Australian Government

# AURMTD4001 Test suspension dampers using a dynamometer

**Release 1**

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

# AURMTD4001 Test suspension dampers using a dynamometer

## Modification History

| Release | Comment |
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| **Release 1** | Replaces AURM442076B Test suspension dampers using a dynamometer<br>Unit code updated to meet policy requirements<br>Reference to OHS legislation replaced with new WHS legislation |

## Unit Descriptor

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| **Unit descriptor** | This unit of competency describes the skills and knowledge required to test suspension dampers using a dynamometer.<br>It requires the technical ability to use a dynamometer to test suspension dampers and to analyse and interpret test results in order to maximise damper performance in the motorsport and performance enhancement environments.<br>No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication. |

## Application of the Unit

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| **Application of the unit** | This unit applies to individuals who set up, conduct dynamometer tests on suspension damper performance and log, analyse and report the test data in order to maximise damper performance in motorsport and performance enhancement environments. |

## Licensing/Regulatory Information

Not applicable.

# Pre-Requisites

| **Prerequisite units** | |
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| MEM30012A | Apply mathematical techniques in a manufacturing, engineering or related environment |

# Employability Skills Information

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| **Employability skills** | This unit contains employability skills. |

# Elements and Performance Criteria Pre-Content

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| Elements describe the essential outcomes of a unit of competency. | Performance criteria describe the performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide. |

# Elements and Performance Criteria

| ELEMENT | PERFORMANCE CRITERIA |
|---|---|
| 1. Prepare for dynamometer operation | 1.1. Use team instructions, category regulations and component supplier specifications are used to specify job requirements, including design, quality, materials, equipment and specifications<br>1.2. Observe workplace health and safety (WHS) requirements, including regulatory requirements, equipment and system isolation requirements, and personal protection needs, throughout the work<br>1.3. Check dynamometer for calibration and serviceability and prepare for operation |
| 2. Conduct dynamometer testing | 2.1. Determine appropriate load and run sequence and test parameters<br>2.2. Connect dampers to dynamometer and confirm security of connections<br>2.3. Perform the selected dynamometer testing sequence in accordance with technical specifications and directions and/or the locally authorised method<br>2.4. Analyse dynamometer test data and make valid conclusions about damper condition and performance<br>2.5. Report findings, including recommendations for damper configuration and/or modifications to improve performance based on dynamometer data, to appropriate persons<br>2.6. Test damper modifications with confirmation runs<br>2.7. Present data to team members to complement suspension set-up |
| 3. Clean up work area and log test results | 3.1. Perform dynamometer shutdown procedure in accordance with manufacturer requirements<br>3.2. Disconnect dampers from dynamometer<br>3.3. Clean and refurbish dynamometer and associated tooling and equipment<br>3.4. Conduct operator maintenance of dynamometer<br>3.5. Log dynamometer test results to create/add to damper history |

# Required Skills and Knowledge

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit.

**Required skills**

Required skills include:

- technical skills to the level required to use workplace technology related to dynamometers, including associated software and hardware, tooling, equipment, calculators and measuring devices
- communication skills to the level required to communicate ideas and information to enable confirmation of work requirements, coordination of work with technical supervisors, other technicians and team members, and to report work outcomes and problems
- literacy skills to the level required to collect, organise, understand and analyse information related to dynamometer test results, team requirements and safety procedures
- numeracy skills to the level required to use mathematical ideas and techniques to correctly complete measurement of suspension damper performance required for the team
- problem-solving skills to the level required to use pre-checking and inspection techniques to anticipate test problems in order to work efficiently and effectively
- team skills to the level required to work with others and in a team by recognising dependencies and using cooperative approaches to optimise workflow and productivity
- planning skills to the level required to plan and organise activities, including the preparation and layout of the work area, and the obtaining of equipment and materials to avoid backtracking, workflow interruptions or wastage

**Required knowledge**

Required knowledge includes:

- suspension damper and dynamometer terminology
- preparation procedure for dynamometer testing
- dynamometer operation and use of associated hardware and software
- test environment correction factors
- dynamometer data interpretation and analysis
- damper modification and adjustment procedures
- operator dynamometer maintenance
- procedures for reporting task completion
- metric and imperial units of measurement
- WHS policies and procedures
- applicable commonwealth, state or territory legislation, regulations, standards and codes of practice, including WHS, personal safety and environment, relevant to

| REQUIRED SKILLS AND KNOWLEDGE |
| --- |
| testing suspension dampers using a dynamometer |

