Balancing battery and engine: A review of hybrid electric vehicles and their potential pitfalls

[*1]Jeno Paul

[*1]Professor, Department of Electrical and Electronics Engineering Adi Shankara Institute of Engineering and Technology

[2]Alex Shaju

[2]Department of Electrical and Electronics Engineering Adi Shankara Institute of Engineering and Technology

Corresponding Author: P. Jeno Paul
Email: jeno.eee@adishankara.ac.in

Abstract:

In an effort to replenish the world's dwindling petroleum reserves, researchers are exploring a range of alter- native energy sources that might power hybrid vehicles. Because of the damage it does to the environment, using fossil fuels in vehicles is a major cause for concern. Various sources are being studied for potential use in automobiles, including batteries, fuel cells, super capacitors, and solar cells. Hybrid electric vehicles (HEVs) powered by renewable energy sources could be the way of the future when it comes to transportation. Power conditioning, energy management systems (EMS), and propulsion systems are just a few of the numerous components and techniques covered in this article that pertain to HEVs. Various other domains associated with HEVs are also discussed, including as automotive systems and DC machinery. A variety of models and techniques derived from experimental and simulation data are detailed. With the help of relevant references, the table provides a concise overview of the performance of various HEV system combinations. A number of scholars have compiled an exhaustive evaluation of HEVs, including all aspects such as EMS, source combinations, and models. While hybrid electric vehicles (HEVs) can be partially powered by present technology, more sophisticated systems and increased dependability are still required. This study has emphasized a number of problems, difficulties, and characteristics pertinent to the upcoming generation of hybrid vehicles.