

THE LATERAL 'STRENGTH' OF TRACK UNDER THE INFLUENCE OF VEHICLE FORCES

The ability of track to withstand the lateral forces imposed on it by vehicles passing over curves at high speeds and cant deficiencies has been studied for some time.

The original work carried out by the SNCF produced a formula that has been widely accepted. An essential part of this work was the concept of a threshold value of forces below which the track was stable and above which progressive and rapid deterioration occurred. This concept was not supported by earlier BR work that showed logarithmic relationships between forces and track displacements and between displacements and numbers of applications of a constant force. The latter relationship was confirmed on the test track with high-speed tests using the experimental Advanced Passenger Train.

A special laboratory vehicle (Lab 25) was then developed, which was able to simulate the vertical and lateral forces that occur when a vehicle runs over curved track at high speed. This vehicle was used for a series of tests on the West Coast Main Line, which concluded that more information was required, particularly with regard to the rate of regain of track strength after tamping. Further tests have been carried out and this report summarises the situation and considers the implications.

It is concluded that BR track has more than adequate strength, under most circumstances, to withstand the forces imposed on it by current traffic.

A method of measuring that strength now exists and so it may be possible to modify operating practices e.g. by running at higher speeds, even when this imposes larger forces on the track. Such a course of action is not recommended until the variations in track strength are more fully understood and the forces imposed on the track by vehicles more closely defined so that the resultant deterioration in track geometry can be quantified.

If it is necessary to improve the strength of a weak section of track the dynamic track stabiliser (DTS) can be used.