



Australian Government

Department of Education, Employment and Workplace Relations

MEM19021B Diagnose and service micro-mechanisms

Release: 1

MEM19021B Diagnose and service micro-mechanisms

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers diagnosing and servicing micro-mechanisms, including clocks and watches.
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Application of the Unit

Application of the unit	This unit covers the competencies required to diagnose and service micro-mechanisms. Work is undertaken autonomously or within a team environment using predetermined standards of quality, safety, workplace procedures and accepted workplace techniques/methods. This unit includes procurement and fitting of replacement parts. It also includes adjustment and checking to achieve timekeeping and water resistance of completed timepieces to specification/tolerance. If manufacturing of parts is required, the appropriate machining units should also be selected. Band: A Unit Weight: 6
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM18055B	Dismantle, replace and assemble engineering components
	MEM19020B	Fault-find and maintain micro-mechanisms

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 performance requirements for servicing	1.1. Features and performance characteristics of micro-mechanism are identified. 1.2. Performance problems common to make and model are identified. 1.3. Performance requirements for given task are identified and clarified with appropriate persons.
2. Diagnose faults and servicing requirements	2.1. Overall condition of micro-mechanism is assessed. 2.2. Physical condition and operational functioning of components inspected and verified, if necessary, with appropriate persons. 2.3. Servicing requirements are established with appropriate persons. 2.4. Performance problems are diagnosed and verified, if necessary, with appropriate persons. 2.5. Replacement parts are sourced according to enterprise procedures.
3. Service micro-mechanisms	3.1. Components are dismantled and cleaned to specification. 3.2. Requirements for new components are identified. 3.3. Components are refinished/replaced as required. 3.4. Components are assembled and lubricated to specification. 3.5. Components finished and adjusted to specification.

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:

- identifying features and performance characteristics by critical observation of materials/design/finish
- identifying movement type
- identifying typical performance problems and special servicing requirements for given mechanism

REQUIRED SKILLS AND KNOWLEDGE

- identifying missing/damaged components
- determining remedial action
- assessing casing components for wear/damage or missing parts
- using parts and movement catalogues
- determining sequence required for servicing, with reference to available parts, design of product, nature of servicing requirement
- repair costing, including provision for replacement parts
- standard checks of assemblies and subassemblies, balance assembly, escapement, wheel train, motion work, power source (mainspring), calendar, winding and setting mechanisms
- checks for tensioning, functioning, cleanliness, clearances/tolerances, wear and damage
- verifying functioning of additional mechanisms e.g. auto-winding, generating systems, calendar mechanisms
- identifying faults affecting performance
- cleaning and refinishing components e.g. pivots
- selecting and applying correct lubricant based on materials used and torque requirements
- building assemblies and subassemblies
- fitting appearance parts
- evaluating water resistance of completed watch
- adjusting timekeeping to tolerance

Required knowledge

Look for evidence that confirms knowledge of:

- methods/media for identifying performance characteristics
- reasons for specific performance problems/faults e.g. wear, broken parts, fatigue, knocking
- faults in design or materials and special servicing requirements
- general condition features such as obvious damage, contaminants, rust etc.
- interchangeability of parts for specific timepiece
- factors affecting sequence/process for servicing
- techniques, tools and diagnostic equipment for diagnosing and identifying performance problems
- techniques for dismantling assemblies and subassemblies
- operation of equipment for refinishing pivots/bearing replacement
- techniques and procedures for assembling components, assemblies and subassemblies
- applications and use of different lubricants
- correct alignment of hands relating to date change mechanism and dial graduations
- adjusting timekeeping

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 diagnose and service micro-mechanisms. 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 diagnosing and servicing micro-mechanisms 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, standards, manuals and reference materials.

EVIDENCE GUIDE**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.

Micro-mechanisms

Mechanical and electric watches and clocks of recent manufacture, or restoration pieces. May include day/date, automatic winding or generating systems. Clock mechanisms may include alarm, striking and chiming mechanisms

Components

Power source, wheel trains, mechanical oscillating systems, motion work and calendar systems

Inspection

Observations of clearances, fits and adjustments, functioning. Operation of systems and performance analysis

Appropriate persons

Customers, supervisors/managers/suppliers, technical experts, colleagues

Specifications

Manufacturer specifications. Recognition of components of product and how quality of component and materials will affect performance

Unit Sector(s)**Unit sector**

Co-requisite units

Co-requisite units		

Competency field

Competency field	Jewellery and horological
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