

Case Study: Window Regulator Assembly Line



Hankinson Inc.
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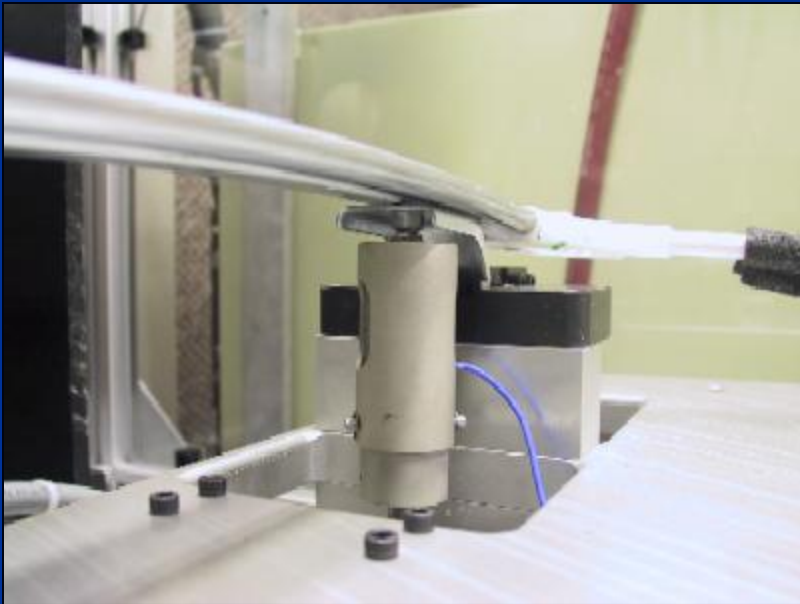
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Performance & NVH Test Station



Accelerometer Actuators

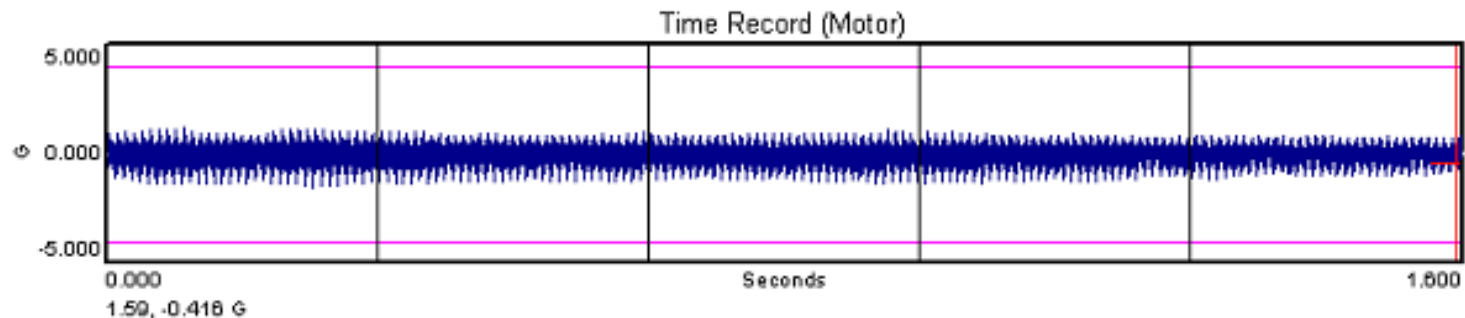
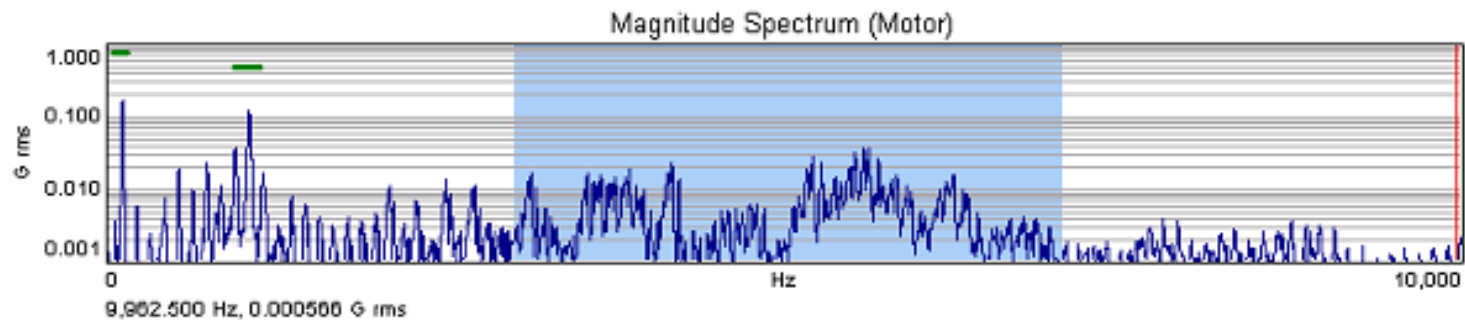


