



**Australian Government**

# **AURETD3001 Service and repair electronically controlled steering systems**

**Release 1**

## AURETD3001 Service and repair electronically controlled steering systems

### Modification History

Release	Comment
Release 1	<p>Replaces AURE320871A Service and repair electronically controlled steering systems</p> <p>Unit code updated to meet policy requirements</p> <p>Reference to OHS legislation replaced with new WHS legislation</p> <p>Licensing statement added to unit descriptor</p>

### Unit Descriptor

Unit descriptor	<p>This unit covers the competence to locate and rectify faults in electronically controlled steering systems. It applies specifically to electrical/electronic control systems and components and does not cover systems which are electronically controlled and operated.</p> <p>Licensing, legislative, regulatory or certification requirements may apply to this unit in some jurisdictions. Users are advised to check with the relevant regulatory authority.</p>
-----------------	--

### Application of the Unit

Application of the unit	<p>The unit includes identification and confirmation of work requirement, preparation for work, servicing and adjustment of systems, repair of faults, retesting of systems and completion of work finalisation processes, including clean-up and documentation.</p> <p>Work requires individuals to demonstrate some judgement and problem-solving skills in managing own work activities and contributing to a productive team environment.</p>
-------------------------	---

### Licensing/Regulatory Information

Not applicable.

## Pre-Requisites

Not applicable.

## Employability Skills Information

<b>Employability skills</b>	This unit contains employability skills.
-----------------------------	--

## 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.
---	--

## Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work	1.1. Work instructions are used to determine job requirements, including quality, material, equipment quantities and service manuals 1.2. Job specifications are read and interpreted 1.3. WHS requirements, including personal protection needs, are observed throughout the work 1.4. Electronic system protection devices, processes and precautions are identified appropriate to the application 1.5. Equipment and tooling are identified and checked for safety and correct operation 1.6. Procedures are identified to minimise task time
2. Service and adjust electronically controlled steering systems	2.1. Service information is accessed and interpreted prior to commencing servicing procedures 2.2. Current status and previous fault history of electronic steering/suspension system is determined in conjunction with the customer 2.3. Current status of the electronic system is confirmed through a road test program 2.4. Electronic system is serviced in accordance with manufacturer/component supplier specifications and enterprise procedures 2.5. Fluids and lubricants are used in accordance with WHS and manufacturer/component supplier specifications 2.6. Used fluids and lubricants are disposed of according to enterprise and WHS requirements
3. Rectify identified electronically controlled steering system faults	3.1. Road test results are interpreted to verify system fault diagnosis 3.2. Customer is notified of identified fault(s) and agreement is given before work is carried out 3.3. Faulty components are removed and refitted with approved replacement parts in accordance with workplace procedures and customer requirements 3.4. Faulty components are disposed of in accordance with workplace procedures and warranty requirements 3.5. System adjustments are completed for components replaced
4. Test and confirm system faults have been rectified	4.1. Test procedures are carried out to confirm rectification of system faults 4.2. Documentation is completed in accordance with workplace/customer requirements

ELEMENT	PERFORMANCE CRITERIA
	4.3.Outcomes of rectification work is explained to the satisfaction of the customer to enable invoicing documentation to be completed
5. Clean up work area and maintain equipment	5.1.Material that can be reused is collected and stored 5.2.Waste and scrap is removed following workplace procedures 5.3.Equipment and work area are cleaned and inspected for serviceable conditions in accordance with workplace procedures 5.4.Serviceable equipment is tagged and faults identified in accordance with workplace procedures 5.5.Maintenance is completed in accordance with manufacturer/component supplier specifications and site procedures 5.6.Tooling is maintained in accordance with workplace procedures

