



Australian Government

**Assessment Requirements for
FWPCOT4225 Apply principles of
pneumatics and hydraulics to analyse
potential equipment failures**

Assessment Requirements for FWPCOT4225 Apply principles of pneumatics and hydraulics to analyse potential equipment failures

Modification History

Release	Comments
Release 1	This version released with FWP Forest and Wood Products Training Package Version 8.0.

Performance Evidence

An individual demonstrating competency must satisfy all of the elements and performance criteria in this unit.

There must be evidence that the individual has:

- used a simple system diagram to describe the operation of:
 - one pneumatic system of an item of equipment used in forest or wood products operations
 - one hydraulic system of an item of equipment used in forest or wood products operations
- conducted basic failure modes, effects and root causes analysis on hydraulic or pneumatic components of an item of equipment used in forest or wood products operations
- provided one recommendation for reducing the risk of equipment failure or malfunction as part of preventative maintenance.

Knowledge Evidence

An individual must be able to demonstrate the knowledge required to perform the tasks outlined in the elements and performance criteria of this unit. This includes basic knowledge of:

- key concepts of pneumatic power systems in worksite forest or wood products equipment, machines or plant, including:
 - purpose and advantages of pneumatic power transmission
 - terminology used in pneumatic power systems, including prime movers: linear, rotary, radial; pressure, flow, orifice flow, force, torque, holding pressure, load, lift, stroke
 - atmospheric, gauge and absolute pressure
 - vacuum
 - Pascal's law application to pneumatic power transmission
 - formulae for pressure, force
 - measurement units

- pneumatic power system operation in worksite forest or wood products equipment, machines or plant, including:
 - purpose of components, including mechanical, electrical and electronic components
 - types of gases
 - contamination
 - precision control
 - operational response rate
 - performance characteristics
 - difference between air production and air consuming systems
 - risks of pressure in hydraulic power systems, including actuator stopped or stalled, stored energy
 - hazards, including crushing and pinch points, sudden shoot out, presence of carbon monoxide in system, exposure to compressed air, split tube or pipe
 - types of frequent malfunctions during operations
- key concepts of hydraulic power systems in worksite forest or wood products equipment, machines or plant, including:
 - purpose and advantages of hydraulic power transmission
 - terminology used in hydraulic power systems – pressure, flow, force, torque, holding pressure, linear movement, rotary movement, load, lift
 - atmospheric, gauge, and absolute pressure
 - Pascal's law application to hydraulic power transmission
 - formulae – pressure, force
 - measurement units
- hydraulic power system operation in worksite forest or wood products equipment, machines or plant, including:
 - purpose and function of components, including mechanical, electrical and electronic components
 - types of fluids
 - contamination
 - pressure and flow control
 - performance characteristics
 - components, including reservoir, gauge, filter, control valves, pressure relief valves, pump, actuator, regulator
 - risks of pressure in hydraulic power systems, including pump running, pump stopped, stored energy
 - hazards, including crushing and pinch points, burns from hot oil at high pressure, fire from oil leaks, flailing hydraulic lines, injection of oil into the skin, oil leaks on floor, skin exposure to oil
 - types of frequent malfunctions during operations, including pressure fluctuation, fluid leakage and excessive temperature, overheating, excessive noise, insufficient power
- techniques for determining 'mean time between failures' (MTBF)

- techniques for undertaking failure modes, effects and root causes analysis on hydraulic and pneumatic components of worksite forest or wood products equipment, machines or plant.

Assessment Conditions

Assessment of the skills in this unit of competency must take place under the following conditions:

- physical conditions:
 - skills must be demonstrated in a forest or wood products work environment or an environment that accurately represents workplace conditions
- resources, equipment and materials:
 - basic technical references relevant to hydraulic and pneumatic systems and components
- specifications:
 - workplace procedures and manufacturer specifications relevant to hydraulic and pneumatic power systems and components in forest and wood products equipment, machines and plant.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

Links

Companion Volumes, including Implementation Guides, are available at VETNet: - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=0d96fe23-5747-4c01-9d6f-3509ff8d3d47>