Intelligent Vehicle Monitoring System and Fuel maintenance using Wireless Communication

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Abstract— As all are recognizable from the expressions of engine vehicle producers foreseeing the mileage of their items pretty nearly, that are working on Spark Ignition, Compressed Ignition motors under obliged circumstances mileage on interstate and so forth., the engine vehicles shows the measure of fuel in the fuel tank by method for some sign like bars going through the E (void) and F (full) pointers. The producer gives the detail that every bar maps to the relating liters of fuel give or take. In actuality each one of us may have encountered the issue with dishonorable estimations of the present fuel level in the tank with the current bars representation framework. Maybe it would not be testing push to demonstrate the data with respect to mileage numerically on computerized presentation. This work goes for defeating the disadvantages of this current framework by giving clear data to the client about the precise evidence of fuel level digitally in liters and further separation to go with the accessible fuel. Since the fuel tank blasts have been seen over the world, the consideration ought to be taken from the assembling organizations for security of travelers. To attain the prerequisite the fuel tank configuration is changed such that the part is made for the fuel tank. Thus the development of high pressure because of expanding temperature is avoided to the greatest extent. As and when the fuel level tumbles down to certain limit, the caution will be created to the proprietor. At certain time if there happens sudden fall of fuel level,the alarm is created to indicate fuel robbery.

Key words: Float Sensor, Solenoid Valve, Relay, Buzzer

I. INTRODUCTION

It is constantly useful for each organization to get the musings of basic individuals for the business achievement of vehicles. The advertising may not be attractive until the makers fulfill client requests. The innovative improvement of science impacts the individuals to know the exact mileage data than the surmised scope of the same. Prompting the advancement of advanced speedometers giving definite speed some immaterial deferral. Yet, the representation of the level of fuel is still in bars presenting vagueness to the clients.

This work portrays of discovering the definite level of fuel that is accessible inside a fuel tank and shows on LCD quickly when we begin the motor. By utilizing the sensor that matches the criteria the prerequisite can be accomplished. Sensor is a device which distinguishes a physical thing to react for some sort of inputs. It is ideal to utilize Electro Magnetic Sensors (EMS). These are utilized to discover physical amounts, for example, weight, temperature thus on and it is changed over into electronic signs. The fuel gauge vehicle consists of two different sections:

1) The sensing unit
2) The indicator

A fuel gauge is an instrument used to show the level of fuel contained in a tank which are utilized as a part of bike vehicle and four wheeler vehicles likewise in underground stockpiling tanks. Fuel mileage in vehicles alludes to the relationship between the separations went by a car to the measure of fuel devoured. In the present situation, utilization of car and petrol cost expanding with higher rates, so it is important to utilize fuel financially and additionally to maintain a strategic distance from the wastage of fuel. In ordinary mileage computation strategies, human need to compute the mileage of the vehicle physically by voyaging vehicle until it get vacant. The downside of this procedure is that there is no ongoing mileage estimation furthermore the time it now, prolonged. Accordingly request develops to show the utilization and also mileage continuously.

II. OBJECTIVE

As of now fuel mileage pointers are made accessible to most recent motorbikes running on fuel infusion innovation just and these are not open in carburetor based motorbikes. Considering these circumstances we have added to a minimal effort interesting system and framework for getting quick mileage readings progressively relating to the measure of fuel devoured and the distance travelled by the motorbike. This gadget can keep running on carburetor based motorbikes furthermore can be added as an upgrade to existing motorbikes as well. Another real part of the assembling organizations of autos is to give wellbeing and great fuel productivity of the vehicle. To evade mischance among which one is fuel tank blast, another partition of fuel tank in bike vehicles is been proposed in the present work. Subsequently keeping away from the full tank fuel which may prompt high pressure, and henceforth the blasts can be forestalled.

III. PROPOSED METHOD

The float sensor is settled in the fuel tank. The sensor readings are noted for most extreme and least fuel.
Fuel sensor reading: Maximum Value- Minimum Value=X ,Least perusing is reference esteem.
Actual reading = Current value - Reference value
Tank capacity=5 liter
(5000ml/X)=Y
Distance to be travelled= (actual reading) x (Y) km

1) An idea of fuel tank partition is actualized into primary tank and store tank. Amid the fuel infusion

mode, store tank gets filled first. As and when the fuel level crosses 1liter, the fuel stream is changed over to primary tank through valve.

