

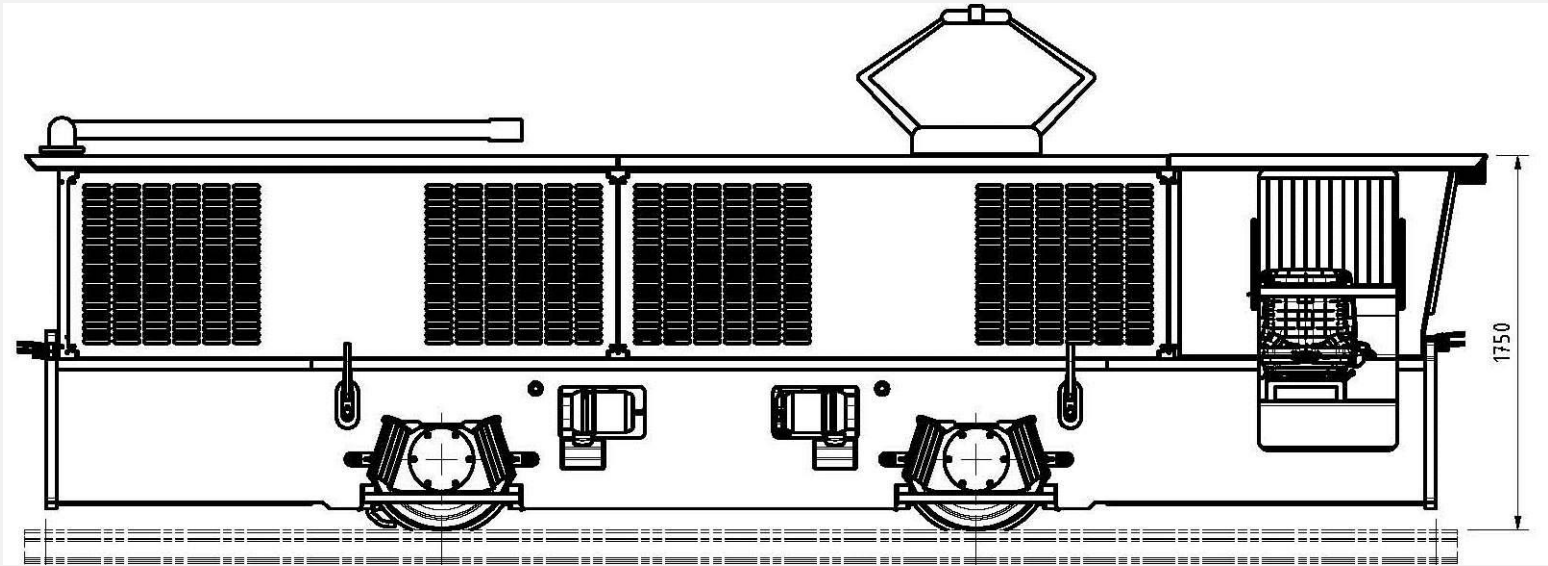


*In
Mining and Tunnelling*

Per Ek

Morgårdshammar AB , Sweden.

LX-T Locomotives - Types

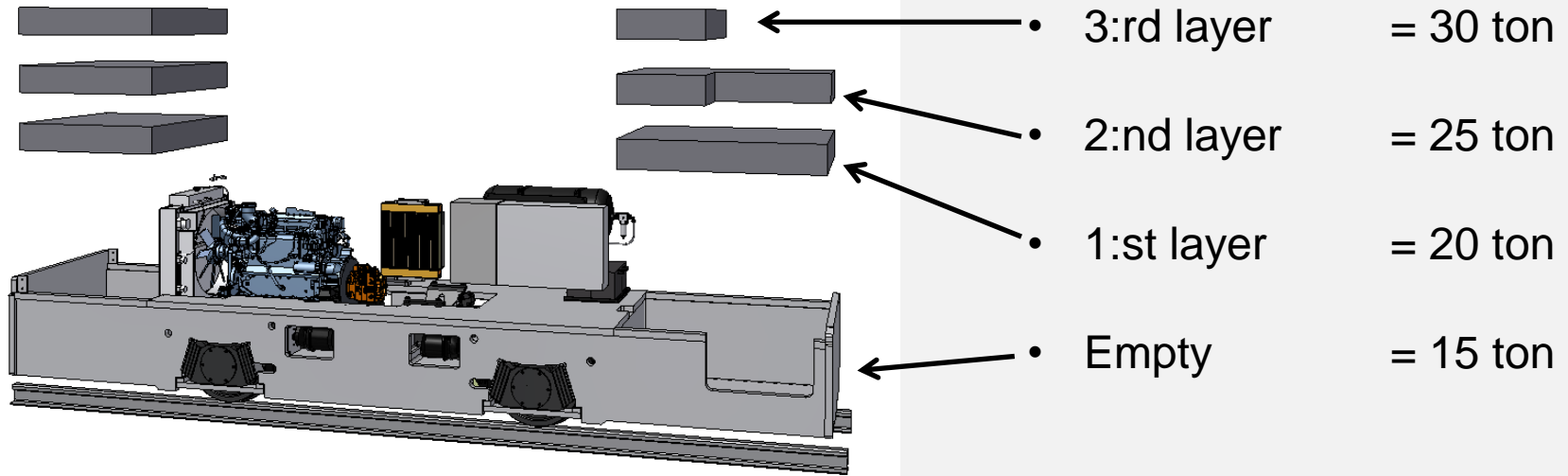


T stands for trolley which is the power supply. The weight of the LX-T loco is also adjustable in the weights 15 – 20 – 25 – 30 ton.

