

To Reduce and Minimize Air & Noise Pollution for I.C. Engine with using Aqua Silencer

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Abstract— In recent scenario, there are many types of silencer. And they makes more noise as well as more air pollution, So we are working on the reducing and minimizing the noise and air pollution by using Aqua Silencer. An Aqua silencer I an attempt in good direction, it is mainly dealing with control of emission and noise. An Aqua silencer is fitted to the exhaust pipe of engine. Sound produced in atmosphere. This mainly because of small sprockets in water molecular, which lowers its amplitude thus, lowers the sound level. Because of this property water is used in thus silencer and hence its name Aqua silencer. This noise and smoke level is considerable then the convent silencer, it is cheaper and easy to install.

Keywords: Silencer, Noise Reduction, Pollution Control

I. INTRODUCTION

Silencer is the component utilized to suppress the operation of the engine emission exhaust and much more utilized in all the Automotive and industrial engine application. The process to reduce sound level is performed by silencer form the invention time of it. The metallic cylindrical structure having circular cross section involving the pipes and some chambers to reduce the turbulence of the exhaust gases are the main geometrical structure of silencer. Silencers are also termed as mufflers. Pollutants coming out form the engine are CO, CO₂, SO₂, NO_x and unburnt, Hydrocarbons which caused major effect on the human body and environment as well. One other the attempt to perform the task of establish the aqua silencer setup is reduce the greenhouse gases which draw major contribution to global warming.

Basic interest to modify the basic structure of normal silencer into the aqua silencer is to suppress the sound level and also to control the pollutants level extracting from the engine. Pollutants coming out form the engine are CO, CO₂, SO₂, NO_x and unburnt Hydrocarbons which caused major effect on the human body and environment as well. One other the attempt to perform the task of establish the aqua silencer

II. HISTORICAL PERSPECTIVE - EARLY STEPS

In the early older days many researchers have been made on the aqua silencers design perspective using several different mediums such as using of micro perforated plates, nano-tubes, mufflers, scrubber tanks and hydrocarbon absorbers etc. To reduce noise level and pollution level as well. But it was never successfully made for the cars, it was always limitedly used for the heavy engines used in the industry running on diesel fuel. Also after many inventions it was made working for the tractors etc heavy duty vehicles but still it was not possible for the moving or say propelling vehicle, it was only possible for the steady vehicle not for a propelling vehicle .Also after several attempts it was made possible for

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IV. PROBLEM DEFINITION

- All the available silencers for automobile application only have the ability to reduce the noise of exhaust gases or only the pollution but no one had the ability of doing both together simultaneously.
- Automobiles are the machine which is widely used for agricultural purpose, and the emitted gases liberated from it affect the atmosphere as well as the crops so to prevent it we have designed this project.
- Many innovation for this were made for heavy diesel engines used in industries with the usage of scrubbers.
- Later on even new styled aqua silencers were designed for the 2-Wheelers but that also were only applicable in steady position
- Finally our project is a solution to the automobile which will reduce the noise as well pollution on a considerable extend.

V. RESEARCH OBJECTIVE

- To use the most efficient and affordable assembly at a same time.
- To decrease the sound of exhaust by a sufficient extent to reduce the noise pollution.
- To reduce the air pollution as well, up to a certain considerable level by purifying the emission gases through the exhaust.
- To fabricate aqua silencer suitable for the automobile vehicles, public transport vehicles, tractors etc.

VI. MODIFIED DESIGN OF AQUA SILENCER

A. Working

The input here is given by the exhaust of a silencer of an automobile vehicles from the exhaust the emitted gas is transmitted to the first chamber of the system there it is passed through a number of perforated tubes where the carbon is separated from the emitted gasses in an considerable amount by getting dispersed. Left content along with the emitted gasses is delivered to the second chamber where it mixed up with the activated charcoal and gets further filtered and then it mixed with the mixture of lime and water. And finally it released to the atmosphere with the less amount of polluted gasses and low amount of carbon in it. Here the entire assembly is mounted with the help of flanges and joints and the system casing is built up of the galvanized and stainless steel material with the perforated tubes inside it.

B. Fabrication Process

For the purpose of mounting this silencer the perforated pipes are placed on a specific distance according to requirement and then the chamber is covered with the galvanized sheet. Then this chamber is connected with the another chamber with the help of flanges and joints in which the mixture of activated charcoal and lime water is mixed for the further refining of the emitted gasses and it is connected with the first chamber by the means of welds and joints.

Components required the inbuilt pneumatic jack systems

- Perforated tube
- Activated charcoal
- Flanges
- lime water
- Fabricated chambers

1) Perforated Tube

It is used for the purification of the carbon by spreading the same and lowering its content in the exhaust gasses.

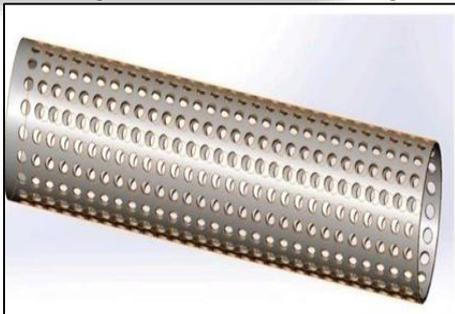


Fig. 2.1: Perforated tube

2) Activated Charcoal

It is used here in the second chamber in the powdered form in order to absorb impurities and harmful gasses from the gas from the first chamber.



Fig. 2.2: Activated charcoal

3) Flanges

These are one type of tight leak proof joints used to connect two pipes of same or different diameter for the transmission of gases through them. (It may be oval, ellipse or even square shaped it varies as per model year).



Fig. 2.3: Flanges

4) Lime Water

It is a liquid which is filled in the second chamber along with the activated charcoal and water which is used for the further purification of exhaust gasses.

5) Fabricated Chamber

These are made from the collaborations of small attachments of perforated tubes, lime water, activated charcoal used for the refining of the exhaust gasses from the tractor silencer. With a covering of thin galvanized and stainless sheet on them. These tubes and water mixture hold a considerable amount of carbon in to them and emit the rest with lowering the amount of harmful gasses and carbon content further to the atmosphere.



Fig. 2.5.2: Fabricated chamber



Fig. 2.5.2: Fabricated chamber

6) Ball Valves

These are operating mechanism which controls the passage of water from the chamber for its replacement purpose after a considerable time period.



Fig. 2.6: Ball valve

7) Connectors

It is a joining device used to connect the ball valves with the frame of the chamber.



Fig. 2.7: Connector



Fig. 2.8: U-bent

8) U-Bents

These are also a kind of connector pipes which connect two of the chambers vertically or horizontally as per requirement which a fixed bending angle.

VII. IMPLIFICATION FOR FINAL DESIGN

Following figure shows the final model of our project



Fig. 3: Fabricated model

VIII. CONCLUDING REMARKS

In this dissertation work, the prototype made for the attempt to reduce the noise levels and the pollution level both considerable at a great level simultaneously is achieved satisfactory. The results are concluded as follows:

- 1) This aqua silencer can efficiently change the result in a great loss in noise and air pollution.
- 2) The material is used for its manufacturing are low in cost and the manufacturing is efficient.
- 3) It can directly be replaced by the regular silencer at the time of manufacturing it will result in further reduction in cost.
- 4) This innovation would helps the atmosphere by cancellation of noise and air pollution. Use of accurate materials and better manufacturing skills gives us better results.

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