



Australian Government

AURETR2008 Remove and replace electrical units and assemblies

Release 1

AURETR2008 Remove and replace electrical units and assemblies

Modification History

Release	Comment
Release 1	New unit of competency

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes required to remove and replace electrical units and assemblies, such as headlights, tail-lights and electrical units and assemblies that do not form an integral part of the vehicle's computer area network databus (CAN-bus) network to facilitate body repair activities or similar. The unit includes identifying and confirming work requirements, preparing for work, removing and replacing electrical units and assemblies, and completing work finalisation processes, including clean-up and documentation. Work requires individuals to demonstrate some judgement and problem-solving skills in managing own work activities and contributing to a productive team environment. Assistance from a licensed person must be sought in relation to air conditioning and LPG, CNG and LNG system and components and in recommissioning systems. Users are advised to check with the relevant regulatory authority.
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Application of the Unit

Application of the unit	Work applies to electrical units and assemblies that are fitted in light and heavy vehicle, mining, construction, agricultural, motorcycle, outdoor power equipment and marine environments.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the required performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge and/or the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work	1.1. Workplace instructions are used to determine job requirements 1.2. Workplace health and safety (WHS) requirements are observed throughout the work 1.3. Procedures and information are sourced and interpreted 1.4. Tools and equipment are identified for effective removal, replacement and testing procedures
2. Remove electrical units and assemblies	2.1. Correct information is accessed and interpreted from manufacturer and component supplier specifications 2.2. Electrical units and assemblies are removed using approved methods, tools and equipment 2.3. Assistance from a licensed person is sought in relation to removing air conditioning and LPG, CNG and LNG systems and components 2.4. Removal activities are carried out according to industry and WHS regulations and guidelines, and workplace policies and procedures 2.5. Units and assemblies are handled and stored according to manufacturer and component supplier requirements
3. Replace electrical units and assemblies	3.1. Correct information is accessed and interpreted from manufacturer and component supplier specifications 3.2. Electrical units and assemblies are replaced using approved methods, tools and equipment 3.3. Assistance from a licensed person is sought in relation to replacing air conditioning and LPG, CNG and LNG system and components 3.4. Replacement activities are carried out according to industry and WHS regulations and guidelines, and workplace policies and procedures
4. Test electrical units and assemblies	4.1. Carry out testing procedures of replaced electrical unit and assemblies 4.2. Options for diagnosing faults are identified and used, using appropriate tools and diagnostic techniques 4.3. Components or systems are checked and tested without causing damage as a result of inappropriate testing procedures 4.4. Faults are identified from test results and causes of faults are determined 4.5. Diagnosis findings are reported according to workplace procedures, including recommendations for necessary

	repairs or adjustments 4.6. Post-replacement testing is conducted and results are documented according to workplace procedures
5. Clean up work area and maintain equipment	5.1. Material that can be reused is collected and stored according to workplace sustainability practices 5.2. Waste and scrap are removed following workplace procedures 5.3. Equipment and work area are cleaned and inspected for serviceable condition according to workplace procedures 5.4. Faulty equipment is identified, tagged and isolated according to workplace procedures 5.5. Operator maintenance is completed according to manufacturer and component supplier specifications and site procedures 5.6. Tools and equipment are maintained according to workplace procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to:
 - follow verbal and written instructions
 - clarify workplace instructions and determine job requirements
 - gain information from appropriate persons and assistance as required
- learning skills to identify sources of information, assistance and expert knowledge to expand skills, knowledge and understanding
- literacy skills to:
 - read and follow information in written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
 - obtain and record measurements
 - document required repairs and parts
- numeracy skills to:
 - test, measure and analyse test equipment results compared to desired system performance
- planning and organising skills to:
 - plan own work requirements and prioritise actions to achieve required outcomes and ensure tasks are completed on time
 - identify risk factors and take action to minimise them
- problem-solving skills to:
 - recognise a workplace problem or potential problem and take action
 - refer problems outside area of responsibility to appropriate person and suggest possible causes
 - seek information and assistance as required to solve problems
- self-management skills to:
 - select and use appropriate equipment, materials, processes and procedures
 - recognise limitations and seek timely advice
 - follow workplace documentation, such as codes of practice and operating procedures
- teamwork skills to:
 - identify and describe own role and role of others
 - work with diverse individuals and groups
 - apply knowledge of own role to complete activities efficiently to support team activities and tasks
- technical skills to use workplace technology and tools relating to removing and replacing vehicle electrical units and assemblies, including:
 - specialist tools and equipment

REQUIRED SKILLS AND KNOWLEDGE

- electrical measuring equipment
- technology skills to:
 - operate a range of electrical diagnostic test equipment
 - use technology to collect, analyse and provide information