Type	M ton	Width	Gauge	Length	Height	Axle dist.
LX-T 15	15	1400 (*1500)	750-900 (*1000)	6500	1750	2500
LX-T 20	20	1400 (*1500)	750-900 (*1000)	6500	1750	2500
LX-T 25	25	1400 (*1500)	750-900 (*1000)	6500	1750	2500
LX-T 30	30	1400 (*1500)	750-900 (*1000)	6500	1750	2500

LX-T Locomotives – Adjustable weight

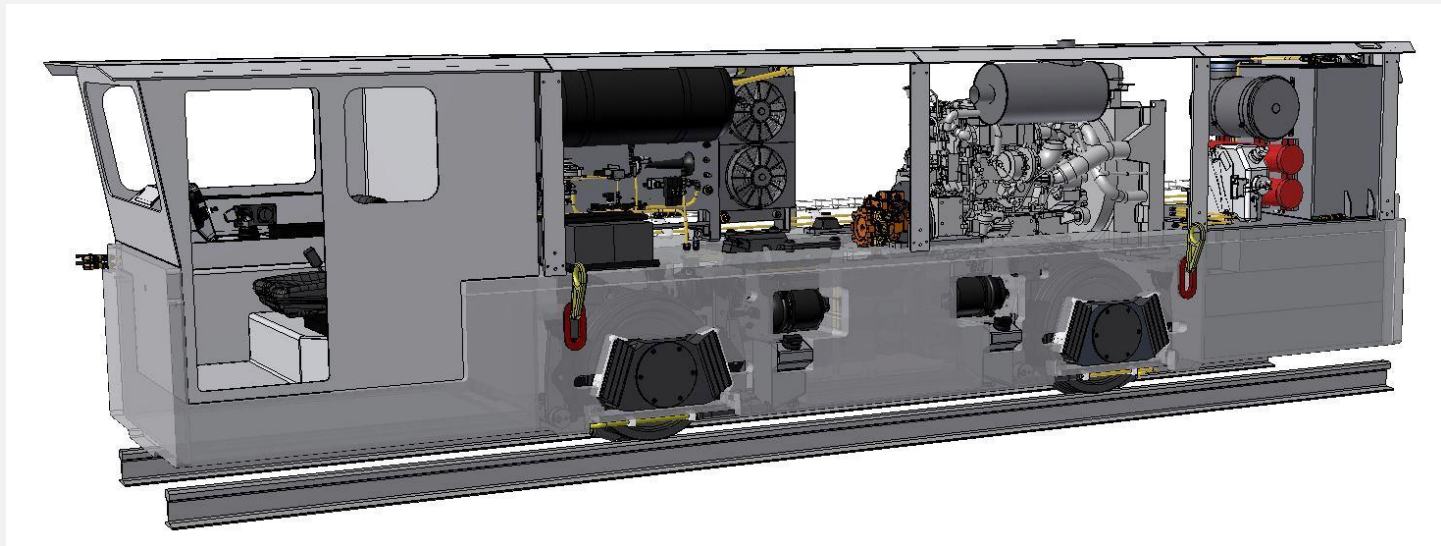
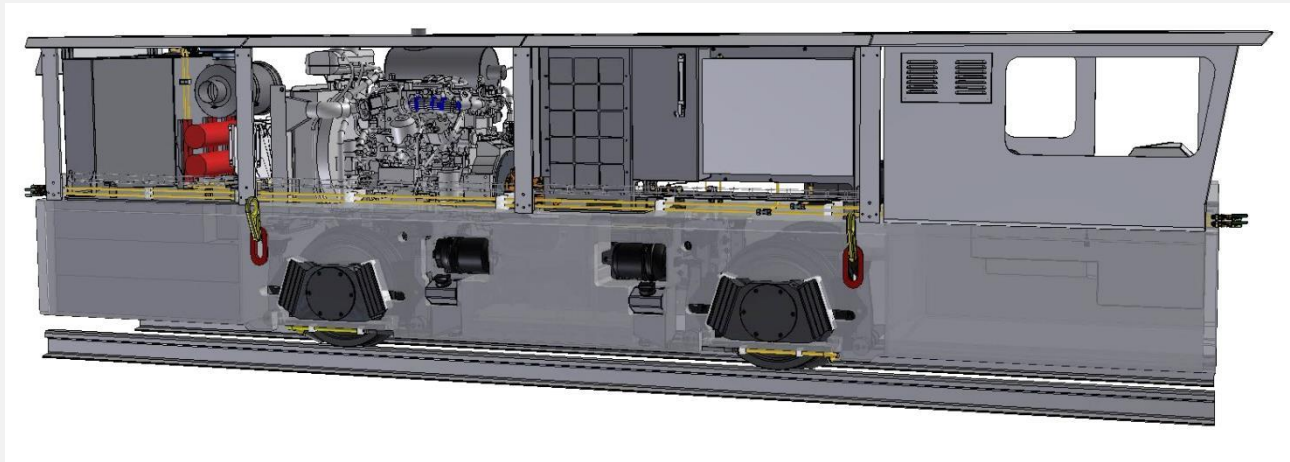
To adjust the weight of the loco we work with ballast which can be supplied and fitted by MH or by the end user out from supplied drawings.



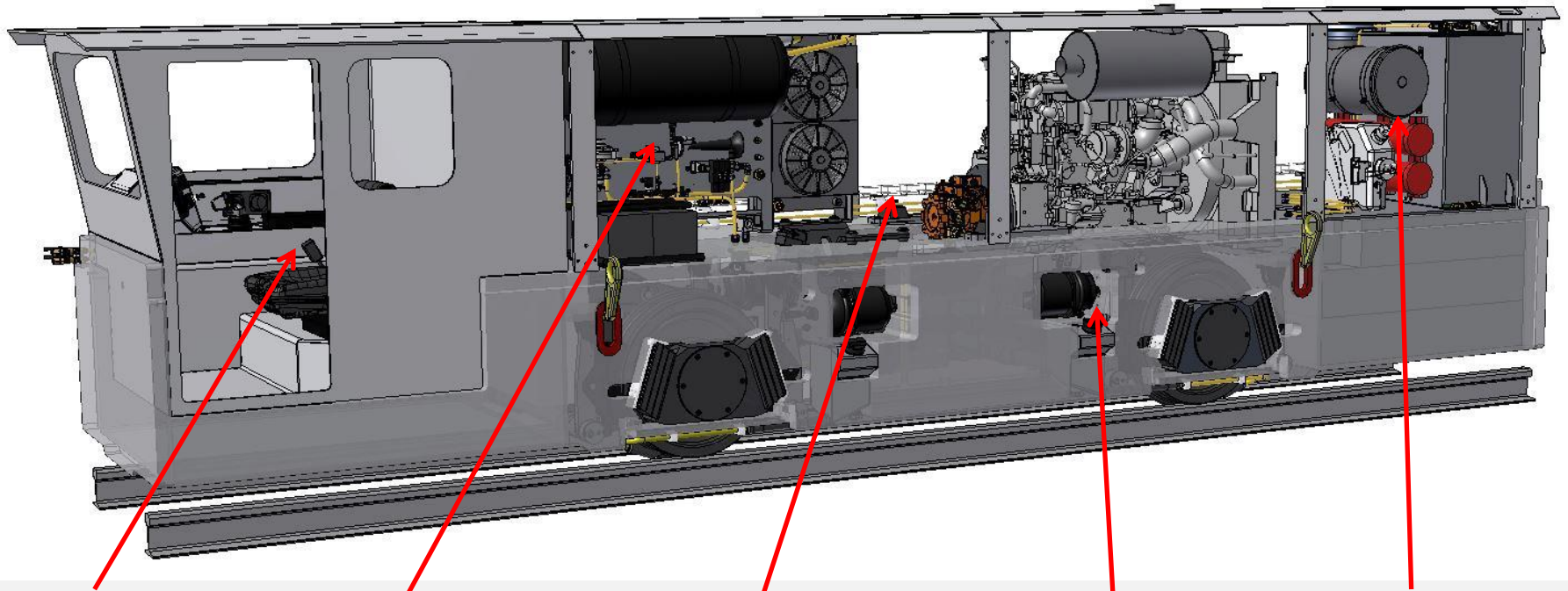
Each ballast have lifting device for easy handling.

