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## TEAR AND WEAR OF CENTER PLATE UNITS OF RAIL TANKS

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Structural elements of the rolling stock are of great importance for the safety of passengers and freightage, especially it concerns friction units, because some of them are operated under rude conditions. The presence of abrasives, absence of lubricant, specific spectrum of absorbed load provoke severe wear of contact surface.

The pivot unit ensures connection of the body with the bogie, executes the transmission of force between them and is responsible therefore for the safety of a whole wagon. The pivot unit consists of a center plate, end-trust bearing and pivot itself [1].

The comparative study of four – and eight-axle tank wagon features makes emphasis on numerical analysis of friction assemblies and on tribology particularities of different rail tanks. The equations and equation-based software have been developed in order to analyze wear in center plates units considering not only distribution of contact pressure but also load rates in connection areas.

Tear and wear rates in friction units of 8-axle rail tank are lower as compared to 4-axle tank wagon. It is explained by smaller basis (3200 mm), determined by smaller dimensions of cross beam, despite of comparatively larger load rates. The larger tear and wear zones in friction assemblies of 8-axle tank wagon are located between the copper of the tank and the cross beams, as the cistern has a significant basis and a gross weight.

The tear and wear process also intensifies when a tank wagon moves in narrow curves and thus affects the surface of center plate unit, the  $\varphi$  angle of the turn of the center plate relative to end-trust bearing being larger.

The results of the research have shown that the tear and wear rates depend on mileage, radius of track curves and on wagon structure, particularly on its basis. Particularly, and this conclusion is confirmed by other researches, under the similar operation and freight load conditions tear and wear rates increase following linear dependency on total mileage but nonlinear dependency on the mileage run in the track curves.

**Key words:** railway, rolling stock, tank wagon, tribology, center plate unit, tear and wear, numerical analysis.

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