_____

AUTOMATIC BREAK FAILURE INDICATOR FOR FOUR WHEELER

Md. Nasir Hussain[1], S.Ramya[1], K. Manisha[1], K.Manasa[1], M. Vishnuvardhan[2]

[1]UG Student, Department of ECE, Vaageswari College of Engineering, Karimnagar, Telangana, India
[2]Assistant Professor, Department of ECE, Vaageswari College of Engineering, Karimnagar, Telangana, India
mohammednasirhussain56@gmail.com

ABSTRACT: The braking system of a car is undoubtedly one of its more important features. The aim of this work is to create a better braking system with indicator. Brake failure occurs only because of worn out of brake shoe and cut in liner. It consists of two sensors. One sensor is connected with the brake shoe. The other sensor is the brake liner. The signal from the two sensors is given to a microcontroller. When the brake shoe is worn out, the sensor senses signal to the microcontroller. Also if the brake liner is cut, the sensor sends signal to the microcontroller. The microcontroller analyses the signal and operates the corresponding indicator. It nothing wrong, the vehicle will move and if any one critical, the vehicle will stops and the screen shows the indication of brake failure. Since this indicates the status of the brake, the user can identify the condition of the brake and thus limiting the chances of malfunction.

KEYWORDS: Braking, brake shoe, failure, microcontroller, malfunction.

1. INTRODUCTION

Today accidents are occur due to many reasons, the one of the main reason is brake failure, it caused to due to poor maintenance as well as product defect, in order to safe guard the valuable human for accident the accident monitoring of brake is very important thing in automobile Vehicle safety is the avoidance of automobile accidents or the minimization of harmful effects of accidents, in particular as concern to human life and health. Special safety features have been built into vehicles occupants only, and some for the safety of others. We have pleasure in introducing our new concept "Brake Failure Indicator for four wheeler". This is equipped by relay braking unit. It is genuine concept which is fully equipped and designed for automobile vehicles. This forms an essential part of best quality. This product underwent test in our automobile vehicles and it is best. A brake is a mechanical device that inhibits motion by slowing down a body or by slowing it. Brakes retard the motion of a body creating friction between two working surfaces and converts the kinetic energy of the moving body in to heat. Brakes are generally applied to moving as well as tiers. Sometimes brake failure may occur when the brake lining is cut-off.

1.1 Postulate

There are some objectives need to be achieved in order to complete the work. These objectives will act as a guide and will limit the system to be implemented for certain situations. To develop a model of AUTOMATIC BREAKE FAILURE INDICATOR FOR FOUR WHEELER by using the ULTRASONIC sensor detect oil level and give instant response to arduino. To use arduino (IDE) software to generate a computer program for the arduino in order to get signal for the real time. To on the buzzer oil level will be detected.

_____

1.2 Importance

The main aim of this paper is to develop a module to detect the oil level in the vehicle by using the concept ultrasonic waves. The system consist of ultrasonic sensor, buzzer, andArduino UNO.Ultrasonic sensor is used to detect the distance between sensor and the top surface of the oil. This detection is performed without physical contact between the sensor and oil surface. Ultrasonic sensors utilize the principle of sound reflection to measure the depth. The calculation is performed by high level language program that reside in an arduino.

2. CHOICE OF ULTRASONIC SENSOR

There are numerous types of ultrasonic range sensors available with key differences in frequency and power consumptions. Ultrasonic sensor with high frequency will have a sharper beam width and can detect obstacles in longer range. Also some of the new sensors have similar range detection as previous models but with less power consumption. In this project, the ultrasonic sensor must be able to detect obstacles or objects from 2cm to 400cm. Since the whole system power supply will be taken from battery supply, the less current consumption is crucial and must be able to operate at low voltage. HC-SR04 meets the criteria of this project to detect the obstacles in a short period after the long research was done between the HC-SR04 and others Ultrasonic sensors.

