IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 3, June 2025
Impact Factor: 7.67

Range Extension of Series Hybrid Electric Vehicle Using PMDC Motor

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Abstract: *This paper presents the design and development of a Series Hybrid Electric Vehicle (SHEV) incorporating a Permanent Magnet Direct Current (PMDC) motor for extended range and improved efficiency. The SHEV architecture decouples the internal combustion engine (ICE) from the drive train, using it solely to charge the battery through an Integrated Belt Starter Generator (IBSG). A 7 kW PMDC motor drives the wheels, powered by a 4.8 kW, 51V Lithium Iron Phosphate (LFP) battery. The control system manages power flow for seamless transitions between electric and hybrid modes, while regenerative braking enhances energy recovery. The project demonstrates the feasibility of SHEVs in bridging the gap between conventional and fully electric vehicles, offering efficient urban mobility and reduced emissions.*

Keywords: Series Hybrid Electric Vehicle (SHEV), PMDC Motor, IBSG, Range Extension, LFP Battery

DOI: 10.48175/IJARSCT-27575