



A Leader in Electric Motor Testing

# Tip Of The Week

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## Slip Sliding Away

Ever hear the term “good engineering practice”? Understanding exactly how things happen in your equipment really helps when trying to understand the why behind some of the things you should be doing such as reversing the polarity of your slip rings on AC generators and synchronous machines.

Electrolytic action is the number one cause of slip ring wear. Slip ring wear is greatest when the slip ring polarity is more positive in relation to the carbon brush. This occurs in the following instances:

- During shut down when the brushes are left in contact with the slip ring. This is one reason most technical documentation for your machine will recommend the brushes be lifted if the unit will be idle for an extended period. When shut down the brush is always negative with respect to the slip ring material.
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- During operation when a brush has a negative polarity, the slip ring will always be less negative than the brush because of the contact voltage drop between the two.

In both cases water vapor provides the electrolytic medium for electrolytic effects between the brush and slip ring. Current transfer from the electrolytic effect is accomplished when soluble metal ions on the slip ring surface go to the brush, and hydroxide ions move to the metal ring. This process results in a continuous loss of slip ring material. When the slip ring is negative and the brush is positive, current transfer is accomplished when hydrogen atoms from moisture move to the slip rings and hydroxide ions move to the carbon brush. This means that no slip ring base material is lost and the ring develops a healthy film.

So, how do you even out your slip ring wear in AC generators and synchronous machines? Follow the manufacturer’s recommendations for reversing brush polarity at regular intervals. If you do not have recommendations from your equipment’s manufacturer you will need to perform regular inspections and over time develop your own interval that works best for you.

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. 126 or [lou@pdma.com](mailto:lou@pdma.com).

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