

List of Figures

1.1	Representation of the lubricant film.	7
1.2	The coordinates for a sphere.	26
1.3	The coordinates for a cone.	27
1.4	Optimization diagram for the full journal bearing.	35
1.5	Optimization diagram for the rectangular Michell pad.	36
1.6	The hydrosphere bearing.	37
1.7	The conical bearing.	38
1.8	The flow between two cylinders.	39
1.9	Bearing element for the thermal wedge effect.	40
1.10	Cam and tappet configuration.	41
1.11	The density-pressure relation for a typical mineral oil.	42
1.12	The viscosity-temperature-pressure chart for water.	45
1.13	The viscosity-pressure chart for a sebacate.	46
1.14	Elastomeric seal model.	48
2.1	The lemon type bearing.	55
2.2	Clearance circle maps of impedance for short bearings.	56
2.3	Pressure distributions in a journal bearing.	60
2.4	Clearance circle maps of mobility for short bearings.	62
2.5	The crank mechanism.	65
2.6	Characteristics for a ruptured-film full journal bearing.	72
2.7	A typical impulse diagram.	73
2.8	A maximum pressure diagram.	74
2.9	A cavitation boundary diagram.	75
2.10	Full journal bearing optimization for an alternating impulse load.	76
2.11	Typical journal centre paths.	77
2.12	A squeeze film damper diagram.	80
3.1	Focus properties for a ruptured-film full journal bearing.	86
3.2	Survey of the equilibrium modes.	88
3.3	Stiffness and damping for a ruptured-film full journal bearing.	91
3.4	Stiffness and damping for a complete-film full journal bearing.	91
3.5	Onset speed of instability for a rotor.	93
3.6	Journal centre limit cycles for a balanced Jeffcott-rotor.	95

B	Tables of Integrals	303
B.1	Harmonic Film Profile	303
B.2	Hertzian Film Profile	307
B.3	Parabolic Film Profile	308
B.4	Useful Definite Integral	308
C	Asymptotic Steady-State Solutions	309
C.1	Full Journal Bearing	309
C.2	Michell Bearing	311
D	Impedance and Mobility Definitions	313
D.1	Impedance for the Partial-Arc Bearing	313
D.2	The Full Journal Bearing	315
E	Optimum Similarity Analysis	319
E.1	Similarity Analysis	319
E.2	A Simple Model: Jeffreys' Equation	321
E.3	More Complicated Modelling	324
E.4	Objections to Dimensional Analysis	326
E.5	Assessing Optimum Similarity Analysis	326
F	Asymptotic EHL Solutions	329
F.1	Elastic-Isoviscous Lubrication	329
F.2	Piezoviscous Lubrication	330
F.3	Soft-Layered Solids	331
F.4	Gupta's Solution for Soft-Layered Solids	332
G	Surface temperature distributions	335
	Bibliography	339
	Index	353