

Exercising your connections

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By Frank Bourlon

Exercising your connection is whenever you move a connector back and forth over the pins it normally resides on, whether it's a PC board or wherever two connectors are plugged together.

Exercising connectors is a very effective preventive maintenance practice that will help you locate loose connections and connections that have become so corroded that the connection lacks the ability to conduct electricity. Machines fail to operate properly or sometimes not at all if connections corrode.

You'll know that a connector might be corroded when you press the inch button on a DC motor and it responds by violently speeding up. That's due to the loss in a feedback circuit. If the feedback is speed control (a tachometer mounted to the end of the motor), the problem could be a loose wire or push-on connector on the printed circuit board of the main motor drive.

Loose wires are normally caused by vibration at the motor and by opening and closing the motor control cabinet. Corrosion on the motor drive board push-on connector, used to accept the signal from motor tachometer, will cause the motor to operate wildly. Loss of this signal means that the motor drive thinks the motor has stopped which will lead the motor drive to try to speed the motor up. Once the tachometer is connected properly, the motor will respond normally.

The same problem occurs whenever the loss is an armature feedback signal, since it is used in place of the tachometer signal. The difference is that the signal comes from the DC motor drive and represents motor load in the form of amperage. The signal wires are attached to the drive motor shunt, which normally looks like a bar of metal with two wires screwed on to it. The wires sense a small portion of the total current (amperage) being consumed by the main DC motor.

The end of the two wires connected to the shunt is then connected to the main drive PC board by a push-on connector. If this connector becomes corroded the main DC motor will move violently.

The solution is to exercise the connector. In most cases, unplugging and replugging the connector several times is enough to create a good connection. Sometimes, emery cloth will be needed to remove the corrosion. In the worst case, the pins on the connector will need to be replaced. Or you can just replace the entire connector.

Tighten, don't replace

Newspapers have spent thousands of dollars replacing PC boards that really only needed their loose connections tightened or cleaned.

Again, exercise your connectors - especially those responsible for carrying feedback signals.

Fuses are another area that require inspection. In an earlier column I wrote about the press controller that caused the newspaper's machine to surge throughout the run before coming to a complete stop.

Operators thought the issue might have been the spray dampening system. In reality, two fuses governing the armature feedback circuit had corroded to the point where a nonconductive surface was created between the fuses' edges and the fuse holder.

Once the fuses were cleaned, the press malfunction was solved.

Loose connections and corrosion cause lots of unexplained electrical connections that are misdiagnosed. Keep on exercising the connections on your press equipment as well as any other equipment that you may be responsible for in order to keep them operating properly.

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