



Australian Government

Department of Education, Employment and Workplace Relations

AURT322666A Repair/retrofit air conditioning systems

Release: 1

AURT322666A Repair/retrofit air conditioning systems

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers the competence required to repair/retrofit automotive air conditioning systems.
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Application of the Unit

Application of the unit	<p>The unit includes identification and confirmation of work requirement, preparation for work, degassing and re-gassing of the system, repair and retrofit of system and the completion of work finalisation processes, including clean-up and documentation.</p> <p>Work involved includes automotive air conditioners fitted to light vehicles, heavy vehicles, mobile plant and equipment, and marine craft.</p> <p>Work requires individuals to demonstrate discretion, judgement and problem-solving skills in managing own work activities and contributing to a productive team environment.</p> <p>Requirements of State/Territory licences to purchase ozone depleting substance and State/Territory licences to handle ozone depleting substance are to be observed.</p> <p>Work is carried out in accordance with award provisions.</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare to repair and retrofit air conditioner system	1.1. Nature and scope of work requirements are identified and confirmed 1.2. OH&S requirements, including individual State/Territory regulatory requirements and personal protection needs are observed throughout the work 1.3. Procedures and information such as workshop manuals and specifications, and tooling required, are sourced 1.4. Method options are analysed and those most appropriate to the circumstances are selected and prepared 1.5. Technical and/or calibration requirements for repair and retrofit are sourced and support equipment is identified and prepared 1.6. Warnings in relation to working with air conditioning and refrigerant are observed
2. De-gas and re-gas air conditioner system	2.1. Correct information is accessed and interpreted from manufacturer/component supplier specifications 2.2. System is de-gassed using approved recovery unit 2.3. System is evacuated in accordance with manufacturer/ component supplier specifications and industry codes of practice and State/Territory legislation with reference to ozone depleting substances 2.4. System is re-gassed and performance tested using approved methods and equipment 2.5. De-gas and re-gas air conditioner system is completed without causing damage to any component or system 2.6. De-gassing and re-gassing operations are carried out with respect to ozone depleting substances and according to industry regulations/guidelines, OH&S legislation, legislation and enterprise procedures/policies
3. Repair/retrofit air conditioning systems	3.1. Correct information is accessed and interpreted from manufacturer/component supplier specifications 3.2. Air conditioning repair/retrofit procedures are determined after performance testing 3.3. Repair/retrofit of the system and components are carried out in accordance with manufacturer/component supplier specifications

ELEMENT	PERFORMANCE CRITERIA
	3.4. Repair/retrofit air conditioning system is completed without causing damage to any component or system 3.5. Repair/retrofit is carried out according to industry regulations/guidelines, OH&S legislation, legislation and enterprise procedures/policies
4. Prepare air conditioning system for use	4.1. System is tested prior to placing into service and results are documented according to enterprise policies and procedures 4.2. Service schedule documentation is completed 4.3. Final inspection is made to ensure protective guards and safety features are in place 4.4. Job card is processed in accordance with workplace procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- apply research and interpretive skills sufficient to locate, interpret and apply manufacturer/component supplier procedures, workplace policies and procedures
- apply analytical skills required for identification and analysis of technical information
- apply plain English literacy and communication skills in relation to dealing with customers and team members
- apply questioning and active listening skills for example when obtaining information from customers
- apply oral communication skills sufficient to convey information and concepts to customers
- apply planning and organising skills to own work activities, including making good use of time and resources, sorting out priorities and monitoring one's own performance
- interact effectively with other persons both on a one-to-one basis and in groups, including understanding and responding to the needs of a customer and working effectively as a member of a team to achieve a shared goal
- establish safe and effective work processes which anticipate and/or resolve problems and downtime, to systematically develop solutions to avoid or minimise reworking and avoid wastage

REQUIRED SKILLS AND KNOWLEDGE

- use mathematical ideas and techniques to correctly calculate time, assess tolerances, apply accurate measurements, calculate material requirements and establish quality checks
- use workplace technology related to the repair/retrofit of air conditioning systems, including the use of measuring equipment, computerised technology, specialist tooling and communication devices and the reporting/documenting of results

Required knowledge

A working knowledge of:

- OH&S regulations/requirements, licence requirements, equipment, material and personal safety requirements
- ozone protection legislation
- dangers associated when working with refrigerants
- identification of application, purpose and operation
- identification of component parts to include physical, fluids, gases and heat generation
- types and layout of service/repair manuals (hard copy and electronic)
- refrigerant types and application
- system electrical circuits
- refrigerants/oils and capacities
- repair/retrofitting procedures
- de-gas, re-gas procedures
- work practices in relation to preventing damage to sensitive electronic components
- system performance testing procedures
- enterprise quality procedures
- work organisation and planning processes

