



Australian Government

MEM18005 Perform fault diagnosis, installation and removal of bearings

Release: 2

MEM18005 Perform fault diagnosis, installation and removal of bearings

Modification History

Release 2. Quantum of hours of workplace practice removed. Supersedes and is equivalent to MEM18005 Perform fault diagnosis, installation and removal of bearings (Release 1).

Release 1. Supersedes and is equivalent to MEM18005B Perform fault diagnosis, installation and removal of bearings.

Application

This unit of competency defines the skills and knowledge required to perform fault diagnosis, installation and removal of bearings.

It covers performing routine bearing checks during operation and non-operation, diagnosing bearing faults, identifying bearing requirements for replacement or installation, and removing and installing bearings to industry and enterprise standards of quality and safety.

Where diagnostic skills are not required and where straightforward removal and replacement of pre-manufactured bearings is undertaken, unit MEM18055 Dismantle, replace and assemble engineering components should be regarded as sufficient.

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

Band: A

Unit Weight: 4

Pre-requisite Unit

MEM09002	Interpret technical drawing
MEM11011	Undertake manual handling
MEM12023	Perform engineering measurements
MEM12024	Perform computations
MEM13015	Work safely and effectively in manufacturing and engineering
MEM14006	Plan work activities
MEM16006	Organise and communicate information
MEM18001	Use hand tools
MEM18002	Use power tools/hand held operations

MEM18003	Use tools for precision work
MEM18006	Perform precision fitting of engineering components
MEM18055	Dismantle, replace and assemble engineering components

Competency Field

Maintenance and diagnostics

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.								
1 Determine job requirements	<table><tr><td>1.1</td><td>Follow standard operating procedures (SOPs)</td></tr><tr><td>1.2</td><td>Comply with work health and safety (WHS) requirements at all times</td></tr><tr><td>1.3</td><td>Use appropriate personal protective equipment (PPE) in accordance with SOPs</td></tr><tr><td>1.4</td><td>Identify job requirements from specifications, drawings, job sheets or work instructions</td></tr></table>	1.1	Follow standard operating procedures (SOPs)	1.2	Comply with work health and safety (WHS) requirements at all times	1.3	Use appropriate personal protective equipment (PPE) in accordance with SOPs	1.4	Identify job requirements from specifications, drawings, job sheets or work instructions
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2 Perform routine bearing checks during operation and non-operation	<table><tr><td>2.1</td><td>Inspect bearing installation and determine task requirements</td></tr><tr><td>2.2</td><td>Check bearing installation during operation using standard procedures of listening, feeling and observing, and using appropriate test equipment</td></tr><tr><td>2.3</td><td>Check seal condition for seal and wear leaks</td></tr><tr><td>2.4</td><td>Check lubricating devices for correct operation</td></tr></table>	2.1	Inspect bearing installation and determine task requirements	2.2	Check bearing installation during operation using standard procedures of listening, feeling and observing, and using appropriate test equipment	2.3	Check seal condition for seal and wear leaks	2.4	Check lubricating devices for correct operation
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3 Diagnose bearing faults	<table><tr><td>3.1</td><td>Perform visual and sensory inspection of bearing arrangement</td></tr><tr><td>3.2</td><td>Test bearings for correct operation and malfunction using manufacturers' specifications and diagnostic</td></tr></table>	3.1	Perform visual and sensory inspection of bearing arrangement	3.2	Test bearings for correct operation and malfunction using manufacturers' specifications and diagnostic				
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Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
			equipment
		3.3	Identify faulty bearings for replacement
		3.4	Identify causes of failure
		3.5	Take corrective action to avoid recurrences, where necessary
4	Identify bearing requirements for replacement or installation	4.1	Inspect bearing installation and determine task requirements
		4.2	Determine operational function of bearings to be installed or replaced
5	Remove bearings	5.1	Determine bearing removal techniques and tools
		5.2	Remove bearings from shafts or bearing housings with minimal damage to components
		5.3	Inspect condition of serviceable items using measuring and test equipment
		5.4	Repair serviceable items using engineering techniques, tools and equipment
6	Install plain bearings	6.1	Select standard replaceable items for plain, wrapped, flanged, split bush and thrust bearings from manufacturers' parts lists, catalogues or engineering drawings
		6.2	Select installation techniques and tools
		6.3	Size bearings to correct clearance
		6.4	Cater for lubrication requirements to meet specification and/or application requirements
		6.5	Fit and tension down bearings and run according to manufacturers' recommendations or SOPs

Elements describe the essential outcomes.

