



PAC Racing Springs Technical Brief (PAC-Tech 001)

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Discussion objective:

Comparing actual frequency measurements of three types of outer valve springs impacted and measured for spring Natural Frequency.

Synopsis:

Take three different types of valve springs, specifically outer springs from an assembly and measure true natural frequency with a digital oscilloscope. The springs consist of a high rate dual drag race spring (sample A), a standard triple drag race spring (sample B), and a Top Fuel Titanium spring (sample C).

Measure the oscillation of the coils with a piezo-electric force transducer after impacted in a fixture. The data shows a primary impact and the secondary coil oscillations (natural frequency). The scope exports the data and calculates the frequency between the 10 cycles. Data was recorded at 100Khz sampling rate. The three graphs below show the differences in spring types and designs.

Summary:

Results differed significantly; the high rate dual spring showed the highest natural frequency with the outer of the Titanium spring assembly showing the least amount of frequency.

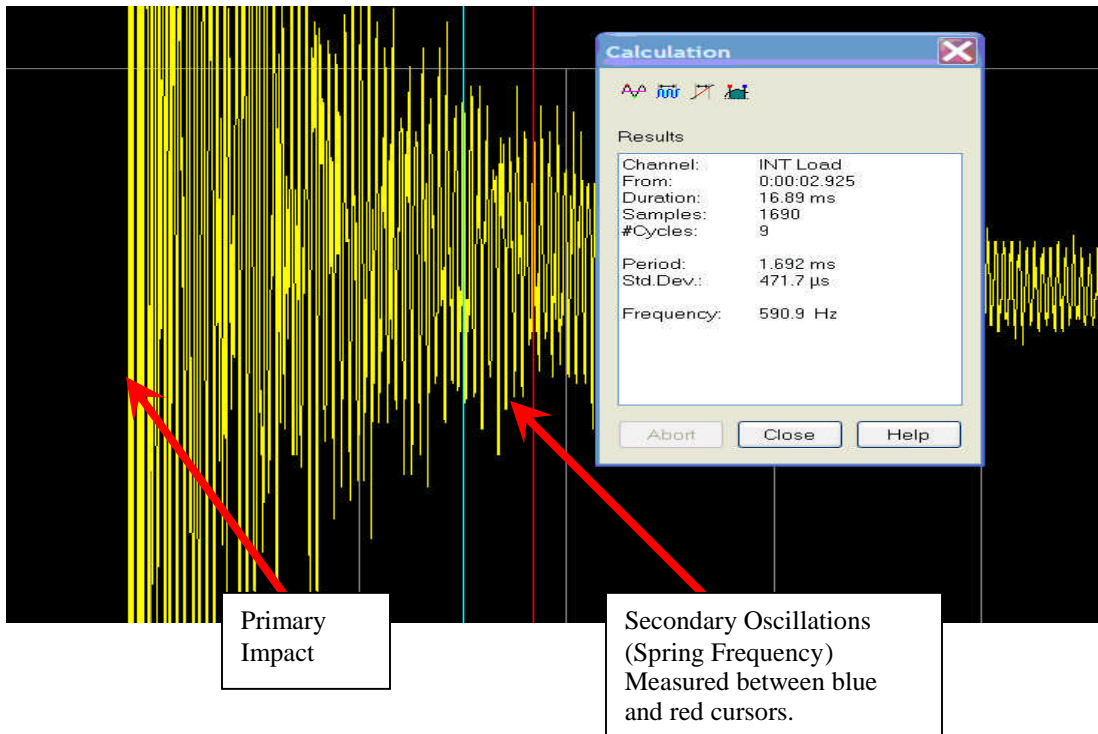
Sample (A) PAC-1354 High Rate Dual (outer) installed at 310lbs. @2.300 (590.9 Hz = 35,454 CPM)

Overall, a 10.4% increase above the standard triple outer spring and 17.4% increase in frequency over the titanium dual outer spring.

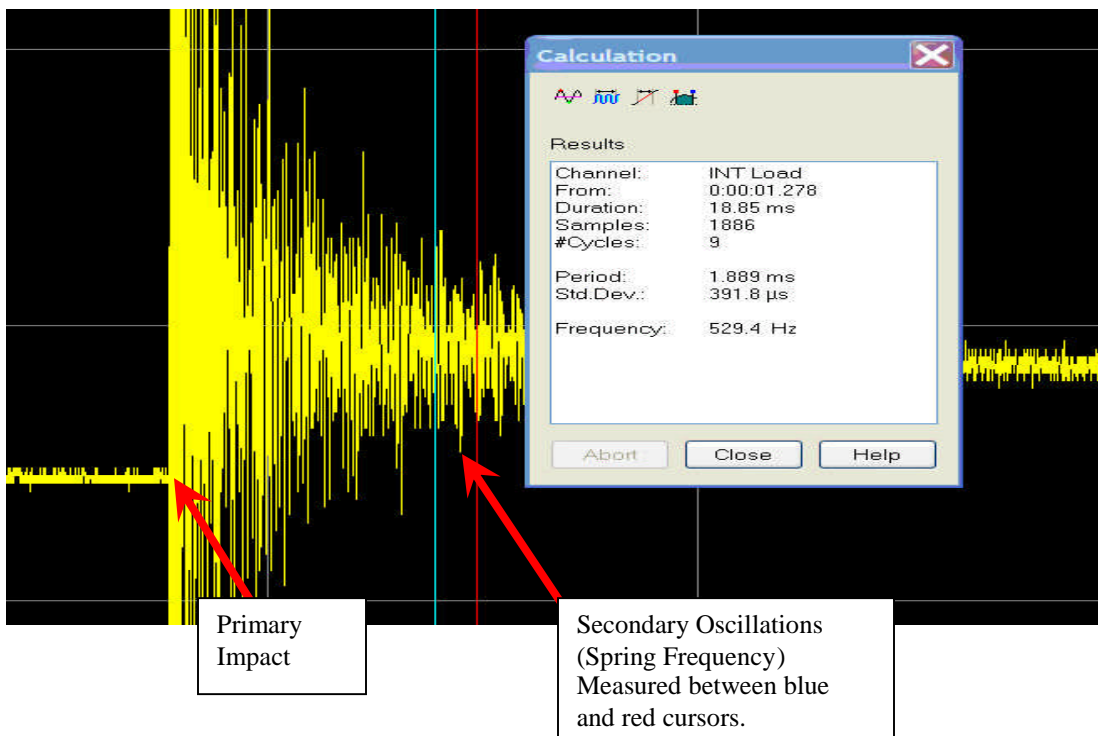
Sample (B) 1262 Standard Triple (outer) installed at 276lbs. @2.300 (529.4 Hz = 31,740 CPM)
A 4.9% increase in frequency over the Titanium dual

Sample (C) Top Fuel Titanium Spring (outer) installed at 163lbs. @2.300 (503.3 Hz = 30,198 CPM)

Sample (A) High Rate Dual Spring Assembly (outer spring PAC-1354) (590.9 Hz)



Sample (B) Standard Triple Spring Assembly (outer spring 1262) (529.4 hz)



Sample (C) Top Fuel Titanium Dual Spring Assembly (outer spring) (503.3 Hz)

