

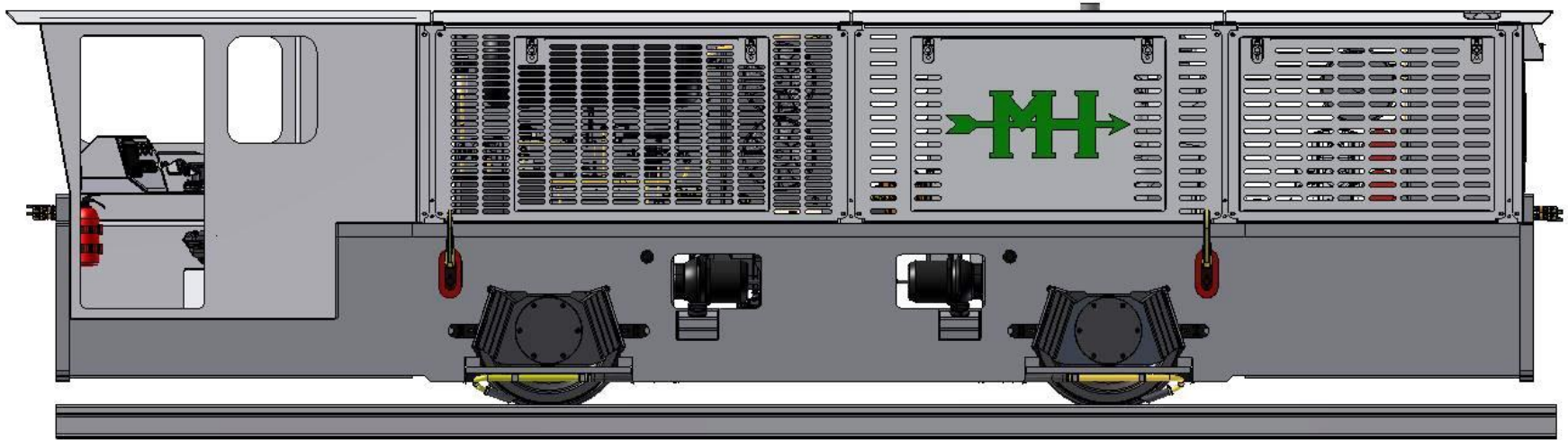


*In  
Mining and Tunnelling*

**Per Ek**

Morgårdshammar AB , Sweden.

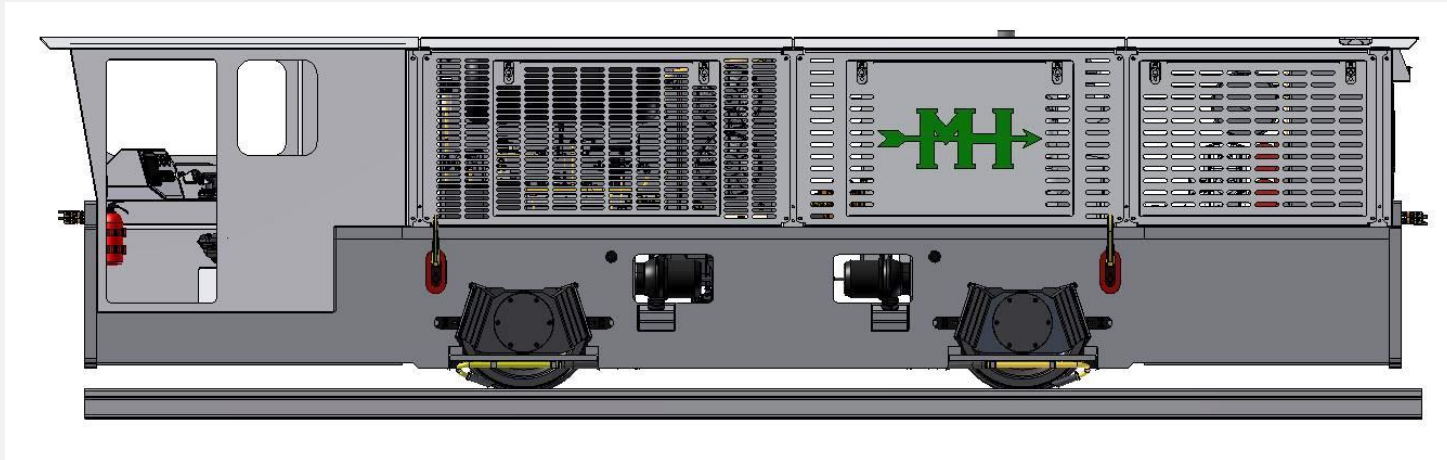
# LX Locomotives - Types



The LX locomotive can be in different styles of powertrain and power supply.

