



Australian Government

MEM27008 Maintain induction, exhaust and emission control systems

Release: 1

MEM27008 Maintain induction, exhaust and emission control systems

Modification History

Release 1. Supersedes but not equivalent to MEM18032B Maintain induction/exhaust systems

Application

This unit of competency defines the skills and knowledge required to assess induction, exhaust and emission control system operation and repair or replace faulty components.

It applies to induction and exhaust systems on mobile and stationary plant and equipment.

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
MEM13015	Work safely and effectively in manufacturing and engineering
MEM16006	Organise and communicate information
MEM18001	Use hand tools
MEM18002	Use power tools/hand held operations
MEM18055	Dismantle, replace and assemble engineering components

Competency Field

Fixed and mobile plant

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	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
2	Assess induction and exhaust system operation	2.1	Apply principles, terminology and applications of supercharging, filtering, inter and after cooling to assess induction and exhaust system operation
		2.2	Obtain relevant information and interpret prior to any testing
		2.3	Undertake checks safely and to prescribed testing procedures
		2.4	Determine and record flows, pressures and temperatures
		2.5	Isolate faults to component level and determine appropriate corrective action using appropriate test instruments and equipment
3	Assess emission control system operation	3.1	Inspect emission control system components against manufacturer specification
		3.2	Check fuel evaporative control system and engine crankcase ventilation
		3.3	Service, adjust or replace components to manufacturer specifications, workplace procedures and WHS and environmental requirements
4	Rectify faulty components	4.1	Determine component wear and clearances using manufacturer recommendations

Elements describe the essential outcomes.

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

- 4.2 Determine if faulty components should be repaired or replaced
- 4.3 Repair faulty components where appropriate
- 4.4 Select replacement components using manufacturers' data
- 4.5 Remove and refit repaired or replacement components to engine
- 4.6 Record all test and rectification activities
- 4.7 Ensure engine is free of air and exhaust leaks after repair work is carried out

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.

Faults include one (1) or more of the following:

- excessive air inlet restrictions
- excessive exhaust back pressures
- too much or too little boost pressure
- ineffective inter or after cooling

Unit Mapping Information

Release 1. Supersedes but not equivalent to MEM18032B Maintain induction/exhaust systems

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 MEM27008 Maintain induction, exhaust and emission control systems

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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, drawings and service documents to maintain induction and exhaust systems
- checking induction and exhaust system for correct operation
- checking emission control system performance for correct operation against specifications
- using test instruments and equipment to isolate faults down to component level and visually and dimensionally checking components for wear against specifications
- undertaking calculations and numerical operations to maintain induction and exhaust systems
- removing and refitting components to engines, including using replacement parts from manufacturers' catalogues
- checking induction/exhaust system for leaks
- using appropriate tools, equipment and techniques for each task
- recording all test and repair activities in accordance with procedures.

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)
- principles and terminology of supercharging, filtering, inter and after cooling
- performance and operational specifications of the induction and exhaust system
- procedures and safety precautions for testing induction/exhaust systems for correct operation
- equipment and procedures necessary to test flows, pressures and temperatures associated with induction/exhaust systems
- components and applications of supercharging apparatus
- maintain induction, exhaust and emission control systems

- types of emissions, their relationship to standards and specifications and their effects on the environment
- sources of emissions from mobile and stationary plant and equipment
- exhaust gas recirculation (EGR) systems
- supplementary catalytic reduction (SCR) systems
- role of particulate filters, charcoal canisters, fuel evaporative control systems and crankcase ventilation in controlling emissions
- supercharging apparatus such as turbo charging equipment
- common faults associated with induction/exhaust systems and causes of those faults
- appropriate action and procedures for correcting common faults in induction/exhaust systems
- component specifications/tolerances and actions to be taken if the components are outside of specification
- action to be taken if the components are 'just' within specification
- measuring instruments to be used to carry out dimensional checks on components
- the operation of the apparatus installed to balance fuel injection to boost pressure and control devices installed to prevent excessive turbocharger RPM and/or boost pressure
- procedures and safety precautions for removing/fitting components to engines
- procedures for recording test and repair activities undertaken on induction/exhaust systems
- consequences of air/exhaust leaks on the safe operation of the induction/exhaust system and procedures for testing for leaks in induction/exhaust systems.

Assessment Conditions

- Assessors must:
 - have vocational competency in maintaining induction/ exhaust systems 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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