



Australian Government

AURTTA021 Diagnose complex system faults

Release: 1

AURTTA021 Diagnose complex system faults

Modification History

Release	Comment
Release 1	New unit of competency.

Application

This unit describes the performance outcomes required to diagnose faults in complex vehicle, vessels or machinery systems to determine the repair action necessary to restore system performance. It involves confirming the existence of a complex system fault, choosing the required diagnostic procedure and tools, applying the diagnostic procedure, reporting conclusions, and making repair recommendations.

A complex system integrates two or more automotive systems, or incorporates three or more mechanical, hydraulic, pneumatic, electrical or electronic sub-systems. Examples include electronically controlled automatic transmissions, anti-lock braking systems, and engine management systems integrating ignition, fuel and transmission control systems.

It applies to those working in the automotive service and repair industry.

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

Competency Field

Mechanical Miscellaneous

Unit Sector

Technical

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. Identify and confirm	1.1 Nature and objective of diagnosis requirements are determined

Elements Elements describe the essential outcomes.	Performance Criteria 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.
work requirement regarding complex system fault	from workplace instructions 1.2 Existence of fault is confirmed from direct or indirect evidence 1.3 Information, including customer complaint, is sourced to provide a full overview of all faults and conditions under which they occur
2. Analyse information	2.1 Function and operation of the system when operating correctly are identified 2.2 Information is analysed and affected systems are identified 2.3 Manufacturer specifications and other technical information are accessed and interpreted 2.4 Tests are identified and selected from range of available options, and testing sequence is established 2.5 Testing equipment is obtained and prepared according to manufacturer specifications and workplace procedures 2.6 Tools, equipment and materials required to support the diagnostic process are identified, selected and prepared for use 2.7 Hazards associated with the work are identified and risks are managed according to workplace procedures and safety requirements
3. Perform diagnosis	3.1 Tests are applied systematically and efficiently to gather precise data on system operation according to manufacturer specifications, workplace procedures, and safety and environmental requirements 3.2 Test results are compared with manufacturer specifications and conclusions are drawn and documented according to workplace procedures, including recommendations for necessary repairs 3.3 Diagnostic findings are verified, as required, by using reliable alternative or optional process according to manufacturer specifications and workplace procedures 3.4 Conclusions are provided to appropriate personnel or customer to confirm further action to be taken
4. Complete work processes	4.1 Vehicle or machinery is presented ready to be repaired or returned to the customer 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

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:	research, organise and interpret technical information from manufacturer and workshop literature when seeking specifications and procedures.
Writing skills to:	legibly and accurately fill out workplace documentation when reporting diagnostic findings and making repair recommendations.
Oral communication skills to:	clarify instructions, gain information from customers and supervisor, report diagnostic findings, and make repair recommendations.
Numeracy skills to:	measure components and use basic mathematical operations, including addition and subtraction, to calculate tolerances and deviations from manufacturer specifications.
Planning and organising skills to:	plan own work requirements and prioritise and sequence actions to achieve required outcomes and ensure tasks are completed within workplace timeframes.
Technology skills to:	- use precision measuring equipment, such as micrometers and vernier calipers - use specialised integrated system diagnostic equipment, such as scan tools.

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 for working safely with the vehicle systems being tested, including procedures for: - selecting and using personal protective equipment (PPE) - using tools and equipment.
---	---

Unit Mapping Information

Equivalent to AURTTA4021 Carry out diagnosis of complex system faults

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 AURTTA021 Diagnose complex system faults

Modification History

Release	Comment
Release 1	New unit of competency.

Performance Evidence

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

- diagnose complex system faults on three different vehicles, machinery or vessels
- the above diagnosis must involve two of the following types of complex faults:
 - one fault that is in a complex system that integrates two or more automotive systems
 - one fault that incorporates three or more mechanical, hydraulic, pneumatic, electrical or electronic sub-systems.

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 complex system faults in vehicles, vessels or machinery, including working safely with the systems being tested, including procedures for:
 - selecting and using personal protective equipment (PPE)
 - using tools and equipment
- types, application and operation of complex systems, including:
 - systems that integrates two or more automotive systems
 - systems that incorporate three or more mechanical, hydraulic, pneumatic, electrical or electronic sub-systems
- diagnostic procedures for complex systems, including stages within the diagnostic procedure
- methods of gathering information on complex system faults, including customer questioning techniques
- types and applications of diagnostic flow charts
- types, applications, limitations and operation of diagnostic tools, including:

- multimeters
- scan tools, including:
 - diagnosis trouble codes (DTC) and the conditions that caused the code to be set
 - live data
 - snap shots
- oscilloscopes
- mechanical, hydraulic and pneumatic test equipment
- methods of differentiating between fault symptoms and fault cause.

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 vehicle or machinery complex system faults that they have diagnosed, 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 system specifications
- three different vehicles, vessels or machinery that have the complex system faults specified in the performance evidence
- tools, equipment and materials appropriate for diagnosing complex system faults in vehicles, vessels or machinery.

Links

Companion Volume implementation guides are found in VETNet -

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

Companion Volume implementation guides are found in VETNet -

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