

## Air conditioning

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### Function

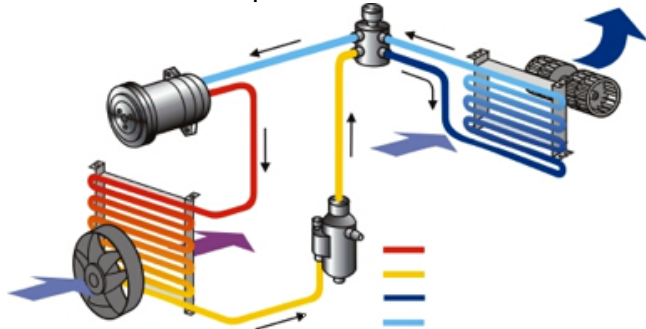
The air conditioning in a vehicle must cool the passenger compartment and draw moisture out of the fresh air supply. As such it provides an assurance of pleasant passenger compartment temperatures even in strong sunlight and condensation-free windows when humidity levels are high.

### components of vehicle air conditioning

The most important components of vehicle air conditioning systems are:

- Compressor
- Capacitor
- Dryer
- Expansion valve
- Evaporator

The individual components are interconnected via hose lines to form an enclosed system known as



the refrigerant circuit. The refrigerant circulates in the refrigerant circuit. It is driven by the compressor.

The refrigerant circuit is divided into two sides:

- The part between the compressor and the expansion valve is called the high-pressure side.
- The area between the expansion valve and the compressor is the low-pressure side.

### Ablauf in der Fahrzeugklimaanlage

The gaseous refrigerant is compressed in the compressor and heated to a very high temperature.



Finally, it is pressed through the capacitor at high pressure. The capacitor is usually located near to the radiator. In the capacitor, heat is drawn from the very hot refrigerant, causing it to condense, i.e. change from a gas to a liquid.

In the dryer (the next station), impurities and air pockets are separated out of the liquid refrigerant. This safeguards the effectiveness of the system and protects the components against damage caused by impurities.

After the dryer, the liquid refrigerant travels to the expansion valve. The function of the expansion valve is similar to that of a weir. Upstream of the weir, it ensures that constant pressure is maintained. Downstream of the weir, on the other hand, decompression can occur as a result of volume expansion. As the expansion valve is positioned directly upstream of the evaporator, the refrigerant decompresses into the evaporator. During this process, its physical condition changes from liquid to gas. \_\_\_\_\_

Like the capacitor, the evaporator is a heat exchanger. It has a huge surface area across which it emits evaporation chill into the atmosphere. The chill emitted is then injected into the passenger compartment by the ventilation system, where it is responsible for making passengers feel comfortable. \_\_\_\_\_

In modern vehicles, air conditioning is part of thermal management. This includes both engine temperature control in all operating conditions and heating/cooling the passenger compartment.

Accordingly, a modern thermal management system comprises components for:

- <link <https://www.my-cardictionary.com/engine-cooling-engine-cooling.html> internen link in neuem>Engine cooling
- Vehicle heating
- Air conditioning

Components of these assemblies interact and often form a single unit. The vehicle air conditioning system is thus a combination of car heating and refrigerant circuit. This combined approach enables the desired climate conditions to be established regardless of the conditions outside the vehicle.

## Safety

The air conditioning is an essential factor for safety and ride comfort. ?It makes an active contribution to accident avoidance. This is because the physical stress and strain caused by rising temperatures inside the vehicle causes levels of concentration and impairs capacity of reaction.

A study commissioned by carried out by the German Federal Highway Research Institute and carried out by the Gesamthochschule Wuppertal found that at a temperature of 27°C inside the vehicle, the number of accidents in towns and cities increases by 11%; at an inside temperature of 32°C this figure is approx. 22%. The air conditioning ensures that drivers keep a "cool head", therefore driving more prudently and with higher levels of concentration. The ability to concentrate is crucial to accident avoidance. Furthermore: A well-maintained air conditioning system will prevent condensation on windows in autumn and winter, maintain good visibility and thus increase safety.

## Environmental protection

Regular inspection of the air conditioning system in a garage is an important contributing factor for the protection of the environment. Every year, up to 10% of refrigerant escapes from air conditioning systems as a result of natural evaporation. In the absence of regular service and maintenance, this figure can continue to increase due to leaks and porous hoses, placing further strain on the environment. An AC service restores the air conditioning system to perfect working condition

## Depreciation

To ensure that the air conditioning system remains in perfect working condition in the long term, it should undergo an annual AC check.

As the air conditioning system operates under constant pressure, its components are subject to a process of natural wear. Hoses and seals also age, dry out, coming loose and leaking as a result. This causes the refrigerant to evaporate and impairs cooling performance. The situation can be rectified by having the system checked and if necessary topped up with refrigerant. It is also advisable to have an AC service carried out every two years. An AC service includes for example:

- Replacing the refrigerant
- checking for leaks and if necessary
- replacing the dryer.

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## Bilder

## Hersteller



DENSO Aftermarket



Valeo\_EN



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MANN-FILTER

MAHLE

Quelle:

<http://www.my-cardictionary.comhttps://www.my-cardictionary.com/cardictionary/electric/products/air-conditioning.html>