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" Real Time Alcohol Detector & Auto-cut Off Engine System "

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ABSTRACT

"Prevention is better than cure ." This quote perfectly summarizes the purpose of the alcohol engine lock system with MQ3 sensor. This system is a proactive approach to prevent accidents caused by drunk driving, rather than waiting for an accident to happen and then trying to remedy the situation.

The use of technology in preventing drunk driving has proven to be an effective tool in saving lives and preventing injuries on the road. The implementation of the alcohol engine lock system with MQ3 sensor has been met with some resistance from those who feel that it infringes on their personal freedoms. However, it is important to remember that the safety of all road users should be a top priority.

The use of the system can help reduce the number of accidents caused by drunk driving and ultimately save lives. It is a small price to pay for the safety of all road users. In conclusion, the alcohol engine lock system with MQ3 sensor is a critical technology in preventing alcohol-related accidents on the road. This system has been successfully implemented in various countries around the world and has proven to be an effective tool in reducing the number of accidents .

INTRODUCTION

The current scenario shows that the most of the road accidents are occurring due to drunk-driving. The drivers who drink alcohol are not in an stable condition and so, rash driving occurs on highway which can be risky to the lives of the people on road, the driver inclusive. The enormity of the dangerous driving transcends boundary.

The laws in India are currently prohibiting drivers to drink and drive so that the fine can stop them to drink and drive. Whatsoever, effective observation of inebriated drivers could be a challenge to the policemen and road safety officers, the rationale for this stems from the natural inability of citizenry to be present additionally as state among identical house and time. This restricted ability of enforcement agents undermines each manual effort geared toward edge drink-driving. There is therefore the need for an alcohol detection system that can function without the restriction of space and time.

The Indian Ministry of Statistics reported thousands of road accidents in 2016. Though the report declared speed violation is the foremost reason for these accidents, it will safely be inferred that almost all of the cases are because of driver's unstable condition caused by drivers becoming drunk before they drive. The investigation done by the Planet Health Organization in 2008 shows that concerning 50%-60% of traffic accidents square measure associated with drink-driving. Moreover, WHO information on road traffic deaths disclosed 1.25 million traffic deaths were recorded globally in 2013 with the low- and middle-income countries having higher fatality rates per a 100K population (24.1% and 18.4% respectively), information collected showed that several of economic vehicles drivers in Bharat admitted to drinking alcohol throughout operating days. This shows that almost all drivers, particularly

business and serious duty trucks drivers interact in drink-driving, which may result in accident. Bharat sets a legal limit of 30mg/100mL blood alcohol concentration (BAC), any level higher than that's same to be ineligible.

The BAC depicts the amount of alcohol in an exceedingly sure volume of blood. It's measured as either grams of alcohol per metric capacity unit of blood or milli litters of blood, (mg/ml, utilized in a lot of Europe). For BAC level from 0.4 to 0.6, drivers feel dazed/confused or otherwise disoriented, and it's typically not safe for a driver to drive a vehicle beneath such condition. Also, BAC level for 0.7 to 0.8 makes a driver's mental, physical and sensory functions to be severely impaired. At this stage, a driver is inactive and incapable of driving. BAC level of 0.2 to 0.3 continues to be not safe however the motive force still. So, there is need of such system which can reduce the number of road accidents caused due to drunk driving .

OBJECTIVE

The main objective of this project is to develop an alcohol detection system that ensures vehicle safety by automatically cutting off the engine when alcohol is detected in the driver's breath.

1. The specific goals are:
2. To detect the presence of alcohol using the MQ-3 sensor.
3. To alert nearby people through a buzzer when alcohol is detected.
4. To automatically stop or prevent the engine (BO motor) from running using a MOSFET (IRF540) switch.
5. To design a low-cost, reliable, and efficient system for preventing drunk driving.
6. To promote road safety and reduce accidents caused by alcohol consumption.

COMPONENTS USED

1. MQ-3Sensor:

- The MQ-3 is an alcohol sensor used to detect alcohol concentration in the air.
- It gives an analog output based on the amount of alcohol vapor detected.
- It is highly sensitive to ethanol and can be directly connected to microcontrollers or comparator circuits.

2 BO Motor:

- Used to represent the vehicle's engine in the prototype.

- When alcohol is detected, the motor automatically stops, simulating the engine cut-off feature.

3 MOSFET IRF540:

- A power MOSFET used as a switch to control the BO motor.
- It provides high-speed switching and efficient power control.

4 9V Battery:

- Powers the entire circuit, supplying sufficient voltage for the sensor, motor, and control components.

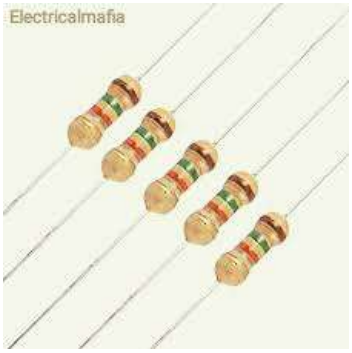
5 Buzzer

- Provides an audible alert when alcohol is detected.

- Helps in warning nearby people about the driver's condition.

6 Resistors:

- Used to control the current in the circuit and ensure the safety of other components.
- Also helps in voltage division and signal conditioning.



WORKING PRINCIPLE

The MQ-3 sensor detects alcohol vapors in the driver's breath. When the driver exhales near the sensor:

- The resistance of the sensor decreases as the alcohol concentration increases.
- The output voltage from the sensor rises.
- This signal is sent to the control unit (microcontroller or comparator).
- If the alcohol level crosses a predefined threshold:
- The MOSFET IRF540 switches off the BO motor (engine simulation).
- The buzzer turns ON to give a warning signal.
- Thus, the system automatically prevents the vehicle from running under the influence of alcohol.

ADVANTAGES

- Prevents drunk driving and reduces road accidents.
- Simple, low-cost, and reliable design.
- Quick response and high sensitivity.
- Can be integrated with vehicle ignition systems.
- Easy to implement and maintain.

APPLICATION

- Used in cars, buses, and trucks for driver safety.
- Can be installed in school buses or public transport vehicles.

- Useful for law enforcement and traffic monitoring.

CONCLUSION

The Alcohol Detector and Auto Engine Cut-Off System is a life-saving innovation that can effectively prevent accidents caused by drunk driving. By combining the MQ-3 sensor with components like MOSFET IRF540, BO motor, and buzzer, this system offers an efficient, low-cost, and practical solution to enhance road safety.

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