

Fabrication of Brake Failure Detection and Acceleration Locking System in Automobiles

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Abstract:- The aim is to design and develop a control system based an automatic brake failure detector and acceleration locking system using IR Sensor and the control unit. The main theme of the project is to monitor the brake system at every moment and if there is any brake failure the acceleration is locked automatically, i.e. the driver cannot accelerate the vehicle furthermore. An IR sensor is placed on the brake kit assembly. The sensor is connected to the control unit; the output of the control unit is connected with the fuel pump that pumps fuel from the fuel tank to the fuel injector. Hence, when the brake fails, the control unit sends signals to the fuel pump such that it stops pumping fuel from the fuel tank to the fuel injector.

Keyword- Accident, Automobile, Brake failure, Sensor, Solenoid valve, Control.

INTRODUCTION

Today accidents occur due to lot of reasons; one of the main reasons is the brake failure. In order to safe guard the valuable human life from accidents; the monitoring of brake is an essential thing in automobile.

The pleasure in introducing a new "FABRICATION OF BRAKE FAILURE DETECTION & ACCELERATION LOCKING SYSTEM IN AUTOMOBILES" which is equipped by sensors and control unit. It is genuine project which is fully equipped and fabricated for automobile vehicles.

MANUFACTURING PROCESS:

Manufacturing processes are the steps through which raw materials are transformed into a final product. The manufacturing process begins with the creation of the materials from which the design is made. These materials are then modified through manufacturing processes to become the required part. Manufacturing processes can include treating (such as heat treating or coating), machining, ore shaping the material. The manufacturing process also includes tests and checks for quality assurance during and after the manufacturing, and planning the production process.

NEED FOR AUTOMATION:

Nowadays almost all the manufacturing process is being atomized in order to deliver the products at a faster rate. The manufacturing operation is being atomized for the

following reasons.

- ❖ To achieve mass production
- ❖ To reduce man power
- ❖ To increase the plant efficiency
- ❖ To reduce the work load
- ❖ To reduce the production cost
- ❖ To reduce the production time
- ❖ To reduce the material handling
- ❖ To reduce the fatigue of workers
- ❖ To achieve good product quality

MAJOR COMPONENTS:

i) BRAKE SHOE:

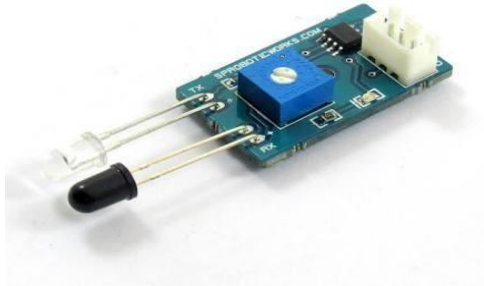
A brake shoe is the part of a braking system which carries the brake lining in the drum brakes used on automobiles, or the brake block in train brakes and bicycle brakes. The brake shoe carries the brake lining, which is riveted or glued to the shoe. When the brake is applied, the shoe moves and presses the lining against the inside of the drum. The friction between lining and drum provides the braking effort. Energy is dissipated as heat.



IR SENSOR:

In the broadest definition, a sensor is an object whose purpose is to detect events or changes in its environment, and then provide a corresponding output. A sensor is a type of transducer; sensors may provide various types of output, but typically use electrical or optical signals. For example, a thermocouple generates known voltage (the output) in responseto its temperature (the environment). A mercury-in-glass thermometer, similarly, converts

measured temperature into expansion and contraction of a liquid, which can be read on a calibrated glass tube.



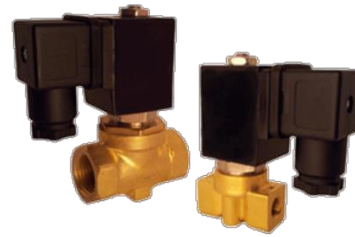
CONTROL UNIT

In automotive electronics, Electronic Control Unit (ECU) is a generic term for any embedded system that controls one or more of the electrical system or subsystems in a motor vehicle. Types of ECU include Electronic Control Module (ECM), Power train Control Module (PCM), Transmission Control Module (TCM), Brake Control Module (BCM or EBCM), Central Control Module (CCM), Central Timing Module (CTM), General Electronic Module (GEM), Body Control Module (BCM), Suspension Control Module (SCM), control unit, or control module.



SOLENOID VALVE:

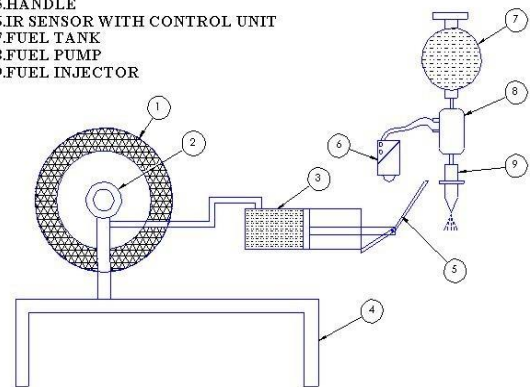
A solenoid valve is an electro mechanically operated valve. The valve is controlled by an electric current through a solenoid: in the case of a two-port valve the flow is switched on or off. Solenoid valves are the most frequently used control elements in fluidics. Solenoids offer fast and safe switching, high reliability, long service life, good medium compatibility of the materials used, control power and compact design.



WORKING PRINCIPLE

Very simple and easily available components are used in this project for the purpose of fabrication. This consists of a braking system, an IR sensor and a control unit. Also the fuel tank and solenoid valve are used. The IR sensor normally senses the braking system of the vehicle. The fuel tank is connected to the solenoid valve and the supply of 12V is given to the solenoid valve through switch. The IR sensor is connected to the AC supply. If the braking system works without any problem, sensor works as usual. If there is a brake failure, IR sensor detects the failure and sends signal to the control unit. The control unit thus closes the solenoid valve and cuts off the fuel supply. Further the vehicle cannot be accelerated unless the brake is repaired.

- 1.WHEEL
- 2.BRAKE SHOE
- 3.BRAKE OIL
- 4.FRAME
- 5.HANDLE
- 6.IR SENSOR WITH CONTROL UNIT
- 7.FUEL TANK
- 8.FUEL PUMP
- 9.FUEL INJECTOR



2D – WORKING PRINCIPLE

MERITS:

- The major advantage of the system is that it reduces the man power during driving
- The effectiveness of the equipment is comparatively higher than the mechanical drive
- The compactness and responsiveness of the equipment is high.

DEMERITS:

- The traction control is always been an issue while using the equipment.
- When an engine stops the control of the vehicle has to be considered as a major drawback of the project.

CONCLUSION:

The project makes its impact in reducing the accidents due to brake failure. Most of the accidents can be reduced by using the system effectively. The foresaid disadvantages can be reduced and it can be controlled in the future extension of the project. Implementation of the project in the automobile is also cheaper which will be affordable for any automobile industry to implement in the vehicles.

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PHOTOGRAPH :

