Australian Government

Department of Education, Employment and Workplace Relations

MEM21010A Service watch power generating systems

Release: 1

MEM21010A Service watch power generating systems

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers servicing techniques for mechanical self-winding (automatic) watches and quartz watch power generating systems. It covers servicing of components, and adjusting and testing mechanisms for optimum performance.

Application of the Unit

Application of the unit	This unit applies to servicing work undertaken by a watch repair tradesperson on watch power generating systems. Work would normally be undertaken in watch service and repair centres and jewellery stores where service and repairs are offered. This unit has been developed for watch service and repair apprenticeship training and the recognition of trade-level skills in watch servicing and repair. Band: A Unit weight: 2 points

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
	MEM21009A	Inspect, diagnose, adjust and repair

Prerequisite units		
		mechanical watches
	MEM21008A	Service mechanical watches
	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.

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.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Establish servicing requirements and liaise with customer	1.1. Inspect watch condition and performance concerns 1.2. Prepare written and verbal quotations 1.3. Agree with customer on recommended service procedures to remedy faults 1.4. Identify mechanical self-winding or quartz generating system type 1.5. Prepare watch for handover 1.6. Record and document repair process
2. Disassemble and reassemble self-winding or quartz generating mechanisms	2.1. Open and close self-winding or quartz generating watch cases correctly 2.2. Remove and replace case components, dial and hands, movements and sub-assemblies in correct sequence without damaging or marking 2.3. Verify condition of case pushbuttons, gaskets and replace, as required 2.4. Clean cases and bands, as required 2.5. Apply dismantling and assembly precautions
3. Service and adjust self-winding or quartz generating watch mechanisms	3.1. Inspect condition of self-winding or quartz generating watch mechanisms 3.2. Lubricate components and sub-assemblies according to manufacturer specification 3.3. Replace faulty or worn component parts 3.4. Clean self-winding or quartz generating watch mechanism components 3.5. Inspect self-winding or quartz generating mechanism for cleanliness and rectify imperfections or faults 3.6. Adjust self-winding or quartz generating mechanism components for correct operation, end shake and clearances
4. Test and adjust self-winding or quartz generating mechanism function and performance	4.1. Perform pre-service inspection and fault-finding of self-winding or quartz generating mechanism action, function and wrist sensitivity 4.2. Verify watch performance/rate testing and amplitude 4.3. Perform simulated wear and power generation tests, as appropriate
5. Apply industry workshop standards	5.1. Use hand tools and equipment safely and correctly 5.2. Handle components without damaging or marking

ELEMENT	PERFORMANCE CRITERIA
to perform work	5.3. 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: • inspecting and fault-finding of self-winding or quartz generating mechanisms (e.g. wear, function and actions) • dismantling and reassembling of self-winding or quartz generating mechanisms • dismantling and reassembling of watch movements according to procedures and manufacturer guidelines • applying lubrication to self-winding or quartz generating mechanisms (e.g. correct application, type and amount) • servicing of the barrel and mainspring slipping device • running time performance testing of self-winding or quartz generating mechanisms (e.g. using automatic winding machine)
Required knowledge
Required knowledge includes: • types of self-winding or quartz generating watch • identify and name the components of a self-winding or quartz generating mechanism • inspection and fault-finding procedures of self-winding or quartz generating mechanisms (e.g. wear, function and actions) • lubrication techniques of self-winding or quartz generating mechanisms (e.g. correct application, type, amount and cleanliness) • function of the barrel and mainspring slipping device • performance testing of self-winding or quartz generating mechanisms (e.g. using automatic winding machine - cyclomat) • 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 self-winding (automatic) watches and quartz watch power generating systems 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: • dismantle and assemble self-winding or quartz generating mechanisms using correct techniques and precautions • inspect, fault-find and adjust self-winding or quartz generating mechanisms • conduct wear, performance and power generation testing • clean components and apply lubricants correctly.
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.	
System type and construction	System type and construction may include: • mechanical self-winding • quartz watch power generation (e.g. kinetic and auto quartz) • types of construction (e.g. rotor, buffer, pedometer and case winding) • features of construction (e.g. single and two way winding) • performance characteristics (e.g. constant motive force)
Record and document repair process	Record and document repair process may include: • extent and date of repair • cost of replacement part

RANGE STATEMENT	
	• time spent on procedure
Dismantling and assembly precautions	Dismantling and assembly precautions may include: • sequence of inspection and adjustment of self-winding or quartz generating mechanism • verification of correct operation of oscillating weight, reversing wheel and mainspring slipping device • correct selection, application and amount of lubrication for self-winding or quartz generating mechanism
Faulty or worn component parts	Faulty or worn component parts may include: • oscillating weight ball bearings • rotor posts • reversing wheel pivots • clicks • slipping bridle • driving gear • friction clutch • generating rotor
Self-winding or quartz generating components	Self-winding or quartz generating components may include: • oscillating weights and rotor • transmissions, reverser wheels and wig wag • mainspring and barrel • slipping devices
Watch performance/rate testing	Watch performance and rate testing may include: • beat error diagnosis and adjustment • rate adjustment • amplitude
Wear and power generation tests	Wear and power generation tests may include: • machine simulation wear test (e.g. rotational machine) • testing by wrist wearing • kinetic voltage test
Hand tools and equipment	Hand tools and equipment may include: • timing machine

RANGE STATEMENT	
	• mainspring winders • cyclomat • case opening and closing tools
Appropriate working environment	Appropriate working environment may include: • clean bench and working area • adequate lighting and ventilation • organised tools and equipment • ergonomic seating
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

Co-requisite units

Co-requisite units		

Competency field

Competency field	