Australian Government

Assessment Requirements for AURETR132 Diagnose and repair automotive electrical systems

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 a fault in at least three of the following electrical system single wire (non CAN-bus) circuits:
  - entry-exit locking systems with electric motor control circuit
  - power windows circuit
  - interior or exterior lighting circuit
  - turning indicator circuit
  - brake light circuit
  - hazard warning light circuit
  - electrical drive motor circuit
- carry out at least four of the following electrical connector repairs to a vehicle or machinery wiring harness:
  - crimp two different terminal types and sizes
  - remove two faulty connectors from the back of different terminals
  - solder two different wire gauges to electrical terminals
  - apply heat shrink insulation to two different crimped or soldered joints
  - check terminal retention on two different female terminals and connectors
- carry out a diagnostic test in the course of the above for at least one of the following faults:
  - high resistance in an input system
  - damaged connectors or wiring
  - shorted or worn system components.

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 automotive electrical systems, including:
  - information provided by customers and supervisors
  - manufacturer specifications and procedures or equivalent documentation
- workplace procedures required to diagnose and repair automotive electrical systems, 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 automotive electrical 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 automotive electrical systems and associated components, including:
  - current, voltage, resistance and power
  - series circuits
  - parallel circuits
  - series and parallel circuits
  - Ohm's law
  - Faraday's law
  - Kirchhoff's law
  - magnetism and direct current (DC) motor operation
  - electromagnetic interference and radiation
  - cable types and sizes and current carrying capacity
  - circuit protection devices
- purpose and operation of automotive electrical systems and components, including:
  - wiper motors
  - electric windows

- electric door locks
- fan motors
- horns
- lighting
- radio aerials

- diagnostic testing procedures for automotive electrical systems, including:
  - visual, aural and functional assessments of electrical system components, including:
    - component damage and wear
    - component or connector corrosion
    - component water or moisture ingress
  - common faults in electrical circuits, including:
    - open circuits
    - high resistance circuits
    - short circuits
    - damaged insulation
    - frayed wires
    - burnt wiring
    - water and moisture ingress
    - connector damage
    - terminal damage
  - using diagnostic flow charts
  - testing electrical systems, including procedures for:
    - accessing electrical terminals and using test probes without damaging connectors, fuse holders or wiring
    - checking resistance, current flow and voltage drop of system circuits
  - procedures for using:
    - digital multimeters
    - test lights and probes
    - oscilloscopes
- repair procedures for automotive electrical systems, including:
  - selecting and soldering wires
  - selecting and crimping terminals
  - removing and replacing connectors
  - removing and replacing electrical systems and their components
- post-repair testing procedures for automotive electrical systems, including:
  - checking for electrical connector mating
  - checking circuit current flow
  - static and dynamic performance tests of automotive electrical systems.

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 electrical 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 automotive electrical system specifications
- three different vehicles or machinery with electrical system faults
- diagnostic equipment for electrical systems, including multimeter
- tools, equipment and materials appropriate for repairing automotive electrical systems, including:
  - automotive wiring
  - heat shrink
  - soldering iron.

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