2) While showing the fuel level digitally, the aggregate sums of fuel in both the parts are included.
3) When the fuel level crosses beneath 1liter, the signal will be produced showing the low fuel. Additionally when there is sudden fall of fuel level because of stealing, the controller consequently produces an alert advising to the proprietor.
4) On selecting the accompanying methods of pace, the mileage worth and the fuel level qualities are shown on LCD.
    1) Traffic in highway
    2) No traffic in highway
    3) Traffic in city
    4) No traffic in city

IV. BLOCK DIAGRAM

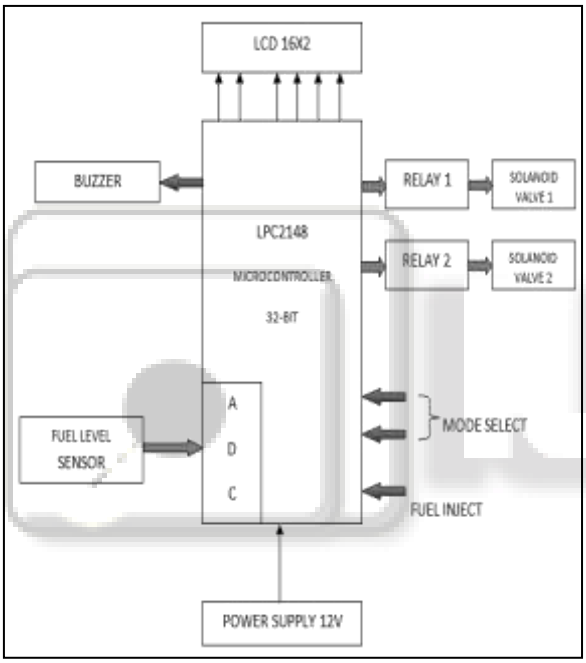

Fig. 1:

The fuel level sensor reading is converted to digital value using ADC which is one of the peripheral of LPC2148 controller. The voltage given to this controller is 3.3v. The other peripherals are driven by 5v supply. The two relay switches are used which are controlled by the microcontroller. This relay switch is used to ON and OFF the solenoid valve. The buzzer is used to indicate the low fuel and fuel theft. The mode select pins used to switch between the modes in which the vehicle is travelled. When the fuel level reaches low, the fuel inject mode is enabled. The fuel level and the selected mode will be displayed on the LCD.

The two wheeler vehicle gets started as soon it is operated by the keys. The rider has to manually switch to the modes by selecting the appropriate nature of the journey. The modes are as follows, mode 1 indicates highway with moving traffic, mode 2 indicates highway without traffic, mode 3 indicates traffic in city and mode 4 indicates city without traffic. By selecting these modes the speed of the vehicle and the corresponding fuel consumption is monitored. This monitored data is digitally displayed on the LCD.

When the fuel level falls down, fuel injection mode is selected, based on fuel level in the tank, the two solenoid valves which are connected between partitioned tank opened and closed. If the fuel level falls below 1liter, valve 1 gets opened. The fuel from the reserve tank is flowed into the main tank. When the reserve tank fills more than one liter, the valve 2 is opened and the main tank gets filled. The buzzer generates an alarm sound when fuel falls down indication low fuel.

V. WORKING

The implementation of the proposed system is as shown in the figure 3.2. The two wheeler vehicle gets started as soon it is operated by the keys. The rider has to manually switch to the modes by selecting the appropriate nature of the journey. The modes are as follows, mode 1 indicates highway with moving traffic, mode 2 indicates highway without traffic, mode 3 indicates traffic in city and mode 4 indicates city without traffic. By selecting these modes the speed of the vehicle and the corresponding fuel consumption is monitored. This monitored data is digitally displayed on the LCD.

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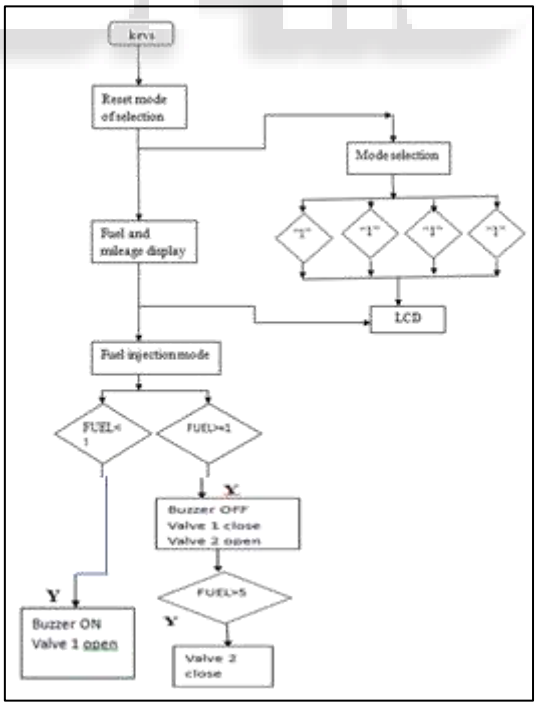

