KOLEJOVÉ POHONY

To optimize railway sidings.

Rope Shunting Device LTV-NV

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Place of Destination and Basic Description

The LTV-NV line shunting equipment is designed to shift railway wagons as they are loaded or unloaded on the dead-end tracks of railway sidings, liquid product bottling yards and terminals. It is able to move and brake a set of wagons weighing up to 2,500 tonnes according to local conditions. The rope shunting device is made up of basic units: a power station, a return station and a shunting trolley which is pulled along the track by means of a transport rope. The trolley is equipped with standard wagon buffers and a screw coupler or semi-automatic suspension coupler on the side of the coupling with the set.

For markets where automatic couplers (SA3) are used, we also offer this connection variant.
An integral part is an electrical switchboard with a control system and a tensioning rope aggregate.
The set's start and braking are controlled by a frequency converter. The programming machine in the technology switchboard allows logical links to the existing technology devices of the train (feed nozzle and arms, rail weight, etc.).
The entire shunting device technology can be designed and implemented in a potentially explosive (Ex-performance) environment if needed.

BASIC TECHNICAL DATA LTV-PV:	
The Maximum towing force*:	15 - 160 kN
The nominal output*:	7,5 kW, 11 kW, 15 kW, 22 kW, 30 kW, 37 kW, 45 kW
The maximum carriage speed with load / without load*:	0,4 m/s / 0,2 m/s
The maximum weight of the shifted set*:	up to 2500 t
The track slope:	up to 3 ‰
The track:	shifting in the arc and at the adjusted crossings
The operating:	from local box, operators panel or remote control

*Depending on the local conditions and needs of the user

Drive station

Drive station is made up of a welded travel frame, which is anchored on a concrete base by means of anchor screws, with the main drive running in it. Inside the drive frame is a compact drive unit made up of a 3-phase air-cooled electric motor and a planetary gearbox, with a drive cable disc mounted on the outlet flange.

On the concrete base of the driving station there are pulleys, guiding the powered rope to the return station and to the shunting trolley, event. anchoring the end of the rope. The tensioning of the transport rope is carried out by means of a hydraulic aggregate which is placed on the concrete base of the driving station.

The layout of the main elements of the shunting device in the track requires individual solutions at all times. It depends mainly on the space next to the tracks available and on the power used. A distributor with a control system can be located directly at the driving station on a reinforced concrete base, or in a substation off the track. Sensors are placed in the track for the safe and accurate function of the rope device.

Below are some examples of arrangements:

Fig. 1) Layout diagram of the LTV-NV rope shunting device: carriage with rollers + drive station behind stop-buffer.

