



Australian Government

**Assessment Requirements for AURETH008
Diagnose and repair HVAC and
rechargeable energy storage cooling systems
in battery electric vehicle**

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Modification History

Release	Comment
Release 1	New unit of competency.

Performance Evidence

Before competency can be determined, individuals must demonstrate they can perform the following according to the standard defined in the unit's elements and performance criteria, range of conditions and foundation skills:

- diagnose and repair heating, ventilation and air conditioning (HVAC) system and rechargeable energy storage system (RESS) cooling system components on two different battery electric vehicles (BEVs), in which the work must involve:
 - repairing or replacing one HVAC system component to correct performance deficiencies
 - repairing or replacing one RESS cooling system component to correct performance deficiencies.

Knowledge Evidence

Individuals must be able to demonstrate knowledge of:

- work health and safety (WHS) and occupational health and safety (OHS) requirements relating to diagnosing and repairing HVAC and RESS cooling systems, including procedures for:
 - identifying hazards and controlling risks associated with:
 - working with high voltages in BEV electrical systems
 - wearing jewellery while working around high electrical currents
 - working with refrigerants at boiling point given risk of frostbite
 - working with system lubricants, including carcinogenic oils
 - handling flammable refrigerants
 - determining appropriate procedures for minimising risk associated with hazards, including applying electrical safety precautions:

- using personal protective equipment (PPE), including electrical safety gloves with 1000 volt rating and high voltage (HV) insulating mat with Australian standards rating
- identifying and using fire safety equipment as appropriate
- using the 'one hand rule'
- following live system warning tags and signs
- depowering the vehicle
- isolating the HV RESS electrical supply
- stabilising the vehicle electrical system
- environmental requirements, including procedures for:
 - trapping, storing and disposing of waste released from HVAC and RESS cooling systems
 - preventing the escape of refrigerant to the atmosphere
- key requirements of AS 5732 Electric vehicle operations: Maintenance and repair
- operating principles of HVAC systems and RESS cooling systems and associated components, including:
 - types of HVAC systems, including engine operated and electric motor operated systems
 - types of RESS and RESS charging
 - reasons for cooling the RESS
- application, purpose and operation of HVAC systems and RESS cooling systems and components, including:
 - alternating current (AC) electric motor compressors
 - HVAC control units
 - HVAC control unit inputs and outputs
 - HVAC ejector cycle systems
 - RESS cooling systems, including air cooling, liquid cooling and HVAC cooled systems
- diagnostic testing procedures for HVAC and RESS cooling systems, including:
 - accessing and interpreting scan tool system data, including:
 - diagnostic trouble codes (DTCs)
 - live data
 - freeze frame data
 - waveforms
 - using diagnostic flow charts
 - testing electrical systems, including procedures for:
 - accessing electrical terminals and using test probes without damaging connectors, fuse holders or wiring
 - determining damage to compressor motor windings
 - checking insulation resistance of compressor motor windings
 - checking routing and damage to HV cabling

- HVAC dynamic and static testing
- analysing abnormal noise
- analysing component failure
- repair procedures for HVAC systems and RESS cooling systems, including:
 - tightening connections
 - replacing faulty or damaged cable connections
 - removing and replacing faulty or damaged components
- post-repair testing procedures for HVAC and RESS cooling systems, including:
 - DTC clearing procedures
 - checking for electrical connector mating
 - static and dynamic performance tests of HVAC systems and RESS cooling systems.

Assessment Conditions

Assessors must satisfy NVR/AQTF assessor requirements and hold an Australian Refrigerant Council (ARC) Refrigerant Handling licence.

Competency is to be assessed in the workplace or a simulated environment that accurately reflects performance in a real workplace setting.

Assessment must include direct observation of tasks.

Where assessment of competency includes third-party evidence, individuals must provide evidence that links them to the BEV HVAC and RESS cooling systems that they have worked on, e.g. repair orders.

Assessors must verify performance evidence through questioning on skills and knowledge to ensure correct interpretation and application.

The following resources must be made available:

- automotive repair workplace or simulated workplace
- ARC accredited service decal sticker (ARCTick)
- PPE and safety equipment, including electrical safety gloves with 1000 volt rating and HV insulating mat with Australian standards rating
- manufacturer specifications for BEV HVAC and RESS cooling systems
- AS 5732 Electric vehicle operations: Maintenance and repair
- two different BEVs with HVAC and RESS cooling system components accessible for diagnosis and repair or replacement activities
- electrical diagnostic equipment appropriate to the BEV HVAC and RESS cooling being diagnosed and repaired as specified under tools and equipment in the range of conditions
- tools, equipment and materials appropriate for repairing HVAC and RESS cooling systems in BEVs.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b4278d82-d487-4070-a8c4-78045ec695b1>

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