



**Australian Government**

# **AURMTE101 Test engines using a dynamometer**

**Release: 1**

# AURMTE101 Test engines using a dynamometer

## 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 test engines using a dynamometer. The engines being tested may be in a vehicle or stand alone. It involves preparing for the task, selecting the correct test procedure, carrying out testing, analysing test results, and completing workplace processes and documentation. It involves setting up and conducting dynamometer tests on engines, and logging, analysing and reporting the test data in order to maximise engine performance.

The unit applies to those working in the motor sport industry.

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

## Unit Sector

Motorsport Technical - Engines

## 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 for dynamometer operation             | 1.1 Determine job requirements from test information<br>1.2 Check dynamometer for calibration and serviceability according to manufacturer and workplace procedures<br>1.3 Select and check tools, equipment and materials for serviceability<br>1.4 Identify hazards associated with the work and manage risks according to safety and environmental requirements<br>1.5 Check engine or vehicle prior to testing according to manufacturer and workplace procedures<br>1.6 Check and secure engine or vehicle connections to |

| ELEMENTS                       | PERFORMANCE CRITERIA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                | dynamometer according to manufacturer, workplace and safety procedures                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 2. Conduct dynamometer testing | 2.1 Determine required load and run sequence and test parameters<br>2.2 Carry out selected dynamometer testing sequence according to manufacturer and team procedures and safety requirements, and document data<br>2.3 Calculate correction factors and apply to data                                                                                                                                                                                                                                           |
| 3. Analyse test results        | 3.1 Analyse dynamometer test data and draw conclusions about condition and performance of engine and associated systems according to manufacturer specifications and workplace procedures<br>3.2 Report findings based on dynamometer data according to workplace procedures<br>3.3 Test recommended engine modifications on dynamometer according to manufacturer and workplace procedures and safety requirements, and document data<br>3.4 Present data to team members according to workplace procedures     |
| 4. Complete work processes     | 4.1 Carry out dynamometer shutdown procedure according to manufacturer and workplace procedures and safety requirements<br>4.2 Disconnect engine from dynamometer according to manufacturer and workplace procedures<br>4.3 Check and maintain dynamometer and associated equipment according to workplace procedures<br>4.4 Check and store tools and equipment according to workplace procedures<br>4.5 Process workplace documentation, including dynamometer test results, 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 | <ul style="list-style-type: none"> <li>Locates required sources of information efficiently</li> <li>Applies learning and processes to different situations.</li> </ul> |
| Numeracy | <ul style="list-style-type: none"> <li>Uses basic mathematical operations to complete measurements, calculate analytical requirements, calibrate</li> </ul>            |

| SKILL                   | DESCRIPTION                                                                                                                                                                                           |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         | testing equipment, and present test results.                                                                                                                                                          |
| Reading                 | <ul style="list-style-type: none"><li>Identifies, organises and interprets technical information relating to engine dynamometer testing.</li></ul>                                                    |
| Planning and organising | <ul style="list-style-type: none"><li>Plans own work requirements</li><li>Prioritises actions to achieve required outcomes</li><li>Ensures tasks are completed within workplace timeframes.</li></ul> |
| Technology              | <ul style="list-style-type: none"><li>Uses specialised equipment.</li></ul>                                                                                                                           |

## Unit Mapping Information

Supersedes and is equivalent to AURMTE001 Test engines using a dynamometer.

## 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 AURMTE101 Test engines using a dynamometer

## Modification History

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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:

- carry out dynamometer testing on at least two different engines.

## 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 test engines using a dynamometer, including:
  - information provided by customer and supervisors
  - manufacturer specifications and procedures or equivalent documentation
  - test information and workplace instructions, including:
    - category regulations and component supplier specifications, including allowable quality, materials, equipment and specifications
- workplace procedures required to test engines using a dynamometer, including:
  - establishing serviceability of tools and equipment
  - documentation procedures, including:
    - dynamometer test results
  - 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 testing engines using a dynamometer, including procedures for:
  - connecting and securing engines to dynamometers

- dealing with exhaust gases from engines
- dealing with high levels of noise
- environmental requirements, including procedures for trapping, storing and disposing of fluids released during engine testing
- application, purpose and operation of engine dynamometers, including associated hardware and software
- dynamometer testing parameters, including:
  - run-in period for new engines
- engine and chassis dynamometer testing procedures, including:
  - dynamometer preparation procedures
  - engine connection and securing procedures
  - vehicle connection and securing procedures
  - test environment correction factors
  - dynamometer data interpretation and analysis, including:
    - recommendations for engine configuration and/or modifications to improve performance
- required checks of engine and vehicle, including:
  - engine oil level and condition
  - cooling system condition and coolant level
  - exhaust extraction system connection
  - drive shaft condition and connection
- operator dynamometer maintenance procedures
- engine performance and dynamometer terminology.

## 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 engines that they have tested using a dynamometer, 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
- two different engines requiring testing using a dynamometer
- engine or chassis dynamometer
- tools and equipment appropriate for connecting, securing and disconnecting engines to dynamometers.

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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