



Australian Government

MEM19021 Diagnose and service micro-mechanisms

Release: 1

MEM19021 Diagnose and service micro-mechanisms

Modification History

Release 1. Supersedes and is equivalent to MEM19021B Diagnose and service micro-mechanisms

Application

This unit of competency defines the skills and knowledge required to diagnose and service micro-mechanisms of clocks and watches, including the procurement and fitting of replacement parts, adjustment and checking to achieve timekeeping and water resistance of completed timepieces to specification.

Where the manufacturing of parts is required appropriate machining units should also be selected.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Band: A

Unit Weight: 6

Pre-requisite Unit

MEM09002	Interpret technical drawing
MEM11011	Undertake manual handling
MEM12023	Perform engineering measurements
MEM13015	Work safely and effectively in manufacturing and engineering
MEM16006	Organise and communicate information
MEM18001	Use hand tools
MEM18002	Use power tools/hand held operations
MEM18055	Dismantle, replace and assemble engineering components
MEM19020	Fault find and maintain micro-mechanisms

Competency Field

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Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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|---|--|-----|---|
| 1 | Determine job requirements | 1.1 | Follow standard operating procedures (SOPs) |
| | | 1.2 | Comply with work health and safety (WHS) requirements at all times |
| | | 1.3 | Use appropriate personal protective equipment (PPE) in accordance with SOPs |
| | | 1.4 | Identify job requirements from specifications, drawings, job sheets or work instructions |
| | | | |
| 2 | Identify performance requirements for servicing | 2.1 | Identify features and performance characteristics of micro-mechanism |
| | | 2.2 | Identify performance problems common to make and model |
| | | | |
| 3 | Diagnose faults and servicing requirements | 3.1 | Assess overall condition of micro-mechanism |
| | | 3.2 | Inspect and check physical condition and operational functioning of components and verify with appropriate persons, as required |
| | | 3.3 | Diagnose performance problems and establish servicing requirements |
| | | 3.4 | Source replacement parts according to SOPs |
| | | 3.5 | Determine overall repair costs for servicing |
| | | | |
| 4 | Service micro-mechanisms | 4.1 | Refinish and replace components, as required |
| | | 4.2 | Assemble components and lubricate to specification |
| | | 4.3 | Finish components and adjust to specification |

Foundation Skills

This section describes those required skills (reading, writing, oral communication and numeracy) that are essential to workplace performance in this unit of competency.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Micro-mechanisms include one (1) or more of the following:

- mechanical watches and clocks
- electric watches and clocks
- pieces of recent manufacture
- restoration pieces
- day and date systems
- automatic winding systems
- generating systems
- alarm mechanisms
- striking and chiming mechanisms
- calendar mechanisms

Components include one (1) or more of the following:

- power source
- wheel trains
- mechanical oscillating systems
- motion work
- calendar systems
- casing components
- pivots

Checks include one (1) or more of the following:

- tensioning
- functioning
- cleanliness
- clearances
- tolerances
- wear
- damage
- water resistance

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Inspection includes observations of one (1) or more of the following:

- clearances
- fits and adjustments
- functioning
- systems and performance analysis
- materials
- design
- finish
- movement type
- typical performance problems
- special servicing requirements
- assemblies
- subassemblies
- escapement
- wheel train
- motion work
- power source (mainspring)
- calendar
- winding and setting mechanisms

Faults and damage include one (1) or more of the following:

- wear
- broken parts
- fatigue
- knocking
- contaminants
- rust

Appropriate persons include one (1) or more of the following:

- customers
- supervisors
- managers
- suppliers
- technical experts
- colleagues

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM19021B Diagnose and service micro-mechanisms

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

Assessment Requirements for MEM19021 Diagnose and service micro-mechanisms

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria on at least two (2) occasions and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- inspecting feature and performance characteristics for given mechanism
- performing checks and verifying functioning of mechanisms, including identifying faults affecting performance
- identifying missing and damaged components and determining remedial action
- sourcing replacement parts using parts and movement catalogues
- determining sequence required for servicing with reference to available parts, design of product and nature of servicing requirement
- determining the overall repair costs, including provision for replacement of parts
- cleaning and refinishing components and selecting and applying lubricant according to on materials used and torque requirements
- evaluating water resistance of completed watch and adjusting timekeeping to tolerance.

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- safe work practices and procedures and use of personal protective equipment (PPE)
- methods for identifying performance characteristics
- reasons for specific performance problems and faults
- faults in design or materials and special servicing requirements
- general condition features, including obvious damage
- interchangeability of parts for specific timepiece
- factors affecting sequence and 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 pivot and 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.

Assessment Conditions

- Assessors must:
 - have vocational competency in diagnosing and servicing micro-mechanisms at least to the level being assessed with relevant industry knowledge and experience
 - satisfy the assessor requirements in the *Standards for Registered Training Organisations 2015* or its replacement and comply with the *National Vocational Education and Training Regulator Act 2011*, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires
- Where possible assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions. This must cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills
- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

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