

FABRICATION OF VEHICLE EMISSION CONTROL USING AQUA EXHUAUST SYSTEM

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Abstract—Emissions released from the vehicles mixes with atmospheric air causing air to be polluted leading to global warming and other health hazards. The pollution mainly occurs due to contribution of (CO), UBHC, (No) and Lead to the atmospheric air as vehicle emissions leading to more hazardous effect living beings as they inhale poisonous gases. Rather than emission that has been given out from any vehicle there are several other causes as emissions from electric power generating stations domestic fuel consumption other industrial process that occurs. A method of controlling the emissions using three different diameter tubes that are being drilled with holes of varying diameters arranged sequentially and distilled water is used here and termed as Aqua exhaust system. This system mainly deals with the reduction in the release of harmful gases to the atmosphere. The noise level can be decreased when the gases are made to pass through water. Here the exhaust gases are given directly to the aqua silencer removing the catalytic converter placed as single unit.

Keywords— Three tubes drilled with different diameter, Distilled water, Carbon monoxide, Nitrogen oxide, Hydrocarbons, Air pollution

1. INTRODUCTION

Today s world is full of automobile, electrical and electronic components. The waste gases produced by these components makes the atmosphere toxic as they produce gases which are toxic in nature. We are in a critical condition to rectify these disorders and clean the atmosphere. To do this we have to make a research over those gases and take steps to reduce these from atmosphere. The following gases are released during the operation of IC engines causes air pollution. They are Nitrogen oxides, carbon monoxides, hydrocarbons and compounds of sulfur and lead. Most of the toxic substance goes into the atmosphere due to incomplete combustion of fuel and during acceleration of engine with the exhaust gases. An Aqua Exhaust System is deals with it for the reduction of the toxic gases that are mitted to atmosphere. The reason why we go for aqua exhaust system 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 through automobile releasing the gases like carbon dioxide and Hydrocarbon. In order to avoid this type of gases Aqua exhaust system was introduced. They are fitted to the exhaust pipe of the engine, and ore given to tank containing distilled water. Sound produced under water is less hearable than it produced in atmosphere. The noise and smoke level is considerable less than the conventional silencer. In this silencer, the distilled Water is used so it is called Aqua exhaust system

2. PROBLEM IDENTIFICATON AND SOLVING

In ordinary vehicle emission control system we are using catalytic converter, filter and muffler etc. We can reduce the emission to a certain extent as the emission causes air pollution. By the usage of our silencer the CO, No, HC

emission can be made less than conventional or ordinary silencer.

3. COMPONENTS AND DESCRIPTION

TUBES OF DIFFERENT DIAMETRIC HOLES

The holes are being drilled on the tubes are of diameter as 8, 9, 11mm because the engine exhaust manifold diameter is same and 12 inch long as per the design and made from the stainless steel because it has high melting point 15100 The hole diameter varies along the length of the tube in increasing order. The holes are distributed in uniform manner. One end of the tube is connected to exhaust pipe of the engine where as other end is closed



fig2: Tubes drilled with holes of different diameter

The pipes are being drilled with holes of different diameter according the given length of tube. They are being arranged systematically according to pipe diameter. They

are arranged one above another as opposing direction for the given length.



fig3: Inner tube arrangement

The figure represents the following arrangements that are being done on the given silencer. They are being covered or welded on one side and the open side is the inlet for the exhaust gas entrance to the silencer. They are being covered by an outer shell and opening is provided on the shell as the gas comes out through the valve opening.



fig3: Outer shell arrangement

4. RESERVOIR TANK

The tank is being provided on the other side of the silencer. The exhaust gas after treating with the silencer arrangement comes in contact with the distilled water. The tank is being filled with distilled water. The outlet of the silencer is taken and given to the inlet of the reservoir tank. Suitable baffles are provided which will encourage through scrubbing of the exhaust gas. The baffles also prevent entry of water into the silencer to a considerable extent

5. METHADODOLOGY

The following methodology introduced in our project is as follows:

- Development of three tubes of varying diameters arranged sequentially that are being drilled with the holes of different diameters.
- They are covered by an outer shell.

- Reservoir tank arrangement is made for the required fabrication process.

Assemblage of the given silencer and tank arrangement as outlet from silencer is given as inlet to tank.

