

THE LIFE CYCLE OF A TURNOUT

FIRST MAINTENANCE SERVICE

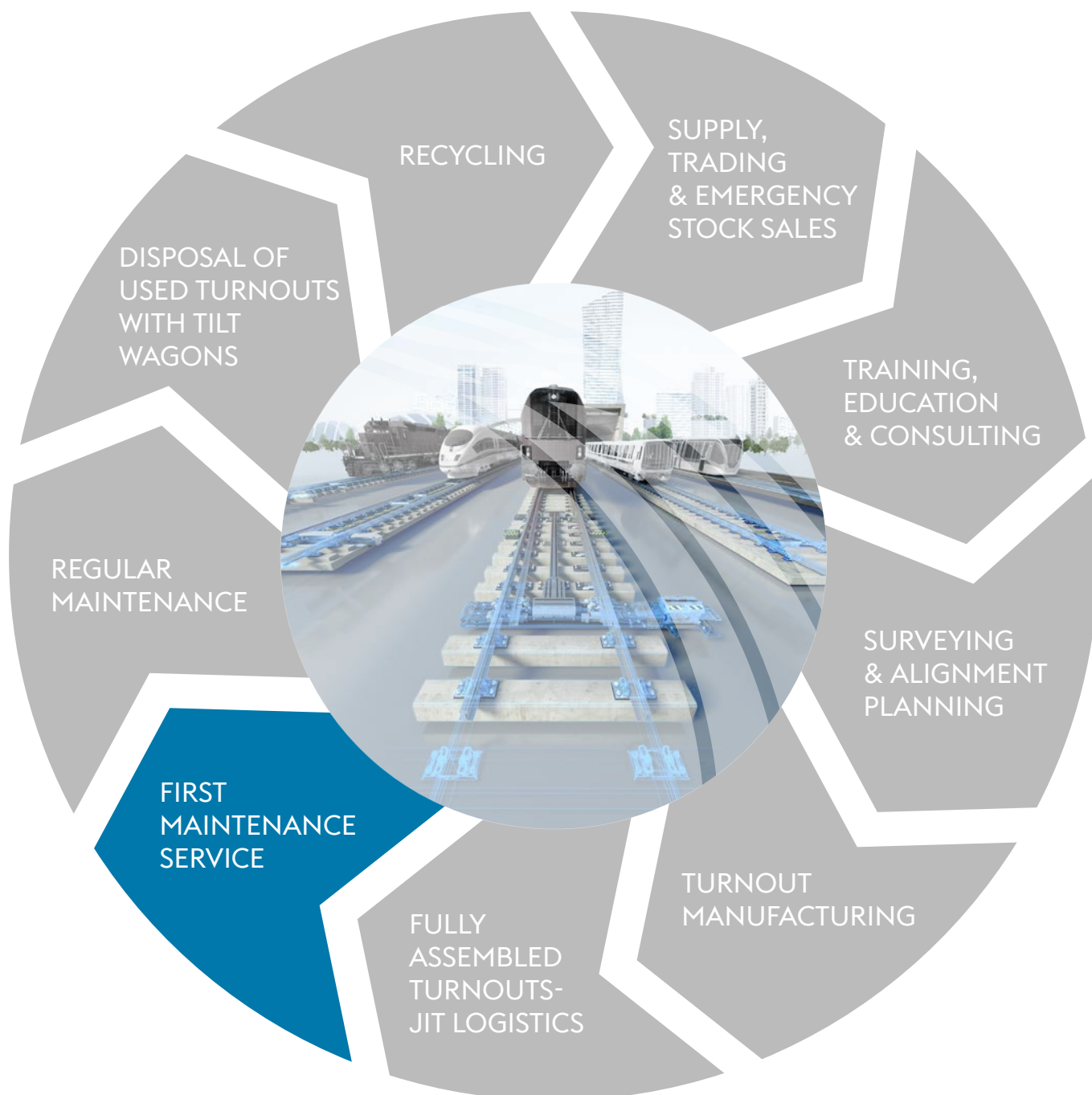
For your Performance on Track®.

