

INA ELGOGLIDE® Plain Bushes in SUW 2000 Gauge Changeover Systems from ZNTK Poznań S.A.

Examples of Application Engineering

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Automatic gauge changing facility from ZNTK

Five different power systems and 15 different train control systems as well as five different track gauges in Europe and Asia regularly cause delays in cross-border rail traffic. Due to differing technical standards, the engine and – if the other country uses a different gauge – the bogies of the cars often must be changed at borders, causing extra costs and delays. Automatic gauge changing facilities

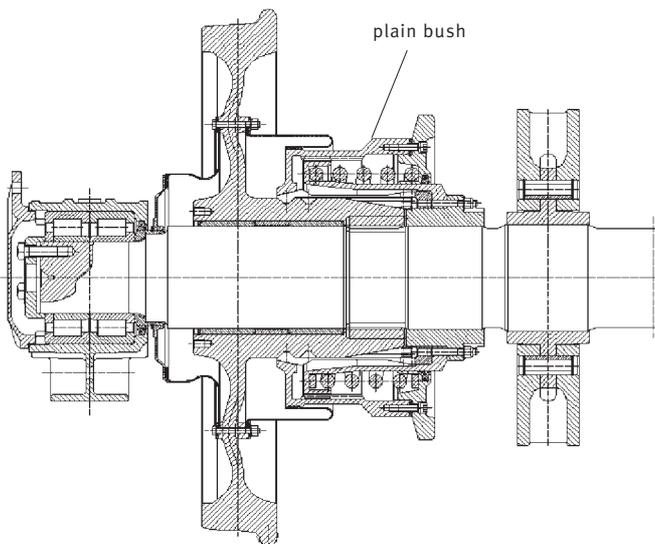
at border stations automatically adjust the distance between the wheelsets on the axle. As a train passes over such a facility, the wheels are unlocked and guided on special rails over the wheel flange in specially arranged profiled rails, adjusting the distance between the wheelsets on the axles to the new gauge. This makes it unnecessary to change the bogies of passenger trains and

to reload goods from one freight car to another with a different track gauge. The Polish SUW 2000 system makes it possible to integrate railway systems into Euro-Asian transport corridors, improving their interoperability.

INA Schaeffler KG supplies maintenance-free ELGES spherical plain bearings for the gauge changeover systems built by ZNTK Poznań S.A.

Function

The axial motion of the wheels along the axle during gauge adjustment must take place with minimum wear and friction. That is why INA has developed special, maintenance-free cylindrical plain bushes with an ELGOGLIDE® sliding layer which can support very high radial loads and high impact loads. They are used with great success to take up high alternating loads, generate very little friction, offer good damping characteristics and permit axial motions.



Locking mechanism of the SUW 2000 system with INA plain bushes



Gauge changeover system

Field tests

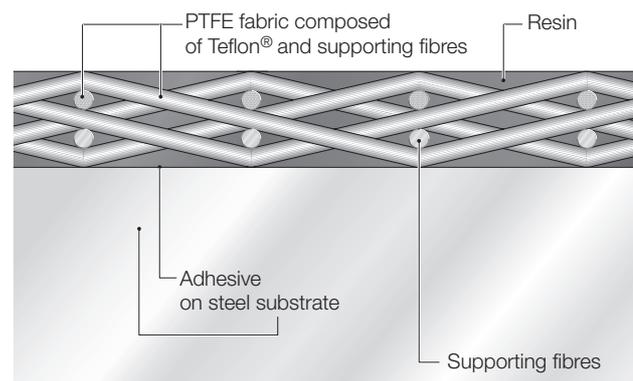
The gauge changeover system with ELGES spherical plain bearings has been tested successfully in a number of test cars since 1998.

Passenger trains that are equipped with variable-gauge wheelsets have been running daily on two routes: between Warsaw/Poland and Vilnius/Lithuania (since November 2000) and between Cracow/Poland and Kiev/Ukraine (since December, 2003). As they run over the gauge changing facility at a speed of ca. 5 to 30 km/h, the wheelsets are automatically adjusted from 1 435 mm to 1 520 mm gauge and viceversa.

Examination of the bushes at 100,000 km intervals showed very low wear rates that promise a service life of more than 500 000 km. In the same series of tests, freight cars are currently being tested successfully as well.

Structure of ELGOGLIDE® plain bushes

These plain bushes are radial dry plain bearings that consist of a thin-walled, cylindrical steel support body and the maintenance-free sliding layer. The ca. 0.5 mm thick ELGOGLIDE® coating consists of a fabric that is embedded in synthetic resin and is glued extremely firmly to the support body. In conjunction with the support body, the flow behaviour of the sliding layer is negligible, even under very high loads. The bond is resistant to moisture and swelling. The plain bushes are maintenance-free throughout their calculated operating life.



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