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Pollution Controlling in Vehicles by Using an Alarm

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Abstract: ***Now a days air pollution is most dangerous thing that causes disease such as lung cancer, tuberculosis etc., The air pollution cannot be controlled totally but it can be controlled partially. Our idea is based on controlling air pollution partially and also to safe the people from polluted air by using our idea. The vehicles should be checked and must be serviced for twice a month. If it is not done the emission from the vehicles pollute the air more. Our idea is to inform the consumers to service their vehicles . To send a message from the respective vehicle companies to the consumers by using GPS tracker.. When the consumer exceeding the particular limit at that time the companies gave a message to the consumers for servicing their vehicles. We set an alarm in the vehicle which is connected to the motor it will create a beep sound continuously when the vehicle is not serviced. After servicing their vehicles the alarm will back to its normal condition. Suppose if they try to off the alarm in a vehicle in wrong manner the vehicle is totally off and they cannot be taken for normal usage. So the people must service their vehicles in a particular time. This idea is an innovative one and it will be implemented by us as soon as possible.***

1. Introduction

Air pollution is one of the serious environmental concern of the urban Asian cities including India where majority of the population is exposed to poor air quality. The health related problems such as respiratory diseases, risk of developing cancers and other serious ailments etc. due to poor air quality are known and well documented. Besides the health affects, air pollution also contributes to tremendous economic losses, especially in the sense of financial resources that are required for giving medical assistance to the affected people. The poor are often the most affected segment of the population as they do not have adequate measures to protect themselves from air pollution.

2. Development of Pollution

The rapid urbanization in India has also resulted in a tremendous increase the number of motor vehicles. The vehicle fleets have even doubled in some cities in the last one decade. This increased mobility, however, come with a high price. As the number of vehicles continues to grow and the consequent congestion increases, vehicles are now becoming the main source of air pollution in urban India. Although, the air quality can be improved through a combination of technical and non-technical measures, legislative reforms, institutional approaches and market-based instruments, there are certain unique challenges which the country has to face in tackling the problem of urban air pollution. These include, the transport features which are different from the developed countries particularly in terms of the types of vehicles commonly used, the manner in which the road network is operated and sharing of the limited space by pedestrians and non-motorized modes with modern vehicles in Indian cities.

Vehicles in India are often much older and usually comprise technologies considered as out-dated in the developed world. The non-technical measures taken include, awareness raising regarding the possible economic and health impacts of air pollution and available measures for improving air quality, increasing use of cleaner fuels and purchase of vehicles with advance emission control devices, increasing institutional framework and capacity building for the monitoring of vehicle emissions. The document presents a review of the vehicular emission problems in Indian cities, the various developments that have taken place in the past including the studies conducted for assessment of the air quality in cities, the legislation and standards adopted for the control of vehicle emissions, the role of the various concerned agencies, the steps taken for improvement in the quality of the automotive fuel, the overall impact of these measures and the future strategy to be adopted for vehicular emission reduction and related issues.

3. Major Vehicle/Fuel Pollutants

Automotive vehicles emit several pollutants depending upon the type of quality of the fuel consumed by them. The release of pollutants from vehicles also include fugitive emissions of the fuel, the source and level of these emissions depending upon the vehicle type, its maintenance etc. The major pollutants released as vehicle/fuel emissions are, carbon monoxide, nitrogen oxides, photochemical oxidants, air toxics namely benzene, aldehydes, 1-3 butadiene, lead, particulate matter, hydrocarbon, oxides of sulphur and polycyclic aromatic hydrocarbons. While the predominant pollutants in petrol/gasoline driven vehicles are hydrocarbons and carbon monoxide, the predominant pollutants from the diesel based vehicles are Oxides of nitrogen and particulates.