DEVELOPED FOR YOUR BENEFIT – FULL SERVICE SOLUTIONS FOR THE TURNOUT LIFE CYCLE

As a complete provider of turnout solutions, voestalpine Turnout Technology Zeltweg covers the entire product life cycle of a turnout. Only a company with experience in the whole duration of the life cycle of turnouts and turnout components can professionally evaluate and optimize specific product characteristics, and develop designs to sustainably extend the life of a turnout.

In addition to the manufacturing of turnouts, our range of services includes technical services, logistics and disposal of used turnouts with tilt wagons. Our comprehensive maintenance service through techniques that extend the life of the turnouts, such as installation monitoring, first maintenance service and turnout service, complete our offer. This provides our customers with of the highest installation quality and cost-effectiveness, as well as

higher track availability due to shorter route closures. For us, offering complete solutions means understanding the needs of our customers and developing customized system solutions with added value in order to implement innovative designs together with our customers, for greater efficiency and cost-effectiveness, and to head down new paths together.





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INCREASE YOUR TRACK AVAILABILITY THROUGH EXCELLENT QUALITY

Turnouts play a crucial role in rail infrastructure and are conceived and produced according to the highest quality and safety standards.

The requirements placed on our turnouts are very different – our solutions are always optimally tailored to specific customer needs. In our capacity as world market leader, we have a decade of experience as well as profound know-how in the design and construction of complete solutions in all models and for all track classifications. We profit from this knowledge, which constantly guarantees our further development and enables us to present innovative solutions to our customers.

A turnout system made by voestalpine combines the product with the service, thus ensuring sustainable customer benefits. We stand for competence, modern technologies and progress, as well as the constant availability of our turnout systems. The initial servicing of turnouts significantly increases the quality of our systems and thus extends both the availability and the life of the systems. These activities are made up of four service levels that are optimally coordinated with one another and thus substantially reduce costs. Most of our activities during the initial servicing of turnouts can be performed while the track remains in operation.



1. CHECKING THE TURNOUT CONDITION

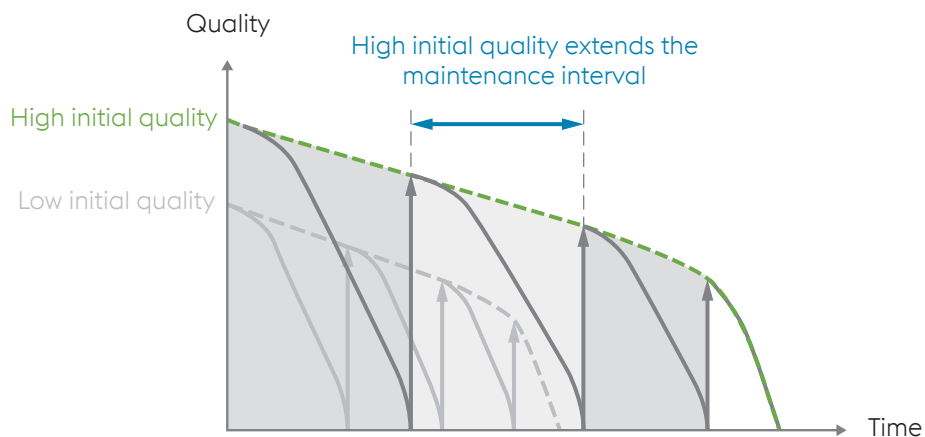
The initial service level in the course of the first maintenance service of turnouts consists of a visual check of the condition of the turnout.

During this check, the following items are assessed: the correct switch attachment on the stock rail, the height and direction of the turnout, the position of the sleepers and anti creeper as well as any damage. At this service level, changes in the position compared to the condition before commissioning can be determined. If necessary, the correct height and direction can be determined and documented by a survey team.

