

A New Trend in the Automation of Air Conditioning System in a Car

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Abstract - No modern car comfort guidelines as much respect as air conditioning. If you have ever driven on a hot summer day without the benefit of AC in your car's cabin, you know the value of a working air-conditioning system. Now a days most of the car having automatic ac control system by using single condition which is used by temperature sensor, but we are using two condition which is automatic ac control with automatic door opening & closing system using IR sensor.

Keywords: *Temperature sensor, IR sensor, automatic climate control.*

1. NEED OF THE A/C IN A CAR:



You're stopped the car in heavy traffic on afternoon. Sweat drips from your neck body and all the way down your back until your shirt absorbs it, making a humidity spot between human and the seat. Your legs are either stuck to the vinyl upholstery or prickled by its cheap velvet. Your hands feel like they're about to slip off the steering wheel, and you're thankful your eyebrows are keeping the sweat from running into your eyes. Well, mostly.

Automotive air-conditioning. It's become practically universal, with 99% of all innovative cars as of seasonal 2010 coming furnished with it. When it's absent, we notice.

II. HISTORY OF A/C:

It's also been with us longer than you might think. Packard invented automotive AC all the way back in the year of 1939, and in the year of 1940 was the first car company to proposal factory-installed air conditioning. Of course, this initial system did not have a thermostat, but it was superior than not having anything at all other. The idea fixed on, though, and by 1969, more than half of all new cars were sold with air conditioning manufactured in. That's not containing the aftermarket AC units that could be installed during the first heat wave of the year, when the new owner lamented his tight-fisted at the dealership in January.

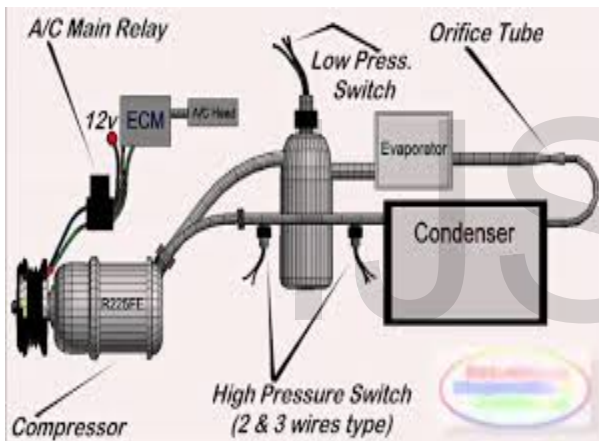
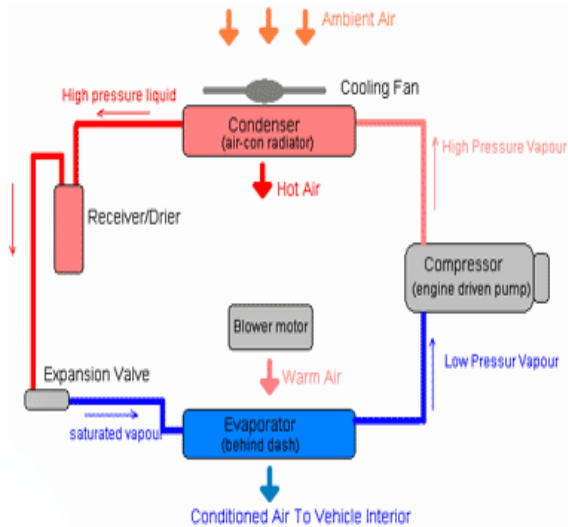
Finally, it was predicted that the refrigerant used for decades in automotive AC, known as **R-12**, **CFC-12**, or its name called **Freon**, was damaging the ozone layer of the global. (it's a chlorofluorocarbon). It was restricted from being manufactured in the United States and an alternative, called **R-134a** or **HFC-134a**, was needed for all cars manufactured for coming years after 1996. Now, any car older than that needs to be retrofitted with a new system that can use the newer as safer refrigerant.

