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A Review on Advancements in Braking Systems in Auto Motive Industry

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Abstract--- *The paper mainly discusses about the Braking systems which are being updated these days. It also explains about the necessity of upgrading in the systems in detail the factors that are influencing the changes like road conditions etc. The braking systems should always be in a upgrade form so as to ensure the passenger safety. It mainly shows the process of some of the advance braking systems.*

Keywords--- *Automated Safety Systems, Braking Systems, Motive Industry.*

I. INTRODUCTION

A brake is a mechanical device that inhibits motion by absorbing energy from a moving system. It is used for slowing or stopping a moving vehicle, wheel, axle, or to prevent its motion, most often accomplished by means of friction.

Automated safety systems besides enhancing active safety devices due to increased rate of accidents in India. The results suggested that many of these accidents were caused by inattention. Automatic braking system combine sensors technology and brake control system to prevent high speed impact.

Some of the automatic braking systems can prevent collisions altogether but most of them are designed and placed for the luxury and high cost vehicles. Since high-cost vehicles are more likely to be fatal than low-cost automatic braking systems can save lives and reduce the amount of property damage that occurs during an accident in normal vehicles.

Advance Braking Systems

An anti-lock braking system (ABS) prevents skidding, reduces stopping distance and allows you to steer your vehicle around obstacles you'd otherwise hit.

The system engages when it detects a wheel has locked and starts to skid. It then 'pumps' the brake (applying and releasing it) much quicker than you can. Traction Control systems offer the added feature of improving your vehicle's traction on slippery surfaces when accelerating.

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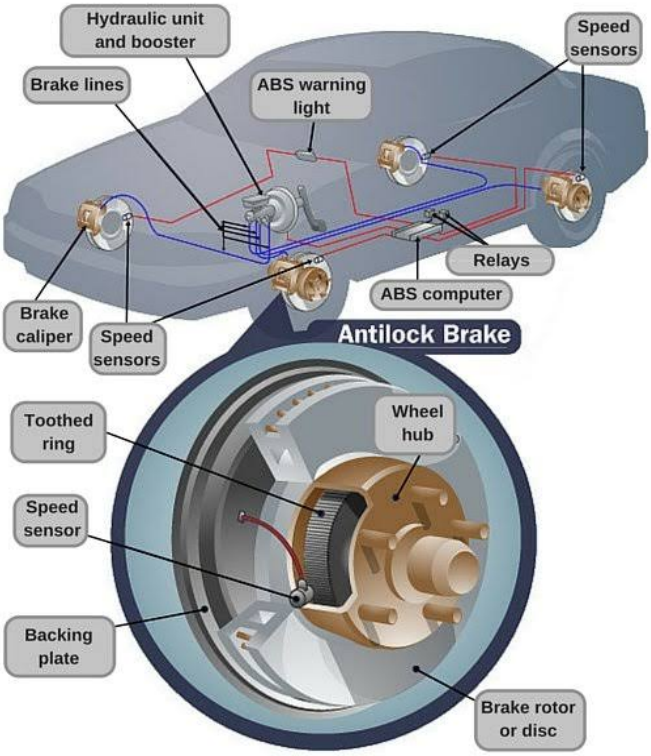

Fig 1.0: Diagram explaining the ABS in a car

ABS facts

1. ABS isn't automatic - it only works when the brakes are on. It's activated by pressing the brake quickly and firmly, and maintaining pressure.
2. Pumping or easing off the brakes stops ABS working.
3. ABS will not prevent skids on corners caused by excessive speed. Having ABS is not a licence to drive faster or follow other cars more closely.
4. Stopping distance tends to be shorter on wet and slippery roads, but can actually increase on shingle or soft snow.
5. When ABS brakes are activated, the brake pedal may vibrate or there may be a thumping noise.

II. LITERATURE SURVEY

[1]Dineshkumar C has discussed about the braking systems in which he inculcated IR sensors which is used for passenger vehicles in journal "AUTOMOTIVE BRAKING SYSTEM FOR PASSENGER VEHICLE TO ENHANCE SAFETY" published in November,2017.[2.] Prof. Bhushan S. Rakhonde also involved the micro controllers and with fusion of some sonsors in braking systems discussed in his paper "ADVANCE AUTOMATIC BREAKING SYSTEM FOR VEHICLE" published in January, 2017. [3] Dr.G. Sivakumar also discussed the importance of the braking system advancement in his journal published in August, 2014.

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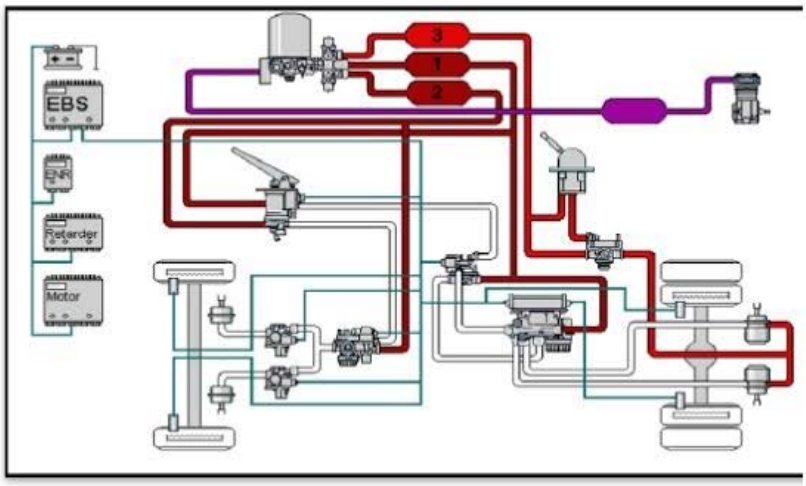
III. WORKING OF ADVANCED BRAKING SYSTEMS

A significant speed of the vehicle may indicate that a collision is likely to occur in which case the system is capable of automatically activating the brakes. The signal from the IR sensor which is connected to the stepper motor through control unit which make the braking system to control at this situation. The speed sensor senses the speed of the vehicle and stepper motor is activated depends on the speed of the vehicle. The braking is activated by programmed in the control unit. The stepper motor which drags the braking cable which is connected to the both front and rear wheels at varying force. However, automatic brakes can save your life if you ever suffer from a momentary lapse in concentration. The concept of this project is cost effective and can be used these in passenger vehicle.

Electronic Braking Device

The simple idea behind an EBD system is that it need not be necessary to apply the same amount of braking force on each wheel so as to reduce the speed of the car or bring it to a complete stop. An EBD system makes use of three components which make it tick. The speed sensors, brake force modulators and electronic control unit (ECU).Most of the cars today come fitted with ABS or Anti-lock Braking system. Coupled along with ABS, there is another electronic marvel called the EBD or electronic brake force distribution. Simply put, EBD is a system wherein the amount of braking force on each wheel of the car can be varied taking factors such as load bearing on each wheel, condition of the road, speed of the vehicle and so on.



EBS COMPONENTS

Legends:

1EBS central module	**2** Brake signal transmitter
3Proportional relay valve	**4** ABS solenoid valve
5 Axle modulator	**6** 3/2 relay valve
7ABS sensors	

Fig 1.1: Diagram showing the main components of Electronic Braking components

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IV. CONCLUSION

The idea of developing and designing new braking systems using many means is really useful and efficient for the daily changing traffic conditions and changing technology in cars. Good Brakes are really necessary to control the speed on any kind of road and the advancement taking place is really helpful for the automobile designers to increase their scope of designing new models .

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