

The results demonstrate that the 1X and 2X components in axial and radial vibration signal are clearly detectable. The combination of the 1X and 2 X components in axial (Fig.16-a and b) and radial vibration (Fig.16-c and d) indicates the presence of misalignment and load imbalance, as expected.

6. Conclusion

This paper has dealt with the design and the developmental aspects related to a low cost vibration sensor. To improve the characteristic signal detection capability in the acceleration signal, a new noise cancellation algorithm using auto-correlation function and adoptive threshold based filters is developed in this paper.

The potential of the proposed signal processing technique has been assessed under different operating and fault conditions, in order to extract the fault feature frequencies of the weak fault signals in the presence of strong noise. These methods have been proved to be very effective for filtering the periodic, white Gaussian and random noise in real-time acceleration signals.

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