

Comparison of Torsional Vibration Measurement Techniques

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Abstract

Noise and vibration performance plays an important role in the development of rotating components, such as engines, drivelines, transmission systems, compressors and pumps. The presence of torsional vibrations and other specific phenomena require the dynamic behaviour of systems and components to be designed accurately in order to avoid comfort and durability related problems. This paper provides an overview of the instrumentation and challenges related to torsional vibration testing. The accuracy and performance of five measurement techniques (high-speed incremental encoder, dual beam laser interferometer, zebra tape, zebra disc, direct pulse measurements with magnetic probe) is investigated by measurements on a Fiat Punto 1.4 liter engine. The potential sources of error are discussed to explain the inaccuracies of each technique.