

# Design and Fabrication of Anti-Locking Engine system using Alcohol detector with Arduino

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## Abstract –

In this project, the Design and Fabrication of Anti-Locking Engine system using Alcohol detector with Arduino. The integrating an alcohol detector with an anti-locking system in vehicles is to enhance safety by preventing impaired individuals from driving. This technology helps reduce the risk of accidents and fatalities caused by drunk driving by preventing the vehicle from starting or disabling its acceleration when alcohol is detected in the driver's system.

**Key Words:** LCD display, Arduino board, buzzer, DC motor, MQ3 alcohol sensor,

## 1.INTRODUCTION

Driving under the influence of alcohol is a major cause of traffic accidents and fatalities worldwide. To address this safety concern, anti-locking engine systems with alcohol detectors have emerged as an effective solution. This technology uses Arduino, a versatile microcontroller, in conjunction with alcohol sensors to create a system that can detect the presence of alcohol in a driver's breath and take preventive measures to ensure the vehicle does not start if the alcohol level exceeds a predefined threshold. Arduino-based systems are ideal for this application due to their flexibility, affordability, and compatibility with various sensors and components. The alcohol detector, typically a gas sensor like the MQ-3, is connected to the Arduino board. This sensor is designed to detect the presence of alcohol in the air, providing a voltage output proportional to the alcohol concentration. This approach offers a proactive method to ensure that drivers who are under the influence of alcohol are not able to operate their vehicles, thereby reducing the risk of accidents. Additionally, this technology can be customized and extended with additional features, such as logging alcohol test results, integrating with vehicle security systems, or even notifying authorities in case of a failed test. The anti-locking engine system with alcohol detection is not only a technological innovation but also a societal solution aimed at promoting safer roads and reducing alcohol-related incidents. It underscores the importance of combining technology with safety measures to create a more secure driving environment.

## 2.LITERATURE REVIEW

Altaf et al. (2017) designed a system using microcontroller and using a MQ3 alcohol sensor that will stop the engine of the vehicle if it detects the alcohol consume by the driver and introduced system that will detect drunken driver by alcohol sensor through driver breath fitted on steering in front of driver. As well proposed system also focuses on providing system to monitor cars and when alcohol detects at starting of ignition of car then car's ignition will immediately turn-off and if alcohol detected after starting and while driving then application will reduce the fuel supply.

Ramaswamy et al. (2022) proposed the design and implementation of an Alcohol Detection with Engine Locking for cars using the Ultrasonic Sensor and Arduino-UNO as the controlling unit is done. The system will continuously monitor the level of alcohol concentration by alcohol detection sensor and thus turn off the engine of the vehicle if the alcohol concentration is above the threshold level.

Venu et al. (2022) used Arduino Uno3 microcontroller attached to an alcohol sensor which detects the presence of alcohol by analysing breath of a person driving the vehicle. Engine of the vehicle is turned off and the emergency siren is blown as soon as alcohol is detected, thereby minimizing the chances of any mishaps that could have happened. Therefore, loss of life and property is avoided. Alcohol sensor is installed on the steering of the car, with the end goal that when the level of liquor crosses a reasonable farthest point, where the start of vehicle will kill and the motor will stop. The Arduino always uses the alcohol sensor information to check drunk driving and works a bolt on the vehicle motor to stop the engine.

T. Shambaiah et al. (2024) addresses the issue of drunk driving by implementing a robust and reliable solution. This project employs various hardware components, including Arduino, an alcohol sensor, a DC motor as the engine, GSM technology, a GPS module, and a display module. By combining these technologies, we have developed an automated system that detects alcohol levels in the driver's breath and disables the engine if alcohol is detected, ensuring safer roads and Preventing accidents caused by drunk driving.

### 3.METHODOLOGY

The primary goal is to prevent a vehicle from starting if the driver has consumed alcohol, thus ensuring safety on the road.

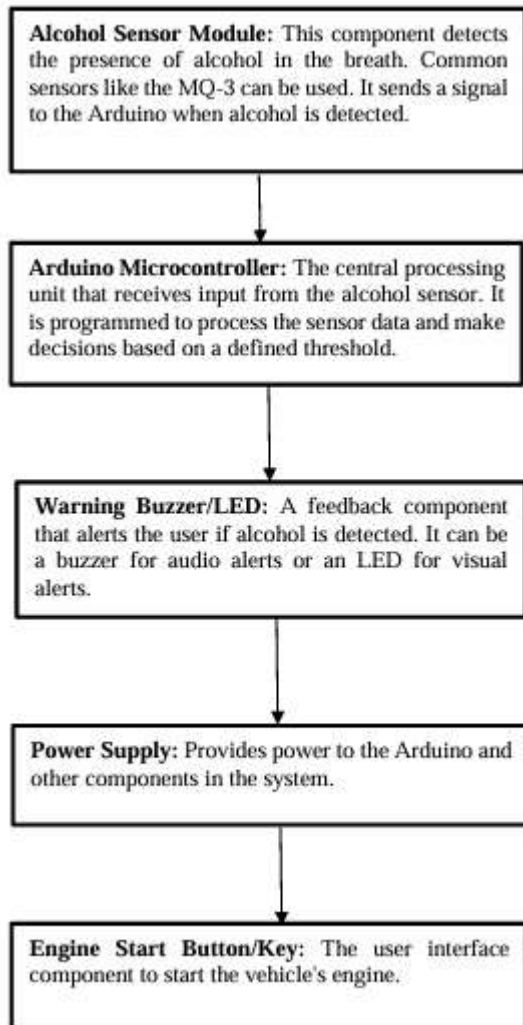


Fig -1: Methodology

### 4.COMPONENTS

#### A.Dual Shaft DC motor

A dual shaft DC motor is a type of direct current (DC) electric motor that has two output shafts, usually extending from both ends of the motor's housing. This design allows for the motor to output rotational motion from both ends, which can be useful in various applications where two separate outputs or functions are required. Dual shaft DC motors are commonly used in robotics, conveyor systems, and other machinery where precise control and versatility are important. They come in various sizes and power ratings to suit different industrial and commercial needs.



