



Australian Government

Department of Education, Employment and Workplace Relations

MEM21014A Service mechanical chronograph watches

Release: 1

MEM21014A Service mechanical chronograph watches

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers servicing techniques for mechanical chronograph watches, including sub-assemblies and case components. It covers inspection and replacement of faulty components, testing, adjusting and lubrication procedures for chronograph mechanisms to ensure optimum performance and timekeeping.
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Application of the Unit

Application of the unit	<p>This unit of competency applies to servicing work undertaken by a watch repair tradesperson on mechanical chronograph watches. Work would normally be undertaken in watch service and repair centres and jewellery stores where service and repairs are offered.</p> <p>This unit has been developed for watch service and repair apprenticeship training and the recognition of trade-level skills in watch servicing and repair.</p> <p>Band: A</p> <p>Unit weight: 6 points</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
	MEM21011A	Service calendar and other dial indication mechanisms for watches
	MEM21010A	Service watch power generating systems
	MEM21009A	Inspect, diagnose, adjust and repair mechanical watches
	MEM21008A	Service mechanical watches
	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 type of chronograph watch mechanisms and components 1.2. Prepare written quotation and inform customer of watch condition and performance concerns, outlining recommended service procedures to be undertaken to remedy identified faults 1.3. Verify and agree on servicing requirements with customer 1.4. Prepare watch for handover 1.5. Establish appropriate working environment 1.6. Record and document repair process
2. Disassemble and reassemble chronograph watches	2.1. Open and close chronograph watch cases correctly 2.2. Remove and replace case components, dials and hands, movements and sub-assemblies in correct sequence without damaging or marking 2.3. Verify condition of case pushbuttons, operation and gaskets and replace, as required 2.4. Clean cases and bands, as required 2.5. Apply dismantling and assembly precautions
3. Service and adjust chronograph mechanisms	3.1. Inspect condition of chronograph components 3.2. Lubricate chronograph mechanism with correct type and amount according to manufacturer specifications 3.3. Replace faulty or worn components 3.4. Clean chronograph components 3.5. Inspect chronograph watch for cleanliness and rectify imperfections and faults 3.6. Adjust chronograph components for correct end shake, clearances and penetrations
4. Test and adjust chronograph watch function and performance	4.1. Perform pre-service inspection and fault-finding of chronograph action, function and depthings 4.2. Verify and confirm dial and hand fitting, and casing up of chronograph 4.3. Verify watch performance and rate testing 4.4. Perform final adjustment and correction of recording and zeroing mechanism
5. Apply industry workshop standards to perform work	5.1. Use hand tools and equipment safely and correctly 5.2. Handle components without damaging or marking

ELEMENT	PERFORMANCE CRITERIA
	5.3. Establish a clean and appropriate 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:

- diagnosing faults in complex mechanical watches
- dismantling/reassembling mechanical watch movements in accordance with procedures and manufacturer guidelines
- inspecting and adjusting chronograph watch mechanisms and sub-assemblies
- fault-finding and inspecting watch mechanisms and sub-assemblies
- performing timekeeping analysis and adjustment techniques
- selecting and applying correct amount of lubrication for chronograph mechanisms

Required knowledge

Required knowledge includes:

- basic functions and operations of the chronograph or stop watch (e.g. start, stop and reset)
- identification of the component parts of a chronograph watch mechanism
- inspections and adjustments techniques of mechanical chronograph mechanisms
- dismantling/reassembling techniques for mechanical chronograph watches in accordance with procedures and manufacturer guidelines
- manufacturer specification and tolerances for lubrication, performance and timekeeping
- chronograph watch case construction, and pushbuttons and pendants servicing
- band construction and components
- occupational health and safety (OHS) regulations and procedures)

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
<p>Overview of assessment</p>	<p>A person who demonstrates competency in this unit must be able to service mechanical chronograph watches to industry standards, manufacturer specifications and in accordance with safety regulations and procedures.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>Assessors must be satisfied that the candidate can competently and consistently:</p> <ul style="list-style-type: none"> • dismantle, assemble and clean chronograph watches using correct techniques and precautions • inspect, fault-find and adjust chronograph mechanisms • perform function and performance testing • perform chronograph dial and hand fitting • select and apply lubricants correctly.
<p>Context of and specific resources for assessment</p>	<ul style="list-style-type: none"> • 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.
<p>Method of assessment</p>	<ul style="list-style-type: none"> • 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	
	<p>application.</p> <ul style="list-style-type: none"> • 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	
<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>	
Types of chronograph watch mechanisms	<p>Types of chronograph watch mechanisms may include:</p> <ul style="list-style-type: none"> • types (e.g. application of dial scale indications - tachymeter and telemeter) • chronograph operating systems (e.g. pillar wheel actuated or cam controlled) • features (e.g. minute record, hour record, automatic and split second) • performance characteristics of chronograph watches
Appropriate working environment	<p>Appropriate working environment may include:</p> <ul style="list-style-type: none"> • adequate lighting and ventilation • clean bench and working area • tools and equipment organised and in good condition

RANGE STATEMENT	
	<ul style="list-style-type: none"> ergonomic seating
Record and document repair	<p>Record and document repair may include:</p> <ul style="list-style-type: none"> date and extent of repair cost of replacement part time spent on procedure
Dismantling and assembly precautions	<p>Dismantling and assembly precautions may include:</p> <ul style="list-style-type: none"> inspection of condition and adjustments of chronograph assembly functions verification of correct recording system operation (e.g. engagement, depthing, end shake, penetration) correct selection, application and amount of lubrication for chronograph mechanisms adjustment of timekeeping performance and balance amplitude during chronograph function
Chronograph components	<p>Chronograph components may include:</p> <ul style="list-style-type: none"> operating mechanism (e.g. single and double pusher action) clutch system for chronograph engagement transmission (e.g. minute and hour record) flyback and zeroing
Chronograph action	<p>Chronograph action may include:</p> <ul style="list-style-type: none"> start, stop, reset to zero hand zeroing indexing minute and hour record
Dial and hand fitting	<p>Dial and hand fitting may include:</p> <ul style="list-style-type: none"> hand fitting tools and supports alignments and synchronisation
Watch performance and rate testing	<p>Watch performance and rate testing may include:</p> <ul style="list-style-type: none"> beat error diagnosis and adjustment rate adjustment/positional errors amplitude (e.g. chronograph start - maximum variation <math>\leq 40</math> degrees)
Hand tools and equipment	<p>Hand tools and equipment may include:</p> <ul style="list-style-type: none"> movement holders for operating chronograph

RANGE STATEMENT	
	functions <ul style="list-style-type: none"> • timing machine • rose cutters • tools for removing chronograph driving wheel • hand staking and fitting tools and supports • case opening and closing tools
Clean and safe work environment	Safe and clean work environment may be specified through: <ul style="list-style-type: none"> • 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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