# The Fuel Theft detection and Mileage Monitoring System

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*Abstract*— **In this project we have developed an enhancement of the vehicle alarm security system. The safety of vehicles fuel is extremely essential for public so this project came to notice due to the alarming rate at which vehicles fuel are being stolen in our country.**

**In this project we show the amount (distance) of fuel Present in fuel tank digitally by using Ultrasonic Sensor. Also fuel theft is measure problem in all over world. In our project if fuel gets theft then text message will send to owner of bike also buzzer makes noise so that owner of bike get aware.**

**The project works in the field of the fuel management system, which handles the theft alert and sensors, logs which determines the live situation of the fuel tank. Fuel theft is measured only when the engine is in OFF state. The milage will be calculated by help of infrared sensor to infrared sensor to measure the distance and fuel level is measured by Ultrasonic senser and send to vehicle owner.**

*Index Terms:* **Arduino, GSM Module, infrared sensor, Mileage, Ultrasonic sensor.**

## I.INTRODUCTION

As we all know, today fuel is a non-renewable energy on the earth and this makes fuel a precious thing for the humanity. Industries, which use fuel, are having a headache of fuel theft and fuel related problems. The major problem seenby the world of fuel is fuel theft and for that, they do not have any major solution or parameter to have control on it. Our project mainly monitors the fuel in tank with ignition conditions and Milage checking and updating.

Figure A:
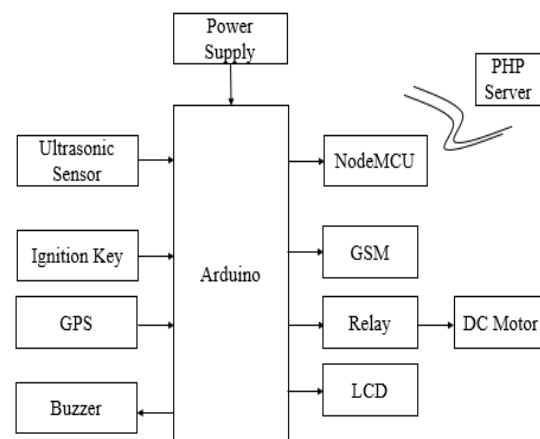


## II. PROPOSED SYSTEM

In this project we are using ultrasonic sensor to detect the fuel level. Initially if we want to start the bike we need to switch ON ignition key at that time it will send the location to the PHP server and when the ignition key is OFF then also the location will be updated to PHP server.

If the vehicle is in off condition but if the fuel level is reduced then automatically an message alert will be sent to the concerned owner whose number is defined in the coding.

## III. WORKING PRINCIPLE

Fuel theft in parked vehicles is increasing day by day these days. Moreover increasing fuel prices adds to the frustration of a fuel theft. this project focuses on the fuel theft problem and mileage problems puts forward an effective solution for these problems.

It detects weather the vehicle is turned off. If the fuel decreases while vehicle is turned off it triggers an event and this event is linked to message sending functionality. Fuel level sensing gauge will be connected to microcontroller. Quantity of the fuel will be displayed on LCD.A GSM modem sim card will be interfaced with UNOIf the fuel level in the tank in the tank decrease while vehicle is in OFF state, then an alert will be sent to user mobile in text form GSM modem

Step-1: After switching on the system, the GSM based fuel theft security is installed

Step-2: As soon as the system is activated the modem is initialized and connected.

Step-3: GSM modem is activated and interfaced properly with the peripherals

Step-4: The system then reads the mobile number that is loaded in the microcontroller

Step-5: After the system is activated it display the safety of the fuel on the LCD screen the circuit which is kept standby through an IR beam focused on to the photodiode. When The beam path breaks, alarm will be triggered.

Step-6: when the sensor is obstructed as shown in the image below between the LED.