Rail Bracket



Motor

Example Data & Test Criteria



Results

Cable-Rail

Rail spike / fixture bump PASS (0.301 G)
Rail spike / fixture bump PASS (-0.455 G)
Rail spectrum overall PASS (0.118 G)
Ratchet envelope PASS (0.001)

Motor

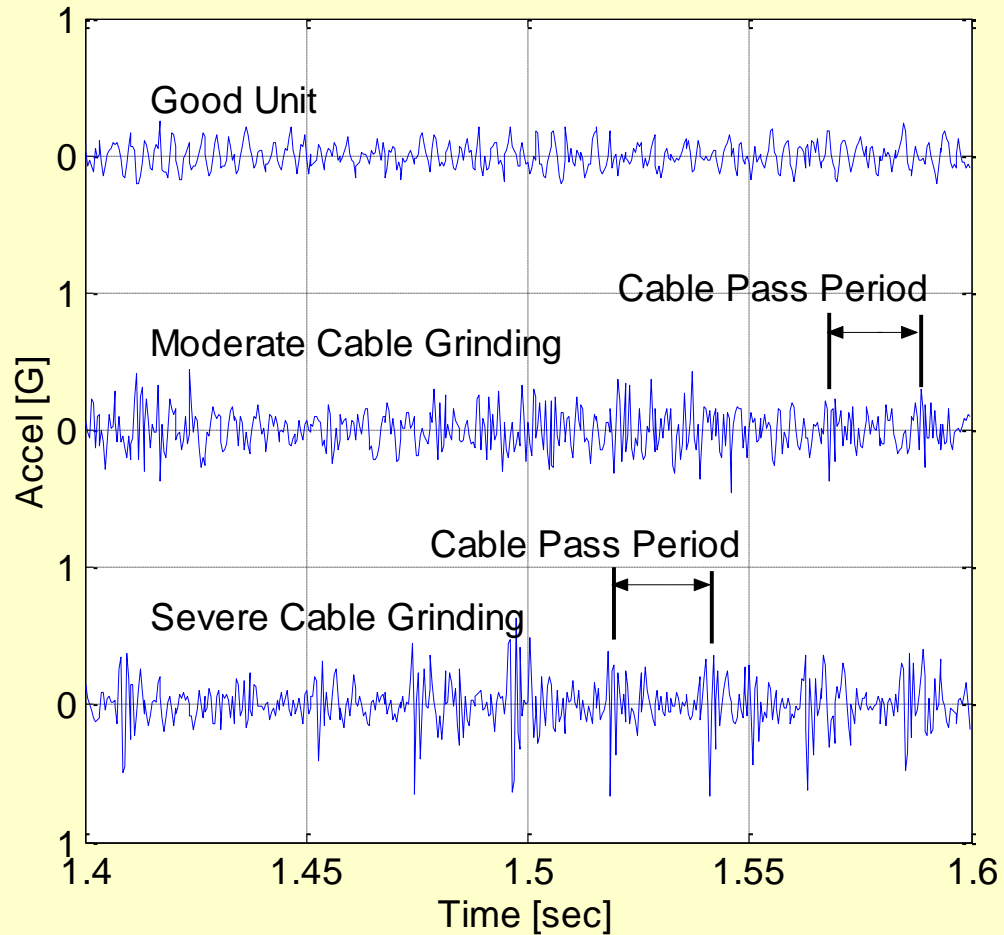
Mtr spike / fixture bump PASS (1.191 G)

