

MISALIGNMENT & VIBRATION



MISALIGNMENT = Occurs when the geometric centerline of two coupled shafts are not collinear along the rotation axis of both shafts.

DETECTION TIPS:

To distinguish misalignment from unbalance:

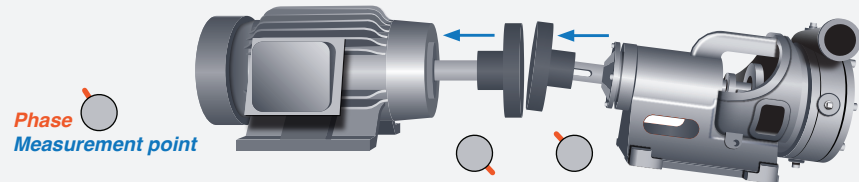
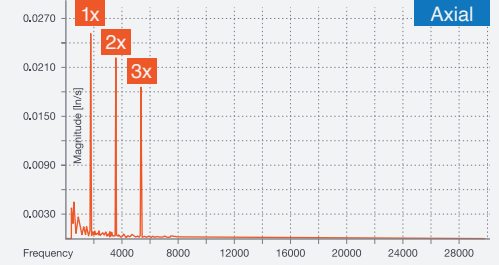
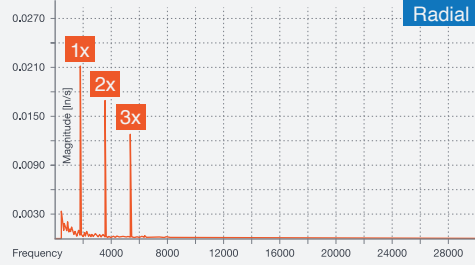
If the coupling side bearings on each machine are essentially 180° out of phase, it is almost certainly a misalignment issue.

If the horizontal and vertical phase at the same bearing are essentially in phase or 180° out of phase, misalignment is highly likely.

Soft foot indication:

A soft foot condition induces a distorted motor frame resulting in abnormally high 2x line frequency vibration.

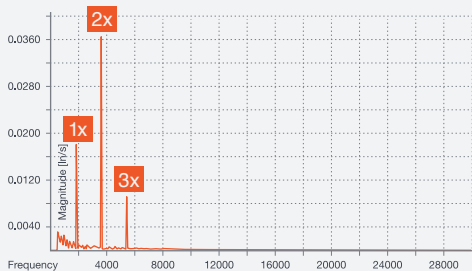
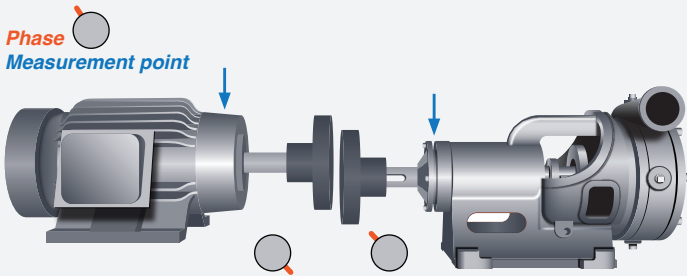
ANGULAR MISALIGNMENT



Axes of the shaft centerlines cross each other at one point.

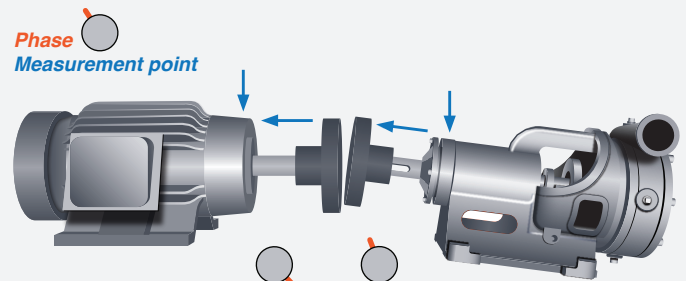
- High axial vibration and amplitude at 1x.
- 180° phase change with harmonics at 2x and 3x.

OFFSET MISALIGNMENT



- Higher Harmonics mean severe offset misalignment.
- High radial vibration at 2x with a lower 1x.
- Similar symptoms to angular misalignment.

COMBINED MISALIGNMENT



- In practice, alignment faults will most often show a combination of offset and angular misalignment.
- Diagnosis may show both 2x and an increased 1x signal in the axial and radial readings.