ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology
Vol. 1, Issue 3, November 2014

Embedded Early Intimation and Diagnosis of Fault In Automobiles

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Abstract:Main objective of this paper is to provide intimation about the fault that occurs in four wheeler. The main fault, the fault which leads to the engine fault, the fault which leads to the temperature rise, is the fault which arises from clutch and gear box. These are the main faults and it should be corrected at earliest for that accuracy is needed. This paper also deals with the fault related to safeness, for safe travelling correct and accurate operation of break and steering should be ensured, this paper also deals with the intimation faults occurs break and steering.RTC is provided for real time clocking of the system.To make it happen practically, this paper provides idea of using various kinds of sensors, comparative algorithm and microcontroller. In this paper the idea for early intimation is also enabled. So that timely change and complete utilization of spares are enabled.

Keywords: Microcontroller; Sensors; RTC; Comparative algorithm.

I. INTRODUCTION

Now a days travelling in four wheeler is very usual, for that safeness of passengers and the engine should be preserved. To enhance the performance of the engine to exist long lasting, idea is can be implemented by using the various kinds of sensors. The kind of sensors that we use here is pressure sensor for the check of clutch, and break, the sensor that we use here is the motion sensor to check the steering performance, the other sensor called pressure sensor to check the gear performance, because these are the important peripheral parts which plays vital role in the operation of four wheelers and these mechanical component also plays vital role in preserving the performance of the engine.

The early replacements can be done to enhance the performance but with having some residual performance of the main components left behind will be a waste. Due to the presence of residual performance the second hand markets will use this components again to some other customers will lead to disaster, these paper also hints the hidden idea to evict second hand markets among the honest.

II. COMPARATIVE ALGORITHM SYSTEM

This algorithm involves in normal comparison with the reference which is stored in the form of program codings in the flash memory of the controller. It involves in three stages pattern generation, comparison, result.

A. PATTERN GENERATION:

It is nothing but the generation of patterns from the main components via sensors.

The pressure sensor which is kept at the upper part of the break and clutch pedal, the force sensor which is kept lever which transfers the gear, finally motion sensor which is kept at the occurrence of torsion and the front wheel rims.These sensor inputs are collected via the ports of the microcontroller

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B. COMPARISON:

Already programmed codings are installed in the flash memory of the controller, it is programmed in the way that the comparison occurred automatically when patterns reaches the controller. Then the controller compares the patterns with the reference (which is recorded from the sensor when the spares are new).

C. RESULT:

If the deviation from the reference is beyond the specified point then the result will be positive, which means the respective spare should be replaced at once if not it may lead to engine problem and drop in the performance. If the deviation is not deviated beyond the maximum point then the result will be negative, which means the respective spare can be continued.

III.HARDWARE IMPLEMENTATION

A. FORCE SENSOR

A force sensing resistor is a material whose resistance changes when a force is applied.They are also known as an force sensitive resistor. It consists of conductive polymer in which the resistance changes according to the force applied.

B. PRESSURE SENSOR

Pressure sensor is a sensor in which it generates the electric pulse according to the pressure applied as input to the sensor. It is also called as transducers, pressure transmitters, pressure senders..etc. Its operation is very simple, it consists of piezoelectric crystal which emits electric signal according to the pressure delivered as input.

C. MOTION SENSOR

It is also called as electronic motion sensor which senses the moving objects (moving living or non living things). Its function is very simple it consists of optical illumination or simply called as light emits from one end, the other end records the light emitted. If there is any

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change in the illumination or the change in the microwave signal it detects the motion.

D. 8051 MICROCONTROLLER

The controller used in experimental result is of Atmel type:

AT89C51 features are:

1. 4 Kbytes of In-System Reprogrammable Flash Memory. Endurance 1,000 Write/Erase Cycles
2. Fully Static Operation: 0 Hz to 24 MHz
3. Three-Level Program Memory Lock
4. 128 x 8-Bit Internal RAM
5. 32 Programmable I/O Lines
6. Two 16-Bit Timer/Counters
7. Six Interrupt Sources
8. Programmable Serial Channel
9. Low Power Idle and Power Down Modes

Description:

The AT89C51 is a low-power, high-performance CMOS 8-bit microcomputer with 4 Kbytes of Flash Programmable and Erasable Read Only Memory (PEROM). The device is manufactured using Atmel's high density nonvolatile memory technology and is compatible with the industry standard MCS-51 instruction set and pin out.The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a versatile 8-bit CPU with Flash on a monolithic chip, the Atmel AT89C51 is a powerful microcomputer which provides a highly flexible and cost effective solution to many embedded control applications. In addition, the AT89C51 is designed with static logic for operation down to zero frequency and supports two software selectable power saving modes. The Idle Mode stops the CPU while allowing the RAM, timer/counters.

IV. SYSTEM IMPLEMENTATION

The sensor plays the vital part in implementing system. The pressure sensor which is kept over the pedal of the break and clutch. If the given pressure over the pedal goes beyond the normal or the deviation from reference is more then the controller sends the negative command, in sense the concern spare should be changed.

