BÖLÜM 4

Power Split Device in Series-Parallel Hybrid Electric Vehicles

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INTRODUCTION

Especially in the last decade, pollutants originating from vehicles are frequently discussed. Compared to the 1990s, modern internal combustion engines have achieved significant success in reducing pollutants. However, due to the rapid increase in the number of vehicles, these achievements unfortunately could not prevent the increase in emissions [1-3]. With the developing technology, alternative propulsion sources have been developed for the internal combustion engines in vehicles. Thus, electric vehicles or hybrid electric vehicles that can be driven by electric motors instead of conventional vehicles are also used today.

In fact, historically electric vehicles are as old as conventional motor vehicles. Since energy storage and resupply can be done practically in conventional vehicles, it is also in demand today. Although the interest in electric and hybrid electric vehicles has increased greatly in the last decade, the demand is still not at the desired level [4,5].

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combustion engine (also called range extender) used in hybrid electric vehicles is the primary source of emissions for such vehicles. It is therefore essential that this internal combustion engine be used only when necessary. In addition, the operation of the internal combustion engine in the most efficient region is another priority condition. Electric motors and also generators can operate at high efficiency over a wide speed range. However, since the primary drive source in series-parallel hybrid electric vehicles is the electric motor, the choice of the electric motor (in terms of power, torque and speed) also affects the characteristics of the internal combustion engine. The power split device design, which regulates the power balance, also plays an important role in this engine-motor matching.

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