

General Air Condition Systems

By TransAmCowboy a.k.a. Matt Ballard

A Special thanks to our FBN Members in their help.

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Sections Covered

Basic Air condition parts and what they do

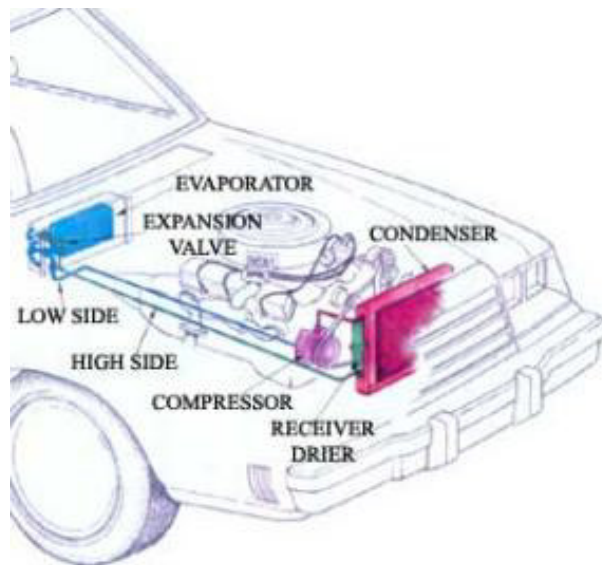
Special Tools needed

Converting R12 to 134a

D.I.Y. Tips and F.A.Q.

Disclaimer

**Tired of Not so Cold A/C? Is your A/C not working? Need to put the System back together?
Hopefully this Article will help ya'll.**



This is the basic Layout of you car's A/c

Air Condition parts and what they do

The parts in order of use...



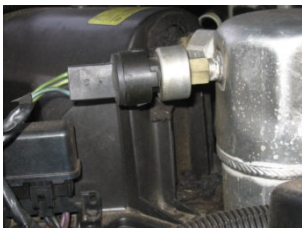
Compressor: The compressor is the “Heart” of the air conditioning system powered by a drive belt. When the A/C is turned on the clutch engages the compressor, then pumps refrigerant vapor under high pressure to the condenser.

Condenser: The condenser is mounted in front of the Radiator (Looks just like the radiator). Upon entering the condenser the refrigerant is a vapor. The vapor is condensed to a liquid. This generates a great deal of heat. The heat is then removed from the condenser by air flowing through the condenser on the outside.

Expansion Valve: The pressurized refrigerant flows from the receiver-drier to the expansion valve. The valve is a small screen that the fluid, Freon pushes through with enough force (which isn't a lot) to become a gas. Then the Freon floats, now on the Low Side, to the evaporator.



Receiver-Dryer: The now liquid refrigerant moves to the receiver-dryer. This is a small reservoir for the liquid refrigerant, and removes any moisture that may have leaked into the refrigerant. Mostly is used to clean the Oil in the system the oil traps dirt and moisture. Moisture in the system can cause a big mess, with ice crystals causing blockages worst yet Damage other components



Pressure switch: This regulates the pressure of in the system telling compressor to turn on/off.

Evaporator: The evaporator looks like a car radiator. It has tubes and fins and is usually mounted inside the passenger compartment behind the plastic above the passenger's feet. As the cold low-pressure refrigerant is passed into the evaporator, it vaporizes and absorbs heat from the air in the passenger compartment. The blower fan inside the passenger compartment blows cold air to the ducts. On the "air-side" of the evaporator, the moisture in the air is reduced, creating condensation, and the condensation is collected and drained away.

Compressor: Back to the compressor. That draws in the low-pressure refrigerant vapor to start all over again. The refrigeration cycle then runs all the time.

Special TOOLS needed

Yes, every man should have a few dozen (if not hundred) TOOLS!!!!