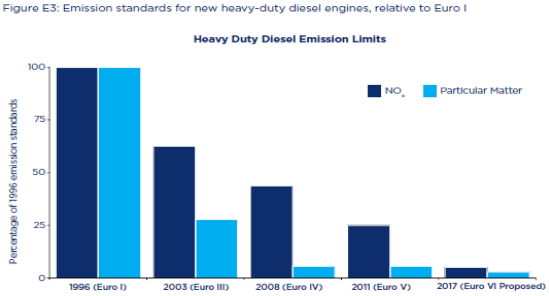

Figure 1: For diesel emission limits

4. Health and environmental effects of vehicular pollutants

General/Overall Effects

The vehicular emissions have damaging effects on both human health and ecology. There is a wide range of adverse health/environmental effects of the pollutants released from vehicles. The effects may be direct as well as in-direct covering right from reduced visibility to cancers and death in some cases of acute exposure of pollutants specially carbon monoxide. These pollutants are believed to directly affect the respiratory and cardiovascular systems. In particular, high levels of Sulphur dioxide and Suspended Particulate Matter are associated with increased mortality, morbidity and impaired pulmonary function.

Carbon Monoxide: Affects the cardio vascular system, exacerbating cardiovascular disease symptoms, particularly angina; may also particularly affect fetuses, sick, anemic and young children, affects nervous system impairing physical coordination, vision and judgments, creating nausea and headaches, reducing productivity and increasing personal discomfort.

Nitrogen Oxides: Increased susceptibility to infections, pulmonary diseases, impairment of lung function and eye, nose and throat irritations.

Sulphur Dioxide: Affect lung function adversely.

Particulate Matter and Respirable Particulate Matter (SPM and RPM):

Fine particulate matter may be toxic in itself or may carry toxic (including carcinogenic) trace substance, and can alter the immune system. Fine particulates penetrate deep into the respiratory system irritating lung tissue and causing long-term disorders.

Lead: Impairs liver and kidney, causes brain damage in children resulting in lower I.Q., hyperactivity and reduced ability to concentrate.

Benzene: Both toxic and carcinogenic. Excessive incidence of leukemia (blood cancer) in high exposure areas.

Hydrocarbons: Potential to cause cancer. These are all the diseases caused by the airpollution.

Fuel consumption in India:

Since the birth of automotives in the 19th century, diesel and gasoline are used as the primary source of energy for the vehicles. As per information available with CIA's World Factbook , 2008, India is one of the top ten oil consuming country in the world. With the oil consumption of 2,438,000 barrels per day, India stands 6th amongst top ten oil consuming countries of the world. Further as per PCRA (Pollution Conservation Research Association) , an average consumption pattern of petroleum products in India is as follows:

Consumption Pattern of Petroleum products in India

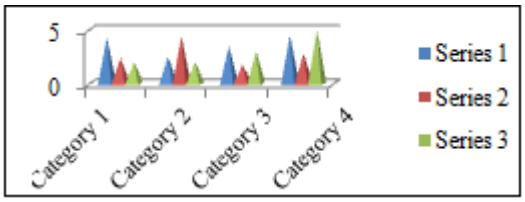

Figure 2: Bar chart for polluted level.

Transport (Petrol, Diesel, CNG, Aviation fuel) =51
Industry (Petrol, Diesel, Fuel oil, Naphtha, Natural Gas) =14
Commercial & other =13
Domestic (LPG & Kerosene= 18
Agriculture (Diesel) =4

Vehicular pollution problems in India:

Motor vehicles have been closely identified with increasing air pollution levels in urban centers of the world (Mage et al, 1996; Mayer 1999) . Besides substantial CO2 emissions, significant quantities of CO, HC, NOx, SPM and other air toxins are emitted from these motor vehicles in the atmosphere, causing serious environmental and health impacts. Like many other parts of the world, air pollution from motor vehicles is one of the most serious and rapidly growing problems in urban centers of India (UNEP/WHO, 1992). The problem of air pollution has assumed serious proportions in some of the major metropolitan cities of India and vehicular emissions have been identified as one of the major contributors in the deteriorating air quality in these urban centers The problem has further been compounded by the concentration of large number of vehicles and comparatively high motor vehicles to population ratios in these cities. Reasons for increasing vehicular pollution problems in urban India are as below :

- High vehicle density in Indian urban centers.
- Older vehicles predominant in vehicle vintage.
- Predominance of private vehicles especially cars and two wheelers, owing to unsatisfactory public transport system, thereby causing higher idling emissions and traffic congestion.
- Absence of adequate land use planning in development of urban areas, thereby causing more vehicle travel and fuel consumption
- Inadequate inspection & maintenance facilities.
- Adulteration of fuel & fuel products
- Improper traffic management system & road conditions
- High levels of pollution at traffic intersections
- Absence of effective mass rapid transport system & intra-city railway networks
- High population exodus to the urban centers.
- Increasing number Skyrocketing buildings in the urban areas causes stagnation of the vehicular emissions to the ground level and unable its proper dispersion.

