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DESIGN OF AUTOMATIC HAND BRAKE APPLY WITH SPEED CONTROL BRAKING SYSTEM

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Abstract – Automatic hand brake apply with speed control braking systems one the braking systems in automobile at the time of vehicle turn off condition. This braking system is a pneumatically operated one. This project helps us to apply the hand brakes when the key is taken out of the ignition slot. Again when the key is inserted the hand brakes are released automatically. The control unit is receives the signal from the key switch. The key switch is ON at the time of vehicle start condition. Also an emergency switch is provided in this system which helps at the time of critical conditions. This project eliminates the necessary of applying hand brakes at all the time when the vehicle is parked. Also a sensor is placed the vehicle senses continuously and in case of any emergency situation, the brakes and the bumper activated automatically by the pneumatic systems.

Keywords-Pneumatic braking

I. INTRODUCTION

AUTOMATIC HAND BRAKE APPLY WITH SPEED CONTROL SYSTEM, which is fully equipped by automatic system. It is a genuine project which is fully equipped and designed for Automobile vehicles. This forms an integral part of best quality.
In this project we have over comes existing failure using proximity sensor, our project has an unique ability to sense speed and control braking to avoid accidents we have also introduced automatic hand brake release when car is turned OFF with EMERGENCY SWITCH.
The brake shoes are attached by steeper motor. The handbrake which is connected to both front and rear wheels of the vehicle. The main aim of the system is to reduce the impact from the high speed collision.

II. LITERATURE REVIEW

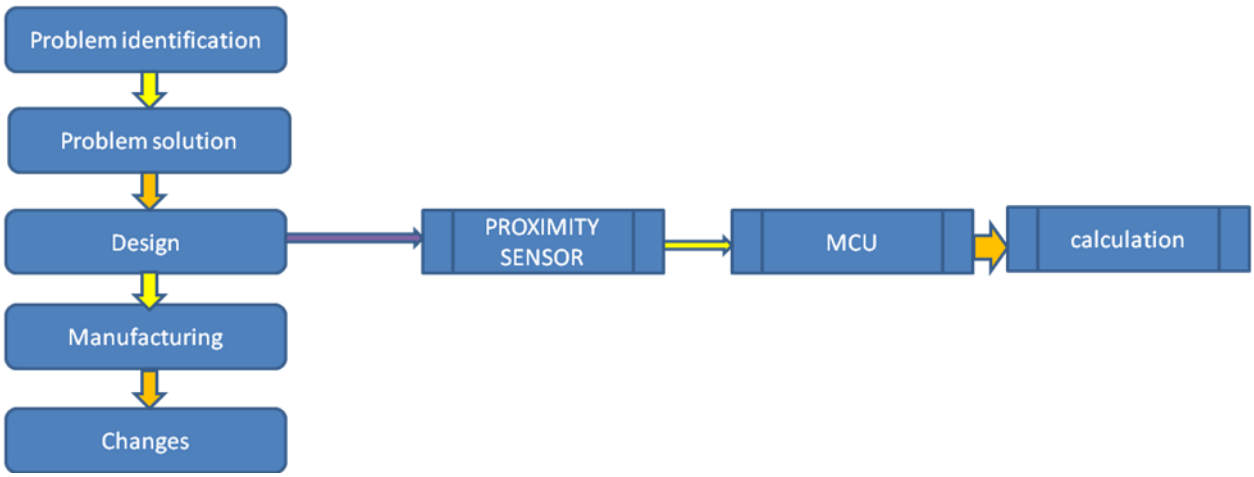
The brake system is the main safety of automotive directly. The vehicle are the key to the future so that the safety of the person is similarly important. Air brakes respectively functions longer delay than the hydraulic brake because of the air pressure system . The pneumatic brakes generally functions according to the compressor through the air pressure value , so the function depends according to the speed control system. The heavy commercial vehicle braking system layout is designed keeping various parameters .The non-linear of the pneumatic sub- system of the air brake system which relates he pressure in brake camber to the brake valve plunger displacement and the supply pressure to the brake valve as been developed in the system.

