



Australian Government

AURETR010 Repair wiring harnesses and looms

Release: 1

AURETR010 Repair wiring harnesses and looms

Modification History

Release	Comment
Release 1	New unit of competency.

Application

This unit describes the performance outcomes required to test an existing wiring harness and loom, remove, fabricate and fit the new wiring harness and loom, and then test its operation. It involves preparing for the task, performing the work, and completing workplace processes and documentation.

It applies to those working in the automotive service and repair industry. The wiring harnesses and looms include those in agricultural machinery, heavy commercial vehicles, light vehicles, 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 repair wiring harness and loom	1.1 Job requirements are determined according to workplace instructions 1.2 Technical procedures and information are accessed and interpreted

Elements Elements describe the essential outcomes.	Performance Criteria 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.
	1.3 Hazards associated with the work are identified and risks are managed 1.4 <i>Tools and equipment</i> are selected and checked for serviceability
2. Test wiring harness and loom assembly	2.1 Wiring harness and loom are inspected for damage 2.2 Harness and loom are tested using appropriate tools and fault finding techniques according to workplace procedures and <i>safety and environmental requirements</i> , and without causing damage to components or systems 2.3 Inspection and test results are compared with manufacturer specifications 2.4 Faults are identified from test results and causes of faults are determined
3. Remove wiring harness and loom	3.1 Wiring harness, loom assembly and associated components are labelled before removal 3.2 Harness and loom components are removed according to manufacturer specifications, workplace procedures and safety requirements, and without causing damage to components or systems
4. Repair and refit wiring harness and loom	4.1 Electrical circuit wiring diagrams are accessed and interpreted from manufacturer and component supplier specifications 4.2 Harness and loom are repaired or fabricated using appropriate techniques and according to workplace procedures 4.3 Repaired or fabricated harness and loom assembly is refitted and reconnected according to manufacturer and component supplier specifications 4.4 Post-repair testing is carried out according to workplace procedures to confirm fault rectification, and any further problems detected as having been introduced during the repair or fabrication process are rectified
5. Complete work processes	5.1 Final inspection is made to ensure work is to workplace expectations and vehicle, vessel or machinery is presented ready for use 5.2 Work area is cleaned, waste and non-recyclable materials are disposed of, and recyclable material is collected 5.3 Tools and equipment are checked and stored and any faulty electrical equipment is identified, tagged and isolated according to workplace procedures 5.4 Workplace documentation is processed according to workplace

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	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:	locate appropriate sources of information efficiently.
Reading skills to:	interpret text, symbols and wiring diagrams relating to fabricating, testing and repairing wiring harnesses and looms in manufacturer specifications, and workplace instructions and procedures.
Writing skills to:	legibly and accurately fill out workplace documentation when recording parts and material used.
Oral communication skills to:	clarify instructions.
Numeracy skills to:	- match component part numbers to workplace instructions and vehicle and component part lists - interpret measurements of wire size and gauge relating to wiring harnesses and loom fabrication and repairs - measure components to determine compliance with specifications.
Planning and organising skills to:	plan own work requirements and prioritise actions to achieve required outcomes and ensure tasks are completed within workplace timeframes.
Technology skills to:	use specialised workplace technology, tools and equipment relating to repairing wiring harnesses and looms, such as soldering irons and heat shrink insulation.

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.

<i>Tools and equipment</i> must include:	• multimeter • continuity tester • crimping tools • soldering equipment • heat gun • terminals and connectors • wire and cabling.
<i>Safety and environmental requirements</i> must include:	• work health and safety (WHS) and occupational health and safety (OHS) requirements, including procedures for: • using safety data sheets (SDS) • selecting and using personal protective equipment (PPE) • identifying firefighting equipment • safely handling hazardous materials and toxic substances • following soldering equipment safe operating procedures • environmental requirements, including procedures for trapping, storing and disposing of hazardous materials and toxic substances released during repair processes.

Unit Mapping Information

Equivalent to AURETR2010 Fabricate, test and repair wiring harnesses and looms

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 AURETR010 Repair wiring harnesses and looms

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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, performance criteria, range of conditions and foundation skills:

- repair an existing basic wiring harness or loom assembly of the wiring systems of two different vehicles, vessels or machinery
- fabricate a new basic wiring harness or loom assembly for the wiring system of one vehicle, vessel or machinery.

Knowledge Evidence

Individuals must be able to demonstrate knowledge of:

- work health and safety (WHS) and occupational health and safety (OHS) requirements relating to repairing wiring harnesses and looms, including procedures for:
 - using safety data sheets (SDS)
 - selecting and using personal protective equipment (PPE)
 - identifying firefighting equipment
 - safely handling hazardous materials and toxic substances
 - following soldering equipment safe operating procedures
- environmental requirements, including procedures for trapping, storing and disposing of hazardous materials and toxic substances released during repair processes
- location and content of workplace procedures and manufacturer specifications relating to wiring harnesses and looms
- types of wiring systems found in vehicles, including:
 - basic single wiring, including:
 - tailer harness
 - driving lights harness

- accessory wiring harness
- complex multi-wiring with varying wire gauges
- controller area network databus (CAN-bus) wiring, including:
 - twisted pair
 - shielded wiring
- testing procedures, including:
 - accessing electrical terminals and using test probes without damaging connectors, fuse holders or wiring
 - testing wiring harnesses and looms, including resistance and voltage drop and circuit performance checks
 - visual and functional assessments, including:
 - component damage and wear
 - component corrosion
 - water and moisture ingress
 - damaged insulation
 - frayed wires
 - burnt wiring
 - terminal and connector damage
- removal procedures for wiring harnesses and looms, including:
 - accessing wiring and removing panels and covers
 - removing and replacing components
 - disconnecting terminals from connectors
- repair procedures of wiring harnesses and looms, including:
 - determining cable and terminal types and sizes according to circuit current draw
 - wire soldering procedures
 - terminal crimping
 - replacing male and female terminals within a connector housing
 - protecting and routing harness and loom
- post-repair testing procedures of wiring harnesses and looms, including procedures for checking full operation of associated electrical 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 vehicle, vessel or machinery wiring harnesses and looms that they have repaired, 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 machinery wiring specifications
- three different vehicles, vessels or machinery requiring repairs to their wiring harnesses and looms
- tools, equipment and materials appropriate for repairing wiring harnesses and looms, including:
 - multimeter
 - continuity tester
 - crimping tools
 - soldering equipment
 - heat gun
 - terminals and connectors
 - wire and cabling.

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