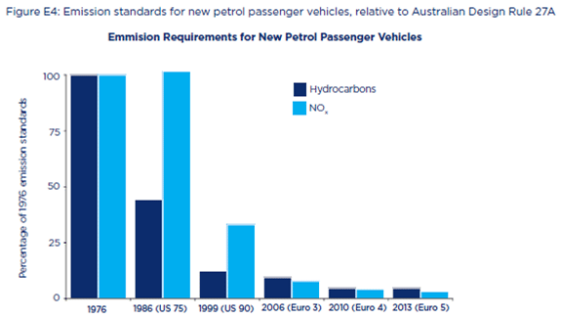

Figure 3: Petrol passengers

5. Existed Method In Air Pollution Control:

- Improvements in Engine Technologies
- Improvement in Fuel Quality
- Improvements made in Gasoline Quality
- Improvements made in Diesel Quality
- Indian Initiative for Alternate Fuels

Improvements in Engine Technologies:
Mass emission norms for vehicles for the first time at manufacturing stage as well as for in-use vehicles have been notified during 1990-91, the manufacturers did not require any major modification for meeting these norms. The emission norms along with fuel quality specifications laid down in 1996 required the automobile manufacturers to make modifications in the engine design particularly in regard to crankcase emission and evaporative emission control. From April, 1995 new passenger cars were allowed to register only if these were fitted with catalytic converters. Emission norms for such cars were tightened by 50% as compared to 1996 norms. All petrol cars manufactured after April 1, 1996 are equipped with positive crankcase ventilation (PCV) system. Retrofitting of in-use pre 1996 petrol cars with PCV system helped to reduce total hydro carbon emissions. Activated charcoal canisters for engines for diurnal soak vent vapor recovery controlled evaporative emissions. Activated charcoal absorbs fuel vapors from fuel tank and carburetor fuel bowl and purges it into the engine. Vehicles manufactured in India after April 01, 1996 has evaporative emission control system. The testing method for passenger cars norms was changed to cold start from hot start from April 01, 1998, which is a strict procedure than previous one. The norms for the year 2000 notified under the Motor Vehicle Rules require major modification in the engine design especially in regard to the fuel injection system in passenger cars and fitment of catalytic converters in 2-stroke engine. These standards are akin to Euro-I norms adopted in the European countries in 1992.

The technologies for vehicle emission control which are achievable withreference to European Union regulations for Combustion Ignition (CI) and Spark Ignition (SI) engines are respectively.

Improvement in Fuel Quality:
Much of the pollution control depends on the quality of the fuel. There are various constituents/parameters in the fuels (Gasoline & Diesel) together contributes towards emissions from the vehicles. There exist code of standards or specifications for the gasoline and diesel to be sold in the market in every country. National or other legally enforceable specifications represent the minimum quality that must be supplied and it is implicit that engine designers should ensure that their vehicleswould run satisfactorily on such a quality of fuel. In India the Bureau of Indian Standards (BIS) notifies the requisite specifications for gasoline and diesel. There are a total of 15 parameters in gasoline specifications out of which 4 are environment related parameters. Similarly, there a total 16 parameters in dieselspecifications, out of which 4 are environment relatedparameters**.**

