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AUTOMATIC BREAKING SYSTEM & CLUTCHING SYSTEM

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ABSTRACT

A original ultrasonic reverse warning system is a new system. It can assist drivers while applying brake. It includes ultrasonic emitter and receiver that can produce and receive the ultrasonic waves to detect the distance between car & obstacle. But it is not good for the safety of cars, In this, we are meant to design a system that can help drivers stop the car automatically, An electronic circuit was construct. According to this circuit we design, a signal was produced to braking system of car based on the distance between car and obstacle for an safe braking purpose. Error is also discuss and during the experiment, the improvement for the original system has also achieved.

INTRODUCTION

With the current fast development in automobile technology, there has been a tremendous increase in the number of automobiles. Market research results show that in 2010 the world's car number hits 6.9 billion, the number of cars yet to appear after the next 8 years will be 1.16 times the current one[1]. Cars have become a major tool of transportation in the live society. Car safety system becomes perfect as its number sources nowadays. Because you can not always see what is behind you, reversing accidents are very common. A reversing system alerts you how far the distance is from obstacles in the reversing vehicle pathway. Mainly, there are three different kinds of system used in the vehicle reversing system for detecting the distance, an ultrasonic system, infrared system and the radar system.

These three systems have strengths and weaknesses. Ultrasonic systems [2] is widely used in many applications, whose strength lies in its wide range of detection and anti-interference. The original material is cheap and production cost is low, making its price more widely acceptable. Its weakness liess in the valid radius of detection that is the rather limited and in its accuracy in obstacle detection that is the lowest among the three. systems are generally used in middle and low-end cars.

The infrared system[3] is can have long-distance detection and accuracy outshining that of ultrasonic. However, It's also plagued by issues like high manufacturing cost and underperformance in the detection before it mirror obstacles. Therefore, this one is used with the ultrasonic system in high-end cars or automobiles. The radar system[4] is outperforms the other two. This system is outshines the other two in detection of radius, range and anti-interference. However, Its high manufacturing cost is not preferred by manufacturers of home use and in commercial automobiles. This type of system is can generally using in military vehicles. Original ultrasonic reversing warning system[5] is more like a safety distance alarm system & It is used for monitor a distance between the source car and obstacle, If the distance is minimum than the safety distance, It will active the alarm and give a notice to the driver. On the other hand, the brake system is important to introduced for our design. The most common braking system is the ABS (anti-lock braking system) in the automobile.

MATERIALS AND METHODS

Materials

DC motor

Diode

LED

Phototransister

IC 555

Relay switch

Wheel
Ply board
Resistance
Gun
Battery (6V)

DESIGN

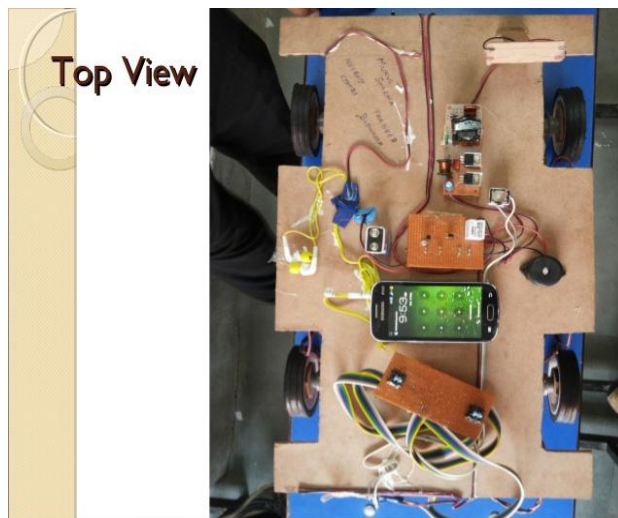


Fig 1 :ABS system layout

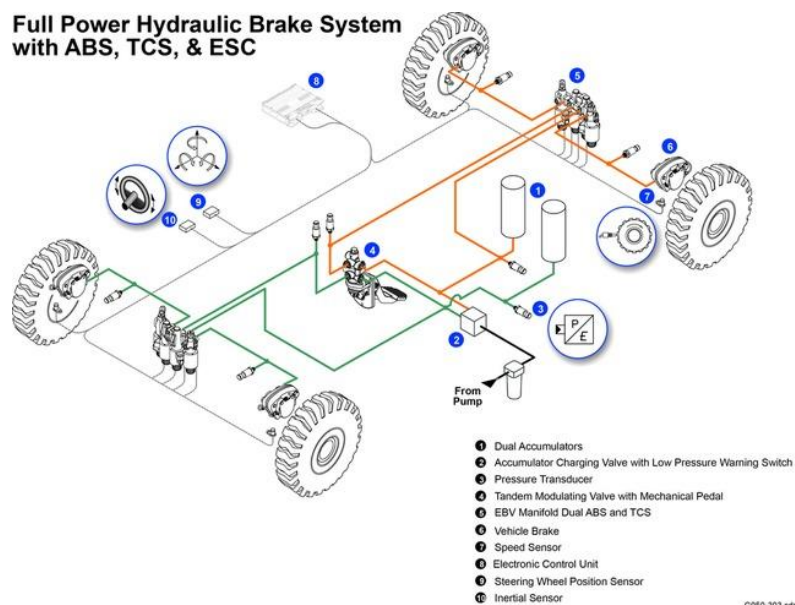


Fig 1 :ABS system layout

RESULTS AND DISCUSSION

As the result of this the work, The design is a good based on our the purpose. The function of each part in this circuit is working well and the whole system is successfully achieved. The safety distance is determine and the LED was lighted up when the safety distance is reaches.



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FORMULAE

$$V_B = V_E + 0.7V$$

$$A = V_{out} / V_{in}$$

$$\alpha = I_c / I_E$$

$$\beta = I_B / I_C$$

Table 1: Distance and the number of echoed pulse

Distance/m	Number of pulse
0.4	5
0.5	6
0.6	7
0.7	8
0.8	9
0.9	10
1	11

CONCLUSION

In this design we improve the original reverse warning system by adding an automatic braking system. The original ultrasonic braking system can only alert the driver by buzzer while the distance between car and the obstacle is less than or equal to a distance, it will not do anything else. This is a new function of our design that could be possible used for all the vehicles. By this in the times of fast development in electronic science and technology, there is a soaring number of cars. People have higher expectations of cars and need safer, smarter and more comfortable cars. Therefore, the safety system of cars will be better developed and have more market demands. The car-reversing control system in this design is a basic procedure for future researches. With future study and research, we hope to develop the system into an even more advanced speed-control system for automobile safety. Using this design as a theoretical ground, we will mount ultrasonic probes all around the car, tell us the speed between the moving car and cars around it. At the same time, we add newly microcontrollers in our design circuit, enabling the car to limit the speed. With the operation of the microcontroller, we can tell if the speed is within the safe zone, thus reminding or forcing drivers to reduce the car speed to keep the distance or stop the car if it's getting dangerous, it can greatly reduce the number of car accidents. By doing so, we maximize the guarantee of life safety of those who are tired or drunk drivers. We believe that the distance control system can be designed into an updatable system. For instance, we may enter the tyre type, weather and the road condition to change the preset range of the safe driving distance, making the system safer and smarter. This will also give such a system a bigger market space and more competitive fields in the market. Realizing this certainly requires tons of work and learning, like the programming & the operation of microcontrollers and automobile structure.

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