LX-T Locomotives - Modules

The easy design and location of components in a module thinking facilitates operating, maintenance and service in a modern way.



LX-T Locomotives - Modules



Cabin

Air and hydraulic supply

Electric Motor and
powertrain

Brake system

Steering/elect
ric cabinet
and
Fogmaker

LX Locomotives - Cabin



Welded steel construction.

Open type in front driving position with window and additional passenger seat.

Ergonomically designed and adjustable driver seat.

Magnetic controlled steel bar at opening which allow driving when fixed.

Option:

- Fully closed with door.
- Heat/AC ventilation.

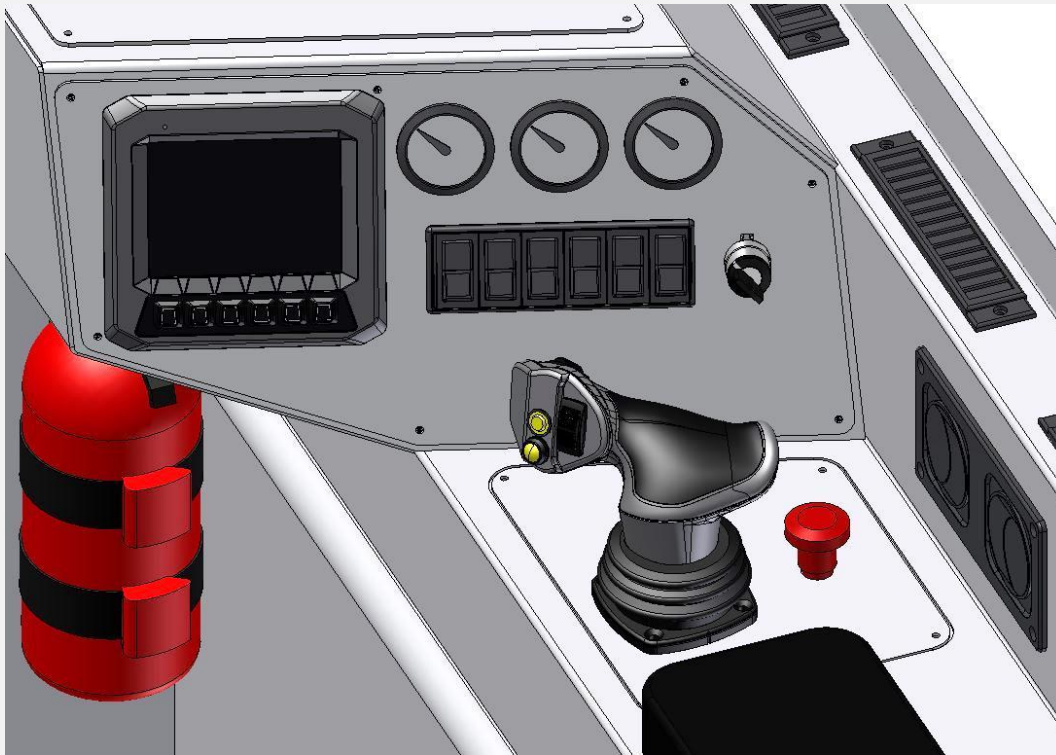
LX Locomotives - Cabin

Location of each equipment is well thought out to have the most practical way of reach and operation of the loco.

Camera and monitor is standard in cabin.



LX Locomotives - Cabin



Joystick with, speed/brake control and buttons controlling , FNR, high/low gear, parking brake, sanding device, dead man device and horn.

Buttons for emergency stop and Fogmaker sprinkler system is located beside joystick.

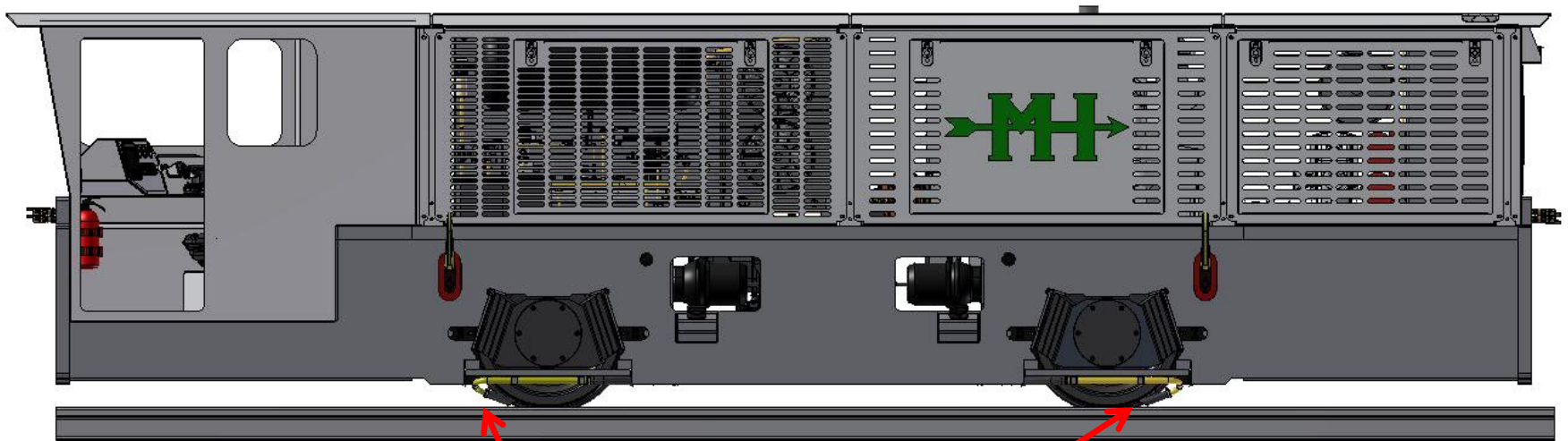
LCD display showing, speed, rpm and engine information. Manometers for reservoir/brake pressure and optional wagon brake.

