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Nickel alloy coated fuel tank with digital fuel level indicator security system

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Abstract

In current trends we hear a lot about the fuel thefting by drivers and in fuel stations. The most of the fuel stations are cheating the customer by, not filling fuel for the given amount.In India most of the vehicles consist of Analog fuel gauge only, so it is very easy to cheat the customers in additional the commercial vehicle drivers are also cheating their owners by fuel thefting. As we are in the modern world, this project brings an solution for the above problem. The digital fuel indicator in this project uses programmed aurdino UNO with LCD display will show the correct value of the fuel present in storage like numeric values such as 1.5l, 2.5l. So that we can check amount of fuel in the tank at any time so that the driver will have knowledge that when will the fuel has to be refilled. Additionally the security system in this project will report the quantity of fuel in tank to owner through SMS. It was achieved by GSM modem, the measured value from aurdino UNO was transferred to GSM. The GSM was programmed with owner's phone number so that it can be done.

Introduction

In the digital age, we use a digital fuel level indicator, but it won't display the exact value that is present in the fuel tank (shows amount of fuel in bars rather than liters or milliliters), preventing us from receiving the correct value. Due to that the driver can cheat the owner and also in fuel station they will also cheat by using the pump also. In order to address this issue, we are working on developing a digital fuel level indicator with security system that displays the precise amount of fuel in terms of liters or milliliters [1], [2], [3]. This project primarily focuses on providing the owner with a message-based indication of the fuel level. Fuel theft is a current problem that we hear about all the time. In this project, our main focus is on developing a digital display that shows the precise gasoline level in the vehicle's tank and aids the owner in tracking fuel that is filled at the gas station and also by the driver.

The sending unit and the gauge make up the two components of a traditional gasoline indication. conventional fuel measurement technique. The transmitting unit, which is housed in the car's fuel tank, is made up of a float that is often foam-ended and is attached to a thin metal rod [4], [5], [6]. The metal rod's finish is mounted on a potentiometer or variable resister. The variable resistor is made out of a strip of resistive material that is positioned above it and slides across it when the float moves in relation to the amount of fuel in the fuel tank, altering the resistance and current flow. The gauge reads "fuel empty" because the fuel tank is almost empty and the float has moved to the bottom of the tank, which moves the strip on the resistor and increases resistance to its maximum. This decreases current flow

through the resistor and causes the resistance to increase to its maximum. The gauge is made of a bimetallic strip, or a strip made of two different kinds of metal with different thermal coefficients of expansion. The strip bends as a result of one metal expanding less than the other when resistance falls, current increases, and the band heats up [7], [8]. This bending action causes the needle to move on the fuel gauge. The bimetallic strip cools as resistance rises because less current flows through the heating coil. The strip straightens up and pulls the gauge from full to empty as it cools.

Section snippets

Methodology

Based on the analysis done for this project, we concentrate on developing digital displays that accurately depict the amount of fuel in the vehicle's tank and assist in determining how much fuel was packed at the gas station [9]. This work also aims to send notification of quantity of the fuel available in tank to an owner’s mobile phone through SMS. So that the driver and owner can able check the quantity of the fuel at hand in tank at some time & several situation like after refilling of…

Procedure

Lead is oxidized to Pb2+ and insoluble PbSO4 is produced at the anode of the lead-acid storage battery when it is in operation [13], [14], [15], [16]. PbO_2 is converted to Pb2+ ions at the cathode, where $PbSO_4$ is also produced (see Fig. 1)….

Result analysis

The proposal idea of this project, will give better & accurate information that the conventional Analog fuel gauge. Because the analogue system has so many flaws, for example, the driver cannot accurately determine how much petrol is left in the tank and not have the idea for the distance covering. Sometimes, the Analog method will not give proper information so that the drivers are affected a lot. The major drawback in this system is after refueling or restarts the needle will takes sometimes…

Conclusion

In the experimental result of digital fuel indicator we can see the quantity of fuel in digital value with the help of programmed audrino. It will measure the fuel is only when above 1l, It displays the correct value of the fuel only on plain roads and shows error valve on slope surfaces. By using the security system, owner can able check the amount of fuel available in tank at any time & any situation like after refilling of fuel, after a long drive and after constantly parked for several…

CRediT authorship contribution statement

S. Venugopal: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software. **L. Karikalan:** Supervision. **R. V. Sanjay Mohan:** Validation, Visualization, Writing – original draft, Writing – review & editing….

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.…

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