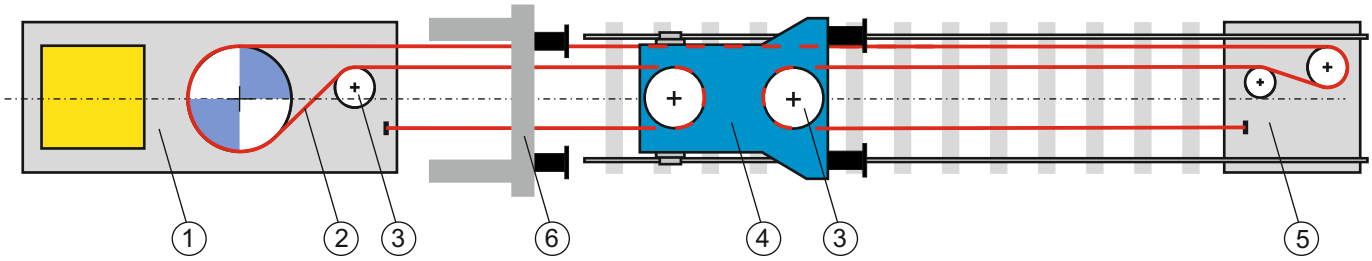
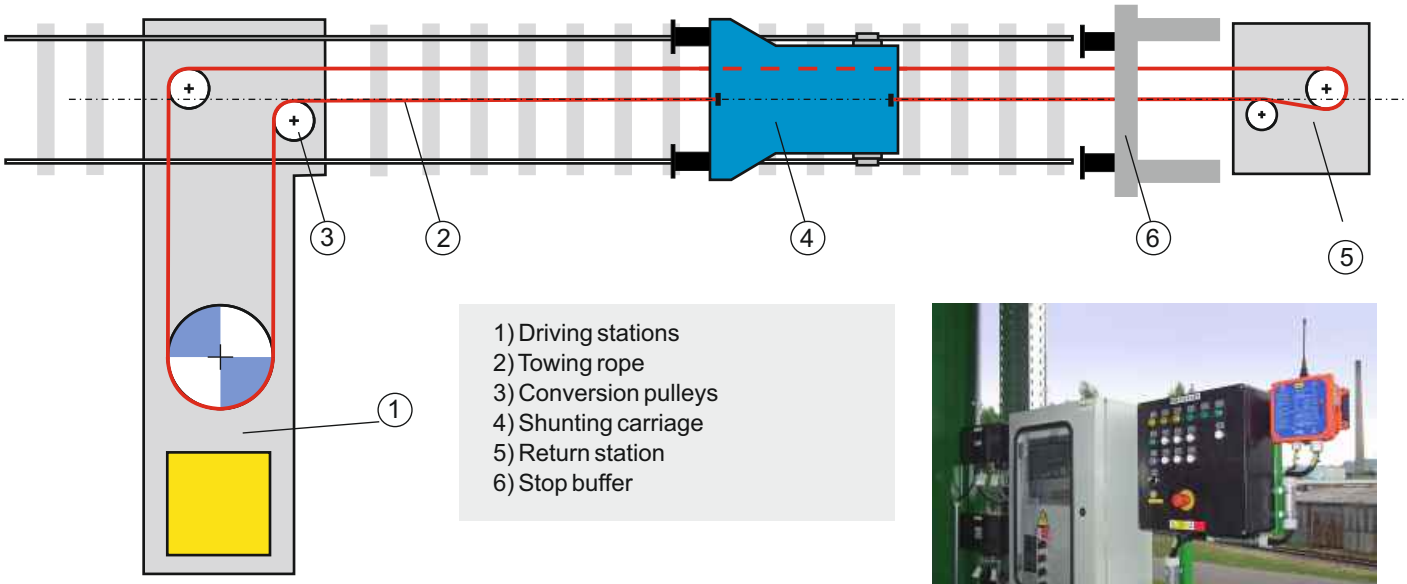


Fig. 2) Layout diagram of the LTV-NV rope shunting device: carriage without rollers + drive station perpendicular to the track.



1) Driving stations
2) Towing rope
3) Conversion pulleys
4) Shunting carriage
5) Return station
6) Stop buffer

Fig. 3) Example of arrangement of remote control box.

Return Station

The return station consists of a welded frame with stored rope pulleys and a grip - in the case of a "tri-cable system" the rope is firmly anchored to the concrete base of the return station.

The pulleys provide guidance for the transport rope to the carriage, where it is terminated in the case of a "two-cable system" by means of a tether, orbit and rope clips.

The construction of the return station is protected by a steel cover.

Driveway and Towing Rope

The siding itself serves for the trolley's running and the trolley's parking position is generally at the end of the track at the stop.

Steel tow rope not lubricated is designed according to STN EN 12385-4 with diameter according to the projected load. In the track, the movable branch of the rope is supported by plastic sliding elements which reduce wear and tear on the rope by the abrasion and keep it clean.

Controls

The shunting device is operated by default using a local control box located in a clear location next to the tracks, or from a control desk in the operator's room. Another option is remote control using a radio set. The operator can thus manipulate railway wagons from any point on the line. The service control point is the switchboard itself, which is used only for maintenance and repair purposes.

Capture Wagon and Set

To connect the shunting carriage to the wagon or wagon set, the wagon bumpers will come to rest - the hook of the coupler will be fitted or the semi-automatic coupling will come on automatically when it comes into contact with the wagon hook.

Once the required handling has been completed, the operator must disengage the hook of the screw coupling or release the coupling from the outside. The use of the coupling clutch increases safety because the operator may not enter the rail between the wagons and speed up the handling when the operator only disconnects the couplings.

Shunting Progress

- The shunting locomotive moves the wagon train into the shunting device area.
- The operator disconnects the train from the locomotive and it can perform other tasks.
- The operator uses a local control box or remote control to move the pushcart to the first wagon of the set. The coupling of the carriage is connected to the coupling of the wagon.
- The operator shall carry out the required operations with the wagon, or the set of wagons, when loading or unloading them.
- After serving the wagons, the operator will take the wagons to the place by the same procedure, unhook the coupling of the carriage, where a shunting locomotive will take over.

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