

EFFECT OF HIGH SPEED OPERATION ON S&T COMPONENTS UNDER DIFFERENT SITE CONDITIONS

There is a potential to run in excess of the present 125 mile/h speed limit. BR Research was requested to assess the structural integrity of various signal and telecommunications components at facing points under high speed traffic.

It is concluded that:

- The geometry of bolted track joints is worse than that of welded joints.
- There is an appreciable variation in the amount of voiding present at points.
- Increasing the line speed from 125 mile/h to 150 mile/h would have little effect on the strain levels in the lock rods and long detector rods of an electric point machine.
- Strain levels are largely controlled by the track support conditions, so excessive voiding in the vicinity of the point machine should be avoided.
- Except at poorly supported sites, maximum strains in the rods are little affected by vehicle type, except that the Mk3 coach can produce disproportionate strains which may be due to wheel irregularities.
- At poorly supported sites, rod strains may exceed the fatigue limits.
- The fatigue failure of cast clamp lock bodies at any of the sites investigated is unlikely at speeds up to 150 mile/h, provided there are adequate radii at the critical locations.
- Fatigue failure of cast clamp lock bodies with adequate radii will be unlikely at any sites with welded rail joints, provided normal geometry standards are maintained.
- Fatigue failure of cast clamp lock bodies with adequate radii will generally be avoided at sites with bolted joints, provided conditions are not substantially worse than at the test site, but a more specific limit cannot yet be formulated.
- Lock arm strains are sensitive to axle load but not to vehicle speed.
- Magnitudes of lock arm strains are affected by the stock/switch rail gap. There is a risk of fatigue failure with a tight lock, but a minimum gap cannot be specified on the basis of available data.

Recommendations are made on maintaining support in the vicinity of electric point machines, and on investigating the behaviour of these machines when preceded by bolted joints.