

ACTIVE LATERAL SUSPENSION ON PILOT VEHICLE

The set of POP train track tests in January 1980 was the last in a series that started in December 1978. Earlier tests investigated the improvements in lateral ride obtained with an actively controlled secondary suspension that provided additional damping in both the yaw and sway modes. For the latest set of tests a more complex suspension, based on potential control, was used. The basic concept of suspension is that at low frequencies it should follow a smooth path. Thus at low frequencies, assuming the bogies follow the track (a valid assumption for the frequencies below the kinematic frequencies), the secondary suspension displacement must be minimised whilst at higher frequencies an absolute position feedback is used.

Testing was carried out on the WCML between Crewe and Carstairs. Comparisons of the lateral ride for both the conventional passive suspension and the actively controlled suspension were made as well as comparisons between both types of active suspension.

The conclusions are lengthy, but in summary:

- Both systems give a considerable improvement in vehicle ride.
- The improvement in ride tended to increase with deterioration in passive ride.
- The absolute damping system improved the ride throughout the frequency spectrum whilst the positional control was most effective in the 1-2 Hz range.
- The positional control system was much better at avoiding bump stop contact around curves than the absolute damping system.
- With both systems the overall ride improvement deteriorated on curvaceous track.