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III. How does the Car AC Works?

A car's AC works much in the same way a residential air conditioning system works, but on a much smaller scale. The first and most significant element is refrigerant. In the case of most vehicles made after the 1990s, the refrigerant of choice is R134a. It's less harming to the environment, the ozone layer in

particular, than its pre-1990s predecessor, R12 (also known by the brand-name Freon).



A car's AC depends on the thermodynamic properties associated with these operating within a closed loop under the correct pressure. Air conditioning and climate control systems ensure your journey is comfortable - whatever the weather outside.

Air conditioning and climate control systems keep a constant, ideal temperature inside your car, ensuring you stay cool and comfortable at all times.

The air conditioning system complements the heating and ventilation system in your car. It includes a cooling system, heating, humidity controller and blower unit and works fair like the heat pump in a refrigerator. In simple terms, the air is directed concluded an evaporator, where it misses its heat to the refrigerant. The cooled and dried air is then blown into the cabin of the car. A compressor chills the refrigerant down to the required temperature.

Naturally friendly - no CFCs All air conditioning systems in our cars are environmentally friendly and do not use refrigerants containing CFCs. Some, such as the one in the Golf, feature an outwardly controlled compressor with an evaporator temperature which can be controlled between 2 and 12? C. This ensures the air is not dehumidified any more than is necessary, decreasing the amount of energy required, and therefore fuel consumption.

A constant, ideal temperature in the car helps our concentration and a reaction stay sharp, and also means our passengers enjoy a more pleasant journey. We offer both a semi-automatic 'Climatic' air conditioning system and 'Climatronic' automatic air conditioning in our cars.

a. Manual Air Conditioning:

Manual air conditioning system produces a enjoyable, consistent temperature throughout your entire journey. It's enormously user-friendly, and attains your required car cabin temperature speedily and efficiently. You can decide the air distribution and blower speed you want and set it manually.

b. Climatronic Automatic Air Conditioning:

Climatronic controls the temperature of the cabin based on the chosen temperature setting, adjusting the blower speed and operating the air distribution flaps automatically to ensure a pleasant interior climate in all conditions, with negligible draught as the air flows through the person along for the ride compartment.

Climatronic also includes a pushbutton unfreeze function to clear fogged or iced-up windscreens. This directs the full airflow onto the inside of the glass at the highest blower and heat output settings. If the outside temperature is above 0°C, the cooling system slices in as well to dry the air before it is heated.

IV. New trend of Air Conditioner System in a Car

Now a days most of the car having automatic ac control system by using single condition which is used by **temperature sensor** ,but we are using three condition which is automatic ac control with automatic door opening &closing system using **IR sensor**.

We are using same process in ac control, in addition we are using automatic door opening & close according to the required temperature ,in present windows should want to closed manually but we are using three conditions to close automatically if any of them keeps their hand in door it will indicated using IR sensor before the door close. According to this idea, we can make modern air conditioning system in a car. We feel uncomfortable when the temperature is increased inside the car if the weather condition is hot. When we

feel just uncomfortable, the modern air conditioning system will start to operate automatically.

This project works under the three conditions, one is the checking the passenger presence inside of the car. The second one is interior temperature of the car is increased above our fixed temperature and another condition is all the wind shield of the car is closed .when the three conditions are occurring then only the modern air conditioning system will start to operate.

The human presence is determining by the providing push button switch under the all seat. All the push button switches are interconnected.

Temperature sensor is fixed inside the car for sensing the temperature. In this temperature sensor, we can adjust and set our comfortable temperature rate.