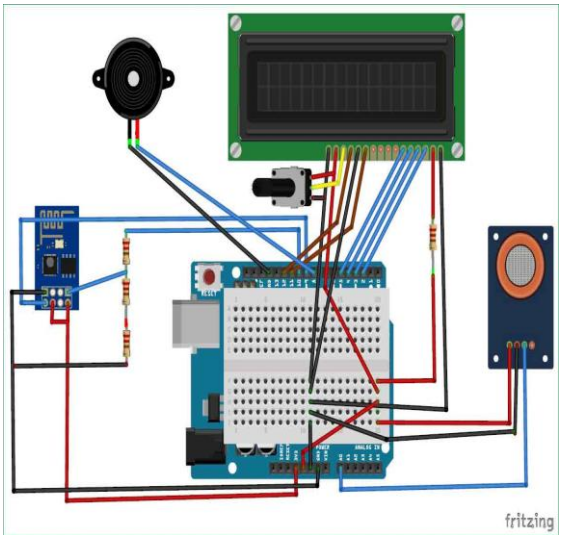

Figure 4: Existed method to control the pollution

Improvements made in Gasoline Quality
Phasing out of lead: the specification of lead in India was 0.56 gm/l max up to 1994. It has been totally phased out and there is no leaded gasolineproduction. India has been totally stopped from February 1, 2000.

Increasing the Octane Number: increase in the octane number (RON – 88 and AKI - 84) has been done with effect from April 1, 2000. This has been achieved through installation of new facilities and change in refinery operations. Premium grade of gasoline with octane number 93 is now supplied in all major cities.

Introduction of benzene content limit: A limit of 3% (vol) max has been introduced in the four mega cities w.e.f April 1, 2000. The content of benzene in the gasoline has been further reduced to 1% w.e.f April 1, 2005 in 11 mega cities states ahead. However, gasoline with 3% benzene content is made available throughout the country from April 01, 2005.

Reduction of sulphur content:The sulphur content in gasoline has been reduced from 0.2 % max to 0.05 % from April 1, 2005 all over the country. Further w.e.f 01.04.2010, the content of sulphur in gasoline is proposed to be reduced to 0.005% (50 mg/kg) from existing 0.015% (150 mg/kg, in 11 mega cities namely Delhi, Mumbai, Kolkata, Chennai, Bangalore, Hyderabad including Secunderabad, Ahemdabad, Pune, Surat, Kanpur & Agra). However, all over the country, content of sulphur in gasoline is proposed to be 0.015% (150 mg/kg) from 01.04.2010.

Improvements made in Diesel Quality:

Increase in Cetane number:Cetane number has been increased from 45 to 48 from April 1, 2000. Presently, diesel with cetane number of 51 is being sold in the 11 mega cities of the country, while for the entire country; diesel with cetane number 48 is being sold from April1, 2005.

Reduction of sulphur content: The sulphur content in diesel has been reduced from 1% max as on April 01, 1996 to 0.25% max. w.e.f. January 1, 2000. The Indian refineries haveinstalled Diesel Hydro-De- Suplhurisation (DHDS) plants for reducing the diesel sulphur content from 0.1% max to 0.25 % max at a total cost of Rs. 5568.31 crores in June 1997. This has enabled supply of diesel with 0.25% sulphur in the entire country from January 2000. In addition, in the 4 metro cities, sulphur content in diesel has been reduced to 0.05 % max. Further the Sulphur content in Diesel is proposed to be reduced further to 0.005 % (50 mg/kg) in the 11 mega cities by 01.04.2010. The amount of sulphur in diesel is proposed to be 0.035% (350 mg/kg) all over the country.

***Improvements in distillation recovery specification*:**
Improvement have been done in the distillation specification of diesel, i.e reduction of distillation recovery to achieve 85% and 95% vol. recovery at 3500◦C and 3700◦C respectively from April 1, 2000 thereby improving the performance and life of diesel engine and emission reduction. With the introduction of euro equivalent vehicle technology, the refineries also have upgraded their technology to supply commensurate fuel in the market.

