel fuel injection systems, including procedures for:
 - dismantling, cleaning, adjusting and reassembling conventional injectors
 - removing, installing and timing high pressure injection pumps
 - adjusting and tuning mechanical unit injection systems
 - bleeding fuel systems
- post-repair testing procedures for diesel fuel injection systems, including procedures for:
 - checking fuel system leakage
 - assessing engine performance.

Assessment Conditions

Assessors must satisfy NVR/AQTF assessor requirements.

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 fuel injection systems 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 fuel injection system specifications
- two different heavy vehicles with faults in their diesel fuel injection systems
- diagnostic equipment for diesel fuel injection systems
- tools, equipment and materials appropriate for repairing and adjusting heavy vehicle diesel fuel injection systems.

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