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Critical aspects for assessment and evidence required to demonstrate competency in this unit

It is essential that competence is fully observed and there is ability to transfer competence to changing circumstances and to respond to unusual situations in the critical aspects of:

- observing safety procedures and requirements, in particular, the dangers associated with handling refrigerants
- communicating effectively with others involved in or affected by the work
- selecting methods and techniques appropriate to the circumstances
- completing preparatory activity in a systematic manner
- identification of application, purpose and operation
- application of full repair sequence as per the Range Statement to an air conditioning system relative to the qualification being sought
- accurately interpreting performance test results
- conducting de-gas, re-gas, evacuation of refrigerant operations according to industry codes of practice and legislation
- completing repair and retrofit of air conditioning systems and associated components within workplace timeframes
- vehicle/equipment is presented to customer in compliance with workplace requirements

Context of, and specific resources for assessment

Application of competence is to be assessed in the workplace or simulated worksite

Assessment is to occur using standard and authorised work practices, safety requirements and environmental constraints

Assessment is to comply with regulatory requirements, including Australian Standards

The following resources should be made available:

- workplace location or simulated workplace
- material relevant to the repair/retrofit of air conditioning systems
- equipment, hand and power tooling appropriate to the

EVIDENCE GUIDE	
	repair/retrofit of air conditioning systems <ul style="list-style-type: none"> • activities covering mandatory task requirements • specifications and work instructions
Method of assessment	<p>Assessment must satisfy the endorsed assessment guidelines of the automotive industry's RS&R Training Package</p> <p>Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge</p> <p>Assessment must be by direct observation of tasks, with questioning on underpinning knowledge and it must also reinforce the integration of key competencies</p> <p>Assessment may be applied under project related conditions and require evidence of process</p> <p>Assessment must confirm a reasonable inference that competence is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances</p> <p>It is preferable that assessment reflects a process rather than an event and occurs over a period of time to cover varying quality circumstances. Evidence of performance may be provided by customers, team leaders/members or other persons subject to agreed authentication arrangements</p> <p>Competence in this unit may be assessed in conjunction with other functional units which together form part of the holistic work role</p>
Guidance information for assessment	

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

RANGE STATEMENT	
Variables	Variables may include: <ul style="list-style-type: none"> • refrigerant leak detecting • refrigerant re-gassing and de-gassing • system evacuation • mechanical removal and replacement of components • system/component testing • performance testing
Faults	Faults include excessive cabin temperature
OH&S	OH&S requirements are to be in accordance with legislation/regulations/codes of practice and enterprise safety policies and procedures. This may include protective clothing and equipment, use of tooling and equipment, workplace environment and safety, handling of material, use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances
Personal protective equipment	Personal protective equipment is to include that prescribed under legislation/regulations/codes of practice and workplace policies and practices
Safe operating procedures	Safe operating procedures are to include, but are not limited to the conduct of operational risk assessment and treatments associated with ozone depletion risks, vehicular movement, toxic substances, electrical safety, machinery movement and operation, manual and mechanical lifting and shifting, working in proximity to others and site visitors
Emergency procedures	Emergency procedures related to this unit are to include, but are not limited to emergency shutdown and stopping of equipment, extinguishing fires, enterprise first aid requirements and site evacuation
Environmental requirements	Environmental requirements are to include but are not limited to ozone depletion protection, waste management, noise, dust and clean-up management

RANGE STATEMENT	
Quality requirements	Quality requirements are to include, but are not limited to regulations, including Australian Standards, internal company quality policy and standards and enterprise operations and procedures
Statutory/regulatory authorities	Statutory/regulatory authorities may include Federal, State/Territory and local authorities administering acts, regulations and codes of practice
Tooling and equipment	Tooling and equipment may include hand tooling, refrigerant leak detecting equipment, evacuation equipment, refrigerant recovery and/or recycling equipment, thermometers, ram air fan and refrigerant re-gassing equipment
Materials	Materials may include spare parts, refrigerant, refrigerant oils and cleaning material
Communications	Communications are to include, but are not limited to verbal and visual instructions and fault reporting and may include site specific instructions, written instructions, plans or instructions related to job/task, telephones and pagers
Information/documents	<p>Sources of information/documents may include:</p> <ul style="list-style-type: none"> • verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, memos, material safety data sheets, diagrams or sketches • safe work procedures related to the repair/retrofit of air conditioning systems • regulatory/legislative requirements pertaining to the automotive industry, including Australian Design Rules and ozone protection legislation • engineer's design specifications and instructions • organisation work specifications and requirements • instructions issued by authorised enterprise or external persons • Australian Standards

Unit Sector(s)

Unit sector	Technical
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Co-requisite units

Co-requisite units	

Competency field

Competency field	
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