



A Leader in Electric Motor Testing

Tip Of The Week

July 8, 2019

Electric Motor Reliability Trifecta - Troubleshooting (Part 2)

(Continuing the Trifecta series, picking the top three finishers in a horse race can be worth a lot of money. Applying the Trifecta theme to motor reliability, the top three applications of test technology to ensure you win big in reliability are: Quality Control, *Trending, and Troubleshooting.*) This week we continue the Trifecta conversation of Troubleshooting.

The last tip focused on troubleshooting the power circuit and power quality fault zones of a running motor. This week we assume the power circuit and power quality have been cleared and shift our troubleshooting to the motor and machine train with the motor still running. The fault zones specific to the physical motor are the stator, rotor and airgap. A five second EMAX Power Test can give you three phase impedance measurements to flag or clear the stator fault zone. Although standard caution setpoints exist for impedance imbalance it is important to remember these alarms are based on a loaded motor. Unloaded or lightly loaded motors will produce higher impedance imbalances and similar loading from history should be used for comparison.

In less than a minute the EMAX Rotor Eval and Eccentricity tests produce time domain and spectrum graphs to identify anomalies with the rotor and airgap. Steady state loading is a primary interest with these tests in that a varying load will smear the spectrum plot making the data difficult to analyze. Analysts prefer heavier loads, due to the higher slip increasing the stress on potentially cracked or broken rotor bars. However, don't be afraid of light loads for comparison to previous tests at similar loading.

Finally we shift our focus to the machine train because as electricians often say, "It's not always the motor." Many machine train anomalies reflect directly onto the power being fed to the motors and can be seen clearly on the EMAX Current Demodulation test. Fan blades, gears, belts, etc., can be identified and marked with band alarms for comparison to historical readings on a convenient waterfall plot. Default band alarms for these shaft line components do not exist so talk to your vendor to discuss recommended changes from baseline to establish your band alarms. Discussing amplitude changes in machine train frequencies with the vibration department at your facility will allow for cross technology verification of possible anomalies and more accurate asset health assignments.

Visit our PdMA YouTube Channel at <https://www.youtube.com/watch?v=4ACW-AZddtQ> to listen to Todd and Noah discuss details on Troubleshooting for electric motor reliability. The next tip, Troubleshooting (Part 3), will discuss the considerations for troubleshooting a motor that is not running.

You are invited to submit an Electric Motor Testing Tip of your own and receive a free PdMA® mug or hat if we publish it! Contact Lou at 813-621-6463 ext. 166 or lou@pdma.com.

Copyright 2019 PdMA® Corporation. All rights reserved. The PdMA Tip of the Week is produced by PdMA. PdMA shall not be liable for any errors or delays in the content, or for any actions taken in reliance thereon.