And the photo transistor, it becomes active low. During which the message about the fuel theft is displayed on the LCD screen and an alarm message is sent to the mobile no. which is loaded in the microcontroller and the buzzer starts ringing, After the obstruction is removed from the sensor, it becomes active high. During which the message "fuel is intact and safe" will be displayed on lcd screen and message about its safety is sent to the mobile number that is loaded in the microcontroller

Step-7: After the key is on, mileage monitoring system will be activated and by using the GPS the location of the vehicle is noted in the PHP server

Step-8: The distance traveled by the vehicle is noted by the help of the PHP server

And stored in the memory card

Step-9: At the same time fuel used by the vehicle will be sensed by the ultrasonic senser and it is noted in the memory card

Step-10: These noted data is converted in mileage by using the following formula

Distance traveled/fuel used

Step-11: Result mileage data will be send to owner's mail with attached graph

## IV. HARDWAREREQUIREMENTS

A. Arduino uno:
- Arduino Uno is a microcontroller board developed by Arduino.cc which is an open-source electronics platform mainly based on AVR microcontroller Atmega328.
- The current version of Arduino Uno comes with USB interface, 6 analog input pins, 14 I/O digital ports that are used to connect with external electronic circuits. Out of 14 I/O ports, 6 pins can be used for PWM output.

B.GSM:
A GSM modem is a device which can be either a mobile phone or a modem device which can be used to make a computer or any other processor communicate over a network. A GSM modem requires a SIM card to be operated and operates over a network range subscribed by the network operator. It can be connected to a computer through serial, USB or Bluetooth connection.

C.Ultrasonic sensor:
- An ultrasonic sensor transmit ultrasonic waves into the air and detects reflected waves from an object. There are many applications for ultrasonic sensors, such as in intrusion alarm systems, automatic door openers and backup sensors for automobiles.
- An ultrasonic sensor is an instrument that measures the distance to an object using ultrasonic sound waves.
- An ultrasonic sensor uses a transducer to send and receive ultrasonic pulses that relay back information about an object's proximity.
- High-frequency sound waves reflect from boundaries to produce distinct echo patterns

D. LCD:
LCD (Liquid Crystal Display) is the innovation utilized in scratch pad shows and other littler PCs. Like innovation for light-producing diode (LED) and gas-plasma, LCDs permit presentations to be a lot more slender than innovation for cathode beam tube (CRT).

LCDs expend considerably less power than LED shows and gas shows since they work as opposed to emanating it on the guideline of blocking light.

A liquid-crystal display (LCD) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals combined with polarizers
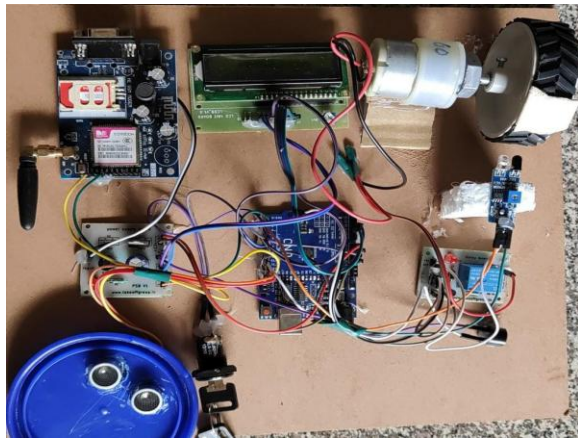
## V. RESULT GRAPH
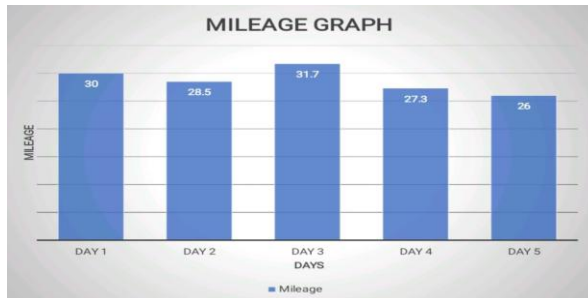


These result graph gives the information about how much, the vehicle gives mileage day to day life. It has mileage in y axis and days in x axis.
According to the above graph in day 1 vehicle got 30 km/L. Day 2 vehicle got 28.5 km/L hence mileage will continue to change according to vehicle usage.

## VI. PROTOTYPE DEVELOPED



## VII. CONCLUSION

A novel method of designing a low-cost and compact theft control system for a vehicle was designed and demonstrated in this project. This work is an ultimate threat for vehicle thieves. We can also monitor the fuel consumed by vehicle. Nowadays, the vehicles

are least secured when it is stolen by thieves. By this work which is presented in this project, it is very easy to track the vehicle at a higher degree of accuracy, since it is based on GSM Technology, which is very developed now. So it is very much easy to get back the vehicle.

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