

## FABRICATION OF A ROAD SENSING AUTOMOBILES TO CONTROL THE SPEED OF AN ENGINE

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### ABSTRACT

The world health organization reveals its report that many people in India die due to road accidents than any other people in the world including the more populous china. It is mainly due to the over speeding of the vehicle, drink and driving, less use of helmets etc. so in order to avoid that we designed a project to control the speed of the engine automatically by using road sensing automobile system which controls the speed of the engine according to speed limit in that region. The system consists of the circuit which senses the speed limit of the region and automatically reduces the speed of the vehicle within the prescribed speed limit. When the automobile is in the region where speed limit is 50 kmph, a road limit sensor in the system senses the speed through radio frequency and the system controls the speed of the vehicle to within 50 kmph. When the automobile then switches to a lane with speed limit of 20 kmph, the system brings down the speed to within 20 kmph.

**Keywords:** *sensing automobile system, Speed and Engine.*

### INTRODUCTION

The World Health Organization has revealed in its first ever Global Status Report on Road Safety that more people die in road accidents in India than anywhere else in the world, including the more populous China. The report pointed to speeding drinking-driving and low use of helmets, seat belts in vehicles as the main contributing factors [1]. In 2004, road accident was the top ninth cause of death in 2004. The statistics for India are chilling. At least 13 people die every hour in road accidents in the country, the latest report of the National Crime Records Bureau reveals. According to the report, speed is the main reason behind accidents [2]. An increase in average speed is directly related to both the likelihood of a crash occurring and to the severity of crash consequences. In 2007, 1.14 lakh people in India lost their lives in road mishaps which is significantly higher than the 2006 road death figures in China Road deaths in India registered a sharp 6.1% rise between 2006 and 2007 (Fig.1).

However, road safety experts say the real numbers could be higher since many of these accident cases are not even reported. Meanwhile, an analysis of the National Crime Records Bureau (NCRB) report points to Andhra Pradesh having the highest share of deaths due to road accidents (12%), followed by Maharashtra and Uttar Pradesh (11% each).

## **METHODOLOGY**

A two-stroke, engine is a type of internal combustion engine which completes a power cycle with two strokes of the piston during only one crankshaft revolution. Fig.2 shows the two stroke petrol engine. The working of two stroke petrol engine consists of two strokes. They are

1. upward stroke.
2. downward stroke

Fig.3 shows the RFID transmitter. RFID (Radio frequency identification) Transmitter is fitted in the region where the speed limit has to be achieved. This transmitter is connected with a 5volt external battery supply. This transmitter sends the signal to the RFID receiver in the engine about the speed limit in the region. With these 5 volts battery, the bandwidth is only about 10mts to 20mts. In order to achieve a higher bandwidth, the voltage supply has to be increased along with the increased size of the transmitter [3].

Fig.4 shows the RFID receiver. RFID (Radio frequency identification) Receiver is connected with the input of the micro controller Atmega 328 which is located inside the vehicle. When the vehicle enters the speed limit zone the signal from the RFID transmitter is received by the RFID receiver. The RFID receiver, which is connected with the microcontroller, receives the signal from the transmitter and sends the received signal to the micro controller. The RFID receiver is operated by the power supply given by micro controller [4].

Fig.5 shows the atmega 328 micro controller. This micro controller acts as the main unit in this project. It receives signal from the receiver and operates the servo motor. The micro controller consists of 16 pins and is operated by supplying 5 volts external battery. Four pins at input are connected to the RFID Receiver which receives signal from the RFID Transmitter. Four pins at output is connected with the servo motor which controls the secondary throttle valve in the engine. Another five pins in the output is connected with the LCD display which displays the speed limit at the region. The micro controller controls the

servo motor according to program fed in it. The programs are fed into the micro controller by arduino compiler.

Fig.6 shows the servo motor. Servo motor is connected with the output of the microcontroller. Servo motor is run by 9 volts external battery. Once the microcontroller receives the signal from the receiver, it controls the servo motor. Each and every rotation of the motor is controlled by the micro controller. The motor is coupled with the secondary throttle valve in the engine and it controls the inlet flow of air and fuel mixture by opening and closing of the throttle.

LCD (Liquid crystal display) is fitted at the output of the micro controller. It has 5 pins and runs with micro controller power supply itself. It doesn't require any external power supply. Once the micro controller receives signal the LCD shows the speed limit of the region.

