

A MECHANISM FOR THE FORMATION OF SHORT WAVELENGTH RAIL CORRUGATIONS BASED ON SLIP STICK VIBRATIONS

Corrugations on railway lines occur in more than one form and are caused by more than one mechanism. On BR lines the most common type of corrugations have a wavelength in the range 40-80mm and appear to be caused by a wear mechanism rather than by plastic flow.

The report outlines a model of corrugation formation which attempts to explain how wear patterns produced by slip stick vibrations might be reinforced to produce short wave corrugations as found on BR.

Initial results from a computer programme written to check the model are encouraging, however two questions concerning the metallurgy of the wheel rail contact remain unanswered:

- What causes the creep force creepage relationship to have a negative slope at high creepage?
- Why do rail steels of very similar composition have very different susceptibility to corrugation formation?

Answers to these questions are necessary before the problem of rail corrugation can be fully understood.

The fact that very similar rail steels have a very different susceptibility to corrugation formation would tend to support the idea of a non-linear mechanism so that very small changes in metallurgical properties could have such a large effect.