



## AUTO IGNITION OFF ECO-FRIENDLY VEHICLE

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### ABSTRACT

*Traffic lights, traffic jams, unnecessary halts, narrow roads and road blocks are the most inevitable reasons which halt the vehicle for indefinite time. People at that time very usually refuse to off the vehicle ignition to avoid any complexity which usually arouse during engine start up. As per the recently concluded research conducted by Indian institute of Roadways and transport, Chennai, that if we switch off the engine at traffic lights delayed up to 30 seconds than it improve fuel efficiency through various means. This research paper presents the most awaited simplest analogous circuitry to save fuel during vehicle idling for more than 30 seconds and consequently reduce overall fuel consumption ratio as well as environment pollution.*

**Key words:** *engine; efficiency; ignition; roadways; second; transport; idling; etc.*

### **I. Introduction:**

The overcrowded roads of under developed, developing & developed countries and Indian roads in particular are now a day's struggling to maintain every day increasing traffic load. As per the researches going on recent times each human being living in metro cities, spent approximately 40 hour or more a month in traffic.

Vehicle idling is a situation when our vehicle stuck in traffic jam or any unusual circumstances that keep the vehicle engine on continuously, this situation is called idling. According to FHWA if we gather the data of idling practiced by truck drivers worldwide, the total fuel use by idling trucks is estimated to be over 2 billion gallons per year worldwide (Data source- The Federal Highway Administration's (FHWA's) Highway

Statistics and The Bureau of the Census' VIUS). Workday idling is determined to be a potentially much larger energy user than overnight idling, but data are required before any definitive conclusions can be reached.



*Fig1: vehicle idling.*

Existing technologies can reduce overnight idling, but still more study and research is required to reduce workday idling as well. There is plethora of technologies available but it becomes less efficient at the time of implementation due to associated complexities but the proposed system is very much efficient and user friendly.

## II. Literature review

Idling means, running a vehicle's engine when the vehicle is on but not running on road run or not in kinetic inertia. This situation commonly occurs when vehicles stopped at a red light, vehicles waited to get the parking and stationary with the engine running. When idling, the engine runs without any loads except the engine accessories.

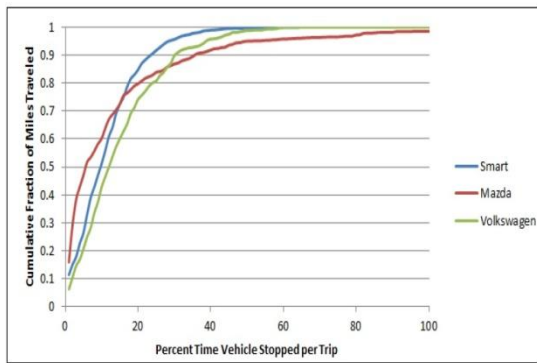
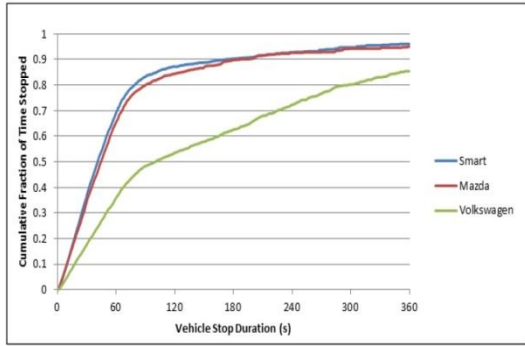
The previous attempts to resolve the problem of idling remain encircled between embedded approach and sensor

based approaches. There are two main types of engine energy saving systems available which are -energy storage system (ESS) re-start and combustion re-start. ESS re-start may uses electrical energy from an ESS (either a standard 12-V starting/lighting/ignition battery or an additional ESS), from an electric machine connected to the engine, or with a belt alternator starter (BAS) system to start the engine. The restarting is being controlled manually. This system is now not in use because of its in-efficiency. Number of automobile companies attempted to made gadgets in order to reduce the amount of time engines spend idling, chiefly due to fuel economy and emissions concerns but those gadgets are now out of production.

