

SERVICE AND REPAIR AUTOMOBILE AIR-CONDITIONING UNITS

UNIT CODE: ENG/OS/RAC/CR/03/5/A

UNIT DESCRIPTION

This unit covers the competencies required to service, identify and analyze faults found in automobile air conditioning units. It also covers competencies for identifying and repairing faults, performing refrigerant recovery/recycling and retrofitting on automobile air-conditioning units as well as performing test-run on repaired units.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT These describe the key outcomes which make up workplace function.	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Service automobile air conditioning components	1.1 <i>Tools and equipment</i> are selected as per job requirements 1.2 <i>Components</i> are checked for damage and replaced if required in line with manufacturer's specifications
2. Prepare for troubleshooting and repair	2.1 Appropriate diagrams, charts and manuals are interpreted in line with the job requirements 2.2 Appropriate materials, tools and equipment are selected based on job requirements 2.3 Power supply is checked to ensure compliance with manufacturer's specifications
3. Identify and repair faults in automobile air conditioning systems	3.1 Safe working practices are observed throughout the task as per work place procedures 3.2 <i>Tools, equipment and instruments</i> are selected and used in line with job requirements 3.3 <i>Components</i> are tested following manufacturer's manuals and work place troubleshooting policy 3.4 Components with faults are diagnosed in line with manufacturer's manuals and work place troubleshooting policy 3.5 Air-conditioning system requiring recovery/recycling is identified 3.6 Refrigerant recovery/recycling is performed according to manufacturer's manuals 3.7 Retrofitting/conversion is performed according to manufacturer's manuals where applicable

	<p>3.8 Remedial action is taken to overcome faults in line with manufacturer's manuals and work place troubleshooting policy</p> <p>3.9 Work is completed in line with workplace safety guidelines and <i>environmental legislations</i></p>
4. Test-run repaired unit	<p>4.1 <i>Unit</i> is tested in line with manufacturer's manual and work place procedures</p> <p>4.2 Report is prepared in line with manufacturer's manual and work place procedures</p> <p>4.3 Unit is handed over to the user according to work place procedures</p> <p>4.4 Report is prepared in line with work place procedures</p>
5. Prepare service and maintenance reports	Report writing

RANGE

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. Tools, equipment and instruments may include but not limited to:	<ul style="list-style-type: none"> • Pliers • Screwdrivers • Hammers • Chisels • Spirit levels • Phase testers • Files • Fin combs • Nut drivers • Socket wrenches • Brazing equipment • Arc welding equipment • Multi-meters • Leak detectors • System analyzers • Recovery/recycling units • Weighing balance • Refrigerant identifier

	<ul style="list-style-type: none"> • Vacuum pumps
2. Components may include but not limited to:	<ul style="list-style-type: none"> • Electrical controls <ul style="list-style-type: none"> ○ Thermostats ○ Defrost timers ○ Defrost heaters ○ Defrost sensors ○ Thermo discs ○ Relays ○ Switches ○ Overload protector • Compressors • Blowers • Capacitors • Electronic control cards • Magnetic clutch
3. Environmental legislations may include but not limited to:	<ul style="list-style-type: none"> • Environmental Management Coordination Act • Environmental Protection Agency (EPA)
4. Unit may include but not limited to:	<ul style="list-style-type: none"> • Air conditioning system • Automobile

REQUIRED SKILLS AND KNOWLEDGE

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

Required Skills

The individual needs to demonstrate the following skills:

- Interpreting schematic diagrams
- Servicing and maintaining of automobile air conditioning components
- Preparing materials
- Proper handling of tools, equipment and instruments
- Repairing and testing electrical system
- Tube processing
- Proper handling of refrigerant and refrigeration oil
- Recovery/recycling refrigerants
- Retrofitting and conversion

Required Knowledge

The individual needs to demonstrate knowledge of:

- Protective personal equipment/safety gears
- Handling of tools, equipment and accessories
- Safety signs and symbols
- Good housekeeping
- Interpretation of schematic diagrams
- Types of equipment
- Basic electricity
- Basic electronics
- Air conditioning principles
- Recovery/Recycling
- Retrofitting and conversion
- Motor insulation testing procedure
- Air conditioning system testing procedure
- Compressor operations
- Relevant legislations

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Adhered to safety procedures 1.2 Diagnosed automobile air conditioning faults 1.3 Serviced automobile air conditioning system 1.4 Recovered/Recycled refrigerants 1.5 Repaired/retrofitted automobile air conditioning system 1.6 Tested and commissioned the repaired unit 1.7 Carried out housekeeping 1.8 Prepared service report
<p>2. Resource implications</p>	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 2.1 Work place location and units 2.2 Tools, equipment and instruments for troubleshooting and repair 2.3 Materials relevant to the task 2.4 Diagrams, specifications and manuals relevant to the task

3. Methods of assessment	Competency may be assessed through: 3.1 Demonstration 3.2 Direct observation with oral questioning 3.3 Written tests 3.4 Portfolio 3.5 Third party reports
4. Context for assessment	Competency may be assessed individually on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment or during industrial attachment.
5. Guidance information for assessment	Holistic assessment with other units relevant to the sector, workplace and job role is recommended.

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