Stearns®
Brakes, Clutches and Electronic Components

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Solenoid Coils

Stearns can supply custom voltage coils as well as NEMA voltage coils because Stearns designs, winds and molds or encapsulates coils as part of brake construction in a lean and rapid response environment.


Picture 1: winding coil on a bobbin


Picture 2: coil molding

Insulation and Construction:

Current solenoid coil offerings are class B and class H insulation grades.

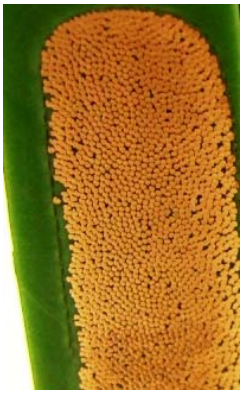
Class B molded coils are standard with solenoid-style brake selection. The class B coil is bobbin wound with the coil and lead-wires injection molded in a rynite material. A single voltage coil would have two lead-wires while a dual voltage coil has four lead-wires. Injection molded coils are black in color.

Class H encapsulated coils are offered as an option. The insulation materials exceed class F motor requirements. The class H coil is wound on an arbor then vacuum encapsulated in epoxy material before a final cure. The encapsulated coil single voltage has screw terminals while a dual voltage coil has a combination of screw terminals and lead-wires. Encapsulated coils are green in color. These are heavy duty, *"robust"* coils for demanding environments and cycle rates. Most Stearns coils are wound with pulse resistant wire.


Picture 3
Class H vacuum encapsulated coils are green
Class B injection molded coils are black

Cass B molded coils are the standard. Class H encapsulated coils are recommended for:

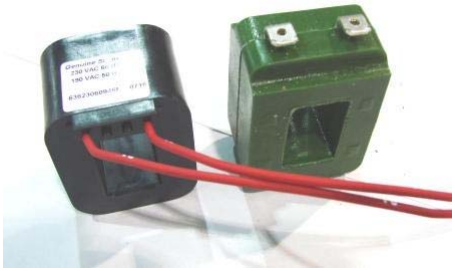
- Rapid cycle use
- Extreme environmental conditions
- Brakes subject to mild voltage variation.
- Applications subject to electrical stress such as transient voltage occurrences.
- Class H coils have a structural quality as a result of the epoxy vacuum encapsulation of the coil and is resistant to coil warpage that may occur in the injection molded class B coil.



Picture 4: encapsulation detail

Dual and Single Voltage Coils:

All Stearns solenoid coils are wound for single phase use and can be wired across two of the three phases of a three phase motor. Single voltage coils have two lead-wires or terminals which simplifies wiring. Dual voltage coils, such as a 115 / 230, 60 hz coil, have the flexibility of combining lead-wires for the low or high coil rating. Dual voltage coils reduce inventory.



Picture 5: single voltage coils
two leadwires or two terminals

Picture 6: dual voltage coils
four leadwires or two leadwires with two terminals.

Stearns also offers a single voltage, dual frequency coil with three lead-wires. The coil is used at a single voltage and can be wired to one of two designed frequencies. As an example, a 460VAC 50 / 60 hz coil can be wired at 460 VAC, 60 hz for domestic use and re-wired for 460 VAC at 50 hz for European use.

All coils are marked with the coil part number, voltage and frequency. Dual voltage and dual frequency coil lead-wires and terminals are numbered for use with the wiring diagram.

Coil size:

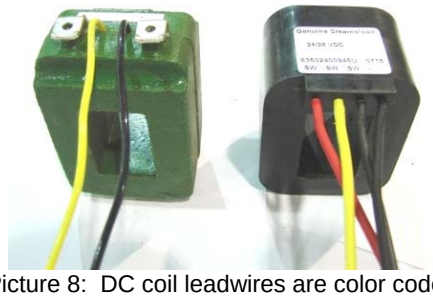
Coils and solenoids match in size and are paired with a compression spring to release a spring set brake through the coil force. When replacing a coil, the part number on the coil will identify the coil size, the voltage and whether the coil is encapsulated or injection molded. Encapsulated and injection molded coils are interchangeable within the same solenoid size. A coil can be upgraded at site from an injection molded to a vacuum encapsulated coil as necessary based on actual conditions or usage.

Picture 7: Size 4 & size 9 coils

AC v. DC

AC coils have a pull in amperage requirement which will draw the solenoid plunger across the air gap and release the disc pack against the spring force. When the solenoid plunger is fully seated into the solenoid frame, the amperage drops to a minimal value. It requires very little amperage to keep a brake in a released condition. The values are in the print and internet catalog. Consider amperage supply and line drop in selecting a coil voltage.

DC coils look exactly like AC solenoid coils. DC coils have two windings. The lower resistance winding is placed in series with a higher resistance winding as the plunger moves across the air gap. This change is made either by closing mechanical contacts or use of an electronic solid state timer switch. DC and AC solenoid coils have similar reaction times which vary by size and range from 30 ms to 80 ms depending on the coil size. There is no performance advantage to a DC solenoid coil, it is not more rapid acting. The swirtch and a wiring diagram are provided with the DC coil repair kit and DC SAB style brakes.



Picture 8: DC coil leadwires are color coded
To match wiring diagrams.

An injection molded class B coil that deforms internally as a result of repeat low voltage conditions will restrict plunger movement. The plunger is unable to seat into the solenoid and stays in a high amperage condition. Check the air gap, voltage and amperage when replacing the coil.

Expect a long, productive cycle life from your well selected Stearns brake coil.

Your suggestions and comments are encouraged, your own stories and experiences most welcome.

Stearns®: **Reliable brakes through design, manufacture and support.**