Australian Government

MEM21008 Service mechanical watches

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MEM21008A Service mechanical watches

Application

This unit of competency defines the skills and knowledge required to service mechanical watches, including movements, sub-assemblies and components. It covers common servicing requirements for mechanical watches undertaken by all watch repairers.

Where work beyond normal servicing requirements is required unit MEM21009 Inspect, diagnose, adjust and repair mechanical watches should also be selected.

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

Band: A

Unit weight: 4

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

Competency Field

Horology

Elements and Performance Criteria

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
1	**Determine servicing requirements and liaise with**	1.1	Follow standard operating procedures (SOPs)
		1.2	Comply with work health and safety (WHS) requirements at all times

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
	customer	1.3	Identify watch type, functions, construction and components
		1.4	Carry out pre-repair tests to verify water resistance, as required
		1.5	Prepare written quotation and inform customer of watch condition, completeness and performance concerns
		1.6	Outline recommended service procedures to be undertaken to remedy identified faults
		1.7	Verify and agree on servicing requirements with customer
		1.8	Prepare watch for handover
		1.9	Record and document repair process
2	**Disassemble watch, case and movement components for servicing**	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 watch cases
		2.4	Use hand tools and equipment in safe and correct manner
		2.5	Remove case components and movement sub-assemblies in correct sequence without damaging or marking
		2.6	Verify condition of case gaskets and replace, as required
		2.7	Clean watch case and band, as required
3	**Service watch case, movement, sub-assemblies and components**	3.1	Inspect condition of movement, sub-assemblies and case components
		3.2	Confirm servicing requirements
		3.3	Replace faulty or worn component parts/movement, sub-assemblies or case

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
		3.4	Select appropriate cleaning methods and clean components
		3.5	Inspect watch case and components for cleanliness and rectify imperfections and faults
4	**Reassemble watch, movement and case components**	4.1	Reassemble watch movement and case components according to manufacturer specifications
		4.2	Assemble motion work and verify and adjust hand setting tension
		4.3	Check and adjust component operation and watch functioning
		4.4	Lubricate components and sub-assemblies according to manufacturer specification
		4.5	Apply watch assembly inspections and precautions
5	**Test and adjust watch function and performance**	5.1	Verify function of watch movement and sub-assemblies
		5.2	Correctly set up and operate mechanical watch timing machine and interpret readings
		5.3	Verify watch performance and rate testing and adjust according to manufacturer specifications, as required

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.

Watch type, function, construction and components include one (1) or more of the following:	• manual wound • shock-resistance system • regulating system • power reserve indicator • mainspring • gear train • escapement • oscillator • winding and setting
Function and operating principles of mechanical watches include the following:	• shock resistance system • regulating systems (conventional, free sprung and Etachron) • mainsprings as generators of power motive force • gear train to transmit power • escapement to release power • oscillator to control the speed of release of power • winding and setting to wind watch and set hands to time
Record and document repair includes one (1) or more of the following:	• extent and date of repair • cost of replacement part • time spent on procedure
Appropriate working environment includes the following:	• clean bench and working area • adequate lighting and ventilation • tools and equipment are organised and in good condition • ergonomic seating • ventilation

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.

Case components and movement sub-assemblies include one (1) or more of the following:	• glass and bezel • case back and gaskets • crown, pendant and gaskets • balance and cock assembly • pallet and escapement components • barrel and mainspring assembly • gear train • winding and setting mechanisms
Inspect condition includes inspection of the following:	• originality of components • corrosion • cleanliness • wear
Cleaning methods include one (1) or more of the following:	• conventional • ultrasonic • vibrational • hand cleaning • types of watch cleaning solutions used • precautions for handling and disposing cleaning solutions
Verify and adjust hand setting tension includes one (1) or more of the following:	• test for correct friction • conventional cannon pinions • friction driving wheel • short off centre
Watch assembly inspections and precautions include one (1) or more of the following:	• winding and setting engagement, operation and lubrication • gear train end shake, backlash and lubrication • mainspring engagement, hooking, tension and lubrication • escapement action, operation e.g. pallet jump and lubrication • oscillator end shake, balance spring condition and correct amount lubrication
Mechanical watch timing machine includes the following:	• Witschi watch expert or equivalent giving an indication of rate in seconds a day, beat error and amplitude

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Watch performance and rate testing includes one (1) or more of the following:	• in-beat under 0.5 milliseconds • rate adjustment +/- 10 seconds per day • amplitude minimum 220 - 270 degrees fully wound

Hand tools and equipment include one (1) or more of the following:	• timing machine
	• case opening/closing tools
	• oilers and oil pots
	• hand cleaning tools:
	  • pith
	  • peg wood
	  • rodico
	  • solvents jar

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