# EFFECT OF 140MPH OPERATION ON S&T COMPONENTS

The higher speed potential of the new generation of Intercity locomotives, together with possible future business opportunities accruing from higher speed passenger services suggest there may be a requirement to run passenger trains over facing points at speeds above 125mph. The type testing of the Class 91 locomotive offered the opportunity to obtain information on the structural behaviour of facing switch components at speeds above 125mph. Such data should help provide a logical basis for assessing the safety of running 140mph passenger trains over facing points.

The report provides the following conclusions:

- Tallington Switches – Increasing speed from 125mph to 140mph will halve the stretcher bar shoe's life and reduce the conventionally mounted clamp lock body's life by 40%. However, the body's life should still be in excess of the assumed ten-year design life.
- Other Sites – The fatigue behaviour of rail clamp point locks is dependent on the vibration severity of the site. This effect can be more important than speed. At severe sites, short body lives are expected at existing speeds and even shorter lives are predicted at 140mph. At such sites, lock arm cracking may be possible, although it is considered to be unlikely. There is no conclusive information on how site conditions influence the fatigue behaviour of stretcher bar shoes and point machine components.

And the following recommendations:

- If the additional component failures caused by 140mph operation are unacceptable, a rigorous crack detection procedure should be instigated. An even higher level of integrity could be achieved by clamping the points.
- A short series of fatigue tests on threaded rod ends should be performed to reduce the uncertainty in the point machine predictions.
- In order to eliminate the uncertainty in the extrapolation analysis, serious consideration should be given to carrying out a trial at speeds up to at least 140mph.
- When practical, welded rail joints should be used for new switch layouts.

**BR Research Report Ref: TM-MF-169**
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**Date of Publication: October 1988**

AEAT Abstract Date:
09/07/2002