Extra buttons available for free choice options.

LX - Locomotive

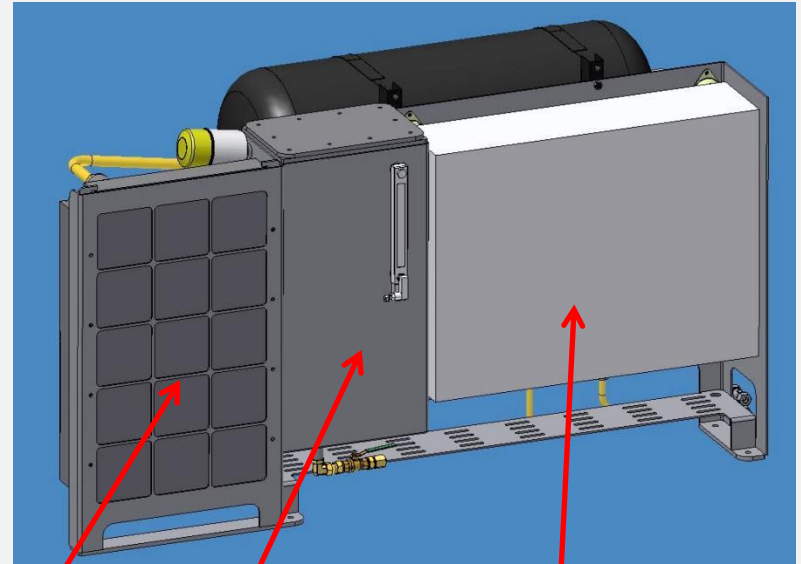
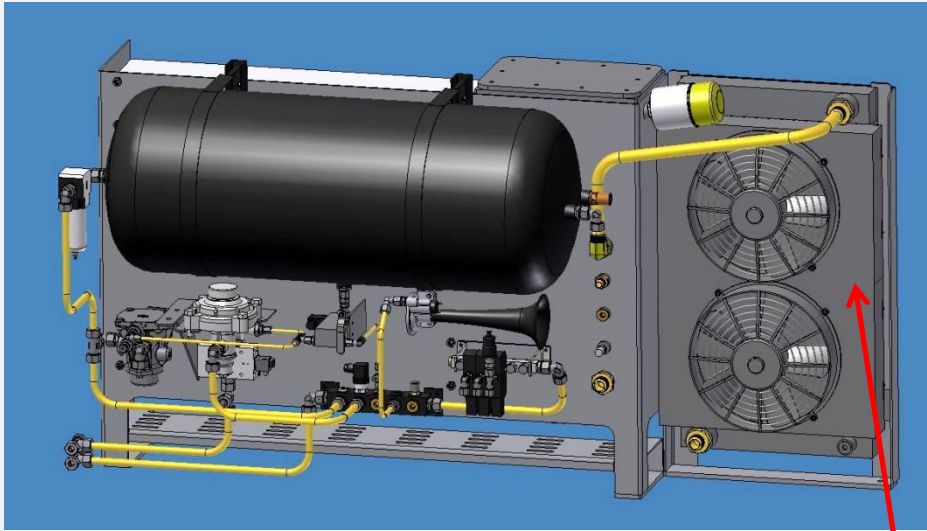
Sanding device

Controlled/activated by button integrated in joystick.



sanding points

LX Locomotives – Air/hydraulic supply



The module for air and hydraulic is well designed to limit the space demand. Part location for easy check and maintenance work.

Volumes

Hydraulic	30L
Axle gear/each	14L

Cooler and oil tank hydraulic system.

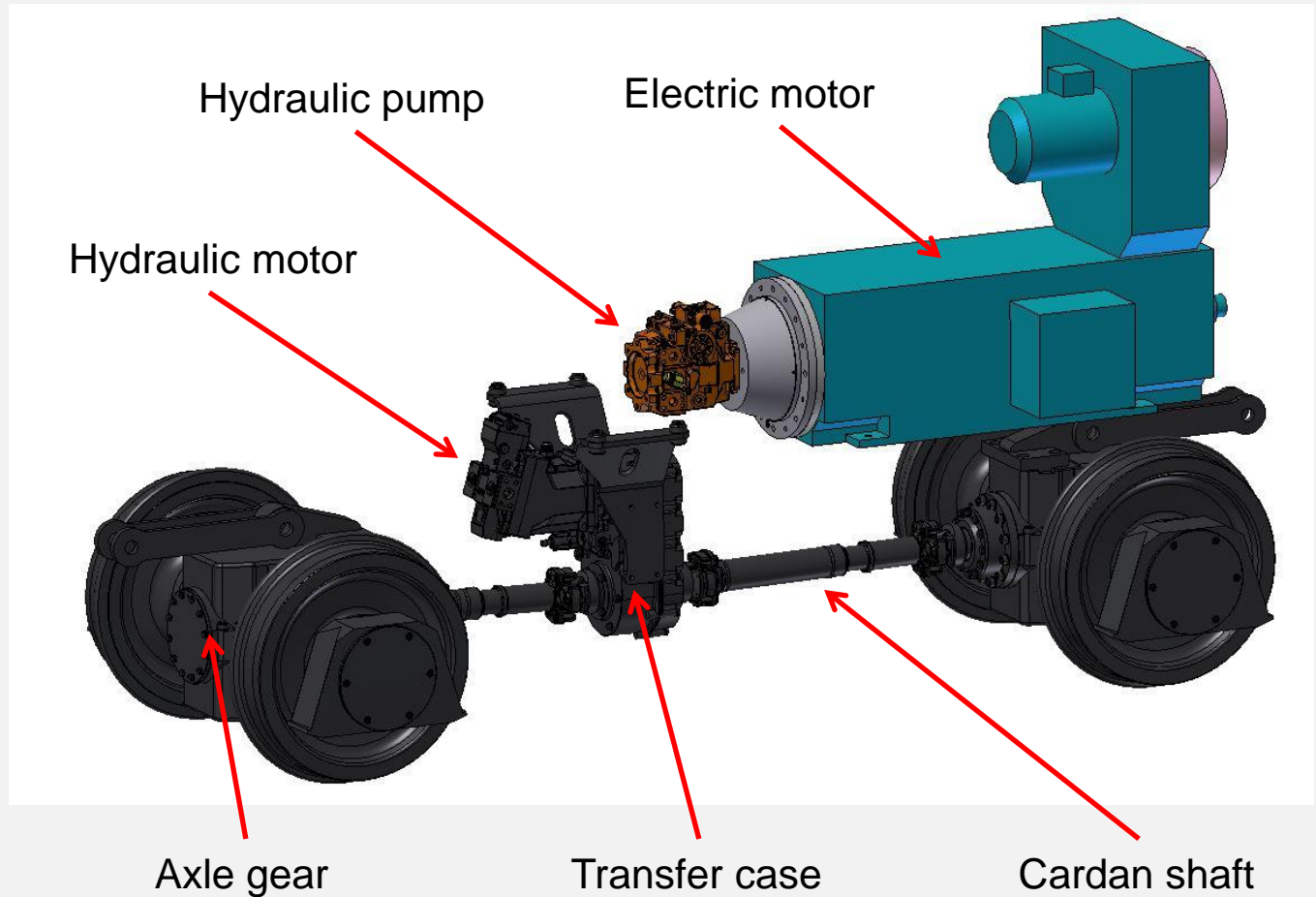
Electric system/cabinet incl. Switch control box with contactor relays etc.

