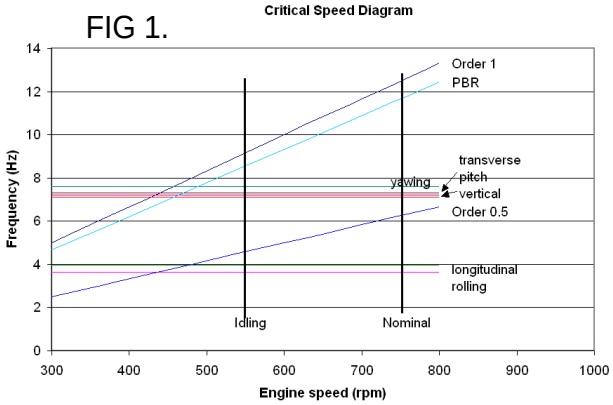
MAIN & AUXILIARY ENGINE SUSPENSION

Vibracoustics Ltd engineers in co-operation with Wartsila Vasa, designed and supplied both the main and auxiliary engine suspension systems for M/S Crown Jewel, operated by Crown Cruise Line of the USA and built by Union Naval de Levante of Spain. Four Wartsila Vasa 8R32 medium speed engines driving two C.P. propellers via flexible couplings into twin input / single output reduction gears provided the power. Each engine was mounted on a Vibracoustics Ltd 'Vee' arrangement (see data sheet 60-A-01, Product Group 60), consisting of ten VRD35L1** mountings and four VRD35S0** end mounts.

FIG 1.

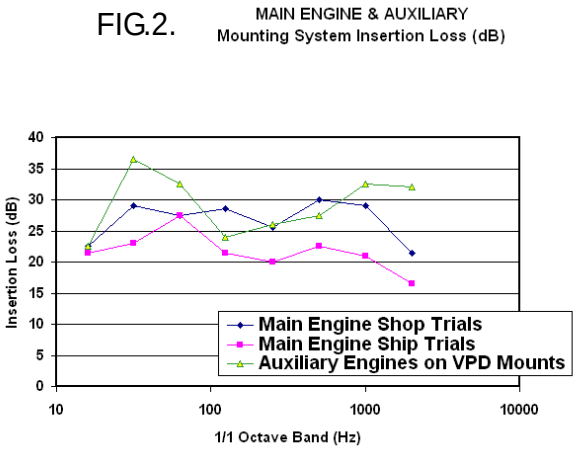


The suspension natural frequencies were designed to lie between engine half and first order with the roll and longitudinal frequencies placed below engine half order but above propeller shaft speed (see Critical Speed diagram Fig. 1).

Natural frequencies measured by Wartsila during shop trials were in excellent agreement with calculated values, confirming both the accurate inertia predictions and the narrow stiffness tolerances to which all Vibracoustics 'VRD' mountings are manufactured.

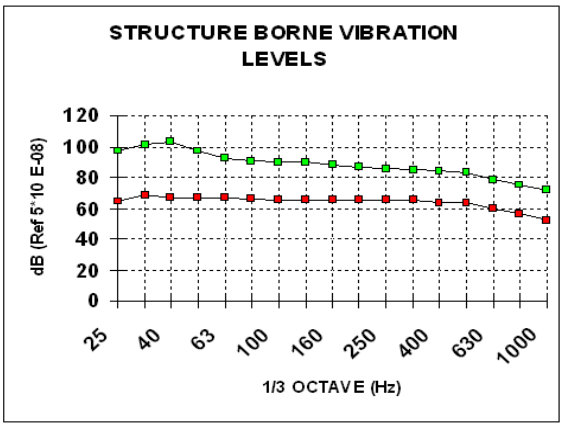
In addition to natural frequency measurements, vibration velocities above and below the mountings in shop tests and on sea trials were recorded (see Fig. 2). Both results were excellent, however shop test insertion loss values were higher at all frequencies, a fact which highlights the significant influence seating impedance has on achievable isolation performance.

FIG.2.



The Auxiliary generating sets were powered by 2 x 6R32 and 2 x 4R32 Wartsila Vasa engines running at 720 rpm. Each was installed on an arrangement of Vibracoustics VP8¼D mountings (Product Group 57) and again the measured natural frequencies were in good agreement with predicted values. The approximate insertion loss measured on sea trials approached and exceeded 25dB in all octave bands and indeed exceeded 30dB in several (see also Fig 2).

FIG 3.



In addition to the frequency measurements, Wartsila Overall levels achieved on the ship were 45.2dBA average in the cabins and 55.2dBA average in the public areas whilst structure borne vibration levels were only 1.5 mm/sec r.m.s. under rated conditions.

Similar Vibracoustics main engine suspensions using 'VRD' mounting (Product Group 60), are operating successfully in Ro-Ro, Fishing, Ferries, Cruise and Research vessels. Typical performance, recorded above and below engine mountings on a Ferry installation is shown in Fig. 3.The Vibracoustics 'Vee' suspension is particularly effective in the 25Hz to 63Hz Octave range when compared to conventional mounting arrangements.

Vibracoustics Limited, Prestwold, Loughborough Leicestershire. East Midlands. LE12 5SH.
Tel: +44(0)1509 881333 Fax: +44(0)1509 881662 E-mail: mail@vibracoustics.com Website address : www.vibracoustics.com