



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **MEM30010A Set up basic hydraulic circuits**

**Release: 1**

## MEM30010A Set up basic hydraulic circuits

### Modification History

Not Applicable

### Unit Descriptor

<b>Unit descriptor</b>	This unit covers setting up and selecting components associated with single linear hydraulic systems.
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### Application of the Unit

<b>Application of the unit</b>	<p>This unit applies to all engineering or manufacturing environments.</p> <p>The unit refers to simple hydraulic circuits containing single linear actuators and motors.</p> <p>Work is carried out under supervision.</p> <p><b>Band: 0</b></p> <p><b>Unit Weight: 0</b></p>
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### Licensing/Regulatory Information

Not Applicable

### Pre-Requisites

<b>Prerequisite units</b>		

## Employability Skills Information

<b>Employability skills</b>	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. Determine system requirements	1.1. Instructions regarding system requirements are obtained, understood and clarified as necessary. 1.2. Circuit drawings using standard symbols are interpreted correctly.
2. Select components for simple hydraulic circuits	2.1. Suitable fluids are selected for given hydraulic systems from specification charts and in accordance with safety procedures involving fluids. 2.2. Linear actuators and motors are selected to suit system requirements. 2.3. Control valves are selected to suit system requirements.
3. Verify component selection	3.1. Circuits are set up and operated on laboratory benches. 3.2. Operation is analysed and outcomes are verified against system requirements.

## 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:

- interpreting simple hydraulic circuit drawings
- testing operation of simple hydraulic circuits
- assessing performance
- documenting circuit specifications and test results
- applying fluid power principles

#### Required knowledge

Look for evidence that confirms knowledge of:

- fluid power:
  - definition of the term fluid power
  - differences between pneumatic and hydraulic systems
  - advantages and disadvantages of fluid power compared with mechanical and

**REQUIRED SKILLS AND KNOWLEDGE**

- electric power systems
- safety procedures when working with fluid power equipment
- basic properties of fluids
- selection and suitability for different applications
- basic properties and units - mass, volume, density, specific volume, relative density, force and weight, pressure (absolute, atmospheric and gauge), temperature (celsius and kelvin), viscosity, surface tension
- introduction to temperature and pressure effects on the basic properties and applications
- precautions to be taken when changing type of fluid in a system
- awareness of different components including:
  - pipes (rigid and flexible)
  - valves, types and functions
  - filters and strainers for liquids
  - gauges and instruments - pressure/temperature gauges, liquid level gauges, thermometers, thermocouples, manometers, piezometers
  - pipe fittings - elbows/bends, enlargement/contractions, coupler/unions, tees
  - tanks and vessels - storage tanks, pressure vessels, header and surge tanks, weirs/dams/reservoirs
  - flow measurement instruments - venturi and orifice meters
  - pumps, motors/turbines
- linear actuators:
  - types, selection and functions
  - methods of supporting linear actuators
  - introduction to calculations related to linear actuators
  - recognition and drawing of standard symbols
  - observation and analysis of performance of linear actuators in laboratory circuits
- control valves (hydraulic and pneumatic):
  - directional controls and functions
  - check valves and functions
  - pressure controls and functions
  - flow controls and functions
  - recognition and drawing of standard symbols for control valves
  - drawing and analysis of typical circuits containing control valves
  - observation and analysis of performance of valves in basic circuits
- circuit design and analysis (single linear actuator):
  - drawing and analysis of circuit diagrams containing basic components
  - setting up and operating circuits on pneumatic and hydraulic benches in a fluid

<b>REQUIRED SKILLS AND KNOWLEDGE</b>
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power laboratory
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## Evidence Guide

<b>EVIDENCE GUIDE</b>	
<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>	
<b>Overview of assessment</b>	<p>A person who demonstrates competency in this unit must be able to set up basic hydraulic circuits and verify outcomes.</p>
<b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b>	<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>
<b>Context of and specific resources for assessment</b>	<p>This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, i.e. the candidate is not in productive work, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered 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 setting up basic hydraulic circuits, or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
<b>Method of assessment</b>	<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 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>
<b>Guidance information for</b>	

**EVIDENCE GUIDE**

assessment

**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.

<b>Simple hydraulic circuits</b>	Limited to linear actuators, motors, control valves
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<b>Safety procedures</b>	Selecting a suitable fire resistant fluid for a system, given its operating conditions; following required precautions when changing a system from one fluid to another
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**Unit Sector(s)**

<b>Unit sector</b>	
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**Co-requisite units**

<b>Co-requisite units</b>	



## Competency field

Competency field	Engineering technician
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