Control voltage	24 V
Battery	2 x 180 Ah
Generator	110 A

LX-T Locomotives - Powertrain

For LX-T

Transmission in reliable hydrostat solution for smooth and well controlled speed regulation mainly consisting of hydraulic pump, valve arrangement, hoses, hydraulic motor and transfer case to enable high and low speed.



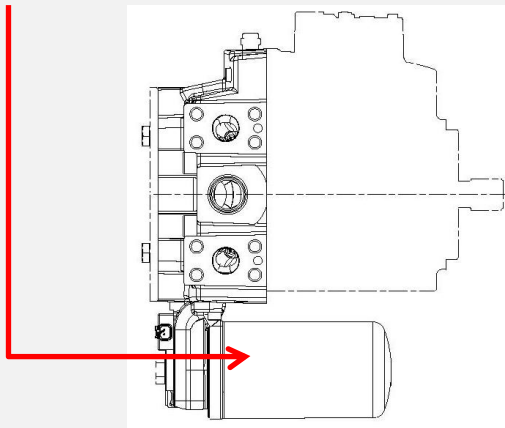
LX-T Locomotives – Hydraulic Pump

The Danfoss logo is displayed in white cursive script on a red rectangular background.

For LX-T

**H1 Axial Piston Single Pump,
type 078.**

- 78,1 cm³
- Working pressure 400 bar
- Filter extension incl. for complete system cleaning.



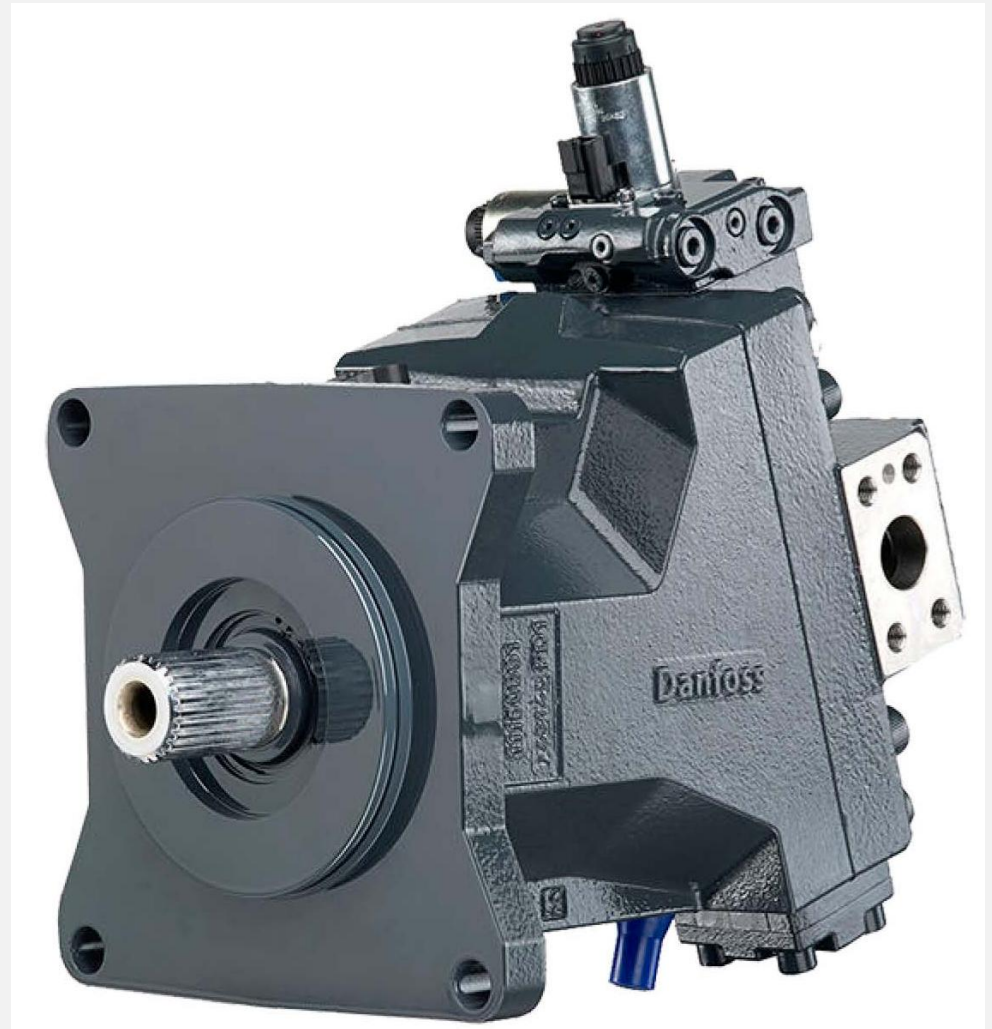
LX-T Locomotives – Hydraulic Motor

The Danfoss logo is displayed in white cursive script on a red rectangular background.

