



Northern Engineering

Beaver Island Boat

Vibration Analysis Report – 9/27/2021

ABS Cert: 19-DUL3524128

Analysis By:
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Tim McQueer

MDOT has approved the contract for the shaft alignment/vibration analysis.

We visited the Emerald Isle on 9-22-2021 to perform inspection on Port and Stbd engines, gears, and shafts.

We used Equipment listed below:

CSI 2140 analyzer, Serial #B21401172703

CSI triaxial accelerometer 100 mv/g, Serial #P15190

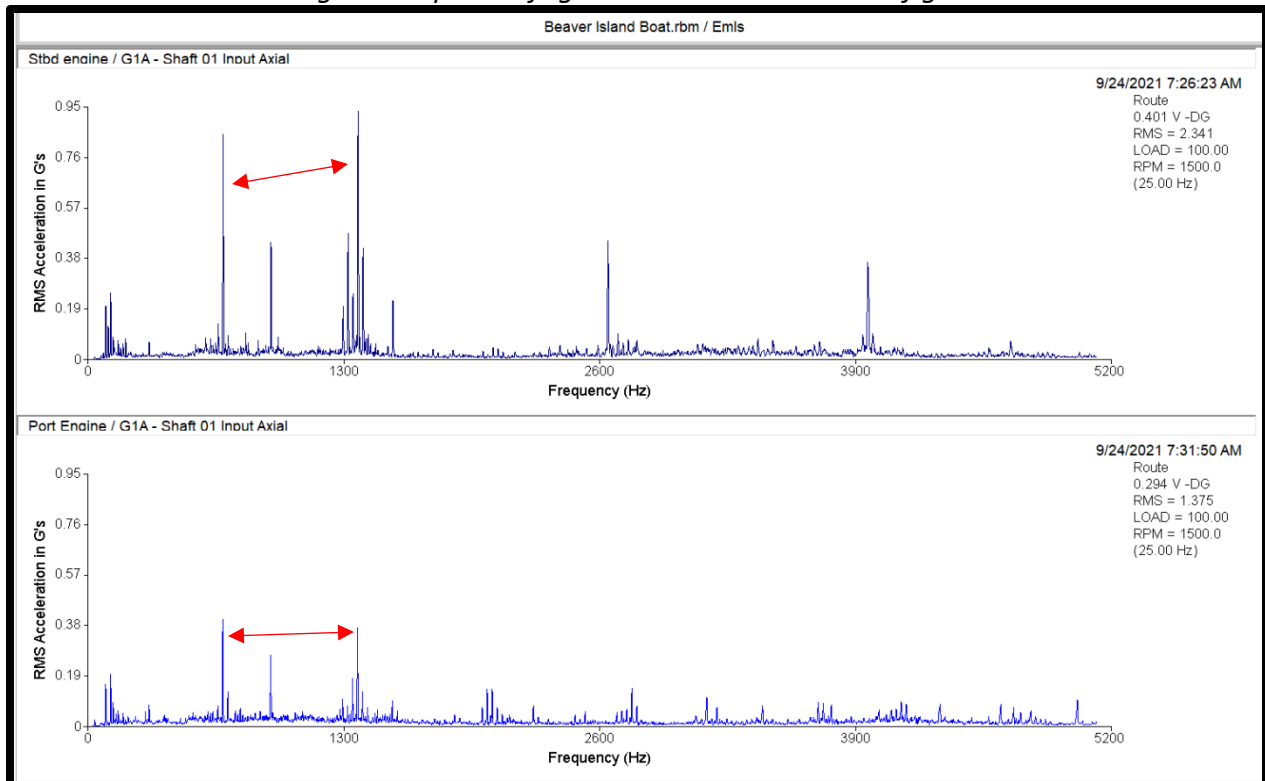
CSI single accelerometer 100 mv/g, Serial #P404462 & serial #965(right angle)

RDI Iris Motion Amplification camera

We collected vibration data on the way out to the Island and here are the findings.

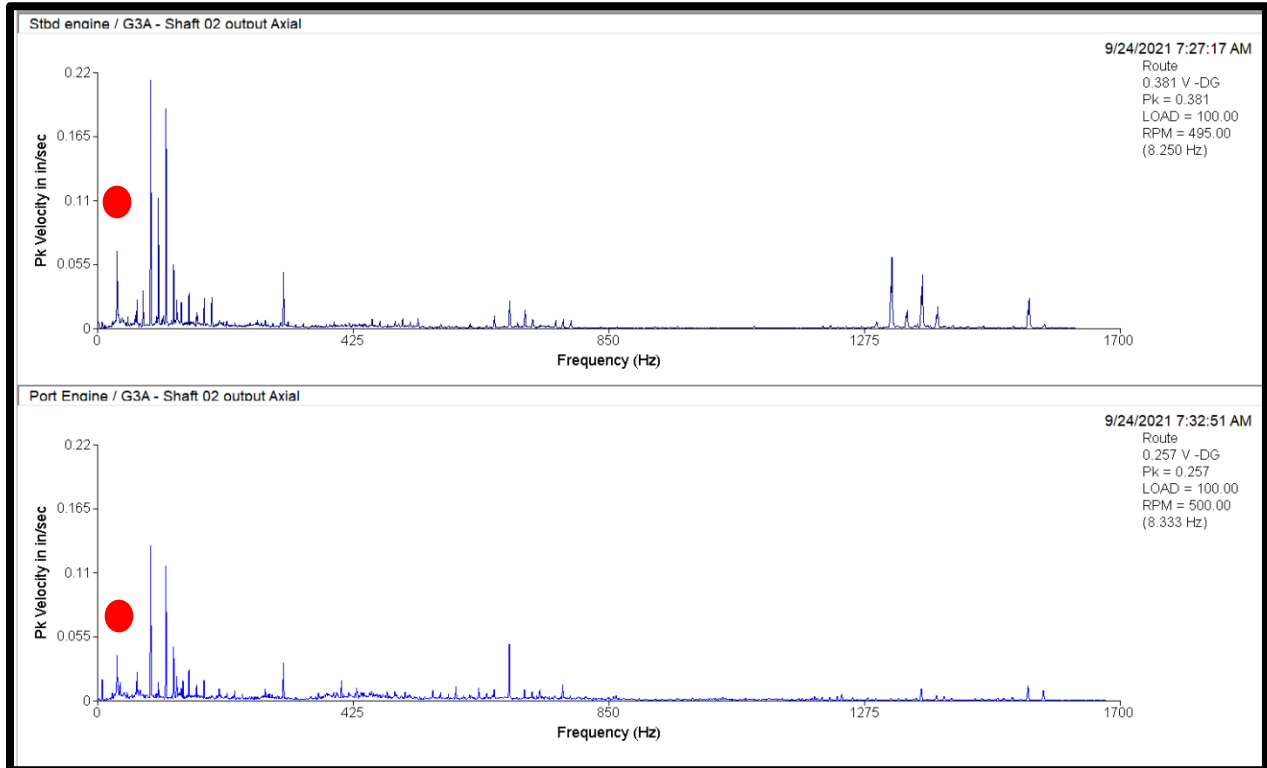
The axial reading is higher on the STBD engine and marine gear.