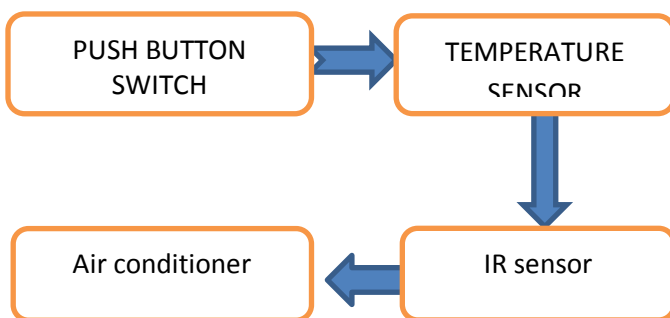
If the temperature of the car is increasing above our comfortable temperature rate that sensor will detect and send the signals to the receiver.

And then the **windows shield is raised automatically** if any person should keep the hands between the windows shield only after checking and indicating to the passenger by means of alarm sound. After checking the above three conditions, the modern air conditioning system is switched on automatically.

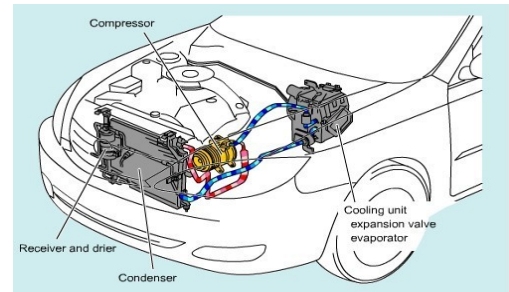
If the temperature inside the car is increased above our comfortable rate, the door will be raised automatically after receiving signal from the temperature sensor.



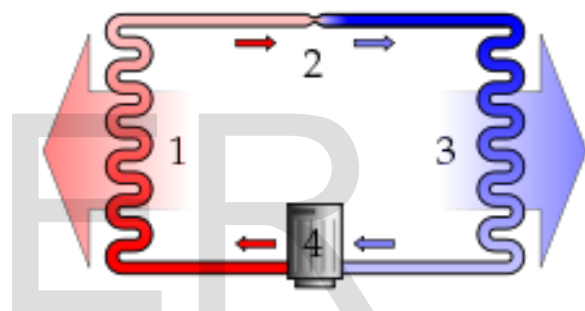
V. Block Diagram:



Air conditioning has worked lovely much the same way for its entire existence: it cools and removes moisture from the air. There are three main parts in the system they are **compressor**, **condenser**, and **evaporator** that achieve this, good a few other parts to keep the system running smoothly. Let's take a look at each running time of a car.



VI. A SIMPLE DIAGRAM OF THE REFRIGERATION CYCLE:



- 1) Condensing coil,
- 2) Expansion valve
- 3) Evaporator coil
- 4) Compressor.

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In the refrigeration cycle, heat is conveyed from inside the car to the environment. A refrigerator is an instance of such a system, as it transports the heat out of the interior and into its environment (i.e. the room). Circulating refrigerant vapour enters the compressor (located in the engine bay) and it is compressed to a higher pressure from the normal pressure, ensuing in a higher temperature as well. The hot, compressed refrigerant vapour is now at a temperature and pressure at which it can be condensed and is routed through a Condenser, usually situated in front of the car's radiator. Here the refrigerant is cooled by air flowing across the condenser coils and condensed into a liquid. Thus, the circulating refrigerant discards heat from the system and the heat is carried away by the air.

The condensed and pressurized liquid refrigerant is next routed through an expansion valve where it undergoes an abrupt reduction in pressure. That pressure reduction results in flash evaporation of a part of the liquid refrigerant, lowering its temperature. The cold refrigerant is then routed through the evaporator which is located in the passenger compartment. The air (which is to be cooled) blows across the evaporator, causing the liquid part of the cold refrigerant mixture to evaporate as well, further lowering the temperature. The warm air is therefore cooled.

VII. AUTOMATIC CLIMATE CONTROL

Most competing systems used a separate heating system and an engine-mounted compressor, driven off of the crankshaft of the engine via a belt, with an evaporator in the car's trunk to deliver cold air through the rear parcel shelf and overhead vents. General Motors made a front mounted air conditioning system optional in 1954 on Pontiacs with a straight-eight engine that added separate controls and air distribution. The alternative layout founded by Nash "became established practice and continues to form the basis of the modern and more sophisticated **automatic climate control** systems.

