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RF BASED TWO WHEELER ANTI-THEFT SYSTEM

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Abstract - The objective of a new anti-theft system for two-wheelers, Uses an innovative approach to fuel supply control through radio frequency (RF) technology. The system integrates an RF module with the existing fuel supply mechanism, allowing for real-time monitoring and management of fuel accessibility. The device has the ability to cut off the fuel supply in the case of unwanted access, making the vehicle unusable.

An RF transmitter mounted on the vehicle and matching receivers that the owner operates are essential parts that enable secure communication. To improve user involvement and security, the system also has a mobile application for remote monitoring and notifications. With the increasing incidence of two-wheeler theft, this solution aims to provide a reliable and cost-effective means of protection, ensuring peace of mind for owners. The effectiveness of the system was validated through extensive testing, demonstrating its ability to significantly reduce the risk of theft while maintaining ease of use.

Key words: Radio frequency, Transmitter, Receiver, Anti-theft, Solenoid valve

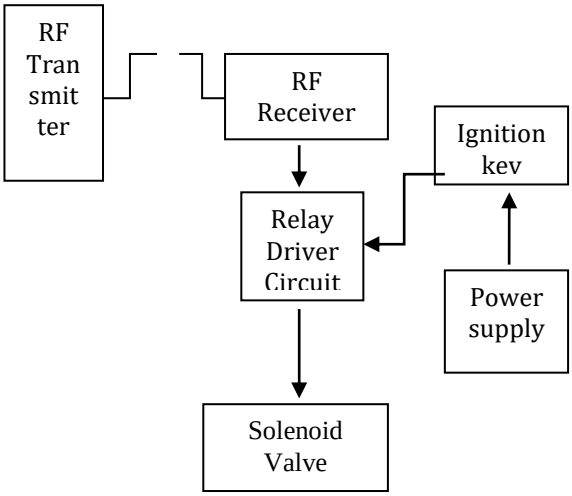
1. INTRODUCTION

The increasing incidence of two-wheeler theft presents a serious problem, necessitating the development of creative protection measures. Traditional anti-theft mechanisms, such as locks and alarms, often fail to determined thieves, leading to substantial financial losses and emotional distress for owners. To address this increasing issue, we suggest an advanced anti-theft system that makes use of radio frequency (RF) technology to control the fuel supply system.

This system aims to enhance the security of two-wheelers by integrating seamlessly with their fuel supply lines. The system efficiently immobilizes the vehicle in the event of unauthorized attempts to start it by using radio frequency (RF) communication to enable owners to remotely control fuel access. Real-time monitoring and notifications are made possible by the ease of a mobile application, guaranteeing that owners are always aware of the condition of their vehicle.

Our approach not only focuses on preventing theft but also on empowering users with control over their vehicles. After much investigation and testing, we have created a workable and efficient solution that provides two-wheeler owners with an extra degree of security in an increasingly unpredictable environment. The purpose of the paper is explained in this introduction, which also provides context for a thorough examination of its elements, capabilities, and possible effects on vehicle security.

2. BLOCK DIAGRAM



3. OBJECTIVES

Prevent Unauthorized Start and Operation: Control fuel flow such that it allows only when a particular radio frequency signal from the owner's transmitter is detected. This will stop unauthorized people from starting or moving the two-wheeler.

RF-based Authentication: Use RF technology for secure owner identification, ensuring that fuel flow is controlled and only activated when the rightful owner is present with the RF transmitter.

Enhance Vehicle Security: Act as an additional layer of security by directly controlling the fuel supply, making it challenging for thieves to bypass the system or start the vehicle without permission.

Remote Fuel Control: Allow the owner to remotely control fuel flow, so the vehicle remains disabled unless the RF device is within range, further deterring theft attempts.

Easy Integration and User Operation: Ensure that the system is user-friendly and can be seamlessly integrated with existing two-wheeler fuel systems, allowing quick activation and deactivation for the owner without complex procedures.

4. COMPONENTS

1. RF Transmitter and Receiver:

Transmitter: Mounted on the vehicle, it sends a coded signal when activated.

Receiver: Installed on the owner's device (like a Smartphone), it receives signals from the transmitter.

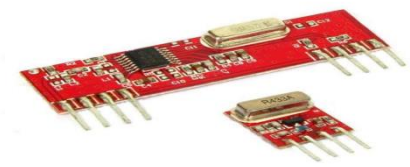


Figure: 1 RF Transmitter and Receiver

2. Solenoid Valve:

A key component that controls a fuel flow. When deactivated by the RF system, it stops the fuel supply, preventing the vehicle from starting.

Figure: 2 Solenoid Valve

3. Power Supply:

A reliable source, such as the vehicle's battery or a dedicated rechargeable battery, to power the system components.

Figure: 3 Battery

4. Key fob/Remote Control:

Description: A small device for the user to activate or deactivate the system remotely.

Options: Pre-made RF remote or custom remote using a microcontroller.

Figure: 4 RF Remote Control

5. Relay:

Relay is an electrically operated switch. Current flowing through the coil of the relay creates a magnetic field which attracts a lever and changes the switch contacts.

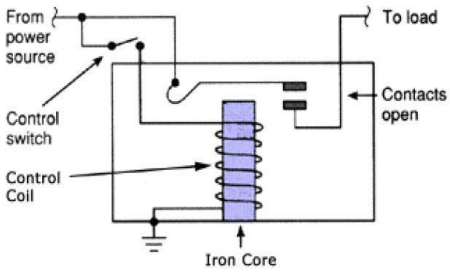


Figure: 5 Relay Circuit

5. WORKING PROCEDURE

The proposed system upon installation, the anti-theft system is connected to the two-wheeler's fuel supply line and electrical system. The RF transmitter is integrated with the ignition system, while the receiver is linked to a remote control.

A secure key fob must be used for the owner's authentication. This guarantees that the system can only be controlled by authorized users. When the owner turns the ignition key and switch on the RF transmitter,

it sends a signal to the receiver. If the system recognizes the authorized signal, it allows the fuel solenoid valve to open, enabling fuel flow and starting the engine.

An RF transmitter notifies the signal to receiver to deactivate the solenoid valve in the event of a prohibited attempt to start the car. This cuts off fuel supply, preventing the engine from starting.

Using a key fob, the owner can remotely turn on or off the anti-theft device. This allows for real-time control over the vehicle's security features.

In case of theft, the owner can immediately disable the fuel supply, rendering the motorcycle inoperable until the system is reset with the correct key or app access.

The observations are mentioned in the below Table: 1

S No	Key condition	RF Receiver	Solenoid valve Operating condition
1	Off	Off	Close
2	On	Off	Close
3	Off	On	Close
4	On	On	Open

6. CONCLUSION

An important achievement in vehicle security is the creation of a fuel supply control system for two-wheelers that uses radio frequency technology to prevent theft. This device offers a workable and efficient way to counteract the growing number of two-wheeler theft cases by utilizing RF communication and combining a solenoid valve to regulate gasoline flow.

The system not only enhances security by immobilizing the vehicle in the event of unauthorized access but also empowers owners with real-time control and monitoring through a user-friendly key fob. The risk of theft is significantly decreased by users being able to remotely control the fuel supply and receive real-time notifications, which provides that they can react swiftly to possible threats.

All things considered, this creative strategy provides a dependable and effective way to safeguard two-wheelers, making the streets safer and giving owners more peace of mind. The integration of such technologies will be essential to improving the overall security environment for personal vehicles as technology develops further.

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