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PERFORMANCE OF MAGNETIC FUEL INDUCTION TECHNOLOGY TO REDUCE THE EXHAUST EMISSION

T. Varun Kumar, S. Balaji, K. Mohan Babu and K. Hari Gautham
P. A. College of Engineering and Technology, Pollachi, India
E-Mail: ercrazyvarun@gmail.com

ABSTRACT

Automobiles are the basic necessary part in our day today life, while they have made transport easy and convenient from one place to other. Nowadays, due to the toxic emissions and an increased risk of accidents they have also made human life more complicated and vulnerable. Emission is the major cause of air pollution and this paper states about the emission in automobile sector. When analyzing the emission in automobiles, they have the major application of air pollution and it creates many major harmful diseases. To control the automobile emission system here we use the Magnetic fuel induction technology to detect and control the emission. Finally this article also review about new emerging technology i.e. fuel induction Technology and developments done across the various areas.

Keywords: magnetic fuel induction technology (MFIT), emission, catalytic convertor.

INTRODUCTION

Over the last decades in India, there has been a tremendous increase in the usage of automobiles and the increase in number of automobiles industries also. Even though the transport sectors a plays private role in the development of any country, it brings an unavoidable environmental issue along with transportation. Day by day the production, marketing and sales of the automobiles are being increased it also creates the pollution to the environment.

According to the statistics the Indian automobile industry has sold 40, 80, 950 lacks of automobiles in India. In automobiles heavy motor vehicles and railway engines produce large amount of exhaust, these exhaust directly affect the environment by the means of the air pollution due to this pollution ozone layer gets depleted. Already there are several problems arises, due to ozone layer depletion in various parts of the country. If this problem is not concentrated this may lead to ozone layer depletion in our country also. Increase in fuel economy leads to decrease in fuel wastage and make use of waste energy into useful one. By this action we can develop our economy as well as environment without damaging our environment.

MAJOR COMPONENTS EXHAUSTED EMISSION

Due to incomplete combustion in the engine, there are a number of combustion products like hydrocarbons (HC), Carbon monoxide (CO), Nitrogen oxides (NOx), etc. Emissions of many air pollutants have been shown to have variety of negative effects on public health and the natural environment.

Hydrocarbons are a class of burned or partially burned of fuel, and they are a major contributor to smog, which can be a major problem in urban areas. Prolonged exposure to hydrocarbons contributes to asthma, liver disease, lung disease, and cancer. Nitrogen oxides are generated when nitrogen in the air reacts with oxygen at the high temperature and pressure inside the engine; they are the precursors to the formation of ozone. They also contribute to the formation of acid rain. It destroys resistance to respiratory infection. NOx production is increased when an engine runs at its most efficient (i.e. hottest) part of the cycle. It gives damages to lung tissues and reduction in lung function.

Carbon monoxide is a colorless, odorless gas. As automobile emission controls have improved in recent years, carbon monoxide emissions in western countries have decreased.

However, a rapid increase in industrialization and in the number of automobiles in rapidly developing countries like China and India have resulted in increased carbon monoxide emissions in those countries.CO is the product of incomplete combustion of fuel, it also reduces the blood's ability to carry oxygen and due to overexposure (carbon monoxide poisoning) may be fatal also particularly dangerous to person with heart disease.

