



Australian Government

AURETU203 Service air conditioning and HVAC systems

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Modification History

Release	Comments
1	This unit of competency was first released in AUR Automotive Retail, Service and Repair Training Package Release 10.0.

Application

This unit describes the skills and knowledge required to service air conditioning systems, including heating, ventilation and air conditioning (HVAC) systems, fitted to a range of vehicles and machinery. Servicing includes performance testing, inspection and mechanical maintenance of air conditioning and HVAC system components. It does not include recovering, recharging or adding refrigerant.

The unit applies to those who work in the automotive service and repair industry. Automotive air conditioners, in addition to HVAC systems, include those in agricultural machinery, heavy commercial vehicles, light vehicles or mobile plant machinery. The systems used vary depending on the work context.

Licensing/Regulatory Information

Licensing requirements apply to this unit. Users are advised to check with the relevant regulatory authority.

An Australian Refrigeration Council (ARCTick) Automotive Refrigerant Handling Licence is required for those carrying out this work. An ARCTick trainee licence is required to undertake this training.

Pre-requisite unit(s)

No pre-requisite units

Competency field(s)

Electrical

Unit sector(s)

Electrical Technical - Air Conditioning and HVAC

Elements and Performance Criteria

Element	Performance criteria
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<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Prepare to service system	1.1 Identify job requirements from workplace instructions 1.2 Access and interpret servicing information, including manufacturer specifications and Australian automotive refrigerant handling code of practice 1.3 Identify servicing option required for the job 1.4 Identify hazards and environmental issues, assess potential risks and implement control measures in line with workplace policies and procedures 1.5 Identify tools and equipment required for inspection and servicing activity and establish serviceability according to workplace procedures
2. Test operation of system and components	2.1 Visually check system and report extent of damage according to workplace procedures 2.2 Carry out system performance tests according to manufacturer specifications, workplace procedures, and workplace health and safety and environmental requirements 2.3 Report findings and make recommendations for necessary servicing according to workplace procedures
3. Service system and components	3.1 Read and interpret Australian automotive refrigerant handling code of practice 3.2 Check for and record fault codes using a scan tool according to manufacturer specifications and workplace procedures 3.3 Service system and components according to manufacturer specifications, Australian automotive refrigerant handling code of practice and workplace procedures 3.4 Carry out post-service performance tests according to workplace procedures 3.5 Confirm and report service issue has been resolved according to workplace procedures
4. Complete work processes	4.1 Conduct final inspection according to workplace procedures and confirm vehicle is ready for use 4.2 Clear work area and dispose of or recycle materials according to workplace procedures 4.3 Complete service label and workplace documentation according to workplace procedures

Foundation skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance but not explicit in the performance criteria.

Skill	Description
Learning	Locates required sources of information efficiently
Reading	- Interprets text, symbols and diagrams relating to service information in manufacturer specifications, and workplace instructions and procedures - Interprets information from safety data sheets (SDS)
Writing	Legibly and accurately fill out workplace documentation, including the service label appropriate to the work performed and the licence conditions held, when reporting service and inspection findings, making maintenance recommendations, and recording parts and materials used
Oral communication	- Listens to workplace instructions and asks questions to clarify job requirements - Participates in verbal exchanges to report faults, diagnostic and test findings and service repair recommendations to relevant personnel
Numeracy	- Matches refrigerant classes and identification markings to workplace instructions, part lists and manufacturer specifications - Interprets weight measurements, including tare and gross weights - Interprets readings on digital and analogue pressure gauges - Measures temperatures and pressures, and uses basic mathematical operations, including addition and subtraction, to calculate deviations from manufacturer specifications
Planning and organising	- Plans own work requirements - Prioritises actions to achieve required outcomes - Ensures tasks are completed within workplace timeframes
Technology	Uses workplace technology and tools

Range of conditions

N/A

Assessment Requirements for AURETU203 Service air conditioning and HVAC systems

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:

- service the air conditioning and HVAC systems of two different vehicles or machinery, with different refrigerant classes, in which the work must involve:
 - one air conditioning system, in which the work must include checking system operating pressure
 - one heating, ventilation and air conditioning (HVAC) system
- complete service labels for the above jobs.