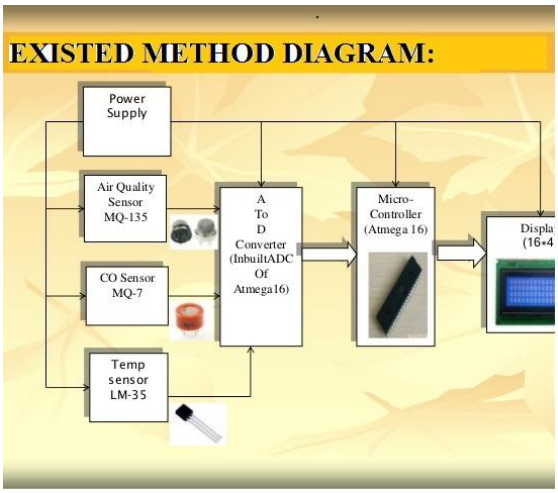

Figure 5: existed method

Initiative for Alternate Fuels:
The selection of alternate fuels depends on the load of emission to be allowed, the technology available and the cost of system to be developed. A system thatfulfills the legislative requirements and can be sold at the lowest price is to be generally accepted. The Alternate fuels have to meet the following criteria:1. Technical Acceptability 2. Economically Competitiveness 3. Environmentally acceptability 4. Safety and Availability. The important fuel that are considered as meeting the above criteria include Natural Gas (CNG/LNG), Propane (LPG), Ethanol, Methanol, Diesel, Electric fuel, Hydrogen, Di-methyl Ether(DME), P-series, Fuel Cell and Solar fuels. Indian Government has taken various initiatives time to time for the development and promotion of cleaner alternative to conventional automotive fuels i.e. diesel and gasoline.Based on technical acceptability, economically competitive, environmentally acceptable and safety & availability criteria, several alternative fuels have been considered form time to time all over the world as low cost substitutes for gasoline and diesel. The coming paragraph describes details on the status of development and implementation of various alternative cleaner fuels in India.

Liquefied Petroleum Gas (LPG):
LPG is a by-product of natural gas processing or a product that comes from crude oil refining and is composed primarily of propane and butane with smaller amounts of propylene and butylenes. Liquefied petroleum gas (LPG) consists mainly of propane, propylene, butane, and butylene in various mixtures. Lower carbon-to-hydrogen ratio, higher octane rating and its ability to form a homogeneous mixture inside the combustion chamber enable it to produce lesser emissions compared to conventional fuels.

Ethanol:
Ethanol has high octane and relatively clean combustion characteristics. The presence of oxygen in ethanol facilitates combustion reducing CO and HC emissions. Ethanol is a safe replacement for toxic octane enhancers in gasoline such as benzene, toluene and xylene. While the calorific value of ethanol is lower than that of gasoline by 40% it makes up a part byincreased efficiency. So far its use as100% fuel is concerned it has no problem in designing an engine to run on only ethanol.

6. Proposed Method

Our idea is to reduce the air pollution from the vehicles. Because the vehicles emitting gas is highly dangerous to our human beings and environment. In this idea using methods are sensing, tracking, indication and communication. First the vehicle is made by GPS tracker is connected to the speedometer and the alarm is connected to the motor. The vehicle is monitored by the company persons through this process. Normally the vehicle emitting the gas its not a problem. If the vehicle exceeding the permissible limit that only create a problem. The vehicle exceeds a particular kilometer like 5000-7000 means the vehicle must be serviced. But only few peoples are service their vehicles properly so we implement our idea in this place the bike or any other vehicle reached the particular kilometer the GPS tracker is attached to the speedometer. Using this tracker it send a message to the service company. The company send a message to the customers before they reached their particular limit. That means if the vehicle reached the 4500 kilometer the service company gave a message to the person bring the vehicle for servicing . When the person use the message and service their vehicle is no problem. If they ignored the message means the vehicle reaches the 5000kilometer our alarm automatically gives the alarm sound. The alarm sound creates a nuisances to us and our neighbors. If they try to off the alarm in a wrong manner means the vehicle is totally off because the alarm is connected to the motor.

So the person must service their vehicle then only the alarm will off. Otherwise the vehicle continuously give the alarm sound. We servicing the vehicle periodically means the emitting gas contain some dangerous particle is removed from the emission. Using this method we control the pollution from the good manner. This idea is implemented in future days by us. Oil changed in the vehicle means it temporarily control the pollution.

7. Advantages

- Free from pollution
- Efficient
- Economically less
- Reliable one

8. Conclusion

Using this idea we have to control the emitted dangerous gas from the vehicle in a good manner. This idea is implemented in a the bike the pollution rate is reduced to the lowest level. In the idea is eco friendly and free from side effects also. Pollution control in this types of methods in 1.futureFuel Quality -2.Premixed Oil Dispensers 3.Measures to Prevent Adulteration of Fuels. Future using this methods we develop this idea and implemented by us.