



Australian Government

AURHTF102 Diagnose and repair heavy vehicle diesel fuel injection systems

Release: 1

AURHTF102 Diagnose and repair heavy vehicle diesel fuel injection systems

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 diesel fuel injection systems of heavy vehicles and machinery. The unit involves preparing for the task, sourcing a diagnostic testing strategy, diagnosing the cause of the fault, carrying out the repair, performing post-repair testing, and completing workplace processes and documentation.

The unit applies to those who work in the automotive service and repair industry. The diesel fuel injection systems include those in agricultural machinery, heavy commercial vehicles, mobile plant machinery or marine vessels. 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.

Unit Sector

Mechanical – Heavy Vehicle Technical – Fuel Systems

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. Prepare to diagnose and repair fuel injection system	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

ELEMENT	PERFORMANCE CRITERIA
	implement control measures in line with workplace policies and procedures 1.5 Identify tools and equipment required for testing strategy and establish serviceability according to workplace procedures
2. Diagnose fuel injection system	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 fuel injection system	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 vehicle 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 not explicit in the performance criteria.

SKILL	DESCRIPTION
Learning	- Locates required sources of information efficiently - Develops a sequenced plan for a specific task
Reading	Organises and interprets technical information from workplace procedures, manufacturer procedures and

SKILL	DESCRIPTION
	manufacturer specifications
Oral communication	• Clarifies instructions • Obtains information from customers and supervisors
Numeracy	• Measures fuel injection system components • Uses mathematical operations • Calculates areas, volumes and tolerances • Calculates deviations from manufacturer specifications
Planning and organising	• Plans own work requirements • Prioritises actions to achieve required outcomes • Ensures tasks are completed within workplace timeframes
Technology	• Uses diagnostic equipment • Uses precision measuring equipment

Unit Mapping Information

Supersedes and is equivalent to AURHTF002 Diagnose and repair heavy vehicle diesel fuel injection 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 AURHTF102 Diagnose and repair heavy vehicle diesel fuel injection systems

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 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

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 diesel fuel injection systems, including:
 - information provided by customers and supervisors
 - manufacturer specifications and procedures or equivalent documentation
- workplace procedures required to diagnose and repair heavy vehicle diesel fuel injection systems, 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

- workplace health and safety (WHS) requirements relating to diagnosing and repairing heavy 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 relating to diagnosing and repairing heavy vehicle diesel fuel injection systems, including procedures for trapping, storing and disposing of diesel fuel released from injection systems
- operating principles of heavy vehicle diesel fuel injection systems, including:
 - phases of combustion
 - composition of diesel fuel
- purpose and operation of heavy vehicle diesel fuel injection systems and components, including:
 - low pressure fuel supply systems, including:
 - fuel pumps
 - filters and separators
 - common rail injection systems
 - 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 heavy vehicle 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 heavy vehicle 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 heavy vehicle diesel fuel injection systems, including procedures for:

- checking fuel system leakage
- assessing engine performance.

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 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.

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>