

Comparison of Air Isolation with Rubber Isolation of a Diesel Generator

The mounting scheme of one of the Diesel generators onboard a 60 m superyacht was converted from traditional elastomeric 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 Diesel generators were running, one at a time, during this measurement. Spectra 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).

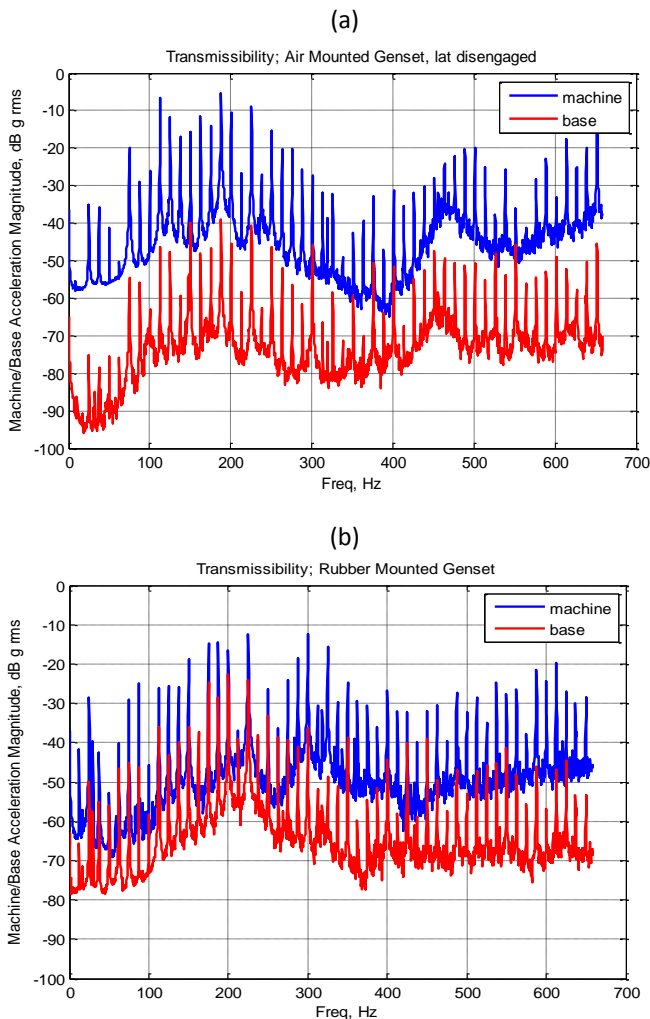


Figure 1 Spectra of acceleration measured across the mount at one of the mounting feet of the air mounted Diesel generator (a) and at the same mounting foot of the rubber mounted Diesel generator (b)

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 is 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 in excess of ~25 dBs in low frequency isolation performance (in terms of lowering the transmitted vibration) than 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.

Lowering the transmitted vibration from the Diesel generator 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 (a) and linear scale (b), measured on the deck with the air-isolated and rubber-isolated Diesel generators running, one at a time.

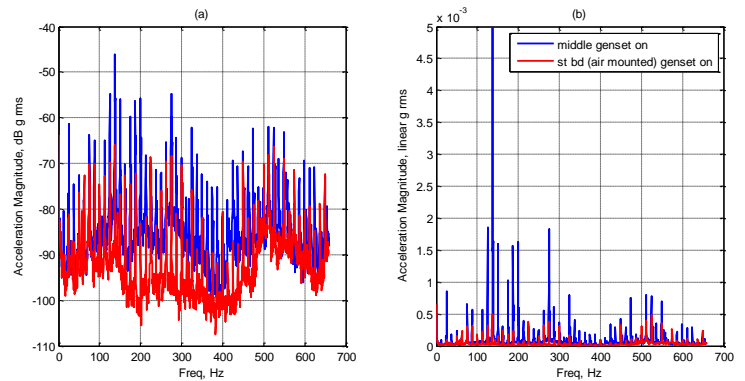


Figure 2 spectrums of the acceleration in dB scale (a) and linear scale (b) measured on the deck with the air mounted and rubber mounted gensets running, one at the time

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