

SERVICE AND REPAIR AUTOMOBILE AIR-CONDITIONING UNITS

UNIT CODE: ENG/OS/RAC/CR/02/4/A

UNIT DESCRIPTION

This unit covers the competencies required to service and repair automobile air conditioning units. It involves servicing, identifying and repairing faults in automobile air conditioning units. It also entails carrying out refrigerant evacuation, recovery and recycling; charging, test-running and commissioning serviced automobile air conditioning unit.

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. Prepare for service of air conditioning components	1.1 Safe working practices are observed throughout the task as per work place procedures and applicable KS ISO standards 1.2 <i>Tools and equipment</i> are selected as per job requirements 1.3 Interpreted manufacturers manuals 1.4 Identified automobile system components and accessories 1.5 Identified type of refrigerant 1.6 Identified type of lubricant 1.7 Performed safe handling of refrigerants
2. Perform troubleshooting	2.1 Safe working practices are observed throughout the task as per work place procedures 2.2 Appropriate manufacturers manuals are interpreted per the job requirements 2.3 Appropriate materials, tools and equipment are selected based on job requirements 2.4 Trouble shooting is performed based on work place procedure
3. Identify and repair faults in air conditioning components	3.1 Safe working practices are observed as per work place procedures 3.2 <i>Tools, equipment and instruments</i> are selected as per job requirements 3.3 <i>Components</i> with faults are tested according to manufacturer's manuals and work place procedures 3.4 Air-conditioning components requiring recovery/recycling are identified as per work place procedure 3.5 Repair action is taken as per manufacturer's specifications 3.6 Task is completed in accordance with workplace procedures

	and <i>environmental legislations</i>
4. Perform refrigerant evacuation, recovery and recycling	<p>4.1 Identified automobile A/C unit to be evacuated</p> <p>4.2 Observed health, safety and environmental requirements as per work place procedures and applicable ISO standards and applicable KS ISO standards</p> <p>4.3 Identified necessary tools, equipment and instruments</p> <p>4.4 Carried out A/C unit recovery, recycling and evacuation as per work place procedure</p> <p>4.5 Carried out housekeeping</p>
5. Charge refrigeration unit	<p>5.1 Identified refrigeration unit to be charged</p> <p>5.2 Observed health and safety requirements as per work place procedures and applicable ISO standards and applicable KS ISO standards</p> <p>5.3 Identified necessary tools and equipment</p> <p>5.4 Identified the applicable refrigerant as per the Refrigeration unit requirement</p> <p>5.5 Carried out the charging as per the Refrigeration unit requirement and work place procedures</p> <p>5.6 Carried out housekeeping</p> <p>5.7 Task is completed in line with workplace procedures and environmental requirements</p>
6. Commissioned serviced unit	<p>6.1 Identified unit to be commissioned</p> <p>6.2 Observed health, safety and environmental requirements as per work place procedures and applicable ISO standards</p> <p>6.3 Identified necessary tools, equipment and instruments</p> <p>6.4 Carried out unit test-running as per work place procedures</p> <p>6.5 Operating parameters of the unit are confirmed as per work place procedures</p> <p>6.6 Carried out housekeeping</p> <p>6.7 Serviced unit is handed over to user as per work place procedures</p> <p>6.8 Prepared service report as per work place procedures</p>

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	<ul style="list-style-type: none"> • Pliers

<p>instruments may include but not limited to:</p>	<ul style="list-style-type: none"> • Screwdrivers • Hammers • 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 • Vacuum pump • Blower
<p>2. Components may include but not limited to:</p>	<ul style="list-style-type: none"> • Electrical controls <ul style="list-style-type: none"> ○ Thermostats ○ Thermo discs ○ Relays ○ Switches ○ Overload protector • Compressors • Magnetic clutch • Capacitors • Electronic control cards • Magnetic clutch • Sight glass • Receiver/drier • Belts • Hoses and pipes • Ducts • Air filters
<p>3. Environmental legislations</p>	<ul style="list-style-type: none"> • Environmental Management Coordination Act Environmental Protection Agency (EPA) • KS ISO 5149-4:2014

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 manufacturers manuals
- Servicing and maintaining of automobile air conditioning components
- Preparing materials
- Proper handling of tools, equipment and instruments
- Tube processing
- Proper handling of refrigerant and refrigeration oil
- Recovery/recycling refrigerants

Required Knowledge

The individual needs to demonstrate knowledge of:

- Personal protective equipment
- Uses and handling of tools, equipment and instruments
- Safety signs and symbols
- Housekeeping
- Interpretation of manufactures manual
- Uses and specifications of refrigerants, refrigeration oil and refrigeration components
- Basic electronics
- Electrical principles
- Technical drawing
- Heat transfer
- Refrigeration principles
- Recovery/recycling process
- Compressor operations
- Applicable Legislations
- Air conditioning principles

EVIDENCE GUIDE

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

1. Critical aspects of competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Observed safe working practices 1.2 Interpreted manufacturers manuals 1.3 Selected materials, tools, equipment and instruments 1.4 Carried out troubleshooting 1.5 Tested components with faults 1.6 Carried out evacuation, recovery and recycling 1.7 Performed repairs 1.8 Carried out A/C unit recovery, recycling and evacuation 1.9 Carried out housekeeping 1.10 Carried out test-run of A/C unit 1.11 Handed over A/C unit to user 1.12 Prepared service report
2. Resource implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 2.1 Work place location and automobile A/C units 2.2 Tools, equipment and instruments for troubleshooting and repair 2.3 Materials relevant to the task 2.4 Manufacturers manual, specifications relevant to the task
3. Methods of assessment	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 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	<p>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.</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the sector, workplace and job role is recommended.</p>