



**Australian Government**

# **MEM09208 Detail fasteners and locking devices in mechanical drawings**

**Release: 1**

# MEM09208 Detail fasteners and locking devices in mechanical drawings

## Modification History

Release 1. Supersedes and is equivalent to MEM09208A Detail fasteners and locking devices in mechanical drawings.

## Application

This unit of competency defines the skills and knowledge required to produce detailed engineering drawings containing fastening and locking devices to Australian Standard (AS) 1100.101 Technical drawing - General principles. Critical dimensions and specifications for the drawing are predetermined and drawings are carried out with or without the use of computer-aided design (CAD) systems.

This unit is suitable for those working within a drafting work environment and can be applied across all engineering disciplines.

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

## Pre-requisite Unit

**MEM09204 Produce basic engineering detail drawings**

MEM09229 Read and interpret technical engineering drawings

## Competency Field

Drawing, drafting and design

## 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. Determine job requirements                    | 1.1 Follow standard operating procedures (SOPs)<br>1.2 Comply with work health and safety (WHS) requirements at all times<br>1.3 Identify job requirements from available information<br>1.4 Determine purpose and scope for drawing and identify and address further information needs |

| Elements                                         | Performance Criteria                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Elements describe the essential outcomes.</i> | <i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>                                                                                                                                                                                                                                                                                                       |
|                                                  | 1.5 Verify the drawing parameters with appropriate personnel<br>1.6 Identify and prepare equipment, organisational files, templates and symbols required to complete work                                                                                                                                                                                                                                    |
| 2. Identify system requirements                  | 2.1 Determine components required from catalogues, tables, standards and specifications<br>2.2 Identify required fasteners based on their type, features and uses<br>2.3 Identify required mechanical location and locking devices based on their features, uses and thread types<br>2.4 Identify and apply relevant codes, standards and symbols used for components and methods used to locate on drawings |
| 3. Prepare detail drawing                        | 3.1 Lay out drawing in accordance with the sketches and specifications<br>3.2 Apply line work in accordance with standard industry drawing practice<br>3.3 Produce detail and assembly drawings containing engineering fasteners and location devices<br>3.4 Consult with support services<br>3.5 Present drawing according to organisational requirements                                                   |
| 4. Document and store drawings                   | 4.1 Document drawings and associated technical information in accordance with project requirements and SOPs<br>4.2 Store drawings in accordance with SOPs                                                                                                                                                                                                                                                    |

## Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

## Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the

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|--------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| candidate, accessibility of the item, and local industry and regional contexts) are included.                                                    |                                                                                                                                                                                                                                                                                              |
| Available information includes one or more of the following:                                                                                     | <ul style="list-style-type: none"> <li>• construction documents</li> <li>• building and coordination information</li> <li>• work specifications</li> <li>• information for plant services equipment</li> <li>• industry codes, standards and regulations</li> <li>• design brief.</li> </ul> |
| Fasteners are defined as any mechanical device for joining or affixing two or more components together and include one or more of the following: | <ul style="list-style-type: none"> <li>• threaded fastening devices</li> <li>• machine screws</li> <li>• set screws</li> <li>• cap screws</li> <li>• rivets</li> <li>• circlips.</li> </ul>                                                                                                  |
| Mechanical location devices include one or more of the following:                                                                                | <ul style="list-style-type: none"> <li>• pins</li> <li>• keys and keyseats.</li> </ul>                                                                                                                                                                                                       |
| Locking devices include one or more of the following:                                                                                            | <ul style="list-style-type: none"> <li>• lock nuts (double nuts)</li> <li>• nyloc nuts</li> <li>• split nuts</li> <li>• deformed</li> <li>• washers</li> <li>• wiring</li> <li>• chemical methods of thread locking.</li> </ul>                                                              |
| Appropriate personnel include one or more of the following:                                                                                      | <ul style="list-style-type: none"> <li>• designer</li> <li>• engineer</li> <li>• supervisor</li> <li>• contractor/consultant</li> <li>• builder.</li> </ul>                                                                                                                                  |
| Support services include one or more of the following:                                                                                           | <ul style="list-style-type: none"> <li>• estimating department and personnel</li> <li>• engineering department and personnel</li> <li>• drafting department and personnel</li> <li>• project manager</li> <li>• factory manager or staff.</li> </ul>                                         |

## Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM09208A Detail fasteners and locking devices in mechanical drawings.

## Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

# Assessment Requirements for MEM09208 Detail fasteners and locking devices in mechanical drawings

## Modification History

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## Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- determining purpose and scope for drawing requirements utilising all available information
- identifying system requirements for fasteners and locking devices based on their features, uses and thread types for inclusion in the drawing on at least two occasions
- producing drawings to AS 1100.101 Technical drawing - General principles, detailing fasteners and locking devices on at least two occasions
- verifying parameters of the design brief with appropriate personnel
- consulting with appropriate support services and presenting drawing
- documenting and storing drawings in accordance with SOPs.

*Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.*

## Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- safe work practices and procedures
- different approaches to drawing
- copyright and intellectual property issues and legislation in relation to drawing
- quality assurance procedures
- organisational standards for drawing in relation to accuracy, presentation and inclusion of all relevant information
- personnel and support services appropriate to drawing requirements
- order of drawing process
- organisational checking procedures for drawings
- layout and presentation requirements
- standards applicable to the work to be undertaken
- process of storing paper drawings and electronic drawing files

- International System of Units (SI)
- different types of fasteners used in engineering
- different types of location and locking devices used in engineering
- terminology associated with the preparation of mechanical drawings
- different types of thread forms, types and sizes
- types of nuts and uses for locking purposes
- manufacturing processes required to create a drilled and tapped hole and a threaded feature
- grades of bolts and their applications.

## Assessment Conditions

- Assessors must:
  - have vocational competency to detail fasteners and locking devices in mechanical drawings at least to the level being assessed with relevant industry knowledge and experience
  - satisfy the assessor requirements in the Standards for Registered Training Organisations 2015 or its replacement and comply with the National Vocational Education and Training Regulator Act 2011, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires.
- Where possible, assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions that cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required including relevant workplace procedures, product and manufacturing specifications.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

## Links

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