As per the research published recently, in the United States, about a billion gallons (3.8 billion liters) of fuel is consumed by idling heavy-duty truck and locomotive engines each year and in case of Indian traffic scenario, the idling cause major environmental as well as financial degradation. The proposed system is quite unique in every aspect and capable enough to bring revolution in the field of automotive design.

According to the recent research conducted independently by top three vehicles manufacturing companies over the 'vehicle stop duration' and 'percent time vehicle stops per trip' shows the exact condition of

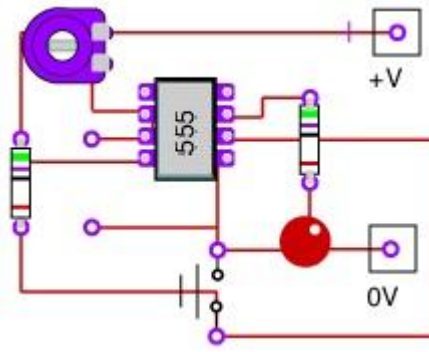
vehicle idling worldwide. The generated graph is presented below.



*Fig2: Graphical representation of the results generated after the survey over idling worldwide.*

## II Principle

The proposed system consisting of dual sensorized input assessment and monitoring based real time idling removal system in which one pairs of INFRARED sensors act as a movement sensor and sense vehicle's mode of inertia. The IR sensor monitors even a minute momentum of wheels and provides its feed back to the micro controller assigned to it. The microcontroller process the real time data inserted to it and finally trigger 555 timer circuit to count actual idling session.



*Fig3: Simulation of 555 timer in Proteus.*

The idling session can vary according to the circumstances and can be altered manually through potentiometer. When the wheel lost its kinetic inertia and maintains static inertia for more than 30 seconds, the system turn off the ignition in order to save fuel and curb carbon emission.

## III. Methodology & Implementation

The Proposed system is based on an embedded programmed circuit which has been made using 89S52 microcontroller, 555 timer and IR sensors where microcontroller act as a central processing unit, timer counts actual idling session in real time and IR sensor act as wheel motion recorder and continuous data feeder link between central processor and ground reality.

Programming is written in embedded 'C' and keil software is used to run the source code for delay setting. After completion of multiple testing and simulating steps, the code is generated and burned into the Microcontroller using ATMEL-89s52

series burner. Universal zero PCB is used to develop the test circuit and practical implementation in order to check working of each individual part.

Demonstration of working is utmost important step in any research oriented project.

1. To implement the IR sensor based idle avoidance circuit, a small four wheel drive vehicle is being developed with 434 Mhz RF controlling, adequate suspension system, steer by wire facility and differential less wheel base.
2. The system loaded vehicle is tested many times in different circumstances with efficiency, which shows its utility and user friendliness in practical.
3. The prototype is designed and fabricated indigenously with the use of existing machinery and technicality present with us.

### **III. Observation and Results**

The vehicle idling and implications associated to it proved to be a major roadblock in the way of user-friendly and environment-friendly transportation means design and development. The proposed programmed IR sensor based system brings a new revolution in this field by providing best alternative with minimum cost and maximum ease.

The close observation of system working, performed over self designed and fabricated prototype, under laboratory condition provides good indicative towards the upcoming success and paved the way for its commercialization. In the entire time span of its working, the overall system run swiftly and as per the program which shows its efficiency and trustworthiness.

### **IV Conclusion**

Vehicle idling is becoming much concerning issue day by day as the bulk of idling based research conducted till date has concluded that the effects of heavy and medium-duty diesel vehicle idling produces – environmental degradation as well as less fuel efficiency. Sometimes idling in traffic jams become necessity for safety, vehicles can be turned off while waiting for passengers or for freight trains to pass due to longer halting times. If each car in the United States idles just 6 minutes per day, about 3 billion gallons of fuel are wasted annually, costing drivers \$10 billion or more. The system proposed in this paper will definitely help to change the face of current idling conditions and capable enough to act as a single handed answer to many idling related consequences.

## V      **References:**

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