



POTENTIAL MAINTENANCE PROBLEMS INCLUDE:

- > Obstruction in blower motor restricting airflow to cabin
- > Leak/failure causing system contamination
- > Coil damage, causing refrigerant leak
- > Physical obstructions in coils or radiator/condensor, reducing system performance
- > System pressure increase resulting in AC system shutdown
- > Compressor damage, reducing refrigerant charge
- > Inadequate lubrication, reducing performance, or causing expensive system damage
- > Internal obstructions restricting refrigerant flow
- > Damaged valves/hoses causing refrigerant leak/contamination
- > Damaged cooling fan causing engine overheating, poor AC system operation and poor fuel economy



HOW DOES THE AIR CONDITIONING SYSTEM WORK?

Vapourization Low pressure liquid refrigerant becomes vapour

Blower Motor
Pushes air over evaporator coils, providing cooler air to the cabin.

Suction Accumulator (AC Drier)
Removes humidity (water) from refrigerant and turns any remaining liquid refrigerant to vapour.

Evaporator
Low-pressure liquid refrigerant cools evaporator coils, transferring heat from inside the vehicle to the refrigerant. Water from humidity collects on the coils.

Pressure Reduction
Cool, low pressure liquid refrigerant travels to pick up heat from cabin and begin cycle.

Low Pressure Liquid Line/Expansion Valve

Liquid is separated into high pressure and low pressure refrigerant. Cooler, low-pressure liquid refrigerant continues through the AC system to the evaporator. High pressure refrigerant is discharged from the system.

Compression
Low pressure vapour refrigerant subjected to high pressure increases temperature of refrigerant.

Clutch Cycling Pressure Switch

Monitors pressure/temperature inside the accumulator/drier and prevents the compressor from pumping refrigerant if the system temperature drops. Also prevents evaporator from freezing up.

Compressor

Compresses the refrigerant vapour, increasing refrigerant pressure and temperature. Also circulates refrigerant and refrigerant oil throughout the AC system.

Condensation

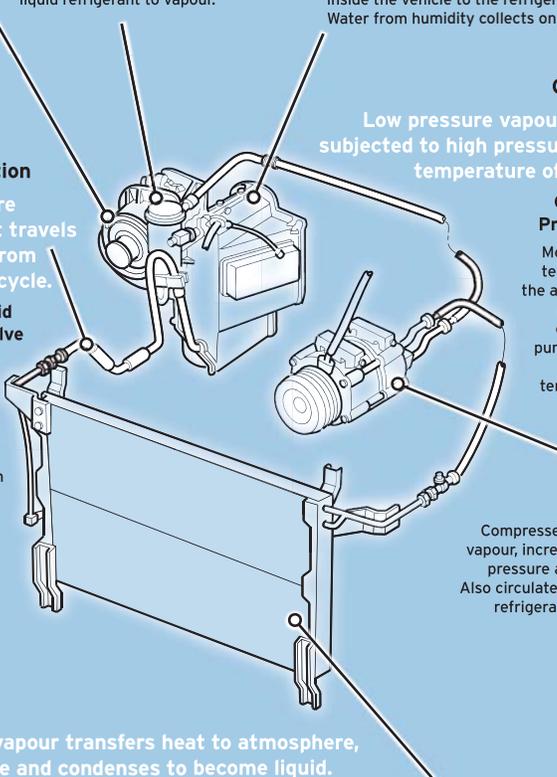
Hot refrigerant vapour transfers heat to atmosphere, releases pressure and condenses to become liquid.

Cooling Fan

Pulls outside air through the condenser to help cool the refrigerant.

Condenser Core (Radiator/Condenser)

The condenser is the opposite of the evaporator. Hot, high-pressure refrigerant vapour is exposed to the relatively cooler air outside the vehicle as it travels through the compressor coils, transferring refrigerant heat to atmosphere. Refrigerant then becomes liquid.



PRODUCT KNOWLEDGE

AIR CONDITIONING

Air conditioning (AC) systems perform two main functions: lowering the temperature and lowering the relative humidity of a vehicle's interior. **“A COMFORTABLE JOURNEY”**

But the system does not add cold air to the cabin - it removes heat!

THREE IMPORTANT AC CONCEPTS:

Heat transfer

Warm air is attracted to cooler air. AC systems remove heat from an isolated environment (inside the car) to an area capable of absorbing heat (outside the car).

