

# Manufacturing of Magnetic Shock Absorber for Bicycle

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**Abstract**— This project is based on suspension system of two wheelers which were formally depending upon spring type, hydraulic and pneumatic suspension systems. This report gives information about magnetic suspension system and the magnetic suspension system is turning out to be the new option to these conventional suspension systems. The aim of this project is to study and investigate the response of system, when it is subjected to road surface irregularities with the hope that it would help automobile industry. This project presents design, construction and working of magnetic suspension system. This system uses magnets and spring as passive dampers, which are used to reduce displacement and acceleration of sprung mass in order to improve ride comfort. By using this type of absorber we can absorb the more number of shocks and variations are absorbed with more accuracy. This type of Suspension has no problem of leakage of oil like hydraulic shock absorber. Also this has less maintenance than other types of shock absorber that we can made this type of shock absorber for the efficient work of vehicle and for reducing the maintained cost of vehicle.

**Key words:** Magnetic Shock Absorber, Magnet, Spring

## I. INTRODUCTION

Magnetic suspension system is mainly based on the property magnets that like poles of magnets repel each other. This characteristic of magnets is used for suspension work of system. This system also contains spring in between these two magnets to avoid direct contact of two magnets due to overloading. This system finds large number of applications in automobile industry.

In today's world automobile sector has reached its peak. In two wheeler suspensions system used in coil spring is that after some time it becomes not only harder but also reduces cushioning effect. This limitation has overcome by magnetic suspension. The cushioning effect is provided by magnetic suspension is existing for long time.

There is one magnet fixed at the top of the inner portion of the cylinder. The second magnet placed at bottom of the inner portion of cylinder that reciprocates up and down due to repulsion. The two magnets fight against each other to achieve the aspect of suspension.

## II. BLOCK DIAGRAM

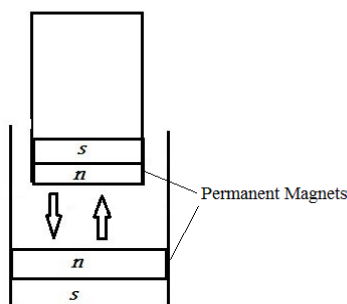


Fig. Block Diagram of Project

Figure shows the fundamental parts of solar car which we are going to model and implement. The main four parts are PV Module, Battery, DC motor and charge controller.

### A. Neodymium Magnet:



A neodymium magnet (also known as NdFeB, NIB or Neo magnet), the most widely used type of rare earth magnet, is a permanent magnet made from an alloy of neodymium, iron and boron to form the Nd<sub>2</sub>Fe<sub>14</sub>B tetragonal crystalline structure.

Developed in 1982 by General Motors and Sumitomo Special Metals, neodymium magnets are the strongest type of permanent magnet commercially available. They have replaced other types of magnets in the many applications in modern products that require strong permanent magnets, such as motors in cordless tools, hard disk drives and magnetic fasteners.

### B. Hollow Structural Sections



- High strength, high resistivity and low electrical conductivity.
- Can be made by integrating both non-magnetic & non-metallic materials.

Non-magnetic materials:

1. Titanium
2. Stainless steel
3. Aluminium

### C. Fork:



A bicycle fork is the part of a bicycle that holds the front wheel.

A fork typically consists of two blades which are joined at the top by a fork crown. The crown is always at the front as is the arch. Above the crown, a steerer tube attaches the fork to the bicycle and the handlebars (via a stem) allowing the rider to steer the bicycle. The steerer tube of the fork interfaces with the frame via bearings called a headset mounted in the head tube.

### D. Final Assembly of Shock Absorber

In a vehicle, shock absorber reduces the effect of travelling over rough ground, without shock absorber the vehicle would have a bouncing ride, as an energy is stored in the spring and then released to the vehicle, possibly exceeding the allow range of suspension movement .

Control of excessive suspension movement without shock absorption requires stiffer springs, which would intern gives a harsh ride. In this project a new suspension system based on magnetic power which can be used in automobile in future. The suspension system consists of magnets freely moving inside the cylinder with their same poles facing each other. Since the magnetic poles repel each other while moving closer, the up and down spring action is obtained.



### ACKNOWLEDGMENTS

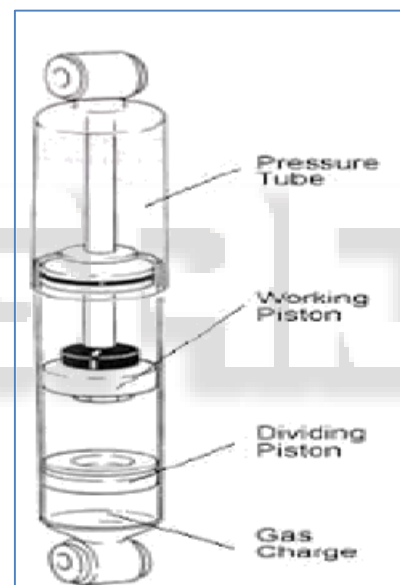
We offer our sincere and hearty thanks with a deep sense of gratitude to our Managing Director Hon. Mr. Bhausaheb Rupnar to give such platform and Project Guide Prof. Babar P.D. for his valuable direction and guidance to our project, his meticulous attention towards our project work without taking care of his voluminous work.

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### III. RESULT AND OBSERVATION:



### IV. CONCLUSION

The project has provided us an excellent opportunity and experience to use our limited knowledge. We gained a lot of practical knowledge regarding planning, purchasing, machining and team management while doing our project work.

### REFERENCES

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