



**Australian Government**

# **AURETR027 Install ancillary electronic systems and components**

**Release: 1**

# AURETR027 Install ancillary electronic systems and components

## Modification History

| Release   | Comment                 |
|-----------|-------------------------|
| Release 1 | New unit of competency. |

## Application

This unit describes the performance outcomes required to install and test ancillary electronic systems and components in vehicles or machinery. It involves preparing for the task, installing and testing the operation of the systems and components, and completing workplace processes and documentation. These electronic systems and components may require programming following installation to enable them to communicate with the vehicle or machinery controller area network data bus (CAN-bus or LIN-bus) topography.

It applies to those working in the automotive service and repair industry. Ancillary electronic systems and components include those being installed in agricultural machinery, heavy commercial vehicles, light vehicles, marine vessels, mobile plant machinery, motorcycles or outdoor power equipment.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

## Competency Field

Electrical

## Unit Sector

Technical - Electrical and Electronic

## Elements and Performance Criteria

| Elements                                   | Performance Criteria                                                                                                                                                                                        |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Elements describe the essential outcomes.  | Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold and italicised text is used, further information is detailed in the range of conditions section. |
| 1. Prepare to install ancillary electronic | 1.1 Job requirements are determined according to workplace                                                                                                                                                  |

| <b>Elements</b><br>Elements describe the essential outcomes.   | <b>Performance Criteria</b><br>Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold and italicised text is used, further information is detailed in the range of conditions section.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| system and components                                          | instructions<br>1.2 Manufacturer specifications and installation fitting instructions are sourced and interpreted<br>1.3 Installation options are considered and those most appropriate to the circumstances are selected<br>1.4 Hazards associated with the work are identified and risks are managed<br>1.5 Tools, equipment and materials are selected and checked for serviceability                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 2. Install and test ancillary electronic system and components | 2.1 Electronic system and components are checked for correct application and damage<br>2.2 Electronic equipment is installed according to manufacturer specifications, workplace procedures and <b>safety requirements</b> , and without causing damage to components or systems<br>2.3 Programming code is sought and interpreted, as required, to enable installed equipment to communicate with vehicle or machinery controller area network<br>2.4 Installed system and components are tested for correct operation according to workplace procedures and manufacturer specifications<br>2.5 Post-installation testing of other electrical and electronic systems is carried out according to workplace procedures to confirm correct operation, and any problems detected as having been introduced during the installation process are rectified |
| 3. Complete work processes                                     | 3.1 Final inspection is made to ensure work is to workplace expectations and vehicle or machinery is presented ready for use<br>3.2 Work area is cleaned, waste and non-recyclable materials are disposed of, and recyclable material is collected<br>3.3 Tools and equipment are checked and stored and any faulty electrical equipment is identified, tagged and isolated according to workplace procedures<br>3.4 Workplace documentation is processed according to workplace procedures                                                                                                                                                                                                                                                                                                                                                            |

## Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance and are not explicit in the performance criteria.

| Skills                             | Description                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning skills to:                | <ul style="list-style-type: none"> <li>locate appropriate sources of information efficiently.</li> </ul>                                                                                                                                                                                                                                                                         |
| Reading skills to:                 | <ul style="list-style-type: none"> <li>interpret information from manufacturer and workshop literature when seeking specifications and procedures</li> <li>interpret text, symbols and diagrams in ancillary electronic system and component fitment information in manufacturer specifications, and workplace procedures.</li> </ul>                                            |
| Writing skills to:                 | <ul style="list-style-type: none"> <li>legibly and accurately fill out workplace documentation when reporting work performed and recording parts and material used.</li> </ul>                                                                                                                                                                                                   |
| Oral communication skills to:      | <ul style="list-style-type: none"> <li>clarify instructions</li> <li>report findings and make installation recommendations.</li> </ul>                                                                                                                                                                                                                                           |
| Numeracy skills to:                | <ul style="list-style-type: none"> <li>match material and component part numbers to work instructions and vehicle and machinery component part lists</li> <li>measure voltage, current and resistance, and use basic mathematical operations, including addition, subtraction, multiplication and division, to calculate deviations from manufacturer specifications.</li> </ul> |
| Planning and organising skills to: | <ul style="list-style-type: none"> <li>plan own work requirements and prioritise actions to achieve required outcomes and ensure tasks are completed within workplace timeframes.</li> </ul>                                                                                                                                                                                     |
| Technology skills to:              | <ul style="list-style-type: none"> <li>use workplace technology and specialist tools relating to the installation of ancillary electronic systems and components.</li> </ul>                                                                                                                                                                                                     |