Latent heat of vapourization

When changing from solid to liquid (or vice versa), heat can be added to a substance without raising its temperature.

Pressure

Applying pressure to a substance changes the temperature of a vapour and the boiling point of a liquid. AC systems use pressure to transfer heat - from the vehicle cabin to the AC system and from the refrigerant to the air outside the vehicle.



IT'S NOT THE HEAT, IT'S THE HUMIDITY

Warm air holds moisture. For example, your body produces perspiration when heated. If it is warm, and the humidity is high, the hot, humid air cannot absorb any excess moisture, and perspiration remains on the skin. If it is cooler, and the humidity is low, the air can absorb moisture from the skin surface.



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THE EMOTION
IN MOTION.



Mazda Genuine Parts are designed and tested by Mazda engineers to perform best for Mazda vehicles. All Mazda air conditioning parts are priced to be competitive.



A WORD ON REFRIGERANT:

Refrigerant is a specially-formulated chemical that passes through the AC system to exchange heat from inside the cabin to outside the vehicle. Refrigerant is a liquid that absorbs heat easily at low temperatures and turns easily into vapour.

Efficient refrigerant has the following qualities:

- > Low boiling point
- > Ability to absorb heat without changing state
- > Ability to operate as a liquid or vapour in a high-pressure environment
- > Liquifies easily at moderate temperatures
- > Environmentally safe, non-toxic
- > Mixes well with oil
- > Non-corrosive on metal to avoid damage to system parts

COMMON AIR CONDITIONING REFRIGERANT ISSUES:

Low refrigerant charge

Symptoms include poor AC performance and continual compressor operation (which can also affect engine performance).

Contaminated/dirty refrigerant

Refrigerant exposed to outside air through improper maintenance or damaged hoses/components can become contaminated with dirt or other harmful particles. These particles can block refrigerant flow or cause internal system damage.

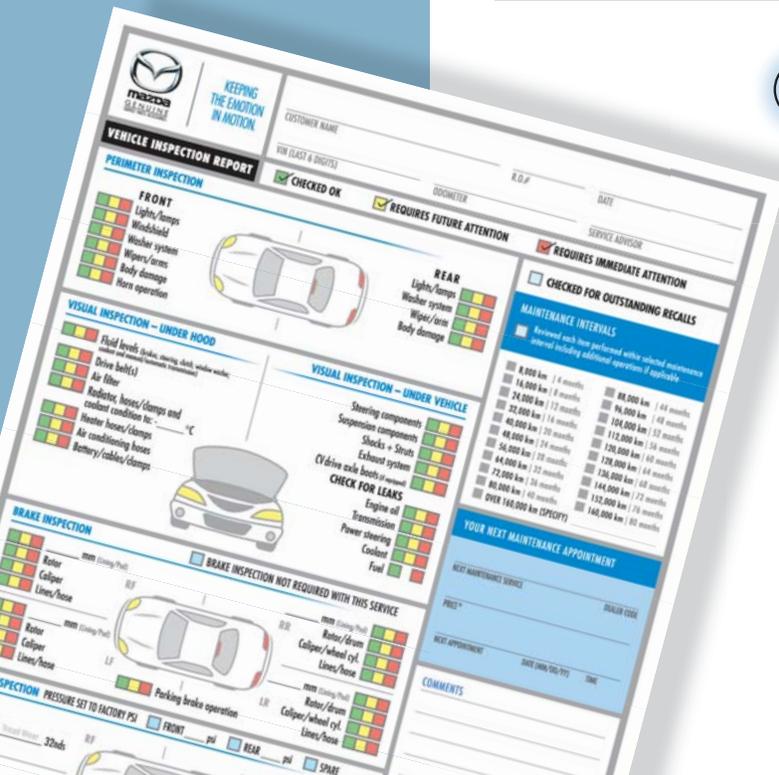
Cross-contamination

If different refrigerants are mixed (and therefore contaminated), the AC system will not function properly. In this case, the AC system must be completely drained and re-filled with fresh refrigerant.



CHECK IT ON THE VEHICLE INSPECTION REPORT

AC systems should be inspected annually. Your Mazda Technicians can perform a visual inspection of air conditioning hoses looking for excessive moisture, component damage, or loose or damaged hoses, that could compromise performance. Testing using specialized equipment may be necessary if visual inspection result or A/C performance is poor.



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