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DETERMINING THE PARAMETERS OF AN IMPROVED RAILWAY BRAKE EQUIPMENT

Kovtanetz M., Kravchenko K., Prosvirova O., Diomin R., Nozhenko V.
Volodymyr Dahl East Ukrainian National University

High speed train discs must be capable of absorbing large amounts of heat in emergency brake applications from maximum speed. Heat dissipation during braking is low and therefore it is crucial to ensure low initial brake temperatures.

This can only be achieved with good cooling characteristics, since brake mass must be kept to a minimum to ensure low unsprung mass. It must also be taken into consideration that emergency braking from maximum speed is relatively rare, however the brake system must be capable of performing this duty without excessive thermal loading.

Ventilated brake discs are commonly employed for their good cooling qualities, however this type of brake disc can generate substantial pumping losses when rotating at high speed. The effects are very serious because a high number of discs (usually 4 discs per axle) rotating at high speed (up to 2000 min-I) require very high levels of power, just for disc rotation.

This has resulted in the development of numerous 'low loss' ventilated disc designs and the use of solid discs. Obviously, a very fine balance of low pumping losses and good cooling characteristics are necessary to satisfy braking and power consumption requirements for all vehicle routes.

The basis of the proposed technical solution the task of increasing the efficiency of the method of braking of the locomotive and equipment for its implementation through effective use of compressed air, which is discharged from the brake cylinder, and the cooling of the brake pad and the working surface of the disk, the categorization of products galling to contact "brake pad and brake disc".

The basis of the model the task of increasing the efficiency of the method of braking of the locomotive and equipment for its implementation through effective use of compressed air, which is discharged from the brake cylinder, and the cooling of the brake lining and the working surface of the disk, the categorization of products galling to contact "brake lining and brake disc".

Suggested ventilated disc brake for which reasonably desegment the task of increasing the efficiency of the method of braking of the locomotive and equipment for its implementation through effective use of compressed air, which is discharged from the brake cylinder, and the cooling of the brake pad and the working surface of the disk, the categorization of products galling to contact "brake pad and brake disc".

Justified quantification of factors affecting the process of supplying compressed air between the brake disc and the brake pads during braking and the dynamics of their actions.

Consequently, the use of the proposed design will allow:

- effective use of compressed air which is discharged from the brake cylinders,
- cooling the area of frictional contact of the brake pad and brake disc", using the compressed, cooled air into the holes of the brake pads,
- improving braking performance and reduce the intensity of wear of the brake pads due to the timely disposal, the frictional wear of the zone,
- increasing the level of traffic safety of trains by increasing the reliability of the braking.

The coefficient of heat transfer by radiation is given depends on the degree of tone color scheme (dark, light) radiating surface of pad, of the absolute temperature of the pad and the ambient temperature. In a modified construction of the pad coefficient of heat transfer by radiation is not considered, because it does not significantly affect the wear pads because organized weak heat removal from the zone of friction of the wheel roll surface and overlay in the environment.

The heat transfer coefficient by convection is calculated according to the criteria of Reynolds and Prandle.

The presence of grooves in the proposed design of pads reduces the intensity of wear, especially at high speeds, through the stabilization of the temperature regime at the expense of increasing the efficiency of heat removal from the zone of friction in the environment. During braking, the cold air that is blown under the cover, heats up and goes effectively in the environment. As a consequence, there is an increase, which reduces the average temperature of the friction of the working surface of the pad, thereby increasing the time to reach the maximum temperature at which there is destruction of the projections of the actual contact. In the overlay model when increasing the initial speed of braking of the intensity of the heat increases.

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