MODULE CONTENT

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| Unit of Competency | **DIAGNOSE AND REPAIR MANUAL AIR CONDITIONER SYSTEM** |
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| Module Title | **DIAGNOSING AND REPAIRING MANUAL AIR CONDITIONER SYSTEM** |
| Module Descriptor | This unit covers the knowledge, skills and attitudes required to diagnose and repair the manual air conditioner system. |
| Nominal Duration | **hours** |
| Summary of the Learning Outcomes: | |
| Upon completion of this module the student must be able to: | |
| LO1. Prepare to diagnose and repair manual air conditioning system | |
| LO2. Diagnose manual air conditioning system | |
| LO3. Repair manual air conditioning system | |
| LO4. Complete work processes | |

**LEARNING EXPERIENCES**

**LEARNING OUTCOMES NO. 1**

**PREPARE TO DIAGNOSE AND REPAIR MANUAL AIR CONDITIONING SYSTEM**

| **Learning Activities** | **Special Instructions** |
| --- | --- |
| Read Information Sheet 3.1-1 Prepare to diagnose and repair manual air conditioning system | If you have some problem with the content of the information sheet don’t hesitate to approach your Trainer.  If you feel that you are now knowledgeable on the content of the information sheet, you can now answer the self-check provided in the module. |
| Answer Self-Check 3.1-1 on Prepare to diagnose and repair manual air conditioning system | Try to answer the Self-check without looking at the Answer Key  Compare your answer to Answer Key 3.1-1 |
| Observe Trainer’s demonstration on Task Sheet 3.1-1 on Prepare to diagnose and repair manual air conditioning system | Listen carefully and attentively so that you may be able to perform a task correctly  Ask questions if are in doubt for clarification |
| Perform the Task Sheet 3.1-1 on Prepare to diagnose and repair manual air conditioning system | Remember the step-by-step procedure of the Prepare to diagnose and repair manual air conditioning system |
| Evaluate the performance using the Performance Criteria Checklist 3.1-1 | Repeat the task in case fail to meet the criteria |

**INFORMATION SHEET 1.1-1**

**PREPARE TO DIAGNOSE AND REPAIR MANUAL AIR CONDITIONING SYSTEM**

**Learning Objectives:**

After reading this **Information Sheet**, you must be able to:

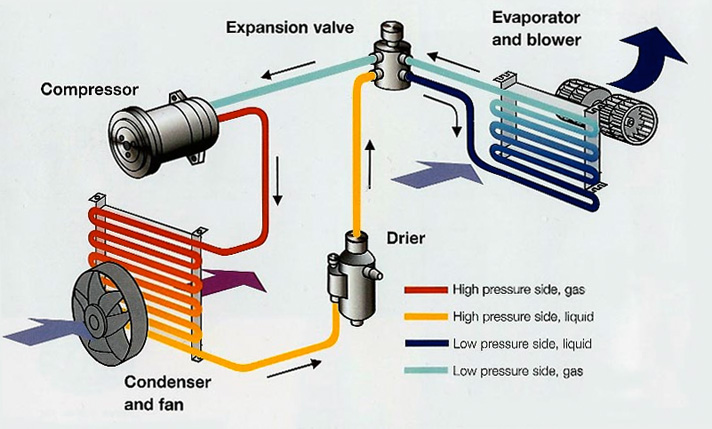
1. Determined job requirements
2. Sourced and interpreted diagnostic information.
3. Verified symptoms.
4. Identified hazards associated with the work and managed risks.
5. Selected and checked tools, equipment, and materials.
6. Reported defective and damaged tools and equipment.
7. Checked and reported availability of materials.

**CAR AIR CONDITIONING SYSTEM**

**INTRODUCTION**

A car air-conditioner works on the same principle as your room air-conditioner or a refrigerator. The fundamental principle involved is heat-exchange. A refrigerant gas (now commonly used is R134-a) that forces the transformation of liquid to gas and back to liquid, and in the process it absorbs or releases heat. Heat is absorbed when it expands (from liquid to gas form).

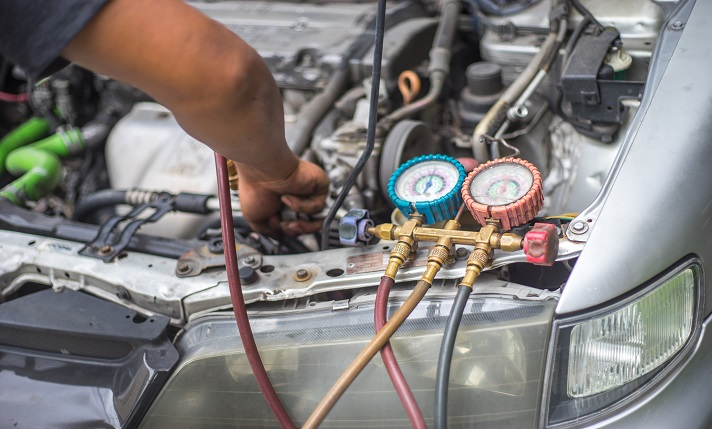
The compressor of an AC, compresses the low-pressure gas into high-pressure, heating it up in the process. The condenser and the fan force this gas to cool down, turning it into a high-pressure liquid form, losing some of the heat in the process. This liquid high-pressure refrigerant flows through an expansion valve just before it enters the cabin, allowing it to expand, reducing pressure and further cooling it down.

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**The above mentioned cold liquid flows through the internal condenser or cooling coil, where it absorbs heat from the cabin as it evaporates into gaseous form. A blower motor pushes that cold air into the cabin, where it is compressed into a high-pressure gas and the cycle repeats itself.**

**With the basic functioning of an AC dealt with, let’s get on with the commonly observed faults and possible remedies. How to check if there is no refrigerant gas in the system? Switch on your AC and if the blower motor is working, warm air is coming out, you hear the AC compressor clicking on and the condenser fan is working, but still, the car’s cabin is not cooling down, the suspect surely is the low AC refrigerant.**

**A well-maintained car AC system can run for years with minor checks and top up of refrigerant every 2-3 years. If the gas has escaped, there is a leak somewhere in the system. It’s advised not to get it refilled before doing a complete test to eliminate the leakage. Look out areas include joints of the pipes and hoses that come from the condenser. Usually, a UV dye is fed into the system and checked with a UV light for leakage. The easier way of doing it though is simple soapy water, poured over the pipe and valves to check for leaks.**

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**Moving to when the AC compressor is not coming on. Open the bonnet of the car, with the engine on and the AC off, you can observe that the belt that turns the AC compressor will continue to rotate and the outer part of the pulley will turn with it, but the center part of it will remain idle. This part is an electromagnetic clutch that operates the AC compressor and cycles it on and off. The same will start rotating the moment you turn on the AC.**

**There is a safety valve built into the compressor. First, if there is low refrigerant in the system the compressor will not turn on. Secondly, a fuse or a relay that powers the compressor could have malfunctioned. This is normally caused by water entering the system or faulty wiring. The third reason why the compressor is not firing up can be the compressor itself going bad. The same is normally characterized by symptoms like oil leaking out of it, abnormal squeaking and rattling noise coming out of the compressor. Replacing the compressor is a costly affair; make sure you check thoroughly to ensure that if indeed the compressor is at fault.**

**To extend the life of your AC compressor, it is advised to get the system checked every 2-3 years, along with topping up the refrigerant, add a few ml of compressor oil to keep it lubricated. If your used car is giving you frequent troubles, and you intend to sell it off, look no further than** [**CARS24**](https://www.cars24.com/)**. We offer you the best price in the market, instant payment, and free RC transfer.**