- **LX-H** = Hydrostatic with low/high gear in both directions.
- **LX-G** = Gearbox with 2 or 3 gears in both directions.
- **LX-T** = Trolley and hydrostatic, power from overhead electric trolley line.

# LX Locomotives - Types



The weight is adjustable and in two models of locomotive

1. LX - H, G, T 15 – 20 – 25 – 30 ton
2. LX - G, H 35 – 40 – 45 ton.

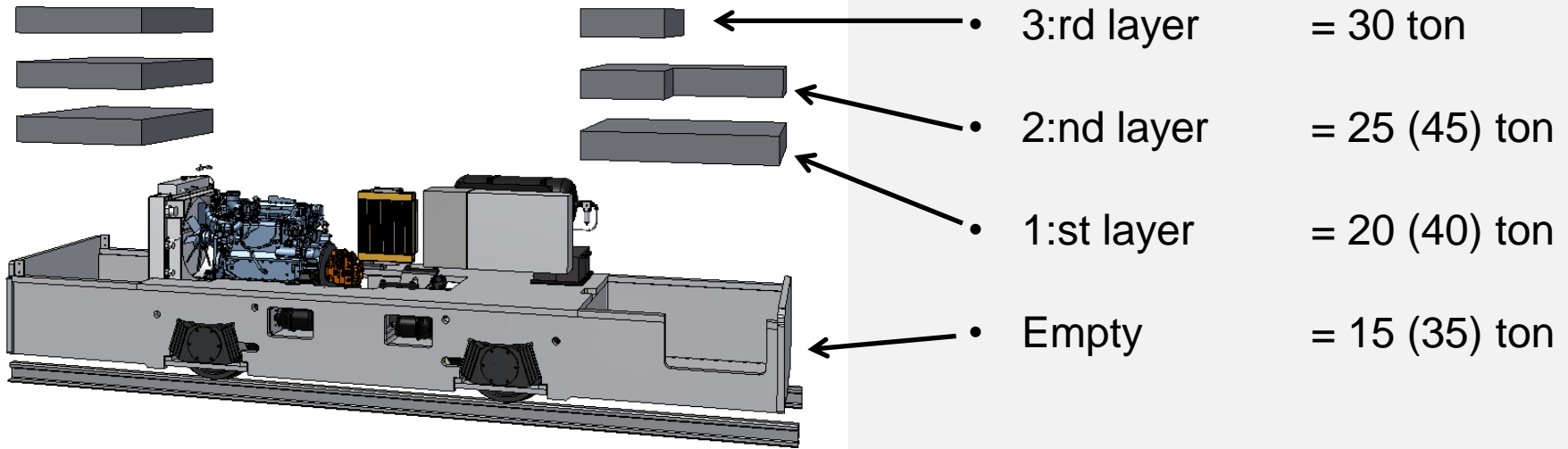
Type 1.	M ton	Width	Gauge	Length	Height	Axle dist.
LX 15	15	1400 (*1500)	750-900 (*1000)	6500	1750	2500
LX 20	20	1400 (*1500)	750-900 (*1000)	6500	1750	2500
LX 25	25	1400 (*1500)	750-900 (*1000)	6500	1750	2500
LX 30	30	1400 (*1500)	750-900 (*1000)	6500	1750	2500

Type 2.	M ton	Width	Gauge	Length	Height	Axle dist.
LX 35	35	1550 (*1650)	750-900 (*1000)	7500	2050	3000
LX 40	40	1550 (*1650)	750-900 (*1000)	7500	2050	3000
LX 45	45	1550 (*1650)	750-900 (*1000)	7500	2050	3000

