



Australian Government

AURLTF101 Diagnose and repair light vehicle mechanical fuel injection 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 diagnose and repair faults in the mechanical fuel injection systems of light vehicles. 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 working in the automotive service and repair industry. The mechanical fuel injection systems include those in light vehicles, light commercial vehicles or outdoor power equipment.

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

Unit Sector

Mechanical Light Vehicle Technical – Fuel Systems

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 diagnose and repair light vehicle mechanical 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 implement control measures in line with workplace policies

ELEMENTS	PERFORMANCE CRITERIA
	and procedures 1.5 Identify tools and equipment required for testing strategy and establish serviceability according to workplace procedures
2. Diagnose light vehicle mechanical 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 light vehicle mechanical fuel injection system	3.1 Identify required information for repair activity 3.2 Identify required repair 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 mechanical fuel injection system components • Uses mathematical operations • Calculates distances and tolerances • Calculates deviations from manufacturer specifications • Interprets ratios and units, such as parts per million (PPM) from exhaust gas analysers.
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.

Unit Mapping Information

Supersedes and is equivalent to AURLTF001 Diagnose and repair light vehicle mechanical 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 AURLTF101 Diagnose and repair light vehicle mechanical fuel injection 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:

- diagnose and repair a fault in three mechanical fuel injection system components, including:
 - at least one fuel distributor
 - at least two of the following:
 - fuel injector
 - fuel pressure regulator
 - fuel pump and filter
 - fuel accumulator
- carry out a diagnostic test in the course of the above for at least one of the following faults:
 - low system pressure
 - leaking injectors
 - low fuel pump volume.

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 light vehicle mechanical fuel injection systems, including:
 - information provided by customers and supervisors
 - manufacturer specifications and procedures or equivalent documentation
- workplace procedures required to diagnose and repair light vehicle mechanical 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 light vehicle mechanical fuel injection systems, including procedures for working with high pressure petrol fuel systems
- environmental requirements relating to diagnosing and repairing light vehicle mechanical fuel injection systems, including procedures for trapping, storing and disposing of fluids released from fuel system
- operating principles of light vehicle mechanical fuel injection systems, including carburation
- purpose and operation of light vehicle mechanical fuel injection systems and components, including:
 - fuel supply, including:
 - high and low pressure system
 - electric fuel pump
 - fuel accumulator
 - fuel metering, including:
 - air-flow sensor
 - fuel distributor
 - differential pressure valves
 - fuel injectors
 - cold-start enrichment and warm-up enrichment, including:
 - cold-start valve
 - thermo-time switch
 - warm-up regulator
 - auxiliary air device
 - full load enrichment
- diagnostic testing procedures for light vehicle mechanical fuel injection systems, including procedures for:
 - cold-start enrichment inspection
 - testing injectors, including:
 - opening pressure
 - leakage integrity
 - spray shape
 - chatter
 - testing system pressure, including:
 - primary system pressure

- control pressure
- analysing exhaust gas, including cold and hot engine exhaust gas analysis.
- repair procedures for light vehicle mechanical fuel injection systems, including procedures for removing, replacing and injection pump timing mechanical fuel injection systems
- post-repair testing procedures for light vehicle mechanical fuel injection 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 mechanical 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 mechanical fuel injection system specifications
- vehicles with faults in the mechanical fuel injection system components specified in the performance evidence
- diagnostic equipment for mechanical fuel injection systems, including exhaust gas analyser
- tools, equipment and materials appropriate for repairing mechanical fuel injection systems.

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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