

TRACK TESTING OF A VERTICAL AIR-PUMP ACTIVE SUSPENSION FITTED TO LAB 4 (HASTINGS COACH) ON THE WEST COAST MAIN LINE

The aims of the work reported here were to develop the electrically driven air-pump suspension design to a stage suitable for manufacture, and to build five prototype units. In parallel, an electronic control system was to be designed and tested in the laboratory coupled to the first prototype air-pump. The remaining four air-pumps were to be installed in Laboratory Coach 4 (Hastings). By careful positioning of the air-pumps and the standard airspring reservoirs within the vehicle body, it would be a simple matter to plumb the airspring to either of these components. This would enable direct comparisons to be made during track tests between the ride quality of the vehicle in its actively and passively suspended forms, together with comparisons to a MkIII coach.

Fairly intensive track testing spread over a period of six months but extending to only fourteen days of running, which included commissioning and control system development, resulted in robust and stable active vertical suspension for rail vehicles.

Testing was only conducted at speeds up to 100mph for which a 40% improvement in ride on the WCML has been repeatedly demonstrated.