# Exhaust Gases Reuses for Air Conditioning System in Automobile Vehicles

**N.Ashikrahman[1], M.Abhijith[2], T.Karthikprabhu[3],C.Selvakumar [4]**
Department of E&TC
[1, 2] UG Students,RVS Technical Campus-Coimbatore
[3, 4]Assistant Professor,RVS Technical Campus-Coimbatore

***Abstract-****Nowadays air conditioning system is emerged as an essential thing in automobiles. The a.c. system works by the power developed from the engine with the help of the fuel. The compressor of this system is driven by the power. This leads to the drop in the mileage of the vehicle. This can be overcome by regenerating the exhaust gas with the help of a turbocharger. The gases leaving the turbocharger is set to run the compressor shaft of the a.c. The exhaust gases rotate the turbine and thus the rotary power is transferred to the shaft of the centrifugal compressor of the a.c.*

## I. INTRODUCTION

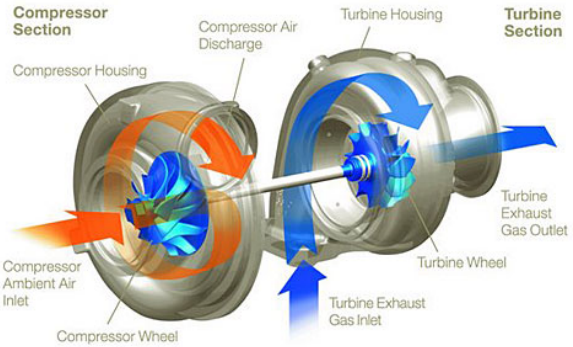
Today, energy crisis and environmental pollution have become two primary problems which are concerned by the countries all over the world. As one of the largest consumers of oil and also the largest pollutant emission sources, IC (Internal Combustion) engine becomes an important object for energy saving and emission reduction. At present researchers mainly focus on following two aspects for reducing energy crisis and relieving polluting gases. One is the research on IC engine alternative fuels owing to the shortage of petroleum resources and the soaring oil prices; the other is to explore new technologies for IC engine energy saving, including the technologies for IC engine waste heat recovery. Nowadays climate changes are becoming unpredictable. Average atmospheric temperature is increasing at a significant rate. We find it difficult to cope up with the sudden changes in the weather conditions hence the need for an efficient air condition system is increasing. So, the present automobile AC system is hence more often put use. This situation demands for an improvement in the contemporary system. The increasing fuel prices are also one of our main concerns. The power required for the working of the AC system is usually drawn from the automobile engine, which in turn results in increased fuel consumption. A recent comprehensive study of fuel consumption for vehicle AC on a state-by-state basis using thermal comfort based approach shows that US uses an estimated 7 billion gallons of gasoline every year for air conditioning vehicles. This is equivalent to 6% of domestic petroleum consumption, or 10% of US imported crude oil. The study further shows that vehicle air conditioning loads are the most significant auxiliary loads and outweighs even other significant loads such as rolling resistance, aerodynamic drag or driveline losses. The fuel economy of vehicle drops substantially when the AC compressor load is added to the engine. The AC increases the fuel consumption of a conventional gas-fuelled car by approximately 35% and significantly higher for hybrids. So energy efficient airconditioning systems are getting significant attention from the automotive industry to improve fuel economy of their vehicles. These situations led us in a search for an alternative powering solution for the automobile airconditioning system, which does not extract power directly.

## II. EXISTINGSYSTEMS

Now the A.C. in automobile uses the power from the engine to run the air conditioning system .the air compressor is coupled with the fan belt of the engine by a belt .when the ac is turned on the belt engages with the fan belt .when we stand in front of a car and turn on the A.C. we can hear the sound when the belt of the air compressor engages with the engine fan belt.

## III. TURBOCHARGER

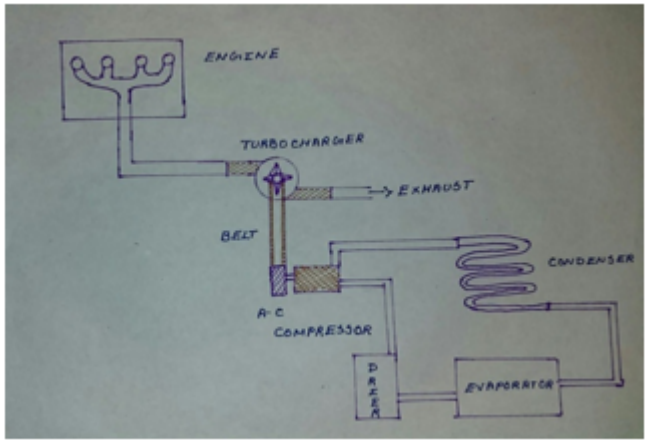
The objective of a turbocharger is to improve an engine's volumetric efficiency by increasing density of the intake gas (usually air) allowing more power per engine cycle. The turbocharger compressor draws in ambient air and compresses it before it enters into the intake manifold at increased pressure. Turbochargers are commonly used on truck, car, train, aircraft, and construction equipment engines. They are most often used with otto cycle and diesel cycle internal combustion engines.



## IV. METHODOLOGY

We have developed a concept to run the A.C. system by using the exhaust gas. The main idea is the usage of turbocharger to produce shaft power. The shaft power from the turbocharger is used to run the A.C. compressor. we have coupled the A.C. compressor with the turbocharger. The turbocharger will be driven by the exhaust gas leaving out of the engine. The shaft power from the turbocharger is used to run the A.C. compressor using a belt drive. The exhaust gas from the engine will be driving the turbocharger. And the rotary power or the shaft power from the turbocharger will be coupled to the compressor by using belt drive. The power from the fan belt of the engine is replaced by the shaft power from the turbocharger , and this runs the A.C. system further .

## V. DIAGRAMATIC SKETCH




## VI. RESULTS AND CONCLUSION

By implementing this concept the extra fuel usage by the vehicle for air conditioning system can be reduced. The installation of this in a vehicle is very simple. In consideration with our country's fuel cost can reduce some of the usage and make use of it for some other purpose.

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