Development of an Integrated Motor/Generator Driver and Controller for a New Parallel Hybrid Electric Heavy Motorcycle

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ABSTRACT

In recent years, as the environmental protection cost has risen and global warming, it is important to slow down the environment from pollution. If the merits of both the internal combustion engine and the electric motor can be integrated to become a hybrid electric vehicle, HEV, it must have ultra-low emission and energy-saving but still keeping high performance. The central purpose of this study was to develop an integrated motor/generator (IMG) driver and controller. Electronic control systems used by digital signal processor (DSP). The linear matrix inequality (LMI) method is applied in the design of dynamic output feedback controller for mismatched uncertain variable structure system (VSS). According to this new LMI theory based output feedback variable structure control (VSC), the mismatched variable structure system is asymptotically stable with better performance. In this study, simulate analyze of integral system which the vehicle operate under variations of vehicle load. As for the construction of the test platform, the components have been allocated and real tests have verified the function of the single power output and the integration of two different powers. In this study, the prototype of the hybrid electric heavy-duty motorcycle has established and it has been displayed on the Taipei world trade center.

Keywords : Hybrid electric heavy motorcycle (HEV) ; Integrated motor/generator (IMG) ; Linear matrix inequality (LMI) ; Variable structure system (VSS)

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