Extending maintenance intervals

If the correct position and perfect function of all components are ensured at the beginning of the product life cycle, this will demonstrably extend the maintenance intervals and the overall life of

the turnout. Major dynamic loads acting on the vehicle and turnout will be avoided, while the life cycle will be increased and the life costs (LCC) will be substantially reduced.





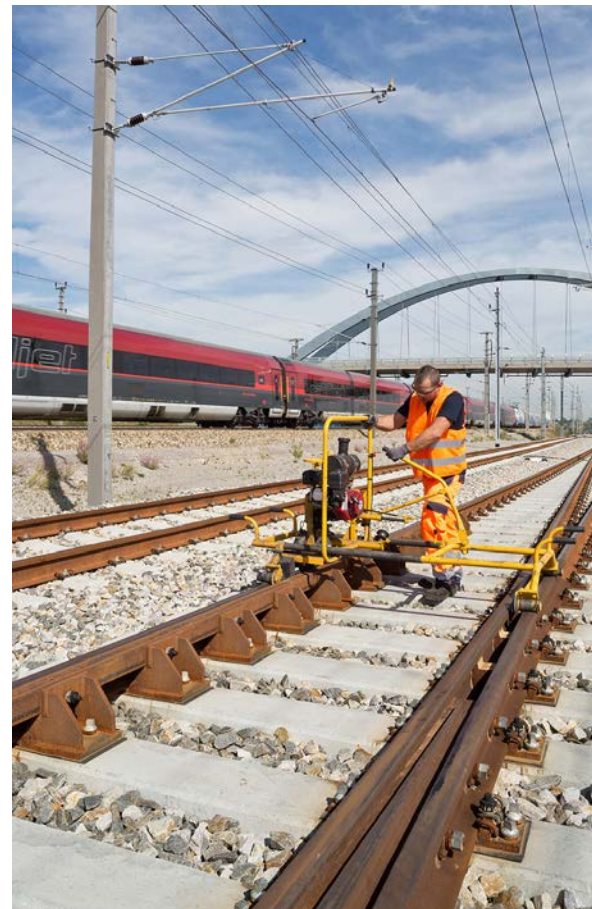
2. PROCESSING/MAINTENANCE BY WAY OF GRINDING

Passage of the first few trains intensify work hardening on the material surface, which leads to laps in the area of the switch device and the crossing.

These laps occur on the stock rail and the crossing, as well as in the area of the point of the switch. If they are not removed, this leads to break-outs or cracks on the components within a very short time, which make early component replacement or repair welding necessary. In order to avoid such break-outs and the associated malfunctions, our service ensures that these laps are de-burred on all newly installed turnouts or components – especially switch devices, stock rails and crossing areas - in the course of the second phase.

Avoiding failures

Ideally, this grinding process takes place after a load of approx. three million gross tons in the case of simple turnouts and after two million gross tons in the case of curved turnouts. Experience shows that these values are reached six to eight weeks after commissioning. Final tamping should have already been completed by this time.





INCREASE IN TRACK AVAILABILITY. REDUCTION OF LIFE CYCLE COSTS.

3. ADJUSTMENT OF THE TRACK AS WELL AS OF THE SETTING, LOCKING AND END POSITION DETECTION SYSTEMS

In the course of the third service level, the track as well as the setting, locking and end position detection systems will be checked and adjusted.

When it comes to the track, the first maintenance service of turnouts mainly refers to roller systems, correction of the switch attachment, inspection and maintenance of the insulated joints as well as the correct position of the fastening system. The settings of the locking, setting and end position detection systems are checked and precisely re-adjusted if necessary. In addition, gauge, switch and groove widths are measured again and inspected, because

shifts can be caused by the installation or the tamping process and the passage of the first trains. Geometric inspections are particularly important after the grinding process. If the measurement values show deviations during the third service level, these deviations are corrected and regulated immediately. We are only allowed to carry out this work on private railways, not on ÖBB track. This approves the turnouts after the latch test.

