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## Power Generation from Exhaust Gas of an Engine

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### ABSTRACT:

In this project, we modify a stationary diesel engine for producing power using turbine. Nowadays in automobile field many new innovating concepts are being developed. We are using the power from vehicle exhaust to generate the electricity which can be stored in battery for the later consumption. In this project, we are demonstrating a concept of generating power in a stationary multiple cylinder diesel engine by the usage of turbines. Here we are placing a turbine in the path of exhaust in the silencer. The turbine is connected to a dynamo, which is used to generate power. Depending upon the airflow the turbine will start rotating, and then the dynamo will also start to rotate. A dynamo is a device which is used to convert the kinetic energy into electrical energy. The generated power is stored to the battery. It can be stored in the battery after rectification. The rectified voltage can be inverted and can be used in various forms of utilities.

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### INTRODUCTION:

In recent the years the scientific and public awareness on environmental and energy issues has brought in major interests to the research of advanced technologies particularly in highly efficient internal combustion engines. Viewing from the socio-economic perspective, as the level of energy consumption is directly proportional to the economic development and total number of populations in a country, the growing rate of population in the world today indicates that the energy demand is likely to increase. A heat engine is a system that performs the conversion of heat or thermal energy to mechanical work. Examples of everyday heat engines include the steam engine, the diesel engine, and the gasoline (petrol) engine in an automobile. Heat engines are designed to produce useful work only. The efficiency of a modern internal combustion engine is about 37% in a normal spark ignition engine. The energy in the form of heat is rejected by means of exhaust, circulating cooling water, lubrication oil & radiation.

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### COMPONENTS:

1. Frame.
2. IC Engine.
3. Turbine.
4. Dynamo.
5. Battery
6. Fuel Gauge
7. Nozzle
8. Wires
9. LED

- **Frame**

A vehicle frame, also historically known as its chassis, is the main supporting structure of a motor vehicle to which all other components are attached, comparable to the skeleton of an organism. Shown in figure



- **IC Engine**

An internal combustion engine (ICE) is a heat engine in which the combustion of a fuel occurs with an oxidizer (usually air) in a combustion chamber that is an integral part of the working fluid flow circuit. In an internal combustion engine, the expansion of high-temperature and high-pressure gases produced by combustion applies direct force to some component of the engine.



- **Turbine**

A steam turbine is a mechanical device that extracts thermal energy from pressurized steam, and converts it into rotary motion. It has almost completely replaced the reciprocating piston steam engine primarily because of its greater thermal efficiency and higher power-to-weight ratio.



- **Dynamo**

Dynamo is an electrical generator. A This dynamo produces direct current with the use of a commutator. Dynamo was the first generator capable of the power industries. The dynamo uses rotating coils of wire and magnetic fields to convert mechanical rotation into a pulsing direct electric current



- **Battery**

It is a device user to store the power. The power is stored in the form of DC current only. There are many types of batteries are used Lead acid, lithium fluoride and in this work 8Amp current and 12 voltage specification is used.



- **Fuel Gauge**

A fuel gauge is a measuring instrument that determines and reports the amount of fuel that is left in a vehicle's tank or tanks. Each gauge consists of two separate components: an indicator and a sensing or sending unit.



- **Nozzle**

A nozzle is a device designed to control the direction or characteristics of a fluid flow (especially to increase velocity) as it exits (or enters) an enclosed chamber or pipe

- **Wires**

A wire is a single usually cylindrical, flexible strand or rod of metal. Wires are used to bear mechanical loads or electricity and telecommunications signals. Wire is commonly formed by drawing the metal through a hole in a die or draw plate

## LED

LEDs are “directional” light sources, which means they emit light in a specific unlike incandescent and CFL, which emit light and heat in all directions. That means LEDs are able to use light and energy more efficiently in a multitude of applications.

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## CONCLUSION

During the Process, we study that it has been identified that there are large potentials of energy savings through the use of waste heat recovery technologies. Waste heat recovery entails capturing and reusing the waste heat from internal combustion engine and using it for heating or generating mechanical or electrical work. It would also help to recognize the improvement in performance and emissions of the engine if these technologies were adopted by the automotive manufacturers. And the desired result is obtained by the various preparations of manufacturing applications and science of thermal, we obtain the process output. And is shown in the below mentioned figure



From this project, it has been identified that there are large potentials of energy savings through the use of waste heat recovery technologies. Waste heat recovery entails capturing and reusing the waste heat from internal combustion engine and using it for heating or generating mechanical or electrical work. It would also help to recognize the improvement in performance and emissions of the engine if these technologies were adopted by the automotive manufacturers. The study also identified the potentials of the technologies when incorporated with other devices to maximize potential energy efficiency of the vehicles. The project carried out by us made an attempt to generate electricity in engine exhaust unit. This project has also reduced the cost involved in the concern.



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**ANNEXURES:**

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