

# Yoke Type Track Roller Units in the Tilting System of Swiss ICN InterCity Tilting Trains



Examples of Application Engineering

WL 07 545 GB-D



InterCity tilting train operated by Swiss Federal Railways, built by a consortium of Bombardier/Alstom

The ICN InterCity is the newly designed tilting train operated by Swiss Federal Railways (SBB). Thanks to the electric tilting system, the trains can negotiate curves faster than conventional rolling stock, adding up to a considerable travelling time reduction especially on winding tracks. The seven-part train is driven by eight motors that are suspended from the superstructure, reaching a maximum speed of 200 km/h.

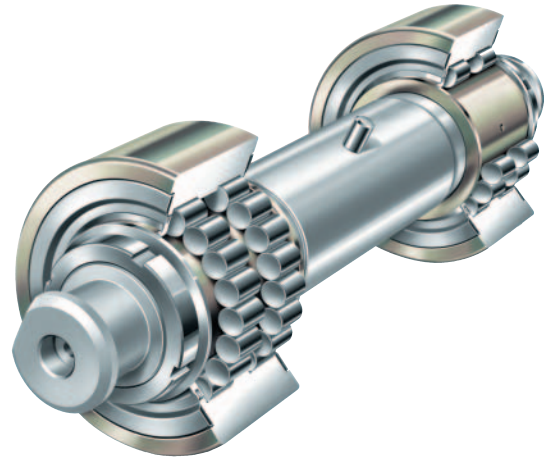
Since 1999, a total of 44 train sets of this class have been delivered, which do service on eight lines in Switzerland. The ICN, which was designed for capacity, is ca. 190 meters long and offers a seating capacity for 457 passengers. SBB sets great store by providing an environment that meets the needs of disabled passengers; therefore, passengers in wheelchairs can move freely through the whole train. One other distinctive feature

is the fact that all ICN trains have been named after outstanding Swiss personalities. In each of the seven open cars, quotations of the personalities after which the train was named were put up above the windows.

**Schaeffler Group Industrial supplies INA yoke type track roller units for the tilting systems in all InterCity tilting trains.**

## Technical Data

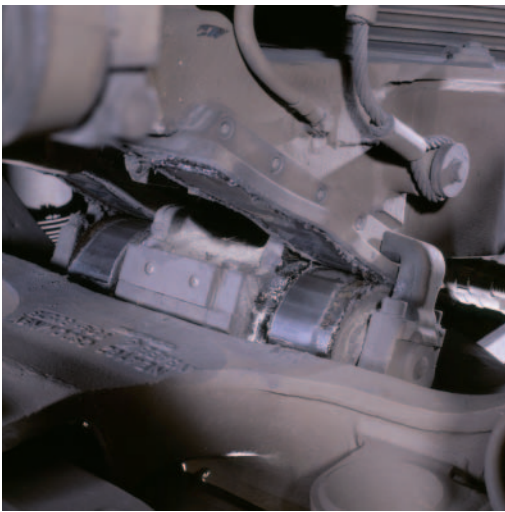
Max. speed	200 km/h
Acceleration	0,59 m/s <sup>2</sup>
Starting tractive power	210 kN
Max. motor output	5 200 kW
Tilting angle	±8°
Empty weight	360 t
Length / width / height of the traction unit	26,9 / 2,83 / 3,95 m
Length / width / height of the cars	27,0 / 2,83 / 3,95 m
Total length of the train	188,8 m



## Tilting technology

Active tilting technology is made use of in the ICN. The tilting of the superstructure as the trains enter and leave a curve is actively generated by actuators. The electromechanical actuators used in the ICN permit tilting angles of +/- 8°. To generate the tilting movement, the bogie is equipped with a bolster that also serves to fasten the superstructure to the bogie.

The bolster is safely supported in the bogie in yoke type track roller units via curved rails. The rails are shaped according to the desired tilting performance.



## INA yoke type track roller units

Yoke type track roller units are complete units consisting of a shaft and two yoke type track rollers. Two yoke type track roller units per bogie support the bolster that, being the main supporting element, makes the tilting motion of the superstructure possible.

The INA special yoke type track roller units used in the ICN are protected from corrosion by a Corrotect® coating and from contamination by a special seal. This ensures a high level of reliability and a long service life.

## Inspection of the bearings

Several of the trains, which require little maintenance, have reached a mileage of ca. 2 million kilometers, after which the first general inspection is due. The yoke type track rollers are successfully refurbished by Schaeffler Group Industrial and are then ready again for about another 2 million kilometers.



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