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

6.6 Check final clearance, adjustments and lubrication and take corrective action, if necessary

7. **Install anti-friction bearings**

7.1 Select standard replaceable ball and roller anti-friction bearings from manufacturers' catalogues, spare parts lists or interpret from engineering drawing to meet specifications

7.2 Determine bearing inside/outside diameters from specifications or manufacturers' catalogue and check using measuring instruments

7.3 Check shafts and housings size for correct fit and clearances

7.4 Select installation techniques

7.5 Fit bearings to shafts or housings

7.6 Seal and cap bearings to specifications, where required

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.

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Plain bearings include one (1) or more of the following:

Rotational plain bearings:

- plain bush
- wrapped bush
- flanged bush
- split bush
- self-lubricating
- thrust bearings for radial
- thrust and combination radial and thrust loading applications

Anti-friction bearings include one (1) or more of the following:

Ball and roller bearings (anti-friction or rolling element bearings):

- self-aligning ball bearings with cylindrical bore
- taper bore (and adaptor sleeve)
- taper bore (and unthreaded adaptor sleeve)
- single row deep groove ball bearings
- magneto bearings (separable ball bearings)
- single row angular contact ball bearings
- double row angular contact ball bearings
- spherical roller bearings including narrow type and C design
- spherical roller bearings (NV, N NS Type)
- double row cylindrical roller bearings
- linear ball bearings
- needle roller bearings
- taper roller bearings
- single thrust ball bearings
- double thrust ball bearings
- single thrust ball bearings with spherical housing washer and seating ring
- spherical roller thrust bearings
- radial bearings with cylindrical, tapered bore (and adaptor or withdrawal sleeve)
- associated bearings for radial, axial and combination radial and axial applications

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Installation/removal methods include one (1) or more of the following:

- press
- dowel
- keys
- keeper plate
- heat
- shrink
- hydraulic and mechanical mounting and dismounting tools and associated methods

Unit Mapping Information

Release 2. Supersedes and is equivalent to MEM18005 Perform fault diagnosis, installation and removal of bearings (Release 1).

Release 1. Supersedes and is equivalent to MEM18005B Perform fault diagnosis, installation and removal of bearings.

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 MEM18005 Perform fault diagnosis, installation and removal of bearings

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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 and interpreting specifications, charts, lists and drawings to perform fault diagnosis, installation and removal of bearings
- performing routine bearing checks during operation and non-operation by observing, listening, feeling and the use of appropriate test equipment appropriate to the installation; checking seal for seal and wear leaks and lubricating devices for correct operation
- performing fault diagnosis of bearings using diagnostic techniques and equipment and testing bearings for correct function/malfunction according to manufacturers' specifications
- identifying faulty bearings and causes of failure and taking remedial action to avoid recurrences
- removing bearings from shafts and bearing housings using appropriate fitting techniques and principles, tools, equipment and procedures; and inspecting condition, including measuring bearings and components to specified tolerances and repairing, where appropriate
- installing rotational plain bearings by sizing for correct clearances, lubricating, fitting, tensioning down and running according to specifications and procedures
- installing anti-friction bearings, including ball and roller by determining bearing inside/outside diameters, checking shafts and housings size for correct fit and clearances using appropriate fitting techniques and principles, tools and equipment and seal and cap bearings to specifications, where required
- undertaking numerical operations, calculations and formulae for diagnosing, installing and removal of bearings.

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)
- procedures for:
 - checking bearings and seals
 - checking bearing lubrication/lubrication devices
 - determining the appropriate clearances for a range of plain bearings
 - ‘sizing’ plain bearings
- manufacturer specifications
- engineering principles relating to fault diagnosis, installation and removal of bearings
- reasons for deciding to replace/not replace given bearings
- common causes of bearing failure and their indicators
- lubricants and lubrication requirements.

Assessment Conditions

- Assessors must:
 - have vocational competency in performing fault diagnosis, installation and removal of bearings 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.
- Assessment must occur in a functioning workplace. Where assessment in the workplace would be unsafe, impractical or threatens the environment, assessment must occur in a sufficiently rigorous simulated environment that reflects the circumstances that would be experienced in a functioning workplace. Assessment must cover all aspects of workplace performance, including 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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