Ensuring availability – Maximizing the life cycle

By ensuring the correct switch position and the optimal adjustment of the roller system, the setting forces are reduced to a minimum. All readjustment work guarantees preservation of the correct wheel-rail contact and a higher initial quality of your turnout system,

including all the advantages mentioned above, such as the extension of maintenance intervals, the avoidance of malfunctions and the increase in availability of the turnout system.



4. FINAL INSPECTION

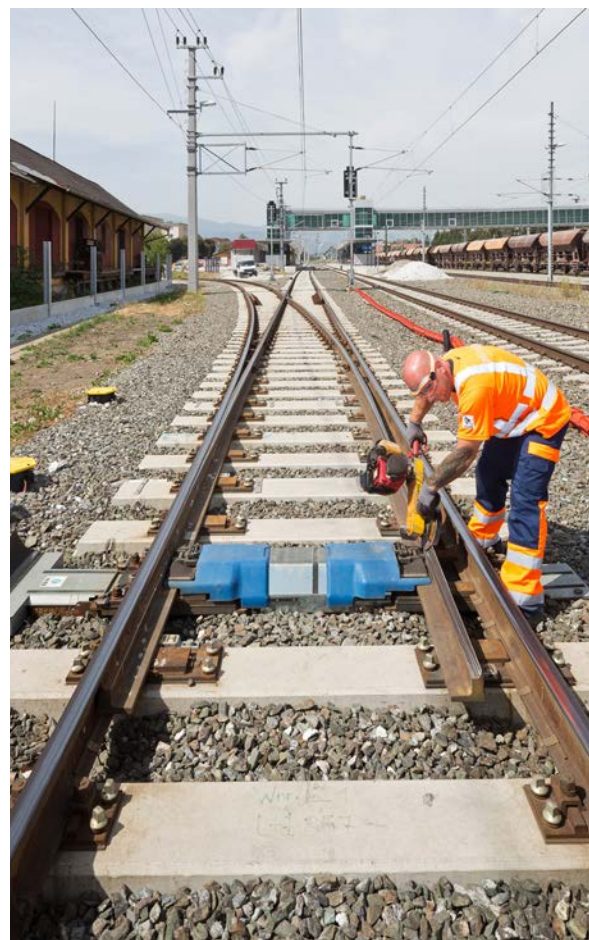
Upon completion of the initial servicing activities by our special teams, a final inspection is carried out in the course of the last service stage.

All results are documented and sent to the customer. Approval is granted by means of a special acceptance test conducted by the infrastructure operator. If the first maintenance service of turnouts takes place within a defined period, this not only means increased track availability and a reduction in life cycle costs for our customers, but also an increase in the warranty period.

Increasing the warranty period

As studies demonstrate, high initial quality at commissioning has a disproportionately positive effect on the life of the turnout. It can be assumed that repairs account for 60% to 70% of the life cycle costs of turnouts. With voestalpine's initial servicing of turnouts, these measures and costs can be considerably and sustainably reduced.

Our experts will be happy to advise you in a personal meeting!





