Commutator: Tang vs. Conventional

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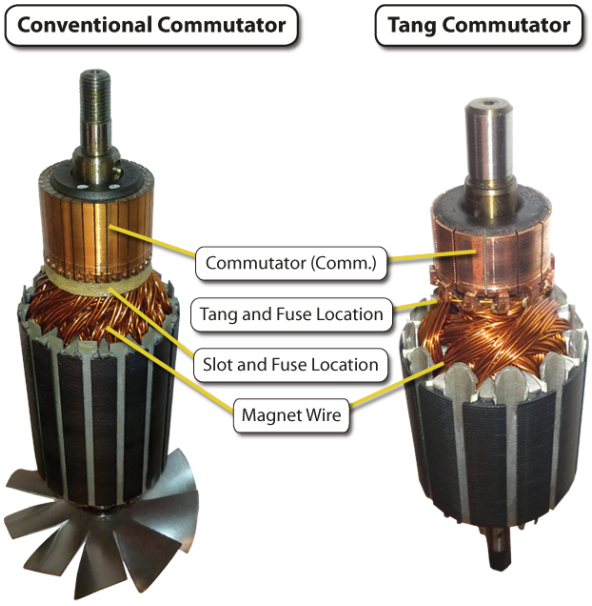
In a brush type electric motor, the commutator (comm) is the rotating switch which connects the motor brushes to the magnet wire in the armature. This switch energizes certain coils of magnet wires as the shaft rotates; this produces the motor's torque. Nearly all Groschopp motors are manufactured with one or the other: Conventional Comm (or slot Comm) or Tang Comm. In this blog, we'll explore the advantages and disadvantages of each type of commutator.

Conventional Commutator

Both conventional and tang commutators rely on a fused connection between the magnet wires and the segmented commutator bars to ensure a good electrical connection. Each segment of a conventional commutator has slits which hold the magnet wire before it is fused, creating a very robust connection. Because of the strong connections utilized on conventional comms they are typically considered a better design choice for applications that see high vibrations and/or RPM. The main drawback with conventional comms is that without expensive machinery the insertion of magnet wires into the commutator slots is a manual operation completed after the armature wires have already been wound. Because of the high labor rates associated with the conventional commutator, the final motor cost is often times much higher than motors manufactured with tang comms.



Tang Commutator

With the right equipment, the wire connection on a tang commutator can be completed right as the magnet wires are being wound. This type of comm has a hook on each segment which catches the magnet wire in the winding machine. It doesn't require a second manual operation to make the connection between the magnet wire and the comm resulting in a relatively inexpensive part cost. However, the connection is not as robust as a conventional comm. However, improved winding methods, better commutator materials, and added secondary operations (such as adding slurry around the tang area and magnet wires) has allowed tang comms to be used in applications that would have been considered too severe in the past.

As is often the case with motor component selection, there is no hard-and-fast rule to dictate which commutator should be chosen for a given application. It is important that the application requirements are thoroughly understood and fully communicated to motor manufacturer's engineers in the early developmental process to ensure that the proper commutator design is selected to meet the customer's needs.

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