Research Paper Technology

# Developement and Experimental Test for Aqua Silencer for air Pollution Control for Diesel Engine


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**ABSTRACT**

Air pollution is most important from the public health point of view and It's contribute heavily to contamination of our environment so it is imperative that serious attempts should be made to conserve earth's environment from degradation. An Aqua silencer is mainly dealing with control of emission and noise.An aqua silencer is fitted to the exhaust pipe of engine. Sound produced under water is less hear able than it produced in atmosphere. This mainly because of small sprockets in water molecules, which lowers its amplitude thus, lowers the sound level. Because of this property water is used in this silencer and hence its name AQUA SILENCER. The noise and smoke level is considerable less than the conventional silencer, it is cheaper, no need of catalytic converter and easy to install.

**KEYWORDS** Aqua Silencer, PUC Test, HSU %

## INTRODUCTION

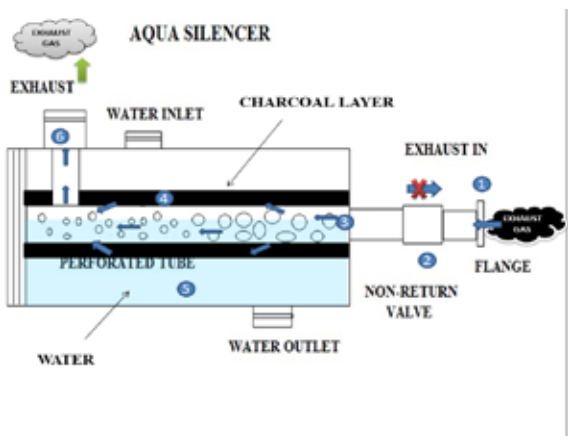



**Figure 1: Working Layout of Aqua Silencer**

Basically an aqua silencer consists of a perforated tube which is installed at theend of the exhaust pipe. The perforated tube may have holes of different diameters. The verypurpose of providing different diameter hole is to break up gas mass to form smaller gasbubbles the perforated tube of different diameter.Generally 4 sets of holesare 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 isprovided and further a metallic mesh covers it. The whole unit is then placed in a watercontainer. A small opening is provided at the Top of the container to remove the exhaust gasesand a drain plug is provided at the bottom of the container for periodically cleaning of thecontainer. Also a filler plug is mounted at the top of the container. At the inlet of the exhaustpipe a non-return valve is provided which prevents the back flow of gases and water as well.

## NEED OF AQUA SILENCER

An aqua silencer is used to control the noise and emission in ic engines. The reason why we go for aqua silencer is, in today life the air pollution causes physical ill effects to the human beings and also the environment. The main contribution of the air pollution is i.c. engine releasing the gases like carbon dioxide, unburned hydrocarbons etc. In order to avoid this type of gases by introducing this aqua silencer. It is fitted to the exhaust pipe of the engine,Sound produced under water is less hearable than it produced in atmosphere. This mainly because of small sprockets in water molecules, which lowers its amplitude thus, lowers the sound level. The emission can be controlled by using the activated charcoal layer and it is highly porous and posses extra free valences so it has high absorption capacity. So absorb the gases from the engine and release much less position to the environment.The noise and smoke level is considerable less than the conventional silencer, no need of catalytic converter and easy to install.

## EXPERIMENTAL TEST AND RESULTS ON THE DIESEL ENGINE

1. Experiments on the Truck Engine Silencer




**Figure 2: PUC Report for Truck without Joint Aqua Silencer**




**Figure 3: PUC Report for Truck with Use of Aqua silencer**

Figure 2 show that the pollution under control reports for the TATA Truck models no 1613 and vehicle no is DD 03 H 9551 without Joint Aqua Silencer and Figure 3 with the Use of Aqua Silencer. Here we have seen that the total amount of pollution which producing by the truck. Here we clearly seen that the HSU % at different RPM.

**2.Experiments on the Car Engine Silencer**




**Figure 4: PUC Report of Car (Diesel Engine) Silencer**

Figure 4 show that the pollution under control reports for the Chevrolet Model Tavera and motor vehicle No GJ 16 AP 7346 without joint Aqua Silencer and Figure 5 with the use of Aqua Silencer. Here we have seen that the total amount of pollution which producing by the car. Here we clearly seen that the HSU % at different RPM.




**Figure 5: PUC Report on car with Aqua silencer**

From the Experimental tested PUC Repot, It is clearly seen that the HSU% is reduced by applying the "Aqua Silencer". PUC Repots of Truck and Car We have to analyze that when Aqua silencer is used around 3% to 4% of hazardous gasses is reduced.

**MERITS**

- Reduce Air Pollution.
- Start the engine easy.
- Control emission and noise in greater level.
- Carbon is precipitated.
- No vibration when the engine is running.

**DEMERITS**

- Frequent water filling is required.
- Silencer weight is more comparing to conventional silencer.
- Cost of activated charcoal is more

**CONCLUSION**

We have Conclude from the experimental test on tata truck and Chevrolet tavera car in that the hazardous gases have been reduced. With the help of PUC report the HSU% is Reduce up to 3% to 4%, it can reduce particular gases only in single equipment'sand also we conclude that the noise can reduced by this equipment's.

**FUTURE WORK**

- Size of Aqua silencer can be reduce by select different parameters
- Aqua silencer can be try for Petrol engine
- Improve the results by using another material
- Work on Simulation Side on Aqua silencer
- Standard Design of Aqua silencer

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