For LX-T

**H1 Bent Axis Variable
Displacement Motor,
Type 160.**

- 160 cm³
- Working pressure 400 bar



LX-T Locomotives – Transfer Case

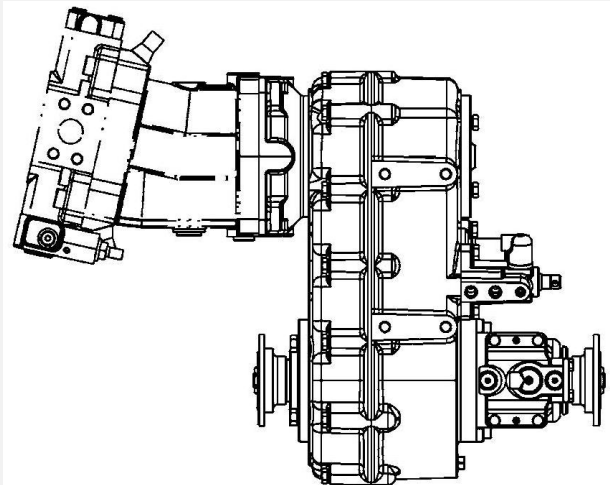


SPICER®

Off-Highway Systems

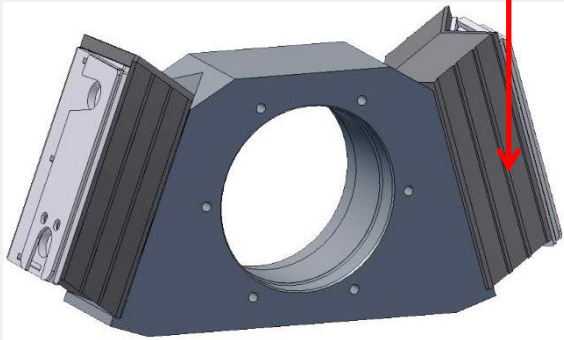
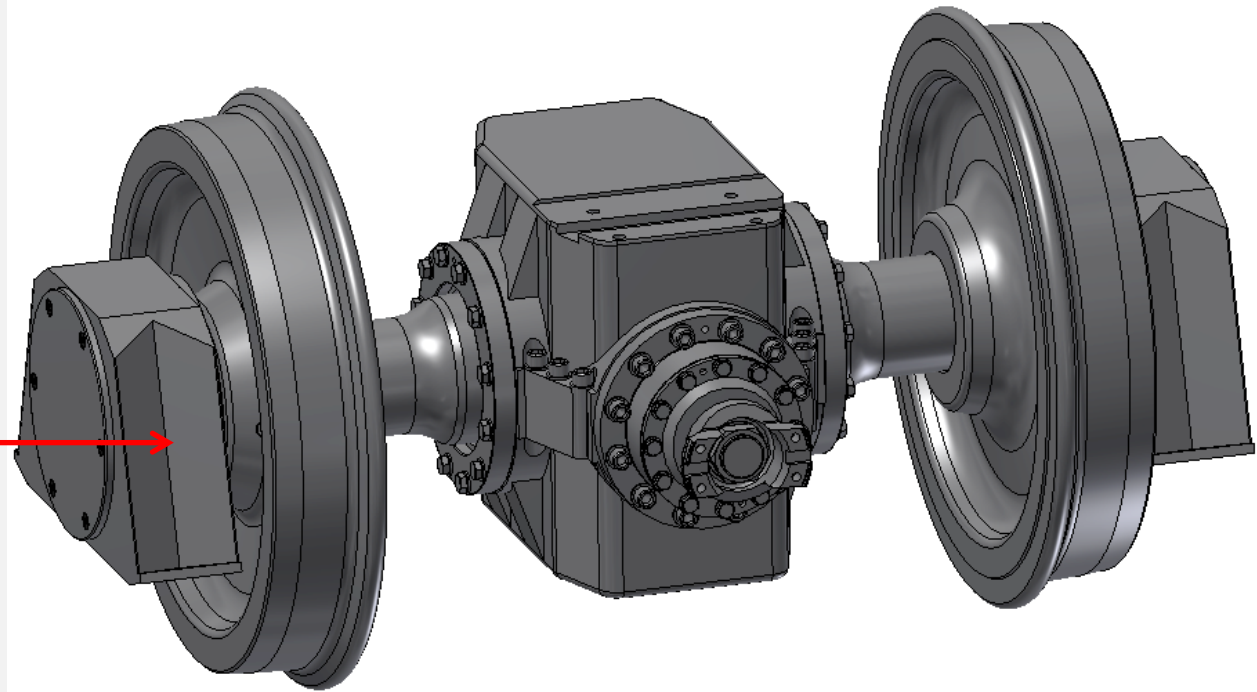
For LX-T

Spicer 360 Hydrostatic Two-Speed Gearbox.
Is specifically designed for hydrostatically driven industrial vehicles which require maximized top speed, efficiency, and tractive effort incl. 4WD disconnect (freewheels).



LX-T Locomotives – Axle gear

The suspension between chassis and axle gears in service free rubber elements of Chevron type mounted on wheel shaft bearing boxes.

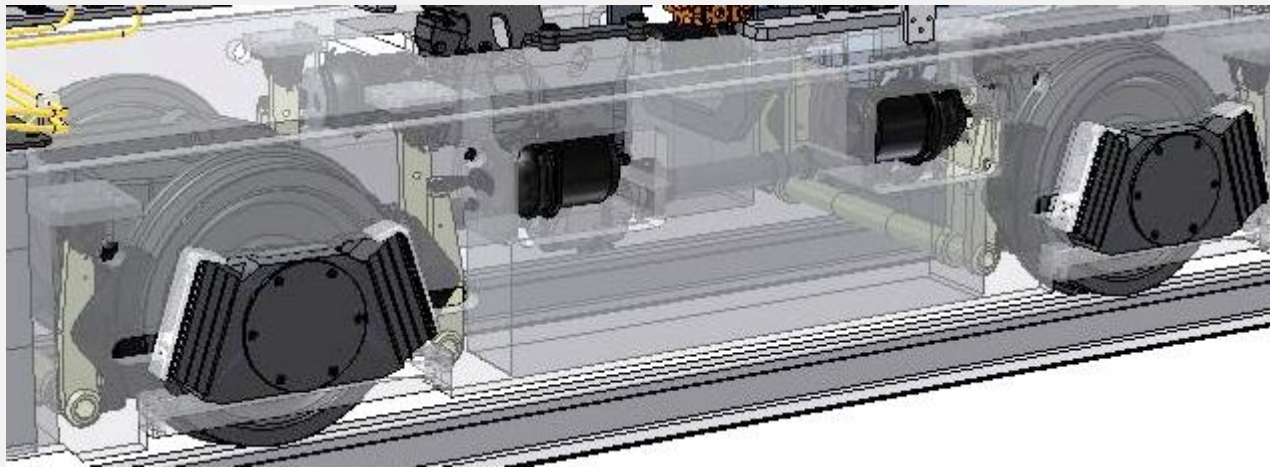


Axle gear

Solid main carrying shaft with centre mounted conical bevel gear carried in spherical roller bearings in wheel boxes.

