

THE APPLICATION OF INDEPENDENTLY ROTATING WHEELS TO RAILWAY VEHICLES

The conventional wheelset has a tendency to steer itself back towards the track centre line following a disturbance, which can be a disadvantage as well as an advantage. These wheelsets are well understood.

This study considers the provision of 'wheelsets' where the two wheels are free to rotate independently, but otherwise act as a rigid wheelset. Experimental work has demonstrated some of the advantages and disadvantages of such wheels, and this report investigates them in more detail by means of theoretical predictions which give a good correlation with the track tests. The results are incorporated in the vehicle dynamics program VAMPIRE.

It is concluded that independently rotating wheels offer considerable advantages in the operation of railway vehicles at speeds above those currently used because of the lack of kinematic instability. Tolerances on the manufacture and maintenance of such vehicles would have to be strict to avoid problems of offset running and the consequent deterioration in ride.