

Comparison of Air Isolation with Rubber Isolation of a Diesel Generator

The mounting scheme of one of the gensets onboard SY-X was converted from traditional rubber isolation to DEICON's 'Computer Controlled Air Isolation System'. The vibration isolation effectiveness of DEICON's system was assessed by measuring the acceleration across one of the mounting feet of the genset and compared to the same measurement done on the rubber-mounted genset installed next to the air mounted one. These two gensets were running, one at a time, during this measurement.

Spectrums of the two acceleration measured on the top (blue trace) and bottom (red trace) of one of the air mounts are shown in Figure 1(a). Clear from Figure 1(a), DEICON's system lowers the transmitted vibration from the genset to the hull by 35+ dBs, especially at low frequencies which are more readily perceived by human body. Figure 1(b) depicts the same measurements on the same mounting foot of the neighboring rubber-isolated genset. Clear from this figure, the air mounting scheme delivers more than ~25 dBs in low frequency isolation performance (in terms of lowering the transmitted vibration) as the rubber mounting scheme. Considering that every -3 dB indicates reduction in vibration power by half, then ~25 dBs of additional transmissibility reduction of air isolation over rubber isolation is equivalent to 8 times (800%) more isolation effectiveness of air over rubber.

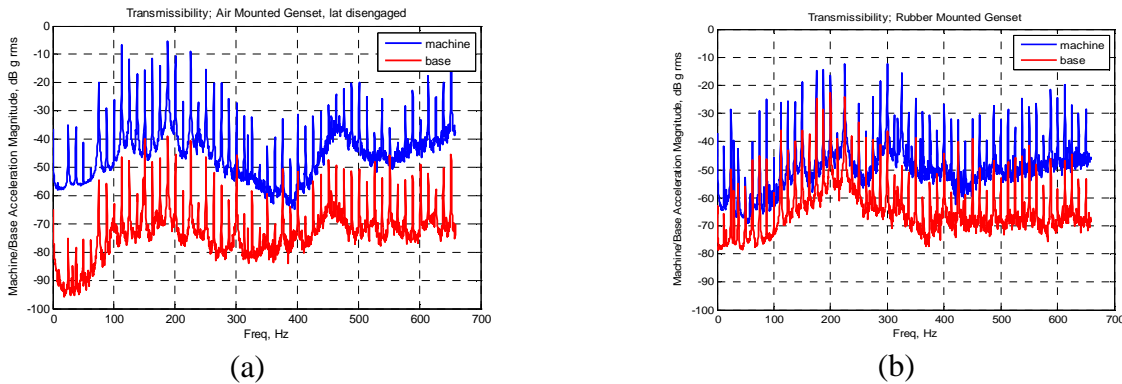


Figure 1 Spectrum of acceleration measured across the mount at one of the mounting feet of the air mounted genset (a) and at the same mounting foot of the rubber mounted genset (b)

Lowering the transmitted vibration from the gen-set to the structure of the yacht, lowers the input energy to the structure and thus lowers the transmission of vibration energy to the deck and other areas. Figure 2 shows the spectrum of acceleration, both in dB scale and linear scale, measured on the deck with the air-isolated st bd genset and rubber-isolated middle genset running, one at a time.

It should be noted that in addition to the mounting arrangement of each genset, the structural layout of the hull underneath that genset influences the transmission of genset vibration to the yacht. Nevertheless, clear from Figure 2, the vibration transmitted from the air-mounted genset (the red traces in both figures) is substantially lower than that transmitted vibration by the rubber-isolated middle genset (the blue traces in both figures).

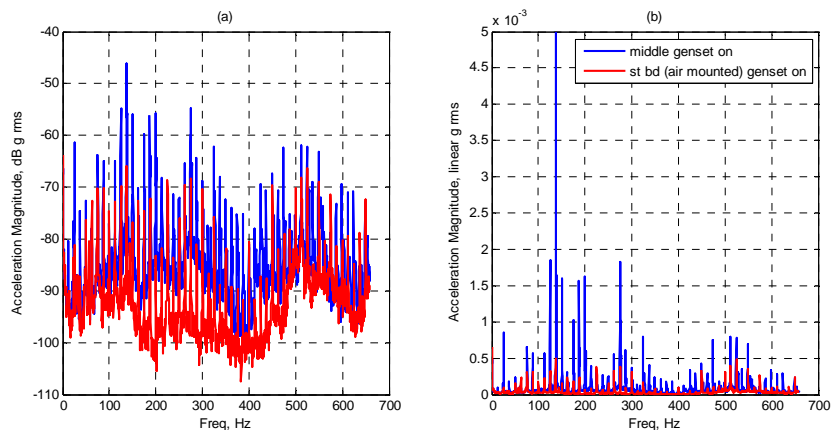


Figure 2 spectrums of the acceleration in dB scale (a) and linear scale (b) measured on the deck with the air mounted and rubber mounted gensets running, one at the time