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 service air conditioning and HVAC systems, including:
 - air conditioning and HVAC system manufacturer specifications
 - Australian automotive refrigerant handling code of practice
 - refrigerant classification systems and safety characteristics
 - original equipment manufacturer (OEM) technical information access and interpretation
- workplace procedures required to service air conditioning and HVAC systems, including:
 - servicing air conditioning and HVAC system procedures
 - 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
- refrigerant safety classifications and characteristics of gases relevant to automotive air conditioning systems, including:

- Class A1 – lower toxicity, no flame propagation, including R-134a
 - Class A2L – lower toxicity, lower flammability, including R-1234yf
 - Class A3 – lower toxicity, higher flammability, including R-600
- work health and safety (WHS) and occupational health and safety (OHS) requirements relating to servicing air conditioning and HVAC systems, including procedures for:
 - interpreting safety data sheets (SDS) for refrigerants and lubricants
 - managing risk of freeze burn and cold burns when handling refrigerants
 - working with system lubricants, including health and safety issues associated with handling refrigerant lubricants
 - handling flammable and non-flammable refrigerants
 - Class A1 refrigerants – lower toxicity, no flame propagation
 - Class A2L refrigerants – lower toxicity, lower flammability
 - Class A3 refrigerants – lower toxicity, higher flammability
 - selecting and using personal protective equipment (PPE)
 - identifying and using fire safety equipment appropriate for refrigerant class
 - avoiding unauthorised refrigerant circuit access
- environmental requirements under the Ozone Protection and Synthetic Greenhouse Gas Management Regulations 1995 and procedures in the Australian automotive refrigerant handling code of practice relating to servicing air conditioning and HVAC systems for:
 - preventing loss of refrigerant to the atmosphere
 - preventing refrigerant cross-contamination and gas mixing
- identification and function of major air conditioning and HVAC system components, including:
 - compressor
 - condenser
 - receiver-dryer
 - flow control device
 - evaporator
 - blower fan
- principles of operation of air conditioning and HVAC systems, including transferring heat from cabin to exterior using refrigerant gas
- workplace procedures for recording and reporting scan tool fault codes
- types of air conditioning and HVAC systems, including:
 - Manual and Electronic air conditioning systems
 - Manual Climate Control (MCC) HVAC systems

- Single-zone Electronic Climate Control (ECC) HVAC systems
 - Multi-zone Electronic Climate Control (ECC) HVAC systems
- inspection procedures for air conditioning and HVAC systems, including:
 - conducting visual, aural and functional assessments for:
 - component damage and wear
 - component corrosion
 - vacuum loss or refrigerant leakage, including:
 - loose or damaged fittings and hoses
 - oil residue indicating possible refrigerant leaks
- identifying receiver-dryer type and condition, including:
 - sealed receiver-dryer units
 - receiver-dryer units fitted with a replaceable desiccant bag
 - indicators that a replaceable desiccant requires replacement, including moisture saturation indicators and service interval triggers
- system performance testing, including:
 - checking system pressure
 - checking blower fan output
 - checking engine fan output
 - checking cabin air filters
- service and adjustment procedures of air conditioning and HVAC systems, including:
 - checking cabin air filters
 - checking and adjusting compressor drive belts
 - changing cabin air filters
 - clearing evaporator condensate water outlet
 - cleaning condenser
- post-service testing procedures of air conditioning and HVAC systems, including:
 - system performance testing
 - measuring vent temperatures
- procedures for completing workplace documentation, including service label.

Assessment Conditions

Assessment of skills must take place under the following 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 serviced, 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 service repair workplace or simulated workplace
 - workplace instructions
 - air conditioning and HVAC system manufacturer specifications
 - Australian automotive refrigerant handling code of practice
 - two different vehicles or machinery with air conditioning or HVAC systems with different refrigerant classes
 - tools, equipment and materials appropriate for servicing air conditioning and HVAC systems, including:
 - thermometer
 - manifold and gauge set (either as a standalone item or integrated into a combined recovery, evacuation and charging unit)
 - leak detection equipment appropriate to the refrigerant class and system being tested

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 Refrigeration Council (ARCTick) Automotive Refrigerant Handling Licence

Mandatory Workplace Requirements

Assessment of performance evidence may be in a workplace setting or an environment that accurately represents a real workplace.

Unit Mapping Information

Previous Code and Title	Equivalence	Comments
AURETU103 Service air conditioning and HVAC systems	Equivalent	Supersedes and is equivalent to AURETU103 Service air conditioning and HVAC systems

Links

Companion volumes, including implementation guides, are found on the national training register - <https://training.gov.au/training/details/AUR>.

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