



Australian Government

**Assessment Requirements for AURETU105
Retrofit automotive air conditioning and
HVAC systems**

Release: 1

Assessment Requirements for AURETU105 Retrofit automotive air conditioning and HVAC systems

Modification History

Release	Comments
Release 1	This version first released with AUR Automotive Retail, Service and Repair Training Package Version 6.0

Performance Evidence

The candidate must demonstrate the ability to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including evidence of the ability to:

- retrofit 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

The candidate must be able to demonstrate knowledge to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including knowledge of:

- methods to locate and interpret information required to retrofit automotive air conditioning and HVAC systems, including:
 - 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
- workplace procedures required to retrofit automotive air conditioning and HVAC systems, including:
 - establishing the serviceability of tools and equipment
 - documentation procedures
 - housekeeping procedures, including:
 - examination of tools and equipment
 - storage of equipment
 - identification, tagging and isolation of faulty equipment
 - safe disposal of materials
 - recycling procedures
- workplace health and safety (WHS) requirements relating to retrofitting 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 refrigerant and oil type, including:
 - service decal sticker
 - testing refrigerant
 - types and location of service ports
- handling, storing and transporting refrigerant cylinders and recovery cylinders, including:
 - pressure ratings
 - pressure relief devices
 - outlet connection type
- identifying and handling 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 federal Ozone Protection and Synthetic Greenhouse Gas Management Regulations, including refrigerant handling licence and refrigerant trading authorisation
- purpose and operation of automotive 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, and hydrocarbon 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 associated modifications for 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 associated 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
 - reasons why R134a refrigerant must not be retrofitted to R1234yf
 - reasons why R134a refrigerant must not be retrofitted to blends of hydrocarbons
- 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 testing and dry nitrogen pressure testing
 - evacuating the system using a vacuum pump and vacuum gauge
 - using manifold gauges, refrigerant scales or charging station 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
 - system performance is operating to manufacturer specifications
 - reported pre-modification issue has been resolved
 - no other faults are present
- static and dynamic performance tests of air conditioning and HVAC systems, including checking:
 - ambient temperature
 - vent temperature
 - condenser and suction line temperature.

Assessment Conditions

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, 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
- retrofit and testing equipment for air conditioning and HVAC systems, including:
 - manifold and gauge set
 - recovery unit and recovery cylinder
 - vacuum pump and gauge
 - leak detector
 - refrigerant analyser
 - refrigerant
 - refrigerant scales or charging station
 - dry nitrogen cylinder and gauge.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards; and hold an Australian Refrigerant Council (ARC) Refrigerant Handling licence.

Links

Companion Volume Implementation Guide is found on VETNet -

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