Modern Turnout Technology for High Speed

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General

High Speed Turnout Geometry

Switch

Swingnose Crossing

Conclusion
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Conclusion
HIGH SPEED
The VAE Group as a Main Supplier of High Speed Turnout Technology Systems Worldwide

VAE - High Speed Turnouts used in:
Germany, Austria, Switzerland, Finland, Netherland Turkey, Spain, Taiwan, China, Korea
Primary Goal of LCC Optimisation

Identification of the optimal component on the base of LCC
Three Key Factors for a Successful High Speed Turnout Technology

Minimizing of Forces
- Turnout Geometry
- Elasticity
- Inclined Running Table

Most Suitable Turnout Component Design
- TOZ Switch
- Swingnose Crossing
- Roller Systems

Robust Drive Locking and Detection System
- Hydrostar DLD System

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SYS File Railway Vehicles Model
Highspeed Crossover
Gallese/Italy

UIC60-7500/3000/15000-tg 0,026
Lateral forces

At the wheel rail interface with a speed of 160 km/h
Results in Comparison with the Parabolic Geometry Turnout tg 0.022

- Maximum lateral forces are reduced by 25%
- Maximum accelerations are reduced by 36%
Measuring Locations on the Vehicle

Motrice ETR 500 Politensione  404 501-2

Y31  Y41
Y32  Y42
Q31  Q41
Q32  Q42
Simulation-Measurements

Lateral forces: speed 178km/h, axle 3, deviating track
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Switch Device
TOZ – Comparison to Standard Design
TOZ Load Rating Optimized Switch Rails

Advantages:
- Optimal combination between switchblade thickness and stockrail thickness
- Almost no gauge widening
- Additional thickness of the switchblade in the most critical area
- Standard set of sleeper and plates are suitable
- Prolonging the service life of the product due to more material. According Swiss/SBB findings twice the lifespan.
TOZ Load Rating Optimized Switch Rails

A TOZ Switch gives you double the Lifespan compared to a Standard Switch!

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A TOZ Switch gives you double the Lifespan compared to a Standard Switch!

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### Technische Dokumentation

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Weichen SBB IV, SBB IV/90 und SBB VI
Einführung von "Tragfähigkeitsoptimierten halben Zungenvorrichtungen TOZ"

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### 4. Ergebnisse der Versuche mit hZV-TOZ

Im Jahre 1999 begonnene Versuche haben gezeigt, dass mit hZV-TOZ die Liegedauer im Vergleich zur bisherigen Bauart mindestens verdoppelt werden kann.

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iFAST
Elastic Inner Stock Rail Fastening with Pi Rolles

iFAST clip

PIROLL Tandem roller

PIROLL plate integrated roller system
iFAST with PIROLL
Inner side rail fastening and switch roller

Advantages:
- Easy assembling and disassembling procedure
- Spring can be preassembled
- Flat spring rate
- Piroll fully integrated in the plate
- Plastic rollers cannot damage the switch blade when wrongly installed
HIGH SPEED TURNOUTS AUSTRIA
Speed 230 km/h
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Centro MN13 Crossing
Force Oscillation in relation to the Spring Rate
INNOTRACK –
Results SP3 Switches & Crossings

Results of demonstrator installation:

- Significant reduction of contact forces by means of KGO and optimized elasticity (soft pads) in S&C
- VAE S&C has the lowest vertical force for the crossing (T/O E454)
High Speed Turnouts with Rheda Classic - Germany
Swing Nose Crossings for High Speed Turnouts

SNX with Cast Manganese Cradle:
- Sole plate consisting of:
  - 1pc Cast Manganese Cradle
  - 3pc Cast Steel Cradle
- Point and Splice Rails – Profile 60E1
- Closure Rails – Profile 60E1
- Length: 25,940m
- Geometry: 1:32,05

SNX Characteristics with Cast Manganese Cradle:
- Sole plate consisting of:
  - 1pc Cast Manganese Cradle
  - 3pc Cast Steel Cradle
- Point and Splice Rails – Profile 60E1A1
- Closure Rails – Profile 60E1
- Length: 20,390m
- Geometry: 1:38,46
Swing Nose Crossings for High Speed Turnouts

**SNX with Long Wingrails:**
- Long Wing Rails made out of profiles 60E1 and 60E1A1
- Point and Splice Rails – Profile 60E1
- Length: 23,013m
- Geometry: 1:38

**SNX with Long Wingrails:**
- Long Wing Rails made out of profile 60E1
- Forged Vee Block
- Closure Rails – Profile 60E1
- Length: 23,016m
- Geometry: 1:38
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Plug and Play Turnout with JIT Supply

- Optimal Turnout Geometry
- Most suitable component design
- Preassembled Turnout in the workshop with tight tolerances
- Just in time supply

Highest Initial Quality

- Smallest maintenance requirements
- Longest Lifespan
- Life Cycle Cost Optimisation
High initial quality for LCC optimisation

A Modern High Speed Turnout Technology extends Lifetime with little Maintenance Requirements
Thank you!

Heinz Ossberger
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voestalpine VAE GmbH