

DEVELOPMENT OF A LOW CONTACT STRESS RAIL PROFILE

Contact stresses between wheel and rail are believed to be influential in the initiation and growth of rolling contact fatigue cracks, particularly on the high rails of curves on high speed lines. A modification to the transverse rail profile has been proposed which should result in reductions in contact stress. Theoretical methods have been used to investigate the effect of profile changes on contact stress and conicity. The predicted contact stresses for the modified profile are up to 50% lower than those for an unused standard BS11 113A profile, whilst the conicity remains within an acceptable range.

The suitability of curves for re-profiling depends on the curve radius and the cant deficiency, although the latter has only a minor effect on contact stress predictions. At a cant deficiency of 150mm this approach is applicable to curves with a radius greater than approximately 1300m. The metal removal required to achieve this profile appears practical using the Speno RPS32 rail grinding train. Tolerances for profile grinding have been suggested.