Dedication

This thesis is dedicated to my wonderful parents, who encourage me to work hard and to respect the others. They help me in every stage in my study through good and bad times, thanks to all brothers, sisters and friends for my assistance. I really appreciate your roles for helping me to success and install the confidence in me that I became capable to do anything in my mind thank you for everything.
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Abstract

This research explains an analytical study for all variables that affect hydrodynamic bearing design, such as pressure, load, friction force, and oil film thickness. The objectives of this research are to calculate the hydrodynamic bearing variables, investigate the effect of shaft misalignment and oil film thickness on pressure distribution, and analyze and plot the results using a Matlab program. The study investigates deriving Reynolds' Equation, which controls the pressure distribution in the hydrodynamic bearing. This equation is a second-order differential equation, solved using the finite difference method, and Matlab is used for analyzing and plotting the results.
هذا البحث يوضح دراسة تفصيلية لكل المتغيرات التي تؤثر في تصميم المحامل الهيدروديناميكية مثل الضغط، الحمل، قوة الاحتكاك، وسمك طبقة التزيت. يهدف هذا البحث لحساب كل المتغيرات في المحامل الهيدروديناميكية. لتحقيق تأثير أنحراف العمود وسمك طبقة التزيت. دراسة Matlab لحساب كل المتغيرات في المحامل الهيدروديناميكية وتم محاولة تحليل وتخطيط النتائج باستخدام برنامج Matlab.

تتحقق من نتائج متغيرات رينولدز التي تتحكم في توزيع الضغط في المحامل الهيدروديناميكية Finite وتم استخدام برنامج Matlab لتحليل وتخطيط النتائج.
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7.1 Conclusion

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Nomenclature

\( h \) the hydrodynamic film thickness (m).

\( c \) the bearing radial clearance (m).

\( R \) the bearing radius (m).

\( L \) the bearing axial length (m).

\( P \) the pressure (Pa).

\( U \) the bearing entraining velocity (m/s), i.e. \( U = (U_1 + U_2)/2 \);

\( \eta \) the dynamic viscosity of the bearing (Pas).

\( x, y \) Are hydrodynamic film co-ordinates (m).

\( \tau_x \) The shear stress acting in the 'x' direction (Pa).

\( \tau_y \) The shear stress acting in the 'y' direction (Pa).

\( \tau_z \) the shear stress acting in the 'z' direction (Pa).

\( v \) the sliding velocity in the 'y' direction (m/s).

\( q_x, q_y \) are flow rate in, \( x \) , \( y \) direction

\( M_v \) Vogelpohl Parameter
h* the hydrodynamic dimensionless oil film thickness

P* Dimensionless pressure

x*, y* Are hydrodynamic dimensionless film co-or

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