



Australian Government

Department of Education, Employment and Workplace Relations

MEM18091B Maintain and repair multi stage, cascade and/or ultra-cold industrial refrigeration systems

Release: 2

MEM18091B Maintain and repair multi stage, cascade and/or ultra-cold industrial refrigeration systems

Modification History

Single band identifier removed to clarify dual status

Unit Descriptor

Unit descriptor	This unit covers maintaining and repairing multi stage, cascade cryogenic and ultra-cold industrial refrigeration systems.
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Application of the Unit

Application of the unit	It includes interpreting drawings and diagrams of complex industrial refrigeration systems; utilising fault finding procedures and test equipment to identify and diagnose faults in systems; isolating faulty components; and rectifying common faults. This unit applies to retrofitting existing multi stage, cascade and/or ultra-cold industrial refrigeration systems; reconditioning components; returning to service and testing systems; and completing service reports for administrative action. The application of this competency must cover a variety of refrigeration equipment and systems. Band: This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C5 (AQF level V). Unit Weight: 4
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM10002B	Terminate and connect electrical wiring
	MEM12002B	Perform electrical/electronic measurement
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM18049C	Disconnect/reconnect fixed wired equipment up to 1000 volts a.c./1500 volts d.c.
	MEM18055B	Dismantle, replace and assemble engineering components
	MEM18086B	Test, recover, evacuate and charge refrigeration systems
	MEM18087B	Service and repair domestic and light commercial refrigeration and air conditioning equipment
Path 2	MEM09002B	Interpret technical drawing
	MEM10002B	Terminate and connect electrical wiring
	MEM12002B	Perform electrical/electronic measurement
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM18049C	Disconnect/reconnect fixed wired

Prerequisite units		
		equipment up to 1000 volts a.c./1500 volts d.c.
	MEM18055B	Dismantle, replace and assemble engineering components
	MEM18086B	Test, recover, evacuate and charge refrigeration systems
	MEM18090B	Maintain and repair industrial refrigeration systems and components
Path 3	MEM09002B	Interpret technical drawing
	MEM10002B	Terminate and connect electrical wiring
	MEM12002B	Perform electrical/electronic measurement
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM18049C	Disconnect/reconnect fixed wired equipment up to 1000 volts a.c./1500 volts d.c.
	MEM18055B	Dismantle, replace and assemble engineering components
	MEM18086B	Test, recover, evacuate and charge refrigeration systems
	MEM18088B	Maintain and repair commercial air conditioning systems and components

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. Undertake preventive maintenance checks/adjustment on multi stage, cascade and/or ultra-cold industrial refrigeration systems	1.1. The temperature, pressure and properties of the multi stage, cascade and/or ultra-cold refrigeration system are checked for conformance to specification. 1.2. The noise/vibration levels of the multi stage, cascade and/or ultra-cold refrigeration system are checked for conformance to specification. 1.3. Preventative maintenance tasks are performed according to manufacturers' specifications using refrigeration techniques/practices.
2. Undertake fault finding on multi stage, cascade and/or ultra-cold industrial refrigeration systems and components	2.1. System components are identified correctly. 2.2. The characteristics and operation of each component is understood. 2.3. The operational function of each component is inspected and tested. 2.4. Correct operation of each component is assessed against specification.
3. Repair/replace faulty components	3.1. Faulty components are localised and malfunction is confirmed by inspection and testing using industrial refrigeration principles, procedures and safety requirements. 3.2. The refrigerant is removed safely from the system and contained in accordance with standard operating procedures and regulatory requirements where appropriate. 3.3. Faulty components are dismantled and repaired to manufacturers' specifications as required 3.4. Replacement parts are selected from manufacturers' catalogues according to required specifications.
4. Return to service multi stage, cascade and/or ultra-cold refrigeration systems	4.1. Components are reassembled and tested for correct operation and assessed against specification. 4.2. The system is charged with correct refrigerant safely and in accordance with standard operating procedures and regulatory requirements where appropriate. 4.3. Using industrial refrigeration principles and system application techniques, correct operation of the equipment is verified. 4.4. Maintenance records/service reports are completed by appropriate designated means.

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:

- using tools, techniques and equipment necessary to check multi stage, cascade and/or ultra-cold industrial refrigeration systems and components for correct operation
- comparing system, sub-systems and component performance/operation against specification
- identifying faulty components and non-compliances
- making required adjustments to achieve specifications
- sourcing and using relevant catalogues/lists
- applying safety procedures, standard operating procedures and legislative requirements to all work undertaken
- documenting results of the adjustments
- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- planning and sequencing operations
- checking task-related information

Required knowledge

Look for evidence that confirms knowledge of:

- measuring instruments/equipment and specifications for checking the temperature/s and properties of the controlled medium/s
- procedures for reporting non-conformances
- measuring instruments/equipment and specifications for checking component noise and vibration levels
- procedures and sequence for performing preventative maintenance
- procedures and sequence for performing safety equipment checks
- specifications and process for identifying system components
- operational characteristics of the system components
- procedures and all legislative and regulatory requirements for safely removing the refrigerant from the system
- procedures for dismantling and repairing components, selecting replacement parts, reassembling and testing
- procedures for completing maintenance records/service reports
- hazard and control measures associated with maintaining and repairing multi stage, cascade and/or ultra-cold industrial refrigeration systems

REQUIRED SKILLS AND KNOWLEDGE
• safe work practices and procedures • calculations and numerical operations within the scope of this unit

Evidence Guide

EVIDENCE GUIDE

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

A person who demonstrates competency in this unit must be able to maintain and repair multi stage, cascade and/or ultra-cold industrial refrigeration systems. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

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.

Context of and specific resources for assessment

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.

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the maintenance and repair of multi stage, cascade cryogenic and ultra-cold industrial refrigeration systems, or other units requiring the exercise of the skills and knowledge covered by this unit.

Method of assessment

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,

EVIDENCE GUIDE	
	standards, manuals and reference materials.
Guidance information for 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.	
Preventative maintenance tasks	Check/adjust fan belts, check/clean filters, check/clean heat exchangers (evaporator and condenser), overhaul of major system components, cleaning of major system components, testing operation of all safety devices

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Maintenance and diagnostics
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