# LX Locomotives – Adjustable weight

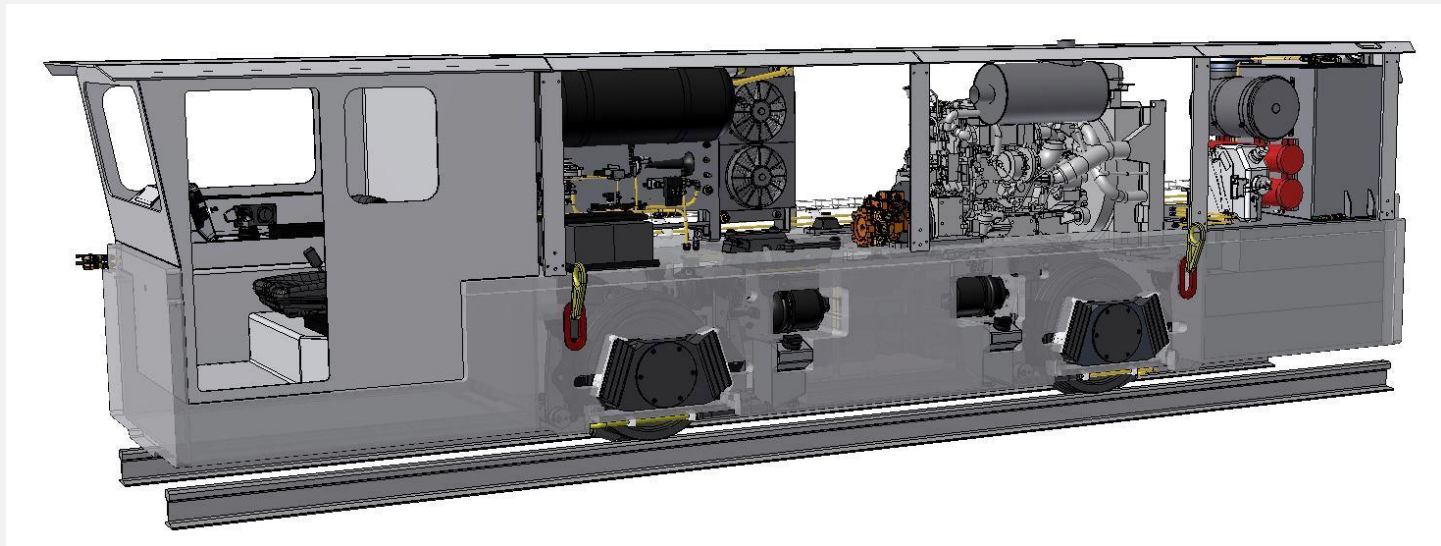
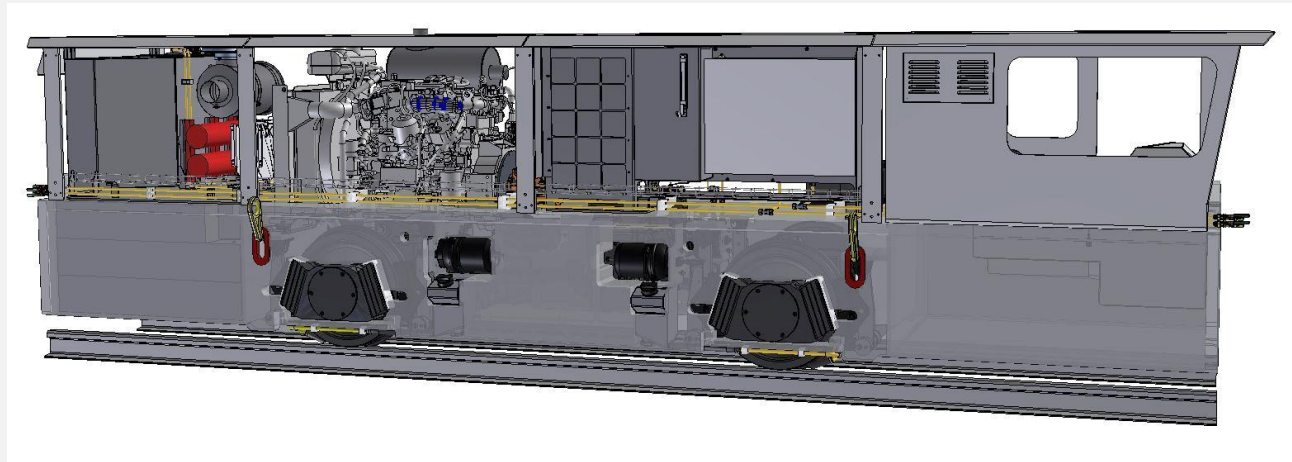
To adjust the weight of the loco we work with ballast which can be supplied and fitted by MH or by the end user out from supplied drawings.



