



**Australian Government**

# **AURETH104 Diagnose and repair traction motor speed control systems in battery electric vehicles**

**Release: 1**

# AURETH104 Diagnose and repair traction motor speed control systems in battery electric vehicles

## 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 and repair faults in the traction motor speed control systems of battery electric vehicles (BEVs). These systems may be referred to as digital motor controllers (DMCs) or motor control units (MCUs). The unit involves preparing for the task, sourcing a diagnostic testing strategy, diagnosing the cause of the fault, carrying out the repair, performing post-repair testing, and completing workplace processes and documentation. Importance is placed in the unit on applying electrical safety procedures when working on high voltage (HV) rechargeable energy storage systems (RESS).

The unit applies to those who work in the automotive service and repair industry.

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

## Unit Sector

Electrical Technical – Hybrid Vehicle and Battery Vehicle

## Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Prepare to diagnose and repair traction motor speed control system in battery electric vehicle	1.1 Identify job requirements from workplace instructions 1.2 Identify required information for diagnosis activity 1.3 Analyse diagnostic options and source testing strategy to identify cause of fault using workplace and manufacturer procedures 1.4 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 1.5 Identify tools and equipment required for testing strategy and

ELEMENT	PERFORMANCE CRITERIA
	establish serviceability according to workplace procedures
2. Diagnose traction motor speed control system in battery electric vehicle	2.1 Implement diagnostic tests set out in testing strategy according to manufacturer and workplace procedures, and workplace health and safety requirements 2.2 Identify cause of fault through analysis of diagnostic test results 2.3 Confirm and report cause of fault according to workplace procedures 2.4 Develop and report recommendations for necessary repairs according to workplace procedures
3. Repair traction motor speed control system in battery electric vehicle	3.1 Identify required information for repair activity 3.2 Identify tools, equipment and materials required for repair activity and establish serviceability according to workplace procedures 3.3 Isolate RESS service plug or manual service disconnect and depower vehicle HV RESS according to manufacturer specifications 3.4 Carry out repairs according to workplace and manufacturer procedures, manufacturer specifications, workplace health and safety and environmental requirements 3.5 Reconnect RESS service plug or manual service disconnect and repower vehicle HV RESS 3.6 Carry out post-repair testing according to workplace procedures, workplace health and safety and environmental requirements
4. Complete work processes	4.1 Conduct final inspection according to workplace procedures and confirm vehicle is ready for use 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	<ul style="list-style-type: none"> <li>• Locates required sources of information efficiently</li> <li>• Develops a sequenced plan for a specific task.</li> </ul>
Reading	<ul style="list-style-type: none"> <li>• Organises and interprets technical information from workplace procedures, manufacturer procedures and manufacturer</li> </ul>

<b>SKILL</b>	<b>DESCRIPTION</b>
	<p>specifications</p> <ul style="list-style-type: none"><li>• Interprets symbols and wiring diagrams.</li></ul>
Oral communication	<ul style="list-style-type: none"><li>• Clarifies instructions</li><li>• Obtains information from customers and supervisors.</li></ul>
Numeracy	<ul style="list-style-type: none"><li>• Matches electrical components and part identification numbers to workplace instructions, vehicle and component part lists, and manufacturer specifications</li><li>• Interprets vehicle electrical measurements and readings on digital and analogue gauges</li><li>• Measures voltage, current and resistance</li><li>• Uses mathematical operations</li><li>• Calculates deviations from manufacturer specifications.</li></ul>
Planning and organising	<ul style="list-style-type: none"><li>• Plans own work requirements</li><li>• Prioritises actions to achieve required outcomes</li><li>• Ensures tasks are completed within workplace timeframes.</li></ul>
Technology	<ul style="list-style-type: none"><li>• Uses specialised tools.</li></ul>

## Unit Mapping Information

Supersedes and is equivalent to AURETH004 Diagnose and repair traction motor speed control systems in battery electric vehicles.

## Links

Companion Volume Implementation Guide is found on VETNet -

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