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Comparitive Study on Alternative Fuels Petrol-LPG

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ABSTRACT: In our project we use alternative fuel in two stroke engine to increase the efficiency. Our fore most aim in selecting this project is to use non conventional fuel against conventional fuel which is becoming scarce and costly now days. With this air is less polluted than conventional fuels. It is also good with regard to economical considerations and engine efficiency. In our project, we have installed LPG fuel system to two stroke vehicle where in we can use both gasoline and LPG. The alternations made to install LPG in the vehicle are discussed. For lower speeds LPG suitable for vehicle and gasoline is suitable for the higher speed operations. So, these combinations of fuel supply will be suitable for city traffic conditions, where mostly the mode of operation is low speed. Using this concept we can control our expenditure in buying of fuels.

KEYWORDS: dual fuel bike, (LPG), two-stroke spark ignition engine, cylinder.

I. INTRODUCTION

In the automobile field now the fuel used is known as petrol and fuel oil (Diesel). Petrol is a volatile fuel which is used in spark ignition engines and fuel oil which is used in compression ignition engine. Basically both the fuels petrol and diesel is obtained from the crude oil (I.e. petroleum). Now the problem is, its availability is decreasing day by day in bulk and insufficient for future decades. Hence an alternative fuel is essential to fight against scarcity. In term of long sight some alternative fuels are suggested and experimented by various manufacturing units with technicians, such alternative fuels are Methyl alcohol, Compressed Natural gas (CNG), Liquefied Petroleum gas (LPG), In this project we have installed LPG as alternative fuel in two stroke Gasoline engine.

II. OBJECTIVE

The main aim is

- To enhance the performance of the two stroke fuel engine.
- To reduce exhaust emissions
- To reduce the cost of buying fuels.
- To compare the results of both fuels (petrol & LPG).
- To help environment in best way .

III. WORKING

To get the system working, we put the LPG cylinder into a box, and fitted it on the rear side of bike. The LPG converter was fixed under the fuel tank, right side of the bike. The inlet gas pipe is connected to inlet of the carburetor through vaporizer, and a vacuum pipe is connected to the inlet manifold of cylinder. We can use one fuel (gasoline & LPG) at a time mostly gasoline used for high speeds whereas LPG used for low speeds. When motorcycle is running in gasoline and if we need to switch over to LPG means we should dry the petrol in fuel tank completely and switch on gas regulator. For LPG to gasoline simply we need to switch off gas connection and on the gasoline connection.

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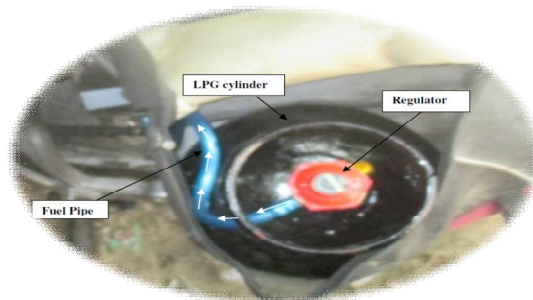


Fig 1 LPG cylinder connection with gas regulator

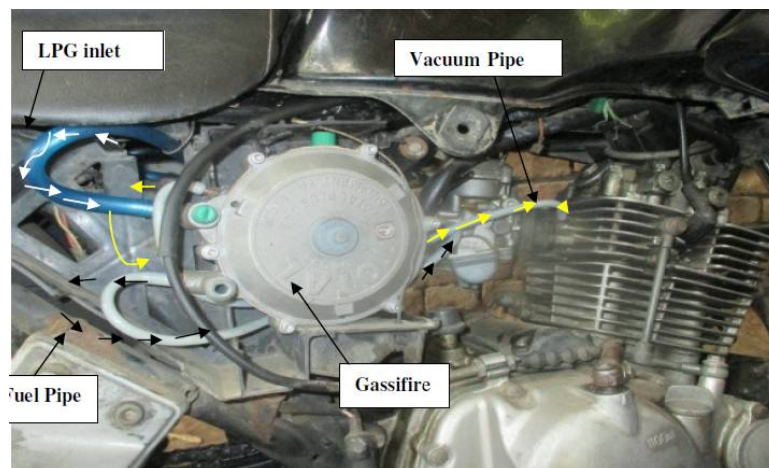


Fig 2 vaporizer to carburetor assembly

IV. PERFORMANCE TEST

PETROL- for 100 ml of fuel it gives 6 km millage

Therefore fuel consumption =12.28g/km

LPG - for 6 km it utilizes 130 gms of fuel

Therefore fuel consumption=21.67g/km

V. EMISSION TEST

To test amount of CO , HC , CO₂ , O₂ in the exhaust of vehicle using both the fuels. On an energy basis LPG has a lower carbon content than gasoline or diesel fuel. When used in spark-ignition engines, LPG produces near-zero particulate emissions, very little CO and moderate HC emissions. Variations in the concentration of different hydrocarbons in LPG can affect the species composition and reactivity of HC exhaust emissions. CO₂ emissions typically are also somewhat lower than those for gasoline due to the lower carbon-energy ratio and the higher octane quality of LPG. NO_x emissions are similar to those from gasoline vehicles. The higher CR of an engine, the more efficient is the engine and more is the power generated with given amount of the fuel.

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HARMFUL GASES	REGULATION %	ACTUAL READING (% VOL PPM)
CO	3.5	2.06
HC		2180
CO ₂	6000	1.21
O ₂		15.52

TABLE 1 EMISSION TEST ON PETROL

HARMFUL GASES	REGULATION %	ACTUAL READING (% VOL PPM)
CO	3.5	1.44
HC		1360
CO ₂	6000	1.21
O ₂		15.52

TABLE 2 EMISSION TEST ON LPG

VI. CONCLUSION

- Mass of fuel consumption for LPG is relatively high as compared to Petrol at different higher power outputs
- CO emissions are very low and quite constant at various power outputs as compared to Petrol.
- HC emission increases with power output but are relatively lower than petrol emissions.
- NO_x is higher or almost similar for LPG when compared with Gasoline at higher power output.
- CO₂ emissions are similar for both LPG and petrol but LPG emissions decreases if power output increases.

The above project is to minimize overall running cost of the Bike and making it useful for daily use by reducing its cost. Also we can to reduce the Harmful Emissions and decrease the danger of ozone depletion by utilizing a clean fuel in our bike engine.

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