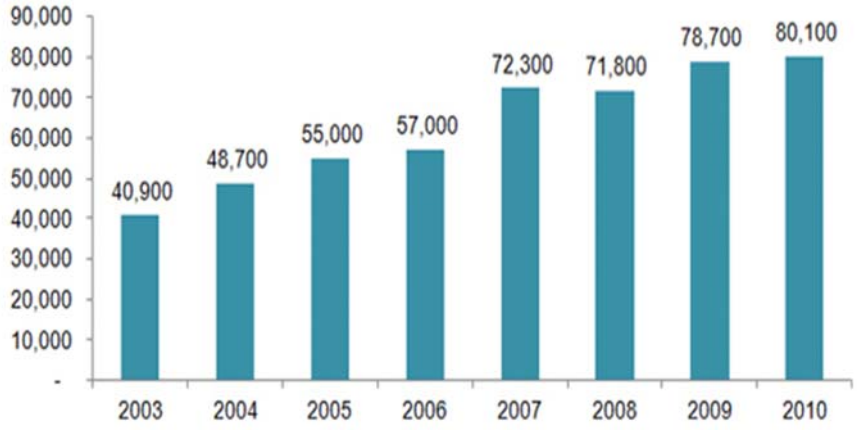

Figure-1. Non fire carbon monoxide incidents by year wise.

ADVERSE HEALTH EFFECTS OF CARBON MONOXIDE

The adverse health effects of carbon monoxide associated with exposure to ambient and indoor concentrations that are related to concentration of COHb in the blood is shown in the (Table-1). Health effects observed may include early onset of cardiovascular disease, reduces the oxygen delivery to the organs of our body, Vision problem and behavioral impairment, decreased exercise performance of young healthy men, reduced birth weight etc. Also reduces the ability to work, Causes asthma and it may leads to death .These carbon monoxides majorly affect the children's because the children's spend their major time by playing in the outdoor environment. These gases are dissolved in the environmental air. It affects the youngsters working hard in the street and road sides.

Table-1. General signs and symptoms associated with carbon monoxide exposure.

S. No.	CO in atmosphere (ppm)	COHb in blood (%)	Signs and symptoms
01	10	2	Asymptomatic
02	70	10	No appreciable effect, except shortness of breath on vigorous exertion; possible tightness across the forehead; dilation of Cutaneous blood vessels.
03	120	20	Shortness of breath on moderate exertion; occasional headache with throbbing in temples
04	220	30	Decide headache; irritable; easily fatigued; judgment disturbed; possible dizziness; dimness of vision.
05	350 - 520	40 - 50	Headache, confusion; collapse; fainting on exertion
06	800 - 1220	60 - 70	Unconsciousness; intermittent convulsion; respiratory failure, death if exposure is long continued
07	1950	80	Rapidly fatal

Source: Winter and Miller (1976), Ellenhorn and Barceloux, 1998 (Ref. 1)

VEHICLE EXHAUSTS DETECTION TECHNOLOGY

Everyone agrees that the amount of pollution produced by motor vehicles should be reduced. In order to encourage this pollution issues, governments have introduced tougher exhaust gas emission legislation. The most popular method used by vehicle manufacturers is the three-way catalyst. This device converts the main pollutants in the exhaust gas to reduce the harmful gasses. However, the three-way catalyst only works efficiently if the air-fuel ratio and can be kept within very tight limits. The oxygen sensor is typically situated in the exhaust pipe just before the three-way catalyst. The central element of the oxygen sensor is exposed to the exhaust gas. By using oxygen sensors which take output from the engines exhaust port and gives feed back to the engine control unit to function the engine properly. This vehicle exhausts detection technology is the method used to detect the emission from the exhaust by using the computers sensors. New technology is adopted to detect the total amount of pollutant emissions from the vehicles which is achieved by real time network monitoring after long running of engines the conditions of automobiles will change emissions like carbon monoxide, hydro carbons and nitrous oxide will be doubled. So the test can be conducted by the carrying the same engines with different load conditions at rated speed at different load applications. The below Figure-2 shows the oxygen sensor of three way catalyst converter.

