



Australian Government

MEM21014 Service mechanical chronograph watches

Release: 1

MEM21014 Service mechanical chronograph watches

Modification History

Release 1. Supersedes and is equivalent to MEM21014A Service mechanical chronograph watches

Application

This unit of competency defines the skills and knowledge required to apply servicing techniques to mechanical chronograph watches, including sub-assemblies and case components, to ensure optimum performance and timekeeping.

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

Band: A

Unit weight: 6

Pre-requisite Unit

MEM11011	Undertake manual handling
MEM13015	Work safely and effectively in manufacturing and engineering
MEM16006	Organise and communicate information
MEM18001	Use hand tools
MEM21008	Service mechanical watches
MEM21009	Inspect, diagnose, adjust and repair mechanical watches
MEM21010	Service watch power generating systems
MEM21011	Service calendar and other dial indication mechanisms for watches

Competency Field

Horology

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 servicing requirements and liaise with customer	1.1	Follow standard operating procedures (SOPs)
		1.2	Comply with work health and safety (WHS) requirements at all times
		1.3	Identify type of chronograph watch mechanisms and components
		1.4	Prepare written quotation and inform customer of watch condition and performance concerns, outlining recommended service procedures to be undertaken to remedy identified faults
		1.5	Verify and agree on servicing requirements with customer
		1.6	Prepare watch for handover
		1.7	Record and document repair process
2	Disassemble and reassemble chronograph watches	2.1	Establish an appropriate clean and safe work environment
		2.2	Select and use appropriate personal protective equipment (PPE) in accordance with SOPs
		2.3	Open and close chronographs watch cases
		2.4	Use hand tools and equipment in safe and correct manner
		2.5	Remove and replace case components, dials and hands, movements and sub-assemblies in correct sequence without damaging or marking
		2.6	Verify condition of case pushbuttons, operation and gaskets and replace, as required
		2.7	Clean cases and bands, as required
		2.8	Apply dismantling and assembly precautions
3	Service and	3.1	Inspect condition of chronograph components

Elements describe the essential outcomes.

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

	adjust chronograph mechanisms	3.2	Lubricate chronograph mechanism with correct type and amount according to manufacturer specifications
		3.3	Replace faulty or worn components
		3.4	Clean chronograph components
		3.5	Inspect chronograph watch for cleanliness and rectify imperfections and faults
		3.6	Adjust chronograph components for correct end shake, clearances and penetrations
4	Test and adjust chronograph watch function and performance	4.1	Perform pre-service inspection and fault-finding of chronograph action, function and depthings
		4.2	Verify and confirm dial and hand fitting, and casing up of chronograph
		4.3	Verify watch performance and rate testing
		4.4	Perform final adjustment and correction of recording and zeroing mechanism

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.

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Chronograph watch mechanisms include one (1) or more of the following:

- types - application of dial scale indications:
 - tachymeter
 - telemeter
- chronograph operating systems:
 - pillar wheel actuated
 - cam controlled
- features:
 - minute record
 - hour record
 - automatic
 - split second

Appropriate working environment includes the following:

- adequate lighting and ventilation
- clean bench and working area
- tools and equipment organised and in good condition
- ergonomic seating

Record and document repair includes one (1) or more of the following:

- date and extent of repair
- cost of replacement part
- time spent on procedure

Dismantling and assembly precautions include one (1) or more of the following:

- inspection of condition and adjustments of chronograph assembly functions
- verification of correct recording system operation:
 - engagement
 - depthing
 - end shake
 - penetration
- correct selection, application and amount of lubrication for chronograph mechanisms
- adjustment of timekeeping performance and balance amplitude during chronograph function

Chronograph components include one (1) or more of the following:

- operating mechanism (single or double pusher action)
- clutch system for chronograph engagement
- transmission (minute or hour record)
- flyback and zeroing

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Chronograph action includes one (1) or more of the following:

- start, stop, reset to zero
- hand zeroing
- indexing minute and hour record

Dial and hand fitting includes one (1) or more of the following:

- hand fitting tools and supports
- alignments and synchronisation

Watch performance and rate testing includes one (1) or more of the following:

- beat error diagnosis and adjustment
- rate adjustment/positional errors
- amplitude (chronograph start - maximum variation +/- 40 degrees)

Hand tools and equipment include one (1) or more of the following:

- movement holders for operating chronograph functions
- timing machine
- rose cutters
- tools for removing chronograph driving wheel
- hand staking and fitting tools and supports
- case opening and closing tools

Unit Mapping Information

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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 MEM21014 Service mechanical chronograph watches

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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
- identifying type of chronograph watch mechanisms and components
- liaising with customer, verifying condition and performance, and identifying repair costs
- dismantling, assembling and cleaning chronograph watches using correct techniques in an appropriate work environment
- inspecting, fault finding and adjusting chronograph mechanisms and components
- using appropriate hand tools and equipment to carry out service in accordance with procedures
- performing function and performance testing of chronograph action
- performing chronograph dial and hand fitting, including hand fitting tools and supports, and alignment and synchronisation
- selecting and applying lubricants in accordance with manufacturers' specifications
- verifying watch
- recording and documenting repairs.

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)
- basic functions and operations of the chronograph or stop watch
- identification of the component parts of a chronograph watch mechanism
- pre-service inspection and fault-finding techniques for chronograph action, function and depths
- inspections and adjustments techniques of mechanical chronograph mechanisms
- dismantling/reassembling techniques for mechanical chronograph watches in accordance with procedures and manufacturer guidelines
- manufacturer specification and tolerances for lubrication, performance and timekeeping
- chronograph watch case construction, and pushbuttons and pendants servicing

- band construction and components.

Assessment Conditions

- Assessors must:
 - have vocational competency in servicing mechanical chronograph watches 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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