*This is both engine axial reading and you see it is higher on STBD side. (Stbd .95 Gs) (Port .42 Gs)
The red lines are marking the output shaft gear mesh and harmonic of gear mesh.*

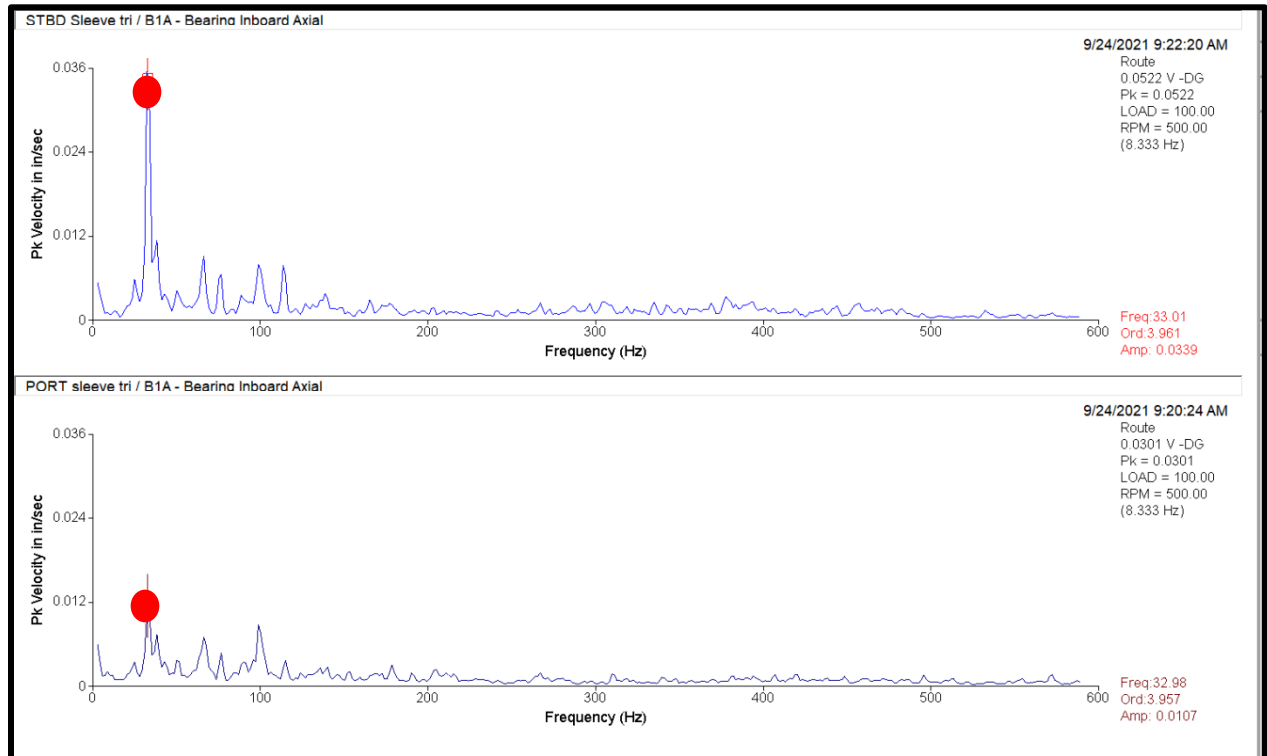


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These are the axial readings of both gears and the highest is on the STBD side. Blade pass is the red mark.



These are the readings taken in the FWD lazarette over sleeve bearing. Blade pass is red mark.



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When we got to the island, we checked alignment and runout on each shaft.

Port side coupling readings with feeler gauge are all less than .002.

.007 on top

.007 on Starboard

.006 on bottom

.006 on port side

Runout by the seal on the shaft was .002.

Starboard side coupling readings we were not able to get. The coupling was stuck and would not come off with using the same force if not more as the port side.

Runout by the seal on the shaft was .005.

The axial reading on the Starboard machine train could possibly relate to angular misalignment and /or a bent shaft. The extra thrust on this side will also have more wear on gears and bearings in the marine drive.

Recommend

Investigate the Starboard shaft and coupling on why this is not coming apart, and/or which might include pulling shaft.