A REVIEW ON HYDROXY PRODUCTION A MILEAGE BOOSTER FOR TWO-WHEELER

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ABSTRACT

This project's main objective is to show that hydrogen has the potential to be marketed as a fuel enhancer. This project's main goal is to convert a motorcycle running on gasoline to run on hydrogen as an addition and burn fuel more efficiently. The ultimate objective is to fuel the car using renewable hydrogen generated in the country. Hydrogen as a byproduct of an electrolysis process, which uses inexpensive electricity, can be used to produce renewable hydrogen.The air intake valve receives the hydrogen that has been created. It now mixes with the fuel mixture made of air and enters the engine's combustion chamber. Fuel usage is decreased because the hydrogen helps the fuel burn completely. The engine's fuel efficiency rises with the decreased fuel use.The exhaust gases include a higher concentration of oxygen than carbon dioxide. This technique also makes it possible to use fewer fossil fuels and lessen environmental damage.

Key words: *HHO Generator, Bubbler, Sodium hydroxide flakes, Battery*

1.INTRODUCTION

In India and China, the average yearly growth rate of energy consumption and the gross domestic product has been substantially higher than global averages. Our goal with this research is to lessen greenhouse gas emissions and, in turn, the carbon footprint that each engine leaves behind. The inability of hydrogen to be stored economically has resulted in the creation of hydrogen on demand. This project's main objective is to show how a car with hydrogen

enhancements that uses an on-demand HHO generator could be commercialized. The air-fuel mixture combines with hydrogen, speeding up the rate of burning. The engine air intake provides the combustible hydrogen. A 150cc bike is equipped with the completed HHO generator, which is powered by an external battery supply. Water is electrolyzed into its constituent base molecules—two hydrogen and one oxygen—by an HHO gas generator. The hydrogen-oxygen gas mixture that is created is filtered using a water bubbler. HO GENERATOR Individual cells are assembled and the steel plates are fastened together with the use of nylon screws. Plate-washer-plate-nuts is how the plates are arranged. The connecting plates link the plates to the external screw—through which the electric charge is transferred—and serve to maintain the integrity of the complete setup.The plates remain in contact with the Teflon cap when this screw is inserted through it.

Whole plates are covered and stored inside an acrylic tube. The tube is closed on both sides with a Teflon cap using an m-seal. The electric charge is supplied to the generator and the hydrogen produced is supplied to the bubbler for the filtration process. The HHO generator circuit is set up. Sodium hydroxide was added to the generator. When it was connected to a 12V battery, the electrolysis process began. The produced hydrogen is passed through a water filter. The resulting gas confirmed that it was hydrogen and a pop was heard as it burned.

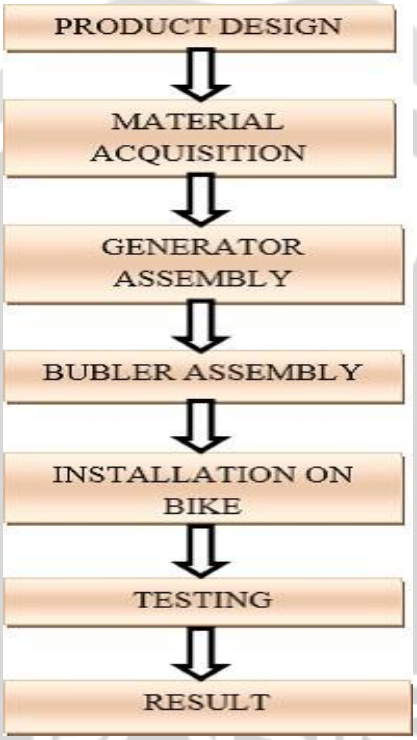

Figure 1. Project Methodology

Table 1. Equipment Used

S.No	List of Components
1.	Two-wheeler
2.	HHO Generator
3.	Bubbler
4.	Battery
5.	Connecting wires
6.	Connecting tubes

Table 2. Two Wheeler Specification

Parameter	Value
Displacement	147.5cc
Maximum power	12bhp@7000rpm
Maximum torque	10.5Nm@6000rpm
No. of cylinders	1
No. of gears	5
Ground clearance	155mm
Fuel tank capacity	12L

Figure 3. Steel plates, screws, washers and nuts

The steel sheet was cut in basic engineering lab as per the following dimensions:Big plates: 152x75mm
Small plates: 152x38mm
Connecting plates: 152x25mm, 101x25mm, 82x25mm.

Figure 4. Finished generator product

2. BUBBLER

To do it, the upper and lower parts of an 80 mm long and 25 mm diameter acrylic tube are closed with a PVC cap. It has entrances and outlets. A quarter of the bubbler is filled with water. A small tube goes into the bubbler through the suction hole, which must be soaked in water. As a result, hydrogen enters the water and forms bubbles. This gas is passed through the outlet of the bubbler. [4] Hydrogen is introduced into the combustion chamber by making a hole in the carburetor and forcing it through the bubble tube.

