Australian Government

Assessment Requirements for AURETR029 Diagnose and repair charging systems

Release: 1

Assessment Requirements for AURETR029 Diagnose and repair charging systems

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 a fault in two of the following charging system components in two different vehicles, vessels or machinery:
  - alternator stator or rotor circuit
  - alternator internal regulator control circuit
  - external regulator battery management system circuit
  - battery to alternator wiring and earthing system circuit
  - machinery charging system circuit.

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 charging systems, including procedures for:
  - using specialised tools and equipment
  - using appropriate personal protective equipment (PPE)
  - identifying hazards and controlling risks associated with:
    - working on high voltage ignition systems
    - wearing jewellery while working around high current wiring systems
- operating principles of charging systems and associated components, including:
  - charging batteries with direct current
  - vehicle system power and electrical current requirements

- generating principles, including Faraday's law and inducing an electromotive force (EMF)
- producing direct current (DC) EMF
- producing alternating current (AC) EMF
- changing AC to DC, including half-wave and full-wave rectification
- application, purpose and operation of charging systems and components, including:
  - generators, including:
    - internal component function and operation
    - regulation of output voltage and current
  - alternators, including:
    - internal component function and operation
    - star-connected and delta-connected stator windings
    - regulation of output voltage, including zener diodes and exciter diodes
  - battery management systems
- diagnostic testing procedures for charging 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
  - load testing charging systems
  - resistance, current flow and voltage drop checks of charging system circuits
- repair procedures for charging systems, including:
  - tightening connections
  - replacing faulty or damaged cable connections
  - removing and replacing faulty or damaged components
- post-repair testing procedures for charging systems, including:
  - DTC clearing procedures
  - checking for electrical connector mating
  - static and dynamic performance tests of charging systems.

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 charging 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
- workplace instructions
- manufacturer specifications for vehicle, vessel or machinery charging systems
- two different vehicles, vessels or machinery with charging system faults
- diagnostic equipment for vehicle, vessel or machinery charging systems, including:
  - multimeter
  - scan tool
- tools, equipment and materials appropriate for repairing vehicle, vessel or machinery charging systems.

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=b4278d82-d487-4070-a8c4-78045ec695b1

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