

Leading Edge Spike Detection

by

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The AAR defines entry spikes or leading-edge spikes as follows (per AAR Rule 1E1 section d):

The “entry spike” at the beginning of the mount must not exceed 30 tons or three times the tonnage after the drop off, whichever is less.

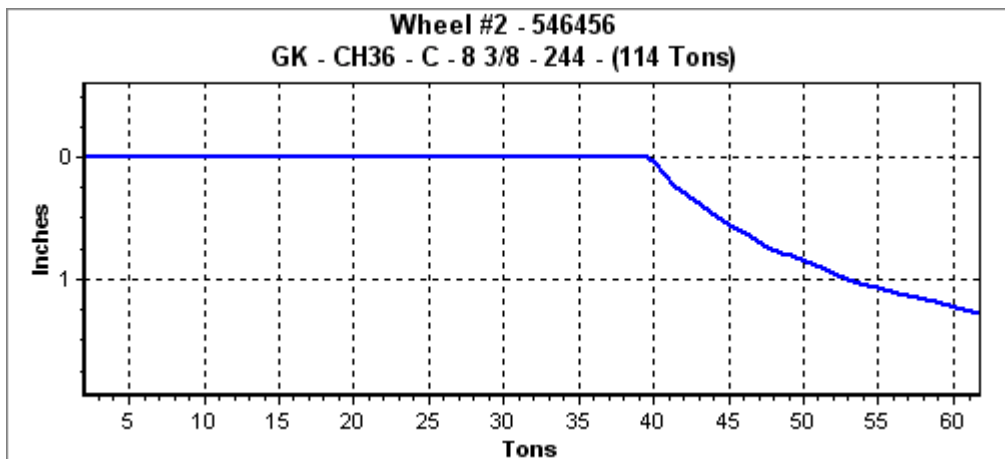
There is a lot of vagueness in the AAR definition. How is an “entry spike” defined in terms of pressure drop off? What is “the beginning of the mount” in inches?

The Wheel Press Recorder (WPR) samples the distance and tonnage every 0.1 seconds or faster. Therefore there is no “spike” per se because the WPR will see several steps where an Ashton Gauge might only see one step. Therefore to define a spike, we use distance to determine the width of the step.

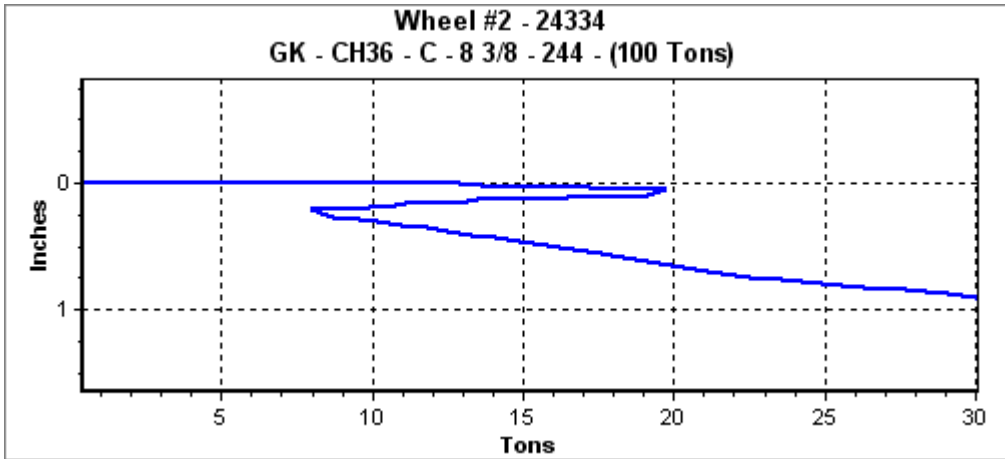
For purposes of detecting entry spikes, the Wheel Press Recorder program version 4.37 or greater will make the following definitions:

An “entry spike” or leading-edge spike will be detected as any drop in pressure exceeding 2 tons within a user-defined window of distance (the “beginning of the mount”). This lets the computer detect that a spike has occurred and then apply the AAR rules as stated above for determination of a misfit.

