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 explain analytical study for all variables which effective hydrodynamic bearing design like pressure, load, fraction 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 in pressure distribution, and analysis and plotting the result by matlab program. The study investigates deriving Reynolds Equation which controlled the pressure distribution in the hydrodynamic bearing. This equation is second order differential equation, solved this equation by finite difference method and mat lab program use to analyzing and plotting the result.

هذاالبحث 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 , التحقق من تأثير أنحراف العمود و سمك طبقة التزيت في توزيع الضغط وتحليل وتخطيط النتائج بواسطة برنامج Matlab. الدراسة تتحقق من اشتقاق معادلة رينولدز التي تتحكم في توزيع الضغط في المحامل الهيدروديناميكية و هي معادلة تفاضلية من الدرجة الثانية في متغيرين . حلت هذة المعادلة بطريقة Finite difference واستعمال برنامج Matlab لتحليل وتخطيط النتائج .

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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 = (U1 + U2)/2;
η	the dynamic viscosity of the bearing (Pas).
x, y	Are hydrodynamic film co-ordinates (m).
τ_x	The shear stress acting in the '**x**' direction (Pa).
τ_y	The shear stress acting in the '**y**' direction (Pa).
τ_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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