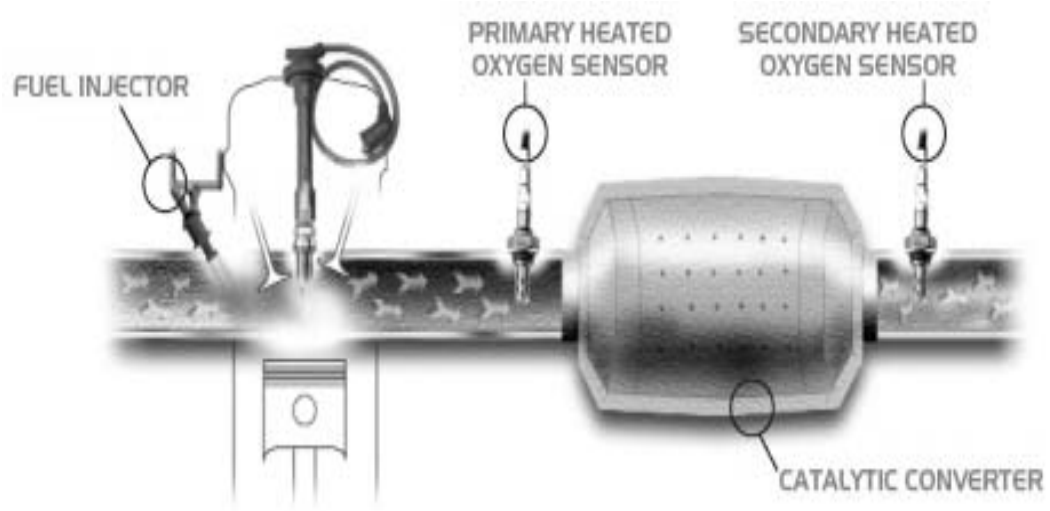

Figure-2. Oxygen sensor for three way catalyst converter.

Problems raised by catalytic converter

In older days we have used a different technique to convert exhaust air into useful gas. In those methods catalytic convertors are the one of the main progress to reduce the emission. Here we can identify the numerous problems arising due to the catalytic convertors and the major problems raised by them are the usage of long running time. This catalytic convertor gets spoiled and they have to be replaced by new catalytic convertors such as here nickel is used as the catalytic convertors when these convertors are spoiled we don't have knowledge about them and convertors starts to produce the new harmful gas. The below Figure-3 shows the defects of the catalytic converter that occurred due to long running time.

Figure-3. Honeycomb cores of catalytic converters.

MAGNETIC FUEL INDUCTION TECHNOLOGY

Magnetic Fuel Induction Technology is a system which is used to combust the hydrocarbon properly. This system consist of two permanent magnets which is

inserted near the fuel passage, where it separates the hydrocarbons and it makes the fuel to burn properly. There it reduces the pollution by the process of complete combustion. In this MFIT system the fuel atomization takes place properly by placing permanent magnets around the fuel inline passages and near to the combustion chamber. This technology enhances combustion process and gives lower emission and improved mileage. The principle of this system is when the hydrocarbon cluster is introduced in the magnetic field the bonds will break into the hydrocarbons and it completely mixes with oxygen, therefore proper combustion takes place to reduce the fuel consumption greatly by 10% and it also reduces the emission. The main function is it reduces the carbon settlement in IC engines and there is no need to maintain regularly.

The fuel line is surrounded by one pole and the air passage line is on another pole which gives higher engine output, better fuel economy and reduces the emission. Magnetic diameter size is close to the fuel passage lines. The main objective of MFIT is to provide significantly improved molecular excitement and turbulence in a petroleum/diesel engines. So that re-polymerization is more effectively resisted and improved fuel efficiency is achieved. It also significantly achieves improved fuel turbulence that the premature production of sludge is prevented and the fuel is pumped and burned much more cleanly and successfully. It is particularly effective for improving the combustion efficiency of diesel (due to more re- polymerization) fuel. It could be beneficial for use in truck, motor vehicle and marine vessel engines. It is effective for use in virtually all types of internal combustion engines and which is particularly effective for use in high temperature and pressure environments. It achieves a greater molecular turbulence than that of obtained using conventional devices. The Figure-4 shows the schematic view of the MFIT system and the Figure-5 shows the working principles of the MFIT system are shown below.

