



Australian Government

Department of Education, Employment and Workplace Relations

MEM21007A Service complex quartz watches

Release: 1

MEM21007A Service complex quartz watches

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers servicing techniques for complex quartz analog, digital and duo display watches, including chronographs and perpetual calendars with multiple step motors and ultrasonic step motor calendar driving systems.
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Application of the Unit

Application of the unit	This unit applies to specialist repairers working in watch service and repair centres and jewellery stores where servicing and repairs on complex quartz watches, chronographs and perpetual calendars is offered. Band: A Unit weight: 4 points
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
	MEM21006A	Service quartz watches
	MEM21005A	Diagnose faults in quartz watches
	MEM21002A	Perform watch movement exchange

Prerequisite units		
	MEM21001A	Replace watch batteries, capacitors and bands

Employability Skills Information

Employability skills	This unit contains employability skills.
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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. Establish servicing requirements and liaise with customer	1.1. Identify watch functions and features 1.2. Prepare written quotation and inform customer of watch condition and performance concerns 1.3. Outline recommended service procedures to be undertaken to remedy identified faults 1.4. Verify and agree on servicing requirements with customer 1.5. Prepare watch for handover 1.6. 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 workshop tools and equipment appropriately 2.3. Open watch cases correctly 2.4. Remove case components and movement without damaging or marking 2.5. Verify gasket condition and replace, as required 2.6. 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 quartz watches	4.1. Reassemble multiple step motors, perpetual calendar mechanisms, watch movement and case components 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

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- dismantling and reassembling complex quartz watches, chronographs and perpetual calendars
- servicing, fault-finding and performance testing multiple quartz step motors
- re-programming or resetting integrated circuits and synchronising analog displays for quartz chronographs and perpetual calendars

Required knowledge

Required knowledge includes:

- 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
- occupational health and safety (OHS) regulations and procedures

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 service complex quartz watches to industry standards, manufacturer specifications and in accordance with safety regulations and procedures.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Assessors must be satisfied that the candidate can competently and consistently:

- service multiple step motors in quartz chronograph and perpetual calendar watches
- fault-find complex quartz watches
- performance test complex quartz watches
- re-programming and resetting integrated circuits and synchronising analog displays for quartz chronographs and perpetual calendars.

Context of and specific resources for assessment

- Assessment may occur on the job or in an appropriately simulated environment. Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and information on workplace practices and OHS practices.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

Method of assessment

- Assessment must satisfy the endorsed Assessment Guidelines of the MEM05 Metal and Engineering Training Package.
- Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of underpinning knowledge.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and

EVIDENCE GUIDE

	application. • Assessment may be applied under project-related conditions (real or simulated) and require evidence of process. • Assessment must confirm a reasonable inference that competency is not only able to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • Assessment may be in conjunction with assessment of other units of competency where required.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

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.

Complex quartz watch functions and features

Complex quartz watch functions and features may include:

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

Record and document repair process

Record and document repair process may include:

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

Appropriate working environment

Appropriate working environment may include:

- suitable watchmakers' bench

RANGE STATEMENT	
	• clean and orderly work area (precautions taken to minimise dust) • suitable lighting and adequate ventilation • ergonomic chair with adjustable height
Workshop tools and equipment	Workshop tools and equipment may include: • timing machine • multimeter • pulse generator • watch repair and construction hand tools • case opening and closing tools • cleaning media • cleaning machines • lubricants • personal protective equipment
Case components	Case components may include: • watch glasses • case back • bezel (e.g. rotating) • crown (e.g. screwed) • pendant • pushbuttons (e.g. arbors and circlips) • gaskets
Watch performance/rate testing	Watch performance/rate testing may include: • current consumption (e.g. manufacture specifications) • pulse generation • lower working limit test • gear train freedom • types of quartz regulating systems (capacitive, inhibition and thermo-compensation) • adjust rate for various types of quartz watch (e.g. +0.25 - 0.3 seconds/day)

Unit Sector(s)

Unit sector	Horology
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Co-requisite units

Co-requisite units		

Competency field

Competency field	
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