

Automatic tyre pressure managing system

[Technology](#), [Cars](#)



ABSTRACT:

The aim of doing this analysis is to develop the study of “ Automatic tyre inflation and deflation system”. According to our study this can be done in all automobiles during long drives, and it can be utilized for uphill climbing and downhill. During longdrives or travelling long distance we need to be cautious of our automobile. We have made in such a way that the machine gets air filled automatically by its control units. The main function of the project is if the air is decreased suddenly in the automobile the sensor gets alerted to the person to use the air tank to fill the tyre with air. Afterwards the air pressure is increased in the tyre of the vehicle, the process is same as the process of indicating the sensor signal when the use of solenoid valve to reduce the excess air in the tyre.

INTRODUCTION:

The “ Automatic tyre inflation and deflation system” is a mechanical device which is widely used in automobile works. It maintains optimal tyre cavity pressure whenever the tyre is rolling in service, thus improving overall fuel economy by reducing the tyre’s rolling resistance. During the air checking in vehicles the manual works increases the man power of the operator. The process of letting of air or gas out of the tyres is known as deflation. One of the main problem in automobile vehicle is deflation, because over a period of time the air is reduced in the running vehicle.

So more time traveled vehicle make way for deflation which makes the tyre to lose its air. There is always a question araised by fleet managers that how frequently the need to check the pressure of the tyre. According to our study

osmosis of air through tyre casing can lead to a loss 1 to 3 PSI per month, depending on the tyre make and model. The type of compounds used in the making of tyre has huge impact on osmosis. another compound is the composition and gauge of the tyre inner liner compound which also plays significance in osmosis.

LITERATURE SURVEY:

Tyre is defined as a ring- shaped covering that fits around a wheel’s rim to protect it and enable better vehicle performance. Tyre is used to provide traction between the vehicle and the road while providing a flexible cushion that absorbs shock. Tyres prevent wheel rim from damages and shocks caused while driving, and provides smoother ride. Most tyres used especially in automobiles and bicycles, which provides traction between the vehicle and the road while providing a flexible cushion that absorbs shock. The birth of tyres were band of iron placed on wooden wheels, which are used in carts and wagons. The tyre will be heated in a forge fire which is placed over the wheel and quenched, causing the metal to contract and fit tightly on the wheels. Wheel Wright a skilled worker carried out this work. the outer ring that is served to “ tie” the wheel segments together for use, providing also a wear resistant surface to the perimeter of the wheels. John Boyd Dunlop a Scottish inventor was the first person to make a practical pneumatic tire. He invented while he was working as a venterinarian in May Street, Belfast on 1887 for his son’s bicycle, in an effort to prevent the problem his son had while riding on rough roads. Dunlop is credited for realising rubber could withstand the wear and tear of being a tire while retaining its resilience.

WORKING:**BLOCK DIAGRAM**

In our study we came up with a model consisting of solenoid valve, control units pressure sensor and tyre model. We used pressure sensor to detect pressure level in the tyre. the level of pressure is already programed in the control unit. When the pressure level decreases, the sensor gives signal to the control unit, then the contoller unit will open the solenoid valve for filling the air, when the required pressure is obtained tghе control unit will turn OFF the solenoid valve. In case the pressure level becomes more than requied level then the control unit will switch ON another solenoid valve for releasing air to the atmosphere. When the required amount is reached the operation will be stopped by the control unit automatically.

ADVANTAGES AND FUTURE SCOPE**ADVANTAGES:**

This concept of dynamically-self-inflating tyre system would be capable succeeding as a new product in the automotive industry. It specially adresses the needs of the consumers for maintaining tire pressure for the following reasons:

- Reduces tyre wear
- Increase in fuel economy
- Increase in overall safety of the vehicle

These type of product does not currently exist for majority of the passenger vehicles, but the idea of implementing these types of tyres, the market

conditions would be favourable for the introduction self- inflating tyre system.

Through all the engineering analysis, it has been determined the self inflating tyre system would function as desired.

The product would be capable of:

- It provides sufficient airflow to the tyre with minimum leakage.
- It withstands the static and dynamic loading exerted on the rotary joints
- Significantly, the self-inflating tyre system would be a successful product because of its economic benefits to investor.
- It has been sold at about \$450/unit, with total first year profit and sales has been nearly \$2.1 million and 58,000 units, respectively
- the product experiences about 12% annual market growth each year for the first five years of the implementation of the product, and bringing total sales up to 370,000 units
- The Break-even on the capital investment is just under three years.

FUTURE SCOPE:

- As mentioned previously, the main beneficiaries of this technology is that will allow tyre pressure to be adjusted for driving conditions will be the vehicle owners.
- An initial investment in the technology, will experience a reduction in tyre wear and an increase in fuel economy; both of these will result in saving money in the long run.
- It is possible to say that society as a whole will be benefited from the resulting design.

- Tyre disposal in landfills will be reduced, and decrease in the rate of consumption of natural resource will truly benefit the society. Also the improvement in the safety of the vehicle will benefit all the people who drive a vehicle on the roadways.
- Everyone will not be benefitted from this technology. Both tyre manufactures and the petroleum industry will be negatively affected by this design
- Tyre manufactures will affected negatively because this product is being designed with reduction of tire wear in the mind.
- Demand of tyre will decrease as tyre last longer and fewer replacements are needed.
- This case is also applicable for petroleum industry since this product results in an increase in fuel economy for passenger vehicles, and also the demand for oil will go down.

CONCLUSION:

The study that we carried out had made an impressive task in the field of automobile field. The project we carried out will reduce the rate of involved in the field of automobile. This project has been designed to perform the entire requirement within the shortest time available. This project is exclusively done to be used in all automobile vehicles. This project is also designed for ideal condition vehicles. The project is also developed for the next level of running condition vehicle. The vehicle which all are available in running condition will sometime need to puncture the tyre. So an alternative method that is sensor are used in these process. The air will be filled in the tyre pressure per the seconds. It is calculated and to find the air filling

efficiency and to find out the punctured tyres. So it is easily identified and used to solve the problems. This process is an advanced technique in our project.