

## Safer Car Ride By Locking Gear System

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**Abstract**— Safety applications are being developed and creating a new era of creative world with mind blowing techniques and these innovative applications are more sophisticated to accomplish and user friendly which also makes machines to make their own decisions. Every driver has his/her own duty wear their seat belts while starting their journey in car. With the increasing number of vehicles and also the accidents happening each year our paper makes the eyes on the techniques that can be implemented to ensure safety while driving. Even though wearing seatbelt is mandatory, drivers avoid wearing it due to which accidents occur. In our project we aim to bring safety to drivers as well as passengers. So whenever the driver starts the car, he could drive it at first gear. He could not shift to second gear unless he wears the seatbelt. Car accidents are increasing day by day and the reason for developing the system is, according to survey nearly 17.9% people are killed in accidents due to cars, vans etc.

As these applications are standard and sophisticated to the organizations, many companies are willing to implement these new ideas. Locking gear system can be defined as the process of locking the gear and when the seatbelt is buckled, the lock is released. In this study, we designed and implemented 'Gear Locking System' in order to avoid accidents to a greater extent.

**Key Words** – Gears, Actuators, Switch, Microcontroller, Seat Belts.

### 1.INTRODUCTION

However safety measures are taken in and around the world for various activities, safety measures must be taken to avoid road accidents. Especially, car accidents are increasing day by day and the reason for developing the system is, according to survey nearly 17.9% people are killed in accidents due to cars, vans etc.

Our main aim of the project is to ensure safety for the car driver and passenger. There are many reasons for accidents in roads such as rash driving, drunk and drive, over speeding etc. in which drivers carelessness are one of the most important issue. Applying brakes at very high speed leads to a very dangerous accidents. Hence the gear must shift only when the seatbelt is buckled. As

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### 1.1 Cars

Cars are the wonderful invention in the early decades of 20<sup>th</sup> century which are used as the preferred means of comfortable transport till now. Our project aims in providing a safer car ride by the use of actuators to lock the lever of the gearing system when the driver fails to wear seat belts while progressing for higher levels in gear shift.

### 2. AVAILABLE TECHNOLOGY

The automobile industry is a wide range of companies that involves manufacturing, design and selling of motor-vehicles and some heavy duty vehicles. Some of them are also called as automakers. And its influence is growing steadily in the world wide.

Autonomous vehicles are controlled by GPS systems, sensors to detect the obstacles crossing across the vehicles and the behaviour of the vehicles can be traced easily while driving on the road.

Electric cars and bikes are invented to store the energy which acts as the source for many commercial purposes. It also equipped with user-friendly interface like displays, automated speed controlled vehicles, giving information about the torque of the wheel and this will prevent the drivers from accidents.

Nowadays technology uses a wireless communication, which is interconnected to the smart phones, tablets and laptops. The sensors installed in the vehicles detects the emergency situations like accidents, collision between two vehicles, over speeding, climatic changes and thus enabling the drivers, a safe journey.

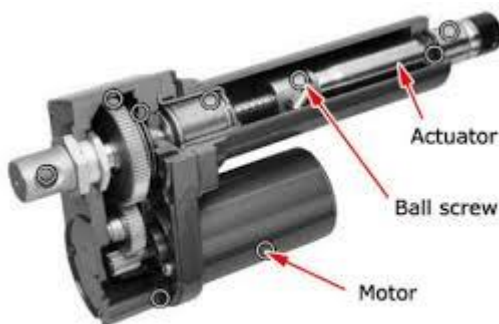
### 3. PROPOSED TECHNOLOGY

Our system aims in providing a safe car ride to the people. So whenever the driver starts the car, he could drive it at first gear. He could not shift to second gear unless he wears the seatbelt. Here the actuator locks the gear at the first gear. When the seatbelt is buckled, a signal is sent to the actuator and then the actuator releases the gear to shift to the next stage. And if the seat belt is not buckled, the driver has to ride the car in first gear only.

