

LOK 13.90E



Max draw pull: **130 kN**

Max towing/pulling capacity: **2600 t***

Electric motors: **2x32 kW, 80 V**

Battery: **2x930 Ah, 80 V**

Max speed: **7 km/h** (slow gear) – **15 km/h** (fast gear)

Nominal weight: **24 t**

Dimension (LxWxH): **4800x2500x3400 mm**



TECHNICAL FEATURES

FRAME: The frame is built in S355 J0 high-strength steel sheets in accordance with the EN 10025 standard. Each sheet and beam contributes to the strength of the frame which is therefore suitable for heavy loads.

CABIN AND DRIVER SEATS: The cabin is made of steel and it is equipped with one driver seat, passenger seat as an option.

It has a rear door that gives access to the two exit corridors, one on the right and one on the left side.

The internal insulation of the cabin is of the anti-condensation type and is suitable for both cold and hot climates.

The glass in the windows and doors is of the ECE R-43 approved type.

The seats are comfortable, adjustable and equipped with armrests. The steering column is also adjustable according to the driver's height.

The cabin can be equipped with a heating and air conditioning system.

All the commands in the cabin are ergonomic, there is a multifunctional LCD display to control and manage all the machine parameters (for example pressures and alarms in progress) and a monitor for external video cameras (option).

BATTERY: Two 80V batteries, each with a capacity of 930 Ah. Steel battery containers with lifting system with forklift or crane. On board battery chargers. Centralized battery filing system with visual floater indicating battery fluid level.

ELECTRIC MOTOR: Two 32 kW AC motors, S2 30', 80 V. Motor performance may vary depending on altitude and temperature.

STEERING SYSTEM: Hydraulic power steering type on front wheels (4-wheel steering as an option).

FRONT AXLE: Heavy duty, steering type, double reduction, with gleason differentials and epicyclical final drive on the wheels.

REAR AXLE: Heavy duty, double reduction, with gleason differentials and epicyclical final drive on the wheels.

SUSPENSIONS: Front and rear suspensions with semi-elliptic leaf springs.

TIRES: 4 pneumatic and interchangeable tires 10.00-R20.

These radial tires are expressively planned for heavy duty and they have a special feature: the framework is composed by a radial tissue with steel meshes, lateral reinforces and the peak stabilized by overlapping meshes.

RAILWAY AXLES: Tilting type railway axles in order to maintain constant pressure between railway wheels and rails.

The railway axles are driven by hydraulic cylinders equipped with nitrogen pressure accumulators acting like a shock absorber; the cylinder pressure is monitored electronically.

The railway wheels have a patented *Zephir* profile with a diameter of 400 mm, made of forged steel and mounted on double tapered bearings.

SERVICE BRAKE SYSTEM: Fully proportional hydraulic brake system acting on the rubber tires; electro-hydraulic pump, No. 2 independent circuits, one on the front axle and one on the rear one; No. 3 nitrogen pressure accumulators able to guarantee No. 6 braking actions even if the hydraulic pump is out of order. The service brake is activated every time that the vehicle is switched off. Warning system of worn brake pads in the cabin.

PARKING BRAKE: The parking brake acts on an independent disc assembled on the transmission. It is always activated when the system is not supplied with hydraulic or pneumatic pressure (brake cylinder with negative action). The parking brake is activated every time that the vehicle is switched off.

SAFETY SYSTEMS:

- No. 9 emergency buttons installed both externally and internally to the cabin and on the remote control if present (option).
- "Dead man" braking system that brakes the machine if the driver does not periodically press the appropriate button (*SIFA* button).
- Emergency braking in rail mode if the driver is not sitting in his driving seat.
- Automatic emergency braking system that is activated in many dangerous situations (for example insufficient hydraulic or pneumatic pressure).
- System that does not allow traction in many dangerous situations (batteries being recharged, insufficient hydraulic or pneumatic pressure, railway axles not in the right position, etc.).
- Handrail along the entire walkable platform.
- Wide and illuminated stairways.
- Beacon light.
- Railway horns.

