

A BASIC STUDY OF WHEEL / RAIL ADHESION

9. FURTHER OBSERVATIONS ON LEAVES

At certain wooded and sheltered sites, autumn leaves become deposited on the railhead. This can drastically reduce wheel/rail adhesion, which can result in train delays and damage to both wheels and rails. Previous studies observed how leaves were lifted and swirled between the bogies in the slip stream of trains, which then results in leaves becoming trapped on the rails.

Previous studies are taken further in this report, focusing on a systematic approach to confirm the way in which leaves become trapped on the rails, and experiments which measure the friction due to leaves and leaf juices - both on running rails and in the laboratory. Drivers' operating sheets and comments, and wheel flat reports have been examined and correlated with the time of year.

The study conclusions include:

- Low adhesion during autumn occurs largely in tree lined cuttings where a large number of leaves can accumulate on the track ballast. The study confirmed that it is the action of passing trains whipping the leaves up into the slip-stream that cause the leaves to be trapped under the train wheels.
- The repeated action of large numbers of leaves being crushed onto the rail can completely cover the wear-band with a film of leaf pulp forming a featureless black mass. This material can totally prevent metal to metal contact, thus reducing adhesion.
- The leaf pulp does not adhere to the rail surface in wet conditions, with low adhesion being due to another component initiating from the leaf on the railhead.
- A remedy was not identified that provides a complete cure to low adhesion problems, unless removal of lineside trees is considered practical or desirable.