General Motor Knowledge
Part 26

Rotor Spiral and End Rings

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Rotor slots are the openings around the outside edge of the rotor lamination that will be filled with aluminum when the rotor is cast. This aluminum forms the conductive rotor bar which is the winding of the rotor. Each rotor lamination is twisted as it is added to the stack. The result is that each rotor slot is spiraled like the red stripe on a barber pole. One reason that rotor slots are spiraled is to prevent cogging or a jerky movement of the rotor as a rotor slot bar makes the transition from one stator pole to another. The second reason for rotor spiral is to reduce or cancel harmfull harmonics of the magnetic flux that passes from the stator to the rotor. Different harmonic fluxes are grnerated in different areas on the face of the stator pole. By exposing the rotor slot bar to different areas of the stator face at the same time, the unwanted harmonics add on one end of the slot but subtract on the other end so that the total effect of the harmonic is reduced.

All things considered, we have found that rotor slot spirals of between 1.5 and 2 slots are most useful. Hold a stack of rotor laminations using both hands. Put one thumb nail on a slot on one side. Put your second thumb nail directly across the stack from the first. How many slots are between your second thumb nail and the other end of the slot marked by your first thumb? 1 slot and half of another? 2 slots? We have guages, but this can be a quick check easly made.