Noise and Vibration in Friction Systems
V. P. Sergienko and S. N. Bukharov
Springer, Switzerland, (2015),
215 pp., 111 Illustrations, Hardcover, 129.00 USD,
ISBN 978-3-319-11333-3

Sergienko and Bukharov's *Noise and Vibration in Friction Systems* is a well laid-out literature review and introductory text for the study of noise and vibration generated by friction interfaces. The extensive reference list draws heavily on publications in the 1980's and 1990's, with only a handful of publications that are less than 5 years old, with a majority of those by the authors themselves. It has a good balance of basic theory, mathematical modeling, measurement methods, materials science and testing results.

Although the theory, math and methods covered in the text can be applied to a broad range of tribopair types, the materials science and testing sections of the book are understandably focused on the authors' work with drivetrain components.

The text appears to have been translated by someone for whom English is not a first language. Several obfuscated translations caused me to pause to figure out the authors' intended meaning. For example the intended meaning of "quadratic mean of the oscillating quantity" is the "root mean square" and a "vortex-current device" is an "eddy current transducer." Actually, once you become accustomed to the translation style, it turns into a secondary game which I thought was fun, but which new students may find distracting.

After a short introductory chapter, Chapter 2 of the book introduces the student to the mathematics describing harmonic, random and nonlinear vibration and then reviews the advantages of piezo transducers.

Chapter 3 is a short review of the acoustic wave equation, the decibel, frequency weighting curves, equivalent sound level, sound level meters, pressure gradient sensors and array processing.

Chapter 4 reviews Fourier derivation and analysis, the spectral content of modulated and random signals, cross correlation analysis and cepstral analysis. It ends with a study of the signal chain in a digital sampling/discrete Fourier analysis vibration measurement system.

Applications begin with Chapter 5's review of friction driven oscillations in mechanical systems operating in a steady state such as metal cutters and bearings, and continue with Chapter 6's treatment of mechanical systems operating in a transitional state such as clutches, brakes and transmissions.

Chapter 7 introduces research in the material sciences aimed at reducing friction induced noise and vibration. Chapter 8 ends the book with a very short overview of the effects of noise and vibration exposure.

It is a very well thought out text which should bring the automotive engineering student up to speed with only a little noise.

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