



Australian Government

Department of Education, Employment and Workplace Relations

MEM18015B Maintain tools and dies

Release: 1

MEM18015B Maintain tools and dies

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers identifying and analysing defects in tooling, disassembling and assessing tooling components, manufacturing or repairing tooling components to conform to specifications, and assembling tooling components. Potential production/maintenance problems are also identified. The tooling being maintained may include press tools, plastic moulds, forging dies, die casting or jigs and fixtures and gauges etc. requiring precision repair.
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Application of the Unit

Application of the unit	This standard may be applied in a tool room situation which involves a great deal of autonomy based on a sound knowledge of the operation of production tooling. The tooling being maintained may include any of the following: press tools, plastic moulds, forging dies, die casting, or jigs and fixtures, gauges etc. requiring precision repair. A normal range of tool room equipment would be used which may include lathes, mills, grinders, hand and power tools used for precision work. For simple maintenance not requiring precision repair, see Unit MEM18006C (Repair fit engineering components). Band: A Unit Weight: 4
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM06007B	Perform basic incidental heat/quenching, tempering and annealing
	MEM07005C	Perform general machining
	MEM07006C	Perform lathe operations
	MEM07007C	Perform milling operations
	MEM07008D	Perform grinding operations
	MEM09002B	Interpret technical drawing
	MEM12003B	Perform precision mechanical measurement
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM18003C	Use tools for precision work
	MEM18006C	Repair and fit engineering components
	MEM18055B	Dismantle, replace and assemble engineering 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. Identify and analyse defects in tooling	1.1. Defects are determined from any of: production components produced, production reports or tool inspections. 1.2. Sequence of maintenance operations is planned.
2. Disassemble and assess tooling components	2.1. Tooling is disassembled, and condition of components against prints, drawings, manufacturers' drawings etc. is assessed. 2.2. Worn/damaged parts are replaced/reconditioned.
3. Obtain and prepare replacement materials	3.1. Materials are obtained to meet tooling requirements.
4. Manufacture/repair tooling components	4.1. Appropriate hand and hand held power tools are selected and used. 4.2. Appropriate machining process is chosen from a range of standard tool room machines. 4.3. Machining parameters are set to produce components to specification. 4.4. Where appropriate, heat treatment is initiated according to specification.
5. Assemble tooling components	5.1. Using acceptable tool making techniques and procedures, tooling components are checked and assembled correctly in conformance with specifications.
6. Measure production components	6.1. Production components are checked with precision instruments to ensure conformance to specifications as required.
7. Identify potential production/maintenance problems	7.1. Conditions leading to tooling failure are identified and recorded. 7.2. Recurrent faults are identified and solutions are initiated.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

REQUIRED SKILLS AND KNOWLEDGE

Look for evidence that confirms skills in:

- obtaining all relevant information with respect to defective tooling
- examining the defective tooling for breakage, wear, etc.
- preparing a sequential plan for the repair/maintenance of the defective tooling and documenting the plan
- disassembling the defective tooling in accordance with acceptable tool making techniques and procedures
- obtaining all relevant drawings, specifications and sample products/components
- marking worn/damaged components for repair or replacement
- testing tooling components for hardness
- obtaining the appropriate materials for manufacture of replacement tooling components
- using the appropriate hand and hand held power tools to fashion/manufacture tooling components to specification
- utilise sample components or sections to test the tooling components being manufactured
- shaping and producing the tooling components to specifications using appropriate machines and machining processes
- assembling and fitting all tooling components to specification using acceptable tool making techniques and procedures
- checking the first-off component/product using appropriate precision instruments for conformance to specification
- recording the conditions that lead to the failure of the given set of tooling
- initiating design modifications/alterations to rectify recurring faults or failure

Required knowledge

Look for evidence that confirms knowledge of:

- common tooling defects from a range of sample products/components
- the probable causes of tooling failure
- the reasons for selecting the probable causes of tooling failure
- the reasons for establishing a sequential plan for the repair/maintenance of defective tooling
- the procedures for documented plans for the repair/ maintenance of defective tooling
- the procedures for disassembling defective tooling
- the specifications of all tooling components
- the precision instruments to be used to check tooling components for conformance to specification
- the reasons for selecting the chosen precision instruments
- the procedures for identifying worn/damaged tooling
- components for repair or replacement

REQUIRED SKILLS AND KNOWLEDGE

- the reasons for deciding to repair or replace worn/damaged components
- the appropriate materials for each component of the tooling to be replaced
- the required physical properties of the tooling to be replaced
- the reasons for selecting the chosen materials in terms of: strength, durability, component finish, heat treatment requirement, and availability
- the procedures for hardness testing materials
- the procedures for obtaining tooling materials
- the hand and hand held power tools to be used to fashion/manufacture the required tooling components
- the reasons for selecting the chosen hand and hand held power tools
- the appropriate machines and machining processes to shape/produce the required tooling components
- the reasons for selecting the chosen machines and machining processes
- the effect of machining parameters on the surface finish and tolerances achievable from machining processes
- the machining parameters appropriate to given machining tasks and specifications
- the reasons for selecting the chosen machining parameters
- the reasons for heat treating the tool steel in accordance with heat treatment procedures and specifications
- the heat treatment of tooling components initiated
- the heat treatment requirements of a range of given tool steels to achieve specified hardness
- the procedures for heat treating tool steels
- the procedures for initiating the heat treatment of tool steels
- the procedures for fitting/assembling the tooling components
- the precautions to be taken when fitting/assembling tooling components
- the appropriate precision instruments for checking the components produced
- the specifications of the finished product
- the common causes of tooling failure
- the procedures for documenting tooling failures
- the conditions leading to the failure of a given set of tooling
- the reasons for selecting the chosen mode of failure
- previous faults with the given set of tooling
- any commonalities of causes of failures or trends/events associated with tooling failure
- appropriate proposed solutions for a range of recurrent faults that may occur in tooling
- the reasons for selecting the chosen solutions
- the procedures for initiating modifications/alterations to tooling design

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 tool and dies. 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 tool and die maintenance 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 should not require language, literacy and numeracy skills beyond those required in this unit. 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.

Guidance information for

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.

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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