RODIX SOLUTION:
Fuse Blows, Hot or Failed Coil(s)

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For Industry

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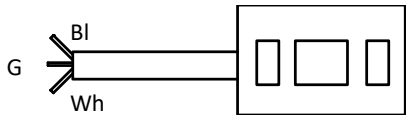
Coils are designed for continuous operation and are designed to provide many years of operation. When a coil fails on a vibratory feeder system, there usually is a definite reason for it. Typically, something has overloaded the coil which causes the coil to draw too much current and overheat. Overheating will cause the electrical insulating materials in the coil to deteriorate. The breakdown of insulation causes high current draw, blown fuses and/or a failed coil. The best way to prolong the coil's life is to operate the coil within its temperature range.

The external temperature of the coil epoxy must not exceed 180 degrees F at any time, lower coil temperatures provide a margin of safety. A coil should never be too hot to hold. If it is too hot, it will fail shortly or has already failed. A bad coil will draw excessive current. The fuse may blow indicating a problem. One test for a failed coil is to measure resistance (hot to common) with an ohm meter and compare it to the resistance on a good coil.

How to test for a bad coil:

Test for low resistance between the power wires, Bl to Wh. The resistance should be close to the following: 6-42-75 (18 Ω), 6-42-78 (13 Ω), 6-42-80 (1.15 Ω), 6-42-81 (.9 Ω), 6-42-89 (4 Ω), 6-42-93 (28 Ω), 6-42-110 (2.3 Ω), 6-42-114 (11 Ω).

Test for high resistance (open) from each power lead to the ground wire (or terminal), G to Bl and then G to Wh. A resistance measurement to ground indicates the coil's electrical insulation has broken down causing a short circuit. Replace the coil.



Overheating and other reasons for a coil to fail:

1. There may be a mechanical tuning problem with the vibratory feeder such as loose fasteners, cracked weld, or cracked or broken springs. The mechanical tuning problem causes the feeder to slow down. The operator then increases the amplitude of the control to maintain the desired part rate. In some cases, this increased current causes the fuse to blow, other times the coils overheat and fail. See Rodix solution: Control, Feeder or Power Line for further details.

2. The gap between the coil pole face and the striker plate effects how much current a coil draws, the larger the gap, the more current it draws. Too large of a coil gap on a vibratory feeder can cause a fuse to blow or a coil to fail. The typical gap on a bowl is .035", the maximum gap is typically less than .100". The gap for a Standard Rodix Inline drive is .035" and never set larger than .060". The gap for a Multi-hanger Inline drive is typically .060" and never larger than .080". The gap for a Mini Multi-hanger Inline drive is typically .030".

3. An overfilled vibratory feeder bowl (one with more than three layers of parts) will draw more coil current than an empty bowl. The additional current can cause heating and coil failure or fuse blowing.

4. Speeding up the vibratory feeder above the feed rate that it was designed for can cause coil overheating and failure.

5. Failure due to hammering occurs when the coil's pole face and the armature hit each other. To detect hammering listen for a loud hammering sound when the vibratory feeder is running. Hammering should be avoided since it can cause the vibratory feeder to self-destruct by breaking springs, welds, and coils.

6. A short-circuited Triac in a feeder control can contribute to a coil to overheating. The characteristics of a control with a shorted Triac are: The control provides full power at 120 pulse power with no power adjustment and will not turn off unless the power switch is turned off. For more information on testing for a shorted Triac, download the Triac Troubleshooting Guide.

Reasons for a fuse to blow:

More than 95% of the energy that comes into the control is consumed by the feeder coil. If the fuse blows when the feeder coil is disconnected, the control has a problem. Unless there is a shorted wire or damaged component on the circuit board, the problem is normally too much current used by the feeder coil. A fuse blowing because of the feeder current dray may happen for several reasons: There could be excessive current caused by a shorted coil. The control being turned up greater than when the feeder was installed would cause more current to flow to compensate for fatigued springs. Also, there could be a loose fastener, a cracked weld, a broken spring reducing the feeding efficiency. A fuse holder with weak spring pressure or a connector or a wire crimp that is loose will cause excess heating. If the coil has an excessive air gap the current will go up.

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