



Australian Government

AURTTF105 Diagnose and repair engine forced-induction systems

Release: 1

AURTTF105 Diagnose and repair engine forced-induction 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 engine forced-induction systems. 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 engine forced-induction systems include those in agricultural machinery, heavy commercial vehicles, light 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 Miscellaneous 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 forced-induction 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 and procedures

ELEMENT	PERFORMANCE CRITERIA
	1.5 Identify tools and equipment required for testing strategy and establish serviceability according to workplace procedures
2. Diagnose forced-induction 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 forced-induction 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	• Interprets workplace instructions such as job cards • Organises and interprets technical information from

SKILL	DESCRIPTION
	workplace procedures, manufacturer procedures and manufacturer specifications
Oral communication	• Clarifies instructions • Obtains information from customers and supervisors
Numeracy	• Measures engine forced-induction components • Uses mathematical operations • Carries out calculations such as areas, volumes, tolerances and 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 precision measuring equipment

Unit Mapping Information

Supersedes and is equivalent to AURTTF005 Diagnose and repair engine forced-induction 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 AURTTF105 Diagnose and repair engine forced-induction 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 turbocharger fault in an engine forced-induction system
- diagnose and repair a fault in at least two of the following components of engine forced-induction systems:
 - variable turbocharger
 - compound turbocharger
 - waste-gate actuator
 - intercooler
 - supercharger.

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 engine forced-induction systems, including:
 - information provided by customers and supervisors
 - manufacturer specifications and procedures or equivalent documentation
- workplace procedures required to diagnose and repair engine forced-induction 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 engine forced-induction systems, including procedures for working with high temperature exhaust and intake system components
- environmental requirements relating to diagnosing and repairing engine forced-induction systems, including those relevant to exhaust gases such as hydrocarbons
- purpose and operation of engine forced-induction systems, including procedures for testing:
 - turbochargers, including:
 - twin scroll
 - twin turbocharger
 - turbo compounding
 - variable geometry turbocharger
 - waste-gate operation
 - lubrication and cooling
 - intercooler operation, including air to air and water to air
 - supercharger operation
- diagnostic testing procedures for engine forced-induction systems, including:
 - intake manifold pressure and vacuum testing
 - intake and exhaust system leak testing
 - turbo boost air pressure
 - intercooler pressure and temperature checks, types include air to air and air to water
 - oil supply
 - oil return to sump
 - turbocharger waste-gate testing
 - visual inspection for oil leakage
 - turbine rotating assembly end float and axial movement
- repair procedures for engine forced-induction systems, including procedures for:
 - removing and replacing turbochargers
 - testing, removing, replacing and adjusting waste-gates
- post-repair testing procedures for engine forced-induction 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 engine forced-induction 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 engine forced-induction system specifications
- one vehicle or machinery with engine forced-induction systems and a fault in turbocharger
- diagnostic equipment for engine forced-induction systems, including dial indicator, vacuum and pressure gauges, and temperature gauges
- tools, equipment and materials appropriate for repairing engine forced-induction systems.

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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