

ABSTRACT

Utilization of waste heat has become an essential consideration in energy savings. Methods that are used for waste heat recovery are primarily meant for the performance enhancement of thermal systems with increased efficiency and fuel saving. In this present study, a waste heat recovery system has been incorporated to evaluate the performance of Indian vehicles operating under BS IV and BS VI vehicular emission standards using diesel and gasoline fuels. The study compares the performance to the systems with and without having a waste heat recovery system. When the waste heat recovery system is used, the engine exhaust has been suitably utilized for preheating the inlet air to the engine and for cabin space heating using a heat exchanger. The use of preheated inlet air is found to cause a reduction in fuel consumption. Also, by employing the waste heat recovery system the energy and exergy efficiencies of both BS IV and BS VI engines are found to be improved irrespective of the fuel types. The BS IV and BSVI diesel engines are found to be more efficient in terms of energy by 3.54 % and 3.98 % respectively. And gasoline or petrol engines are found to be more efficient in terms of fuel savings than the corresponding diesel engines.