



Australian Government

MEM21007 Service complex quartz watches

Release: 1

MEM21007 Service complex quartz watches

Modification History

Release 1. Supersedes and is equivalent to MEM21007A Service complex quartz watches

Application

This unit of competency defines the skills and knowledge required to service complex quartz analog, digital and duo display watches, including chronographs and perpetual calendars with multiple step motors and ultrasonic step motor calendar driving systems.

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

Band: A

Unit weight: 4

Pre-requisite Unit

MEM13015	Work safely and effectively in manufacturing and engineering
MEM16006	Organise and communicate information
MEM21001	Replace watch batteries, capacitors and bands
MEM21002	Perform watch movement exchange
MEM21005	Diagnose faults in quartz watches
MEM21006	Service quartz 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.	
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

customer	1.3	Identify watch functions and features
	1.4	Prepare written quotation and inform customer of watch condition and performance concerns
	1.5	Outline recommended service procedures to be undertaken to remedy identified faults
	1.6	Verify and agree on servicing requirements with customer
	1.7	Prepare watch for handover
	1.8	Record and document repair process
2	Disassemble complex quartz watch cases, movements and components	2.1 Establish appropriate working environment
		2.2 Select and use appropriate personal protective equipment (PPE) in accordance with SOPs
		2.3 Select and use appropriate workshop tools and equipment
		2.4 Open and close watch cases
		2.5 Remove case components and movement without damaging or marking
		2.6 Verify gasket condition and replace, as required
		2.7 Clean cases and bands, as required
3	Service complex quartz watch case and movement components	3.1 Inspect condition of movement and case components
		3.2 Confirm servicing requirements
		3.3 Replace faulty or worn component parts
		3.4 Clean and inspect watch case and components for cleanliness and rectify imperfections and faults
4	Reassemble and test complex	4.1 Reassemble multiple step motors, perpetual calendar mechanisms, watch movement and case components

quartz watches	4.2	Perform work according to manufacturer guidelines and specifications
	4.3	Confirm correct assembly and operation of gear train and perpetual calendar driving system
	4.4	Use correct types and amounts of lubricant
	4.5	Use specialist service tools, jigs and testing equipment
	4.6	Verify watch functioning of calendar and chronograph mechanisms
	4.7	Verify and adjust watch performance and rate testing
	4.8	Perform resetting and zeroing and synchronising of chronograph and perpetual calendar displays

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.

Complex quartz watch functions and features include one (1) or more of the following:

- chronograph
- perpetual calendar
- repeater
- perpetual calendar with multiple step motors
- ultrasonic step motor calendar driving systems

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

- customer written quotation detailing faults
- recommendations of most appropriate service procedure
- cost estimation of replacement part
- time spent on procedure

Appropriate working environment includes

- suitable watchmakers' bench
- clean and orderly work area (precautions taken to minimise

the following:

dust)

- suitable lighting and adequate ventilation
- ergonomic chair with adjustable height

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

- timing machine
- multimeter
- pulse generator
- watch repair and construction hand tools
- case opening and closing tools
- cleaning media
- cleaning machines
- lubricants
- PPE

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

- watch glasses
- case back
- bezel
- crown
- pendant
- pushbuttons (arbors and circlips)
- gaskets

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

- current consumption (to manufacture specifications)
- pulse generation
- lower working limit test
- gear train freedom
- types of quartz regulating systems (capacitive, inhibition and thermo-compensation)
- rate adjustment for various types of quartz watch (+0.25 - 0.3 seconds/day)

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM21007A Service complex quartz watches

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 MEM21007 Service complex quartz 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
- liaising with customer and verifying condition and performance, identifying service costs, and recording and documenting repair process
- dismantling complex quartz watches, chronographs and perpetual calendars using appropriate workshop tools and equipment
- servicing multiple step motors in quartz chronograph and perpetual calendar watches in an appropriate work environment
- fault finding complex quartz watches and identifying faulty or worn components and replacing in accordance with manufacturers' specifications
- reassembling, lubricating, performance testing and adjusting complex quartz watches
- re-programming and resetting integrated circuits and synchronising analog displays for quartz chronographs and perpetual calendars.

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)
- quartz watch construction, components and operating principles, including calendars and motor drive systems
- service procedures for complex analog and digital quartz watches
- client liaison techniques
- fault-finding techniques for quartz watches
- performance testing equipment/procedures
- types of calendar displays
- service procedures to program and reset chronograph and perpetual calendar circuits.

Assessment Conditions

- Assessors must:

- have vocational competency in servicing complex quartz 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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