MEASUREMENT OF TRACK FORCES DUE TO HEAVY AXLE LOAD FREIGHT VEHICLES

During the period November '88 to April '89 various freight vehicles were run over two instrumented bridges on the down line between Reading and Westbury. This report describes the vehicle-based measurements of dynamic track forces that were made at the same time, both over the test bridges and on plain track elsewhere.

A regression analysis is also performed, enabling the resulting dynamic forces from the vehicles tested to be related to vehicle speed and track quality.

The report concludes that:

- There is a large difference in vertical and lateral track forces between the best and the worst vehicles.
- The results give some support to the view that bogie box vehicles offer the lowest track forces, followed by bogie hoppers, with two axled hoppers being by far the worst.
- As far as suspension type is concerned, the LTF, Y25 and O&K bogies gave the lowest forces.
- The relative age of vehicles should also be considered. It is generally accepted that suspension friction level (where applicable) increases with age or time since maintenance.
- The best way to compare the costs of operating vehicles of the types tested is by using a model capable of predicting track maintenance and renewal costs such as Mini-MARPAS.

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