RAILWAY SAFETY AND EFFECTIVENESS IMPROVEMENT

Klyuev S.
Volodymyr Dahl East Ukrainian National University

Railways with mainly passenger service (including high-speed) main problems are: wear of rails and wheels, surface contact fatigue on rails head checks, elevated vibrations and road and rolling stock influence by the out of roundness wheels, increased noise.

Conditions of interaction in «wheel-rail» system provides essential influence on service life, operating costs and organization of railway handling and rolling stock.

Incipient problems decides on the basis of the system approach by which economic efficiency of exploitation and necessity of providing of safety traffic is taken into account. Existing action programm for the reducing wheels wear and rails head checks provides application of the followings methods: tribological materials, building-up of wheel flange, increase of wheel tread thickness, rubber-metal elements, increase of hardness [1,2].

Creation of new types of rolling stocks and trackages saturation requires a lot of time. Thereby the first suggested stage is to concentrate efforts on arrangements, which gives a maximal effect in short terms. As a result of reasons wear influence analysis, concludes that as a primary ar-

rangement which quickly will be realized the methods of wheel flange wear reducing is lubrication in the contact point with the outside surface of rails. Due to forces decrease of carriage motion resistance on rails, lubrication reduces the consumption of fuel-power resources for traction, promotes the service life of wheels and rails, reduces probability of wheels rolling on a railhead, reduces the level of the generated noise.

Sharp high-frequency noise (squeal), radiated from wheels rolling stock interaction with rails, is one of the nonpleasant phenomena, which accompany everyday operating activity of trunk and city railways. A sound, felt as a squeal, lies in a range 500…10000 Hz. A high-frequency squeal in the curves of small radius (R < 650 m) obtains 116 dB. Due to friction modifier application it is succeeded to reduce the indicated level to 92 dB.

A basic problem during development of the automatic wheel flange lubrication system is moments determination of turning on and off the material feed of abrasive material on the flange of wheel. Effective application of lubrication foresees the feed of abrasive material, in that moment when there is a contact of wheel flange with a railhead, fig. 1 [3]. As an information source for wheel flange contact with a railhead moment authentication method of acoustic emission is offered [4]. By the experimental data a flange contact can be simply identified in the range of frequencies from 800…4000 Hz on maximal deviation of sound level pressure from equivalent one.

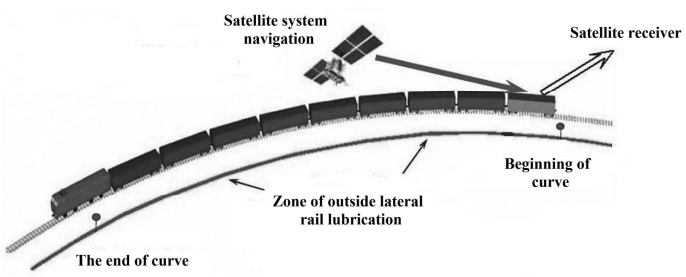

Fig. 1. Technology of lubrication

It is necessary also to mark that efficiency of application of lubrication on the railways essentially also depends on the applied abrasive material. Properties and quality of abrasive material provides conclusive effect on lubricator.

The indicated arrangements conduce to the cutback of spending for railway support and improve efficiency and safety of railway transport.

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