

Answer Key

Testname: AHAC9SHORT03

1. Automotive A/C systems operate on the principle of moving heat from inside to outside of the vehicle. Heat travels from a higher temperature (higher energy level) to a lower temperature (lower energy level).
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2. The major components of a refrigeration cycle include the compressor, condenser, expansion device and the evaporator.
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3. The air-conditioning (A/C) system works as follows:
 - High-pressure liquid refrigerant flows through an expansion device, which controls the amount of refrigerant that is allowed to pass through.
 - When the high-pressure liquid passes through the expansion device, the pressure drops. This causes the liquid refrigerant to evaporate in a small radiator-type unit, called the evaporator. When the refrigerant evaporates, it absorbs heat when changing from a liquid to a gas. As the heat is absorbed by the refrigerant, the evaporator becomes cold.
 - After the refrigerant has evaporated into a low-pressure gas in the evaporator, it flows into the engine-driven compressor. The compressor compresses the low pressure refrigerant gas into a high-temperature, high pressure gas and forces it through the system.
 - This high-pressure gas flows into the condenser located in front of the cooling system radiator. The condenser looks like another radiator, and its purpose and function is to remove heat from the high-pressure gas. In the condenser, the high-pressure gas changes (condenses) to form a high-pressure liquid as the heat from the refrigerant is released to the air.
 - The high-pressure liquid then flows to the expansion device, which controls the amount of refrigerant that is allowed to pass through and meters the flow into the evaporator. When the high pressure of the liquid passes through the expansion device, the pressure drops and causes the refrigerant to vaporize, starting the cycle all over again.[Page Ref: 22](#)
4. A pressure switch is either on or off, whereas a pressure sensor is variable and supplies pressure information to the PCM/BCM.
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5. Superheat is the amount of heat added to the refrigerant after it has changed from liquid to vapor. Superheat is usually measured as the actual temperature difference between the boiling point of the refrigerant at the inlet and at the outlet of the evaporator.
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