Singh, 1964

One year later, working on the same project sponsored by Harley Davidson Motor Company, D. V. Singh's Ph.D. dissertation added tire side slip to Collins' model. For reasons not stated, Singh rederived the equations of motion in a notation similar to Collins, with just a few modifications for tire side slip..

Singh's final equations are (6.11-d) and (6.12-d) on p. 74 of his dissertation. These equations were judged too impenetrable to compare to those in Chapter III, because the coefficients are defined in terms of secondary quantities, which in turn are defined as functions of physical parameters. However, on p.49 he assumes that the tire corning forces (tire side slip) are proportional to the steer angle, which is only true for steady turns. Hence, we judge at least his treatment of side-slip (eq. 4.31) to be incorrect, though if sideslip is prevented we can't say whether or not his equations are correct.

Surprisingly, it was noted by casual review of Singh's and Collins' theses that disagreement exists in their expression for the velocity of the rear center of mass of the vehicle. This can be found on page p. 52 of Singh's dissertation eq. (4.40a-c) and p. 19 of Collin's dissertation eq. (2.13a-c). Equation 4.40(a) of Singh's dissertation has an extra term compared to 2.13(a) of Collins, and some signs appear to be different in subsequent equations, although the coordinate axes chosen in both treatments seem to be equivalent.

Though he refers to Collins and to Collins' references, Singh does not compare his equations to anyone.