



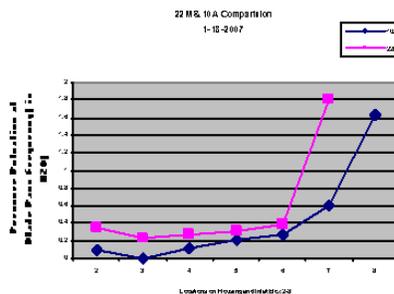
# Air Pulsation



- Early warning signs of broken gear teeth are subtle but can be found with the right tools.
- Replacing parts that are about to fail saves everyone from unnecessary headaches.

## Ventilation Fans

Fan induced vibration from a blade pass can cause structure components to move causing fatigue damage. The extent of damage that can be done can range from an annoying "rattling" to a large scale movement. Using root cause analysis Robinson Fan Company was able to pinpoint the problem using air pulsation analysis.



The basic cause is static pressure variations (air pulsations) that are only found in the housing. What can cause these irregularities are the angle of attack on the fan blades, upstream of airflow into the fan outlet, one side of the structure is weaker than the other and fan dampener settings. However the fan can be monitored to prevent any unpredicted failures to occur.

The unit can be monitored using air pulsation analysis. Air pulsation analysis includes the placement of the sensor in both upstream and downstream areas of the fan impellers over small holes predrilled by the fan manufacturer. Air pulsation analysis is measured around a blade pass frequency in which the results of each analysis are then charted to trend static pressure variations at each point as seen to the right.

What we use in our comparison chart is another fan that is similar in construction with the overall readings. If another fan is not available of the same make-up, we would use a waterfall spectrum that can be generated so we can give the customer a comparison to trend over time the change.

If a problem was detected on the fan housing area we would determine at what location was the highest overall reading recorded. Usually if the fan pulsation has indications of high readings on an inlet point area, it is usually an induced draft or forced draft (uneven airflow). The corrective action would be taken to determine where the secondary flow exists and placing a vortex breaker to destroy the secondary airflow.



*This picture shows the cracks found in the fan housing*

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