VIII. GROWTH IN DEMAND:

Air-conditioning for automobiles came into extensive use from the late twentieth century. Although air conditioners use significant power; the drag of a car with closed windows is less than if the windows are open to cool the occupants evaporative. There has been much debate on the effect of air conditioning on the fuel efficiency of a vehicle. Factors such as wind resistance, aerodynamics and engine power and weight must be considered, to find the true difference between using the air conditioning system and not using it, when estimating the actual fuel mileage. Other factors can affect the engine, and an overall engine heat

IX. GUIDELINES TO KEEP YOUR CAR COOL

Turning on our air conditioning isn't the only possible way to keep your car cool during hot weather. Use these tips to support stated down on high temperatures and uncomfortable conditions in your car:

- ✓ Use a sunshade or window screen. This tried-and-true method of maintaining our car cool should be our go-to option to counteract hot interior temperatures throughout the summer season.
- ✓ Cover our steering wheel with a hand towel. Even if we use a sunshade, it's a good idea to cover your steering wheel with a small towel. This will help to keep the contact temperature of our steering wheel down.
- ✓ Park in a cool area. Whenever possible, park in a cool area. If you're going to be somewhere for an stretched period of time, it's worth it to walk a bit farther in order to park in the sunshade. We'll be happy to enter a not-so-hot car when you return from your day out.

- ✓ Keep our costly belongings out of the sun. Any tapes, CDs or delicate items that you keep in your car should be stored out of the path of direct sunlight. Try storing your tape and CD cases beneath the seat.
- ✓ Park in a garage when probable. Whenever possible, park in a garage. our car will be out of direct sunshine and will have the benefit of near-constant shade. Even a warm garage beats being parked in the sun all day.
- ✓ Keep windows slightly cracked. While it's not a good idea to leave your windows all the way open, it is a good idea to leave them slightly cracked. Check to be sure that you can't fit your arm through the crack in your window. Even a small crack will promote ventilation and help to keep your car cool.
- ✓ Purchase a solar-powered fan. Paired with cracked windows, a solar-powered fan can make our car feel absolute pleasant during even the hottest summer days. These simple fans work to expel hot air from our car. By creating constant air circulation, they lower our car's overall temperature.

X. COST ESTIMATION:

S.NO	DESCRIPTION	Q.NO	PRICE (Rs)
1	IR SENSOR	1	30
2	LM35 TEMP.SENSOR	2	30
3	PUSH BUTTON SWITCH	30	60
4	WIRE	-	50
5	ATNEGA MICROCONTROLLER	3	450
6	RELAY SWITCH	1	50
7	RECEIVER	3	80
TOTAL			770

XI. ADVANTAGES:

- It gives cool effect for human while travelling.
- It also provides for cooling effect to our car
- There is no sweating even though the weather is Hot (during summer period)



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We keep your car cool!

XII. FUTURE DEVELOPMENT:

A modern air-conditioning of automobiles called TIFFE (Thermal systems Integration for Fuel Low-cost) is required to come into fabrication in 2015 and should reduce in fuel consumption by 15%. Maintainable automotive air conditioning is also being reflected.

XIII. CONCLUSION:

Now a days most of the car having automatic ac control system by using single condition which is used by temperature sensor, but we are using two conditions which are automatic ac control with automatic door opening & closing system using IR sensor.

We can enjoy with this kind of air-conditioning system by implementing our idea in the automotive air conditioning system. We don't want to consider whether the air conditioner is switch on/off position while traveling. We feel uncomfortable when the temperature is increased inside the car, if the weather condition is hot. When we feel just uncomfortable, the modern air conditioning system will start to operate automatically.

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