

APT-E TRAIN HIGH SPEED TEST RUNS ON THE MIDLAND MAIN LINE FROM ST PANCRAS TO LEICESTER ON THE 27TH, 29TH AND 30TH OCTOBER 1975

High speed tests were carried out, exploiting the potential of Advanced Passenger Train technology over a line with many speed restrictions and a nominal line limit of 144km/h (90 mile/h). The fastest scheduled train time was cut by 27 minutes for the 99.1 miles, with an average speed of 162.6km/h (101.6 mile/h) start to stop. A maximum speed of 217.6km/h (136 mile/h) was attained on Sundon curve, whilst 9° cant deficiency was achieved on a number of curves throughout the run.

Lateral H forces were satisfactory, and showed that values $\geq 0.85 (10 + P/3)$ were generally initiated by switches and crossings located on curves. A peak force of 72kN was recorded at Glendon Junction on 30 October. This raises the importance of siting pointwork off curves for high speed running or high cant deficiency performance. Ten values $>60\text{kN}$ were detected on power axles, eight being associated with pointwork. On trailer axles there were only three occurrences $>50\text{kN}$, one exceeding $0.85 (10 + P/3)$ on 30 October. Comparisons between running with the tilt active and passive on the power cars showed that the non-tilting vehicles initiated much larger peak lateral H forces, as a result of the body coming into contact with the lateral bump stop.

The ride performance was of a high standard with 'RED' values of 0.03g in the lateral plane for the power cars, and 0.022g to 0.028g for trailer vehicles. Lateral ride indices for the train ranged from 2.7 to 2.78. Over stretches of straight track, approximately two miles in length, at speeds of 200km/h 'RED' values were as low as 0.02g or better. In the vertical plane the ride was again good, with the power cars having a 'RED' value of 0.025g. The trailer cars gave the poorest ride, with 'RED' values of 0.032g to 0.036g. Vertical ride indices for the power and trailer cars ranged from 2.6 to 2.9.