



Rotordynamics of Automotive Turbochargers (Hardback)

By Hung Nguyen-schafer

Springer International Publishing AG, Switzerland, 2015. Hardback. Condition: New. 2nd ed. 2015. Language: English . Brand New Book ***** Print on Demand *****.Rotordynamics of automotive turbochargers is dealt with in this book encompassing the widely working field of small turbomachines under real operating conditions at the very high rotor speeds up to 300000 rpm. The broadly interdisciplinary field of turbocharger rotordynamics involves 1) Thermodynamics and Turbo-Matching of Turbochargers 2) Dynamics of Turbomachinery 3) Stability Analysis of Linear Rotordynamics with the Eigenvalue Theory 4) Stability Analysis of Nonlinear Rotordynamics with the Bifurcation Theory 5) Bearing Dynamics of the Oil Film using the Two-Phase Reynolds Equation 6) Computation of Nonlinear Responses of a Turbocharger Rotor 7) Aero and Vibroacoustics of Turbochargers 8) Shop and Trim Balancing at Two Planes of the Rotor 9) Tribology of the Bearing Surface Roughness 10) Design of Turbocharger Platforms using the Similarity Laws The rotor response of an automotive turbocharger at high rotor speeds is studied analytically, computationally, and experimentally. Due to the nonlinear characteristics of the oil-film bearings, some nonlinear responses of the rotor besides the harmonic response 1X, such as oil whirl, oil whip, and modulated frequencies occur in Waterfall diagram. Additionally, the influences of...



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