

RESEARCH PROPOSAL SAMPLE

EFFECT OF ALTERNATIVE FUELS ON ENGINE PERFORMANCE

ABSTRACT

The research document contains a study on the effect of alternative fuels on engine performance. Also, it will be guided by objectives; cost effectiveness and combustion performance of alternative fuels in an engine. Research questions are administered. Engine holders from various companies will be required to provide needed information in the form of oral or written form of a questionnaire. Actually, for validity and reliability, a pilot survey will be carried out. The estimate sample size to be used in the field is 20 engine companies from different parts of the world.

PROBLEM STATEMENT

For an engine to function, it requires fuel to run it. For instance, there are two engine designs which include internal combustion engine and an external combustion engine. For an engine to operate, it requires an oxidizer (usually air) to assist in fuel combustion which takes place in a chamber. In fact, high-pressure levels and high-temperature levels produced in combustion chamber apply force directly to the engine component. This force is vital in transforming chemical energy into mechanical energy which is essential for engine operation. However, fuel, on the other hand, has become a hazard in our environment due to emissions. Precisely, some fuels such as; petroleum products and diesel release smog containing toxic products, for example, carbon II oxide and unburnt hydrocarbons. They contain tiny air molecules hence incomplete combustion takes place. Also, the air supply is required for combustion to play the role of an oxidizing agent. For example, oxygen molecules oxidize carbon II oxide to carbon IV oxide which is a necessity in ecology.

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As a matter of fact, carbon IV oxide is needed by the plants for photosynthesis or just the process by which plants make their food. Therefore, it has reached to a critical situation where scientific inventions are highly required to come up with fuel that is free from pollution. There are other fuels such as ethanol, methanol, and electricity whose use has not popularized in a technology world. Hence, a research process will be required to determine the efficiency of the alternative fuels on ecological cycles.

CHAPTER ONE

1.0. Objective

1.1. Overall objective

The overall motive of this study is to determine the effect of alternative fuels on engine performance.

1.2. Specific objective

- i. To investigate the cost-effectiveness of alternative fuels.
- ii. To determine combustion performance of alternative fuels on an engine.

CHAPTER TWO

LITERATURE REVIEW

2.0. Introduction.

Alternative fuels are derived from resources unlike other fuels derived from petroleum. Moreover, some of these alternative fuels are produced domestically and they reduce chances of importing petroleum. Some of these fuels include; Ethanol, biodiesel, Natural gas, propane, electricity among others. To illustrate, ethanol is derived from corn and it's well known to be favorable to the environment. However, these fuels cannot be used solely. Actually, they have to be blended with gasoline for them to undergo combustion. Some of fortune 500 companies that have a special interest in engines are now trying to build electric hybrid vehicles. To illustrate, these companies include; Toyota Prius, Chevrolet volt among others. However, use of alternative fuels has not discouraged petroleum product to be in market. This is because; the companies are trying to integrate use of these fuels with the traditional petroleum.

2.1. Combustion performance of alternative fuels on engine.

Alternative fuels have a quality burning power compared to traditional used petroleum. This is because they contain air molecules which play the role of oxidizing agent.

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In fact, these fuels are highly supplied with oxygen. During the process of combustion in the heat engine by traditional petroleum, a lot of carbon II oxide and unburnt hydrocarbons is produced. These gases are emitted into the atmosphere causing global warming and acidic rain is formed. Particularly, carbon II oxide reacts with rain water to form carbonic acid. The acidic rain is corrosive to metallic and possesses a great threat on crops; however, by use of alternative fuels, carbon II oxide and unburnt hydrocarbons are oxidized to form carbon IV oxide essential to plants. Therefore, the engine will produce very little emissions. Also, alternative fuels such as methanol and ethanol produces very high volumetric efficiency when blended with gasoline. Therefore, the braking power is said to better compare to that of gasoline alone. However, most of these fuels have very high octane ratio of around 100 compared to that of gasoline. High octane ratio makes them impossible to start an engine during the cold seasons. Hence, gasoline has to be blended with these fuels to moderate the octane ratio making the engine to start even in times of winter.

2.2. Cost-effectivity of alternative fuels.

Vehicles engines using alternative fuels are said to incur less cost compared to conventional engines. This is because most of these fuels are derived from renewable sources and available resources. For example, ethanol is produced by fermentation of sugars which are readily available from relevant crops. Therefore, it reduces the cost of importing petroleum products from other nations. In addition, this fuel being favorable to the environment reduces the cost of fighting risks of pollution. Threats exposed by pollution in this case are minimized. In spite of the cost saved by the alternative fuels; vehicles using these fuels such as electric vehicles have very high prices in the market. This is because the production is low and the prices would increase if the demand increases hence raising production.

CHAPTER THREE

METHODOLOGY

3.1. Research design.

The research will adopt a descriptive survey method to collect data and analyze the relationship. A descriptive survey is a research study that describes data and characteristics about the population or phenomenon on study. The method enables the researcher to collect direct information about the human behavior which is more

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complicated to study.

3.2. Population

A population of interest is the entire group of targets items from which information is to be derived (Daniel and Gates, 2001). The population of interest will be companies manufacturing conventional engines and alternative fuel engines. Since it is not practical to get Information from the whole population of interest, sample in specific will be selected to take part in the survey.

3.3. Sampling procedure and sample size.

A sample is the proportion of a large population which is thought to be representative of a large population (Saris, 2014). Sampling is a process of identifying and selecting a number of individuals groups from a population in a way that the groups selected contain elements that that represent the entire group. A sample size of 20 vehicle engines will be drawn from a population of 100 vehicle engines randomly to be selected.

3.4. Data collection

A combination of both primary and secondary data will be used. Primary data will be obtained through administering of questionnaires to the target sample population. Secondary data will be collected from text books, journals, magazines and the internet.

3.5. Reliability

Reliability has to do with accuracy and precision at a measurement procedure (Saris, 2014). . Reliability is the measure of the degree of research instruments yields consistent results after repeated trials. The pilot study will be used to improve on the research tools to realize the research objectives.

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