

Track & Infrastructure



Evolution of Rail Logistics

Automated Rail Exchange Systems Increase Quality and Efficiency when Replacing Long Rails

Rail loading trains (Pic 1) have been used successfully by infrastructure operators worldwide for decades.

They enable the transport of long rails directly from the factory or rail store to the construction site, including delivering the rails directly on the track, as well as the collection of old rails for further use or recycling.

Now Robel introduces new loading processes, focusing on the automation of key functions. This minimises the need for personnel while maximising transport performance, thereby increasing efficiency and occupational safety at the same time.

The Basic Components

The ROREXS rail exchange system (Pic 2) is a combination of several wagons with modular superstructures whose core components – transport unit, manipulator and loading unit – feature a new level of automation.

- The transport unit consists of special superstructure modules with with 40-foot or 60foot container frames, which are twist-locked to standardised carrier wagons. ROBEL provides the actual working modules, while the carrier trolleys are provided by suppliers or are already available from the customer.
- The manipulator enables the rails to be loaded at the construction site, i.e. both the long rails to be delivered and the old rails to be picked up.
- The complete newly developed, remote-controlled



Pic 1: ROBEL rail loading trains have been in service worldwide for more than 60 years © ROBEL Bahnbaumaschinen GmbH

loading unit enables particularly gentle rail storage at the construction site and, thanks to its containerframe design with three modules, eliminates the need for special vehicles. Optionally, the system can also be designed for bidirectional operation.

Automated Transport Unit Increases Work Safety

Hydraulically operated row support frames are used for safe and secure storage of the long rails on the transport unit. Depending on the design, they can carry up to eight or ten rails next to each other and two to five layers on top of each other. These rails can be up to a total length of 330 metres. The rail is guided with great care during transit of curves, and the required





degrees of freedom in the longitudinal and transverse directions are guaranteed. A new feature is that the rows of supports can be rotated hydraulically. This allows access to lower layers for loading and unloading without any manual actions: the transport unit no longer needs to be accessed, a quantum leap for operator safety. The rotating process and locking are activated by radio remote control and monitored by sensors.

Rail clamping is also automated. All the usual clamping screw connections for fixing the rail are no longer required, which means that the crew no longer has to risk walking on the load or tighten the screws (Pic 3). Each clamp is only released immediately before unloading, each slot is monitored by sensors and can be individually selected on the remote control.

Manipulator for Careful Rail Handling

The rail manipulator is equipped with an independent



hydrostatic drive and moves on its own rails along the entire length of the train. Two hydraulic grippers at the end of freely movable arms guide the rails during the loading and unloading process. Cameras monitor the rear loading area – the operator thus controls all work processes from the cab.

Automated Loading Unit with One-Man Operation

The new ROREXS design does away with the usual chute wagon sets. Their task is taken over by modular frames with special superstructures on carrier wagons; a flexibly extendable loading satellite at the end of the rack replaces the inclined guide channels. (pic 2) The basic structure, mounted on three long carrier wagons, also results in a flatter inclination that ensures lower stresses on the rails. All hydraulic functions can be controlled by radio remote control. Manual intervention is not required at any point, which is why one operator is sufficient for all operations.

Less Personnel, More Safety

Compared to all previously long rail transport units, ROREXS only requires a minimum of three people to unload or pick up rail pairs at the construction site. Two operators each control the movements of a rail clamp on the manipulator and the functionality of the transport unit, while a third operator at the head of the unit on the track controls unloading and loading via the chute unit. The operator in the manipulator is responsible for the remote control of the row support blocks and clamps. The ROREXs can operate under live overhead lines, as nobody moves on the unit unprotected, i.e. outside the manipulator's cab. Unlike in the past (Pic 3), there is no longer anyone on the loading units or next to the rail loader, which is a big plus for work safety on the track.

Click here to see ROREXS in operation.

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