

Aqua Silencer-A possible solution for reducing engine emission and IC Engine

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Abstract - In this fast growing world with technologies we face problems like Global Warming, various types of Pollution etc. These causes adverse effects on environment as well as human health, the main reason behind this is "Air pollution". There are many sources of air pollution but a major source is emission from vehicles, if we could control the emission we will be able to reduce the pollution. So to reduce the pollution we are going to use aqua silencer. Aqua silencer is used to replace conventional silencer, the paper debriefs the various effects of aqua silencer which is more efficient than the conventional silencer also it reduces the noise and control air as well as noise pollution.

Key Words: Emissions, Aqua Silencer, Pollution, Engine

1.INTRODUCTION

We all know that the automobile industry plays a major role in causing air pollution, so for reducing air as well as noise pollution we are using Aqua Silencer. The exhaust gases released from engine are carbon monoxide (CO), carbon dioxide (CO₂), Nitrous Oxide (NO_x), Sulphur Dioxide (SO₂), Unburnt Hydrocarbons (UBHC). These toxic gases are very harmful for environment, human health. Aqua Silencer is used to control these emissions and also reduces its harmful effects with the help of activated charcoal, lime water and water.

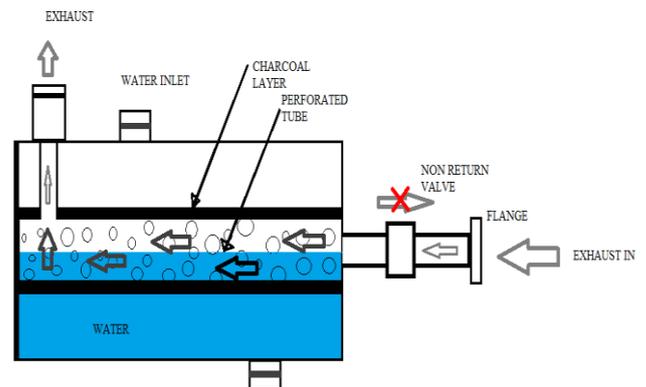
1.1 What is Aqua Silencer?

Basically an aqua silencer consists of a perforated tube which is installed at the end of the exhaust pipe.

The perforated tube has different diameters. Purpose of providing different diameter hole is to break up gas mass to form smaller gas bubbles.

Generally 4 sets of holes are drilled on the perforated tube. The other end of the perforated tube is closed by plug. Around the circumference of the perforated tube a layer of activated charcoal is provided and further a metallic mesh covers it.

The whole unit is then placed in a water container.



A small opening is at the top of the container to remove the exhaust gases & a drain plug is provided at the bottom of the container for periodically cleaning of container.

Also a filler plug is mounted at the top of the container. At the inlet of the exhaust pipe a non-return valve is provided which prevents the back flow of gases and water as well.

- ❑ As the exhaust gases enter into the **Aqua silencer**, the perforated tube converts high mass bubbles in low mass bubbles after that they pass through charcoal layer which again purify the gases.
- ❑ It is highly porous and posses extra free valences so it has high absorption capacity.
- ❑ After passing over the charcoal layer some of the gases may dissolve into the water and finally the exhaust gases escape through the opening in to the atmosphere.
- ❑ Hence aqua silencer reduces noise and pollution.

2. Literature Survey

1.Keval.I.Patel et. al. worked on 2 stroke petrol engine to reduce emission and noise level with the help of aqua silencer. According to them perforated tube which is installed at the end of pipe may have holes of different diameter. The very purpose of providing different diameter holes is to breakup gas mass to form smaller gas bubbles due to the perforated tube back pressure is reduced and noise is also reduced. According to them, the sound and emission can also be controlled more than the conventional silencer, especially he tested carbon test and he found that carbon monoxide (which is very harmful for human health) is reduced 60%-70% compared to ordinary silencer.[1]

2.Prem Sankar R. worked on single cylinder four stroke diesel engine to reduce the pollutants and noise level with the help of aqua silencer. They have fabricated and tested aqua silencer, they have used activated carbon(charcoal) and lime water to reduce the pollution and water to reduce the noise. When the toxic gases dissolve in water, they form acids, carbonates so lime water is used to absorb these gases, also they tested a aqua silencer using lime water and they found that the temperature will be decreased inside the silencer. According to them, the fuel consumption using Aqua Silencer is same as the conventional silencer and more effective than the conventional silencer.[2]

3.Ranjith Krishna P.T. et. al. worked on CI engine to reduce the emission of toxic gases with the help of aqua silencer, they have used water and charcoal layer with the help of perforated tube assembly due to high absorption capacity the charcoal layer (activated carbon) is used to control the emission of toxic gases. Water is used to reduce the noise level because the amplitude of sound is lower in water than atmosphere. On the basis of PUC testing they have concluded that aqua silencer reduces emission more than conventional silencer. [3]

4.Mankhair Ajay. B worked on aqua silencer and he used Titanium Nanotubes as well as charcoal layer because charcoal layer needs to be replaced every three year. Nanotubes consist of manganese, this manganese traps exhaust gases and separates hydrogen molecules. The Ruthenium sensor is a chemical sensor which is used to indicate the condition of water. It acts as a transducer and transmits the signal to control unit.

The control unit is given an electric supply of 12V. The Ruthenium sensor is then activated. Now a signal is transmitted. The exhaust gases now enter the water tub. Water tub reduces noise and toxins from gases get dissolved. Nanotubes are used for regeneration from hydrogen molecules. This silencer controls water and air pollution, it also reduces unwanted vibrations when the vehicle is in steady state.[4]

3. CONCLUSIONS

As the exhaust gases releasing into the atmosphere, it is causing air pollution to a significant amount. So to counter this problem a new device called Aqua Silencer is introduced. We have observed from various tests, the amount of toxic gases like CO,NOx,SO2,UBHC,etc can be reduced as well as noise is also reduced using Aqua silencer. So we can conclude that , aqua silencer is more efficient than conventional silencer.

4. REFERENCES

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