Mechanical Looseness

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Mechanical Looseness is indicated by either type A, B or C spectra. Type 'A' is caused by structural looseness/weakness of machine feet, base plate or foundation, also by deteriorated grouting, loose hold-down bolts at the base and distortion of the frame or base (i.e Soft Foot). Phase analysis may reveal approx. 180° phase difference between vertical measurements on the machine foot, base plate and base itself. Type 'B' is generally caused by loose pillow block bolts, cracks in the frame structure or bearing pedestal. Type 'C' is normally generated

by improper fit between component parts which will cause many harmonics due to non linear response of loose parts to dynamic forces from the rotor. Causes a truncation of time waveform. Type 'C' is often caused by a bearing liner loose in its cap, excessive clearance in either a sleeve or rolling element bearing or a loose impeller on a shaft. Type 'C' phase is often unstable and may vary widely from one measurement to the next, particularly if the rotor shifts position on the shaft from one start-up to the next. Mechanical looseness is often highly directional and may cause noticeably different readings if you compare levels at 30° increments in the radial direction all the way around one bearing housing. Also note that looseness will often cause sub harmonic multiples at exactly 1/2 or 1/3 x rpm (.5x, 1.5x, 2.5x etc.)