THE EFFECT OF SUPER-STRAIGHT RAIL WELDS ON TRACK QUALITY

The vertical quality of the track consists of a significant amount of roughness associated with the 18.3m rail length or its harmonics, and that this is not removed by maintenance tamping. A very large proportion of these irregularities occur at the present positions of the welds and that the previous shape of the welds recurs very soon after tamping. It is assumed that this is due to lack of straightness of the weld causing distortions of the track under high dynamic loads.

A trial was initiated to evaluate the potential for improving the quality of the track both in the short and long term by improving the quality of the welds. From observations of the resulting geometry it was hoped to quantify what could be regarded as a good or poor weld.

During the course of the investigation two methods have been used for the assessment of the quality of the weld and adjacent rail. However, there is no correlation between these methods and therefore further work is required which will lead to a meaningful measure which can be used for quality control.

No clear relationship is established between the weld quality (by either method) and the quality of vertical geometry, except in the case of one particularly bad weld. Most of the irregularities are not associated with weld positions. It may be concluded that either most of the welds produced in this exercise are satisfactory compared with the general quality of this track section or, contrary to earlier belief, the trial period was not sufficient to ascertain the long term behaviour of the welds. Subsequent monitoring will address the second possibility.

It is important that a further comparison should be made of the quality of welds existing on section of track which have deteriorated to show large weld dips. This would determine if there was a relationship between weld quality and geometry.

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