BQ09

Study on the Improvement Magnetic Torque Characteristics of Interior Permanent Magent Motor for Direct Drive Washing Machine

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Generally, motor is controlled jointing the conveyer belt or gear. However, it has many problems which are cost, space limits, and maintenance and repair of belt or gear. Recently, while it has been concerned about direct drive (DD) motor, it has been actively study it. In this paper, DD motor applied to the washing machine owing to space limits in this paper.

And then, interior permanent magnet (IPM) motor applied to the washing machine in order to use the reluctance torque in this paper. Generally, it goes without saying that the magnetic torque characteristics of surface permanent magnet (SPM) motor is better than IPM. But if the magentic torque characteristics of IPM motor is improved like SPM motor, it will be expected that IPM has the merits for the appliance. The barreier shape is important factor to improve the magnetic torque characteristics of IPM motor. This paper deals with three kinds of barrier shape. It can verify that model 3 is the best model in the three models by using finite element method (FEM).

Besides, this paper deals with demagentization of permanent magent by temperature when motor was manufactured not to consider heat. The reason of deals with demagnetization is that demagentization affect magentic torque characteristics.

In this paper, the analysis of select model for DD IPM by FEM is compared with experimental results to verify.

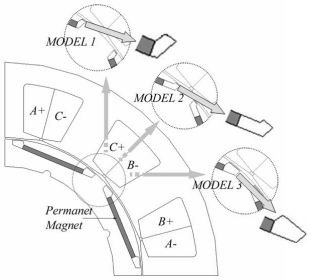

Fig. 1. Analysis models according to barrier shape.

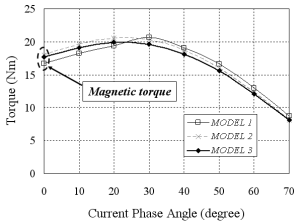

Fig. 2. Torque versus current phase angle curve.

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BQ10

A Study of the Influence of Secondary Reaction Plate upon Transverse Edge Effect in Linear Induction Motors

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Because of the non-continuity of the magnetic field in single-sided Linear Induction Motor (SLIM), they have special characteristics and inherent problems, which do not exist in the rotational-type motors. Longitudinal end effect and edge effect are two major electromagnetic phenomena in these motors, which make the analysis and design of the motors difficult [1]. Especially, edge effect due to the finite geometry in transversal direction could only be obtained by a 3-dimenisional field. In the literature, the research of transverse edge effects in LIM is generally based on an idealized mathematical model [2]-[4]. However, the analytic analyses have not only some restriction such as iron height and yoke flux distribution but also no ability for consideration of complex construction of secondary reaction plate.

In this study, we attempt to investigate the transverse edge effect occurred in the SLIM with short primary member and a complicated secondary structure by using three-dimensional Finite Element Method (3-D FEM). In order to analyze the edge effect, both an effective 3-D analysis model and simple calculation methodology for edge effect are proposed. The calculation methodology for edge effect is entirely derived from the patterns of currents induced in the secondary reaction plate. With the proposal methodology, various models having different constructions in the secondary reaction plate are analyzed to consider the relationship between the construction of secondary reaction plate and edge effect. Fig 1 shows the cross section of various models, which are obtained from model of the same primary geometry, excitation, and parameters except secondary reaction plate

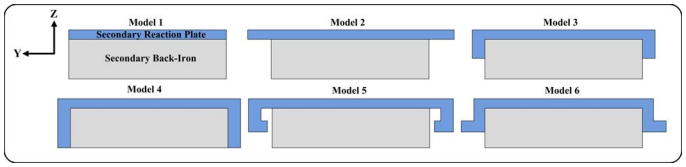

Fig. 1. A cross section of various models with same primary geometry excitation.

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