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Sommario	In this dissertation, the activities carried out during the PhD are comprehensively described. They covered, in parallel to a theoretical-numerical study on the main vibratory phenomena of disc brakes, the development of a simple experimental apparatus to investigate the "creep groan" generation mechanism. The experimental activity was conducted at the Tribology Laboratory of the Department of Civil and Industrial Engineering (DICI) of the University of Pisa with the support of Brembo SpA, which provided the materials (samples and discs) for the research. The experimental characterization of the pad material was carried out on a pin on disc tribometer with the brake disc in place of the tribometer disc and the sample of pad fixed on a suitable interface in the place of the pin. The goal of this tribological characterization was to check the behavior of coefficient of friction between the sample and disc with varying of the operating (speed, load) and geometric (contact area) parameters. After the tribological characterization, in order to determine the influence of the behavior of the coefficient of friction due to the variation of the operating and geometric parameters on the stability of brake system and in particular on its propensity to squeal, numerical simulations in ANSYS environment were carried out on the disc-pad system using the complex eigenvalue analysis. Since it is generally accepted that brake creep groan is due to the

	stick–slip phenomenon an extended literature review was made on the relevant analytical models and simulations with some of the lumped parameter models were performed for a better understanding of the phenomenon. Finally, experimental tests were carried out using a simple experimental apparatus set up to investigate the generation mechanism of the creep groan phenomenon where some operative parameters, such as angular velocity of the disc, load, as well as contact area, stiffness of material of the samples and system stiffness, were varied and their effects on the phenomenon observed. Finally, experimental tests were carried out using a simple experimental apparatus set up to investigate the generation mechanism of the creep groan phenomenon where some operative parameters, such as angular velocity of the disc, load, as well as contact area, stiffness of material of the samples and system stiffness, were varied and their effects on the phenomenon observed.
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