



Australian Government

Department of Education, Employment and Workplace Relations

MEM21008A Service mechanical watches

Release: 1

MEM21008A Service mechanical watches

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers servicing techniques for mechanical watches, including movements, sub-assemblies and components.
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Application of the Unit

Application of the unit	This unit applies to those working in watch service and repair centres and jewellery stores where service and repair are offered. The unit covers common servicing requirements for mechanical watches undertaken by all watch repairers. Work beyond normal servicing requirements is covered by <i>MEM21009A Inspect, diagnose, adjust and repair mechanical watches</i>. Band: A Unit weight: 4 points
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
	MEM18001C	Use hand tools

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 type, functions, construction and components 1.2. Carry out pre-repair tests to verify water-resistance, as required 1.3. Prepare written quotation and inform customer of watch condition, completeness and performance concerns 1.4. Outline 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 watch, case and movement components for servicing	2.1. Establish appropriate working environment 2.2. Open and close watch cases correctly 2.3. Remove case components and movement sub-assemblies in correct sequence without damaging or marking 2.4. Verify condition of case gaskets and replace, as required 2.5. 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 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

ELEMENT	PERFORMANCE CRITERIA
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 as required according to manufacturer specifications
6. Apply industry workshop standards to perform work	6.1. Use hand tools and equipment safely and correctly 6.2. Handle components without damaging or marking 6.3. Establish a clean and safe work environment

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- identifying various mechanical watches by function, escapement and quality
- dismantling and reassembling watch assemblies and movements
- applying correct amount and type of lubrication
- using service equipment (e.g. timing machine, cleaning machines)
- selecting and ordering replacement watch parts

Required knowledge

Required knowledge includes:

- types of mechanical watches by function, escapement and quality
- function and operating principles of mechanical watches, including:
 - shock resistance system (e.g. Incabloc and Kif)
 - regulating systems (e.g. 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
- dismantling/reassembling techniques of watch movements according to procedures

REQUIRED SKILLS AND KNOWLEDGE

- and manufacturer guidelines
- watch cleaning methods
- band construction and components
- 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 mechanical 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:

- use correct dismantling and reassembling techniques (e.g. correct sequence for observations and fault diagnosis)
- undertake function and performance testing (e.g. adjustment of rate, in-beat and amplitude)
- use lubrication techniques (e.g. correct type, amount, application, cleanliness and without spilling)
- safely clean watch movements and cases by machine and hand

Context of and specific resources for assessment

- Assessment may occur on the job or in a simulated working 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

EVIDENCE GUIDE	
	knowledge to ensure its correct interpretation and 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.	
Watch type, function, construction and components	Watch type, function, construction and components may include: • manual wound • shock-resistance system (e.g. Incabloc and Kif) • regulating system (e.g. conventional, free sprung and Etachron) • power reserve indicator • mainspring • gear train • escapement • oscillator • winding and setting

RANGE STATEMENT	
Record and document repair	Record and document repair may include: • extent and date of repair • cost of replacement part • time spent on procedure
Appropriate working environment	Appropriate working environment may include: • clean bench and working area • adequate lighting and ventilation • tools and equipment are organised and in good condition • ergonomic seating • ventilation
Case components and movement sub-assemblies	Case components and movement sub-assemblies may include: • glass and bezel (e.g. rotating) • case back and gaskets • crown, pendant, gaskets • balance and cock assembly • pallet, escapement components • barrel and mainspring assembly • gear train • winding and setting mechanisms
Inspect condition	Inspect condition may include: • originality of components • corrosion • cleanliness • wear
Cleaning methods	Cleaning methods may include: • conventional • ultrasonic • vibrational • hand cleaning • types of watch cleaning solutions used • precautions for handling and disposing cleaning solutions
Verify and adjust hand setting tension	Verify and adjust hand setting tension may include: • test for correct friction (e.g. second hand or

RANGE STATEMENT	
	train not reversing) • conventional cannon pinions • friction driving wheel • short off centre
Watch assembly inspections and precautions	Watch assembly inspections and precautions may include assessing: • 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	Mechanical watch timing machine may include: • Witschi watch expert or equivalent giving an indication of rate in seconds a day, beat error and amplitude
Watch performance and rate testing	Watch performance/rate testing may include: • in-beat under 0.5 milliseconds • rate adjustment +/- 10 seconds per day • amplitude minimum 220 - 270 degrees fully wound
Hand tools and equipment	Hand tools and equipment may include: • timing machine • case opening/closing tools • oilers and oil pots • hand cleaning (e.g. pith, peg wood, rodico and solvents jar)
Clean and safe work environment	Clean and safe work environment may be specified through: • relevant legislation and regulations • enterprise operating procedures • 5S housekeeping related principles and procedures (e.g. sort, straighten, shine, standardise, sustain)

Unit Sector(s)

Unit sector	Horology
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Co-requisite units

Co-requisite units		

Competency field

Competency field	
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