

DEVELOPMENT OF A FAILURE PARAMETER FOR RAIL SQUATS

Squat failures are a significant element in total track damage and hence the ability to predict accurately these failures is required to develop computer-based packages. This enables the civil engineering costs of a mixture of trains on a route to be predicted, allows comparisons between vehicles and traffic types to be made and can be used in the optimisation of maintenance and renewal strategies.

At present squat failures are predicted using the empirically derived parameter $T\sigma^2$ where T is the tangential force and σ is the maximum normal stress in the wheel/rail contact patch. However, a number of limitations have been identified with the relationship; in particular, it incorrectly predicts large numbers of squat failures in areas of large applied traction (i.e. trains accelerating away from stations). This report reviews service and laboratory evidence from squats obtained since $T\sigma^2$ was formulated and recommends an updated squat failure parameter.