1.3 Influences of contact opening speeds in the range of 0.5 to 200mm/s on break arc behaviors of Ag and AgSnO2 contacts in DC14V inductive load circuits of 1 to 5A

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Abstract— Break operations of a DC inductive (L=20mH) current from about 1A to about 5A at 14V were conducted with Ag and AgSnO2 contact pairs under different contact opening speeds from 0.5 to 200mm/s in air. Average break arc duration at each current level was calculated under the respective opening speeds. With the small load current levels, the average break arc durations were not influenced by the contact opening speeds, while the arc durations clearly became shorter with increases in the opening speeds at the load currents of 3A or more. However, such tendencies were not significant with the contact opening speeds over 50mm/s, even when operated to break a load current of 5A. Those tendencies were observed more clearly with AgSnO2 contact pairs than with Ag contact pairs. The above results imply that reductions in break arc discharges by increasing contact opening speeds can be realized both with sufficiently large current levels and sufficiently faster opening speed levels.