## **RESULT AND DISCUSSION**

A frame is made to hold the engine in the correct position. A Teflon pipe is made and one end of the pipe is connected to the carburetor of the engine and the other end is connected to the inlet valve of the engine. In the center of the Teflon pipe a secondary throttle is made and servo motor is coupled here. It is made in such a manner that the servo motor opens and closes the throttle valve and limits the air fuel mixture entering into the engine. When the vehicle with this RSA system enters a particular speed region, for example, 40km/hr the RFID transmitter which is fitted in that region sends a signal to the RFID receiver [5-7]. Whatever may be the speed of the vehicle either it is above the speed limit of the region or below the speed limit of the region the RFID Transmitter just sends the signal about the speed limit in that region. Now consider the vehicle is moving with the speed 80km/hr. Now the transmitter sends the signal about the speed limit of the region to the receiver which is fitted in the vehicle. The RFID receiver in the vehicle receives the signal from the transmitter. Once it receives the signal from the transmitter it transfers the signal to the micro controller Atmega 328. The micro controller which is fed with the default program first send the signal to the LCD about the speed limit region and the LCD displays the speed limit in that region. Within the fraction of seconds the micro controller turns the servo motor which is coupled with the secondary throttle of the engine. Depending upon the speed in that region micro controller turns the servo motor to particular degree. Once the servo is rotated the flow of the air fuel mixture to the inlet is reduced. So automatically the speed of the engine is reduced from 80km/ hr to 40km/hr gradually. Even if you accelerate for higher speed the vehicle will

not run above 40km/hr. For controlling different speeds every procedure remains same but according to the speed the degree of rotation of the servo motor is changed. When the servo rotates 180 degree the engine comes to rest position. Once the signal from the transmitter stops (i.e) the vehicle moves away from that region the servo turn back to the initial position that is 0 degree. And then the vehicle moves with the speed that we accelerate. This project is suitable for all four stroke and two stroke petrol and diesel engines [6].

The fabrication process is carried out in various phases. The systematic fabrication of the attachment is explained below: A frame is made to hold the engine in the correct position. The frame is made of ordinary iron material and welded to form to act as a stand for engine. A Teflon pipe is made and one end of the pipe is connected to the carburettor of the engine and the other end is connected to the inlet valve of the engine. In the center of the Teflon pipe a secondary throttle is made and servo motor is coupled here. It is made in such a manner that the movement of the servo motor opens and closes the throttle valve and limits the air fuel mixture entering into the engine. Fig 9 shows the fabrication work done on the engine to make the secondary throttle valve.

**ADVANTAGES:**

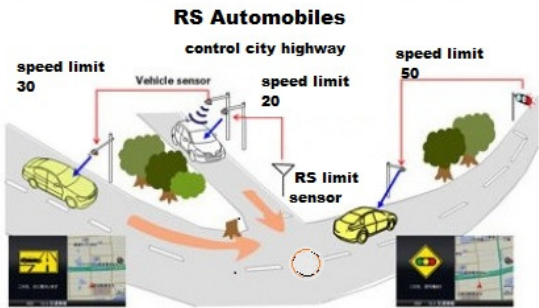
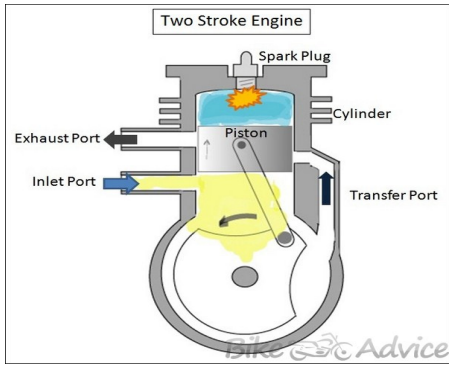
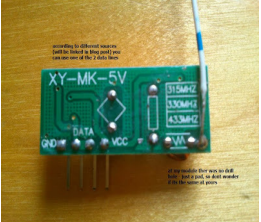
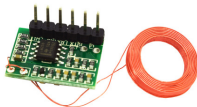
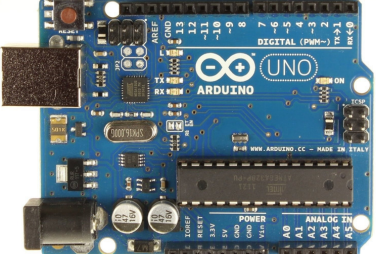

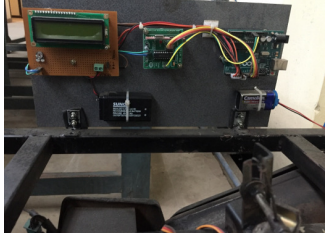
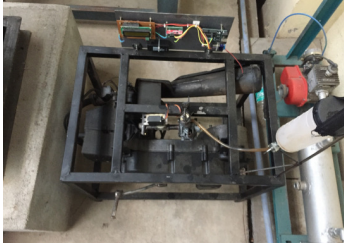
Reduces the human effort to control the traffic. Reduces the road accident due to speed driving. Act as a driving assistant for the driver in speed limit region. Won't allow the driver to break the traffic rules.

