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SF 35

Motor bogie for low-floor tram car Avenio

The bogies SF 35 are a further development of the SF 30 bogies, which are in service in the Combino plus trams in Budapest and Almeda.

As for Combino plus the bogies for Avenio are located in the middle of each carbody section and operate with a swivelling angle of 4.5 °. The floor height in the bogie area is 435 mm which allows flat ramps. The differences between powered bogie and trailer bogie are limited to the traction unit, the stub axle and brake equipment longitudinal forces are transmitted via 2 rubber buffers with sliding plates, which are located on the tranversal beam of the bogie frame.

The secondary suspension is performed by 2 Combi-springs. These springs consist of 1 rubber layer spring which allows for horizontal movements and a conical rubber spring that makes the vertical deflection. 2 anti roll bars give the system the required stiffnes against unacceptable rolling movements. For primary suspension the same conical rubber springs as for the original bogie design are applied.

The motor bogies with the outboard longitudinal traction units have small unsprung mass and a low centre of gravity compared with other 100% low floor bogies.

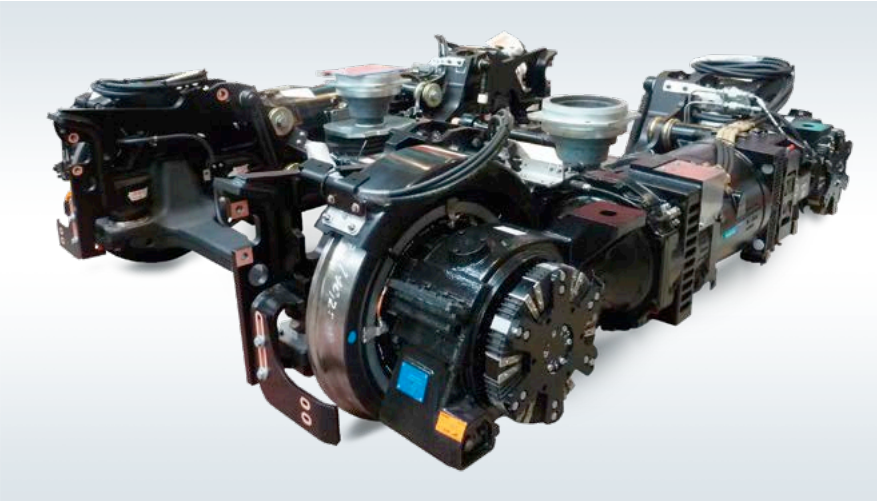
The motor bogie is equipped with completely suspended traction drive units with self ventilated asynchronous motors. The wheels of these motors are arranged in line and speed-coupled by means of the motor gearing unit. This design gives the bogie excellent axle guidance characteristics such as self-centering and low tendency to lateral oscillation. The traction drive units are equipped with spring-loaded brakes, with the brake disc directly arranged on the motor shaft. This allows an easy access to all major traction and brake components.

The torque transmission from the traction motor to the front and rear wheel is effected by a low-noise bevel gear and two cardanic spider couplings, which are arranged at different levels.

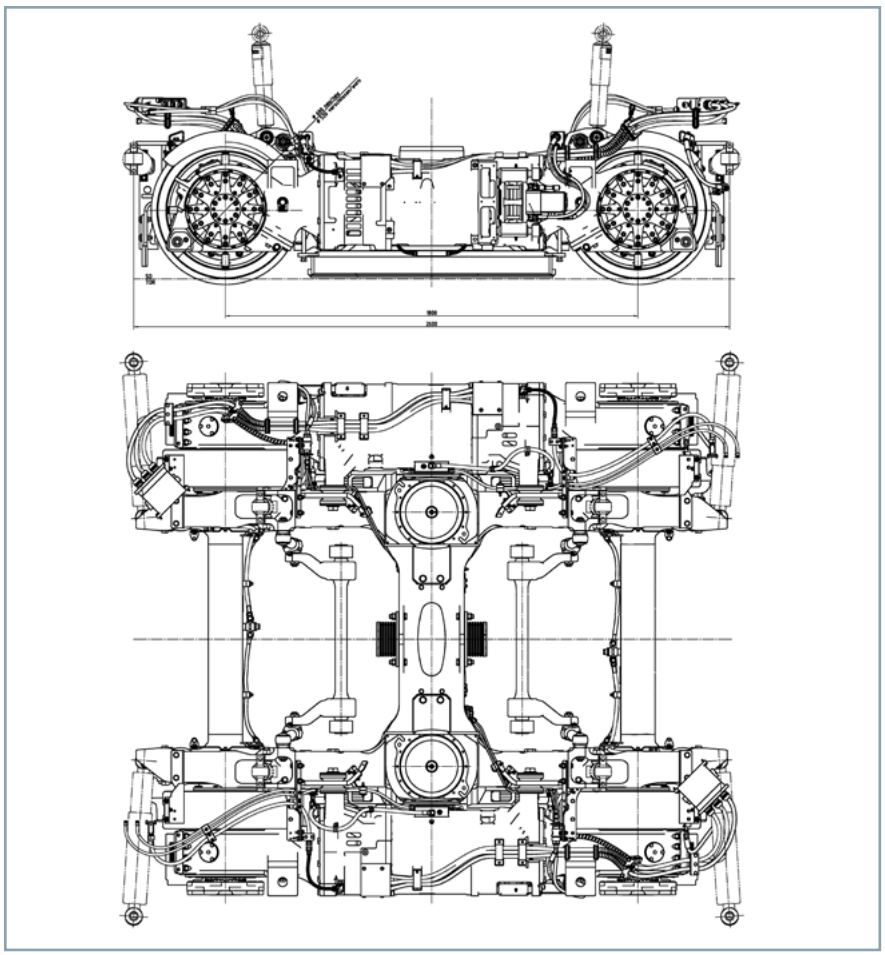
For the trailer bogie the brake disc is directly flanged to the wheel. Braking is carried out by active brake callipers.

The stub axle is of cast or forged design and carries tapered roller bearings. The wheel diameter for both motor and trailer bogie is 600 mm (new) and 520 mm (worn). To reduce wheel squeal, noise absorber can be mounted.

The H-shaped bogie frame is a combination of steel plates, as well as cast and forged parts. Special focus was put on light weight design which allowed to reduce the bogie mass by app. 30%.



Technical data	
Bogie	SF 35
Running Speed	80 km/h
Axle load	2x 10.5 t
Wheelbase	1800 mm
Track gauge	1435 mm
Wheel diameter new / worn	600 (610)/520 mm
Smallest radius of curvature in service/workshop	18 m
Weight PT/CT	App. 4.8 / 3.2 t



References
Munich
Den Haag
Qatar Education City
Bremen

Siemens Mobility Austria GmbH
SMO RS CP BG&P
Eggenberger Straße 31
A-8020 Graz
Austria

Article No. MORS-B10025-00