PASS

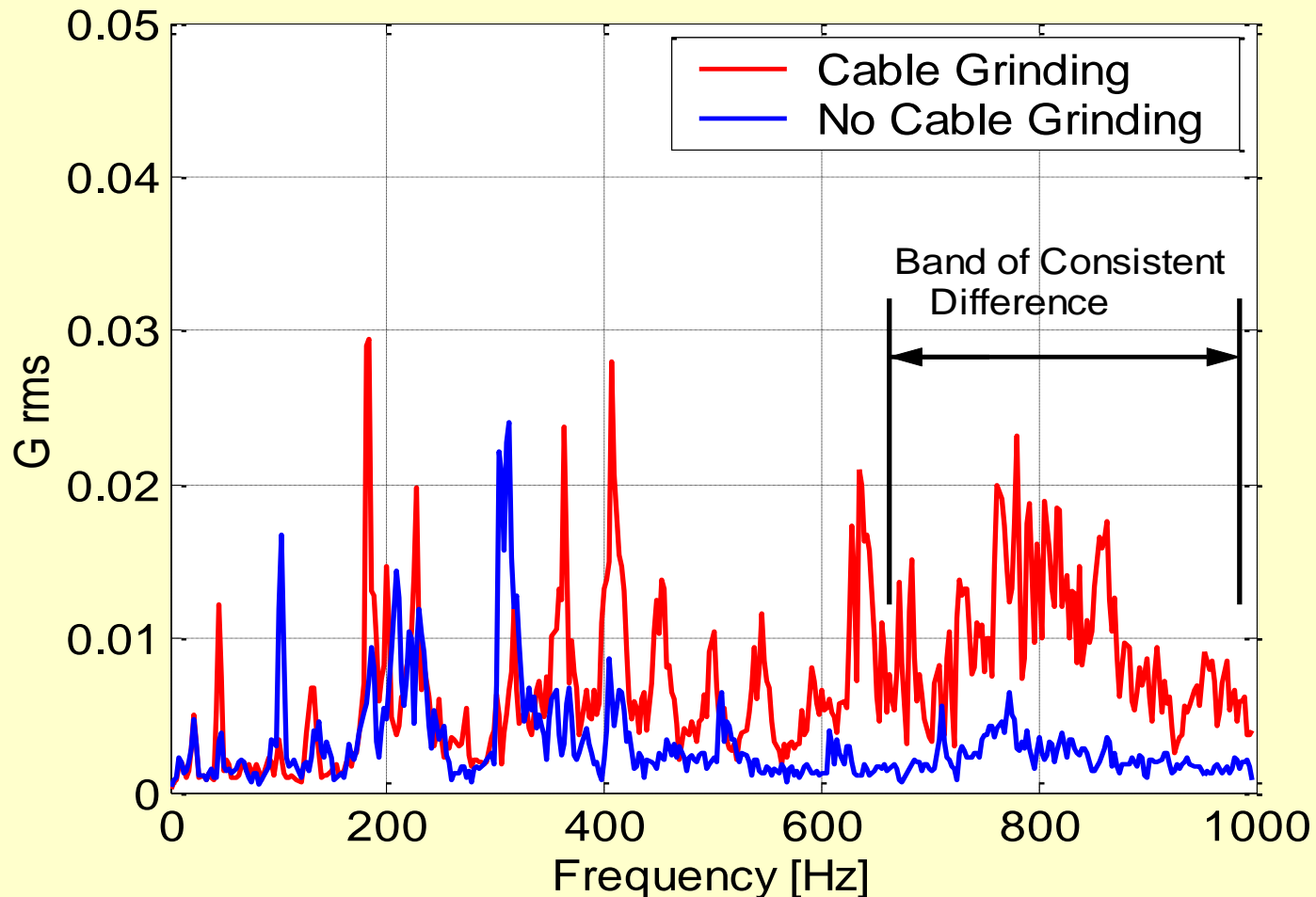
Information for Motor

DA: 0.398 G
Mean: -0.065, Sigma: 0.366, Skew: -0.206, Kurtosis: 3.053
RPM1: 6,220

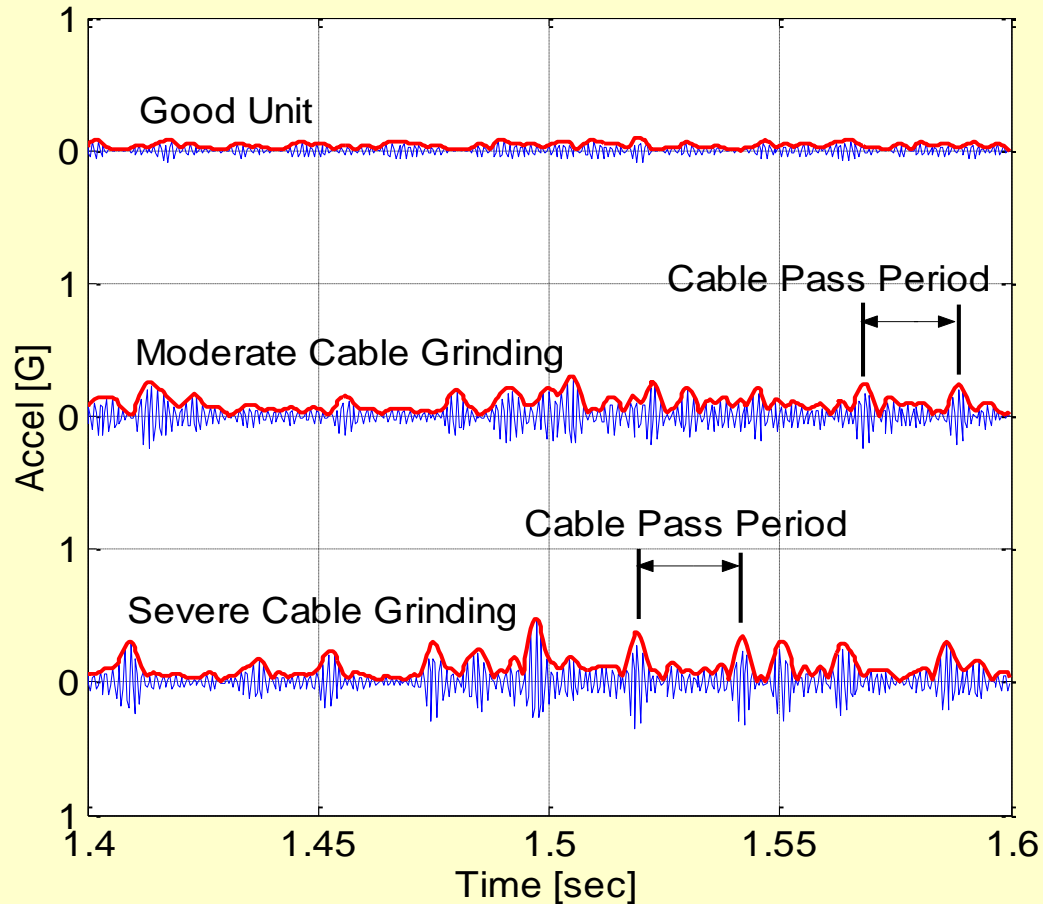
Rail Vibration Data for Cable Grinding Issue



