Design & Fabrication Panic Braking System

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Abstract— Vehicle technology has increased rapidly in recent years, particularly in relation to braking systems and sensing systems. ASS (active safety systems) are being researched and developed to prevent accidents and target mitigation. Among many useful active safety systems, it has been reported that AEBS (Advanced Emergency Braking Systems) effectively prevents accidents and reduces casualties simultaneously. The project aims to distinguish between systems currently in production like traction control (TC), electronic brake force distribution (EBD), brake assist (BA) and electronic stability control (ESC) functions and future systems that are currently in development. The project aims to develop a prototype system that offers a collision functionality in production vehicle, a system which can operate automatically with the help of limit switch circuit and some modification in traditional braking system that can alert the driver in front collision and apply the brake automatically in emergency or critical situation when drive is applied brake force on accelerator pedal.

Keywords: EBD, ESC, AEBS, ASS

I. INTRODUCTION

In Cars there has been development in technology in last few decades. Day by day numbers of vehicles are increasing. The major cause is while driving vehicle on off roads or terrain roads is accident. Many times breakdown of vehicles takes place on hill roads while driving. So panic break control is technology which helps in driving vehicle on hill roads safely. It helps vehicle to stop rolling back from its position. Hill-Start Assist Control (HAC) is the new mechatronic technology as a safety features that detect the backward motion of the vehicle on hill or slope, that electronically controls and increases brake pressure at each wheel.

Downpanic break Control (DAC) automatically controls the brakes to maintain a constant low speed when descending slopes, helping reduce wheel lock and keeps good traction to maintain vehicle control.

A typical problem that is encountered by motor vehicle when they and themselves stopped on an incline and want to begin moving again, is that the vehicle begins to roll in the unwanted direction when the brake pedal is released. So panic break control is new feature which helps in starting vehicle smoothly run and helps to stop rolling back on inclined roads.

A. Objectives

The main objective of this topic is to study:

- To develop a safety car braking system using limit switch and actuator.
- In panic situation, if accelerator pedal will press on his extreme position, it act as break.
- To have control on speed

II. LITERATURE REVIEW

There are many modification are done in braking system

1) Design and Implementation of Automatic Emergency Braking System-Sandeep Thorat*, SanketThorve, Jaydatta Upase and Agampal Singh Dhupar-The Photo electric Sensor Which will sense the any object in front comes in contact with the sensor it will give output to the Electronic Control Unit. ECU automatically alert the driver by blowing the alarm.
2) Active And Emergency Braking System-Shubham Narang, Rishabh Sharma-Active safety braking system will help in emergency conditions by increasing braking force.\
3) An Antilock-Braking Systems (ABS) Control: A Technical Review-Ayman A. Aly,El-Shafei Zeidan,Ahmed Hamed,Farhan Sale

III. BASIC COMPONENTS

A. Tyre:

A rubber covering, typically inflated or surrounding an inflated inner tube, placed round a wheel to form a soft contact with the road.

Fig. 1: Tyre [7]

B. Motor:

An electric motor is an electrical machine that converts electrical energy into mechanical energy

Fig. 2: Motor[8]

C. Drum Brake System:

A drum brake is a brake that uses friction caused by a set of shoes or pads that press outward against a rotating cylinder-shaped part called a brake drum.

Fig. 3: Drum Brake [9]

D. Actuator:

Actuators (also called as power transducers) are electrical devices that transform input energy (control variable) to output mechanical work.

Fig. 4: Roller Actuator [10]

Fig. 5: Door Lock Actuator [11]

IV. WORKING OF PANIC BRAKING SYSTEM

The system is consist of two actuator, motor, wheel, Drum brake, chain, sprocket and gear, spring. Motor drives wheel by using chain drive. Drum brake is connected to door lock actuator by using wire.

Motor is started by using external power supply which drives wheel by using chain drive. When moving on road suddenly obstacle came front of car then situation become panic and sometime we suddenly hit the accelerator pedal. Due to this panic situation accelerator pedal goes to extreme position and become contact with roller actuator(NONC).Roller actuated door lock actuator which is pull brake pedal and brake is applied.

