



Australian Government

Department of Education, Employment and Workplace Relations

MEM21005A Diagnose faults in quartz watches

Release: 1

MEM21005A Diagnose faults in quartz watches

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers testing and diagnosing faults in electronic quartz watches.
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Application of the Unit

Application of the unit	<p>This unit applies to work in watch service centres, jewellery and watchmaking stores and kiosks offering watch service and repair.</p> <p>The unit covers the skills required to diagnose faults where the power cell performance has already been tested and its condition is assessed as good or the correct terminal voltage under load but the watch continues to indicate faults or is stopped. Appropriate diagnostic testing procedures are required to identify or determine the faults in a quartz watch and the extent of servicing required.</p> <p>For repair of mechanical faults refer to the appropriate mechanical watch service units.</p> <p>Band: A</p> <p>Unit weight: 2 points</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

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. Verify watch condition and performance concerns with customer 1.2. Prepare written and verbal quotations 1.3. Agree with customer on recommended service procedures to remedy faults 1.4. Record and document repair process
2. Open and close watch cases	2.1. Determine need to open case for further testing 2.2. Select and use workshop tools and equipment appropriately 2.3. Open and close watch cases correctly 2.4. Inspect parts and report and record results 2.5. Verify gasket condition and replace as required 2.6. Clean cases and bands as required during and after repair
3. Perform tests	3.1. Select appropriate tests for the type of quartz watch 3.2. Select and use appropriate workshop testing equipment 3.3. Test quartz watch output signals using industry-specific equipment 3.4. Assess mechanical condition including freedom of gear train, where applicable 3.5. Maintain testing equipment 3.6. Record test results
4. Analyse results and determine faults	4.1. Interpret test results correctly 4.2. Carry out further testing, as required, to locate faulty components 4.3. Confirm results against manufacturer specifications 4.4. Identify faults from test information 4.5. Evaluate, record and communicate recommended servicing requirements

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

REQUIRED SKILLS AND KNOWLEDGE**Required skills**

Required skills include:

- using testing equipment (e.g. multimeter and quartz timing machines)
- analysing test results for current consumption and voltage
- solving problems
- replacing cells
- accessing and interpreting manufacturer service or technical guides
- communicating with relevant personnel
- replacing watch bands, straps or bracelets

Required knowledge

Required knowledge includes:

- types of quartz watch construction and components
- function/operating principles of electronic quartz watches
- types of cells, power sources, capacitors and electronic storage units
- observation and inspection techniques
- 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 diagnose faults in 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:

- select and perform appropriate tests
- use testing equipment
- analyse test results
- determine faults based on test results and visual inspection
- report most appropriate service procedures.

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 knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related

EVIDENCE GUIDE	
	<p>conditions (real or simulated) and require evidence of process.</p> <ul style="list-style-type: none"> • 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	
<p>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.</p>	
Record and document repair process	<p>Record and document repair process may include:</p> <ul style="list-style-type: none"> • accessing manufacturers' technical guides • prepare customer written quotation detailing faults • recommend most appropriate service procedure • estimate of replacement part • time spent on procedure
Tools and equipment	<p>Tools and equipment may include:</p> <ul style="list-style-type: none"> • watch case opening and closing tools • hand tools (e.g. tweezers, screwdrivers and eyeglasses)
Tests	<p>Tests may include:</p> <ul style="list-style-type: none"> • acoustic, capacitive and inductive pick-ups/sensors • quartz crystal oscillating signals (32 KHz)

RANGE STATEMENT	
	<ul style="list-style-type: none"> • voltage, resistance and current consumption • output pulses (integrated circuits) • pulse generation of step motor • lower working limit • rate (e.g. capacitive and inhibition)
Types of quartz watch	<p>Types of electronic quartz watches may include:</p> <ul style="list-style-type: none"> • analog display • digital display • duo display • anadigi • calendar and/or moon phase • chronograph • perpetual calendar • alarm • kinetic • auto quartz
Workshop testing equipment	<p>Workshop testing equipment may include:</p> <ul style="list-style-type: none"> • quartz timing machines with acoustic and capacitive pick-up • inductive pick-up sensors • multimeters • variable voltage supplies • pulse generators
Faulty components	<p>Faulty components may include:</p> <ul style="list-style-type: none"> • quartz crystal • integrated circuits • electronic circuits • coils • step motors • gear train • dial train • dials and hands

Unit Sector(s)

Unit sector	Horology
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Co-requisite units

Co-requisite units		

Competency field

Competency field	
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