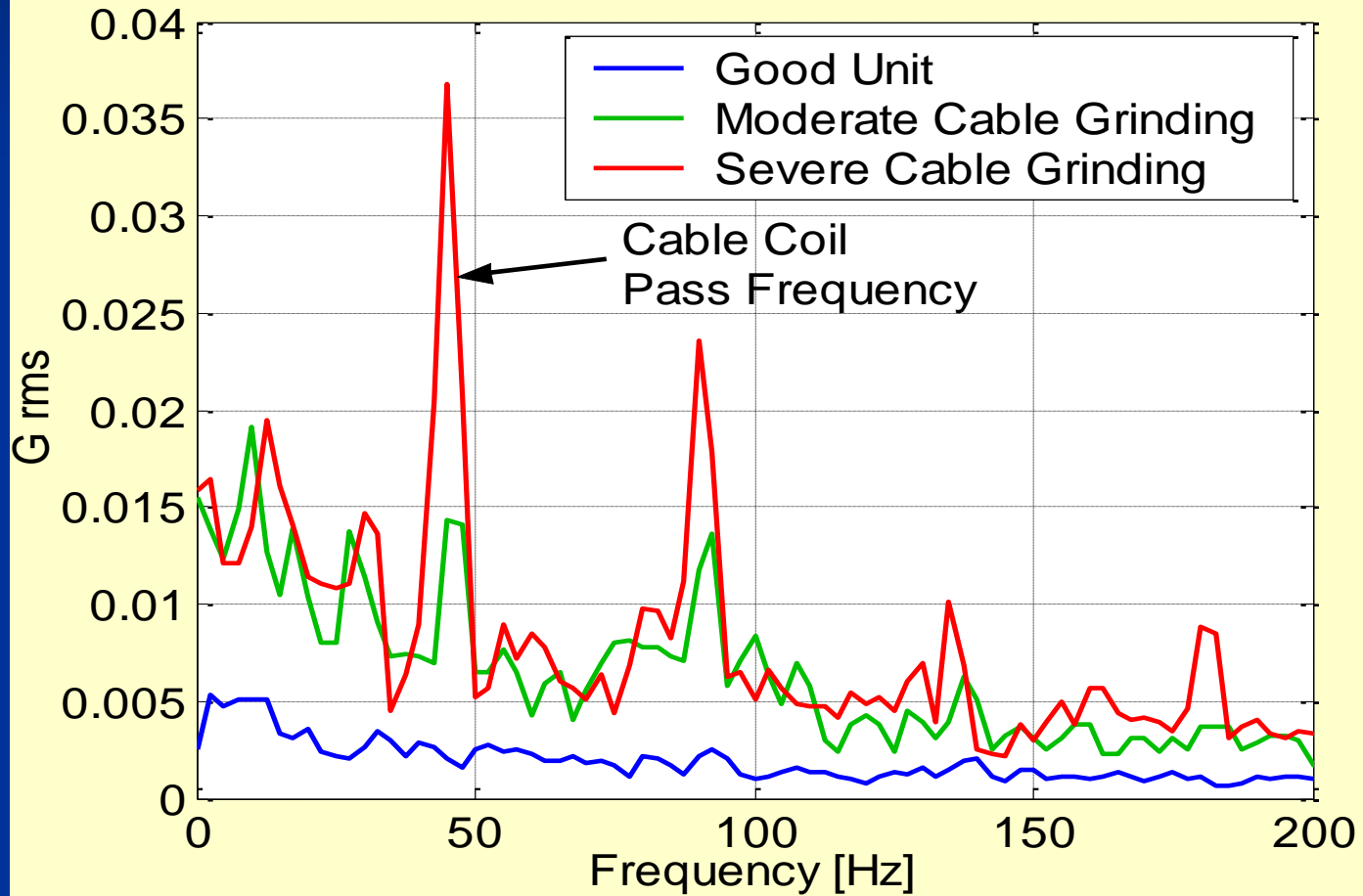
Rail Vibration Spectrums