For the Common Do-It-Yourself Guys/Gals (D.I.Y.) these are some of the Specialty tools needed and purposes

First are Gauges:



Or

The 1st one is a Manifold Gauge it measures the High and Low side. The 2nd one connects the Freon can to the low side and has a gauge to tell what the pressure is so you can add Freon.



Leak detector that.... well... you guessed it help finds leak.



Spanner wrench To take off the A/C Clutch.

Most tools will range from 15 to 45 dollars (Or around that)

Converting R12 to 134a

Old school meets the new age

Read F.A.Q.s before attempting

Before evacuating the system of the old R-12(see F.A.Q.s), you need a simple kit which is pictured below.



Part number : VA-LH11 will take care of most GM vehicles (including 91 and up)

This is the simple kit with just the correct Nipples and Label saying the car has been converted



This includes a CD that will give you more detail on how to do also, comes with a few cans of 134a and adapters.

*****Note: When you add oil to the system Use Ester Oil because it is universal. And even with the system vacuumed out they'll still be traces of R12 in a system.*****

D.I.Y. Tips and F.A.Qs

How do I read the gauge?

-Proper use of tools is needed to properly diagnostic your A/C problems. Most gauges you buy from the auto stores have a "Green Section". Why does it range from 25 to 45? (If memory serves correctly) it is because the compressor should kick on about 25 and kick off at 45. Any more than 45 you have too much Freon in the system or a Faulty Pressure Switch. Also if the pressure is too great you can bleed by pushing in the valve (it's like a tire stem) But try and not to let Freon come out

I have air but not cold?

See next question

My A/C Compressor is not engaging.... why?

One of the most popular questions I've come across. A few things can cause this...

-Not Enough Freon, mostly common, possible leak but most A/C Systems do lose Freon overtime when not being used

-Too much Freon, due to not reading the gauge properly and adding to much

-Switch not reading properly you can manually bypass by unplugging and using a small wire or paper clip and touching on the plug 2 prongs (Trial an error finding out which two has some cars have more) to make sure the compressor comes on.



3rd generation plug you need to cross (squeeze top and bottom to disconnect)

-Mechanical Fault , including but not limited to blown fuses, bad relays, bad wiring or worst case scenario GM Compressors are known from tearing up from the inside (Mostly due to not enough oil) and clogging up the Orifice Tube which means a near complete A/C Overhaul. Why the overhaul? When the compressor shreds internally it sends bits of metal every where in the system.

Cheapest way to fix is to replace Compressor, Receiver –Dryer and Orifice Tube and install a Filter before the Orifice Tube. This Scenario Happened to me and after changing out the filter 2 times I now have COLD A/C.

Replacing a bad A/C Compressor Clutch

For Precise Instructions I found this site that can give much better detail than I could:

http://www.warnernet.com/pdf/819-0316_P-1401.pdf

Me telling you how:

After taking the belt off you need the A/c Spanner Wrench (ask a local Auto store they should have one I can't find a picture of one), the Spanner Wrench is use to hold the Clutch while you take loose the nut in the center. If the clutch is Warm or hot it will be hard to slide the Clutch off, just let it cool down and it will slide off prying on it will mess up the shaft bearings, crake the compressor excreta.

There may be a Snap ring that also needs to be removed.

I have cold air but not blowing...?

-There is a blower motor located on the firewall which is accessible from the engine compartment. First check fuses then check to make sure the Motor is getting juice (Use Dwayne Stephenson Tech help on using a Multi-reader for help on that part) If there is juice getting to the motor then replace. If not, there is a part called the Blower Motor Resistor that controls how fast the blower motor spins. It is located (on 3rd gen cars) in the box where the hoses goes in and out of the passenger car. If that's okay then check your wiring. If all that checks out you may need to replace the Switch that turns on the blower.

Where do I connect the Gauge hose to?

-There are two nipples to access the system one on the Low Side the other on the High side they are both different sizes. The connector will only connect to one of them which will be located near or on the Receiver-Dryer. Picture of one on a 3rd generation is below.