## Required Skills and Knowledge

### REQUIRED SKILLS AND KNOWLEDGE

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

#### Required skills

- collect, organise and understand information related to work orders, plans and safety procedures for circuit and component testing, and major repairs/component replacement
- technical literacy and communication skills sufficient to interpret and apply common industry terminology, and interpret technical information and specifications
- research and interpretive skills to locate, interpret and apply operational and safety information
- communicate ideas and information to enable confirmation of work requirements and specifications, coordination of work with site supervisor, other workers and customers, and the reporting of work outcomes and problems
- plain English literacy and communication skills in relation to dealing with others involved in the work
- questioning and active listening skills, for example when obtaining information on electrical circuit/component testing, servicing and replacement procedures
- plan and organise activities, including preparation and layout of worksite and obtaining of equipment and material to avoid backtracking or workflow interruptions
- work with others and in a team by recognising dependencies and using cooperative approaches to optimise workflow and productivity
- use mathematical ideas and techniques to correctly complete tests and measurements to determine electrical circuit/component major repair/replacement requirements
- use pre-checking and inspection techniques to anticipate planning and scheduling problems, avoid wastage of time and material
- manipulative and dexterity skills to perform electrical testing, and repair/replacement procedures
- problem-solving skills for a range of procedural issues
- use workplace technology related to the service and repair of electronically controlled steering systems, including the use of specialist tooling and equipment, measuring equipment, computerised technology and communication devices and the reporting/documenting of results

#### Required knowledge

A working knowledge of:

- WHS regulations/requirements, equipment, materials and personal safety requirements
- operating principles of electronically controlled steering systems
- construction and operation of electronically controlled steering systems
- relationship to other electronically controlled systems, including shared components (e.g. ECU, sensors) test, diagnosis and fault determination procedures
- types and layout of service/repair manuals (hard copy and electronic)
- service/repair, removal, replacement and adjustment procedures
- post-repair test procedures

**REQUIRED SKILLS AND KNOWLEDGE**

- work organisation and planning processes
- enterprise quality processes

## 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, 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

It is essential that competence is fully observed and there is ability to transfer competence to changing circumstances and to respond to unusual situations in the critical aspects of:

- observing safety procedures and requirements
- communicating effectively with others involved in or affected by the work
- selecting methods and techniques appropriate to the circumstances
- completing preparatory activity in a systematic manner
- servicing and adjusting electronic controls of steering systems to manufacturer/component supplier requirements
- determining the repair/replacement requirements to rectify faults
- repairing/rectifying faults in electronic controls of steering systems to manufacturer/component supplier requirements
- testing, inspecting and evaluating steering system/components to manufacturer/component supplier requirements
- completing workplace and equipment documents.

##### Context of, and specific resources for assessment

Application of competence is to be assessed in the workplace or simulated worksite.

Assessment is to occur using standard and authorised work practices, safety requirements and environmental constraints.

Assessment is to comply with regulatory requirements, including Australian Standards.

The following resources should be made available:

- workplace location or simulated workplace
- material relevant to the service and repair of electronically controlled steering systems
- equipment, hand and power tooling appropriate to the service and repair of electronically controlled steering systems
- activities covering mandatory task requirements
- specifications and work instructions.

#### Method of assessment

- Assessment must satisfy the endorsed Assessment Guidelines



**EVIDENCE GUIDE**

	<p>of AUR12 Automotive Industry RS&amp;R Training Package</p> <ul style="list-style-type: none"> <li>• Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge</li> <li>• Assessment must be by direct observation of tasks, with questioning on underpinning knowledge and it must also reinforce the integration of key competencies</li> <li>• Assessment must satisfy the endorsed assessment guidelines of the automotive industry's RS&amp;R Training Package</li> <li>• Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge</li> <li>• Assessment must be by direct observation of tasks, with questioning on underpinning knowledge and it must also reinforce the integration of key competencies</li> <li>• Assessment may be applied under project related conditions and require evidence of process</li> <li>• Assessment must confirm a reasonable inference that competence is able to be under the particular circumstance, and is able to be transferred to other circumstances</li> <li>• It is preferable that assessment reflects a process rather than an event and occurs over a period of time to cover varying quality circumstances. Evidence of performance may be provided by customers, team leaders/members or other persons subject to agreed authentication arrangements</li> <li>• Competence in this unit may be assessed in conjunction with other functional units which together form part of the holistic work role</li> </ul>
--	---