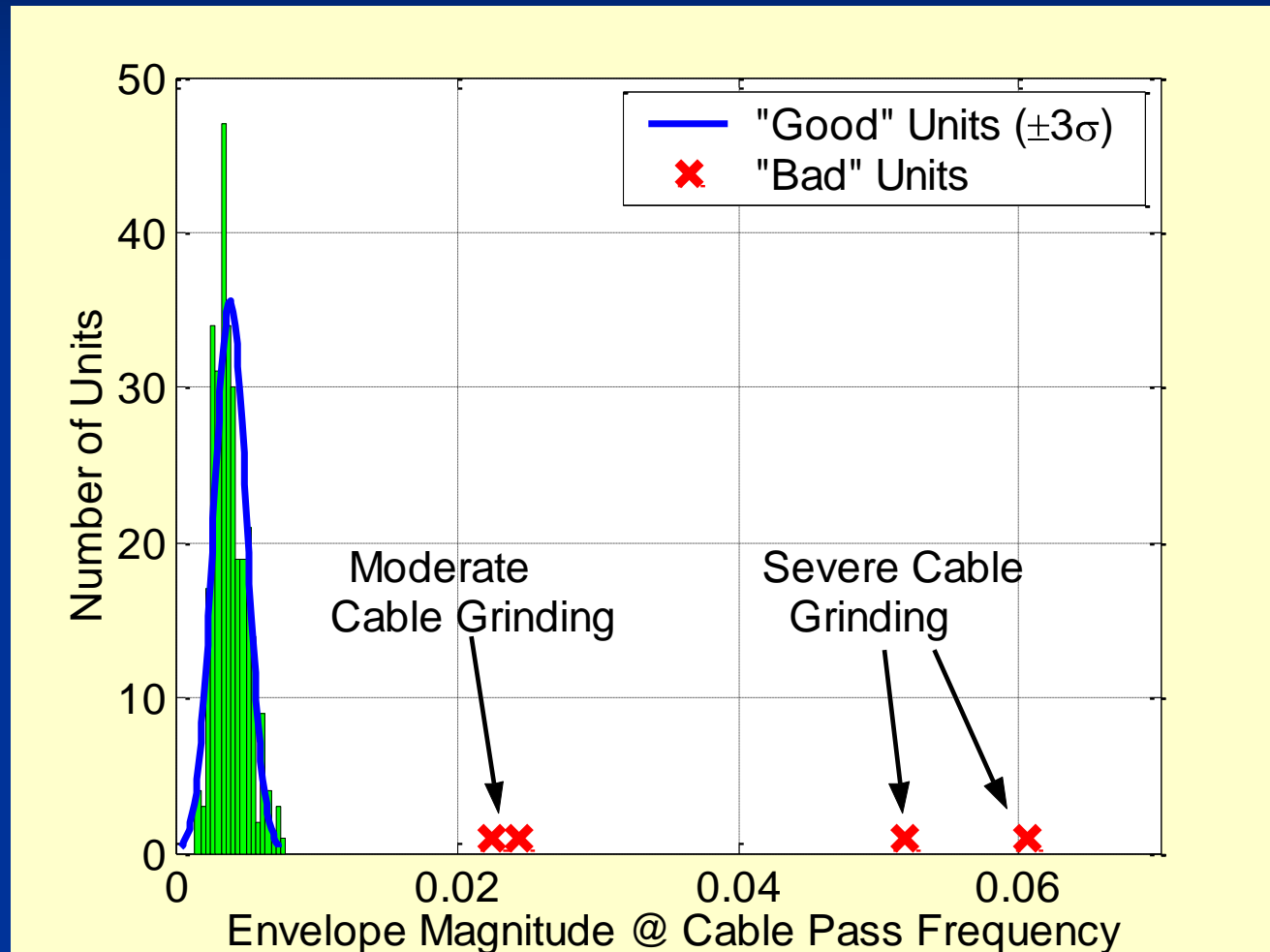
Filtered & Enveloped Rail Vibration Data



