

## ***Interpreting Misalignment Using Relative Motion Diagrams***

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To determine the end-to-end shaking motion perform the steps below:

- Step 1: Determine the end-to-end phase difference in the vertical direction for the driver.
- Step 2: Determine the end-to-end phase difference in the horizontal direction for the driver.
- Step 3: Determine the end-to-end phase difference in the vertical direction for the driven machine.
- Step 4: Determine the end-to-end phase difference in the horizontal direction for the driven machine.
- Step 5: Compare the results of steps 1 and 2. *If the results are different, misalignment should be suspected.*
- Step 6: Compare the results of steps 3 and 4. *If the results are different, misalignment should be suspected.*
- Step 7: Compare the results of 1 through 4. *If at least three out of the four end-to-end shaking modes equals approximately  $0^{\circ}$  or  $180^{\circ}$ , then misalignment is suspected.*

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

- Step 8: Determine the Vertical to Horizontal phase difference at the left bearing.
- Step 9: Determine the Vertical to Horizontal phase difference at the right bearing.
- Step 10: Compare the results of steps 8 and 9. *If the results are NOT  $90^{\circ}$  or  $270^{\circ}$ , misalignment should be confirmed. If the phase differences on each end are different, misalignment should be confirmed.*
- Step 11: Determine the end-to-end amplitude ratio in the vertical direction. Round to the nearest whole number.
- Step 12: Determine the end-to-end amplitude ratio in the horizontal direction. Round to the nearest whole number.
- Step 13: Compare the results of steps 11 and 12. *If the ratios are different, misalignment is confirmed.*