Autonomous Emergency Braking System

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Abstract - *Now a day's vehicle accidents is the major problem. Autonomous Emergency Braking system used an innovative Technique for the purpose of preventing accidents happens in the restricted roadways. The purpose of this system is based an intelligent electronically control with automatic activation of braking system is known as "Autonomous emergency braking system for forward collisions avoidance". This system is assembled on four wheeler vehicle and also in trucks. Automatic braking system uses the Laser sensor which senses the vehicle which come in front of our system and which could be cause for accident. Then sensor gives feedback to Electronic Control Unit (ECU) for applying brakes after prewarning. The Autonomous Emergency Braking Systems also contain camera and sensor based technology to identify potential collisions ahead of the car. It warns the driver or automatically brakes to avoid a crash. This braking system provide pre-crash safety for vehicle. As well as this system improve the response time of vehicle braking to keep safe distance in the middle of two vehicles. By using this system we control the speed of vehicle in small distance.*

***Key Words*: Automatic Braking System, Safety, Laser, Sensor, Camera.**

1. INTRODUCTION

Autonomous emergency braking (AEB) systems detect an impending forward crash with another vehicle in time to avoid the crash. These systems first alert the driver to taking corrective action to avoid the crash. If the driver response is not sufficient to avoid the crash, the Autonomous emergency braking system may automatically apply the brakes to assist in preventing a crash. The National Highway Traffic Safety Administration believes these technologies signify the next wave of potential significant advances in vehicle safety. Autonomous emergency braking systems have the potential not only to save lives but also to reduce moderate and less severe rear end crashes that are common on our roadways.

Automatic emergency braking systems come in three forms: Higher Speed AEB, Low Speed AEB and Pedestrian Auto Emergency Braking. Each manufacturer has a different name for their systems but the features are essentially the same and use similar technology. While any given vehicle may have just one of these systems or a combination, it is rapidly moving in the direction of having a three-in-one AEB system. Low Speed AEB may use lasers to detect a vehicle ahead and more quickly apply the brakes in a stop and go traffic situation where the alert system would be too slow for the driver to react.

2. TECHNOLOGY USED LASER SENSOR:-

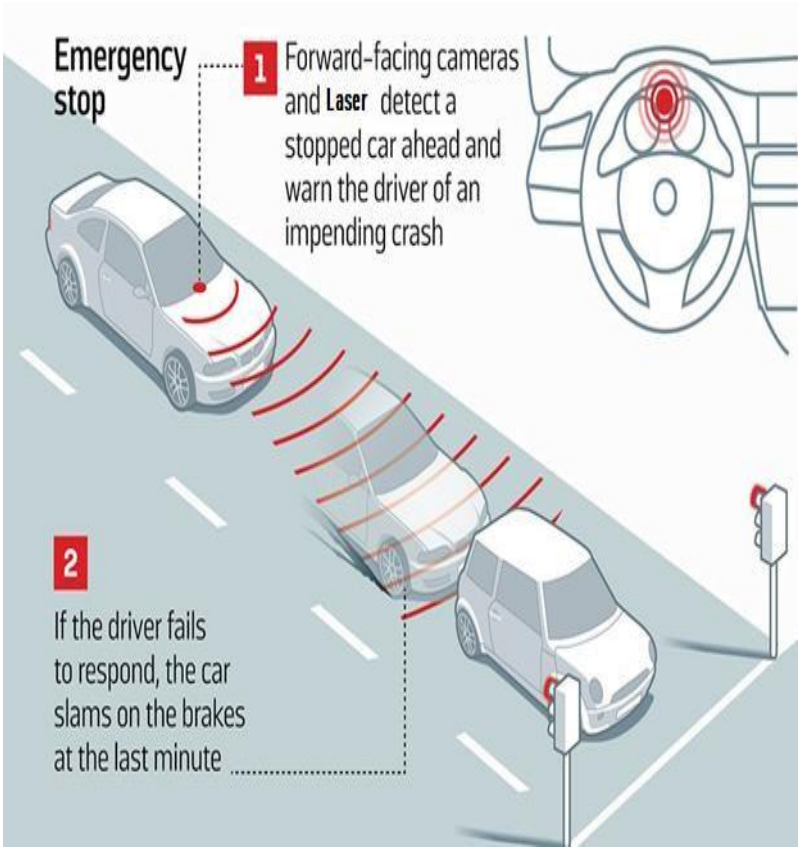
Automotive laser system normally situated behind grille. Laser works well for long ranges scanning. Laser sent waves out from the laser are collide and reflected back bimetallic object. After reflecting back laser measure the time required for returning the laser waves with the help of microcontroller. Microcontroller determine the how far away the object from the system and output of microcontroller send to electronic control unit of the vehicle. These Electronic Control Unit first alert the driver. Some system combines with Laser based detection and information gathered from camera system. At the higher speed if braking system equipment thinks that a crash is highly likely the system will prepare the brakes, and warn the driver via audio as well as flashing light in front of steering wheel and messages on the instrument panel.

