Design and Implementation of EMB System

Donghoon Ban, Seonghun Lee & Jaeseung Hong
Convergence Research Center for Future Automotive Technology, DGIST Daegu, Korea 711-873
dhban@dgist.ac.kr, shunlee@dgist.ac.kr & psman2@dgist.ac.kr

Changhee Yoo & Dongjin Ha
R&D Center / Samgsin Brake Co. Ltd
Daegu, korea 711-713
yooch@sangsin.com & dongle@sangsin.com

***Abstract*—The EMB(Electric Mechanical Brake) system is replacing the former hydrodynamic brake system. A brake system is a nonlinear system which applies a different compressive force depending on the position of the brake pad. The EMB system operates the brake by the motor instead of the hydrodynamic system. So the new design of brake caliper and the development of the motor controller and the invertor are needed. The gap between the pads shall be controlled exactly to operate an accurate force control. The new algorithm to compensate the pad abrasion and the disk abrasion is needed. In this paper, the mechanical part are designed to operate the brake and the EMB controller are designed and implemented with a motor controller and an inverter. The EMB controller model is verified by the MATLAB. The initialization algorithm is developed to compensate the pad abrasion and the backlash of the gear to make the same gap between the disk and the pad. The suggested algorithm detects the pad gap equally and the force depending on the pad gap is measured consistently.**

***IndexTerms*—EMB, Vector control, PI control, Interpolation, Caliper**