



**Australian Government**

# **Assessment Requirements for AURETH012 Service and maintain electrical components in hybrid electric vehicles**

**Release: 1**

# Assessment Requirements for AURETH012 Service and maintain electrical components in hybrid electric vehicles

## 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, performance criteria, range of conditions and foundation skills:

- safely test, service and maintain two different hybrid electric vehicles (HEVs) or plug-in hybrid electric vehicles (PHEVs).

## Knowledge Evidence

Individuals must be able to demonstrate knowledge of:

- work health and safety (WHS) and occupational health and safety (OHS) requirements relating to servicing and maintaining HEV and PHEV electrical components, including procedures for:
  - identifying hazards and controlling risks associated with:
    - working with high voltages on HEV and PHEV electrical systems
    - wearing jewellery while working around high electrical currents
  - determining appropriate procedures for minimising risk associated with hazards, including applying electrical safety precautions when:
    - using personal protective equipment (PPE), including electrical safety gloves with 1000 volt rating and Australian standards rated high voltage (HV) insulating mat
    - identifying and using firefighting equipment as appropriate
    - using the 'one hand' rule
    - following live system warning tags and signs
    - depowering vehicle
    - isolating HV rechargeable energy storage system (RESS) electrical supply
    - stabilising vehicle electrical system
- requirements of AS 5732 Electric vehicle operations - Maintenance and repair

- key electrical components of HEVs and PHEVs and their functions
- RESS battery construction, including:
  - battery internal resistance
  - battery types
  - terminal corrosion
  - terminal resistance
- key components of RESS theory, including:
  - cell failure theory
  - charging characteristics
  - open circuit cells
  - reverse polarisation
  - series cell configuration
  - strapping and layout
- different types of HEVs and PHEVs, including:
  - series, parallel and series parallel
  - strong, mid or weak hybrid systems
- operating principles of RESS and battery management system (BMS)
- key characteristics of HV battery charger and direct current (DC) to DC converter
- operating principles of power distribution unit (PDU).

## Assessment Conditions

Assessors must satisfy NVR/AQTF assessor requirements.

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 electrical systems and components they have serviced and maintained in HEVs or PHEVs, 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
- PPE, including electrical safety gloves with 1000 volt rating and Australian standards rated HV insulating mat
- manufacturer specifications and service procedures for the HEVs or PHEVs being worked on
- AS 5732 Electric vehicle operations - Maintenance and repair
- two different operational HEVs or PHEVs requiring service and maintenance
- electrical test equipment appropriate to the HEVs and PHEVs being serviced, including:
  - digital multimeter with Cat III 1000 volt rating

- insulation tester
- residual voltage tester, if specified in original equipment manufacturer (OEM) test requirements
- scan tool
- tools, equipment and materials appropriate for servicing and maintaining HEVs and PHEVs.

## 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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