

AN EVALUATION OF THE ABILITY OF TRACK BRAKES TO RAISE ADHESION ON LEAF CONTAMINATED TRACK

Reported here are experiments undertaken to assess the ability of electro-magnetic track brakes to remove rolled leaf film from the running surface of rails and evaluate the consequent improvement in wheel/rail adhesion. Facilities for these experiments were kindly provided by the Tyne and Wear Metro, whose trains have track brakes fitted to all bogies.

A pair of single leading track brakes applied to track contaminated with simulated leaf film improved the retardation obtained from disc brakes by at least 0.02g. This indicates that the scraping action of a single track brake improved the apparent adhesion by upwards of 0.02 or some 30%. The improved stopping performance could have arisen by modifying the contamination conditions to produce 'self-controlled' wheelslide which makes better use of the available adhesion. The simulated leaf film in this test was sparse and not as strongly bonded to the rail as many naturally occurring leaf films.

In a separate visual examination of the removal of the simulated railhead leaf film, the running band contamination was found to offer considerable resistance to removal by track brake scraping.

The design proposal to fit track brakes with an attractive force of 2.5 tonnes force would clearly be less effective at clearing leaf film than the Metro track brake with its 6.5 tonnes force.

Overall, the foregoing results suggest that the concept of using magnetic track brakes to raise adhesion on leaf contaminated rails are worth investigating further. It is recommended that any future experiments should be conducted with the appropriate attractive force on the brake and naturally occurring leaf film on the rail. If it is necessary to simulate the leaf film then more time should be allowed in order to achieve a better simulation.