

AUREHV4001A	Test hybrid electric vehicle high voltage batteries
Unit descriptor	This unit describes the performance outcomes required for testing high voltage (HV) batteries in Hybrid Electric Vehicles (HEVs). Importance is placed on the application of HV electrical safety procedures. Licensing, legislative, regulatory or certification requirements may apply to this unit in some jurisdictions. Users are advised to check with the relevant regulatory authority.
Employability skills	This unit contains employability skills.
Prerequisite units	
Co-requisite units	
Application of the unit	Work applies to the identification and confirmation of safety requirements, preparation for work, testing of HV batteries, and completion of work finalisation processes, including clean-up and documentation. Competency may be applied to testing of HV batteries in HEVs such as cars, trucks, motorcycles, marine applications and wheeled plant / equipment. Work requires individuals to demonstrate some judgement and problem-solving skills in managing own work activities.
Competency field	
Unit sector	Electrical

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
1. Prepare for work	1.1. <i>Procedures and information</i> are sourced to determine job requirements, including testing method 1.2. <i>OHS requirements</i> , including personal safety needs, are identified and applied 1.3. Tools and <i>testing equipment</i> are identified and checked for safe and effective operation 1.4. Procedures are determined to minimise task time
2. Test batteries	2.1. Information for battery testing is accessed and correctly followed 2.2. Battery tests are performed and results analysed according to product/manufacture/component supplier specifications 2.3. Battery testing procedures are carried out according to safe operating procedures and guidelines
3. Complete service operations	3.1. Work area is tidied, tools and equipment are replaced according to <i>enterprise requirements</i> 3.2. Job card or repair order is completed according to enterprise requirements 3.3. Report is prepared on the outcomes of the test of the HV battery system, according to enterprise requirements

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- technical skills to:
 - use workplace technology related to testing of HV batteries
 - complete tests and measurements to determine serviceability of batteries
 - use specialist tooling
 - use computerised measuring and diagnostic equipment
 - report and record results
- literacy skills to:
 - collect, organise and understand information related to work requirements, plans and safety procedures for HV battery testing
- communication skills to:
 - communicate ideas and information to enable confirmation of work requirements and specifications
 - interpret and apply common industry terminology
 - coordinate work with site supervisor, other workers and customers
 - report work outcomes and problems
- problem-solving skills to:
 - interpret technical information and specifications
 - interpret test results
 - identify repair options
- self management skills to:
 - obtain information on HV battery testing procedures
 - manage risks and hazards associated with LV and HV HEV electrical systems and components
 - obtain equipment and material to avoid backtracking or workflow interruptions
 - use cooperative approaches to optimise workflow and productivity

Required knowledge

- relevant OHS requirements, including:
 - safe work practices
 - electrical safety
- the principles of electricity, including:
 - AC and DC
- knowledge of the components of LV and HV HEVs and their functions
- general vehicle specific electrical requirements
- applicable Commonwealth, State or Territory legislation, regulations, standards and codes of practice and environmental regulations relevant to the testing of HEV HV batteries in the automotive workplace
- organisational policies and procedures including quality and reporting and recording procedures related to the testing of HEV HV batteries in the automotive workplace

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, if used 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.

Procedures and information may include:

- original equipment manufacturers (OEM) specifications
- engineer's design specifications and instructions
- workplace specifications and requirements

RANGE STATEMENT	
	<ul style="list-style-type: none"> • verbal, written and graphical instructions issued by authorised internal and external persons • diagrams or sketches • industry codes of practice • Australian Standards
OHS requirements may include:	<ul style="list-style-type: none"> • personal protective equipment (PPE) and clothing • electrical protective equipment such as – <ul style="list-style-type: none"> ◦ electrical safety gloves 1000V ◦ HV insulating mats (Australian Standards rated) • workplace environment and safety equipment • following electrical safety precautions, such as: <ul style="list-style-type: none"> ◦ “one hand rule” ◦ live system warning tags or signs • hazard and hazardous materials and substances control • emergency procedures such as – <ul style="list-style-type: none"> ◦ emergency shutdown and stopping of equipment ◦ extinguishing fires ◦ enterprise first aid requirements ◦ site evacuation
Testing equipment may include:	<ul style="list-style-type: none"> • multimeter CAT 3 1000V • AC/DC current clamp • diagnostic scanner or computer interface device • thermal imaging equipment or non contact thermometer • battery management system (BMS) diagnostic equipment • insulated hand tools • oscilloscope
Enterprise requirements may include:	<ul style="list-style-type: none"> • workplace reporting and recording procedures • safe work procedures • quality policies and procedures • sustainability, environment, equal opportunity and anti-discrimination • manufacturer specifications • industry codes of practice

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, 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	<p>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.</p> <p>A person who demonstrates competency in this unit must be able to:</p> <ul style="list-style-type: none"> • observe safety procedures and requirements • communicate effectively with others involved in or affected by the work

EVIDENCE GUIDE	
	<ul style="list-style-type: none"> • select methods and techniques appropriate to the circumstances • complete preparatory activity in a systematic manner • test HV batteries in HEVs according to requirements • complete relevant documentation for recording HEV battery test results.
Context of, and specific resources for assessment	<p>Competency is to be assessed in the workplace or a simulated workplace environment that accurately reflects performance in a real workplace setting.</p> <p>Assessment is to occur:</p> <ul style="list-style-type: none"> • using standard workplace practices and procedures • following safety requirements • applying environmental constraints <p>Assessment is to comply with relevant:</p> <ul style="list-style-type: none"> • regulatory requirements • Australian standards • industry codes of practice <p>Competency is to be assessed using a HEV that utilises HV and LV AC/DC electrical systems. Where simulation is used an operational HEV must be included in the simulation.</p> <p>The following resources must be made available for the assessment of this unit:</p> <ul style="list-style-type: none"> • appropriate PPE • access to a HEV • access to manufacturer's specifications for the HEV • testing equipment • access to a full range of essential tools and equipment • workplace documentation.
Method of assessment	<p>Assessment must satisfy the endorsed Assessment Guidelines of this Training Package.</p> <p>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.</p> <p>Assessment methods must be by direct observation of tasks and include questioning on required skills and knowledge to ensure correct interpretation and application.</p> <p>Competence in this unit may be assessed in conjunction with other units which together form part of an holistic work role.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate the needs of diverse clients.</p> <p>Assessment processes and techniques must be culturally sensitive and appropriate to the language, literacy and numeracy capacity of the candidate and the</p>

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	work being performed.
Guidance information for assessment	

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