International Journal of Advanced Technology in Engineering and Science
Vol. No. 09, Issue No. 04, April 2021
www.ijates.com
ijates
ISSN 2348 - 7550

BUMPER AND ANTI-COLLISION SYSTEM FOR FOUR WHEELERS

Mr, M.Amarnath[1], C.Sridhar[2], G.Santhosh Kumar[3], V.Tamilselvan[4] R.Thulasi Raman[5]

[1]Assistant Professor[2,3,4,5] UG Scholar

[1,2,3,4,5]Department of Mechanical Engineering

[1,2,3,4,5]KSR Institute for Engineering and Technology, Tiruchengode.

ABSTRACT

The technologies are developed in the field of automation that integrates heavy growth of vehicles for public transport. According to Indian road transport situation the Accident are major problem to the Vehicles, to avoid this we developed Anti-collision system especially for four wheelers. The system is based on intelligent electronically control system. This system activates brake as well as extends the bumper from its initial position to reduce the damage caused during collision. The infrared sensor (IR), which is used to sense the colliding object (Obstacles / Human / Any Vehicles in specified range of distance) which is responsible for accident. Then sensor sends feedback signal to the control unit, there by activating the solenoid valve for an activation of system. During the working of Automatic braking system simultaneously the driver can also try to stop the vehicle by pressing brake pedal. Extended bumper with the help of pneumatic pressure reduces the damage to vehicle which occurs in accidents. This system provide pre-crash safety to the vehicle. As well as it improves the response time of vehicle braking to keep safe distance between the vehicles. By using this system we can obtain control the over speed vehicle is short distance.

Keywords; *Anti-collision, safety purpose*

INTRODUCTION

We have pleasure in introducing our project "ANTI-COLLISION SYSTEM FOR FOUR WHEELERS". Which is fully equipped by IR sensors circuit and Pneumatic bumper and braking activation circuit. It is the project which has been fully equipped and designed for auto vehicles. The technology of pneumatics plays a major role in the field of automation and modern machine shops and space robots. The aim is to design and develop a control system based on intelligent electronically controlled automotive bumper activation system is called "automatic pneumatic bumper and break actuation before collision". The project consists of IR transmitter and Receiver circuit, Control Unit, Pneumatic bumper system. The IR sensor senses the obstacle. There is anyobstacle closer to the vehicle (within 1feet), the control signal is given to the bumper and break activation

system. This bumper activation system is activated when the vehicle speed above 80-100 km per hour. The speed is sensed by the proximity sensor and this signal is transfer to the control unit and pneumatic bumper activation system.

CONSTRUCTION

The square tubes are measure and cut for a specified dimensions and welded to form a frame which act as a chassis for our system and resides pneumatic and electronic drives on it. Four wheels are mounted at the bottom side of chassis and on its opposite side, at its front end portion bumper is mounted with the help of pneumatic cylinder. Another pneumatic cylinder is connected to a brake lever of a wheel. These cylinders are directly coupled to a solenoid valve which is controlled by an infrared sensor placed at front side of the vehicle.

MAJOR COMPONENTS

1. Pneumatic Cylinder
2. Solenoid Valve
3. Hoseand Connector
4. Frame
5. Shaft
6. Metal Strip
7. Bearing
8. Battery
9. D C Motor
10. Compressor
11. Circuit;
12. IRSENSOR
13. RELAY

D.C MOTOR

The electrical motor is an instrument, which converts electrical energy into mechanical energy. According to faraday's law of Electromagnetic induction, when a current carrying conductor is placed in a magnetic field, it experiences a mechanical force whose direction is given by Fleming's left hand rule.

- DC Motor capacity : 12V
- Un loading : 130rpm
- Loading : 90rpm

PNEUMATIC CYLINDER

Double Acting Pneumatic Cylinder

1. Stroke length : Cylinder stoker length 160 mm = 0.16 m
2. Quantity: 1
3. Seals : Nitride (Buna-N) Elastomer
4. End cones : Cast iron
5. Piston : EN – 8
6. Media : Air
7. Temperature : 0-80 º C
8. Pressure Range: 8 N/m²

IR SENSOR

Specification:

