Orbit Magazine

Throwback Thursday :: Shaft Position Changes

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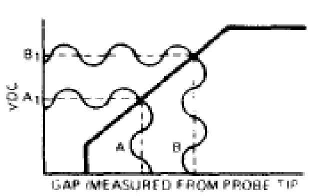
Bently Nevada has a rich history of machinery condition monitoring experience and has always placed a high priority on educating and helping customers manage & maintain their equipment better. Every week, an article or Application Note that was published by Bently Nevada ‘back in the day’ will be highlighted. Although the format may be dated, the information is just as valid and informative as the original printing.

Originally published in 1988.

SHAFT POSITION CHANGES REVEAL MACHINERY BEHAVIOR AND MALFUNCTIONS

The use of proximity transducers has gained universal acceptance for measuring the dynamic motion (p/p mils vibration) of rotating machinery. An equally important parameter in determining the mechanical integrity of a rotating system involves the capability of measuring shaft position with respect to a known reference. Since the proximity transducer is essentially a DC VOLTAGE vs. GAP detection system, the shaft position measurement is provided along with the dynamic motion measurement

Example Typical Output Of Proximity Transducer System



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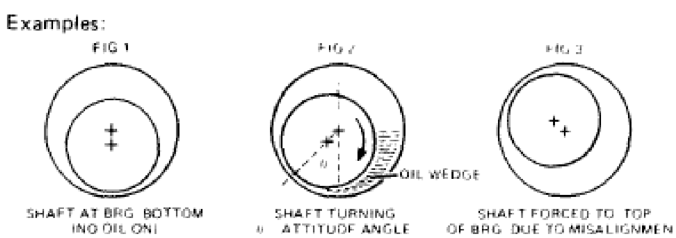
An initial gap is shown at point A on the graph. This gap setting will yield a corresponding DC voltage (A 11 output from the proximity system. Dynamic motion (p/p mils vibration at about point A will yield at time varying sinisoidal voltage changes about the quiescent DC voltage A1. If the conductive surface moves away from the transducer to a gap position B, the proximity system will yield a corresponding DC voltage change to B 1.The dynamic motion at gap position B may be at the same level as position A. However the location of the observed surface has significantly changed.

Practical applications of this measurement capability are as follows:

1. Determine shaft attitude angle in a hydrodynamic bearing
2. Determine the direction of unidirectional preloads such as misalignment
3. Determine final position of a shaft tn a bearing to provide insight or forewarning of bearing instabilities such as oil whirl or oil whip.
4. Determine the position of a thrust collar relative to the thrust bearing.
5. Determine excessive bearing clearance or wear.
6. Determine the amount of bearing babbitt deterioration due to electrostatic discharge.



This measurement capability is provided only by a proximity transducer system observing shaft motion. Casing seismic transducers or shaft-riding (contact) type transducers DO NOT provide any information regarding the position of the rotating element.

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