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Automatic Inspection System For Two Wheeler Servicing

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Abstract - *This report represents an application implemented on a Two wheeler Servicing Inspection system using an ATMEGA 2560 microcontroller. The program controls outputs in sequential order and it is loaded onto the memory of the microcontroller. Each output is activated only when the system receives information about the previous command. These commands are highlighted by an optical LED display. Arduino is easily available in market at low cost and it is open source licenses hence arduino microcontroller is used. For the programming of arduino IDE software is used. And this software is easily available on net and easy to programming.*

Key Words: **Two Wheeler, Arduino mega2560, Sensors, Battery**

1 Introduction

Nowadays servicing problem of vehicles is detected by manually. Our project is going to detect such type of problems by using various types of sensors. In the time of servicing of two wheelers to detect the condition of vehicle with the help of different type of sensor measure the some parameter like tyre pressure, oil level indicator, battery voltage, emission, etc. That all parameter we can see digitally on the monitor screen or LCD displayed by using sensors. This all parameter runs by using the ardinuo microcontroller

2 Component

- Ardinuo mega 2560
- Sensors
- Breadboard
- USB cable
- Battery(9v)
- Resistors(1k,2k,9k,220ohm)
- LED bulb
- Jumper wires

3 Arduino mega2560

Or object can be connected to software on your computer Arduino is an open source physical computing platform based on a simple input/output (I/O) boards and a development environment that implements the Processing language. Arduino can be used to develop application. The boards can be assembled by hand or purchased pre assembled; the open source IDE (Integrated Development Environment) can be downloaded for free from www.arduino.cc

Arduino specifications

- Microcontroller ATmega2560,
- Operating Voltage 5V
- Input Voltage (recommended) 7-12V,
- Input Voltage (limits) 6-20V
- Analog Input Pins 16
- Digital I/O Pins 54 (of which 14 provide PWM output)
- DC Current per I/O Pin 40 mA
- DC Current for 3.3V Pin 50 mA
- Flash Memory 256 KB of which 8 KB used by boot loader
- SRAM 8 KB,
- EEPROM 4 KB
- Clock Speed 16 MHz

4 Breadbord

A breadboard is a circuit board that is used to make temporary circuits. It is a device having electronics and test circuit designs. The electronic elements inside the electronic circuits can be interchanged by inserting the terminals and leads into holes and later connecting it with the help of appropriate wires

5 Sensors

5.1. Oil level indicator Sensor

In the oil level sensor two copper strips are used when we supply the voltage to copper strips and these strips put in the oil tank then oil is covered with strips due to oil voltage is changing and this change in voltage is converted into a liter.

5.2. Vibration Sensor

- Sensor name –ADXL335
- 3-axis sensing
- Single-supply operation
  1.8 V to 3.6 V
- Excellent temperature stability

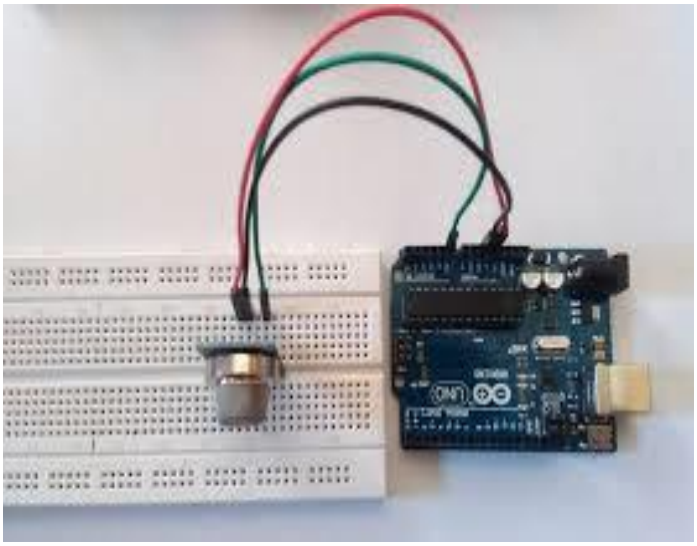
5.3. Emission sensor(MQ-135)