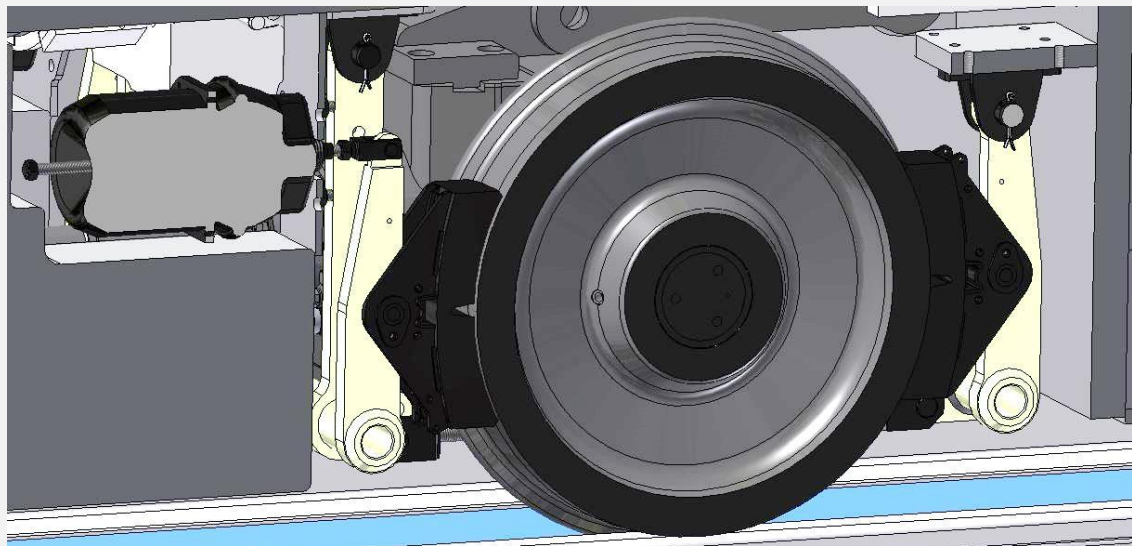
Wheel \varnothing 660 mm.

LX-T Locomotives - Brake system



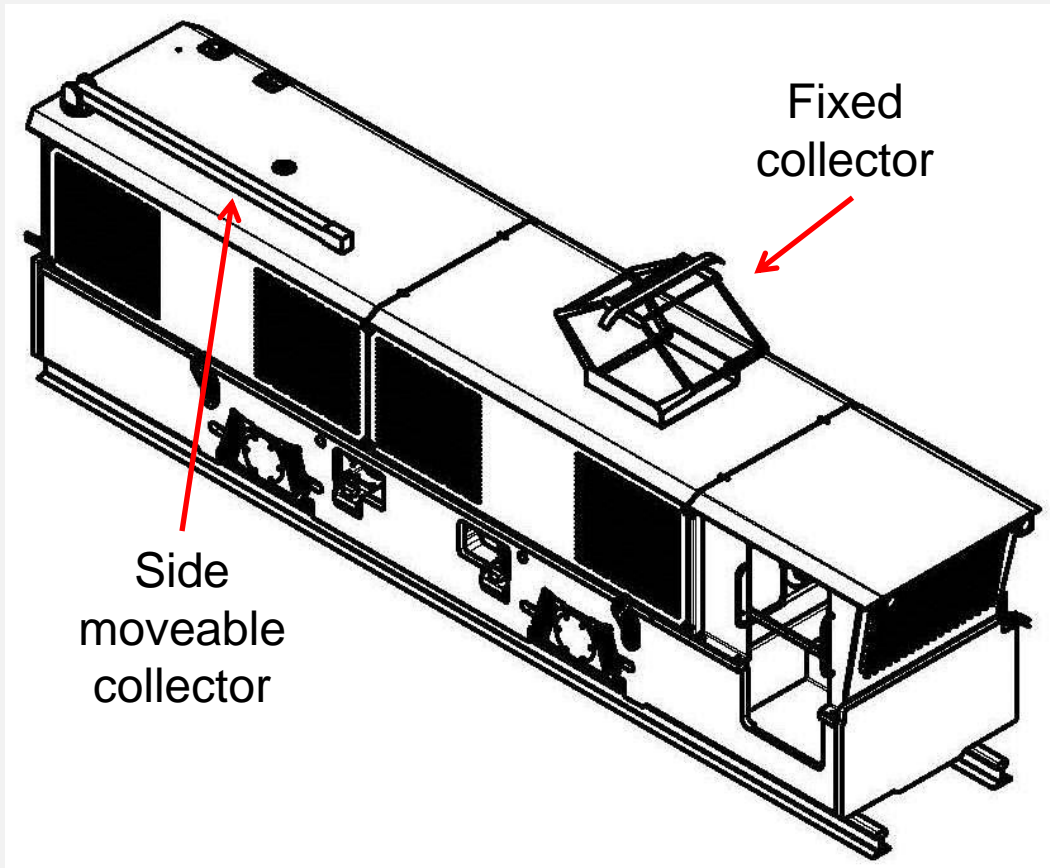
Pneumatically operated brake system consisting of composite brake shoes acting via link system directly on wheel.

Spring suspended parking/emergency brake of safety type automatic applied when air pressure falls.



LX-T Locomotives – In coming power

The incoming power to the loco comes from a overhead DC trolley line and have two ways of input.



The fixed collector is normally in use when operating in the tunnel.

The moveable collector will come in use if train set have to go beside in california switch when meeting other locos. Handled manually.

LX-T Locomotives – Electric motor

Siemens DC Motor

Power output kW	160
@ speed rpm	??
1) Motor voltage	?? V DC
Tractive effort	62 kn
Max speed	30 km/h

1) The incoming voltage comes from a overhead DC trolley line in the tunnel.

Note.