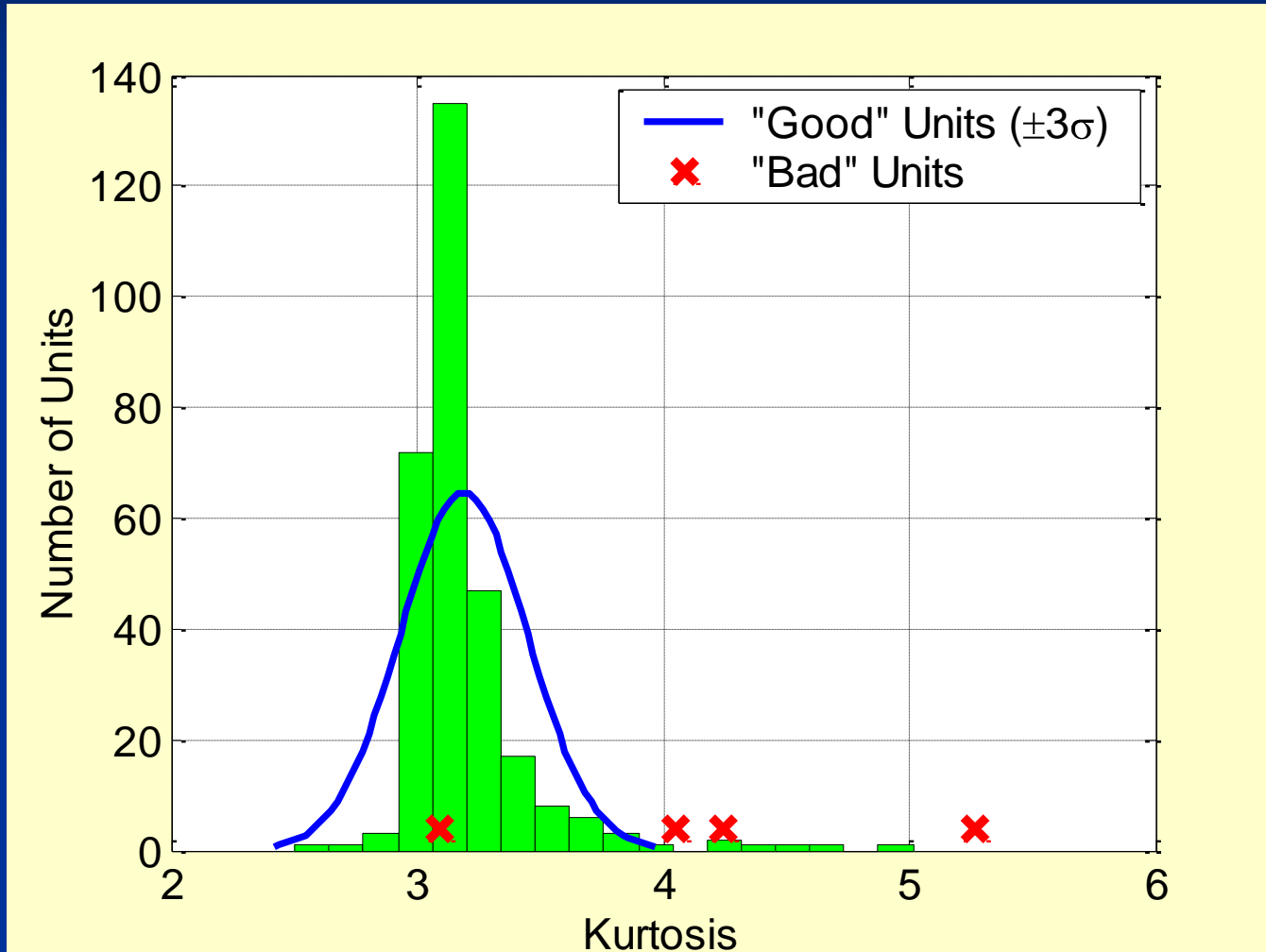
Spectrums of Enveloped Data



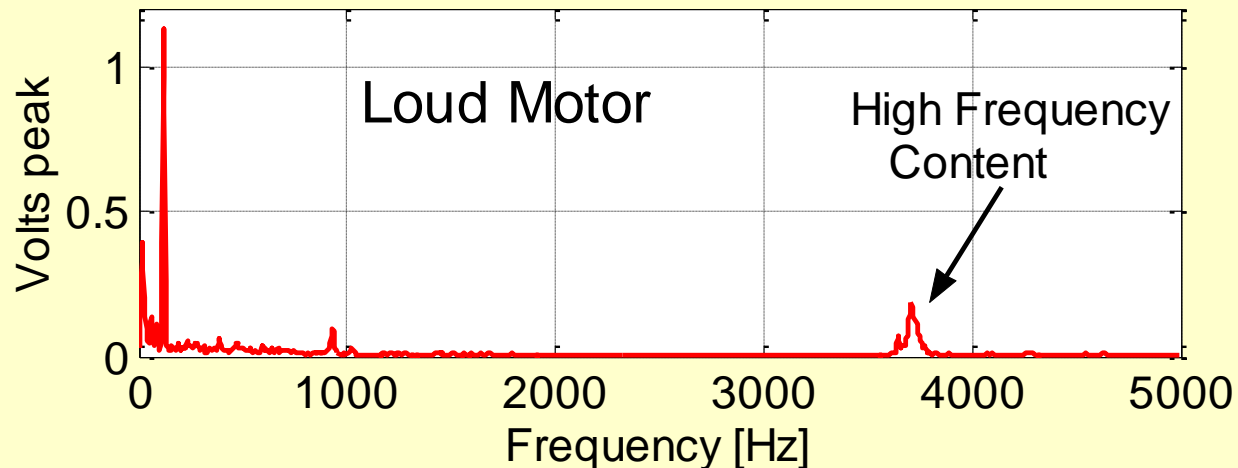
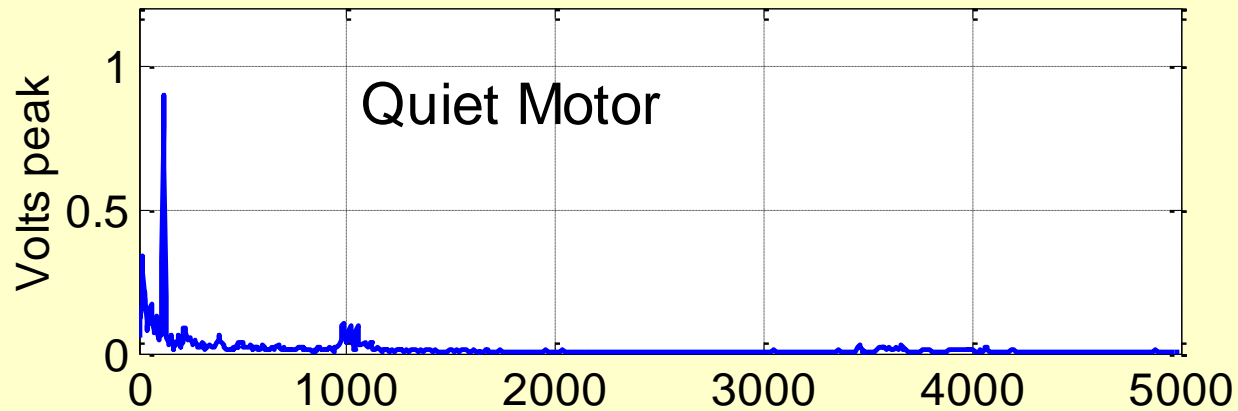
Statistical Analysis of Envelope Criteria for Cable Grinding Issue



Statistical Analysis of Kurtosis Criteria for Cable Grinding Issue



Acoustic Spectrum Comparison for Motor Noise Issue



Statistical Analysis of High Frequency Energy Band Criteria for Motor Noise Issue

