

THE DC TRACTION MOTOR WITH SLOTLESS ARMATURE

The slotless armature concept is an attempt to overcome the problem of poor commutation in DC traction motors. A small (90 HP) motor was fitted with such an armature and has undergone tests to investigate the properties of slotless armature motors in the areas of commutation, eddy current loss and mechanical stress under electrical fault conditions.

It is verified that commutation is markedly improved by adopting a slotless winding. However, it is found that the eddy current loss could be unacceptable if the armature conductors are not divided into two insulated strips or into four strips in many cases.

It appears that all practical designs of slotless traction motor will suffer a shear stress of roughly 2 MN/m^2 between winding and core if subjected to a sudden short circuit. Further work is needed to find an insulating system with a good margin of strength in excess of this figure.