## Range of Conditions

This section specifies work environments and conditions that may affect performance.

Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included. Bold italicised wording, if used in the performance criteria, is detailed below.

|                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b><i>Safety requirements</i></b> must include: | <ul style="list-style-type: none"> <li>work health and safety (WHS) and occupational health and safety (OHS) requirements, including procedures for:             <ul style="list-style-type: none"> <li>using specialised tools and equipment</li> <li>selecting and using appropriate personal protective equipment (PPE)</li> <li>identifying hazards and controlling risks associated with:                 <ul style="list-style-type: none"> <li>working on high voltage ignition systems</li> </ul> </li> </ul> </li> </ul> |
|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|  |                                                                                                                     |
|--|---------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"><li>wearing jewellery while working around high current wiring systems.</li></ul> |
|--|---------------------------------------------------------------------------------------------------------------------|

## Unit Mapping Information

Equivalent to AURETR3027 Install ancillary electronic control unit systems and components

## Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b4278d82-d487-4070-a8c4-78045ec695b1>

# Assessment Requirements for AURETR027 Install ancillary electronic systems and components

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## 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:

- install two ancillary electronic systems and components that require communication with the vehicle or machinery controller area network data bus (CAN-bus) topography of different vehicles.

## Knowledge Evidence

Individuals must be able to demonstrate knowledge of:

- work health and safety (WHS) and occupational health and safety (OHS) requirements relating to installing ancillary electronic systems and components, including procedures for:
  - using specialised tools and equipment
  - selecting and 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
- types and basic operation of common ancillary electronic systems and components, including:
  - driver interlocks, including alcohol interlock devices
  - remote keyless entry systems
  - security alarm systems
  - audio systems
  - mobile phones
  - speed alert systems

- navigation systems
- reverse parking aids, including sensors, audible alerts and cameras
- driver gauges and instruments
- trailer harness connectors
- types of vehicle and machinery communication networks, including:
  - controller area network (CAN)
  - local interconnect network (LIN)
  - media oriented systems transport (MOST)
- types of communication network wiring, including:
  - single wire
  - two wire twisted pair
  - shielded wire
- procedures for installing basic ancillary electronic systems and components, including:
  - techniques for reading and interpreting technical information, wiring diagrams and graphic symbols
  - methods of determining wiring and connection type and size for system
  - methods of determining placement of components on vehicle or machinery
  - methods of connecting system and components to existing electrical system without causing damage or problems, including:
    - selecting and soldering wires
    - selecting and crimping terminals
    - removing and replacing connectors
    - removing and replacing existing electrical components
  - procedures for sourcing and using programming code to allow communication between installed system and existing vehicle or machinery systems
- post-installation testing procedures of basic ancillary electronic systems and components, including procedures for checking:
  - full operation of installed system
  - operation of existing electrical and electronic 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 be by direct observation of tasks.

Where assessment of competency includes third-party evidence, individuals must provide evidence that links them to the ancillary electronic systems and components that they have installed in vehicles or machinery, e.g. work 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 service and repair workplace or simulated workplace
- workplace instructions
- vehicle and machinery wiring specifications relevant to systems and components being installed
- manufacturer ancillary electronic system specifications
- two different vehicles or machinery requiring installation of ancillary electronic systems and components
- tools, equipment and materials appropriate for installing ancillary electronic systems and components.

## Links

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<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b4278d82-d487-4070-a8c4-78045ec695b1>

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