3. ARDUINO

Arduino is a software company, project, and user community that designs and manufactures computer open - source hardware, open source, and microcontroller-based kits for building digital devices and interactive objects that can sense and control physical devices. The project is based on microcontroller board designs, produced by several vendors, using various microcontrollers. These systems provide sets of digital and analog I/ O pins that can interface to various expansion boards (termed shields) and other circuits . the boards feature serial communication interface, including universal serial bus (USB)on some models, for loading programming from personal computers.Arduino are used in automatically controlled devices such as control systems, office machines, automobile engines, power tools and so on. By reducing the size, cost and power consumption, arduino makes it economical to electronically control more and more processes.
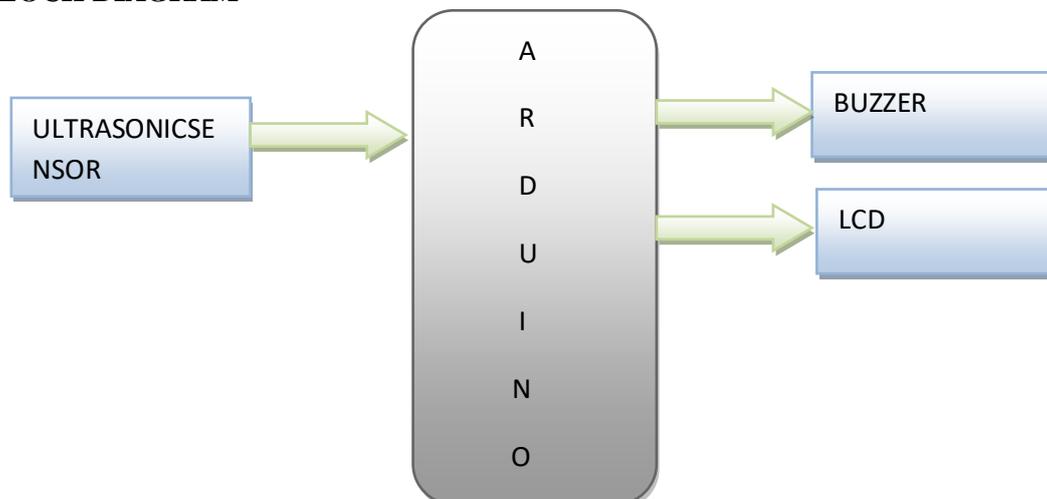
4. BLOCK DIAGRAM

Figure: 1 Block diagram

_____

_____

4.1 The HC-SR04 Ultrasonic Sensors

The ultrasonic sensor must be able to detect obstacles and objects from 2cm to 400cm. Since the whole system power supply will be taken from battery pack, the less power consumption is crucial and must be able to operate at low voltage. SR04 meets the criteria of 16 this standard to detect the obstacles in a short period after the long research work was done to select between the SR04 and others Ultrasonic sensors.

4.2 HC - SR04 features

Ultrasonic ranging module HC - SR04 provides 2cm - 400cm non-contact measurement function, the ranging accuracy can reach to 3mm. The modules includes ultrasonic transmitters, receiver and control circuit. The basic principles of work are:

➢ Using IO trigger for at least 10μs high level signal,
➢ The Module automatically sends eight 40 kHz signals and detect whether there is a pulse signal back.
➢ IF the signal comes back, through high level, time of high output IO duration is the time from sending ultrasonic to returning.

Wire connecting direct as following:

➢ 5V power supply
➢ Trigger Pulse Input
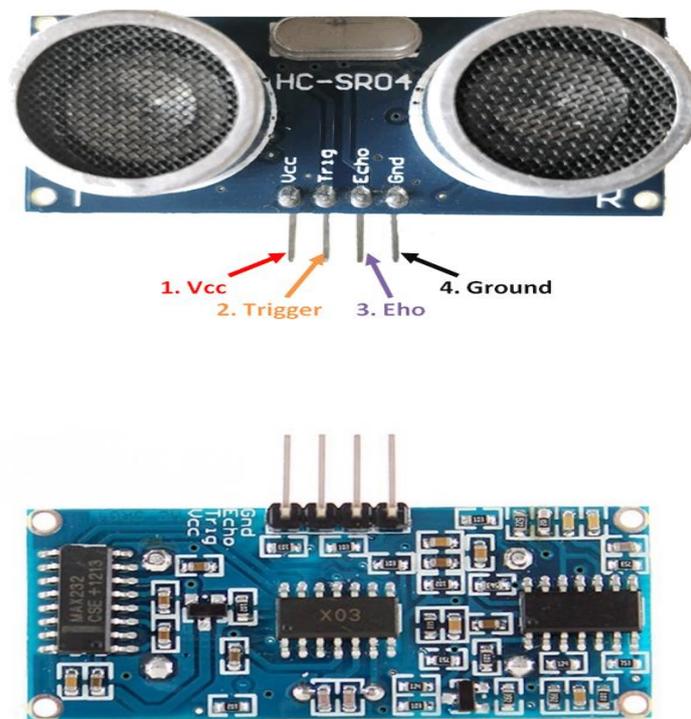➢ Echo Pulse Output
➢ 0V Ground

Fig 2: HC-SR04 ultrasonic sensor

_____

4.3 Arduino UNO

The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter. "Uno" means one in Italian and is named to mark the upcoming release of Arduino 1.0. The Uno and version 1.0 will be the reference versions of Arduno, moving forward.

