

EXTRACTION OF ENERGY FROM WASTAGE HEAT DESSIPATION FROM VEHICLE ENGINE HEAT-UP

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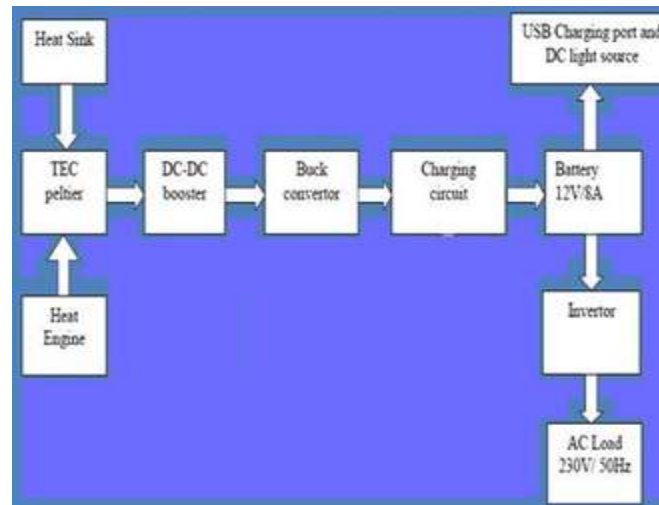
Abstract - The system proposed in this paper is an advance solution for generating the electricity from the waste heat dissipated from the vehicle engine heat-up. As we know almost every vehicle comprises of Internal Combustion (IC) engine and the maximum temperature it heats is about 700°C, this heat is dissipated in the air in the form of gases. So in our system we are utilizing this waste heat and converting it into electricity. By doing this it will increase the efficiency of an engine and also the environment will get less polluted. The technology behind this is Thermo Electric Generator (TEG) and the component which used is called as TEG palate which efficiently converts heat energy into electrical energy. The maximum temperature TEG can handle is about 200°C to 300°C, which is then regulated by DC-DC converter to charge a battery using maximum power point tracking. This circuit will boost the voltage up to 12V and again with the help of Buck Booster the voltage will boost to (12v-15v). TEG works on the principle of Seebeck Effect, which is the direct conversion of temperature difference into electricity. The battery which is used is 12V 8A lead acid battery. The main feature of this battery is that it is a rechargeable battery. This battery can easily charge up to 3 mobiles and can lighten up the dc bulbs at home. This system is not only limited up to DC source, it can be converted to AC source with the help of Inverter circuit. The project is considered successful and ready to be launched in the real system implementation.

Key Words:- Heater, TEC Pellet, Booster, Inverter

1. INTRODUCTION

As the title mention this system will prove to be an effective alternative for extraction/ generation of desired energy from waste energy. According to energy conservation law, energy can't be created or destroyed it will be transformed from one form to another but during transformation there is a energy loss. In our system we are going to use this energy in an efficient way i.e. one of the daily used vehicle is our private cars. So as most of the vehicles are using internal combustion engine this produces a considerable heat and dissipated into the environment. We have proposed a system with a thermo-electric generation technique in which a direct energy transducers are used which produces the electrical power proportional to heat difference maintain around the transducer. Basically this transducer are working on the principle of thermo-couple technique in which it states that whenever there is a difference between the two junction of a material made with a combined elements so that this temperature difference makes the electron flow between the two junction held at different temperature. The energy generated in terms of voltage is forwarded to charge pumping circuitry which boosts the current for further operation towards the useful utilization of energy. To enhance the efficiency and utilization a post generation module is implemented which generates the different form of voltages to drive and satisfy our daily needs like mobile charging, home dc as well as ac lightening.

WORK IMPLEMENTATION



METHODOLOGIES

Heater Plate:- A heating element converts electrical energy into heat through the process of Joule heating. Electric current passing through the element confrontation resistance, resulting in heating of the element. Unlike the Peltier effect, this process is separate of the direction of current flow.

TEC Pellet:- Thermoelectric cooling need the Peltier effect to uses a heat flux between the junction of two different types of materials. A Peltier cooler, heater, or thermoelectric heat pump is a solid-state active heat pump which transfers heat from one side of the device to the other, with consumption of electrical energy, bank on the direction of the current. Such an instrument is also called a Peltier device, Peltier heat pump, solid state refrigerator, or thermoelectric cooler (TEC). It can be used either for heating or for cooling,[1]although in practice the main application is cooling. It can also be need as a temperature controller that either heats or cools

DC DC Micro Booster:- It is used to boost voltage level 0.5v upto 5v



Buck Booster:- The **buck-boost converter** is a type of DC-to-DC converter that has an output voltage magnitude that is either greater than or less than the input voltage magnitude. It is equivalent to a flyback converter using a single inductor instead of a transformer.

Battery Charger:- A **battery charger**, or **recharger** is a device used to put energy into a secondary cell or rechargeable battery by forcing an electric current through it.

Battery:-It is used to store the electric charge. The battery used is of 12v .

Inverter:- A power inverter is an electronic device that converts direct current (DC) to alternating current (AC). The input voltage, output voltage and frequency, and overall power handling calculate on the design of the specific device or circuitry. The inverter does not create any power; the power is provided by the DC source

Transformer:- It is the device that converts voltage level from one stage to another without changing supply frequency. Transformer used is of center tapped type. Rating of the transformer is 12-0-12v.



Output with Toggle:- The supply which is come from [5] Ajay Chandravanshi, Suryavanshi J.G. (2013), the transformer we are using toggle switch for on-off purpose

CONCLUSION

In the above table, we have obtained the required voltage comfortably from the system's heat engine. Thus this system is very much eco-friendly and affordable because of the obtaining the energy from the waste heat from the engine. The main motto of this paper is to extract the unwanted heat that was dissipated from the vehicle engine is extracted. And as we can also use this electricity obtained at our household because the current is converted to AC. This system can be made on large commercial bases, as it is very much efficient. We have successfully achieved our objective by storing the charge in the battery and can be used for many hours continuously. As we are using the tec peltier in series, so that we can generate high voltage subsequently the devices or the appliances can be used for large time period.

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