Australian Government

Assessment Requirements for AURETH107 Diagnose and repair system instrumentation and safety interlocks in battery electric vehicles

Release: 1

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Modification History

Release	Comments
Release 1	This version first released with AUR Automotive Retail, Service and Repair Training Package Version 6.0

Performance Evidence

The candidate must demonstrate the ability to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including evidence of the ability to:

- diagnose and repair system instrumentation and safety interlocks and their associated components on at least two different battery electric vehicles (BEVs) to correct at least one of the following performance deficiencies in each:
  - high resistance in an input system
  - faulty instrumentation or safety interlocks
  - damaged or loose connectors, fuse holders or wiring.

Knowledge Evidence

The candidate must be able to demonstrate knowledge to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including knowledge of:

- methods to locate and interpret information required to diagnose and repair system instrumentation and safety interlocks in battery electric vehicles, including:
  - information provided by customers and supervisors
  - Australian Standards (AS) 5732 Electric vehicle operations - Maintenance and repair
  - manufacturer specifications and procedures
- workplace procedures required to diagnose and repair system instrumentation and safety interlocks in battery electric vehicles, including:
  - establishing serviceability of tools and equipment
  - documentation procedures
  - housekeeping procedures, including:
    - examination of tools and equipment
    - storage of equipment
    - identification, tagging and isolation of faulty equipment

    - disposal of excess materials
    - recycling procedures
- workplace health and safety (WHS) requirements relating to diagnosing and repairing system instrumentation and safety interlocks in battery electric vehicles, 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
    - 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 HV insulating mat
        - identifying and using firefighting equipment
        - using the one hand rule
        - following live system warning tags and signs
        - depowering vehicle
        - isolating HV RESS electrical supply
        - stabilising vehicle electrical system
- environmental requirements relating to diagnosing and repairing system instrumentation and safety interlocks in battery electric vehicles, including procedures for trapping, storing and disposing of waste produced during repair.
- safe operating procedures for tools and equipment, including:
    - digital multimeter with Cat III 1000 volt rating
    - insulation tester
    - residual voltage tester
    - scan tool
    - oscilloscope
- operating principles of system instrumentation and safety interlocks in battery electric vehicles, including reasons for safety interlocks in BEVs
- purpose and operation of BEV instrumentation and safety interlocks, including:
    - battery charger, including charge cable sensor
    - controller signals
    - gear selector inhibitor switch
    - ignition or power key
    - inertia or impact sensor
    - isolation componentry, including HV contactor
    - motor over temperature control
    - under voltage protection
- diagnostic testing procedures for system instrumentation and safety interlocks in battery electric vehicles, including procedures for:
    - accessing and interpreting scan tool system data, including:

    - diagnostic trouble codes (DTCs)
    - live data
  - using diagnostic flow charts
  - electrical system testing, including procedures for:
    - accessing electrical terminals and using test probes without damaging connectors, fuse holders or wiring
    - determining battery state of charge
    - operational tests of safety interlocks
    - testing instrumentation data communication systems using scan tool and oscilloscope
    - undertaking vehicle dynamic and static tests
- repair procedures for system instrumentation and safety interlocks in battery electric vehicles, including procedures for:
  - tightening connections
  - replacing faulty or damaged cable connections
  - removing and replacing faulty or damaged components
  - removing and replacing instrumentation
- post-repair testing procedures for system instrumentation and safety interlocks in battery electric vehicles, including procedures for:
  - DTC clearing procedures
  - checking for electrical connector mating.

Assessment Conditions

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 system instrumentation and safety interlocks 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
- PPE and safety equipment, including electrical safety gloves with 1000 volt rating and HV insulating mat with Australian standards rating
- manufacturer specifications for BEV system instrumentation and safety interlocks
- AS 5732 Electric vehicle operations: Maintenance and repair
- two different BEVs with system instrumentation and safety interlocks accessible for diagnosis and repair or replacement activities

- electrical diagnostic equipment appropriate to the BEV being diagnosed and repaired, including:
  - digital multimeter with Cat III 1000 volt rating
  - insulation tester
  - scan tool
  - oscilloscope
  - residual voltage tester, if specified in OEM requirements
- tools, equipment and materials appropriate for repairing system instrumentation and safety interlocks in BEVs.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

Links

Companion Volume Implementation Guide is found on VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b4278d82-d487-4070-a8c4-78045ec695b1