

PhD research pre-proposal

Code: LERMA-2021/PhD3	
Title: Design, fabrication, and development of efficient exhaust heat recovery system for multicylinder diesel engine	
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Host college: I&A college	Host research unit: LERMA LAB

SUMMARY OF THE RESEARCH PRE-PROPOSAL

Global energy demand is increasing constantly, due to various reasons such as transportation of people, products, excess population and industrial purposes, the researchers are exploring novel ways to meet the energy demands. From the fuel energy supplied, the diesel engine utilizes only a maximum of 30% whereas the rest of the energy is wasted for cooling and exhaust gases. 40% of the fuel energy is wasted in exhaust gas whereas 30% is received by the engine crankshaft. The remaining amount of heat energy remains unused in cooling system as well as in friction losses. The fuel cost increase all over the world have drawn special attention upon Internal Combustion Engines (ICEs). This made the researchers to pay serious interest towards maximizing effective utilization of available heat energy from the engines.

The present research investigates the energy recovery potential of exhaust gases in ICEs aiming at low grade and high-grade waste heat energy. The energy recovery strategy is considered as a series of thermodynamic transformations according to Organic Rankine Cycle (ORC).

In the literature, a number of studies focused primarily on modifying engine design and combustion parameters only. But there were no detail studies conducted so far that focused on heat exchanger and innovative heat recovery system for recovering waste heat energy. This gap mandates the invention of such new conceptual design for exhaust heat recovery heat exchanger to enhance the energy recovery as well as increase the diesel engine overall thermal efficiency.

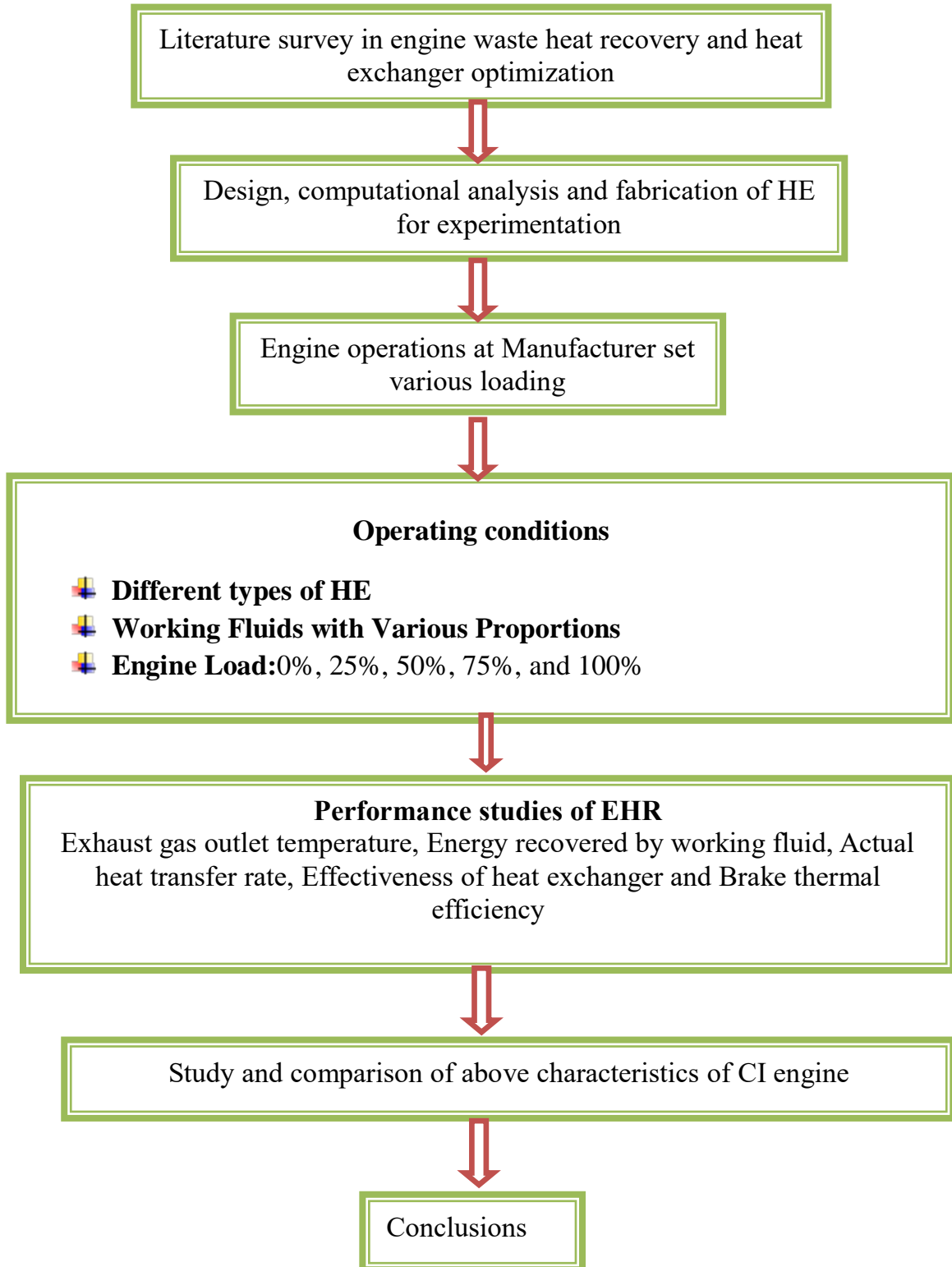


Fig.1. Flow Chart of Proposed Methodology

REQUIRED ACADEMIC QUALIFICATIONS & SKILLS

1. Automotive engineering/ Mechanical Engineering/ Thermal Engineering