Motor Controller Designing, Motor Selection and Motor Positioning for an Electric Track Day Car

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Abstract

This thesis comprehensively delineates the previous researches and proposes mathematical models for motor controlling and corresponding Mathlab Simulink models. Methods of Ideal motor selection for an electric racing car is also broadly described with necessary calculations and negotiations. Motor controller circuit has also been designed according to the prevailing standards and all the calculations are clearly shown. The simulations for the electronic circuits has been conducted and the PCB (printed Circuit Board) design schematics were also been generated by means of the "*proteus*" software. The program for the control of the motor has been written and tested to meet different driving conditions such as coasting, regeneration, cruising, acceleration, and deceleration. The development of the prototype has been done by means of Arduino microcontroller for demonstration purposes. The model was simulated and verified in "*Mathlab Simulink*" and a prototype has been developed to demonstrate the necessary operations of motor controlling and regenerative braking.

Keywords

Zero emission vehicles, BLDC motors, Motor Control, controller Algorithms, Regenerative Braking, Driving Modes

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