February 2016

ASK THE EXPERTS: Vibration Patterns that Indicate Problems with High-Speed Engines

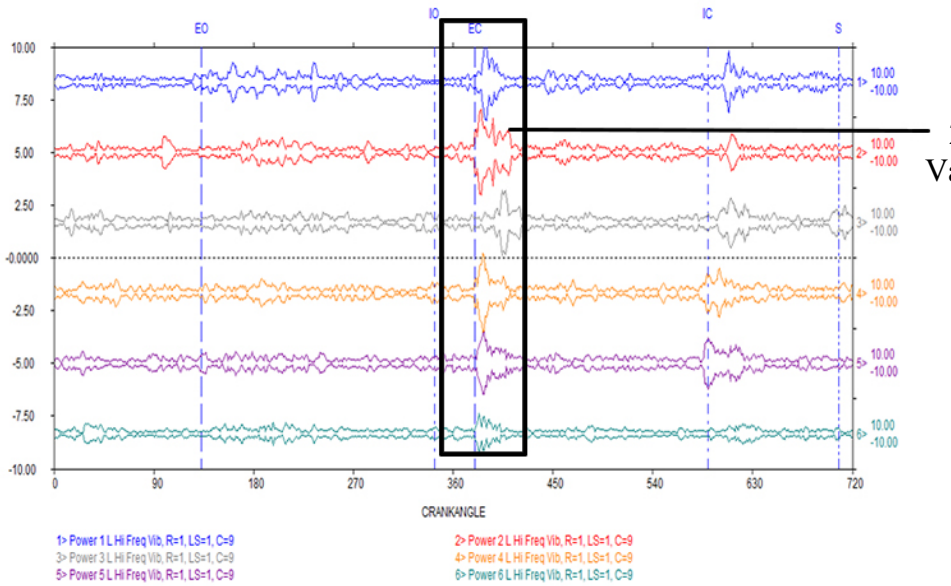
QUESTION: High frequency vibration patterns on a high-speed engine all look the same to me. Can you actually identify problems using these technologies?

Yes, there are common vibration patterns found in high-speed engine analysis.

High-speed engines (greater than 700RPM) typically do not have pressure indicator ports. Despite this, data can still be gathered for analysis:

- With the portable analyzer, significant deficiencies are detectable with cylinder-by-cylinder phased vibration and ultrasonic patterns.
- With the Platinum Online System, similar deficiencies are detectable with cylinder head mounted accelerometers.

The following are some example vibration patterns you will find on high-speed engines. Please note that this is a single trace showing different mechanical problems (data taken from a Waukesha 7042).