PAINTING

Frame standard painting process:

- Sandblasting;
- Grouting
- Sanding (with sandpaper);
- Application of the epoxy primer to prevent oxidation (80 ± 10 micron thick);
- Application of polyurethane enamel paint 40 ± 10 micron thick.

Total paint thickness: about 120 micron.

Cabin and bonnet standard painting process:

- Cathaphoresis (it avoids the formation of corrosion even in the hidden points of the bent sheets);
- Light sanding after cathaphoresis;
- Rinse with clean water;
- Drying chamber at 120 °C;
- Application of thermosetting powder paint with the use of electrostatic guns;
- Passage in the oven at a temperature of about 200 °C for about 20 minutes in order to obtain polymerization of the paint.

Total thickness of the coating about 80/100 microns.

OPTIONS

Standard rail gauge 1435 mm, different rail gauge measures as option

Remote control system

Passenger seat

Rail commands for the second driver

Air conditioning system

Heating system

Transceiver predisposition in cabin with fuse (12V, 10 Ah, negative ground)

LED working lights

Four steering tires

Spare tire (rim + rubber tire)

Additional Trojan refilling for tires

Lathe interlock system

**Interlock system for photoelectric barriers, gates, Jib cranes, light switches, etc.
Photocell safety barrier (automatically stop the machine when it reaches a defined position)**

**Pneumatic system to brake the towed vehicles with: 760 l/min or 1540 l/min air pistons compressor or 2200 l/min air screw compressor.
Capacity of the air tanks: 200 liters (greater capacity on request).**

Air pipes (two or four)

MR pipes (two or four)

***Air Blade System*: to increase the rail friction coefficient in case of rain.**

Pre-arrangement for coupler supplied by the customer

Hydraulic slide for coupler height adjustment

Couplers based on customer requirements (AAR, UIC, Scharfenberg automatic coupler, semi-permanent bar, tow bar, pin hook, etc.)

Electric winch for coupler lifting

In-railing video camera system (1 monitor and 2 video cameras)

Video camera system for coupler (available only with in-rail video camera system)

Rail track short-circuiting signalling system

On-rail presence magnetic sensor

Distance proximity sensors

Battery range extender: diesel generator mounted on the machine to charge the traction battery

***Arctic Pack* for cold environment: electrically heated driver seat, special oils, hydraulic oil heating, extra heater in the cabin, heating of critical components (valves, electronic components, etc.)**

***Rescue kit* (eyebolts and mechanical locking of railway axles in rail mode in case of failure of the hydraulic pump)**