**LIMITATIONS:**

The speed can only be controlled only to a particular limit of the region.

**CONCLUSION:**

As we all know in today's world the population is growing day by day and we all know how difficult it is to control the traffic in these days. We don't enough man power for doing all these things manually. And the death rate of people due to road accidents increases day by day. Hence if this system is implemented in every vehicle the death rate due to road accidents will definitely be decreased. And no man power is required to supervise the speed of the vehicle in the speed limit region. With certain small modification, every vehicle can implement this system.

 <p><b>RS Automobiles</b> control city highway speed limit 30 Vehicle sensor speed limit 20 RS limit sensor speed limit 50</p>	 <p><b>Two Stroke Engine</b> Spark Plug Cylinder Piston Exhaust Port Inlet Port Transfer Port</p>
<p>Fig.1 RSA system diagrammatic representation</p>	<p>Fig.2 two stroke engines</p>
	
<p>Fig.3 RFID transmitter.</p>	<p>Fig.4 RFID receiver</p>
	
<p>Fig.5 micro controller atmega 328</p>	<p>Fig.6 servo motor</p>
	
<p>Fig.7 electronic setup</p>	<p>Fig.8 Full setup</p>

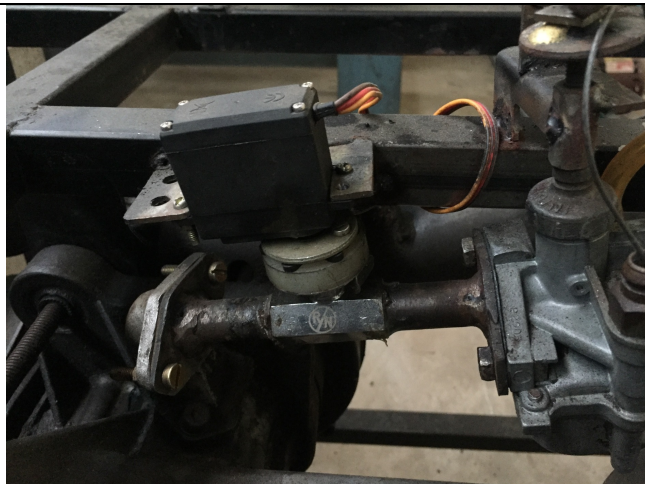
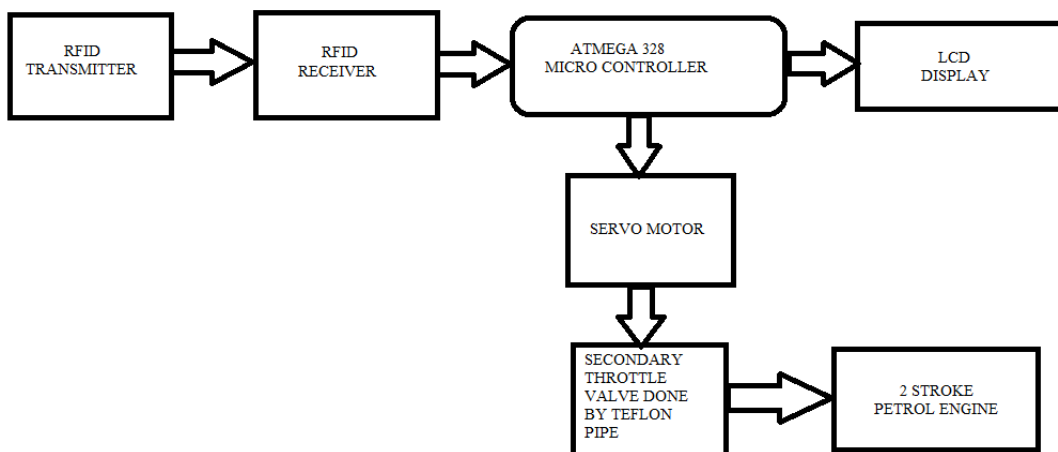


Fig.9 Fabrication work done on the engine for making secondary throttle valve



10. Basic Diagram

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