Required knowledge

- WHS regulations, requirements, equipment, material and personal safety requirements, including:
 - codes of practice
 - personal protection needs
- cable types and sizes and current carrying capacity
- various types of wiring systems found in vehicles, including:
 - basic wiring
 - twisted pair
 - shielded wiring
 - CAN-bus and databus networks
- technical information, wiring diagrams and graphic symbols relating to electrical units and assemblies
- diagnostic and testing procedures, including:
 - testing procedures for faults located in basic electrical circuits
 - analysis of system operation using basic electrical test equipment and other industry-relevant test equipment
 - visual, aural and functional assessments, including:
 - component damage and wear
 - component corrosion
 - water and moisture ingress

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, required Skills and Knowledge, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Critical aspects for assessment and evidence required to demonstrate competency in this unit

The evidence required to demonstrate competency in this unit must be relevant to workplace operations and satisfy all of the requirements of the performance criteria and required skills and knowledge.

A person who demonstrates competency in this unit must be able to:

- observe safety procedures and requirements
- select methods and techniques appropriate to the circumstances
- complete preparatory activity in a systematic manner
- remove and replace a minimum of four units and assemblies in line with workplace, manufacturer and component supplier requirements, including:
 - one headlamp or tail lamp assembly
 - one windscreen wiper washer motor assembly
 - one door or window electrical assembly
- complete final functional test to specification
- present vehicle and equipment in a condition that complies with workplace requirements.

Context of, and specific resources for assessment

Competency is to be assessed in the workplace or a simulated workplace environment that accurately reflects performance in a real workplace setting.

Assessment is to occur:

- using standard workplace practices and procedures
- following safety requirements
- applying environmental constraints.

Assessment is to comply with relevant:

- regulatory requirements
- Australian standards
- industry codes of practice.

The following resources must be made available for the assessment of this unit:

- workplace location or simulated workplace

EVIDENCE GUIDE

	• material relevant to removing and replacing electrical units and assemblies • equipment, and hand and power tools appropriate to removing and replacing electrical units and assemblies • specifications and work instructions.
Method of assessment	Assessment must satisfy the endorsed Assessment Guidelines of this Training Package. Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with the application of required skills and knowledge. Assessment methods must be by direct observation of tasks and include questioning on required skills and knowledge to ensure correct interpretation and application. Competence in this unit may be assessed in conjunction with other units which together form part of a holistic work role. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate the needs of diverse clients. Assessment processes and techniques must be culturally sensitive and appropriate to the language, literacy and numeracy capacity of the candidate and the work being performed.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Workplace instructions may include:	• electronic or hard copy instructions • verbal instructions • written instructions.
Job requirements may include:	• effective unit and assembly removal and replacement techniques • diagnosis and repair methods, processes and equipment.
Workplace health and safety requirements may include:	• personal protective clothing and equipment • hazards associated with high voltage ignition systems • safe use of tools and equipment • safe handling of material • use of fire-fighting equipment • workplace safety policies and procedures • workplace first aid equipment • hazard control, including control of hazardous materials and toxic substances.
Procedures and information may include:	• verbal, written and graphical instructions • signage • work schedules, plans and specifications • work bulletins and memos • material safety data sheets • diagrams and sketches • regulatory and legislative requirements relating to automotive industry • Australian Design Rules • engineer's design specifications and instructions • workplace work specifications and requirements • instructions issued by authorised workplace or external persons • Australian standards • vehicle service requirements and repair manuals.
Tools and equipment may include:	• hand tools • testing equipment, including multimeters and ohmmeters • heat-gun or blower • heat shrink sleeving and flexible conduit

RANGE STATEMENT	
	• terminals and connectors • electrical tape.
<i>Electrical units and assemblies</i> may include:	• basic electrical units and assemblies (non CAN-bus networked), including: • headlight assemblies • tail-light assemblies • side rear-view mirrors • windscreen washer and wiper motors • door and window motor assemblies.
<i>Options for diagnosing faults</i> may include:	• continuity testing • insulation testing • isolating possible faults • replacing blown fuses or circuit breakers • replacing damaged connectors or terminals • visually inspecting and evaluating components.
<i>Inappropriate testing procedures</i> may include:	• intrusive testing (which must not be performed as it is not a recommended test and repair method), which includes: • back probing terminals and connectors and fuse holders with inappropriate test probes • probing terminal and connectors with inappropriate test probes • pushing sharp probes and objects into wiring insulation.
<i>Faults</i> may include:	• open circuits • short circuits • high resistance circuits • damaged insulation • frayed wires • burnt wiring • water and moisture ingress • connector damage • terminal damage • diagnosis trouble codes (DTC) being set.
<i>Post-replacement testing</i> may include:	• validating effectiveness of the replacement action • confirming that reported fault has been rectified • confirming that no other faults are present as a result of the replacement action.

Unit Sector(s)

Competency field	Electrical
Unit sector	Technical – Electrical and Electronic

Custom Content Section

Not applicable.