Australian Government

Department of Education, Employment and Workplace Relations

MEM19020B Fault-find and maintain micro-mechanisms

Release: 1

MEM19020B Fault-find and maintain micro-mechanisms

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers fault-finding and maintaining micro-mechanisms.

Application of the Unit

Application of the unit	This unit applies to watch and/or clock servicing and repair work. Environments may include retail operations through to servicing departments of manufacturers. This unit does not extend to adjusting indexing system for acoustic resonator watches, chronometer escapements and chronograph mechanisms. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools

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Prerequisite units		
	MEM18002B	Use power tools/hand held operations
	MEM18055B	Dismantle, replace and assemble engineering components

Employability Skills Information

Employability skills	This unit contains employability skills.

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. Dismantle micro-mechanism components	1.1. Micromechnism components are dismantled for inspection using techniques and principles appropriate to the task.
2. Verify condition and operation of components	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. Faults are identified using tools, equipment and techniques appropriate to the task.
3. Carry out maintenance	3.1. Maintenance requirements are confirmed, if necessary, with appropriate persons. 3.2. Components are lubricated to specification. 3.3. Components are cleaned/replaced and installed as required.
4. Assemble components	4.1. Components are assembled to specification.
5. Check and adjust components	5.1. Components are checked for correct operation. 5.2. Components are 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:

- dismantling/removing components using appropriate hand tools and techniques
- removing power from the spring
- removing and dismantling movement
- removing and dismantling balance assembly
- removing/dismantling bridges, mainspring, barrel, winding mechanism
- applying procedures to avoid damage to components during disassembly/assembly
- noting position/assembly of components for re-assembly
- checking timepiece for overall condition, damage to case etc.
- cleaning and preparing components for inspection, including movement

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REQUIRED SKILLS AND KNOWLEDGE

- checking components for evidence of toxic contamination, pollution, chemical waste and other contaminants
- checking operation/function of components using appropriate tools and techniques
- identifying defective, damaged or non-serviceable components
- following standard/routine procedures to locate/identify common faults and maintenance requirement
- applying lubricants using appropriate techniques
- cleaning/replacing components in correct sequence, using appropriate tools and techniques
- following OHS procedures
- handling components
- assembling components to specification, including, barrel and mainspring, mechanism (movement), canon pinion, drive train, balance assembly, shock resist system, calendar, winding system and other mechanisms
- verifying operation of components and assemblies, including barrel, mainspring, cannon pinion, endshake, sideshake, power reserve, drive train, calendar, winding system, power source
- adjusting components, assemblies/mechanisms to ensure operation/function to manufacturer specification using appropriate electronic timing and other diagnostic equipment and tools
- operational adjustments and verification including regulation, beat error, balance amplitude, rate, power supply

Required knowledge

Look for evidence that confirms knowledge of:

- component parts, including mainspring, barrel, winding mechanism, electronic circuit, bridges, bearing surfaces, balance assembly, calendar, power source
- techniques and procedures for dismantling/removing components
- common/typical faults and maintenance requirements for common timepieces
- verification processes for condition/function of components of movement including balance assembly, escapement, endshakes, sideshakes, bridges, bearing surfaces, mainspring, barrel, winding mechanism, electronic circuit, freedom of wheel train
- fault-finding procedures
- typical faults caused by wear, blockages and other damage and their effects
- typical contaminants and their effects on operation/functioning of components, including contaminants and foreign objects
- lubricants and lubrication techniques
- cleaning requirements for ensuring correct operation
- OHS procedures for cleaning and maintenance
- techniques/tools for handling and installing components
- tools and techniques for assembling components

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REQUIRED SKILLS AND KNOWLEDGE
• safe work practices and safety measures • required checks and procedures for verifying correct operation/function of components • procedures/techniques for adjusting components • operational specification for components and assemblies • tools and equipment (mechanical and electronic) and their use/application

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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 fault-find and maintain 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 fault-finding and maintaining 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.

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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-mechanism	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
Tools and equipment	Includes standard range of mechanical hand tools and electronic equipment to measure amplitude, rate etc.
Specifications	• Work performed to manufacturer specifications • Recognition of components of product and how quality of component will affect performance

Unit Sector(s)

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Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Jewellery and horological

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