

Interpreting Unbalance Using Relative Motion Diagrams

1. Determine the end-to-end phase difference in the vertical direction.
2. Determine the end-to-end phase difference in the horizontal direction.
3. Compare the results of steps 1 and 2. *If the results are similar, unbalance should be suspected.*

Once unbalance is suspected, the following steps are used to confirm the analysis:

4. Determine the vertical to horizontal phase difference at the left bearing.
5. Determine the vertical to horizontal phase difference at the right bearing.
6. Compare the results of steps 5 and 6. *If the results are similar either 90° or 270° unbalance should be suspected. The phase differences on each end should also be the same. (i.e., both 90° or both 270°)*
7. Determine the end-to-end amplitude ratio in the vertical direction. Round to the nearest whole number.
8. Determine the end-to-end amplitude ratio in the horizontal direction. Round to the nearest whole number.
9. Compare the results of steps 7 and 8. *If the ratios are similar, unbalance is confirmed.*
10. Compare the axial amplitudes to the radial amplitudes at each bearing. *If the axial amplitudes are less than $1/3^{\text{rd}}$ of the radials then unbalance is confirmed.*
11. Compare the axial phase relationships with the radial end-end phase relationships. *If the radial data is closer to in-phase and the axial data is in-phase then unbalance is confirmed. If the radial data is closer to 180° out-of-phase and the axial data is out-of-phase then unbalance is also confirmed.*
12. Compare the axial amplitudes to the radial amplitudes at each bearing. *If the axial amplitudes are less than $1/3^{\text{rd}}$ of the radials then unbalance is confirmed.*
13. Compare the axial phase relationships with the radial end-end phase relationships. *If the radial data is closer to in-phase and the axial data is in-phase then unbalance is confirmed. If the radial data is closer to 180° out-of-phase and the axial data is out-of-phase then unbalance is also confirmed.*