How do I get rid of that Foul odor?

-Quit Farting... LoL Sorry I had to. The Odor is commonly due to mold build up in the A/C. From a bad or leaking Evaporator releasing moisture into the Ducts and every one knows mold likes moisture in dark places. Check for moisture and dry up. Replacing the Evaporator may be needed. By spraying Lysol or odor eliminator on carpet by the intake (again by the passenger's feet) may help to eliminate the smell...but don't spray too much and have it spit back at you through the Ducts!!!!

The air is cool but not cold?

-You may be losing/lost Freon Check pressure and then I recommend adding a leak/stopper and A/C Booster at local Auto stores they sell that mixed in with A/C Freon

Why's R12 not sold anymore?

Has ya'll may know R-12 hasn't been produced since Jan of 1996. It's real name is Dichlorodifluoromethane (CCl₂F₂). The reason they stopped making it is because of it is so hazardous to the Ozone.

Some Urban Legends about R12.....

-It's colder than 134a- Yes and No 134a is designed to be colder the more it is circulated R-12 is as cold on its first loop through the system has the last. Which is why on older cars, it takes a while for it to get REALLY cold. After all the whole A/C system was designed for R-12 not 134a.

-Its all a Government Conspiracy- Honestly, who knows! My opinion is it's not. People say a lot of government officials made too much money off of the switch to 134a I say they just knew R12 was going to be illegal to produce. They just made a Smart Investing choice.

-Freeze 12 is the same thing as R12- No, Where they are compatible they are not the same thing Freeze 12 is not has same cooling effect of R12

-Oil type doesn't matter- Yes it does, PAG oil (Polyalkylene Glycol) does not work at all with R12, R12 basically turns into sludge and break down the Chemical compound of PAG oil. If you are using R12 the only oil you should use is mineral oil. No, not the same one you can get at the grocery store. Ester Oil is supposed to be universal but I only recommend using Ester after you converted R12 to 134a.

What is so dangerous about A/C?

Beside from the Pressure and toxic chemicals not a whole lot of danger. Any time you open the system it should be evacuated. See “What should be done by Certified People?”

A/C comes on when my defroster's on?

This was a question suggested to me to answer by one of our Members, but he answer for me:

“The reason your A/C runs while on defrost is the moisture is pulled out of the air by A/C core before passing through the heater core. If not for this the warm humid air would just fog (condense) the heck out of your windows until they were warm. (Think leaking heater core)

Seth A.k.a. Garneaux”

How do I evacuate the system safely?

-See Below

What should be done by Certified People?

Most of the reason things should be done by certified people are because of the machines they operate and knowledge of said machines.

Evacuating the System for ya'll who don't know what it really means, it's the procedure of removing any Freon or Oil in the system.

It is fairly easy but the machine is EXPENSIVE especially for a Do-it-Yourselfer. If you know you have to evacuate the system I'd HIGHLY recommend let a pro take care of that then take the car home and fix what you need to do.

After you finish ask the Tech to put it on a vacuum test, which is when they apply Vacuum to see if the system has any leak. If you do this before you add any Freon or oil you won't leak any out.

How do you add oil?

Make sure the System is properly evacuated first. First you can add by pouring into the system via low side nipple (you need to measure it out). The second way is a tool the professionals have injects the fluid into the system like a big syringe. Sorry I can't find a Picture. Also can't find all the cars Oil measurement (most cars are different) But on your car should be a VECL

sticker that says how much oil is needed.

Disclaimer

I Matt Nor is Firebird Nation is responsible for any Misinformation or problems you come across from using this Tech Article This is designed to help you understand the basic of Air Conditions.

If you know of any Mistake on this Article please contact me and if I am wrong (after Research) I will correct.

Most of this Information is from memory from 5 years of being a Car Part salesman and being raised around cars. Majority of the Info is recalling of me working on my A/C by working with a gentleman who's been working on A/C for 40 some years.