

DESIGN AND FABRICATION OF CAR REVERSE BRAKING SYSTEM

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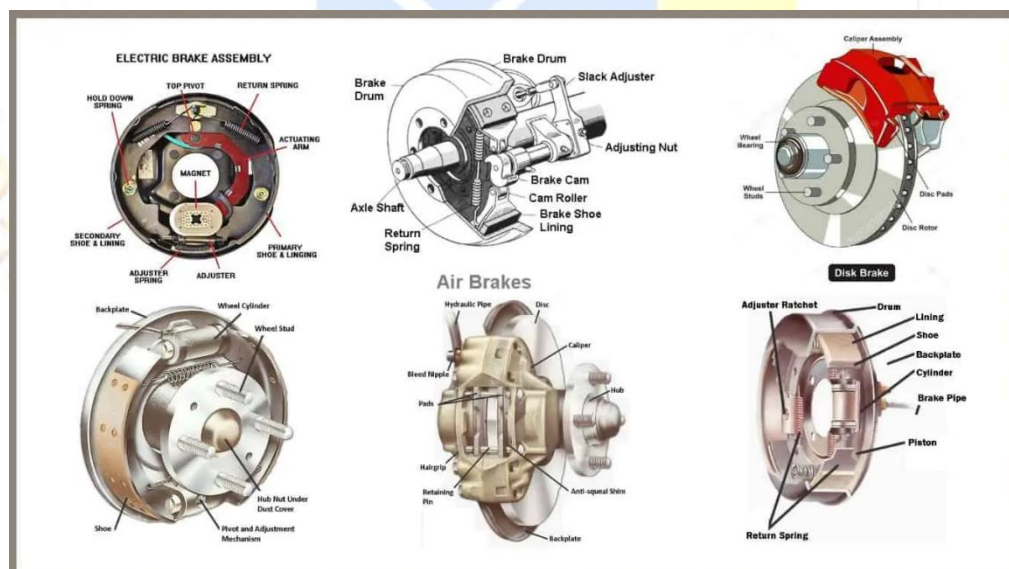
Abstract: The object of the research works in to design distance measurement and electromagnetic braking system using ultrasonic waves. It will be very helpful for accident avoiding in vehicles. Until well into the twentieth century most devices developed for measuring distance worked on the same principle. The measured distance is compared with a standard unit of length. Other means are available. One of these is the measurement for time taken by the sound wave to cover a certain distance. This sound normally lies beyond human hearing. The ultrasonic sensor is used to measure the distance in digital form and automatically braking the vehicle when the obstacle closer to the vehicle. The Aim of this article is to avoid the unwanted accidents occurred by the learners while reverse parking the vehicle. The Blindspot of the vehicle are covered over the ultrasonic sensor. This will help the learner to avoid accidents in slopes and hill stations. The blind spots are the reason for the most of the accidents occurred in our day-to-day life. Because they are difficult to handle for the learners in heavy vehicles and four wheelers.

Key words: Ultrasonic Sensor, Electromagnetic gun, Control unit, Motor, Brake lever

1. Introduction

A motor is a device which is used to make run the vehicle move forward and backward. The principle of converting mechanical energy by electromagnetic means which has been designed. When the current is passed through the wire rotates around the magnet showing the current gets raised to a circular magnetic field around the wire, this motor is called homopolar motor [1]. A device for resting or preventing the motion of a mechanism usually by means of friction. Braking distance, it refers to the distance of the vehicle which is travelling from the point where the brakes are fully applied to when it comes to a complete stop. In the first the drum brakes shoes are mechanically operated with reverse rods (or) cables [2]. DC consists of copper coil winding and armature shaft. The armature comes to approach the winding then 12V DC is applied came to winding via relay. Relay operates by microcontroller and that give discontinuous supply to DC gun. After finished the retract motion armature relive from winding if non flush created on boundary surface of winding (3). Wheel is circular device that can rotate on its axis facilitating movement or performing labors in machine. Common example is found in transport applications. More generally the term is also used for other circular objects that rotate or turn, such as a Ship's wheel and flywheel. The wheel most likely originated in ancient (4).

Micro controllers are designed to play and increasingly important role in revolutionizing various industries and influencing our day-to-day life. Consequently, it as generates a great deal of interest and enthusiasm among students, teacher and practicing engineers (5).