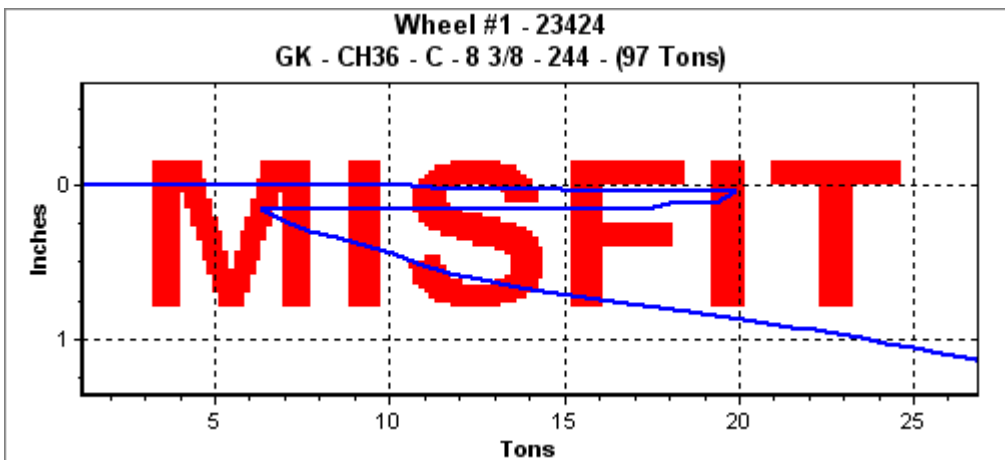
Sample Charts (zoomed to show the start of the mount in greater detail):



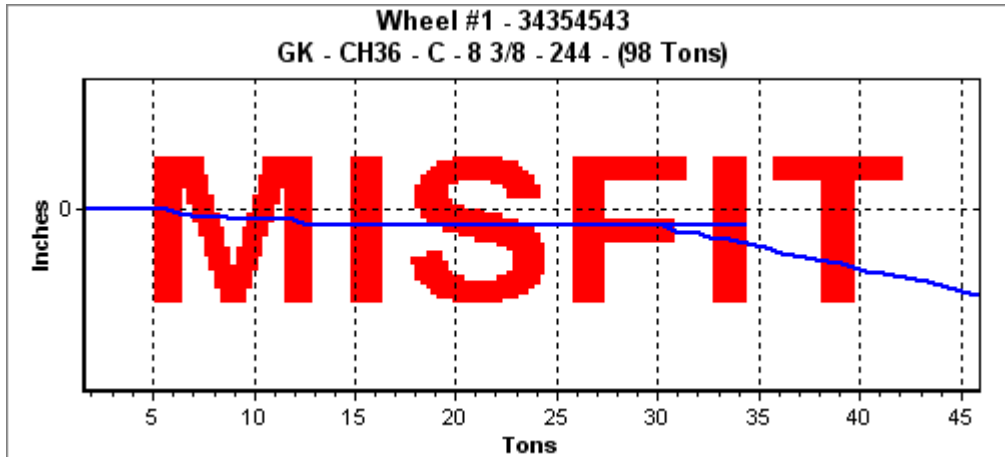
This is an acceptable mount per the above definitions as there is no drop off in pressure exceeding 2 tons.



This is an acceptable mount per the above definitions as the 20 ton spike peak is less than 3 times the drop off tonnage of 8 tons.



This is NOT an acceptable mount per the above definitions as the 20 ton spike peak exceeds 3 times the drop off tonnage of 6 tons.



This is NOT an acceptable mount per the above definitions as the 34 ton spike peak exceeds the 30 ton limit.

The sample charts above were made with a simulator and had "Spike Window Distance" set to 0.25 inches. Note that if Spike Window Distance were set to 0, then every sample mount except the first would have been misfitted as a Pressure Dip. This is because the Spike Window Distance also defines the starting point for Pressure Dip detection per AAR Rule 1E1 section b. Thus, if detection of Leading Edge spikes is not desired, then the detection should be disabled instead of manipulating the Spike Window Distance.

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