The world is on the energy crisis. The limited fossil fuel sources are unable to provide for the fuel in the future demand. This associated with increasing price of fossil fuels and the awareness of the impacts of environmental pollution and global warming, has forced search for an alternative source of energy and their using techniques, which is renewable, simple, safe and non-polluting.

Generally the emissions like CO, HC, CO\textsubscript{2} particulate matters and smoke are emissions from the exhaust gas of engines. Among the emissions, the HC and CO are more toxic in nature which contributes to air pollution.

The combustion reaction in the internal combustion engine depends on many different variables, one of the most important factors in an efficient combustion reaction is the ability of the reactants, the fuel molecules and the oxidant molecules, to interact with each other. Most fuels used in internal combustion engines are in liquid state, like gasoline, diesel, biofuels, and since combustion occurs in the gas phase, achieving a substantially even dispersion of fuel molecules among oxidant molecules can prove difficult due to the vapor pressure of the liquid. Therefore, an efficient combustion reaction would involve providing for the fuel molecules to be substantially and evenly dispersed throughout the oxidant molecules, thereby allowing sufficient interactions between the reactants and promoting the combustion reaction.

Conventional systems and methods attempt to remedy this problem by increasing the quantity of gas phase fuel molecules by increasing the temperature of the liquid fuel to increase the vapor pressure. The present invention has been developed in response to the present state and in particular, in response to the problems and needs that have not yet been fully solved by currently available conventional systems. Hence we have designed a
new fuel supply system where the petrol/biodiesels (having low viscosity) is atomized using the ultrasonic sounds and allowing it to pass through the convective pre-heater where the atomized fuel is converted in to the vapor form (gaseous form) using the exhaust gases from the outlet valve of the engine, which are at the sufficient temperatures to vaporize the bio-diesels and study of these system behavior by using bio-diesel as alternative fuel in the vapor form in the present petrol engine and to check the emission like CO, HC from the exhaust gasses of petrol engine with a 4-s petrol engine. The project’s goal is to develop specific knowledge as to whether these methods will increase the efficiency and oil is an acceptable supplemental fuel.

INTRODUCTION

It is quite common nowadays to learn that every country is in the race to find suitable and affordable alternative fuel options for diesel engine as the present-day diesel fuel reserve is depleting fast. Even though the petrol vehicles are more in population, The research of alternative fuel for petrol (SI) Engines are very less. In addition, the price of conventional petrol fuel is sky rocketing due to great demand, exponential increase of vehicles number on road and political turmoil. Therefore, it is an urgent need for India as well to search for an option to run Petrol engine using a fuel other than conventional and petroleum fuels.

Research work on biodiesel reveals that large number of experimental studies of biodiesel, derived from various feed stocks, as fuel for engines used for transportation and or other applications have been carried out all over the world. Application of biodiesel, as a fuel in transportation vehicles, has nowadays become common in almost all oil importing nations. But when we compare population of the domestic vehicles (petrol vehicles) with transportation vehicles (Diesel vehicles), the Population of the domestic vehicles is more hence we have to concentrate and find alternative fuel for petrol vehicles also.

Controlling operational parameters considered to be practically attractive techniques for reducing the level of CO in SI engine, because it involve minimum additional cost and maintenance. A survey of the literature tells us that that the air-fuel ratio is the important parameter which affects the level of CO emission in a spark ignition engine, while other studies show that ignition timing has an appreciable influence on the level of CO emission and on the onset of knock. Today, usually fossil fuels are used for fuel production. The reserves of these fossil-based fuels are being rapidly depleted. Besides that, when these fuels are used in the internal combustion engines, they produce air pollutants such as CO, HC, and particulate matter. Alternative sources of energy are needed in order to replace the non-renewable resources and also improve air quality. There are many investigations on increasing the engine performance and decreasing the concentration of toxic Components in combustion products by using non-petroleum, renewable, sustainable and non-polluting fuels. The high octane ratings and greater heat of evaporation values of alcohols such as ethanol, methanol make them appropriate fuels for high CR engines with high powers. High octane values can permit significant increases in CR. High heats of evaporation cool down the incoming fuel–air charge and make it denser to promote the power output. The fuels which have high the auto-ignition temperature are ignited at higher temperatures.

