



Australian Government

PUAEQU002 Conduct maintenance and repair of firefighting pumps

Release: 1

PUAEQU002 Conduct maintenance and repair of firefighting pumps

Modification History

Release 1. This is the first release of this unit of competency in the PUA Public Safety Training Package.

Application

This unit of competency involves the skills and knowledge required to inspect, maintain, diagnose faults and carry out repairs on pumping systems used by the Fire and Emergency Services sector. Tasks may be routine or non-routine, requiring various methods to be applied within defined guidelines and standards.

The unit addresses the Work, Health and Safety (WHS) / Occupational Health and Safety (OHS), environmental and workplace procedures for maintaining and repairing Fire and Emergency Services pumping systems.

This unit applies to mechanical trade personnel required to test, diagnose, maintain and repair pumping systems within a service and repair workshop setting.

This unit supports pumping systems commonly used by Fire and Emergency Services, installed in a range of configurations, and may be powered independently or as part of a vehicle system.

Those undertaking this unit may be required to work autonomously, under limited supervision or as part of a team. They will be required to determine tasks and diagnose systems to meet manufacturer and organisation performance specifications on pumping systems.

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

Pre-requisite Unit

Not applicable

Competency Field

Equipment

Unit Sector

Not applicable

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes of the unit

1. Prepare for pump servicing activities

PERFORMANCE CRITERIA

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

1.1 Job requirements are identified from workplace instructions

1.2 Workplace health and safety issues associated with the job requirements are identified

1.3 Appropriate tools, equipment and personal protective equipment (PPE) for the required tasks are identified and located

1.4 The inclusion of foam-related agents is recognised, and action taken to ensure compliance with this WHS/OHS practices and workplace procedures

1.5 Prepare vehicle for service activities in accordance with organisational and manufacturer procedures

1.6 Pumping system is prepared for service activities in accordance with organisational and manufacturer procedures

2. Operate pump for testing and diagnostic purposes

2.1 Hazards associated with pump operations are identified and work area prepared accordingly

2.2 Pump is operated in accordance with manufacturer guidelines, agency performance standards and workplace procedures

2.3 Visual and audible inspection of pumping system and ancillary equipment is conducted to identify faults

2.4 Performance is measured to identify faults, including flow rate and pressure

2.5 Testing operations are carried out, avoiding injury to personnel and damage to equipment

3. Conduct pump servicing and repair

3.1 Repairs are carried out in accordance with workplace and manufacturer procedures, workplace and manufacturer specifications, WHS/OHS and environmental procedures

3.2 Information from manufacturer's documentation,

including diagrams and schematics, is referred to and interpreted accurately

3.3 Post-repair testing is carried out in compliance with workplace procedures, WHS/OHS and environmental requirements

4. Complete servicing and repair

4.1 Work area cleared and materials disposed of or recycled in accordance with workplace procedures

4.2 Findings reported in accordance with workplace procedures

4.3 Relevant workplace inventory is maintained in accordance with organisational requirements

Foundation Skills

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

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the PUA Public Safety Training Package Companion Volume Implementation Guide.

Unit Mapping Information

Not applicable

Links

PUA Training Package Companion Volume Implementation Guide is found in VETNet - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=3eca5672-6d5a-410b-8942-810d0ba05bbf>

Assessment Requirements for PUAEQU002 Conduct maintenance and repair of firefighting pumps

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements and performance criteria and includes:

- applying Work, Health and Safety (WHS) / Occupational Health and Safety (OHS) organisational requirements
- diagnosing and repairing a minimum of two faults, one of which includes a foam related fault
- implementing organisational procedures
- operating pump for diagnostic and testing purposes including:
 - engaging pump
 - maintaining appropriate pressure
 - troubleshooting problems
 - switching between water supply sources
 - using ancillary equipment to support operations in a controlled environment
- undertaking three different types of repair activities on pumps used for firefighting operations

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and includes knowledge of:

- diagnostic testing procedures for pumping systems, including:
 - isolating faults, including internal and external leakage
 - testing system for pressure, suction, and discharge
- inspection and maintenance procedures for key pump components including:
 - assembling pumping system and completing operational tests
 - drive systems
 - filters and strainers
 - mechanical seals
 - mounting brackets and frame
 - overload devices
 - plumbing, bellows, and elbows
- methods to locate and interpret information required to diagnose and repair pumping systems,

including:

- manufacturer and workplace specifications and procedures or equivalent documentation
- post-repair testing and re-testing procedures for pumping systems
- mounting and dismounting of a pump system from vehicle body
- principles of water behaviour and associated risks with firefighting pumping system including:
 - discharge and flow rates
 - motive power
 - operating principles of positive and non-positive displacement pumping systems and associated components
 - principles of hydraulic flow and pressure
 - pump components and their operation
 - pump gauges and controls
 - static and reticulated water supply and their use in pumping operations
- pumping systems and ancillary equipment commonly used in firefighting operations, including:
 - complex pump configurations for draughting and delivery in firefighting operations
- the unique components and operation behaviour of pumping systems and ancillary equipment, including:
 - ancillary equipment used to support the delivery of water and foam
 - cavitation
 - power train for firefighting pumps including the relationship between vehicle engines and the pumping systems (direct couple, power take-off shaft, splitter box)
 - types of primer and their use in pumping operations
- Work, Health and Safety (WHS) / Occupational Health and Safety (OHS) requirements relating to diagnosing and repairing pumping systems, including procedures for:
 - environmental impacts and correct disposal of foam products
 - starting and operating pumping systems
 - working with exhaust fume hazards

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

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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.

Assessment must occur in workplace operational situations. Where this is not appropriate,

assessment must occur in industry approved simulated workplace operational situations that reflect workplace conditions.

The following resources must be made available:

- a range of relevant exercises, case studies and/or simulations
- relevant and appropriate materials, equipment, tools and personal protective clothing and equipment currently used in industry, including:
 - ancillary equipment used for the delivery of foam
 - firefighting vehicles and their pumping systems
 - foam agents used in firefighting operations
 - tools, equipment and materials appropriate for inspecting and servicing pumping systems
 - workplace instructions and manufacturer's specifications

Links

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