



Australian Government

**Assessment Requirements for AURETU005
Retrofit and modify air conditioning and
HVAC systems**

Release: 1

Assessment Requirements for AURETU005 Retrofit and modify air conditioning and HVAC systems

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 the unit's elements, performance criteria, range of conditions and foundation skills:

- retrofit and modify the air conditioning and HVAC systems of two different vehicles or machinery, in which the work must include changing the type of refrigerant.

Knowledge Evidence

Individuals must be able to demonstrate knowledge of:

- work health and safety (WHS) and occupational health and safety (OHS) requirements relating to retrofitting and modifying air conditioning and HVAC systems, including procedures for:
 - working with refrigerants at boiling point given risk of frostbite
 - working with system lubricants, including carcinogenic oils
 - identifying and handling flammable refrigerants, including hydrocarbon (HC) refrigerants
 - selecting and using personal protective equipment (PPE)
 - identifying firefighting equipment
- environmental requirements, including procedures for:
 - preventing loss of refrigerant to the atmosphere
 - handling materials and refrigerant recovery equipment
- key requirements of Australian automotive code of practice: Control of refrigerant gases during manufacture, installation, servicing or de-commissioning of motor vehicle air conditioners
- application, purpose and operation of air conditioning and HVAC systems and components, including:

- high pressure and low pressure sides of air conditioning systems
- compressors, including:
 - piston, scroll and rotary vane compressors
 - electric compressors
 - variable displacement compressors
 - clutchless compressors electromagnetic clutches
- condensers
- receiver-dryers, including filters and desiccants
- expansion valves, including capillary tubes
- evaporators
- thermostats
- refrigerants, including R12, R134a, R1234yf, R290 and R600a blends
- compressor oils
- air conditioner and heating controls, including levers and ducting
- air conditioner and heating electrical circuits and sensors, including:
 - high and low pressure switches
 - pressure relief valves
 - temperature sensors
- climate control systems
- procedures for retrofitting and modifying air conditioning and HVAC systems, including:
 - determining original system fitted to vehicle, including refrigerant and oil type and types of components
 - determining appropriate retrofit and modification options, including:
 - determining required system performance output
 - component replacement, including O rings and seals
 - refrigerant and oil selection
 - procedures for removing and replacing system components
- procedures for changing system refrigerant, including:
 - changing refrigerant gas from R12 to R134a:
 - receiver dryer filter replacement
 - change system fittings for manifold gauge attachment
 - change oil type
 - changing refrigerant gas from R134a to R1234yf:
 - change refrigerant recharging ports
 - change system fittings for manifold gauge attachment
 - changing refrigerant gas from R134a to blends of R290 and R600a:
 - change refrigerant re-charging ports
 - change system fittings for manifold gauge attachment
- procedures for recovering automotive refrigerant, including:
 - testing refrigerant to determine its type

- connecting manifold and gauge set and recovery unit, including types and location of service ports
- identifying recovery cylinder appropriate to the refrigerant
- operating recovery unit, including weighing recovery cylinder before after recovery
- disconnecting and storing recovery unit and cylinder
- procedures for re-gassing air conditioning and HVAC systems, including:
 - testing system for leaks using vacuum and pressure testing
 - using manifold gauges to charge system
- post-retrofit testing procedures for air conditioning and HVAC systems, including procedures for checking for:
 - refrigerant leaks
 - heater core and system water coolant leaks
- static and dynamic performance tests of air conditioning and HVAC systems, including checking:
 - ambient temperature
 - vent temperature
 - condenser and suction line temperature
- procedures for completing workplace documentation, including ARCTick service decal sticker.

Assessment Conditions

Assessors must satisfy NVR/AQTF assessor requirements and hold an Australian Refrigerant Council (ARC) Refrigerant Handling licence.

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 air conditioning and HVAC systems that they have retrofitted and modified, 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
- vehicle or machinery air conditioning and HVAC system manufacturer specifications
- Australian automotive code of practice: Control of refrigerant gases during manufacture, installation, servicing or de-commissioning of motor vehicle air conditioners
- two different vehicles or machinery with air conditioning and HVAC systems requiring retrofitting and modification

- retrofit, modification and testing equipment for air conditioning and HVAC systems, including:
 - manifold and gauge set
 - recovery unit
 - vacuum pump
 - leak detector
 - refrigerant analyser.

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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