

## AERODYNAMIC SPEED LIMITS IN TUNNELS ON THE WEST COAST MAIN LINE

A computer prediction program has been validated against results obtained from Kilsby Tunnel moving model rig tests. Using the program, the aerodynamic speed limits for IC225 operation through tunnels on the West Coast Main Line have been calculated. Modifications required in order to achieve the target speeds through the tunnels have been proposed.

The aerodynamic speed limits for the tunnels considered have been calculated to lie between 90mph and 120mph. The level of modification required varies greatly from one tunnel to another. The minimum requirement is no modification. At the other extreme, the recommended option for Kilsby Tunnel entails the capping or blocking of the two existing large airshafts and the insertion of nine new shafts.

The results are felt to be conservative for two reasons. Firstly, it is known that the prediction program over-predicts, to a modest degree, the strength of some of the pressure waves present in a tunnel. Secondly, it was assumed that the pressure changes experienced by passengers inside the train would be of the same magnitude as those experienced on the exterior of the coaches. This may be an unrealistic assumption depending upon the degree of train pressure sealing. Although Mk IV coaches are unsealed, they will nonetheless afford some small degree of protection from external pressures.