Fig. 2:

VI. RESULTS

The available fuel in the tank is displayed digitally in liters. Here "1" indicates the mode of travel selected. It indicates

highway without traffic. The "M" indicates the distance to be travelled in the available fuel.

Fig. 3:

The message "FUEL LOW" is displayed on the LCD when the fuel level falls below 1liter. Along with the display, the buzzer generates alarm sound thus indicating the rider to fill the tank in nearby fuel station.

Fig. 4:

When the fuel tank gets empty, initially the reserve tank will be filled in the proposed method. The fuel quantity in reserve tank is fixed to 1 liter. The valve 2 is fixed between the two tanks. It opens when the fuel is more than 1 liter. Through the valve opened the main tank is filled. The figure 5.3 indicates the above mentioned criteria. The 1 liter fuel which is filed initially in the reserve is flowed into the main tank. To make this happen the valve 1 is opened by closing valve 2

The modes are as follows:-

Mode 0 indicates City with traffic. In this mode, the vehicle speed is considered as 35kmph. Mode 1 indicates City without traffic. In this mode, the speed of the vehicle is assumed between 40- 50kmph. Mode 2 indicates Highway with traffic. In this mode, speed of the vehicle is between 60-80kmph. Mode 3 indicates Highway without traffic. In this mode the speed is assumed to be more than 60kmph.

To the corresponding modes, respective mileage has been set as shown in the table. The mileage is predefined in the proposed system. Modes according to mileage are mode 1= 50 , mode 2= 53, mode 3=56 ,mode 4= 60 .

MODE 0: As mentioned in the mode 0 with the mileage of 50kmpl, travelling with the speed of 35kmph is showed. In the table 5, for the different float sensor readings of fuel, the distance to be cover is calculated by the microcontroller and tabulated as shown.

FUEL(liter)	Distance To Be Covered(km)
5.092	269
4.149	239
3.583	189
2.734	144
1.792	94
0.849	44
0.566	29

Table 1:

MODE 1: As mentioned in the mode 1 with the mileage of 53kmpl, travelling with the speed of 40-50kmph is showed. In the table 6, for the different float sensor readings of fuel, the distance to be cover is calculated by the microcontroller and tabulated as shown.

FUEL(liter)	Distance To Be Covered(km)
5.281	295
4.244	237
3.489	195
2.546	142
1.603	89
0.566	31
0.377	21

Table 2:

Similarly for Mode 2 and Mode 3

VII. ADVANTAGES, DISADVANTAGES AND APPLICATION

1) The driver or owner can have the simultaneous updates of fuel available and the distance to be covered with that fuel, thus the journey would be easy to the passengers.
2) The fuel theft can be easily discovered, and hence the owner is provided with the safety measure.
3) The new idea of fuel tank partition helps in preventing chances of explosion by making enough space left for air inside the tank.
4) The overall implementation is also applied in either two wheeler or four wheeler vehicles in all type of roads.
5) The major drawback is driver need to switch to the modes of speed manually.
6) The real time implementation may require two fuel level sensors; one is to monitor reserve tank and another in the main tank.
7) The two solenoid one-way valves can be replaced with the single bilateral valve, and hence the system implementation can be made simple.

VIII. CONCLUSION AND FUTURE SCOPE

The information of the fuel present in the two wheeler or in the four wheeler and also the distance to be travelled by the vehicle with the available fuel is been provided to the driver. According to the traffic modes like highway with traffic, highway without traffic,City with traffic and city without traffic the corresponding distance to be covered will be

displayed thus making the journey easy to the driver and he will come to know when to fill the fuel which reduces manually predictingthe distance. And another importance is given to the fuel tank partitioning into main tank and reserve tank so that the fuel tank explosion can be avoided which could be caused due to high pressure. This is one of the safety measure provided to the passengers. In the proposed work, the switching between modes is done manually. The future work can be implemented as automatically switching according the roads. Instead of one-way valves, bilateral valve can be used to reduce the system complexity.

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