2L Exhaust Valve Recession

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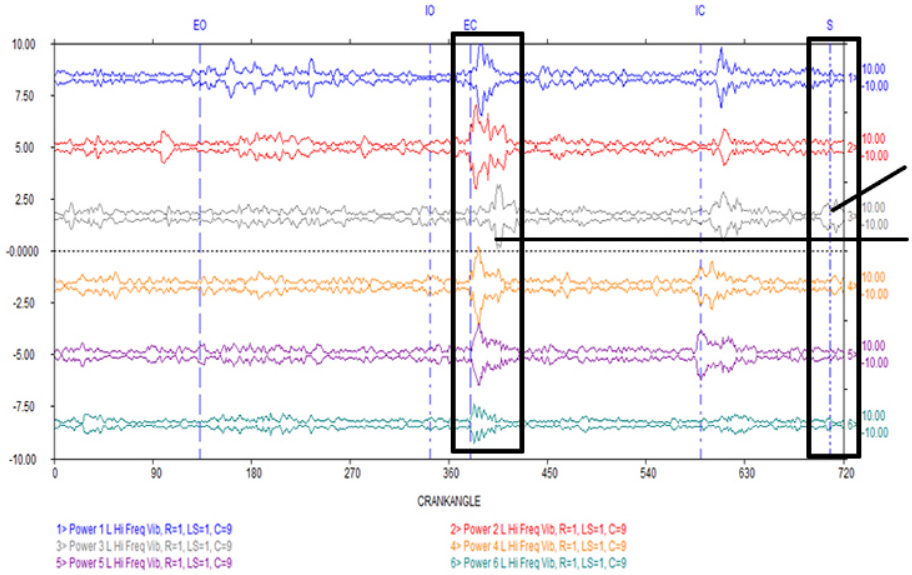
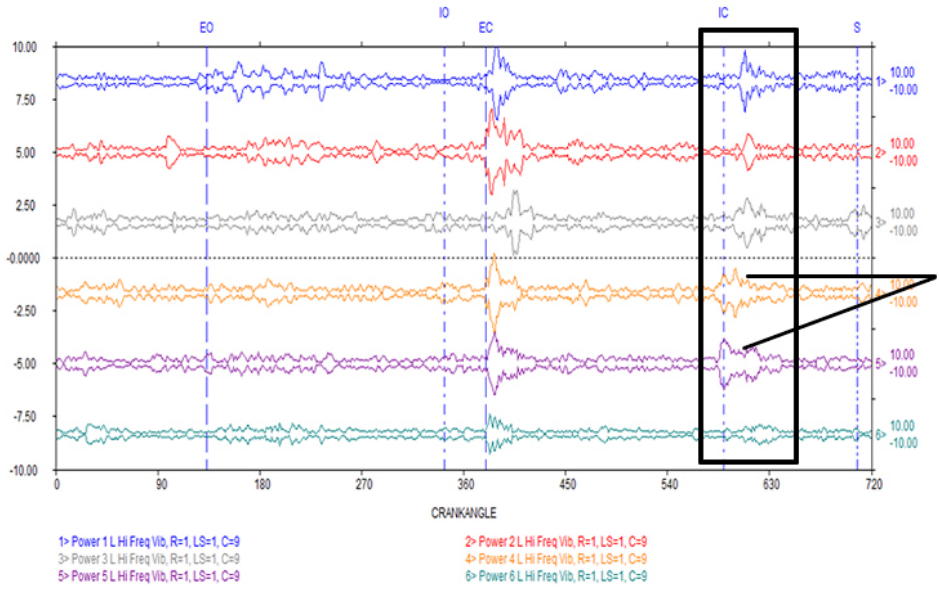


3L Probable Slight Ring Blow-By

3L Exhaust Valve Late Closure



4L & 5L Intake Recession Indicated

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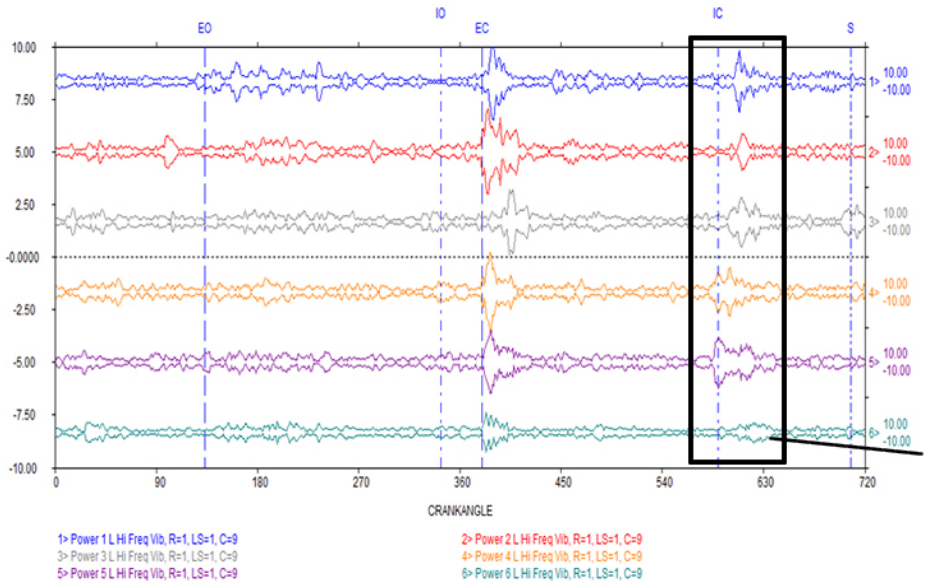

6L Late Closure (insufficient lash adjustment or sticking)

As you can see by looking at the above plots, comparing a healthy phased vibration pattern to a measured one can show problems in particular cylinders. A unit with deficiencies such as these is not running optimally. A main benefit of analyzing units on a regular basis is to obtain maximum reliability. In order to better learn how to analyze these traces to find mechanical problems, Windrock holds training courses throughout the year. Visit our website to find a course for you (www.windrock.com/training).

If you have additional questions about vibration patterns on high-speed engines (or any machinery) or would like information about another topic, please email **sales@windrock.com**.

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