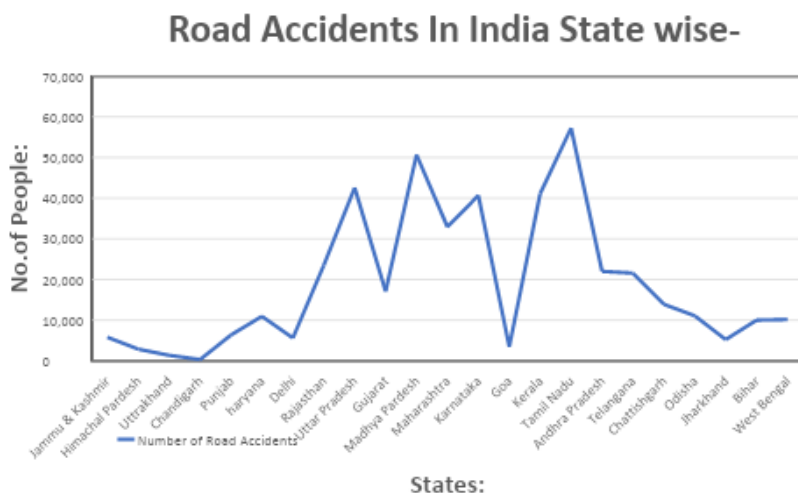
Source: The Engineers Post

Fig (1): Types of Brakes

In this study, several complications have been addressed that can occur during the braking occurs in slopes and the braking done by the leaners. By using the ultrasonic sensors, the risk factor of accidents done by the leaners may be reduced. The study is to learn about the existing system and realize the need and important of the present study.

2. Analysis of current research and development

After evaluating the technical aspects and parameters, then generated several ideas and framed them using software. This allowed us to review and refine our ideas for improvement. Then analyzed there are lot of practical issues is being raised during the implementation of our study in the existing system by software. Then it has been changed a little bit and now it is implemented using ultrasonic sensors. A brake is a device for slowing or stopping the motion of a machine or vehicle, or alternatively a device to restrain it from starting to move again. The kinetic energy lost by the moving part is usually translated to heat by friction. Alternatively, in regenerative braking, much of the energy is recovered and stored for later use. As the standard of living people increased together with the human population it resulted in a drastic increase in the number of moving vehicles on the road. This means that the probability of the number of accidents also increase which resulted in heightened need of safety systems in automobiles. Keeping this fact in mind we have developed a unique way of preventing accidents, by sensing the vehicle which is moving in front measure the distance between the two and if the distance is close enough for a contact, the sensor will immediately send signal to the ECU which actuates the electromagnetic to apply brakes. Thereby preventing a possible accident! (fig2).



Source: Ministry of Road Transport and Highways

Fig (2): Road Accidents in India state wise

3. Methodology

A. Description of the present study design

A machine that converts direct current power into mechanical power is known as D.C Motor. Its generation is based on the principle that when a current carrying conductor is placed in a magnetic field, the conductor experiences a mechanical force. The direction of this force is given by Fleming’s left-hand rule. Consider a part of a multipolar dc motor as shown in fig. when the terminals of the motor are connected to an external source of dc Supply. The field magnets are excited developing alternate N and S poles. The armature conductors carry currents. All conductors under N-pole carry currents in one direction while all the conductors under S-pole carry currents in the opposite direction. Suppose the conductors under N-pole carry currents into the plane of paper and those under S-pole carry current out of the plane of paper as shown in fig. Since each armature conductor is carrying current and is placed in the magnetic field, mechanical force acts on it. Applying Fleming’s left-hand rule, force on each conductor is tending to rotate the armature in anticlockwise direction. All these forces add together to produce a driving torque which sets the armature rotating. When the conductor moves from one side of the brush to the other, current in the conductor is reversed and at the same time it comes under the influence of next pole which is of opposite polarity. Consequently, the direction of force on the conductor remains same. The output of the car reverse braking system is very useful in the automobile sector because it can avoid the unwanted accidents happened in the society by the learners simultaneously. Then it also makes the society to live their lives peacefully without the unwanted accidents happens then and then

