



A Leader in Electric Motor Testing

# Tip Of The Week

July 29, 2019

## Electric Motor Reliability Trifecta - Troubleshooting (Part 4)

*(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.)* The final tip of the Trifecta series will focus on Troubleshooting a de-energized motor.

Part 3 of Troubleshooting focused on the power circuit, insulation, and stator fault zones. This week we look at troubleshooting techniques and considerations on a de-energized motor for the rotor and air gap fault zones. One of the measurements taken during the five minute MCE® standard test is inductance, and with the three phases of inductance, inductive imbalance is calculated. Different rotor positions will change the reflected impedance onto the stator windings changing the inductance measurement uniquely for each phase of the stator winding. However, because of the nature of a three phase balanced system, inductive imbalance should not change and a steady inductive imbalance is a healthy sign. Although stator phase inductance readings rise and fall for each residual field passing the stator phase, rising trends in average inductance are indicative of developing rotor anomalies such as broken, cracked, or high resistance rotor bar and end rings. Performing a detailed Rotor Influence Check (RIC) shows phase resistance measurements for each predefined degree of rotation of the rotor giving a graphical representation of the residual rotor magnetic field. The RIC will allow confirmation of the source of inductance changes as coming from the rotor or stator making the troubleshooting effort much easier. Additionally, the RIC test will allow the analyst to identify air gap offsets due to a larger air gap causing a reduction in the inductance values.

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.

*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](mailto:lou@pdma.com).*

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