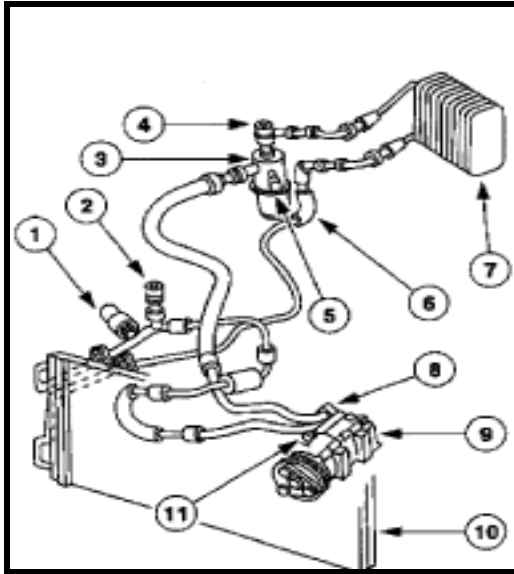


Explanation of a basic A/C repair

A/C system repair can be quite difficult for the technician, not to mention very confusing to the customer. Steps to the basic repair:

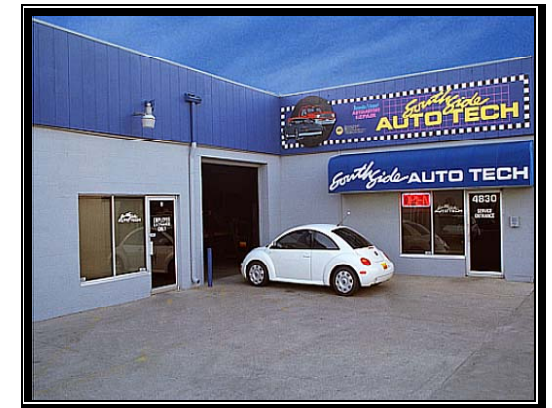
- Duplicate the problem or the concern, check dash A/C controls for proper operation and check temperatures.
- Perform a visual inspection of A/C components for signs of excessive oil leakage.
- Use A/C diagnostic equipment to check system pressures and the electrical components
- Evacuate and recharge system to remove moisture and existing refrigerant, and then recharge the system with the proper amount of refrigerant. Dye would be added at this time if needed.
- Use of the Ultra Sonic Leak Detector to check air samples for leaks.
- Repair or replace defective components.
- Recharge system; verify the repair by checking for any additional leakage.

Now you may ask yourself after this in-depth repair process, how can another leak develop the next year, the next month or even the next day? The answer to that is quite simple. Imagine that your A/C system is like a garden hose. When you plug the end of the hose, what happens? Pressure builds up along the hose and small sprays of water start to appear from pinholes along the hose. Refrigerant acts in very much the same way, taking the path of least resistance. When the most predominant leaks are repaired and the system is brought back to the normal operating pressures (normal operating pressures can be in the 275-psi range) pinholes or weaker components may fail and begin to leak.



1. A/C Pressure Cut-Off Switch
2. A/C Charge Valve Port (High Side)
3. Suction Accumulator/Drier
4. A/C Cycling Switch
5. A/C Charge Valve Port (Low Side)
6. Condenser to Evaporator Tube
7. A/C Evaporator Core
8. A/C Manifold and Tube
9. A/C Compressor
10. A/C Condenser Core
11. A/C Compressor Pressure Relief Valve

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*Basic Air Conditioning
Operation and Frequently
Asked Questions*

What is refrigerant?

Refrigerant, commonly known as Freon, is the fluid that makes you're A/C system work. It transfers heat from one place to another and is used because it can change states very quickly and at very low temperatures.

How does my A/C system work?

The A/C system does three (3) things inside your vehicle:

- Removes heat from the air
- Removes moisture from the air
- Circulates the cooled air

The following components make up the basic A/C system:

Compressor – Has two (2) functions:

- Acts as the pump to circulate the refrigerant
- Raises the pressure and temperature of the refrigerant, so that it will condense and release heat.

Condenser – This is located in the front of the radiator, where it can receive full airflow. Its function is to remove heat from the Freon vapor, releasing the heat to the outside air and condense the Freon into a high-pressure liquid.

Filter/Drier – The drier is used to remove any traces of moisture from the system. The filter is used to separate any foreign particles from the refrigerant.

Expansion Valve – Used to meter refrigerant into the evaporator as cooling requirements change.

Evaporator – The coil removes heat and dehumidifies the air before it enters the vehicle. It provides the maximum amount of heat transfer in the minimum amount of space. It is located in the A/C housing under the dash.

Refrigerant Lines – Hoses and tubes designed specifically to carry refrigerant from one component to the next within the system.

Frequently Asked Questions

Is some refrigerant loss normal?

Over a years time some refrigerant loss is recognized as normal. Vibration, hose porosity and the general construction of the system make a leak-proof system nearly impossible.

When is the best time to get my A/C system checked or serviced?

Ideally, the outside temperature should be above 70 degrees. The higher the outside temperature is, the longer the compressor will cycle thus building higher pressures within the system. This enables our technicians to get more accurate readings and increases the possibility of finding any leaks in the system.

Why does the A/C system operate while the defroster is on?

Remember that one job of the system is to remove moisture from the interior of the vehicle. With the compressor on, moisture is removed so that there will be no fog or frost build up on the inside of the side windows or windshield. Also, continual use allows the compressor seals to stay pliable therefore maintaining their sealing properties.

Why does water puddle under my vehicle after running the A/C system?

The warm air blowing across the evaporator contains moisture; this moisture will condense on the evaporator fins and be drained off as water. A drain tube located in the bottom of the A/C housing leads the water to the outside of the vehicle.

How are refrigerant leaks found?

Visual Inspection – when you have a leak, you lose both refrigerant and oil. Sometimes trace amounts of oil residue can be seen. This looks like oil topped with dirt or dust, giving it the appearance of caking.

Ultra Sonic Leak Detector – sensitive equipment designed to sample air for molecules of refrigerant.

Dye Testing – dye is injected into the system, then checked for leaks using an ultra violet light. It is a common practice to have the customer drive the vehicle for a period of no less than 1 week and no more than 2 weeks for the dye to cycle through the system. The A/C system must be used during this period for the dye test procedure to be effective.

Why are refrigerant leaks so hard to find?

Refrigerant is a colorless, odorless gas so we have to rely on visual inspections (for oil residue) and the use of sensitive test equipment to aid our technicians in finding any leaks. With today's vehicles, the engine compartment is much more congested than ever before, making use of every inch of space sometimes places components in very hard to see locations. Not only is the visual test difficult but also some test equipment will not fit into these cramped remote areas. In addition with the onset of R134A refrigerant, testing has become increasingly difficult because of the molecular structure of the refrigerant and of the oil.