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FABRICATION OF ENGINE CONTROL SYSTEM BY USING SMELL AND TEMPERATURE SENSOR

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Abstract : Modern vehicles require intelligent monitoring systems to ensure safety, efficiency, and environmental protection. This paper presents the fabrication and implementation of an engine control and monitoring system using smell and temperature sensors to detect abnormal engine conditions. Internal combustion engines often produce unusual odors and excessive heat during malfunction, fuel leakage, or incomplete combustion. Early detection of these conditions can prevent engine damage and reduce harmful emissions. The proposed system integrates a smell (gas) sensor and a temperature sensor with a microcontroller-based control unit. The smell sensor is designed to detect harmful gases and unusual odor compounds released from the engine during abnormal operating conditions such as fuel leakage or overheating components. Simultaneously, the temperature sensor continuously monitors the engine temperature to identify overheating or inefficient cooling performance. The collected sensor data is processed by the microcontroller, which analyzes the readings and determines whether the engine is operating within safe limits. If the system detects abnormal smell levels or excessive temperature, it triggers an alert mechanism such as a buzzer or display notification. Additionally, the system can automatically control or shut down the engine to prevent severe mechanical damage and ensure passenger safety.

The fabricated prototype demonstrates a simple, low-cost, and effective solution for real-time engine condition monitoring. The integration of smell and temperature sensing provides a dual-layer safety mechanism that enhances reliability compared to conventional temperature-only monitoring systems. This approach can be applied in automobiles, industrial engines, and generator systems to improve maintenance efficiency and reduce the risk of unexpected failures.

The results show that the proposed system successfully detects abnormal conditions and responds promptly, thereby improving engine safety, reducing maintenance costs, and contributing to environmentally responsible operation.

Index Terms **- smell (gas) sensor and a temperature sensor.**

I. INTRODUCTION

INTRODUCTION

Modern engines require efficient monitoring systems to ensure safety, performance, and longevity. Traditional monitoring systems often fail to detect gas leakage or overheating at early stages. This project proposes a smart control system using gas (smell) and temperature sensors to enhance engine protection.

1.2 Objective

To design a system that detects harmful gas emissions.
To monitor engine temperature continuously.
To automatically control or shut down the engine during abnormal conditions.
To improve engine safety and efficiency.

1.3 Scope

The system can be applied in:
Automobiles
Industrial engines
Generator systems
Boiler monitoring system**s**

II.LITERATURE REVIEW

Various engine monitoring systems have been developed using temperature sensors and pressure sensors. However, integrating gas detection with temperature monitoring provides an added layer of safety. Gas sensors like MQ-series are widely used in safety systems, while temperature sensors such as LM35 provide accurate readings.

III.SYSTEM DESIGN

3.1 The system consists of:

Gas Sensor (Smell Sensor)
Temperature Sensor
Microcontroller (Arduino/8051)
Relay Module
Buzzer/Alarm
Engine (Load)

IV.COMPONENTS USED

4.1 Gas Sensor (MQ-2/MQ-135)

Detects gases like LPG, methane, carbon monoxide
High sensitivity and fast response

4.2 Temperature Sensor (LM35)

Measures temperature in Celsius
Accurate and linear output

4.3 Microcontroller

Acts as the brain of the system
Processes sensor data and controls output

4.4 Relay Module

Used to switch the engine ON/OFF
Provides isolation between control and power circuits

4.5 Buzzer

Provides alert during abnormal conditions

V.HARDWARE IMPLEMENTATION

5.1 Circuit Description

Gas sensor connected to analog input
Temperature sensor connected to ADC pin
Relay connected to digital output
Buzzer connected for alert

5.2 Power Supply

5V regulated power supply used for microcontroller
External supply for engine load

VI.RESULTS AND DISCUSSION

The system successfully detected gas leakage.
Temperature rise was accurately monitored.
Automatic engine shutdown prevented overheating damage.
The response time was quick and reliable**.**

VII.ADVANTAGES

Improves engine safety
Low cost and easy to implement
Real-time monitoring
Automatic operation

VIII. LIMITATIONS

Sensor accuracy depends on calibration
Limited to specific gas detection
Environmental factors may affect readings

IX. APPLICATIONS

Automobiles
Industrial safety systems
Power plants
Smart vehicles

X.FUTURE SCOPE

Integration with IoT for remote monitoring
Use of AI for predictive maintenance
Mobile app control and alerts
Wireless sensor networks

CONCLUSION

The fabricated engine control system using smell and temperature sensors provides an efficient and reliable method for monitoring engine conditions. It enhances safety by detecting harmful gases and overheating, ensuring timely preventive actions. The system is cost-effective and suitable for various industrial and automotive applications.

REFERENCES

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Front View

Side View