



Australian Government

AURKTR001 Diagnose and repair electronic over hydraulic control systems

Release: 1

AURKTR001 Diagnose and repair electronic over hydraulic control systems

Modification History

Release	Comment
Release 1	New unit of competency.

Application

This unit describes the performance outcomes required to diagnose and repair faults in electronic over hydraulic control systems. It involves preparing for the task, selecting the correct diagnostic procedure, carrying out the diagnosis and the repair, performing post-repair testing, and completing workplace processes and documentation.

It applies to those working in the automotive service and repair industry. The electronic over hydraulic control systems include those in agricultural machinery, heavy commercial vehicles, marine vessels or mobile plant machinery.

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

Competency Field

Mechanical - Mobile Plant

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 diagnose and repair electronic over hydraulic control	1.1 Job requirements are determined from workplace instructions 1.2 Diagnostic information is sourced and interpreted 1.3 Diagnostic options are analysed and those most appropriate to the

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system	circumstances are selected 1.4 Hazards associated with the work are identified and risks are managed 1.5 Diagnostic tools and equipment are selected and checked for serviceability
2. Diagnose electronic over hydraulic control system	2.1 Diagnostic tests are carried out according to manufacturer specifications, workplace procedures and safety requirements 2.2 Faults are identified from diagnostic test results and causes of faults are determined 2.3 Diagnosis findings, including recommendations for necessary repairs or adjustments, are reported according to workplace procedures
3. Repair electronic over hydraulic control system	3.1 Repair information is sourced and interpreted 3.2 Repair options are analysed and those most appropriate to the circumstances are selected 3.3 Repair tools, equipment and materials are selected and prepared 3.4 Repairs and component replacements and adjustments are carried out according to manufacturer specifications, workplace procedures and safety requirements, and without causing damage to components or systems 3.5 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 process are rectified
4. Complete work processes	4.1 Final inspection is made to ensure work is to workplace expectations and machinery is presented ready for use 4.2 Work area is cleaned, waste and non-recyclable materials are disposed of, and recyclable material is collected 4.3 Tools and equipment are checked and stored according to workplace procedures 4.4 Workplace documentation is processed according to workplace 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 information from manufacturer and workshop literature when seeking electronic over hydraulic system specifications and procedures.
Writing skills to:	legibly and accurately fill out workplace documentation when reporting diagnostic findings, making repair recommendations, and recording parts and material used.
Oral communication skills to:	- clarify instructions - report diagnostic findings and make repair recommendations.
Numeracy skills to:	- measure electronic over hydraulic system components and use basic mathematical operations, including addition and subtraction, to calculate distances, tolerances and deviations from manufacturer specification - interpret system hydraulic pressure gauges - interpret electrical test meters.
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:	- operate diagnostic and testing equipment - conduct performance testing of components, systems and equipment.

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>Safety requirements</i> must include:	- work health and safety (WHS) and occupational health and safety (OHS) requirements, including procedures for: - working with high pressure fluid hazards - isolating and stabilising machines.
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Unit Mapping Information

Equivalent to AURKTR3001 Diagnose and repair electric-over-hydraulic control systems

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 AURKTR001 Diagnose and repair electronic over hydraulic control systems

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Performance Evidence

Before competency can be determined, individuals must demonstrate they can perform the following according to the standards defined in this unit's elements, performance criteria, range of conditions and foundation skills:

- diagnose and repair a fault in electronic over hydraulic control system components as follows:
 - all four of the following:
 - hydraulic proportional control solenoids (flow, pressure and directional)
 - joysticks, potentiometer or touchscreens
 - sensors and feedback devices
 - electronic control amplifier units
 - one of the following:
 - electronic over hydraulic circuitry
 - servo control valves (flow, pressure and directional)
 - electronic control unit (ECU).

Knowledge Evidence

Individuals must be able to demonstrate knowledge of:

- work health and safety (WHS) and occupational health and safety (OHS) requirements relating to diagnosing and repairing electronic over hydraulic control systems, including procedures for:
 - working with high pressure fluid hazards
 - isolating and stabilising machines
- operating principles of electronic over hydraulic systems and associated components, including operating principles of flow, pressure and directional control in:
 - electronic open loop circuits

- electronic semi open loop circuits
- electronic closed loop circuits
- application, purpose and operation of electronic over hydraulic control systems and components, including:
 - hydraulic proportional control solenoids
 - servo control units
 - sensors
 - feedback devices
 - electronic control amplifier units
 - joysticks
 - electronic control units
 - electronic over hydraulic circuitry
- diagnostic testing procedures for electronic over hydraulic control systems, including:
 - electronic system analysis while using industry-relevant test equipment
 - component wear analysis
 - system operation analysis
- procedures for inspecting and evaluating the following components:
 - proportional control valves
 - servo control units
 - electronic control units
 - sensors
 - feedback devices
- repair procedures for electronic over hydraulic control systems, including procedures for:
 - testing electronic devices
 - replacing electronic devices and adjusting the following:
 - maximum and minimum flow points
 - dither
 - opening ramps
 - closing ramps
- post-repair testing procedures for electronic over hydraulic control 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 electronic over hydraulic control 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 electronic over hydraulic control system specifications
- two different electronic over hydraulic control systems with faults as specified in the performance evidence
- diagnostic equipment for electronic over hydraulic control systems
- tools, equipment and materials appropriate for repairing and adjusting mobile plant electronic over hydraulic control systems.

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