Specifications of MQ-135 gas sensor

- Wide detecting scope
- Fast response and High sensitivity
- Stable and long life Simple drive circuit
- Used in air quality control equipment for buildings/offices, is suitable for detecting of NH3, NOx, alcohol, Benzene, smoke, CO2, etc.
- Size: 35mm x 22mm x 23mm (length x width x height)
- Working voltage: DC 5 V
- Signal output instruction.
- Dual signal output (analog output, and high/low digital output) 0 ~ 4.2V analog output voltage, the higher the concentration the higher the voltage

Interfacing of MQ-135 Gas Sensor with Arduino

In today's world, we encounter different scenario where we see different gasses being emitted in atmosphere such as home appliances like air conditioner and industrial chimneys. Monitoring of these gasses is very important to safety point of view. Gas Sensors are very helpful in accomplishing this task. Small nose like sensor spontaneously responds to the alteration of gas concentration and keep our systems updated for special tasks. Pin Configuration MQ-135 gases sensor.



5.4. Pressure sensor

A pressure sensor is a device equipped with a pressure-sensitive element that measures the pressure in a gas or a liquid against a diaphragm made of stainless steel, silicon, etc., and converts the measured value of an electrical signal as an output

6 Methodology

When two wheelers are coming to the service station for servicing at that time two wheelers is parking on the stand, then various sensors mount on two wheeler such as a pressure sensor at the tyre of bike, oil level indicator sensor put in the oil tank, vibration sensor mount on the engine and other part of the bike to check the vibration of various part, Emission sensor are mounted in the silencer to check the exhaust gas like CO2, NOX etc. Through the wire connection check the voltage of battery. using such sensors analog signals pass to the Arduino. Arduino processes the signal and converts it into digital output signal. The signal displayed on display or computer screen.

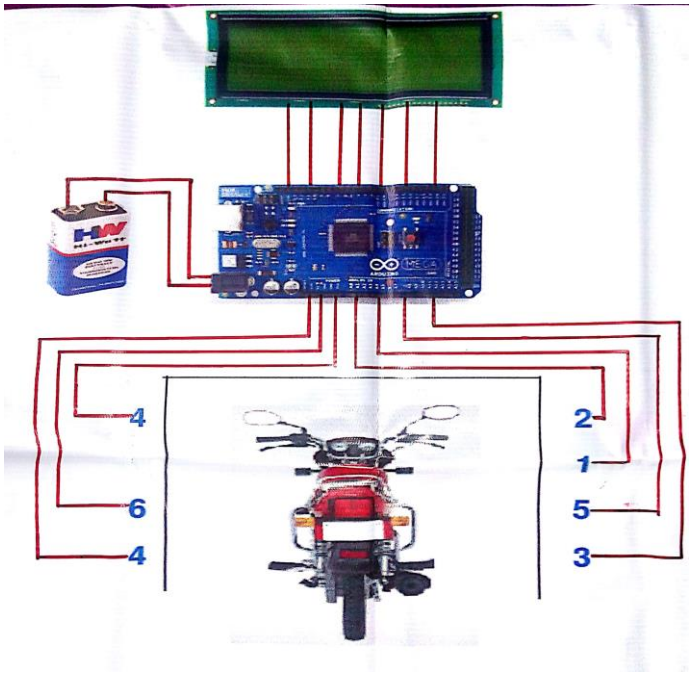


Fig -1: servicing stand with two wheeler

1-Vibration sensor

2-Oil level indicating sensor

3-Emission sensor

4-Tyre pressure sensor

5-Battery

6-Air filter

7 Software

IDE (integrated development environment)
IDE: Arduino is an open-source computer based software and hardware used for designing and manufacturing the microcontroller based kits. It can also build the digital devices and interactive objects that can be sensed and controlled from the physical world. The 8-bit Atmel AVR microcontrollers or 32-bit Atmel's

ARM processors are widely used. It allows a set of digital and analog I/O pins that can be interfaced to the various expansion boards and other circuits. The Arduino platform gives an integrated development environment (IDE) for programming the microcontrollers. Serial communication interfaces including USB are used for loading programs from personal computers. It can also support C, C++ and Java programming languages.

8 Display

Output of Arduino is displayed on display or computer screen. A seven-segment display (SSD), or seven-segment indicator, is a form of electronic display device for displaying decimal numerals that are an alternative to the more complex dot matrix displays.

9 Conclusion

With the help of this inspection system we can detect the such problem of bike at the time of servicing.

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