It is contain to the two medium

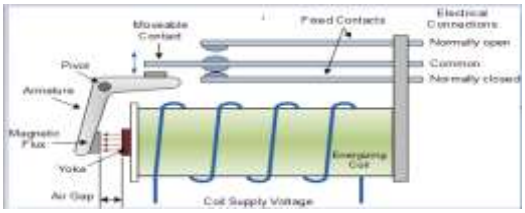
- Transmitter
- Receiver

It is working to the AC or DC power

It is optical detecting sensor

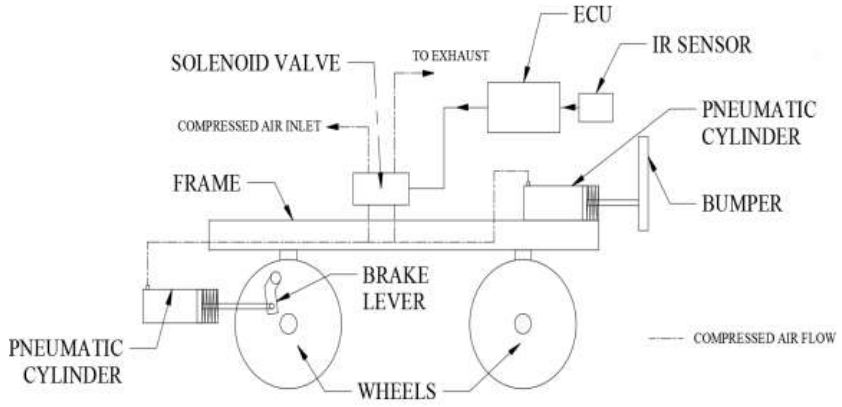
RELAY

A relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays. Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits as amplifiers: they repeated the signal coming in from one circuit and re-transmitted it on another circuit. Relays were used extensively in telephone exchanges and early computers to perform logical operations.



S.No	DESCIRPTION	QTY	MATERIAL
1.	FRAME	AS PER REQUIRMENT	MILD STEEL
2.	SHAFT	AS PER REQUIRMENT	MILD STEEL
3..	METAL STRIP	AS PER REQUIRMENT	MILD STEEL
4.	BEARING	12	STAINLESS STEEL
5..	PNEUMATIC CYLINDER	2	ALUMINIUM
6.	SOLENOID VALVE	1	PLASTIC
7.	D C MOTOR	1	ELECTRICAL
8.	BATTERY	1	ELECTRICAL
9.	HOSE AND CONNECTOR	2 METRE AND 5	PLASTIC AND STAINLESS STEEL
10.	CIRCUIT;		ELECTRICAL
11.	RELAY, IRSENsOR		
12	COMPRESSOR		MILD STEEL

BLOCK DIAGRAM



CONCLUSION

This paper provides an approach to avoid the collision between the vehicles in traffic busy roads. In future this concept can be implemented in four wheelers and prevent the vehicles from accidents and save the peoples from severe injuries. This is not for only based on vehicles collision at the same time if any obstacles like wall, trees, people, etc are coming on the road lane means the system will detects all things and send the message to the unit and then we can save the vehicles from accidents. So simply we can say if this concept was implements in real time systems it will get success means we can say as Accident free vehicle collision system. Hence usage of this system can highly increase safety and efficiency of transportation system, while improvements in this system can bring out the more reliability and safety in the vehicular manufacturing technology.

REFERENCE

1. Y. Bar-Shalom, X. Li, T. Kirubarajan, “Estimation with Applications to tracking and Navigation”, John Wiley & Sons, INC, New York, Chapter 11, pp. 421-490, 2001.
2. Managing Urban Traffic Congestion, “European Conference of Ministers of Transport”, OECD/ECMT 2007.
3. M. A. Hannan, A. Hussain, and S. A. Samad. “System Interface for an Integrated Intelligent Safety System (ISS) for Vehicle Applications”. 2010.
4. BLINDER, ” n.d., para. 1 Retrieved from FAQs.p
5. Kiyoshi Minami, TohruYasuma, Shigeru Okabayashi, Masao Sakata and ItsurMuramoto, TadaoKohzu, “A collision- avoidance warning system using Laser Radar”, SAE international paper,19.
6. Biral F., Da Lio M., Lot R., Sartori R. (accepted). “An Intelligent Curve Warning System For Powered Two Wheel Vehicles”. EUROPEAN TRANSPORT RESEARCH RE-VIEW, ISSN: 1866-8887A
7. Nobuyoshi Mutoh, Yusuke Sasaki, “A Driver Assisting System for Eco-Vehicles with Motor Drive Systems Which Avoids Collision with Running Vehicles by Using Inter-Vehicle Communications”, proceedings of the 2007 IEEE Intelligent Transportation Systems Conference Seattle, WA, USA, Sept. 30 - Oct. 3, 2007.
8. Yusuke Takatori, Hiroyuki Yashima,” A study of driving assistance system based on a fusion network of inter-vehicle communication and in-vehicle external sensors”, 14th International IEEE Conference on Intelligent Transportation Systems Washington, DC, USA. October 5-7, 2011
9. Bertolazzi E., Biral F., Da Lio M., Saroldi A., Tango F. , "Supporting Drivers in Keeping Safe Speed and Safe Distance: the SASPENCE Subproject within the European Frame-work Program 6 Integrating Project PReVENT".
10. Driver related reasons data, “National Highway Traffic Safety Administration(NHTSA)” July 2008.