How to test DC Spindle Motors.

DC Spindle drive problems are often caused by motor problems. Before you send your drive to be fixed, test your Spindle Motor! Assuming the Field source in your spindle drive works.

- Check the Armature brushes. The brush face MUST be shiny and conform to the arc of the armature, with no pitting (caused by electrical arcing). Clean the brush guides with Q-Tips to insure the brushes do not get "hung-up in the guides. Confirm the springs can evenly push on all armature brushes evenly and in both directions of armature rotation. Make sure the brushes are not "cocked" when the armature rotates in one direction or the other. Make sure the brush area is not contaminated with carbon dust or carbon/oil crud.
- 2. Check the Tach brushes. These small brushes deserve extra care and attention. Again, make sure the brush face is shiny and conforms to the arc of the Tach armature. Clean the brush guide and insure the brush springs are evenly seating the brushes on the tach armature in both directions of rotation.
- 3. Note all the wiring, use a Digital Camera B4 you disconnect any wiring! Remove the 2 Armature wires (P&N) from your Spindle Drive.
- 4. Power up the Field winding with your Spindle Drive. Typical idle voltage on the Field are: Fanuc 85VDC, Fuji 50-100VDC Mitsubishi Yaskawa Your meter might show an AC component on the field, this is normal.
- 5. Connect the armature wires up to a 12 V car battery. Perform the test twice, once in each direction/polarity. Use gloves & goggles when handling & connecting the car battery!
- 6. Use a scope or voltmeter to check that the Tach signal is pure DC (exact same voltage but opposite polarity, depending on direction). DC reading must be rock steady. Consult your wiring info to identify the Tach wires, or look for the 2 wires leaving the Tach area.
- 7. With a voltmeter: The AC reading should be below .005 V (5 mv.) in either direction.
- 8. The Spindle shaft should spin absolutely smooth when powered by the car battery. Any rotation lobeing, brush arcing or erratic mechanical noise is a PROBLEM.

Where to have DC Spindle Motors Rewound

- Most motor shops are not equipped to rebuild and test CNC motors, DC or AC. We
 regularly encounter improperly rewound DC motors. Typically the motor shop does not
 understand inter-windings (used by Fanuc to reduce arcing) or they are not careful to
 count windings etc. In general we argue against locally done rewinding. Typically, a bad
 rewind will blow the drive fuses or worse. A full rewind will cost 2-5K! Many shops
 charge a grand just to clean the motor and change the bearings. Belt drive motors rarely
 need bearings! I have steam cleaned (not pressure washed) and then baked (without disassembling) several open frame DC motors with no problems. The key is to keep
 moisture out of the bearings and bake the motor at 100 degrees F for several hours.
- 2. We have been recommending the following 3 motor shops for rewinds since 2003 with no reported horror stories.
- 3. Dreisilker, Chicago 800-922-1882. This is a big place, but they seem to consistently do a good job on every sort of motor
- 4. McBroom, Indiana 800-873-7330. I think they are a good choice for big DC motors
- 5. A1 Electric Motor, Texas 888 336-8430. Mostly AC servo motors