



**Australian Government**

# **Assessment Requirements for AURETR130**

## **Diagnose and repair starting systems**

**Release: 1**

# Assessment Requirements for AURETR130 Diagnose and repair starting systems

## 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 the starting system of two different vehicles, vessels or machinery in which the fault in each system is within one of the following:
  - vehicle starter motor and solenoid circuit
  - vehicle ignition switch to solenoid control circuit
  - vehicle battery to starter motor circuit
  - machinery starting system circuit
- 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
  - loose or damaged connectors or wiring
  - broken or worn solenoids.

## 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 starting systems, including:
  - information provided by customers and supervisors
  - manufacturer specifications and procedures or equivalent documentation
- workplace procedures required to diagnose and repair starting 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 starting 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 starting systems and associated components, including:
  - producing movement due to the force between magnetic fields
  - producing magnetic fields due to current flow through conductors
  - basic direct current motor operation, including simple armature, magnetic field and commutator
- purpose and operation of starting systems and components, including:
  - high current systems, including:
    - armature, commutator, field windings
    - starter motor windings, including series wound, shunt wound, and compound wound
    - permanent magnet starter motors
    - direct drive and reduction-type starter motors
- starting electrical systems, including:
  - solenoids
  - shift levers
  - overrunning clutch flywheel ring gears
  - control circuits systems including:
    - ignition switching, including key start, push-button start, remote start and start-stop systems
    - safety switches, including inhibitor switches and clutch neutral switches
- diagnostic testing procedures for starting 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 starting systems
- resistance, current flow and voltage drop checks of starting system circuits
- solenoid test
- field winding tests
- armature tests, including using a growler
- commutator tests
- brushes and holder tests
- overrunning clutch and pinion tests
- flywheel ring gear tests
- starter motor bench tester operation
- repair procedures for starting systems, including:
  - tightening connections
  - replacing faulty or damaged cable connections
  - removing and replacing faulty or damaged components
- post-repair testing procedures for starting systems, including:
  - DTC checking procedures
  - checking for electrical connector mating
  - static and dynamic performance tests of starting 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 starting 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 starting systems
- two different vehicles, vessels or machinery with starting system faults
- diagnostic equipment for vehicle, vessel or machinery starting systems, including multimeter
- tools, equipment and materials appropriate for repairing vehicle, vessel or machinery starting systems.

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>