# Evidence Guide

| EVIDENCE GUIDE | |
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| The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package. | |
| **Overview of assessment** | |
| **Critical aspects for assessment and evidence required to demonstrate competency in this unit** | Assessors must be satisfied that the candidate can competently and consistently:<br>• interpret and apply team requirements, controlling body and category rules and supplementary regulations<br>• correctly apply and use safety equipment and personal protective equipment<br>• follow task instructions, operating procedures and inspection processes to:<br>  • minimise the risk of injury to self or others<br>  • prevent damage to competition vehicle or equipment<br>  • achieve required outcomes within team time and quality standards<br>• correctly set up and operate a damper dynamometer to test a minimum of two (2) different dampers, with each being a different type or brand, to complete the following:<br>  • determine damper performance<br>  • analyse damper performance data<br>  • assess effect of damper changes and present to team members as information to complement suspension set-up<br>  • confirm effectiveness of damper set-up modifications<br>• work effectively with others<br>• modify activities to cater for variations in workplace context and environment. |
| **Context of, and specific resources for assessment** | • The application of competency is to be assessed in the workplace or a simulated environment that reflects as far as possible the actual working environment.<br>• Assessment is to occur using standard and authorised work practices, safety requirements and environmental constraints.<br>• Assessment is to comply with relevant regulatory requirements, including specified Australian standards.<br>• Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and |

| EVIDENCE GUIDE | |
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| | disability.<br>• The following resources should be made available:<br>  • suspension dampers<br>  • access to tooling and equipment<br>  • dynamometer and test equipment<br>  • technical references or information. |
| **Method of assessment** | • Assessment must satisfy the endorsed Assessment Guidelines of this Training Package.<br>• Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of Required Skills and Knowledge.<br>• Assessment methods must be by direct observation of tasks and include questioning on Required Skills and Knowledge to ensure its correct interpretation and application.<br>• Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.<br>• Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.<br>• Competence in this unit may be assessed in conjunction with other functional units which together form part of the holistic work role. |
| **Guidance information for assessment** | Assessment processes and techniques must be culturally sensitive and appropriate to the language and literacy capacity of the candidate and the work being performed. |

# Range Statement

| RANGE STATEMENT |
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| The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included. |

| RANGE STATEMENT | |
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| **Test parameters** | Test parameters may include:<br>• ambient and damper temperature<br>• damper stroke and frequency<br>• sample rates |
| **WHS requirements** | WHS requirements are to be in accordance with applicable commonwealth, state or territory legislation and regulations, and organisational safety policies and procedures, and may include:<br>• personal protective equipment and clothing and other equipment<br>• safety equipment<br>• first aid equipment<br>• hazard and risk control<br>• elimination of hazardous materials and substances<br>• manual handling, including shifting, lifting and carrying<br>• emergency procedures<br>• team insurance requirements<br>• material safety management systems<br>• controlling body requirements<br>• manufacturer/component supplier specifications<br>• local safe operating procedures |
| **Legislative requirements** | Legislative requirements are to be in accordance with applicable commonwealth, state or territory legislation, regulations, certification requirements and codes of practice, and may include:<br>• award and enterprise agreements<br>• industrial relations<br>• Australian standards<br>• Australian Design Rules<br>• confidentiality and privacy<br>• WHS<br>• the environment<br>• equal opportunity<br>• anti-discrimination<br>• duty of care<br>• health regulations |

| RANGE STATEMENT | |
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| **Tooling and equipment** | Tooling and equipment may include:<br>• damper dynamometer<br>• hand and power tooling<br>• diagnostic computer hardware and software |
| **Information and procedures** | Information and procedures may include:<br>• controlling body rules, category rules and supplementary regulations<br>• event scheduling and location details<br>• team procedures and standards related to:<br>  • testing suspension dampers using a dynamometer<br>  • reporting and communication<br>  • use of tooling and equipment<br>  • emergency service contacts and team persons emergency contacts<br>  • team emergency and event procedures for accidents or injury<br>• work instructions, including worksheets, material safety data sheets (MSDS), assembly procedures, plans, drawings, designs and checklists<br>• manufacturer/component supplier specifications and application procedures for test equipment and material<br>• Australian Design Rules (where applicable)<br>• safety body publications<br>• environmental, hazardous chemicals and dangerous goods legislation and local requirements relating to the disposal and use of fuels, lubricants, coolants and cleaning agents |

## Unit Sector(s)

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| **Unit sector** | Motorsport |

## Co-requisite units

Not applicable.

## Competency field

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| **Competency field** | Technical - Steering and Suspension |