

General Motor Knowledge
Part 18

PSC Motors, The Price Paid

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Most of you have at least heard of our newest motor line, the PSC or permanent split capacitor motor. We have even discussed, in this forum, the similarities in operating principals between the shaded pole and the PSC motor. By intent and design the PSC motors have the same output as the equivalent shaded pole motor.

The PSC motor is quieter than a shaded pole motor. It uses less energy, and requires fewer of our natural resources to build. But, at what price?

On the plus side, our PSC motors generally have higher starting torque than the equivalent shaded pole motor. There is also more torque available to accelerate a fan blade up to speed. The hum typically associated with a running shaded pole motor is not present in the PSC motor. Our shaded pole motors require 50% more watts input than a PSC motor of the same output. The stator of a PSC motor typically requires 5% less steel by weight than a shaded pole stator. It requires 38% fewer pounds of copper to wind a PSC motor.

On the other hand, winding a coil for the PSC motor requires 68% more turns than an equivalent shaded pole motor. The more turns involved, the harder it is to keep each one in its proper place and the more important it becomes to do so. The PSC motor has two of these coils per pole compared to one for the shaded pole. The magnet wire is an average 5 wire sizes smaller for a PSC motor. This is a reduction in wire diameter of 43%. Magnet wire this fine is very delicate and difficult to work with. Much of it is as small as a human hair and for some of you, that is mighty small! Extra special care is required here! The air gap, that distance between the stator and the rotor, is 25% smaller. Another way of saying this might be to say that each particle of grit left in a PSC motor is now 25% larger! We are redefining what "a clean motor" means.

It is not easy on top. Our PSC motor is not easy. But, with it, Morrill Motors is doing its' part to save energy, conserve natural resources and provide employment for more people. One day we might even be in the white house! You know, we probably already are.