



Australian Government

AURTTA013 Diagnose and repair hydraulic systems

Release: 1

AURTTA013 Diagnose and repair hydraulic 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 hydraulic 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 hydraulic systems include those in heavy commercial vehicles, marine vessels or outdoor power equipment. This unit does not apply to agricultural or mobile plant machinery.

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. Prepare to diagnose and repair hydraulic system	1.1 Job requirements are determined from workplace instructions 1.2 Hydraulic system diagnostic information is sourced and interpreted 1.3 Diagnostic options are analysed and those most appropriate to the

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.
	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 hydraulic system	2.1 <i>Diagnostic tests</i> are carried out according to manufacturer specifications, workplace procedures, and <i>safety and environmental requirements</i> 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 hydraulic 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 checked 3.4 Repairs and component replacements and adjustments are carried out according to manufacturer specifications, workplace procedures, and safety and environmental 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 system 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 hydraulic system specifications and procedures. - interpret hydraulic symbols and circuits on hydraulic system components.
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 hydraulic system components and use basic mathematical operations, including addition, subtraction, multiplication and division, to calculate: - distances, tolerances and deviations from manufacturer specifications - hydraulic system pressures, forces, distances and temperature - read precision measuring equipment, including micrometers, vernier calipers, and flow, temperature and pressure gauges.
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:	- use precision measuring equipment - use pressure gauges or flow meters.

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>Hydraulic system</i> must include:	- reservoirs - pumps - valves - actuators
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	• motors • filters • hoses, pipes, fittings and couplings.
Diagnostic tests must include:	• using pressure gauges and/or flow meters.
Safety and environmental requirements must include:	• work health and safety (WHS) and occupational health and safety (OHS) requirements, including procedures for: • using raising, lowering and supporting equipment • working with fluids under pressure • working with stored pressure hazards • working with hot fluid hazards • isolating and stabilising machines or vehicles • environmental requirements, including procedures for trapping, storing and disposing of fluid released from hydraulic systems.

Unit Mapping Information

Equivalent to AURTTA3013 Repair hydraulic 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 AURTTA013 Diagnose and repair hydraulic systems

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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 and repair a fault in two different hydraulic systems, in which the work must involve removing and refitting or replacing three of the following:
 - hydraulic cylinder
 - hydraulic pump
 - hydraulic motor
 - hydraulic valves
 - hydraulic hose.

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 hydraulic systems, including procedures for:
 - using raising, lowering and supporting equipment
 - working with fluids under pressure
 - working with stored pressure hazards
 - working with hot fluid hazards
 - isolating and stabilising machines or vehicles
- environmental requirements, including procedures for trapping, storing and disposing of fluid released from hydraulic systems
- operating principles of hydraulic systems and associated components, including:
 - transmission of energy by hydraulic fluid
 - mechanical advantage

- hydraulic circuits, including open and closed centred systems
- temperature, force, pressure, area and flow
- application, purpose and operation of hydraulic systems and components, including:
 - reservoirs
 - accumulators
 - pumps, including gear and piston
 - valves, including directional, pressure and flow
 - hand and remote cordless controls
 - linear and rotary actuators
 - hoses, pipes fittings and couplings
 - heat exchangers
 - hydraulic fluids
 - hydraulic symbols and system schematic
- requirements of AS 1101.1 Graphic symbols for general engineering, Part 1: Hydraulic and pneumatic systems
- diagnostic testing procedures for hydraulic systems, including:
 - applying and using a flow meter to diagnose faults by carrying out an in-line, bypass or 'Tee' test to evaluate system components
 - visually inspecting hoses, pipes and connectors
 - oil sampling and contamination control
- repair procedures for hydraulic systems, including procedures for removing, repairing, replacing and adjusting hydraulic system components
- post-repair testing procedures for hydraulic systems, including procedures for testing:
 - operational functionality
 - fluid pressures and levels.

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 hydraulic 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 hydraulic system specifications

- two hydraulic systems with faults in the components specified in the performance evidence
- diagnostic tools and equipment for hydraulic systems, including pressure gauges or flow meters
- AS 1101.1 Graphic symbols for general engineering, Part 1: Hydraulic and pneumatic systems
- tools, equipment and materials appropriate for repairing and adjusting hydraulic systems.

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