

DISTRIBUTION OF THE SEVERITY OF DIPPED JOINTS ON BR BOLTED TRACK

A problem that always occurs with jointed railway track is that of dipped joints. The stiffness of the rail is considerably reduced at the joint, and this causes the ends of the rail to deflect downwards under load, which results in poor riding, and eventually voided sleepers and a permanently deformed i.e. dipped joint. Recent work on fishplate breakages suggests that skirt failures are more likely with highly dipped joints. The severity of the joint (usually expressed in terms of the angle of the dip) will depend on the frequency of maintenance; therefore it is likely that distributions of dip angles will vary with track category and particular line speed.

Up to now there has not been a systematic investigation of the relationship between joint severity and line speed, although surveys of dip joint severity have been conducted in the past. Such a study was felt necessary as part of the design of a fatigue-resistant fishplate, and the evaluation of strategies for its deployment. This report gives the results of such a survey, which covered about 5% of the jointed track on British Rail.

Four conclusions evolved:

- It is possible to measure the severity of dipped joints using a track-recording vehicle. The resulting measurements have been correlated reasonably well with those using a straight-edge.
- There is a relationship between joint quality and permitted line speed.
- The proposed joint maintenance criterion of 1500/line speed indicates that more joints require maintenance on the higher speed lines. About 5% of the joints on 70mph line speed lines have dip angles worse than that allowed by the proposed criterion.
- The type of track (bull head or flat-bottomed) seems to have little effect on joint dip angles.