



Australian Government

Assessment Requirements for AURTTE001 Apply knowledge of engine science

Release: 1

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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 and foundation skills:

- apply knowledge of engine science to three different multi-cylinder engines when diagnosing and repairing engine faults or reconditioning engine components
- evaluate and expand knowledge of engine science, including demonstrating knowledge of one of the following:
 - new repair or reconditioning procedure
 - new engine technology
 - new reconditioning machine.

Knowledge Evidence

Individuals must be able to demonstrate knowledge of:

- classifications of engines, including:
 - internal and external combustion
 - rotary and reciprocating engines
 - spark ignition and compression ignition engines
 - engine cylinder arrangements
- engine configurations, including:
 - inline engines, V type engines and slant cylinder engines
 - opposed cylinder engines
- camshaft and valve locations, including:
 - overhead cam (OHC)
 - overhead valve (OHV)

- engine operating principles, including:
 - combustion, including:
 - air to fuel ratios and flame propagation
 - direct and indirect fuel injection
 - detonation and pre-ignition
 - two-stroke and four-stroke cycles
- procedures for measuring engines and engine performance, including:
 - bore and stroke, including:
 - over square, square and under square engines
 - crank throw
 - swept volume and engine volume
 - compression ratio
 - engine efficiency, including volumetric efficiency, thermal efficiency and mechanical efficiency
 - torque and horsepower, including brake horsepower
- construction and operation of petrol engines, including:
 - basic metallurgy relating to engines
 - identification of metric and imperial threads
 - engine components, including cylinder blocks, cylinders, pistons, cylinder heads, combustion chambers, inlet and exhaust manifolds, connecting rods, crankshafts, piston rings, gudgeon pins, camshafts, cams and flywheels
- combustion chambers, including:
 - L head, bathtub, wedge, trapezoidal, hemispherical and heron-type shapes
 - multiple valve designs
- construction and operation of diesel engines, including:
 - direct and indirect injection
 - swirl chambers
 - pre-combustion chambers
- engine diagnosis, including:
 - wet and dry compression tests
 - cylinder leakage tests
 - cylinder power balance tests
 - vacuum tests
 - oil pressure tests
 - sources of fluid leaks
 - exhaust smoke diagnosis
- engine noise diagnosis, including procedures for identifying:
 - common engine noises
 - common abnormal combustion noises
- procedures for expanding knowledge, including location and content of:

- technical literature relating to engine science
- technical information relating to new and emerging engine technologies.

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 engine science they have applied to engines 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
- three different multi-cylinder engines
- technical literature relating to engine science.

Links

Companion Volume implementation guides are found in VETNet -

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

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