B. Details of the intervention (the new product) and control group:

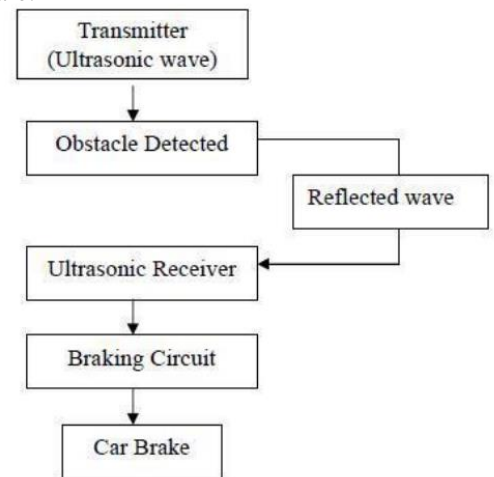
In this project we are using ultrasonic sensor for detecting the objects or vehicles in front of our vehicle. It’s also measured the distance between our vehicle and the coming object. It is consisting of ultrasonic transmitter and receiver. The transmitter always transmitting the waves, the receiver receives the reflected wave and converts it in to digital pulse. The ultrasonic sensor sends a high-low pulse to the controller. The pulse time will vary depends on the closeness between the sensor and the object (fig 2). Using this pulse timing the controller measures the distance. When the distance becomes low, the controller will switch on the relay for applying braking. Before applying braking, the controller will display the alert in the LCD display. Here the electromagnetic core type braking mechanism is used for applying brake in the wheel. An Electromagnetic Core device converts electrical energy to mechanical energy by the interaction of two types of closed magnetic circuits. A first closed magnetic circuit functions to generate high magnetic intensity in a portion of a ferromagnetic core.



Fig (3): Car reverse braking system

The steps required to read the distance and controlling the speed of a vehicle are:

1. Microcontroller makes the I/O line output. (By using the DDR x Register in AVR or TRIS x Register in PIC)
2. The I/O line is made low (this may be the default state of I/O pin)
3. Wait for 10uS
4. Make the I/O line high,
5. Wait for 15uS
6. Make the I/O line low 6
7. Wait for 20uS
8. Now make it input (by using the DDR x Register in the obstacle and come back to the module.
9. Module will keep it low. Wait when the pulse is low, as soon as that becomes high start the timer.
10. After this, wait till pulse is high and as soon as that becomes low copy the timer value and stop the timer



Source:(IRJET) Volume: 05 Issue: 02 | Feb-2018

Fig (3): Block diagram of system

C. Factors determining the choice of the material

The material selected must possess the necessary properties for the proposed application. The various requirements to be satisfied Can be weight, surface finish, rigidity, ability to withstand environmental attack from chemicals, service life, reliability etc. The following four types of principle properties of materials decisively affect their selection Physical, Mechanical, From manufacturing point of view, Chemical. The various physical properties concerned are melting point, thermal Conductivity, specific heat, coefficient of thermal expansion, specific gravity, electrical conductivity, magnetic purposes etc. The various Mechanical properties Concerned are strength in tensile, Compressive shear, bending, torsional and buckling load, fatigue resistance, impact resistance, elastic limit, endurance limit, and modulus of elasticity, hardness, wear resistance and sliding properties. The various properties concerned from the manufacturing point of view are, Cast ability, Weld ability, Surface properties, Shrinkage, Deep drawing etc. Sometimes the demand for lowest possible manufacturing cost or surface qualities obtainable by the application of suitable coating substances may demand the use of special materials. This generally affects the manufacturing process and ultimately the material. For example, it would never be desirable to go casting of a smaller number of components which can be fabricated much more economically by welding or hand forging the steel. Some materials may be scarce or in short supply, it then becomes obligatory for the designer to use some other material which though may not be a perfect substitute for the material designed. The delivery of materials and the delivery date of product should also be kept in mind. Sometimes high strength materials have to be selected because the forces involved are high and space limitations are there. As in any other problem, in selection of material the cost of material plays an important part and should not be ignored. Sometimes factors like scrap utilization, appearance, and non-maintenance of the designed part are involved in the selection of proper materials.

4. Results and Discussion

A new design for the driving learners is implemented for the avoiding of unwanted accidents in the slopes and the blind spot while driving. Because those are the difficulties handled by the new learners while driving. By implementing this technique, the number of accidents occurred by the new learners is reduced and rectified. Then loss occurred due to the accident for the vehicle is reduced.

Findings in relation to the literature review, current trends, and advanced method.

S.No	Antiquated Procedure	Advanced Procedure
01	The existing system only senses the obstacle and alert the driver to apply brake	The system senses and apply brake automatically when obstacle detected
02	There may me accident happen due to the driver's inconvenience& careless	The system totally avoids the unwanted happening of accidents occurred by the learners
03	The safety in this existing system is comparatively lower our system	There is no safety compromission
04	Learner's carelessness causes more damage to the vehicle as well as the victim	Learner feels free and unwanted damage to the vehicle are reduced comparatively in existing system

By this we conclude that the unwanted accidents in the automobile field. Because most of the accidents are happen only by the learners by their careless mistakes and blind spots of the vehicles.by this system those problems are rectified and then it is implemented. Then finally the car reverse braking system is works in the future system

Conclusion

The project carried out will make an impressing mark in the field of automobile. It is very usefully for drivers to drive the vehicle without tension. This project has also reduced the cost involved in the concern. The project has been designed to perform the required task taking minimum time.

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