3. AUTONOMOUS EMERGENCY BRAKING SYSTEM

Principle:

The Autonomous Emergency Braking Systems also contain Laser sensor based technology to identify potential collisions ahead of the car. It warns the driver about object comes in front of the car. If driver does not give response after warning then automatically brakes applied to avoid a crash. This braking system provide pre-rash safety for vehicle and

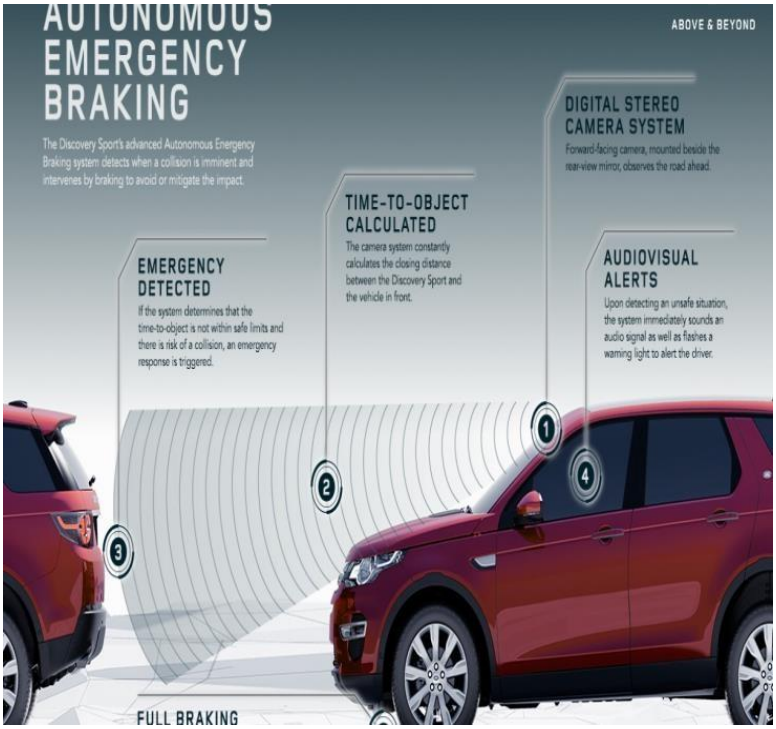
passengers. As well as this system improve the reaction time of vehicle braking to keep safe distance between two vehicles. By using this arrangement we control the speed of vehicle in lesser distance.



Autonomous emergency braking system is generally designed to activate at highway speeds, as long as the forward collision warning sensors are able to detect the vehicle forward. Newer systems work at slower speeds in towns. However, not all autonomous emergency braking features are able to bring your car to a full stop.

Design:

Autonomous emergency braking system is an autonomous road vehicle safety which employs sensors to monitor the proximity of vehicles in front and detect the situations where the relative speed and distance between the host and target vehicles suggest that a collisions imminent. In such situation, emergency braking can be automatically applied to avoid the collision or at least to minimize its effect.



4. CONCLUSION

Autonomous Emergency Braking system with laser is an additional safety to light duty vehicle as well as heavy vehicles with passenger car. It is easy to make such a system in brake assist system vehicles. An emergency switch is provided for emergency uses. The system carried out by us made an impressing task in the field of automobile manufacturing industries. This system will reduce the accidents happens on the roadways. Is also reduces the braking distance of the vehicle.

REFERENCES

1. Monika Davidekova, Michal Gregus ml: "If every car had Autonomous Emergency Braking system for forward collisions avoidance".

2. Sushil Kumar, Vishal Kumar: "Automatic Emergency Braking System".

3. Shubham Pawar, Shailesh Raut, Jai Keni, Vishal Mhaisdhune, C.R. Patil: "Review Paper on Automatic Braking System with Pneumatic Bumper".