

# Axlebox Bearings in the Velaro RUS for Russia



## Examples of Application Engineering

### RFB 4 GB-D



Design study of the Velaro RUS

Graphic: Siemens

In 2006, the Russian state-owned railway company, RZD, placed an order for 8 high-speed trains with Siemens Transportation Systems. The vehicles are based on the Velaro platform, which is a further development of the ICE 3 from Deutsche Bahn. The order, which includes developing, supplying and maintaining the trains, is worth around EUR 670 million.

The trains are 250 meters long and have a capacity of 604 seats and are designed for Russian track gauge (1 520 mm).

4 of the 10 cars of the Velaro RUS are driven, whereby both bogies have two powered axles. This means that the trains do not require power cars.

The trains that can travel up to 250 km/h will first be in operation on the route between Moscow and St. Petersburg.

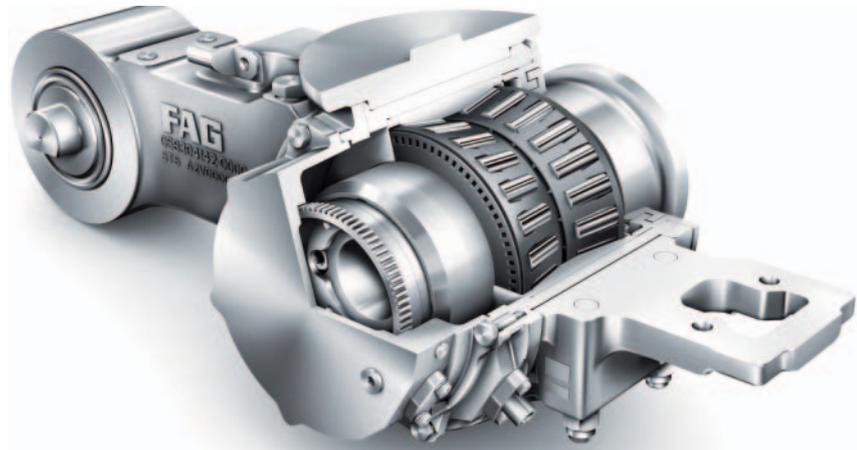
**Schaeffler Group Industrial is supplying the axlebox bearings with swing-arm housings for all Velaro RUS vehicles.**

## Axlebox bearings

The Siemens bogie design is based on the Velaro platform (brand name of a family of high-speed electric multiple units from Siemens). A solution using a swing arm is to be used in the axlebox bearing. Schaeffler Group Industrial has developed a complete swing arm consisting of upper and lower section, housing ring and rolling bearing. Due to the high axle load of 18.5 tons compared with the axle load of the ICE 3, tapered roller bearing units TAROL with a bore diameter of 150 mm are being used.

## Axlebox bearing housing

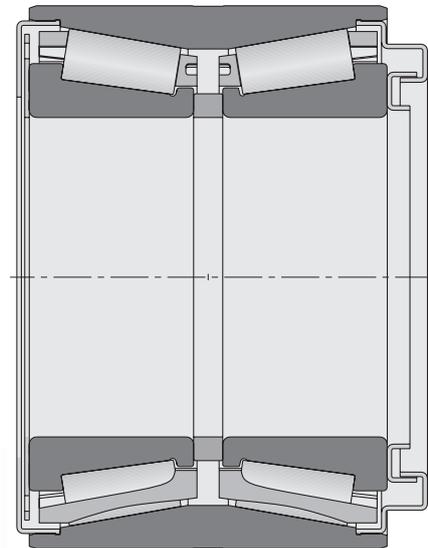
The axlebox bearing housing is made of spheroidal graphite cast iron according to DIN EN 1563 with defined impact strength in the lower temperature range. This means that the extreme requirements of the application (impact strength of 12 joules at -50 °C) are met. The strength of the housing structure has been tested, optimized and confirmed using the FEM (finite element method). Here too, the special requirements regarding the operating temperatures had to be considered.



## Rolling bearings

The tapered roller bearing unit TAROL is a complete unit consisting of basic bearing and seal elements. The bearing is fitted with a reinforced polyamide cage for the extreme operating conditions and is manufactured according to EN 12080. Initial mounting will be carried out at Siemens TS in Graz, Austria.

Siemens mounting personnel will receive expert training from F'IS (FAG Industrial Services) specialists to ensure that the bearings are mounted correctly. The Siemens axlebox bearing mounting facility has been certified by F'IS and is therefore authorized to mount FAG axlebox bearings.



## Lubrication and greases

FAG Arcanol L55 grease was selected for use in the vehicles at temperatures up to -50 °C.

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