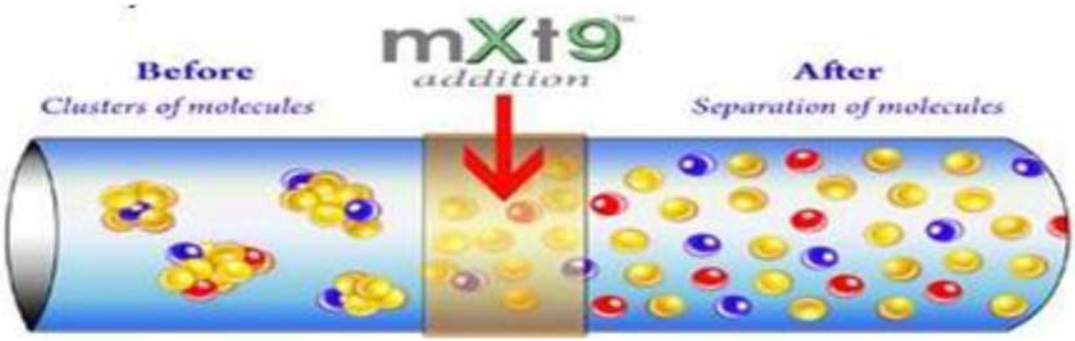

Figure-4. Schematic view of MFIT.

Figure-5. Working principles of MFIT.

ANALYZED RESULTS

After installation of the permanents magnets on the fuel passage the combustion and the fuel economy have been increased. The graph represents the load Vs exhaust emission is shown in figure. Also load Vs brake specific fuel consumption of the vehicle with placing the magnets and without placing the magnets on the diesel engine is shown in the Figure-6. According to the analysis the fuel consumption has been decreased and the exhaust emissions have been decreased because the proper combustion of the fuel had been taken place. The analyzed results have been plotted is shown below.

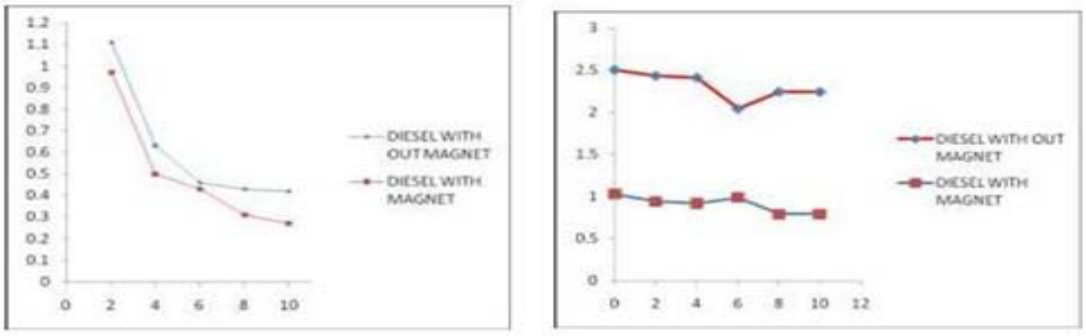

Figure-6. Load (Kg) Vs BSFC (kg/kwhr) and Load (Kg) Vs Exhaust.

CONCLUSIONS

This study introduces a simple low cost catalytic converter to reduce diesel engine exhaust emission. Carbon monoxide is responsible for a large percentage of the accidental poisonings and deaths reported throughout the world each year. Outdoors, concentrations of Carbon monoxide are highest near street intersections, in congested traffic, near exhaust gases from internal combustion engines and industrial sources, and in poorly ventilated areas such as parking garages and tunnels. Such as Indoors, CO concentrations are highest in workplaces or in homes that have faulty or poorly vented combustion appliances. We have put forward some of the methods to improve combustion and decrease emission to decrease the fuel consumption. This may leads to increase in fuel economy. MFIT system is also one the simplest technique to decrease the emission where this system is used to remove the hydrocarbon emission and to reduce the polluted the environment.

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