



Australian Government

Assessment Requirements for AURTTM005 Balance rotating and reciprocating engine components

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 standards defined in this unit's elements, performance criteria, range of conditions and foundation skills:

- balance one four or six cylinder in-line engine crankshaft assembly, including:
 - front pulley
 - crankshaft and flywheel and pressure plate (manual transmission) or drive plate (automatic transmission)
- balance one V8 engine crankshaft assembly, including:
 - front pulley
 - crankshaft and flywheel and pressure plate (manual transmission) or drive plate (automatic transmission)
- balance one piston and connecting rod assembly
- during the above work, perform each of the following methods of adding or removing weight from engine components:
 - drilling
 - welding
 - machining.

Knowledge Evidence

Individuals must be able to demonstrate knowledge of:

- work health and safety (WHS) and occupational health and safety (OHS) requirements relating to balancing rotating and reciprocating engine components, including operational risk assessment and treatments associated with:
 - electrical safety of balancing equipment and machinery
 - equipment and machinery movement and operation

- operating principles of component balancing, including:
 - dynamic balance
 - internally and externally balanced engines
 - reciprocating mass
 - rotating mass
 - sources of torsional vibration
 - gas pressure
 - purpose of counterweights, torsional vibration dampeners, and balance shafts in balancing
 - difference between in-line engine balance, flat plane and V type engine balance, including the effect of the number and angle of cylinders
- balancing procedures and techniques, including:
 - in-line engines, flat plane crankshafts and V type engines
 - protecting crank pins from damage from bob-weight clamping
 - protecting main bearing journals from damage from balancing machine cradle rollers or V block
 - weight matching the pistons and rod ends
 - methods of calculating bob-weight values for V type and in-line engines, including:
 - rotating mass with oil allowance
 - reciprocating mass
 - effect of number of cylinders and V angle on the total calculation
 - mounting bob-weights on crankshafts of V type engines
 - balancing internally balanced engines
 - balancing externally balanced engines
- procedures for adding and removing metal to the crankshaft, including:
 - drilling and finishing to remove weight
 - welding to add weight
 - machining or drilling and adding heavy metal.

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 rotating and reciprocating engine components that they have balanced, 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 engine specifications
- material relevant to balancing rotating and reciprocating engine components
- multi-cylinder crankshafts, flywheels and piston and connecting rod assemblies specified in the performance evidence and requiring balancing
- precision measuring equipment, including:
 - dial indicators
 - inside and outside metric and imperial micrometers
 - scales in 0.1 gram graduations
- finishing machine
- hand, air and power tools appropriate to balancing rotating and reciprocating engine components.

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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