



Australian Government

AURKTA011 Diagnose and repair mobile plant hydraulic systems

Release: 1

AURKTA011 Diagnose and repair mobile plant 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 the hydraulic systems of mobile plant. 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 mobile plant hydraulic systems include those in agricultural machinery 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

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 mobile plant hydraulic system	1.1 Job requirements are determined from workplace instructions 1.2 <i>Mobile plant hydraulic system</i> diagnostic information is sourced and interpreted 1.3 Diagnostic options are analysed and those most appropriate to the circumstances are selected

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.
	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 <i>Repairs</i> 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 vehicle or 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 hydraulic system specifications and procedures - interpret hydraulic symbols and circuits.
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, such as 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 hydraulic pressure gauges and 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>Mobile plant hydraulic system</i> must include:	- reservoirs - accumulators - pumps - valves - actuators - motors - filters - hoses, pipes, fittings and couplings.
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Diagnostic tests must include:	• using pressure gauges and flow meters to determine system pressure settings, pump output and individual system component internal leakage.
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 • isolating and stabilising machines • working with stored hydraulic pressure • working with escaping high pressure oil • working with hot fluid hazards • environmental requirements, including procedures for trapping, storing and disposing of hydraulic fluid released from hydraulic systems.
Repairs must include:	• using pressure gauges and flow meters to set system pressure settings and adjust hydraulic valves.

Unit Mapping Information

No equivalent unit.

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 AURKTA011 Diagnose and repair mobile plant 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 the hydraulic systems of two different mobile plant or agricultural machinery, and:
 - remove, refit or replace two different types of hydraulic valves
 - remove, refit or replace one hydraulic cylinder
- in the course of the above work, undertake two the following:
 - rebuild hydraulic cylinder
 - rebuild motor or pump
 - remove, refit or replace hose
 - remove, refit or replace pump
 - remove, refit or replace motor
 - remove, refit or replace accumulator.

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 mobile plant hydraulic systems, including procedures for:
 - using raising, lowering and supporting equipment
 - isolating and stabilising machines
 - working with stored hydraulic pressure
 - working with escaping high pressure oil
 - working with hot fluid hazards

- environmental requirements, including procedures for trapping, storing and disposing of hydraulic fluid released from hydraulic systems
- AS 1101.1 Graphic symbols for general engineering, Part 1: Hydraulic and pneumatic 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
 - gas loaded accumulators
 - pumps, including gear and piston
 - valves, including:
 - directional control, including valve banks
 - pressure control, including spike or circuit protection valving
 - flow control, including meter in and meter out
 - linear and rotary actuators
 - hoses, pipes fittings and couplings
 - heat exchangers
 - hydraulic fluids
 - hydraulic system schematics
- 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, replacing, repairing and adjusting hydraulic system components
- post-repair testing procedures for hydraulic systems, including:
 - operational functionality
 - flow testing.

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 mobile plant 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 mobile plant hydraulic system specifications
- two different mobile plant or agricultural machinery with hydraulic systems requiring the work specified in the performance evidence
- diagnostic tools and equipment for hydraulic systems, including pressure gauges and 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 mobile plant hydraulic systems.

Links

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