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Nota di contenuto	Introduction -- Background on Viscosity and Lubrication -- Background on Ultrasound -- Literature review -- A Novel Ultrasonic Model for Non-Newtonian Fluids -- Viscosity Measurement at an Aluminium-Oil Boundary -- The Matching Layer Method -- Viscosity Measurement in a Journal Bearing -- Conclusions.
Sommario/riassunto	This thesis presents a novel ultrasonic instrument for non-invasive and in-situ characterization of journal bearing lubricant viscosity. In particular, the application to journal bearings is described by non-

invasively measuring the viscosity and localized power losses throughout operation. This ultrasonic viscometer is based on the reflection of polarized shear waves from a thin resonating coating layer to increase the measurement sensitivity, in comparison to conventional ultrasonic methods. This instrument allows for a full engine oil viscoelastic characterization in-situ. The book investigates the effects of temperature, pressure and shear rate, and describes in detail the ultrasonic setup and method. Further, it demonstrates that the same technique can be applied similarly to monitor the lubrication of other engine components. As such, it offers a unique instrument that can drive the research of oil formulations to improve engine performance and fulfill the requirements of international fuel economy regulations. .