Fig -2: Dual Shaft DC Motor

#### B.MQ-3 Alcohol Detection Sensor

The MQ-3 alcohol detector sensor is a gas sensor designed to detect the presence of alcohol vapor in the air. It is commonly used in various applications, including breathalyzer devices and alcohol detection systems. The sensor operates on the principle of resistance change when exposed to alcohol vapor, and this change in resistance is used to measure alcohol concentration. MQ-3 sensors are affordable and widely available, making them popular for alcohol detection and safety applications. They are often used in conjunction with microcontrollers or other electronic devices to provide alcohol sensing capabilities.



Fig -3: MQ-3 Alcohol Detection Sensor

#### C.9 v Battery

A 9-volt battery is a small, compact power source commonly used in various electronic devices, such as smoke detectors, remote controls, and guitar pedals. It consists of six smaller 1.5-volt cells connected in series to provide a total voltage of 9 volts. These batteries are known for their rectangular shape and the characteristic Snap-On or clip-on connectors. They are convenient for powering low to moderate power devices and are easily replaceable when depleted.



Fig -4: 9 v Battery

#### D.On-Off Switch

An on-off switch, also known as a power switch, is a simple mechanical or electronic device that allows you to control the flow of electricity to a device or appliance.



Fig -5 On-Off Switch

#### E.Arduino Uno

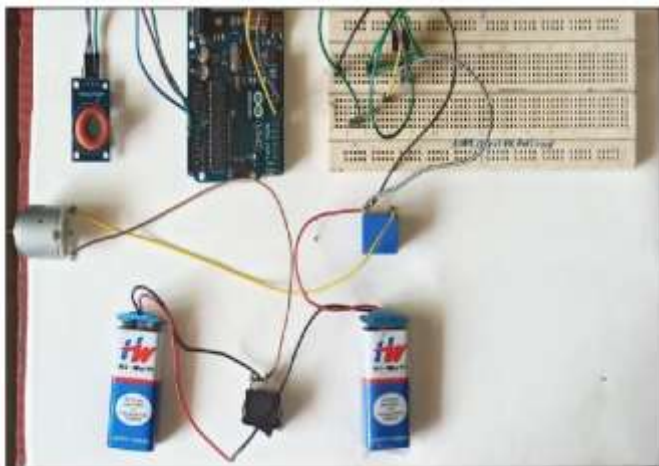
Arduino UNO is a low-cost, flexible, and easy-to-use programmable open-source microcontroller board that can be integrated into a variety of electronic projects. This board can be interfaced with other Arduino boards, Arduino shields, Raspberry Pi boards and can control relays, LEDs, servos, and motors as an output.



**Fig -6:** Arduino Uno

#### 4.EXPERIMENTAL SETUP

The construction of a project for an alcohol detector with an anti-locking system involves integrating two key components: an alcohol detection sensor and an anti-lock braking system. The alcohol detection sensor, typically a breathalyzer or an alcohol-specific gas sensor, is employed to monitor the driver's breath for alcohol content. When alcohol is detected above a certain threshold, the sensor triggers the anti-locking system, which temporarily prevents the brakes from locking up during sudden stops, enhancing vehicle stability and control. In this project enhances road safety by discouraging drunk driving and minimizing the risk of accidents caused by impaired drivers. In this project we only use 8 components. This system is a very easy to fabricate with this component. With the help of this components, it is very easy to implement this system. In this project we use a MQ-3 Alcohol detection sensor, Arduino uno, relay, Dual Shaft DC motor, 9-v battery, On-Off Switch and wires. First, we connect the Arduino VCC to 5V GND to DO to AO. Then connect Collector to coil relay base to d9 Arduino emitter to gnd. Connect two batteries in serial connection for 9V. Uploading the code in Arduino with the help of software.



**Fig -7:** Experimental Setup

#### 5.WORKING

If a driver is drunk and tries to drive the system detects alcohol presence in his/her breath and locks the engine so that the vehicle fails to start. In another case if the driver is not drunk while he starts the vehicle and engine is started but he/she drinks while driving the sensor still detects alcohol in his breath and stops the engine so that the car would not accelerate any further and driver can steer it to roadside. In this system we use Alcohol detection sensor MQ-3 sensor for stop the vehicle if the driver is drunk. If drunk driver wants to start the car the car is enable to start because alcohol detection sensor (MQ-3 sensor) senses the alcohol from drivers' breath. After detection of alcohol the motor is control the motor by transistor BC547 And 5V relay controls the high voltage and current. The system gets input from Arduino and buzzer provide an audible alert to the system. our system will work as switch Between ignition key and battery supply.

#### 6.RESULTS

If alcoholic person tries command on vehicle the alcoholic sensor determines the existing of alcohol and shut down the vehicle engine and sound alarm by which the nearby people will exchange the seat. Peoples are aware of situation by the help of this system present in the vehicles and hence take required action. We can avoid any kind of loss of life by using this system.

#### 7.CONCLUSION

Putting an alcohol detector together with a system that stops the engine from starting if it detects alcohol in the driver's breath can really help make driving safer. When the system senses alcohol, it stops the engine from starting, which could prevent accidents caused by drunk driving. With more work, this kind of technology could become common in cars and make roads safer for everyone.

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