



Australian Government

MEM21019 Service and repair clock striking mechanisms

Release: 1

MEM21019 Service and repair clock striking mechanisms

Modification History

Release 1. Supersedes and is equivalent to MEM21019A Service and repair clock striking mechanisms

Application

This unit of competency defines the skills and knowledge required to service and repair mechanical floor, wall and shelf clocks fitted with rack or count wheel striking mechanisms.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Band: A

Unit weight: 4

Pre-requisite Unit

MEM13015	Work safely and effectively in manufacturing and engineering
MEM16006	Organise and communicate information
MEM21017	Service and repair clock timepieces

Competency Field

Horology

Elements and Performance Criteria

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
1	Determine servicing requirements and liaise with customer	1.1	Follow standard operating procedures (SOPs)
		1.2	Comply with work health and safety (WHS) requirements at all times
		1.3	Identify function and type of striking mechanism
		1.4	Verify clock condition and performance concerns with customer

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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| | | 1.5 | Prepare written and verbal quotations |
| | | 1.6 | Agree with customer on recommended service procedures |
| | | 1.7 | Prepare clock for handover |
| | | 1.8 | Record and document repair process |
| | | 1.9 | Source replacement parts from industry suppliers |
| 2 | Service and repair strike mechanisms | 2.1 | Establish an appropriate clean and safe work environment |
| | | 2.2 | Select and use appropriate personal protective equipment (PPE) in accordance with SOPs |
| | | 2.3 | Remove and replace movement from case, considering case design and strike mechanism employed |
| | | 2.4 | Handle components without damaging and marking |
| | | 2.5 | Use appropriate hand, bench tools and equipment in a safe and correct manner |
| | | 2.6 | Confirm operation of strike mechanism |
| | | 2.7 | Dismantle and reassemble strike components in correct sequence |
| | | 2.8 | Verify orientation of gear trains and strike detents |
| | | 2.9 | Inspect strike release, activation and sound generation and identify wear, condition and faults |
| | | 2.10 | Confirm servicing and repair requirements |
| | | 2.11 | Repair and rectify faults in strike components |
| | | 2.12 | Clean and reassemble mechanism and verify correct set-up, operation and performance |
| | | 2.13 | Select and apply lubricants to strike components |

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

3 Bench test and adjust striking mechanism

- 3.1 Verify correct operation and function of striking mechanism
- 3.2 Verify clock operation over 24-hour period
- 3.3 Determine and rectify striking faults

Foundation Skills

This section describes those required skills (reading, writing, oral communication and numeracy) that are essential to workplace performance in this unit of competency.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Function and type of striking mechanism includes one (1) or more of the following:

- motive force (mainspring or weight driven)
- gear train (transmits power)
- ways of producing striking sound (metal gongs, chime rods, bells or air bellows)
- count wheel striking movements (European or American manufacture)
- rack striking movements (European or American manufacture)

Record and document repair process includes one (1) or more of the following:

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

Operation of strike mechanism includes one (1) or more of the following:

- hour struck corresponds with hands
- release mechanism synchronised with hands
- warning set-up correctly
- function of release mechanism
- sound generation (gongs, rods or hammer engagement)

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Striking mechanism components include one (1) or more of the following:

- release mechanism
- gathering pallet
- detents
- counting mechanism (snail or count wheel)
- rack
- gongs, chime rods and bells
- hammers

Faults in striking mechanism components include one (1) or more of the following:

- incorrect striking
- continuous striking
- striking mechanism stops clock or impacts on timekeeping
- warning set-up
- gong security
- pin security
- gathering pallet engagement with rack teeth, tightness and positioning
- rack tail engagement position with snail
- hammer inserts (condition - worn or aged)
- security of gongs, rods and attachment to case

Correct set-up includes one (1) or more of the following:

- synchronised strike release with hands
- amount of warning
- correct sequence
- sound of strike

Lubricants to striking mechanism components include the following:

- correct lubricants for cams and detents
- techniques for lubricating

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Hand and bench tools and equipment includes one (1) or more of the following:

- clock repairers' hand tools:
 - tweezers
 - screwdrivers
 - eyeglasses
- universal shifter, sockets and spanners
- pliers, end cutters and files
- stakes for supporting removal or replacement of gathering pallet and cannon pinions
- oilers and oil pots and greases
- cleaning brushes, peg wood, solutions, rinses and solvents

Appropriate working environment includes the following:

- clean bench and working area
- adequate lighting and ventilation
- tools and equipment organised and in good condition
- ergonomic seating, including bench height

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM21019A Service and repair clock striking mechanisms

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

Assessment Requirements for MEM21019 Service and repair clock striking mechanisms

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria on at least two (2) occasions and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- identifying function and type of striking mechanism
- liaising with customer, verifying condition and performance, and identifying repair costs
- dismantling and reassembling clocks with count wheel striking mechanisms in an appropriate work environment
- dismantling and reassembling clocks with rack striking mechanisms in accordance with manufacturer's specifications and procedures
- using appropriate hand and bench tools and equipment for servicing and repairing
- adjusting striking clock mechanisms for correct operation and synchronisation with hands and sound generation and tonality and verifying correct set-up
- selecting and applying correct lubricants for cams and detents and using appropriate lubrication techniques
- performing operation and performance testing of striking clocks
- diagnosing faults relating to strike mechanisms
- recording and documenting repairs.

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- safe work practices and procedures and use of personal protective equipment (PPE)
- types of clock striking systems
- difference between designs from various manufacturers
- application of gong rods, bells and hammers to achieve correct resonant sound generation
- strike fault-finding techniques
- fault-finding techniques for ensuring strike does not impact on clock operation
- service and repair techniques for striking mechanisms
- dismantling and reassembling techniques for striking mechanisms.

Assessment Conditions

- Assessors must:
 - have vocational competency in servicing and repairing clock striking mechanisms at least to the level being assessed with relevant industry knowledge and experience
 - satisfy the assessor requirements in the *Standards for Registered Training Organisations 2015* or its replacement and comply with the *National Vocational Education and Training Regulator Act 2011*, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires
- Where possible assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions. This must cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills
- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

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