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Quality Control of Automotive Gearbox Based On Vibration Signal Analysis

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Abstract : In more complex systems, such as automotive gearbox, a rigorous treatment of the data is necessary because there are several moving parts (gears, bearings, shafts, etc.), and in this way, there are several possible sources of errors and also noise. The basic objective of this work is the detection of damage in automotive gearbox. The detection methods used are the wavelet method, the bispectrum; advanced filtering techniques (selective filtering) of vibrational signals and mathematical morphology. Gearbox vibration tests were performed (gearboxes in good condition and with defects) of a production line of a large vehicle assembler. The vibration signals are obtained using five accelerometers in different positions of the sample. The results obtained using the kurtosis, bispectrum, wavelet and mathematical morphology showed that it is possible to identify the existence of defects in automotive gearboxes.

Keywords : automotive gearbox, mathematical morphology, wavelet, bispectrum
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