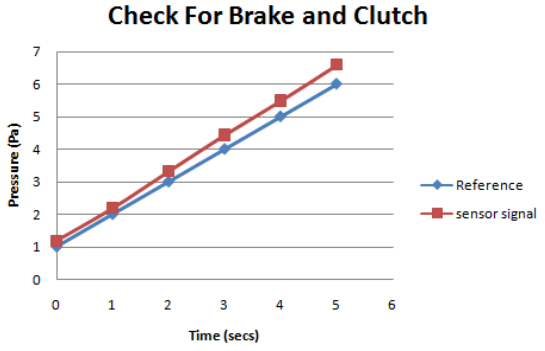

Fig 4: Pressure Vs Time

In the above graph the deviation between the sensor signal and the reference is very less so it reveals that the spare is in good condition.

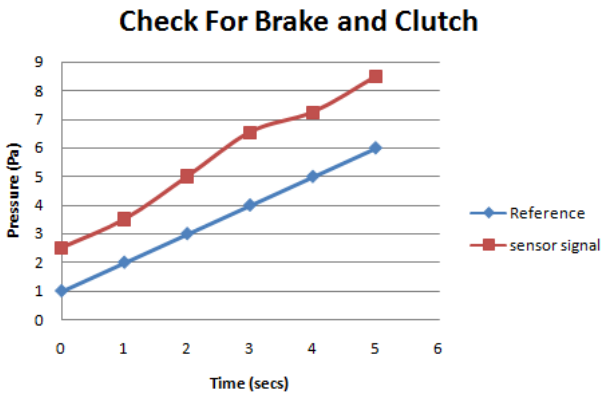

Fig 4.1: Pressure Vs Time(Deviated Result)

In the above graph the deviation between the sensor signal and the reference signal is more, so it reveals that the spare is not in good condition. These graph datas are measured from the simulation and the graph design is obtained.

The same calculation is done for motion and force sensor because for motion sensor the graph goes gradually as shown above, the same deviation occurs which leads to negative or else positive result will come.

Early intimation is also possible by this idea the same sensors is used and the additional concept is that the estimation of life of the spares, to enable this, each spare is tested with different environment and different land ambience, the respective datas are collected and converted to codings, the same is booted in the controller.

When sensor is sensing the spare with particular time the booted coding will calculate its life side by side. If the lifetime reveal is to be replaced nearly then it will intimate that the particular spare should be changed with in particular kilometre else the spare makes engine problem.

Experimental RESULT:

Present paper is designed using 8051 microcontroller.It is proposed to design an embedded system which is used for information security.

In this paper AT89C52 microcontroller is used for interfacing to various hardware peripherals. A serial driver IC is used for converting TTL voltage levels to RS-232 voltage levels.

The simulation is carried out by using PROTEUS design tool. The current design is an embedded system platform, which asks for a prime number input to compute the output.

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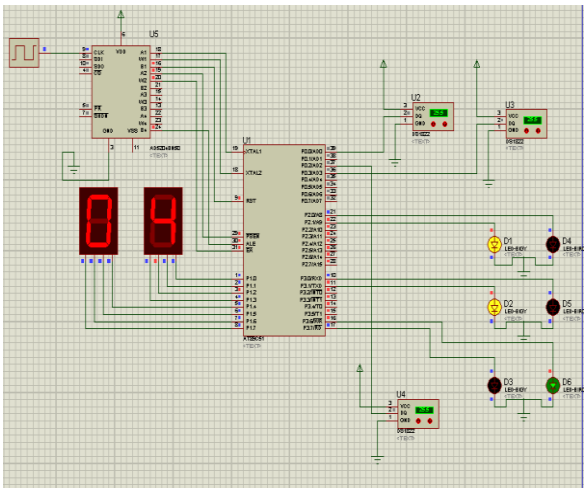

Fig.4.2 Implementation Model

In the above model there is led is presented to display the fault in the concern component of the automobile

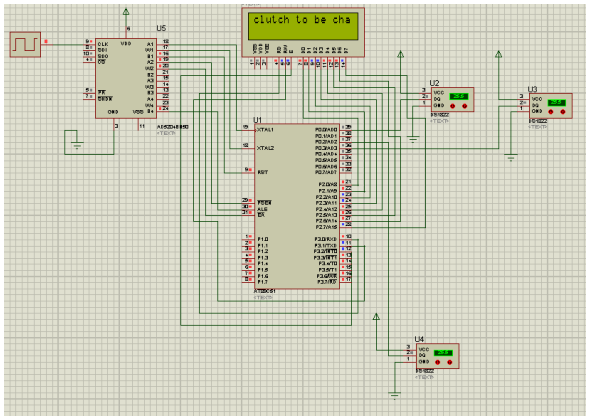

Fig 4.3 'Early Intimation' Implementation model

In the above model the early intimation is enabled in this the lcd displays "clutch needs to be changed with in 50 kms", so that complete utilization of clutch is made, and respectively for other components.

V. CONCLUSION

In this paper the idea of checking the necessary peripheral components which plays vital role in preserving the engine performance and the complete utilization of the spares. Due to this idea there will not be second hand use of spares. This idea is exactly a frugal thinking that the implementation cost is very less comparing to any fault diagnosis and intimation method.

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