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Abstract: This paper emphasizes on the effects of pivot flexibility upon the performance of a TPJB by making comparison between two model predictions i.e. (a) model with rigid pivots, and (b) model with soft pivots. The latter one uses Hertzian contact theory for the calculation of the pivot stiffness and couples it with the fluid film hydrodynamics. Presently, finite element method solves pressure distribution which integrates to give fluid film forces and moments. Predicted static and dynamic characteristics using two different models illuminate the dominance of pivot flexibility effects on the performance of the TPJB. In general, soft pivot model predictions are closely predicted when compared to the previously published test data.

Keywords: Tilting pad journal bearing; Ball-socket pivot; Rocker-back pivot; Static and Dynamic performance

Nomenclature

C_v lubricant specific heat capacity [$\text{m}^2 \cdot \text{s}^{-2} \cdot \text{°C}^{-1}$]

C_b radial bearing clearance [m]

$C_{\alpha\beta}$ damping coefficients; $\alpha, \beta = X, Y$ [$\text{N} \cdot \text{s}/\text{m}$]

C_p radial pad clearance [m]

D_h pivot housing diameter, [m]

D_p pivot diameter, [m]

e journal eccentricity [m]

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