

A Survey Paper on Car Pollution and Fuel Leakage Detection with Engine Lock System

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Abstract— Our project deals with the design and development of Car Pollution and Fuel Leakage Detection with Engine Lock system. Pollution is now common term that our ears are attuned to. We hear about the various forms of pollution and read about it through the mass media. Air pollution is one such form that refers to the contamination of the air. As the uses of vehicles is more in these days, the air pollution is increasing drastically. Every vehicle has its own release of gases, but the problem arises when the release is beyond the standardized values. A fuel leak is one of the leading causes of the vehicle fire. This is because fuel is very flammable. There is a potential for significant burns, injury and even death from fuel leak.

Keywords: Arduino, Sensors, Relay Driver Circuit with Relay, Buzzer, LCD Display

I. INTRODUCTION

Each vehicle has its own release of gases, but the problem arises when the emission exceeds the permitted limits. The primary cause of this release level breach is the insufficient ignition of fuel delivered to the engine, which is due to the improper maintenance of vehicles. This release from vehicles cannot be completely avoided, but it absolutely can be controlled.

When a car engine fails to ignite completely, various gases are released into the air, increasing pollution and harming the environment. An important area of work is the detection and regulation of these gases. This release from vehicles cannot be completely avoided but, it absolutely can be controlled. These are important things to control so we have come up with a concept to reduce pollution. Our project aims to develop an automatic control system for engine lock system, fuel leak detection, and vehicle release level control.

II. EXISTING SYSTEM

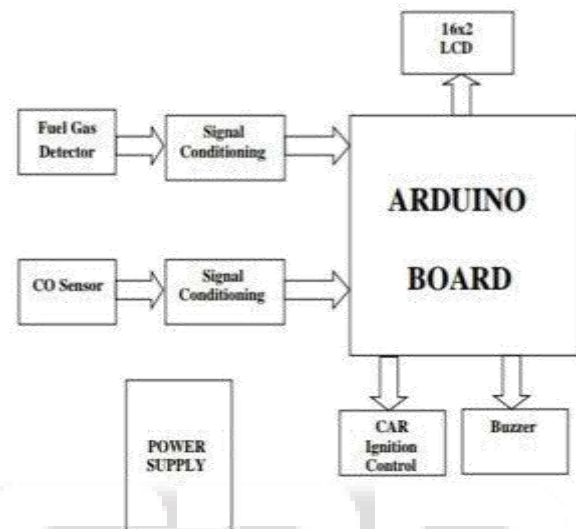
Each and every vehicle emits pollutant of certain standards, but the main problem arises when they exceed the standard norms. The actual cause for the violation of release levels is the incomplete ignition of fuel inside the engine which is mainly due to the improper maintenance of vehicles. This release from vehicles cannot be completely avoided, but it can be absolutely controlled. To overcome the problems of existing systems, a system is proposed to monitor release level of individual vehicles.

III. PROPOSED SYSTEM

“Car Pollution and Fuel Leakage detection with Engine Lock System” is the project which will be helpful in controlling and monitoring car pollution and the fuel leak. In this project we use “sensors” with the help we send input to the Arduino board through signal conditioning. If the car pollution or fuel

leak is detected, buzzer will generate a warning and it will be displayed on the LCD screen.

IV. SYSTEM BLOCK DIAGRAM



V. MODULES

- Arduino
- Sensors
- LCD Display
- Relay Driver
- Micro-controller
- Buzzer
- Power supply

VI. MODULE DESCRIPTION

A. Arduino

Electronics projects can be built using the open-source Arduino platform. In order to create and upload computer code to the actual board, Arduino comprises of a piece of software called the IDE (Integrated Development Environment) that runs on your computer.

B. Sensors

- 1) MQ-6 The MQ-6-LPG is an easy-to-use liquefied petroleum gas (LPG) sensor that can detect airborne LPG concentrations (which are primarily made of propane and butane). Gas concentrations between 200 and 10,000 ppm can be detected using the MQ-6.
- 2) MQ-7 The MQ-7 gas sensor's sensitive component is SnO₂, which has a reduced conductivity in clean air. It uses a cycle of high and low temperatures to make the detection and detects CO when the temperature is low (heated by 1.5V). Both the sensor's conductivity and the gas concentration are increasing. The additional gases that

were adsorbed at low temperatures are cleaned when the high temperature (heated by 5.0V) is reached. Carbon monoxide is quite sensitive to the MQ-7 gas sensor. The sensor is inexpensive and ideal for a variety of applications, and it may be used to detect different gases that include CO.

- [4] <https://www.ijret.org>
- [5] <https://www.researchgate.net>
- [6] <https://www.mdpi.com>

C. LCD Display

This LCD screen is 16 x 2 and has an I2C interface. It can show 16x2 characters on 2 lines with a blue background and white characters. In most cases, especially with Arduino Uno, projects involving LCD displays on Arduino quickly run out of pin resources. The soldering and connecting of the wires adds to the complexity. I2C serves as the communication channel for this 16x2 Arduino LCD screen. VCC, GND, SDA, and SCL are the only pins required for the LCD display. It will spare at least 4 Arduino digital/analog pins. Every connector is an XH2.54 standard (Breadboard type). You can simply connect to the jumper wire.

D. Relay Driver

The microcontroller's output is insufficient to directly drive the relay. As a result, we use a relay driver block with a transistor acting as a switch to drive the relay. We used 1 relay because we are only controlling 1 device Micro-Controller.

- 1) ATmega328 is an 8-bit, 28-Pin AVR Microcontroller, manufactured by Microchip, follows RISC Architecture and has a flash-type program memory of 32KB. ATmega328 is the microcontroller, is used in basic Arduino boards i.e., Arduino UNO, Arduino Pro Mini and Arduino Nano. It has an EEPROM memory of 1kb and its SRAM memory is 2kb. Its excellent features include cost efficiency low power dissipation, programming lock for security purposes, real timer counter with separate oscillator.

E. Buzzer

Buzzer is being used as an output device in this project. It alerts us when it detects car pollution.

F. Power Supply

We need a supply of +5 volts and +12 volts for our project. The microcontroller board and LCD display each receive +5 volts. Relay drivers operate on +12 volts.

VII. CONCLUSION

In this paper we have proposed a Car pollution and fuel leakage detection with engine lock system which is used to detect and monitor pollution and fuel leak in car vehicles. If the fuel leakage is detected, three warnings will be given. If the driver fails to attend these warnings the engine will be automatically locked.

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