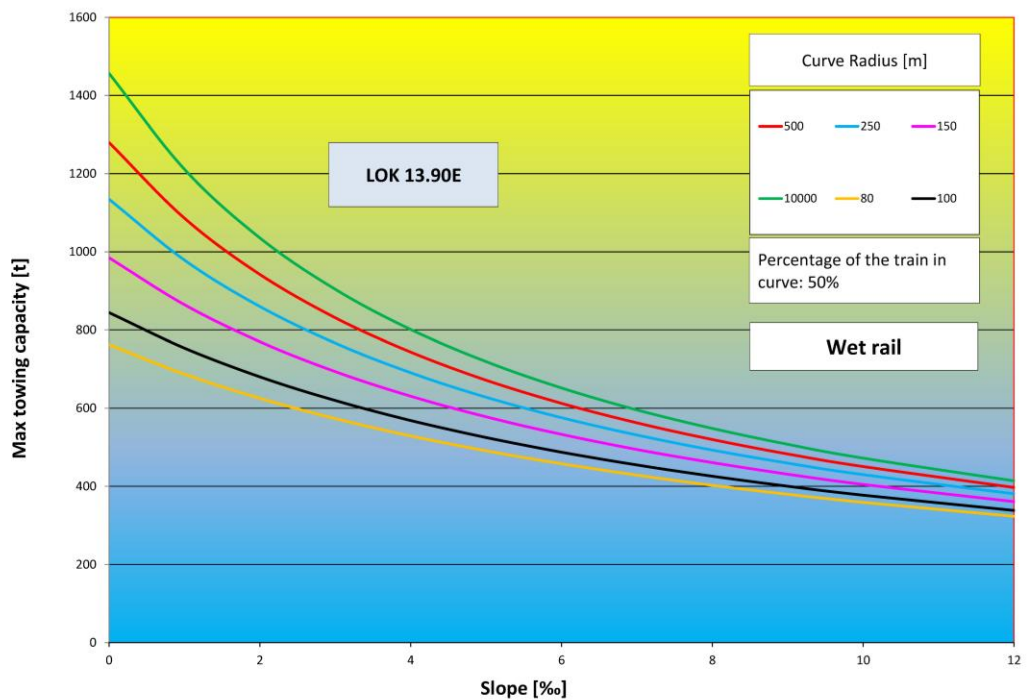
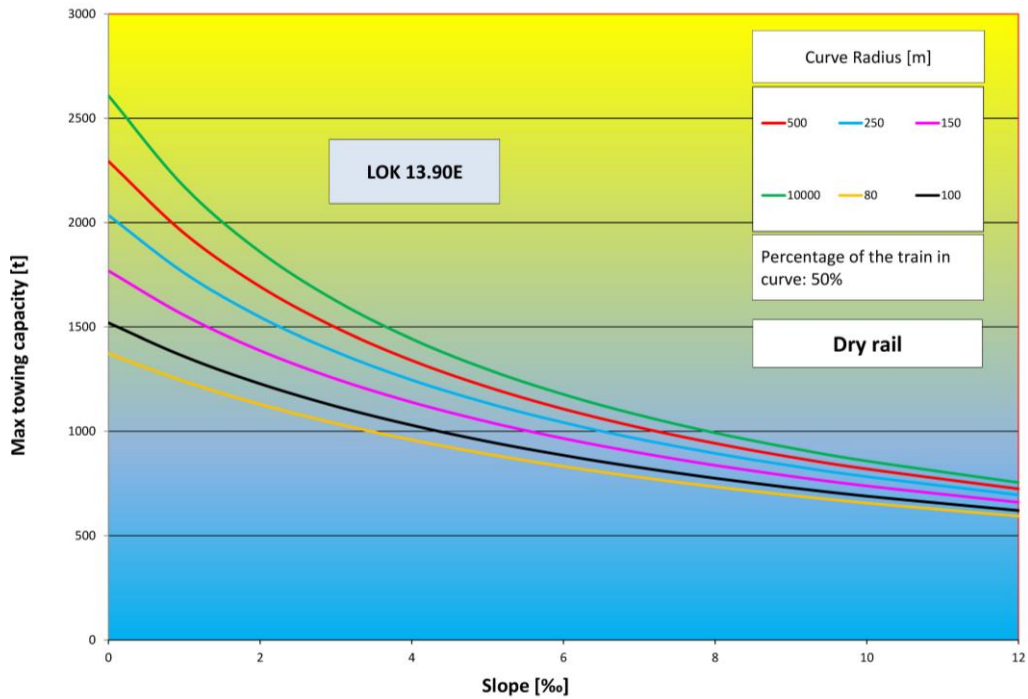
***Off tracking rescue kit* (handling of the railway axles by means of a manual pump in case of failure of the hydraulic pump)**

Standard paint color RAL 1003, customized colors as option

Tool box

Other options available on demand.

TOWING DIAGRAMS



Reference parameters used for the diagrams

- Rolling Resistance: 5 kg/t
- Slope Resistance: 1 kg/t per 1 ‰
- Curve Resistance: $717 / \text{Radius}[\text{m}]$ kg/t (valid for 1435 mm rail gauge)
- Percentage of the train in curve: 50 %
- Dry track traction tires friction coefficient: 0.72
- Wet track traction tires friction coefficient: 0.4