6. WORKING PRINCIPLE

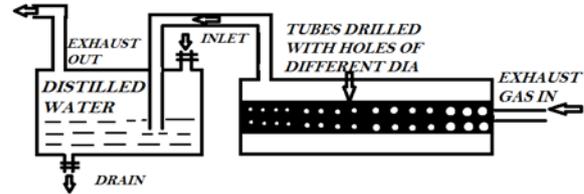


fig5: Block diagram

The exhaust gas enters the silencer as that they consist of three tubes of varying diameters. The tubes are being arranged one above another according to the diameter tubes are drilled with holes of different diameters. The exhaust gas enters the varying pipe arrangements in the silencer through inner pipe and they circulates inside and are given to the second pipe as the flow of gas occurs through the different diametric holes and the gas comes out through the pipes as they are covered by outer shell. The carbon deposits along the surface of the given pipes as they are passed through holes of different diameters. Then the gas are passed to the reservoir tank through the given exhaust valve opening of the silencer. The reservoir tank is filled with distilled water. The exhaust gas are then made to pass through the distilled water. When the exhaust gases are passed through the distilled water the oxides of nitrogen and sulfur are being precipitated. Then the gases are being given to the atmosphere that was made less toxic by using

7. AQUA EXHAUST SYSTEM.

ADVANTAGES

- CO is reduced 60 to 70 % compared to ordinary silencer.
- Low cost Reduce air pollution
- Control of emission and noise
- No vibration during running

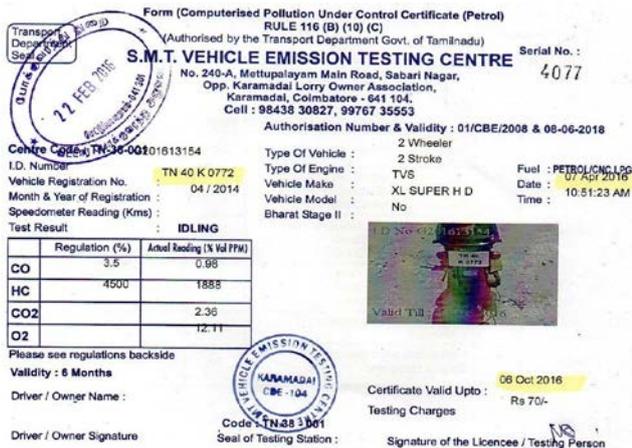
8. EXPERIMENTAL RESULT

Emission testing without Aqua Silencer system

Regulation (%)	Actual Reading (N m l / FFm)
CO	3.58
HC	2.560
CO2	2.59
O2	12.11

Fig6: Test without aqua silencer

Emission testing using Aqua Silencer system



Form (Computerised Pollution Under Control Certificate (Petrol))
 RULE 116 (B) (19) (C)
 (Authorised by the Transport Department Govt. of Tamilnadu)
S.M.T. VEHICLE EMISSION TESTING CENTRE Serial No.: 4077
 No. 249-A, Muttupalayam Main Road, Sabari Nagar,
 Opp. Karamadai Lorry Owner Association,
 Karamadai, Coimbatore - 641 104,
 Cell : 98438 30827, 99767 35553
 Authorisation Number & Validity : 01/CBE/2008 & 08-06-2018

Centre Code: TN36-00101613154
 I.D. Number :
 Vehicle Registration No. : **TN 40 K 0772**
 Month & Year of Registration : 04 / 2014
 Speedometer Reading (Kms) :
 Test Result : **IDLING**

	Regulation (%)	Actual Reading (% Vol PPM)
CO	3.5	0.98
HC	4500	1888
CO2		2.36
O2		12.11

Please see regulations backside
 Validity : 6 Months
 Driver / Owner Name :
 Driver / Owner Signature :
 Seal of Testing Station :
 Certificate Valid Upto : 08 Oct 2016
 Testing Charges : Rs 70/-
 Signature of the Licencee / Testing Person :

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9. CONCLUSION

This system can be applicable in industries where smokes and particulates are generated in very high amounts. As the gas is treated with distilled water the particulates settle down at the bottom of the tank. Depending upon the presence of a toxic gas, changes can be brought in the Aqua Exhaust system.

On the basis on pollution test, with and without Aqua silencer we found our project to have sufficiently reduced harmful gases from the engine exhaust and also some other gases. Oxygen and carbon dioxide are water dissoluble gases. Whereas the carbon monoxide is harmful and tests has shown most reduction of carbon monoxide from exhaust gases. The water level in the tank can be reduced as when the gas enters the tank and mixes with water, hence vapourise it. When the water content in the tank is low .they can be treated /replaced periodically. There will be considerable decrease in toxicity at output as the gas released to the atmosphere.

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