



Australian Government

AURTTL105 Diagnose and repair LNG fuel systems

Release: 1

AURTTL105 Diagnose and repair LNG fuel 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 liquefied natural gas (LNG) fuel systems of vehicles or machinery. It involves preparing for the task, sourcing the diagnostic testing strategy, carrying out the diagnosis and 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 unit applies to LNG fuel systems in agricultural machinery, forklifts, heavy commercial vehicles, light vehicles or mobile plant machinery.

Licensing, legislative, regulatory or certification requirements may apply to this unit in some jurisdictions. Users are advised to check with the relevant regulatory authority.

Unit Sector

Mechanical Miscellaneous Technical – Alternative Fuels

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 LNG fuel system	1.1 Determine job requirements from workplace instructions 1.2 Source and interpret diagnostic information 1.3 Analyse diagnostic options and source testing strategy, selecting those required for the circumstances 1.4 Identify hazards associated with the work and manage risks 1.5 Select and check diagnostic tools and equipment required for testing strategy for serviceability
2. Diagnose LNG fuel system	2.1 Perform diagnostic tests set out in testing strategy according to workplace procedures and safety and environmental requirements

ELEMENTS	PERFORMANCE CRITERIA
	2.2 Identify faults from diagnostic test results and determine causes of faults 2.3 Confirm and report cause of fault according to workplace procedures 2.4 Develop and report recommendations for required repairs or adjustments according to workplace procedures
3. Repair LNG fuel system	3.1 Source and interpret repair information 3.2 Analyse repair options and select those required for the circumstances 3.3 Select and check repair tools, equipment and materials 3.4 Carry out repairs and component replacements and adjustments according to manufacturer specifications, workplace procedures, safety and environmental requirements, and AS/NZ 2739 Natural gas (NG) fuel systems for vehicle engines, and without causing damage to components or system 3.5 Carry out post-repair testing according to workplace procedures and AS/NZ 2739 to confirm fault rectification, and rectify any further problems detected as having been introduced during the repair process
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 Process workplace 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.
Numeracy	• Measures LNG fuel system components and uses mathematical operations to calculate distances, areas, volumes, tolerances and deviations from manufacturer specifications.

SKILL	DESCRIPTION
Oral communication	• Clarifies instructions • Obtains information from customers and supervisors.
Reading	• Interprets information from manufacturer and workshop literature when seeking LNG fuel system specifications and procedures.
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 AURTTL005 Diagnose and repair LNG fuel 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 AURTTL105 Diagnose and repair LNG fuel 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 one of the following components in at least two vehicles with different liquefied natural gas (LNG) fuel systems:
 - mixers
 - regulators
 - fuel lock-off valves
 - electronic control valves or switches.

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 LNG fuel systems, including:
 - information provided by customer and supervisors
 - manufacturer specifications and procedures or equivalent documentation
- workplace procedures required to diagnose and repair LNG fuel 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
- work health and safety (WHS) requirements relating to diagnosing and repairing LNG fuel systems, including procedures for:

- working with extremely cold and flammable gas
- storing LNG
- environmental requirements, including procedures for preventing loss of gas to atmosphere
- key requirements of AS/NZ 2739 Natural gas (NG) fuel systems for vehicle engines
- operating principles of LNG fuel systems and associated components
- application, purpose and operation of LNG fuel systems and components, including:
 - mixers
 - regulators
 - fuel lock-off valves
 - filters
 - tanks
 - control valves and switches
- diagnostic testing procedures for LNG fuel systems, including:
 - mixers
 - regulators
 - fuel lock-off valves
 - electronic control valves and switches
- repair procedures for LNG fuel systems, including procedures for removing, replacing and adjusting the systems
- post-repair testing procedures for LNG fuel 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 LNG fuel 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 LNG fuel system specifications
- AS/NZ 2739 Natural gas (NG) fuel systems for vehicle engines
- two vehicles with different LNG fuel systems with faults
- diagnostic equipment for LNG fuel systems, including exhaust gas analyser
- tools, equipment and materials appropriate for repairing LNG fuel 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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