5. PROGRAMMING

The Arduino Uno can be programmed with the Arduino software. The ATmega328 on the Arduino Uno comes pre burned with a bootloader that allows you to upload new code to it without the use of an external hardware programmer. It communicates using the original STK500 protocol.
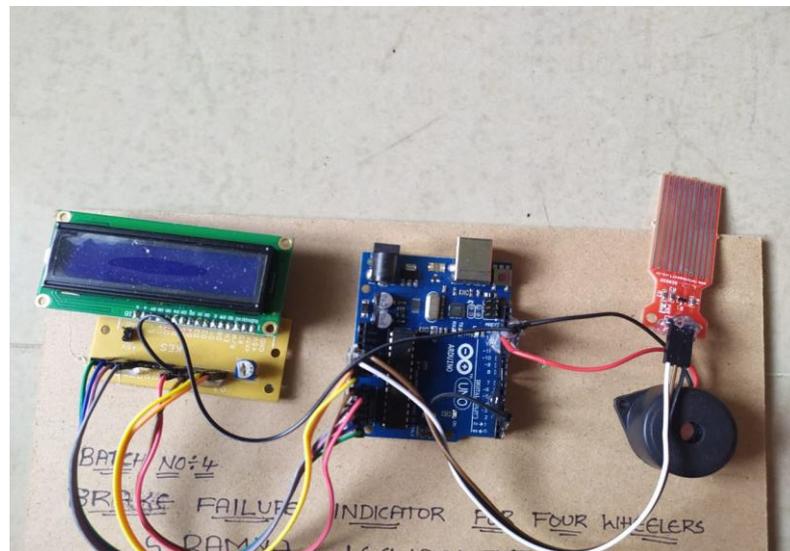
5. RESULT ANALYSIS

Fig.3: Result analysis

_____

7. SYSTEM INTEGRATION

After building every component and modules on prototype board, it is important to test the circuit as well as the functionality of overall system The whole Integrated System has put to a functionality test to confirm that all the hardware and software coding and interfacing are work well

8. CONCLUSION

This setup reduces the accidents and prevents loss of life. Auxiliary braking gives additional capability to the driver and to ensure prevention of damage to life and property. The project gives more confidence that we will be able to apply in practice, whatever theoretical knowledge. If really persuade us to do more and more, perhaps in good way in our future. Brake failure indicator is an early warning system. It constantly monitors the condition of the brake and give audio visual signal. This setup reduces the accidents and prevents loss of life. Auxiliary braking gives additional capability to the driver and to ensure prevention of damage to life and property

9. FUTURE SCOPE

The brake failure indicator circuit is designed for avoiding accidents due to brake failure. If you can grasp the necessary force and the durability that brakes require to stop tones of moving metal, you can understand how brake malfunctions can occur. So many things can cause brake failure. There is something that we all take for granted, the brake on our vehicles. It is very unusual for a vehicle to suffer total failure of the braking system. Though it has so many limitations, this equipment is very effective to detect brake failure and it will find great scope in future.

BIBLIOGRAPHY

[1]. A17 Mechanical Design Committee Report on Cars Ascending into the Building Overhead, ASME, Sept. 1987.

[2]. W.J. Helfrich, "Island Creek Coal Company V.P.-5 Mine," MSHA, Mine Electrical Systems Division Investigative Report No. C080978, August 1978.

[3]. T.D. Barkand, "Investigation of the Accident and Installation and Testing of Dynamic Braking on the Main Elevator at Duquesne Light, Warwick Mine, #3 North Portal," MSHA, Mine Electrical Systems Division Investigative Report C-052287-12, May 1987.

[4]. C. E. Valhovic, "Rational for New Rules, in CSA-B44 Safety Code for Elevators," Elevator World, July 1989.

[5]. J. A. Nederbragt, "Uncontrolled Speed, Up and Down," Elevator World, Dec. 1985.