



Australian Government

Department of Education, Employment and Workplace Relations

MEM30009A Contribute to the design of basic mechanical systems

Release 2

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Modification History

Release 2 - Prerequisites updated - MEM30002A and MEM30003A merged and replaced in MEM05v8 by MEM30032A. Prerequisite outcomes remain equivalent.

Unit Descriptor

Unit descriptor	This unit covers contributing to basic mechanical system design, and selecting the components and mechanical features required to perform simple functions.
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Application of the Unit

Application of the unit	This unit applies to all mechanical engineering environments. Work is carried out under supervision. Band: 0 Unit Weight: 0
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM16008A	Interact with computing technology
	MEM30032A	Produce basic engineering drawings

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Research equipment function and operational requirements	1.1. All relevant drawings, specifications, manuals and documentation are obtained in accordance with workplace procedures. 1.2. Appropriate personnel are consulted to determine requirements. 1.3. Information collected is interpreted and draft functional and operational requirements are prepared and verified with supervisor or design team.
2. Prepare a preliminary sketch/drawing/specification	2.1. Appropriate components, assemblies and fasteners are selected to perform the required function. 2.2. Where required, components and/or materials are selected from supplier/manufacturer catalogues. 2.3. Appropriate and relevant codes are applied to the sketch/drawing/specification in accordance with workplace procedures. 2.4. The preliminary sketch/drawing/specification is referred to a higher authority for approval in accordance with policy and procedures.
3. Issue or file completed sketch/drawing/specification list as required	3.1. Approved sketch/drawing/specification is stored and catalogued in accordance with standard operating procedures. 3.2. Approved sketch/drawing/specification is issued in accordance with standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: <ul style="list-style-type: none"> • reading and interpreting specifications and drawings
Required knowledge

REQUIRED SKILLS AND KNOWLEDGE

Look for evidence that confirms knowledge of:

- relevant codes and standards
- basic mechanical components:
 - shafts
 - bearings
 - seals
 - fasteners, thread systems
 - splines
 - cams
- drive components:
 - electric motors
 - IC engines
 - brakes
 - clutches
 - belts and pulleys
 - chains and sprockets
 - gears
 - couplings
 - universal joints
- lifting systems:
 - lifting jacks
 - hoists
 - winch equipment
- pneumatic systems:
 - advantages and disadvantages
 - compressors
 - pneumatic components
 - typical circuits and applications
 - electrical control
- hydraulic systems:
 - advantages and disadvantages
 - power packs
 - pumps and other components
 - typical circuits and applications
 - electrical control
- pumps and piping system:
 - purpose of pumps and piping systems

REQUIRED SKILLS AND KNOWLEDGE

- pumps, valves, pipes and other components
- typical piping systems

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
<p>Overview of assessment</p>	<p>A person who demonstrates competency in this unit must be able to contribute to the design of basic mechanical systems. Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.</p>
<p>Context of and specific resources for assessment</p>	<p>This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with contributing to the design of basic mechanical systems, or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
<p>Method of assessment</p>	<p>Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.</p>

EVIDENCE GUIDE

Guidance information for assessment	
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Range Statement**RANGE STATEMENT**

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.

Components, assemblies and fasteners	May include shafts, seals, bearings, fasteners, splines, cam, lifting systems, pneumatic circuits, hydraulic circuits, piping systems
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Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units	

Competency field

Competency field	Engineering technician
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