

ANALYSIS AND OPTIMIZATION OF AIR CONDITIONING SYSTEM IN COMMERCIAL BUSES

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Abstract

The research focuses on the design of air conditioning systems in luxury buses, comparing the effectiveness of two distinct ventilation configurations such as overhead AC vents and side-mounted AC vents. The primary objective is to determine the optimal ventilation layout that achieves the desired interior temperature rapidly and efficiently with ambient airflow in the cabin. Computational fluid dynamics simulations are performed using ANSYS to understand the airflow patterns, thermal distributions, and cooling efficiency of both systems. The comparative analysis involves evaluating how these configurations influence the cooling process inside the bus cabin. By simulating various environmental conditions and passenger loads, the research aims to provide comprehensive insights into the functionality of AC systems. The study hypothesizes that side-mounted AC vents with an air flow velocity of 2.042 m/sec with a minimum temperature of 297.9 K cool the cabin more swiftly and effectively than their overhead counterparts with air velocity of 2.03 m/sec and minimum temperature of 302 K. Also side-mounted AC vents covers better area than overhead mounted AC. The findings of this research are expected to have significant implications for the transportation industry, specifically in enhancing passenger comfort and

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