

# AUTOMATIC DRUNKEN DRIVE PREVENTION SYSTEM

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**Abstract**— Driving while either intoxicated or drunk is dangerous and drivers with high blood alcohol content (BAC) are at increased risk of car accidents, highway injuries and vehicular deaths. Prevention measures evaluated include license suspension or revocation, impounding or confiscating vehicle plates, enforcing open container bans, increasing fine penalties, jail, mandating education for youth and lowering legal BAC's.

Even though these much hurdles created by authorities to drunken drive, it is still continuing like serial episodes. As such there is no effective mechanism to prevent this. Here, we have planned to design an Automatic Alcohol Detector, which is integrated with the steering wheel. Ethanol has more capacity to absorb IR rays. So, we use an IR Sensor which is mounted on steering. An IR source led-894 directs IR Energy through the sensor continuously. If the flow of IR rays is interrupted by absorption of alcohol vapour a relay circuit is activated. This relay circuit has control over the fuel supply system and it cuts-off the fuel supply to the engine. This makes the car to come to halt slowly. The higher the concentration of ethanol, the more infrared absorption occurs (same way that a Coolers absorbs visible light, alcohol absorbs infrared light).

## I. INTRODUCTION

- Alcohol affects the central nervous system of a person.
- Even 0.05% BAC makes the sense of judgement impaired and the ability to control steering is affected.
- In this paper we have designed an automatic alcohol detector which is integrated with the steering wheel.
- This Invention relates to apparatus for preventing a motorcar from being driven by a drunk driver.
- When the sensor detects presence of alcohol in the breath of the driver, a relay circuit is activated.
- This relay circuit has control over the fuel supply to the engine of the car.
- The fuel supply is cut-off and the car is brought to halt.

## II. OBJECTIVE

- The object of this invention is to provide a novel and innovative way of preventing drunken driving of a Motorcar by cutting-off the Fuel supply.
- Also to enable a person who is not drunk to drive the same Motorcar.

- To design the system in such a way that it detects alcohol content only from the breath of the driver.
- To extend this idea with more technological advancements and make it available in a cost effective way.

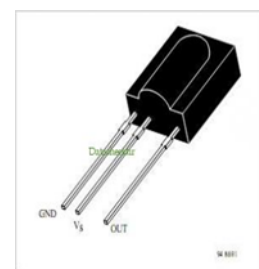
## III. STATISTICS

- Drunk driving remains a serious national problem that tragically affects thousands of victims annually.
- Over 20% of all traffic fatalities in the India each year are caused by drunk drivers.
- Nearly 60% of all accidents which occurs due to drunk driving.
- Each year, around 14000-15000 people die.

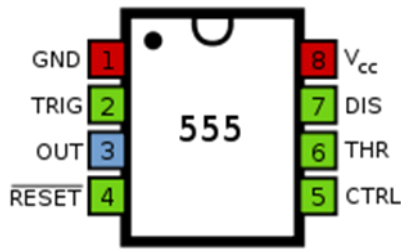
## IV. COMPONENTS USED



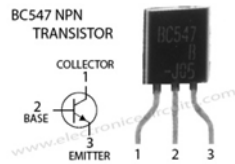
IR LED-894



IR Sensor TSOP 1736



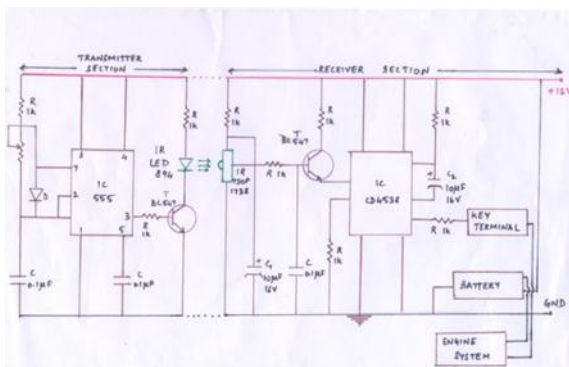
IC-555



TRANSISTOR BC 547



IC-4538B



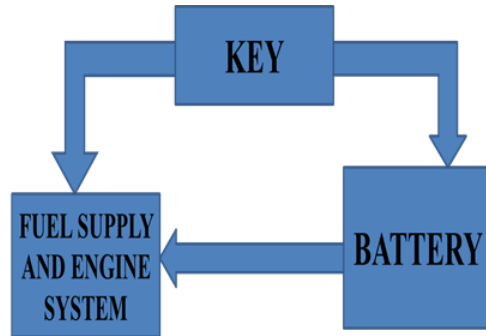
Circuit diagram of alcohol detector

### V. POSITION OF THE INFRARED DETECTION SYSTEM

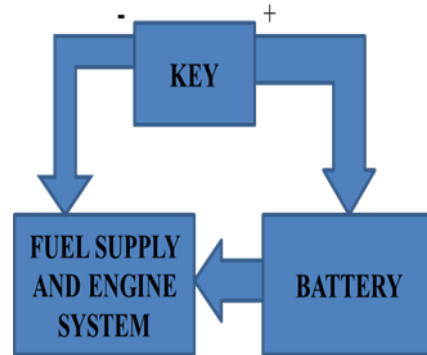
The Specially designed detective sensor is integrated inside the Steering Wheel. One fact to be taken into consideration is that we are not concerned with the amount of alcohol intake of the other passengers in the car. Also the detection system must not be affected due to other extraneous elements [example: in case the vehicle passes near a wine shop].so the sensitivity of the system must be limited to a very small distance.

