

## ROLLING OUT OF RAILS

'Rolling Out' is the name given to the phenomenon that new rails extend under the action of the traffic rolling on them. This extension is known not to be uniform across the rail section as old rail will 'hog' when laid on its side.

The report details a series of tests carried out on service track to gain an understanding of the rolling out process and to see whether it could affect the stress free temperature of the rails. Although experiments have been carried out in the past there were some unexplained factors in the results, believed to be due to the short gauge length over which the measurements were made and to plastic deformation caused by lifting the rail in and out of the track.

The test sites were chosen to represent various traffic densities and speeds, in locations where factors such as heavy traction and braking would not confuse rolling out measurements. Rolling out was thought to occur early in the life of the rail, thus, the measurements at each site were taken over the rails' first year in service.

The report concludes that:

- Rolling out is caused by the rolling contact stresses changing the residual stresses from tension in new rail to compression in the top 10mm of the railhead.
- The amount of rolling out depends on the initial stress in the new rail and on the number of 20-25 ton axle loads in the traffic rolling over the rail.
- The majority of rolling out occurs in the first three months.
- The maximum loss of stress free temperature was 32°F of which 16°F was due to rolling out and 16°F was due to other causes.