## 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, 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.

<b>Electronically controlled steering systems</b>	Electronically controlled steering systems include: <ul style="list-style-type: none"> <li>• electronic control systems in two/four wheel steering systems and fitted to light vehicles and/or heavy commercial vehicles</li> </ul>
<b>Faults</b>	Faults in control systems may include: <ul style="list-style-type: none"> <li>• component malfunction, system adjustment, open, short and grounded circuits</li> </ul>
<b>Service and repair methods</b>	Service and repair methods are to include: <ul style="list-style-type: none"> <li>• diagnosis and determining faults</li> <li>• pre- and post-service/repair testing of system and component operation</li> <li>• service and repair/replacement of system components</li> <li>• service and repair adjustments</li> <li>• removal, dismantling, reassembly and refitting</li> <li>• testing system operations</li> <li>• retrieval and assessment of electronic systems data, including fault codes</li> </ul>
<b>Critical precautions</b>	Critical precautions include: <ul style="list-style-type: none"> <li>• manufacturer/component supplier procedures which must be applied as poor working practices are likely to damage electronic system ECUs and/or other components</li> </ul>
<b>WHS requirements</b>	WHS requirements are to be in accordance with legislation/regulations/codes of practice and enterprise safety policies and procedures, and may include: <ul style="list-style-type: none"> <li>• protective clothing and equipment, use of tooling and equipment, workplace environment and safety, handling of material, use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances</li> </ul>
<b>Personal protective equipment</b>	Personal protective equipment is to include that prescribed under legislation/regulation/codes of practice and workplace policies and practices
<b>Safe operating procedures</b>	Safe operating procedures are to include, but are not limited to:

<b>RANGE STATEMENT</b>	
	<ul style="list-style-type: none"> <li>the conduct of operational risk assessment and treatments associated with vehicular movement, toxic substances, electrical safety, machinery movement and operation, manual and mechanical lifting and shifting, working in proximity to others and site visitors</li> </ul>
<b>Emergency procedures</b>	<p>Emergency procedures related to this unit are to include, but may not be limited to:</p> <ul style="list-style-type: none"> <li>emergency shutdown and stopping of equipment, extinguishing fires, enterprise first aid requirements and site evacuation</li> </ul>
<b>Environmental requirements</b>	<p>Environmental requirements are to include, but are not limited to:</p> <ul style="list-style-type: none"> <li>waste management, noise, dust and clean-up management</li> </ul>
<b>Quality requirements</b>	<p>Quality requirements are to include, but are not limited to:</p> <ul style="list-style-type: none"> <li>regulations, including Australian Standards, internal company quality policy and standards and enterprise operations and procedures</li> </ul>
<b>Statutory/regulatory authorities</b>	<p>Statutory/regulatory authorities may include:</p> <ul style="list-style-type: none"> <li>federal, state/territory and local authorities administering the acts, regulations and codes of practice</li> </ul>
<b>Tooling and equipment</b>	<p>Tooling and equipment may include:</p> <ul style="list-style-type: none"> <li>hand tooling, testing equipment, including multimeters, power tooling, air tooling, specialist tooling for removal/adjustment, specialised system testers, oscilloscopes, scan tooling and LED test lights</li> </ul>
<b>Materials</b>	<p>Materials may include:</p> <ul style="list-style-type: none"> <li>spare parts, lubricants and fluids and cleaning materials</li> </ul>
<b>Communications</b>	<p>Communications are to include, but are not limited to:</p> <ul style="list-style-type: none"> <li>verbal and visual instructions and fault reporting and may include site specific instructions, written instructions, plans or instructions related to job/task, telephones and pagers</li> </ul>
<b>Information/documents</b>	<p>Sources of information/documents may include:</p> <ul style="list-style-type: none"> <li>verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, memos, material safety data sheets, diagrams or sketches</li> <li>safe work procedures related to the service and repair of electronically controlled steering systems</li> <li>regulatory/legislative requirements pertaining to automotive industry, including Australian Design Rules</li> </ul>

**RANGE STATEMENT**

	<ul style="list-style-type: none"><li>• engineer's design specifications and instructions</li><li>• organisation work specifications and requirements</li><li>• instructions issued by authorised enterprise or external persons</li><li>• Australian Standards</li></ul>
--	---

**Unit Sector(s)**

<b>Unit sector</b>	Electrical
--------------------	------------

**Co-requisite units**

Not applicable.

**Competency field**

<b>Competency field</b>	Technical - Steering and Suspension
-------------------------	-------------------------------------