V. ADVANTAGE

- Helps in prevention of accident.
- More confidence in driving.
- Better control of vehicle in panic situation.

VI. LIMITATIONS

- Manually operated.
- It require external power supply

VII. CONCLUSION

The panic braking system is implementation in field of braking system. It will be useful in automobile industry. We are avoiding many mishaps and road accident that might save many innocent lives. Using actuator for braking system is efficient gives quick response during applying brake.

REFERENCES

[1] A.Arunkumar, T. Muthumani , V. Balasubramani , "Design and Fabrication of Antirollback System in Vehicles Using Ratchet and Pawl Mechanism". International Journal of Emerging Technology in Computer Science & Electronics (IJETCSE) pp.2015 Volume 12, ISSN: 0976-1353.

[2] Ayman A. Aly, El-Shafei Zeidan, Ahmed Hamed, Farhan Sale, " ABS Control : Technical Review", Intelligent Control and Automation, 2011, 2, 186-195

[3] Shubham Narang, Rishabh Sharma, "Active And Emergency Braking System" IJREAS VOLUME 5, ISSUE 12 (December, 2015) (ISSN 2249-3905)

[4] Cook George,"Anti creep and hill holderbrake system" (US 2938611 A) , International Conference California pp. 1960, volume12, ISSN :571-656

[5] Sandeep Thorat*, Sanket Thorve, Jaydatta Upase and Agampal Singh Dhupar, "Design and Implementation of Automatic Emergency Braking System" E-ISSN 2277 – 4106, P-ISSN 2347 – 5161

[6] Zhang L., Li H.,"Hilling Start-up Control Method Using Accelerometer". Vehicular Electronics and Safety, IEEE International Conference, pp.2006, volume 9 ISSN: 1457-4689

[7] URL:https://www.google.com/search?biw=1600&bih=789&tbm=isch&sa=1&ei=HQZxXPykN8r9rQGZhKiQBA&q=+jk+tyre&oq=+jk+tyre&gs_l=img.3..0i67l2j0l8.5129.6672..7433...0.0..0.133.466.0j4.....0....1..gwswizimg.....0i7i30j0i10.r3ZXf2GqUNw#imgrc=x6aDqWtxik-kMM:

[8] URL:https://www.google.com/search?biw=1600&bih=789&tbm=isch&sa=1&ei=twZxXOHADpOv9QO13pH4Dg&q=gear+motor&oq=gear+motor&gs_l=img.3.3.0j0i67j0l2j0i67l2j0l4.7400.10757..10998...0.0..0.172.1002.1j7.....0....1..gwswizimg.....0i10j0i7i30j0i7i10i30.CzRJ7zEFO6M#imgrc=bwiJfO7dys7DZM:

[9] URL:https://www.google.com/search?biw=1600&bih=789&tbm=isch&sa=1&ei=wwZxXKKCAdK8rQHxnoPwAQ&q=drum+brakes&oq=drum+break&gs_l=img.3.0.0i10l10.308689.314351..318080...0.0..0.178.2270.0j19.....0....1..gwswizimg.....0..0i67j0.fEyp6jo1OWo#imgrc=RvRI8F1F95ul2M:

[10] URL:https://www.google.com/search?rlz=1C1CHBD_enIN809IN809&biw=1600&bih=740&tbm=isch&sa=1&ei=StCIXNaGMqzy5gKXq2gAw&q=NONC+ACTUTOR&oq=NONC+ACTUTOR&gs_l=img.3...59205.89840..90448...0.0..1.126.1034.1j8.....0....1..gwswizimg.....0..0i67j0j0i5i30.ptwGfCW-YlU#imgrc=V9NzWkWdz9GvxM:
[11] URL:https://www.google.com/search?q=door+actuator&rlz=1C1CHBD_enIN809IN809&source=lnms&tbm=isch&sa=X&ved=0ahUKEwinoZLh6f7gAhUhh-AKHV8yCHYQ_AUIDigB&biw=1600&bih=789#imgrc=EvSoZK4OUudHeM