PERFORMANCE
ON TRACK®

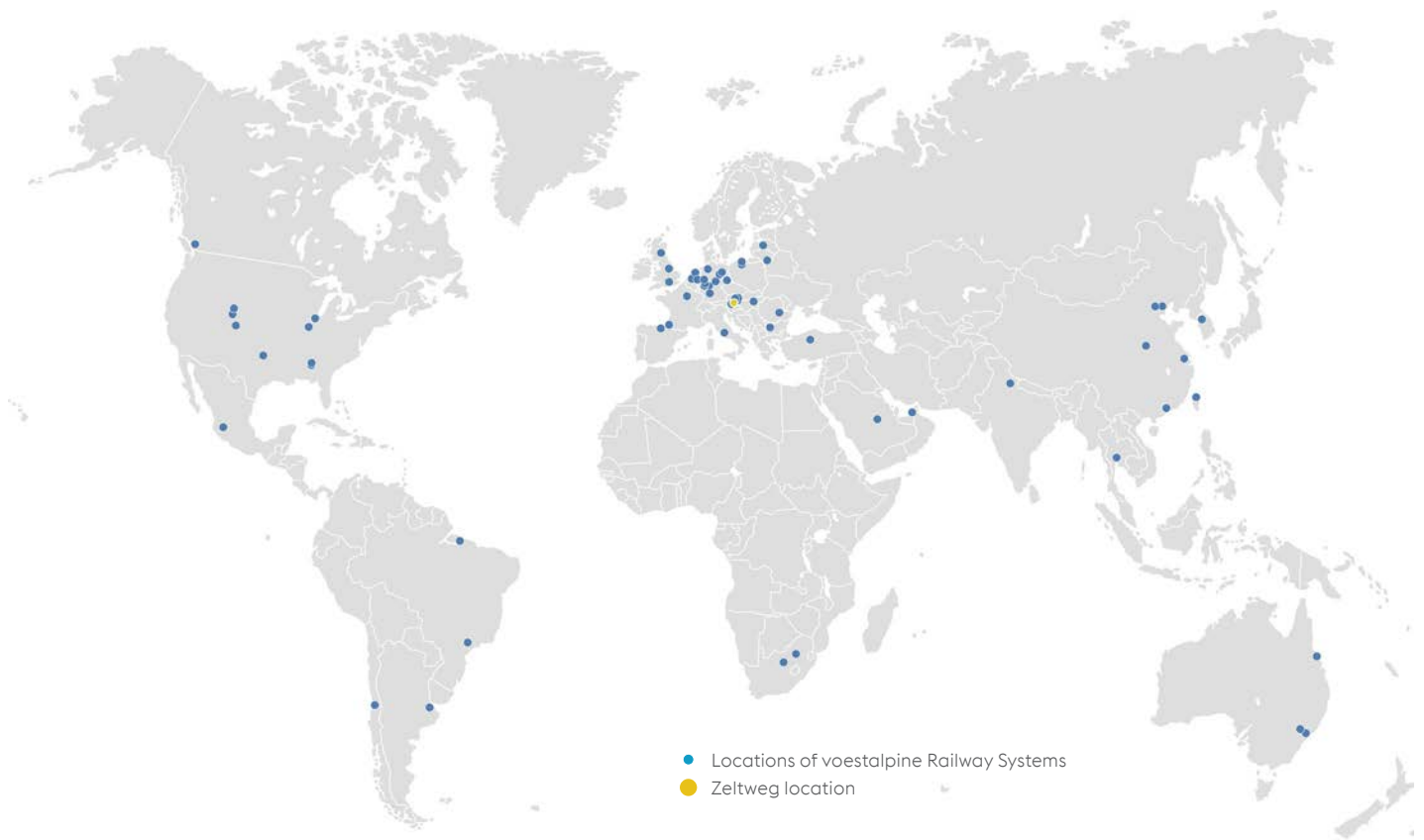
voestalpine Railway Systems

We are a world leader in system solutions for railway infrastructure, and we offer high quality products and services (Track Solutions) for rail, turnouts, fastening systems and signaling technology.

WE ARE PERFORMANCE ON TRACK®.

voestalpine Turnout Technology Zeltweg, a subsidiary of voestalpine Railway Systems, is a leading system partner in the turnout sector. The company develops and produces Vignole turnouts, track connections, slips, crossings and complete layouts, etc. in accordance with international standards or special customer requirements, in all available rail profiles and required gauges. Innovative drive,

locking & monitoring units, diagnostic systems for fixed installations and rolling stock as well as a diverse range of services complete the product portfolio. Notable references in high-speed, heavy-duty and local transport sectors all over the world emphasize the extensive competence of our company.



voestalpine Turnout Technology Zeltweg GmbH

Alpinestraße 1

8740 Zeltweg, Austria

T. +43/50304/28-0

F. +43/50304/68-129

www.voestalpine.com/railway-systems

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