The auto-ignition temperatures of alcohols are higher of gasoline, which make it safer for transportation and storage. The heat of evaporation of alcohol is 3 to 5 times higher than that of gasoline, which makes the temperature of the intake manifold lower, and increases the
volumetric efficiency. The laminar flame speed of methanol is significantly higher than those of most of the hydrocarbon fuels. High laminar flame speed increases thermal efficiency by completing the combustion earlier which decreases heat losses from the cylinder. Methanol exhaust contains lower concentrations of particulate matters than gasoline exhaust. The molecule of methanol has an oxygen atom that makes the gasoline-methanol blends more oxygenated. Which leads to better combustion of the fuel and decreases carbon monoxide and hydrocarbon emissions. Methanol is an alternative fuel and can be produced from natural gas, biomass, and coal and also municipal solid wastes and sewage. Several studies have been conducted on the use of methanol and methanol-gasoline blends as fuel in the SI (Spark Ignition) engines. These results showed that there was an increase in engine thermal efficiency and decrease in CO emissions when pure ethanol and pure methanol fuels were used and the effects of these fuels on engine performance and exhaust emissions.

We know that the combustion reaction in the internal combustion engine depends on many different variables, one of the most important factors in an efficient combustion reaction is the ability of the reactants, the fuel molecules and the oxidant molecules, to interact with each other, Most fuels used in internal combustion engines are in liquid state, like gasoline, diesel, bio-fuels, and since combustion occurs in the gas phase, achieving a substantially even dispersion of Bio-fuel molecules among oxidant molecules can prove difficult due to the vapor pressure of the liquid. Therefore, an efficient combustion reaction would involve providing for the Bio-fuel molecules to be substantially and evenly dispersed throughout the oxidant molecules, thereby allowing sufficient interactions between the reactants and promoting the combustion reaction. Conventional systems and methods attempt to remedy this problem by increasing the quantity of gas phase fuel molecules by increasing the temperature of the liquid fuel to increase the vapor pressure.

The present invention has been developed in response to the present state and in particular, in response to the problems and needs that have not yet been fully solved by currently available conventional systems. Hence we have developed a special system where the use of bio-fuel in gasified form using convective heat exchanger which works as the heat recovering system. This system pre-atomize the Bio-fuel molecules and they are heated to 200-300°c from engine exhaust gases and they are vaporized and these gases are sent to inlet of the engine.

Here we are using Bio-fuels as 100% Turmeric Leaf oil and blends of Methanol, Turmeric leaf oil with petrol in specially designed system fitted with Hero Honda splendor( +) 100 cc bike. When we come to turmeric leaf oil, Turmeric leaf oil has various chemical compounds that include phellandrene, limonene, zingiberene, curcumene, turmerone, turmerone, turmerone and cineole. It is natural antiseptic, aphrodisiac, analgesic, anti-arthritis, anti-inflammatory, anti-oxidant, anti-tumoral, bactericidal, diuretic, hypotensive, insecticidal, laxative, rubefacient and digestive stimulant. Turmeric leaf essential oil is viewed as a strong relaxant and balancer. It also has historical applications as an antiseptic and for skin care use against acne and facial hair in women. It has a great role in flavorings for food additives.

It is one of the most important colouring materials of India. The leaf oil yield the orange-red dye. It is much used to impart a yellow colour to cloth. When we come to Methanol, Methanol can be made from a wide array of feedstocks, making it one of the most flexible chemical commodities and energy sources available today. To make methanol, you need first to
create synthesis gas, which has carbon monoxide and hydrogen gas as its main components.

While natural gas is most often used in the global economy, methanol has the distinct advantage of 'polygeneration' - whereby methanol can be made from any resource that can be converted first into synthesis gas. Through gasification, synthesis gas can be produced from anything that is or ever was a plant. This includes biomass, agricultural and timber waste, solid municipal waste, and a number of other feedstock.

In a typical plant, methanol production is carried out in two steps. The first step is to convert the feedstock natural gas into a synthesis gas stream consisting of CO, CO2, H2O and hydrogen. This is usually accomplished by the catalytic reforming of feed gas and steam. Partial oxidation is another possible route. The second step is the catalytic synthesis of methanol from the synthesis gas. Each of these steps can be carried out in a number of ways and various technologies offer a spectrum of possibilities which may be most suitable for any desired application.

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