3. BATTERY

12 V 35 amps is used as a power source for the generator. The plus and minus poles of the battery are connected to the ends of the generators with connecting cables, so that when they come into contact, current is directed to the plates and electrolysis of water takes place. As a result, water molecules split into two hydrogen molecules and one oxygen molecule. The hydrogen production process can vary depending on the energy source used. More bubbles were observed when testing with a more powerful battery.

Figure 5. Bubbler

4.CONNECTING WIRES

Two wires of 1 meter long are used. One end of both the wires is inserted and fixed onto a connector pins. These wires helps in transporting the current to the generator.

II. Stepwise Progress

Stage A- Required acrylic tube of 101mm diameter and stainless steel plate of 304mmx609mm was bought.

The steel sheet was cut in basic engineering lab as per the following dimensions:
Big plates: 152x75mm
Small plates: 152x38mm
Connecting plates: 152x25mm, 101x25mm, 82x25mm.
Required nylon screw, washers and nuts bought. The acrylic tube was cut at 177.8mm long using a hacksaw blade sodium hydroxide flakes used as catalyst was acquired.

Figure 6. Sodium hydroxide flakes

Stage B

The plates are drilled to push the screw through them. The plates are arranged to form the electrodes. They are arranged like plates-washers-plates-nuts. Nylon screws are used to hold the boards together. Metal nuts are used to evenly lay the tiles. Distilled water and catalytic sodium hydroxide are mixed. The whole generator is installed.

Figure 7. Holes being punched on metal sheets

Stage C

The gap between the acrylic tube and the Teflon cap is closed with an m-seal. The generator was tested and the production of hydrogen confirmed. The generator was attached to the bike and the rest of the tests were done.

Figure 8. Equipment fixed on bike (Full view)

Figure 9. Equipment fixed on bike

5.TESTING & RESULT

A. Test to Do

As the name of our project says "MILEAGE BOOSTER", our ultimate goal is to show an increase in mileage. To prove this, it is not enough to produce hydrogen itself, it must be applied to a working engine and the result obtained. In addition, hydrogen production must be demonstrated. Hydrogen is checked by chip test.

B. Major Tests

Mileage test before and after hydrogen application. Emission test before and after using hydrogen. The emission test is done to reduce pollution by using hydrogen as an additive.The generator was originally made by putting PVC caps on both ends and filling the gap with silicone gel. It did not seem like a good choice because the caps were loose and under high pressure a hydrogen leak could be possible and dangerous. Therefore, these PVC caps were replaced with Teflon caps, which maintained an intact position and did not leak. As the last step, the caps of the tubes were fixed with m-seal. When the generator was first tested with a low-power battery, hydrogen production proved fatal. As a result, the number of plates in the generator was changed, some plates had to be removed, and then a powerful battery was installed. It showed excellent performance in hydrogen production.

A.Splint Test

This experiment confirmed the production of hydrogen. Here, when power was applied to the generator, you could observe the formation of bubbles inside the bubbler. Hydrogen is a highly flammable gas and explodes on contact with a flame. To perform the experiment, the outlet of the bubbler was immersed in a small cap filled with water. Bubbles were observed in it, soon after burning there was a sudden explosion which gave a pop sound because hydrogen is explosive in nature. This confirmed the presence of hydrogen.

B. Mileage Test

The bike used to test this project is a TVS Fiero FX model from 2003. Kilometers were ridden on different terrains. The distance traveled per liter of petrol was observed and entered into a table and a mileage reading was obtained. This test was done before and after the addition of hydrogen.

A. Emission Test

The emission test is done to show the pollution level of the vehicles. With this, we can prove that adding hydrogen as an additive not only increases the mileage, but also reduces the pollution level of the vehicles. Two tests were performed before and after the addition of hydrogen.

4. FUTURE ENHANCEMENT

- This system could be more compact by reducing the number and size of the plates.
- If the plates are smaller, a smaller booster battery can be used.
- A compact arrangement is sufficient for a two-wheeled vehicle.
- The configuration according to the initial calculation is suitable for a four-wheeled vehicle.
- More efficient addition of catalyst increases the production.
- The amount of greenhouse gas emissions can be reduced.
- Reduces the consumption of fossil fuels.

6. CONCLUSIONS

The hydrogen producing cells were prepared and placed appropriately. The generator was then immersed in an alkaline solution of distilled water and sodium hydroxide (NaOH). As a current was passed through the system, it was observed that the water molecules began to split into hydrogen and oxygen gas. It was then tested in a hydrogen loading experiment. After approval, the entire alternator was installed on the test bike and mileage and emissions tests were performed.It was found that emissions were marginally reduced and mileage increased. In addition, this project helped to understand the production process of hydroxy gas and the operation of hydrogen fuel cells. We can conclude that adding hydrogen as a fuel additive reduces the pollution level of vehicles and can be suitable for mass production.

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