

MEASURING AND INDICATION OF FUEL FLOW IN VEHICLES

ABSTRACT

An innovative concept proposed through this paper is to handle the indication and monitoring of fuel flow in automobiles using a concept of Internet of thing. This makes use of a flow sensor along with an Arduino board connected to an LCD Display. This aims in the inspection of quantity of fuel that is being pumped into the vehicle and the readings are displayed in the dashboard of the car. Since the fuels that originate from fossil fuels are non-renewable, it's our duty to efficiently commission it without wastage. This apparatus can be used in vehicles to ensure that the proper and accurate quantity of fuel is filled by the gasoline bunks. It is a very simple technique and it aims in bringing it out to daily use in a cost efficient manner.

Keywords: Automobile, Arduino-Flow Sensor.

INTRODUCTION

Flow meters are the indispensable product of this project. The main objective of this project is to give an innovative concept to handle the theft of fuel in petroleum bunks without any human intervention and to ensure the accurate flow of fuel. According to reports, a customer asked one of the petrol pump staff for a liter of petrol in a jar. However, the petrol measured only 650 ml following which an altercation ensued between the staff and the customer.

An innovative concept proposed through this project is to handle the portable fuel flow indicator in vehicles. This project makes use of a fuel flow sensor along with an Arduino board connected with an LCD display. This project aims in the inspection of the quantity of fuel that is being pumped into the vehicle more accurately and displays the readings in an LCD display that can be placed in the dashboard of any vehicle. Since the fossil fuels such as petroleum products are non-renewable, it is our duty to efficiently commission it without wastage. This project is used in vehicles to inspect the proper and accurate filling of fuel in the fuel tank by the employees of the petroleum bunks. It is a very simple technique and our project aims in bringing out to daily use in a cost efficient manner. This project helps in identifying theft of fuel in petroleum bunks, inspection of the quantity of fuel that is

being pumped into the vehicle more accurately and displays the readings in an LCD display that can be placed in the dashboard of any vehicle. It is low cost and simple in construction. This project is to give the way for providing anti-theft of fuels in vehicles that can be fixed in the vehicle at the time of manufacturing itself. The reason for choosing this project is that, this concept is our innovative concept and we assure that it will definitely help the common man. It makes our innovation popular to the common man. Live readings can be seen on the screen. The system is controlled using programming. Pure mechanical concept of flow meters is implemented. The readings can be displayed in any part of the vehicle based upon the requirement of the owner. This project is designed in such a way that it solves a major problem of theft of fuel in petroleum bunks that can be implemented by car manufacturers in their upcoming model cars. It is cheap, and handling is easy and safe. Since the cost is low, most of the people prefer to have it, and it has less maintenance. It is easy to use and is accurate and precise.

OBJECTIVE

The main objective of this project is to give an innovative concept to handle the theft of fuel in petroleum bunks without any human intervention and to ensure the accurate flow of fuel.

The objective of the project includes:

1. Making our innovation popular to the common man.
2. Live readings can be seen on the screen.
3. Controlling using programming (Arduino).
4. Implementation of pure mechanical concept of flow meters.
5. Can be displayed in any part of the vehicle based upon the requirement of the owner.

METHODOLOGY

The Fuel is pumped into the fuel tank in the fuel filling stations. The flow sensor meter is placed at the mouth of the fuel tank opening. The flow sensor is controlled with a customized programmed Arduino UNO. The readings will be displayed on the dashboard with a LCD Display.

REQUIREMENTS / SPECIFICATION

FLOW SENSOR:

Flow measurement methods flow meters rely on forces produced by the flowing stream as it overcomes a known constriction, to indirectly calculate flow. Flow may be measured by measuring the velocity of fluid over a known area. For very large flows, tracer methods may be used to deduce the flow rate from the change in concentration of a dye or radioisotope. For liquids, various units are used depending upon the application and industry, but might include gallons (U.S. or imperial) per minute, liters per second. A positive displacement meter may be compared to a bucket and a stopwatch. The stopwatch is started when the flow starts, and stopped when the bucket reaches its limit. The volume divided by the time gives the flow rate.

For continuous measurements, we need a system of continually filling and emptying buckets to divide the flow without letting it out of the pipe. These continuously forming and collapsing volumetric displacements may take the form of pistons reciprocating in cylinders, gear teeth mating against the internal wall of a meter or through a progressive cavity created by rotating oval gears or a helical screw.

ARDUINO UNO:

The Arduino UNO is an open-source microcontroller board based on the Microchip **Atmega328P** microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The board has 14 Digital pins, 6 Analog pins, and programmable with the Arduino IDE (Integrated Development Environment) via a type B USB cable. It can be powered by a

USB cable or by an external 9-volt battery, though it accepts voltages between 7 and 20 volts. It is also similar to the Arduino Nano and Leonardo.

The **Atmega328** on the Arduino Uno comes pre-programmed with a bootloader that allows uploading new code to it without the use of an external hardware programmer. It communicates using the original STK500 protocol. ATMEGA 328 is a type of processor that is being used in an Arduino circuit board with a feature called Pulse with Modulation often abbreviated as PWM.

LCD DISPLAY:

The LCD (Liquid Crystal Display) is a type of display that uses the liquid crystals for its operation. Here, It will accept the serial input from the computer and upload the sketch to the Arduino. The characters will be displayed on the LCD.

RESULTS & DISCUSSIONS

We hereby proposed a designed model of a fuel flow indicator which can accurately display the amount of fuel being pumped into the fuel tank of vehicles. This project is designed in such a way that it solves a major problem of theft of fuel in petroleum bunks that can be implemented by car manufacturers in their upcoming model cars.

Additional Features that can be Implemented :

This project can further be improved by adding or modifying some features:

1. Use of sensors to display the information on a mobile phone
2. To use a device to store the last displayed data
3. To make it available in all new cars and bikes.

ADVANTAGES

It is cheap and is safe to handle. Since the components used in this system are of low cost, it is easily affordable. It is safe to handle. There need not be any fear of malfunctioning. It is easy to use and it does not require any skill to operate it. It is hands free and the output will be displayed on the screen. It gives values exactly and precisely.

NCLUSION

A lot of fuel is sometimes being stolen by petroleum bunks. It is our right to get the exact amount of fuel for which we pay. Our project helps in overcoming this issue. This project has been designed to serve

the community who owns and uses cars running on gasoline fuel. It has been designed by keeping the problem of the common man in mind. Thus we conclude that our product will serve good in inspecting fuel flow in a cost efficient manner.