### VI. WORKING PRINCIPLE OF A CAR

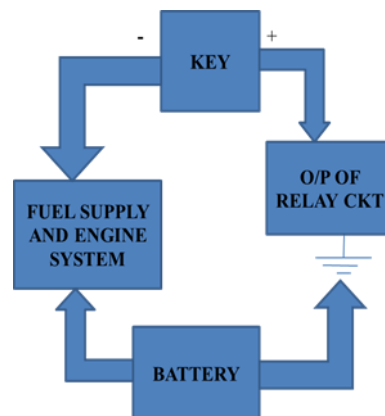
- The key is inserted and turned on. This completes the electrical circuit of the key, engine and the battery.
- The engine is supplied with fuel from the fuel supply system and the required power from the battery.
- Ignition is set-up and the car is started.



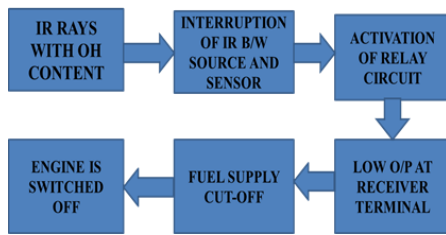
What we have done is...



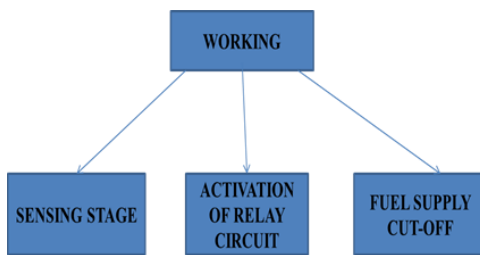
Normal connection



Modified connection



Basic block diagram



Working

#### A. Sensing Stage

- There is always a continuous flow of IR rays b/w the source and the sensor.
- The IR rays has good affinity towards alcohol.
- The IR source, led-894 produces high intensity IR rays, which means it absorbs alcohol of only high content from the air.
- So this symbolizes that ,this mechanism will work only when the driver is over drunk.
- When IR absorbs OH there occurs loss in the amount of IR rays received by the sensor.

#### B. Activation of Relay Circuit

- The loss of IR rays is sensed by the sensor and this leads it to activate the relay circuit.
- Loss of IR  $\propto$  amount of alcohol consumed.
- The result is tat a low o/p is produced at the receiver end.
- The pin 7 containing the low o/p is fed to the key terminal.

#### C. Fuel Supply Cut-Off

The ignition will begin only when the key touches +ve and -ve terminals.

- with low o/p at the key terminal, the key fails to complete the circuit.
- This results in fuel supply cut-off to the engine.
- Thus the engine stops working or doesn't start depending on the position of the car.

#### D. What Happens When the Driver Is Not Drunk?

- When the driver is not that drunk or not completely drunk, there is a continuous flow of IR rays b/w source and sensor.
- This activates the relay circuit and gives a high o/p at pin 7 .
- This high o/p is fed to the key terminal.
- This completes the circuit containing the key, engine and the battery.
- The car begins to move.

### VII. FUTURE DEVELOPMENTS

- The above proposed design can also be implemented in two wheelers.
- A few technological additions like a GPS tracking system could be used to alert the cops.
- Proximity sensors could be used to indicate that the vehicle is going to stop. This could be useful for the vehicles behind.

### VIII. ADVANTAGES

- The advantage of the system is that the driver cannot even tamper with it. Because the fuel supply valve is open only when all the components are working properly. So if anyone tampers with it or if the alcohol content is above a particular limit, fuel is not supplied and the vehicle cannot be started.
- Also when the fuel supply is cut-off ,the car doesn't stop abruptly. This helps to prevent collision with the vehicles coming behind.
- This circuit detects the alcohol directly
- This circuit is simple in construction.
- Readily available ICs are used.
- Responsibility of the circuit is high.
- High Accuracy.

### IX. APPLICATIONS

- Cars
- Trucks
- Buses.

### X. COST OF THE COMPONENTS USED

- IR LED-894: Rs.10
- IR SENSOR-TSOP1736: Rs.25
- IC-555 TIMER: Rs.25
- TRANSISTOR-BC 547: Rs.5
- IC-4538B:Rs.20

### XI. CONCLUSION

- Once our designed Product is launched in all type of vehicles, the main crisis of DRUNKEN DRIVE is

completely eroded; from this we can save number of lives.

- Its not that easy to stop drinking. Also its not too hard to prevent drunk driving.  
So let's fight hard TECHNOLOGICALLY innovating ways to eliminate alcoholism.

#### REFERENCES

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- [3] ieeexplore.ieee.org
- [4] Electronics buzzar