### 4. COMPONENTS AND ACTUATORS

Actuators are the device to convert the electrical signals from the control unit into an mechanical action. An actuator is a type of motor which is mainly responsible for moving or controlling a mechanical based systems. It can be operated using a source of energy, typically hydraulic fluid pressure, electric current, or pneumatic pressure and converts this electrical energy into mechanical motion.

In our system, powerful linear actuators are used to lock the lever of the gearing system. The car moves in first gear as normal but whenever the driver fails to wear his/her seat belt, the actuator locks the lever of the gearing system and it will not allow the driver to proceed with further gear shift. The accuracy and working of the actuator are also reliable.



d. Repeated Linear Movement

Figure - 1: Operation of a Linear Actuator

### 5. WORKING PRINCIPLE

The principle used in this project is Electro-mechanical principle.

### 6. LOCKING MECHANISM

In this project, a switch is connected to the lock of the seatbelt. A switch is an electrical component that can 'make' or 'break' an electrical circuit, interrupting the current or diverting it from one conductor to another. Then the switch is connected to a control unit which is mainly microcontroller. The purpose of microcontroller is to get the input signal from the switch connected to the seat lock.

The control unit then sends the signal based on the input signal.

It is then connected to an actuator which is responsible for moving or controlling a mechanism or system. An actuator requires a control signal from the control unit and it also requires a source of energy. The control signal may be a low energy and it is a DC electric voltage or current. The actuator is connected with the gear shifter. Based on the input from the control unit the actuator locks or unlocks the lever of the gearing system.

If the seatbelt is buckled by the driver, the switch is closed and a corresponding signal is sent to the control unit. The control unit then sends logic '1', if the seat belt is buckled or logic '0', if the seatbelt is not buckled, to the actuator. The actuator locks the gear when it receives logic '0' and unlocks when it receives logic '1'.

So our primary aim is that whenever the car is started the driver can drive it in first gear. If the seat belt is buckled, the driver can shift to second gear and so on. And if the seat belt is not buckled, he can drive the car in first gear only.

### 7. APPLICATIONS

The actuators used here is linear actuators which will be used for many purposes. Here we use the linear actuator to lock the gear lever whenever the driver fails to wear the seatbelt. Our idea used in this project has many applications. It can be used not only in cars but also in vans, trucks, lorries and any four wheelers. By doing so we reduce the car accidents to maximum extent and provide safety to drivers and passengers.

### 8. PROJECT IMPLEMENTATION SUMMARY

The car is to be designed in such a way that the actuators and control unit are integrated in the gear system itself. The main focus while developing this system was to integrate the features in a more significant way. The idea of minimising the road accidents for cars are less in number and our idea will be the new one to safeguard the drivers as well as the passengers. Our idea has the potential to be implemented on all cars soon.

Cost is one of the major hindrance to the widespread use of safety systems. To facilitate the widespread adoption of such safety systems, the use of cost-efficient components is of crucial importance. Therefore, this technique is to be implemented in a more reliable way by using cost-efficient components with high degree of accuracy.

## 9. RECOMMENDATIONS

Our project has the ability to be accepted globally. By implementing this mechanism the road accidents due to over speed and alternative road fatalities will be reduced. This idea of locking the gear has not been completely explored yet, but we hope to continue to develop the project.

This feature will be definitely useful for the car users and moreover it will be a life saving technique. The future car drivers will definitely be benefitted by this life saving technology.

## 10. CONCLUSION

Our main aim of the project is that the driver and passengers must wear seat belts since it is mandatory by the Government of India. Our system has huge potential to drive a new generation with creativity. This idea will bring satisfaction and fulfils the consumer's expectations to ride cars with safety. The world of the future will be more demanding against the limitations of our own intelligence. These technologies will make the biggest impact on our lives in the forthcoming years.

Innovations in the safety side must be implemented in the future and these advances in technology must be taken into account by good capital investments and to become an important concept for road safety, especially for four-wheeler riders. It is important for the automobile industry to take adoptive and safety measure in order to maintain road safety through innovative ideas. This paper adds safety and security to the car riders in forthcoming years.

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