



Australian Government

Assessment Requirements for MEM27001 Maintain and repair stationary and mobile plant engine cooling systems

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MEM18024B Maintain engine cooling systems

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 engine cooling systems
- checking cooling system safely in accordance with specifications and procedures and measuring and recording water/air flows, pressures and temperature of the cooling system using test equipment
- fault finding cooling system down to component level and determining applicable corrective action
- obtaining coolant samples and carrying out testing on coolant condition
- checking cooling system components for wear and clearances using appropriate test equipment to manufacturers' specifications
- undertaking numerical operations, calculations and formulae for maintaining engine coolant systems
- interpreting relevant specifications, parts lists and catalogues for replacement components
- removing, repairing and re-fitting cooling system components to engine in accordance with prescribed procedures
- testing engine for coolant performance and leaks after repairs
- reporting and documenting service, repair/replacement activities.

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 of heat transfer as applied to cooling systems
- effect of water treatment, contamination and corrosion on the effectiveness of cooling system operation
- components of the cooling system and their function, including:
 - engine coolant composition
 - water pumps

- thermostats
- fan systems and drives
- radiators and radiator caps
- expansion tanks
- hoses
- temperature sensors and gauges
- checks and procedures to be carried out on cooling systems, including tests for:
 - corrosion
 - pressure and temperature
 - leaks
 - performance of pumps, thermostats, fans, cooling system sensors and instruments
- procedures for:
 - measuring water/air flows, pressures and temperatures in cooling systems and tools, techniques and equipment
 - testing coolant test samples and tools and equipment
 - testing components for wear and clearances and the appropriate measuring/test equipment
 - obtaining replacement parts
 - removing/replacing cooling system components from the engine
 - checking coolant levels and engine coolant leaks
 - handling hot pressurised cooling systems
 - containing and disposing of cooling system fluids released from the system
 - recording test and rectification
- variations of test results from specifications and the likely causes of those variations and appropriate corrective action to be taken
- precautions to be taken when using test equipment
- reasons for identifying faulty components for repair or replacement
- correct amount of additive/inhibitor to be added to the coolant.

Assessment Conditions

- Assessors must:
 - have vocational competency in maintaining engine cooling 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.

Links

Companion Volume implementation guides are found in VETNet -

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