

# Design and Development of Automatic Pneumatic Bumper System

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**Abstract:** *The Car accidents are happening every day. Most drivers are convinced that they can avoid such troublesome situations. However, the statistics shows that ten thousand dead and hundreds of thousands of million wounded each year. Hence, improvement in the safety of automobiles is prerequisite to decrease the numbers of accidents. Automobile bumper is a structural component of an automobile vehicle which contributes to vehicle crashworthiness or occupant protection during front or rear collisions. The bumper system also protects the hood, trunk, fuel, exhaust and cooling system as well as safety related equipment. Bumper beams are usually made of steel, aluminium, plastic, or composite material. Bumper beams are also the backbone of the energy absorbing systems located at both front and rear on automobiles. This energy absorber which looks like a shock absorber, functions as a connecting member between a bumper and front cross member for the purpose of damping load and the shock load during a low speed collision between the motor vehicle and an obstacle. Under the bumper impact situation these energy absorbers are loaded in compression or tension as well as the bumper moves from a designed outer position toward the vehicle body and are operative to absorb the energy of the impact. After impact, these energy absorbers recover at various rates to return associated with bumper assembly toward its original pre-impact position.*

**Keywords:** Pneumatic hoses and fittings .IR transmitter and IR receiver, Pedestal bearings.

## REFERENCES

- [1] Ahmad Syuhri, Design and Modeling of Hydraulic Crash Damper in a Racing Electric Vehicle, International Journal of Mechanical & Mechatronics Engineering IJMME-IJENS Vol:16 No:03,pp.166-172.
- [2] R. Balamurugan & Dr. M. Sekar, Design of Shock Absorber for Car Front Bumper, IJSTE - International Journal of Science Technology & Engineering | Volume 3 | Issue 09 | March 2017,pp.166-169.
- [3] Prof. M. B. Bankar, Prof. S. K. Pawar, Prof. R. V. Lalge, Design And Development Of Automatic Pneumatic Bumper System, Journal Of Information, Knowledge And Research In Mechanical Engineering, NOV 16 TO OCT 17 ,2017, VOLUME -04, ISSUE - 02,pp.820-825.
- [4] G.V.R.Seshagiri Rao, Vadnala Priyanka, V V S H Prasad, Design and Analysis of Automobile Bumper, International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-9 Issue-1, November 2019,pp.512-516.
- [5] Raj Kumar G, Balasubramaniam S, Senthil Kumar M, Vijayanandh R, Raj Kumar R, Varun S., Crash Analysis on the Automotive Vehicle Bumper , International Journal of Engineering and Advanced Technology (IJEAT) ISSN: 2249 – 8958, Volume-8, Issue-6S3, September 2019,pp.1602-1607.
- [6] A.T. Beyenea, E.G. Korichob, G. Belingardib, B. Martoranac, Design and manufacturing issues in the development of lightweight solution for a vehicle frontal bumper, International Symposium on Dynamic Response and Failure of Composite Materials, ScienceDirectProcedia Engineering 88 ( 2014 ) 77 – 84.