

Wastage Heat Recovery of Vehicle Exhaust

S. Dighe Sima¹, B. Pawar Anil², N. Jadhav Sachin³, V. Joshi Jaideep⁴

^{1,2,3,4}Student, Department of Electrical Engineering, Sanghavi College of Engineering, Nashik, India

Abstract—In a modern vehicle, the power appliances consume more fuel, due to that the mileage of the vehicle is reduced. This fuel consumption is reduced by using the alternative renewable energy sources. There is a source to produce electricity from this exhaust gases. For this thermoelectric generator can be used to recover this waste heat energy. These can convert the thermal energy directly into the electricity. The car exhaust producing the CO₂ emission this affecting on global warming also it consumed the more fuel, by considering the future plan on fuel storage and our responsibility for reducing the fuel consumption in car we design a one idea for disconnection the auxiliary load on bike by using the wastage heat recovery so according to above consideration developing a concept name as “Wastages heat recovery of bike exhaust”.

Index Terms—Thermoelectric Generator, Seeback effect, IC engine.

I. INTRODUCTION

The automobile industry is one of the world’s most important economic sectors. Automobile use IC engines, which have huge amount of energy loss up to 70% in the form of heat energy

In the recent times scientists have tried and refined the automobile technology appreciably, but could not control loss in IC engine in form of waste Heat.

We could not control the waste heat but we convert this waste heat into Electricity by using Thermoelectric Generator (TEG). It is a device which converts thermal energy directly into electrical energy, using Seeback Effect. The use of thermoelectric generator (TEG) in automobile IC engine is a revolutionary idea, which reduced load on alternator which changes the battery, thus contributing to decreases in fuel consumption.

The temperature of the exhaust bend pipe surface through which exhaust gases are flowing, ranges between 200 °C to 300 °C, by attaching a copper plate to this bend pipe hot junction of the thermoelectric module is made, other cold junction is created by aluminum heat sink.

A. Block Diagram

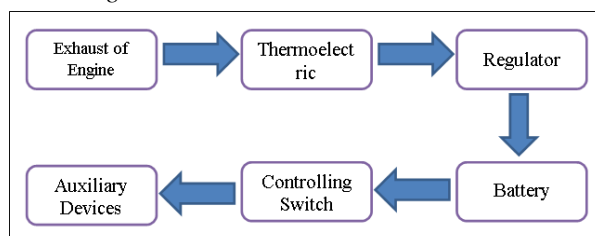


Fig. 1. Block diagram of wastage heat recovery of vehicle exhaust

B. Advantages

1. Carries electricity faster than any other material
2. Light in weight.
3. Large variety of application of area.
4. TEG module does not have rotating components, which results no noise and vibration.
5. Increased Power density.
6. Improve overall efficiency.

C. Limitations

1. Expensive
2. Poor conversion efficiency

D. Applications

1. It is used to charge the battery of the bike
2. It is used as an Emergency lighting
3. It is used for the domestic lighting

II. CONCLUSION

The goal of this project to find a possible way to recover the waste heat from the exhaust of IC engine The purpose of this system to generate the electricity from the wasted heat. By using this project, we reduced the heat dissipated in atmosphere thus it helps to reduced global warming. The performance of engine is not affected by this system because heat extracted from the surface of the exhaust pipe. For the higher temperature range we can used higher range of thermoelectric generator (TEG).

III. FUTURE SCOPE

In future, we can be using this system to recover the high rate of heat to produce high voltage.

REFERENCES

- [1] Anchal Dewangan, Dr. N. K. Saikhedkar, (2015) “Experimental analysis of Waste heat recovery using TEG for an internal combustion Engine.” IJISET, vol. 2, no. 6, pp. June 2015.
- [2] Aravind Karuppaiah, Gansh. S, Dileepan. T, Jayabharathi. S, “Fabrication and Analysis of Thermo Electric Generator for Power Generator.”JIRSET, 2014
- [3] Dipak Patil, Dr. R. R. Arakerimath, (2013), “A Review of Thermoelectric Generator for Waste Heat Recovery from Engine Exhaust.” IJRAME, vol. 1, no. 8, pp. 1-9, Dec. 2013.