

### SLIP RING AND SLIP RING BRUSH MAINTENANCE

SensorData has developed an empirical relationship for determining the time in hours for their slip ring brushes to wear to within 20% of their original length. At 20% the brush spring can no longer be relied upon to maintain enough brush tension to assure good electrical contact with the slip ring. With two (2) brushes per ring that operate at less than 2500 SFM, the rings should maintain a dynamic contact resistance of less than 10 milliohms. The brush life relationship is based on actual field conditions and laboratory testing. Ideal conditions were assumed, i.e., rotation under 2500 SFM, operating temperature under 200 F, and a contaminate free atmosphere. The relationship is:

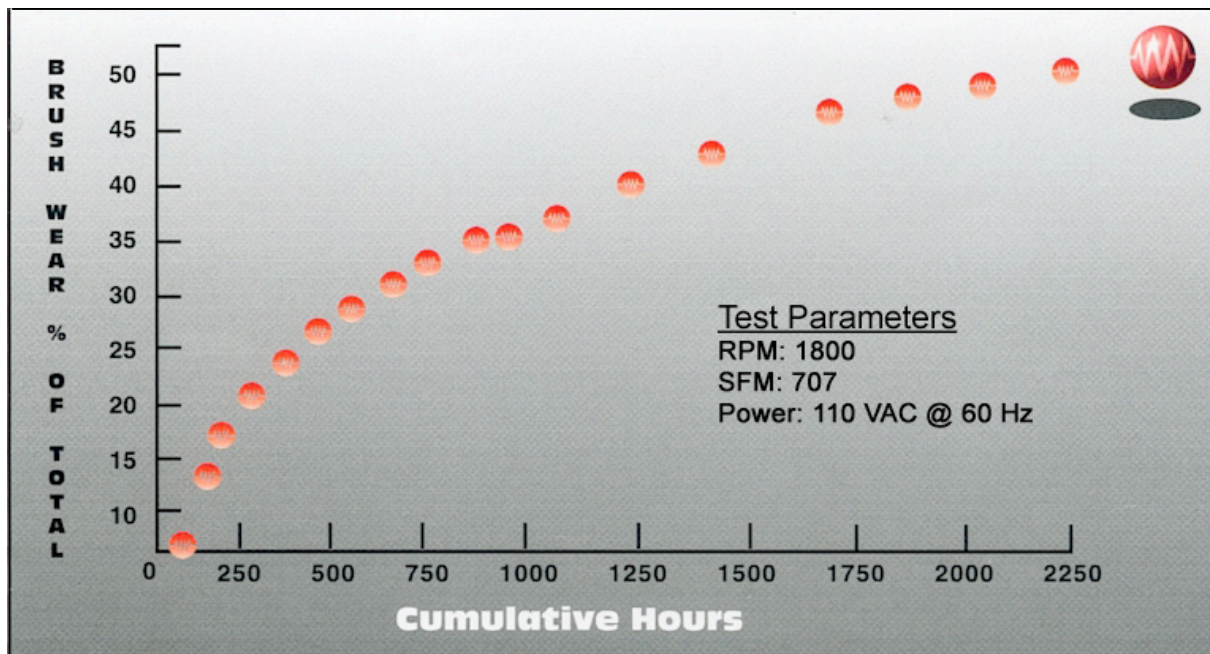
$$\text{Brush Wear; Hrs to 80\% of Total} = \frac{15.5 \times 10^6}{\text{RPM}}$$

A build-up of brush particulate on the rings can effect the quality of the millivolt signal from the strain gage bridge. Removal of the brush particulate is accomplished by removing the brush block assembly and directing filtered shop air on the rings. The brushes have very little transverse strength, and can be damaged if an air stream with excessive force is applied directly to the brushes.

If the slip ring sensor is operated upside down brush particulate can deposit in the receptacle's connector block and short the receptacle's electrical connections. In this case the receptacle should be removed and filtered shop air used to clean the electrical connections and connector block. A solvent wash is not recommended for cleaning brush particulate, since the natural sloughing action of the brush material will be retarded, and a film build-up of graphite will require a new "wear-in" time for the slip rings.

If the slip rings have been exposed to oil a solvent wash will probably be required to assure that the slip rings are completely free of any oil film. SensorData recommends a general purpose solvent, such as Isopropyl Alcohol, applied with a cotton swab. Care must be taken to avoid use of excessive amounts of any solvent, since it could damage the epoxy dielectric between the rings.

Should the need arise to operate slip ring torque sensors at excessive speeds or altitudes or in a vacuum or nitrogen atmosphere, please consult the factory to discuss various available options.



*Slip Ring/Brush Test Scattergram: Cumulative Hours vs. Brush Wear % of Total*