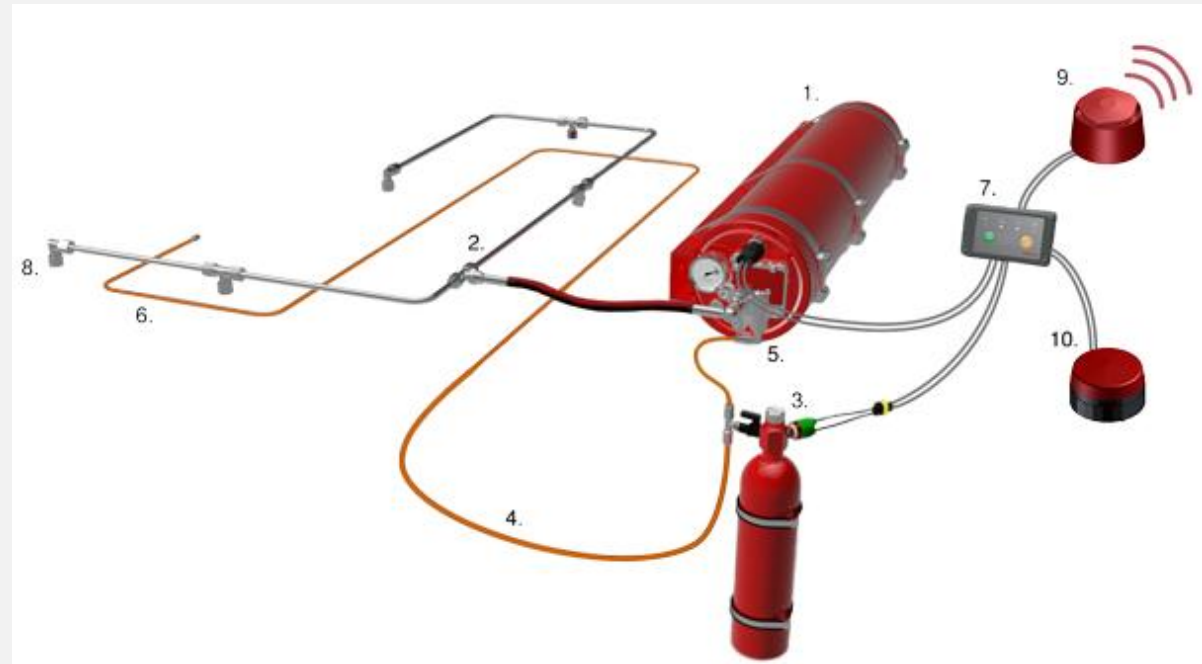
It's not possible to give all data on the motor. All is based on what kind of voltage that shall be in use in the tunnel. 280, 360 or ?? The motor cover a big span of different options in voltage and rpm. When voltage has been decided by the user calculation will be made by Siemens to optimize the output and final performance.



LX-T Locomotives - Fogmaker

FOGMAKER
INTERNATIONAL AB

1. Accumulator with pressurized extinguishing fluid is connected to
2. Distribution system with nozzles in engine room.
3. The detector bottle pressurized 24 bar connected to
4. Detection system made of polymer tube.
5. The accumulator and detector bottle is inter-linked via valve.
6. If there is a fire – the detection tube bursts, the pressure falls in the detection system and the valve in the piston accumulator opens.

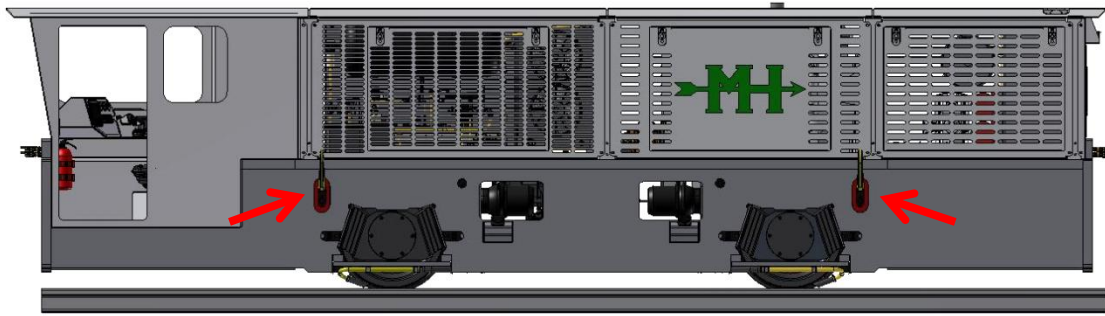


7. The pressure switch warns the driver via the alarm panel, sound- (9) and light signals (10). The extinguishing fluid is pressed through the distribution system's nozzles and a water mist is spread in the protected compartment (8).

1 litre of extinguishing fluid absorbs 540 000 kilocalories and produces 1700 litres of water mist at the same time.

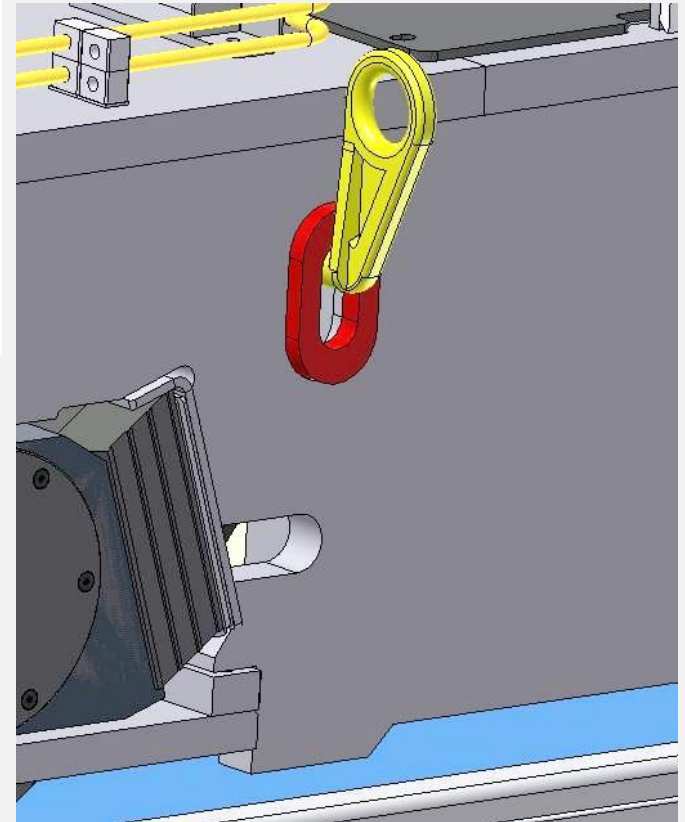
ANSUL available as option.

LX Locomotives - Shipping



The LX locomotive up to 25 ton fits in a 40" container. In the container the loco stands on track for easy unloading.

4 lifting points incl. a set lifting hooks if crane works is needed.





***Thank
You***

