



Australian Government

AURETR138 Diagnose complex faults in motorcycle electrical and electronic systems

Release: 1

AURETR138 Diagnose complex faults in motorcycle electrical and electronic systems

Modification History

Release	Comments
Release 1	This version first released with AUR Automotive Retail, Service and Repair Training Package Version 6.0

Application

This unit describes the skills and knowledge required to diagnose complex faults in motorcycle electrical and electronic systems and determine the repair action necessary to restore system performance. It involves confirming the existence of a fault, developing a diagnostic testing strategy, diagnosing the cause of the fault, reporting conclusions and making repair recommendations. Complex faults are outside the normal scope of a technician's diagnosis and repair work. They include intermittent faults, multi-system faults, faults introduced as a result of system repairs, and indirect faults caused by the influence of external systems, requiring the application of complex diagnostic processes to resolve.

The unit applies to those working in the automotive service and repair industry. The electrical and electronic systems include those in motorcycles or all-terrain vehicles (ATVs).

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

Unit Sector

Electrical Technical – Electrical and Electronic

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Identify and confirm the work requirement	1.1 Identify job requirements from workplace instructions 1.2 Confirm nature of fault according to workplace procedures 1.3 Identify hazards and environmental issues associated with diagnose and repair activity, assess potential risks and implement control measures in line with workplace policies and procedures

ELEMENTS	PERFORMANCE CRITERIA
2. Prepare to diagnose complex faults	2.1 Identify required information for diagnosis activity 2.2 Analyse diagnostic options and develop testing strategy, including, diagnostic method sequence, tests and testing processes 2.3 Identify tools and equipment required for testing strategy and establish serviceability according to workplace procedures
3. Apply diagnostic procedures	3.1 Implement diagnostic tests set out in testing strategy according to manufacturer and workplace procedures, and workplace health and safety requirements 3.2 Verify and report diagnostic findings using reliable alternative process according to manufacturer specifications and workplace procedures 3.3 Develop and report recommendations for necessary repairs according to workplace procedures 3.4 Communicate findings to workplace supervisor and customer and confirm next steps
4. Complete work processes	4.1 Conduct final inspection according to workplace procedures and confirm vehicle is ready for repair process or return to customer 4.2 Clear work area and dispose of or recycle materials according to workplace procedures 4.3 Complete documentation according to workplace procedures

Foundation Skills

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

SKILL	DESCRIPTION
Learning	• Locates required sources of information efficiently • Develops own approach to a task, including steps to confirm findings • Applies diagnostic skills to different vehicles or machinery.
Reading	• Identifies, organises and interprets technical information from manufacturer and workshop literature when seeking electronic and electrical system specifications and procedures.
Oral communication	• Clarifies instructions

SKILL	DESCRIPTION
	Obtains information from customers and supervisors.
Numeracy	- Measures electronic and electrical system components and uses basic mathematical operations, including addition and subtraction, to calculate tolerances and deviations from manufacturer specifications - Uses electrical measuring equipment and interpret units, such as amperes, ohms, and volts.
Planning and organising	- Plans own work requirements - Prioritises and sequences actions to achieve required outcomes - Ensures tasks are completed within workplace timeframes.
Technology	Uses specialised diagnostic equipment.

Unit Mapping Information

Supersedes and is equivalent to AURETR038 Diagnose complex faults in motorcycle electrical and electronic systems.

Links

Companion Volume Implementation Guide is found on VETNet -

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

Assessment Requirements for AURETR138 Diagnose complex faults in motorcycle electrical and electronic systems

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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 a complex fault in the electrical or electronic systems of at least two different motorcycles or all-terrain vehicles (ATVs) in which the work for each must involve a different type of complex fault from among the following:
 - an intermittent fault
 - a fault that affects more than one system
 - a fault introduced as a result of a system repair
 - an indirect fault caused by the influence of external systems
- develop a testing strategy to diagnose the cause of the two complex faults above.

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 complex faults in motorcycle or ATV electrical and electronic system, including:
 - motorcycle or ATV electrical and electronic system manufacturer specifications
- workplace procedures required to diagnose complex faults in motorcycle or ATV electrical and electronic systems, including:
 - establishing the 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
 - safe disposal of materials
 - recycling procedures

- workplace health and safety (WHS) requirements relating to diagnosing complex faults in motorcycle electrical and electronic systems, including procedures for identifying hazards and controlling risks associated with:
 - high voltage vehicle ignition systems
 - high current vehicle electrical systems
 - wearing jewellery while working around high electrical currents
- environmental requirements relating to motorcycle electrical and electronic systems.
- types of complex faults relating to motorcycle electrical and electronic systems, including:
 - intermittent
 - multi-system
 - introduced as a result of system repair
 - indirect, caused by the influence of external systems
- types, function and operation of motorcycle and ATV electrical and electronic systems, including:
 - lighting system
 - ignition system
 - charging system
 - starting system
 - engine management system
 - anti-lock braking system (ABS)
 - immobiliser system
- testing procedures for motorcycle electrical and electronic systems, including:
 - using digital multimeter, scan tool and oscilloscope
 - vehicle dynamic and static testing
 - component failure analysis
 - vehicle continuous and non-continuous monitored systems
- types, functions, operation and limitations of diagnostic testing equipment required to diagnose complex faults in motorcycle electrical and electronic systems
- procedures for accessing and interpreting scan tool system data, including:
 - diagnostic trouble codes (DTCs), including:
 - conditions that set the DTCs
 - conditions for running DTCs
 - live data
 - freeze frame data
 - waveforms.

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 and electronic 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 motorcycle or ATV electrical and electronic system specifications
- two different types of motorcycles or ATVs with complex faults in their electrical or electronic systems
- motorcycle or ATV electrical and electronic system diagnostic equipment, including:
 - digital multimeter
 - scan tool
- tools, equipment and materials appropriate for diagnosing complex faults in motorcycle or ATV electrical and electronic 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 -

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