



State of the Art: Modifications to braking systems on passenger trains

Brief description of innovation

The use of cast-iron block brakes roughens the tread surface, creating so-called rough wheels. When in motion, the rough tread surface rolls over the rail. This causes vibrations which radiate as sound. Preventing rough running surfaces results in considerable noise reduction. By modifying the braking system the wheels remain smooth, thus the train is quieter.



Noise reduction

Approximately 7 dB(A)

Problem context

The IPG for railways consists of a carefully formulated set of projects to reduce noise from railways at the source. After testing the new measures with trains and rails, the second important step is to quickly implement the innovations. Implementing the new measures must result in a clear reduction in noise and a 50% reduction of the existing costs.

As part of the IPG for rail traffic, subproject 2.1.1: modifying braking systems on noisy passenger trains, NS Reizigers will perform tests using trains with modified braking systems. In addition, plans will be developed to accelerate the application of a series of innovative noise reduction measures. The aim of these modifications is a reduction in rolling noise of 6 to 7 dB(A).

In total, NS Reizigers has approx. 1150 coaches (40% of all NS coaches) with braking systems with relatively high noise emission.

Link to other developments

As well as passenger transporter NS, goods transporter Railion, is looking for noise-related adaptations to the braking systems of goods wagons. The actual noise reduction in practice will be determined using the IPG project permanent noise measurement locations.

Project aim

This project aims to make existing passenger trains quieter by relatively simple technical modifications that can be applied on a large scale.

The following sub aims are relevant to the realisation:

Obtaining rail safety related permission for modifications to the braking system from the Transport and Water Management



Inspectorate.

Testing the noise reduction, in accordance with the directive in the new Calculation and Measurement regulation.

Accurately determining the costs and advantages of the tested modifications to the braking system.

The objective of this modification is to realise a noise reduction of approx. 7 dB(A). The rolling stock can then be moved from noise category 2 to noise category 8 and this reduction can also be included in noise calculations.

Description

On Intercity coaches (ICR and ICM-III) and the doubledecker stop trains(DDM-I), cast-iron brake blocks are used as an additional braking system. The main braking system uses disc brakes. In a test programme new brake blocks (so called LL-blocks), are fitted to the IC-coaches and the double-decker stop trains.

Cost-effectiveness

Making rolling stock (wheels and brake blocks) quieter is, generally speaking, considerably cheaper than installing noise barriers.

Schedule

- Both types of passenger cars have successfully completed the acceptance tests
- The long-term test with LL blocks on ICR equipment was started in the middle of 2006 and will run to the middle of 2007
- The long-term test with LL blocks on DDM equipment was started at the beginning of 2007 and will run to the autumn

Available products

www.innovatieprogrammageluid.nl

Realisation

NS Reizigers and Lloyd's Register Rail Europe

Information IPG rail

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Colophon

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