عنوان مقاله:

Numerical Analysis of Turbocharger's Bearing using Dynamic Mesh

نویسندگان:

J. Moradi Cheqamahi – Department of Mechanical Engineering١, Isfahan University of Technology, Isfahan, Iran ٨۴١۵۶-٨٣١١١

M. Nili-Ahmadabadi – Department of Mechanical Engineering١, Isfahan University of Technology, Isfahan, Iran ٨۴١۵۶-٨٣١١١

S. Akbarzadeh – Department of Mechanical Engineering١, Isfahan University of Technology, Isfahan, Iran ٨۴١۵۶-٨٣١١١

M. Saghafian – Department of Mechanical Engineering١, Isfahan University of Technology, Isfahan, Iran ٨۴١۵۶-٨٣١١١

خلاصه مقاله:

Journal bearings are widely used in different machineries. Reynolds equation is the governing equation to predict pressure distribution and load bearing capacity in journal bearings. There are many analytical and numerical methods for solving this equation. The main disadvantage of these methods is their inability to analyze complex geometries. In this paper, a comprehensive method based on dynamic mesh method is developed to solve the conservation equations of mass, momentum and energy. This method has smaller error compared to other techniques. To verify the accuracy of this method, the bearings with different length to diameter ratios are analytically and numerically analyzed under different loads and compared with each other. In continue, the turbocharger's bearing is numerically simulated and the effects of rotational speed change are studied. Finally, the turbocharger's bearing with four axial grooves are simulated. The simulations results show that adding grooves to the turbocharger's bearing causes the bearing eccentricity ratio and lubricant flow rate to increase and the attitude angle, rate of temperature rise and frictional torque to decrease.

کلمات کلیدی:

Journal bearing, Turbocharger's bearing, Axial groove, Analytical solution, Dynamic mesh

لینک ثابت مقاله در پایگاه سیویلیکا:

https://civilica.com/doc/1383463