III. CONCEPT OF AUTOMATIC HAND BRAKE APPLY WITH SPEED CONTROL BRAKING SYSTEM

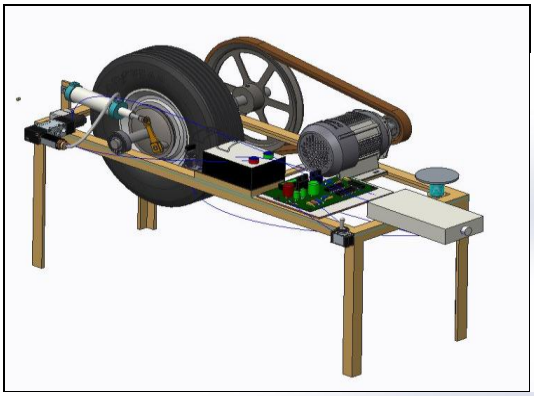
The main objective of this project is to enable and disable the hand brakes when the key is taken out and inserted respectively. This is done with the help of a pneumatic cylinder and a control unit. To show the braking effectively, a wheel arrangement driven by an AC motor is arranged. The power from the motor is transmitted to the wheels through the belt and the pulley arrangement as shown in the figure. The braking arrangement is connected with a pneumatic cylinder through a cable such that when the pneumatic cylinder is actuated, the cable is pulled and the brakes are activated. When the cylinder is actuated in the opposite direction, the cable gets loosened and the brakes are released. The proposed method will automatically inform about the hurdle in the path of the vehicle on the display with the help of different sensors. Ultrasonic sensors are connected in the vehicle to sense the object (Hurdle) and then send signals to the controller. The controller takes different actions based on these signals in order to create a safe environment for the driver. After detecting the obstacle in front of the car, we will directly view the distance between the car and obstacle on the LED display. When the distance between two cars or distance between cars & obstacle is very small, means if accidents like situation are detected by IR sensor then the automatic braking system is activated. Based on the potential safety benefits and problems more research is needed to determine the overall safety impact of these systems. The future scope of the system is implementation on hardware. We can also include buzzers, indication lights and can set speed by using keyboard and keyboard encoder IC in this system. The system involves the controlling of speed of vehicle through the microcontroller. Different commands will send to the ports of controller to control the speed of vehicle. The microcontroller receives commands which show the obstacle in front of the vehicle and output will encoded 8 bit value.

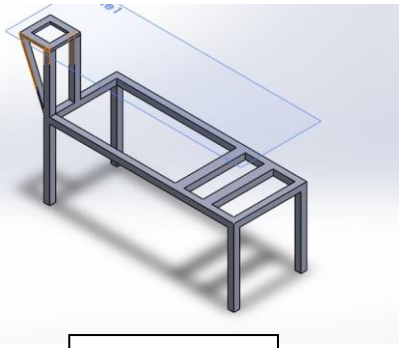
The input signals will come from ultrasonic distance sensor and IR sensors on board the vehicle. After analyzing the inputs from the sensors, controller maintains the speed of vehicle according to the distance from the vehicle. After the detection of the obstacle in front of the car, the distance between car & obstacle directly shows on the LED display. Whenever the distance between car & obstacle goes to minimum then speed of car also decreases. When the distance between two cars or distance between cars & obstacle is very small, means if an accident like situation is detected by IR sensor then the automatic braking system is activated.

IV.**METHODOLOGY**

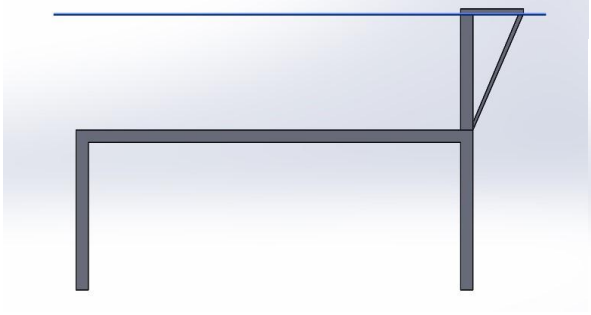


v. **EXPERIMENTAL SETUP**

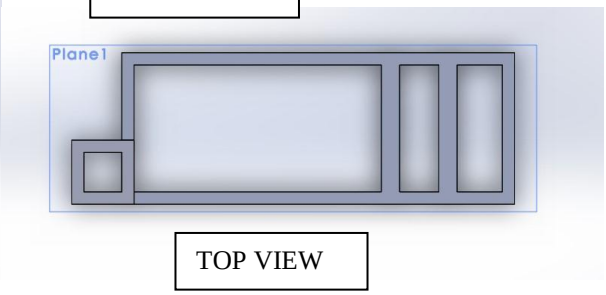




3D VIEW



SIDE VIEW



TOP VIEW

VI.**DESIGN OF PULLEY**

Measured Specifications:

N1/N2 = D2/D1

Where,

N1 = Input speed to the Motor = 1440 rpm
N2 = Output speed from the pulley-2
D2 = Diameter of the pulley-2 = 200mm
D1 = Diameter of the Motor pulley=63mm

∴ N2 = (D1/D2) x N1
= (63 / 200) x 1440
N2 = 453.6 rpm

DESIGN OF BELT

$L = \Pi (r_1 + r_2) 2 l + (r_1 - r_2)^2$

Where,

r_1 = Radius of driving pulley = 63 / 2

r_2 = Radius of followers = 200 / 2

l = Distance between two pulley = 135 mm

$\therefore L = \Pi(31.5 + 100) + 2 \times (135) + (31.5 - 100)^2$

= 413.12 + (135 x 2) + 4692

L = 5375 mm

VII.**RESULT**

Automatic Hand Brake Release With Speed controlling Braking system is nothing but one of the braking systems in automobile at the time of vehicle turn off condition. This project helps to apply the hand brakes automatically when the key is taken out of the ignition slot. Again when the key is inserted, the hand brakes are released automatically. Also an emergency button is provided in this system which helps at the time of emergencies and critical situations. When this button is pressed, the brakes are applied automatically even when the key is not taken out.

VIII.**CONCLUSION**

The automatic brakes are applied when the ignition is turned off. This techniques develops the brake system when the speed system is actually functioned according to it. We have gained a practical knowledge regarding planning, purchasing , assembling and machining. The project proves the extreme level of automation.

IX.**FUTURE SCOPE**

This project says in the development of automation in electric vehicles. The main idea will develop a dramatic change in the field of the automobile. This will help in the development to reduce the number of accidents in the society.

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