

General Motor Knowledge
Part 36

The Shaded Pole Motor
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Last month, we talked about a wire wound around a stator with an electrical current flowing through it and the direction of the magnetic field that this created. We need to talk about this current some more. The current for our motors is AC or Alternating Current, not DC or Direct Current like in a car or boat. Alternating current is the kind found in your home and most businesses and industries throughout the world. Alternating current flows first in one direction then reverses and flows in the opposite direction. This happens 60 times each second in this country. DC maintains the same value and direction once it starts. The importance here is that as the current alternates so does the direction of the magnetic field that it creates, first one direction then the other.

Now, let us examine our shaded pole stator. The main winding is wound around a portion of the stator that we call a pole. Notice that there is another winding located on this pole. We call this winding the shading coil. It is only one turn of large copper wire and it is wound around just a small portion of the pole, but it is very important.

This next explanation is probably an over simplification, but I believe it is a good description of the result of what is happening here. Think of the shading coil as "choking" the magnetic field flowing into the portion of the stator that it is around. The magnetic field in the main part of the stator increased just like the current that created it. The shading coil will "choke" a portion of the stator and delay the magnetic field there. By the time that the magnetic field gets past the shading coil, the field in the main part of the pole is starting to decrease and change direction. The magnetic field is now at its maximum under the shaded portion of the pole, not the under the main portion. The rotor that had aligned itself with the magnetic field under the main part of the pole now turns to align with the magnetic field under the shaded portion of the pole. This process repeats for each pole and each cycle of the alternating current. This magnetic field that appears first in one place then another and so on around the stator is known as "The Revolving Field".

The rotor is now spinning around just as promised. Next month we will take a look at our newest motor type the Permanent Split Capacitor or PSC motor.