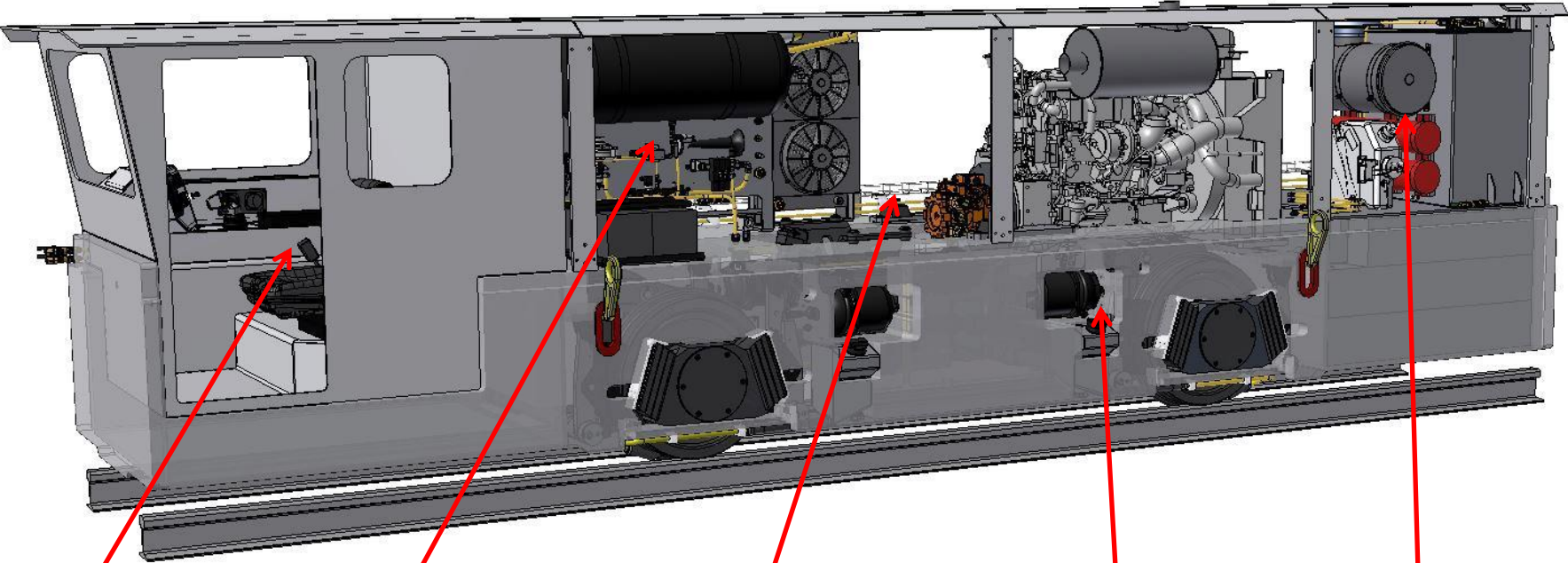
*Each ballast have lifting device for easy handling.*

# LX Locomotives - Modules

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



# LX Locomotives - Modules



Cabin

Air and hydraulic supply

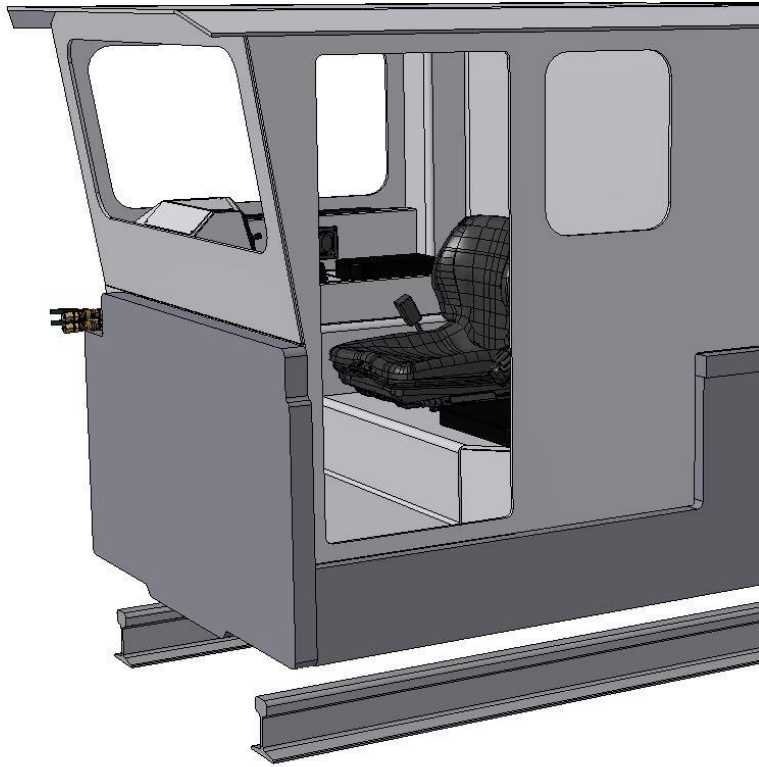
Engine and powertrain

Brake system

Fuel tank 300L  
AdBlue  
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

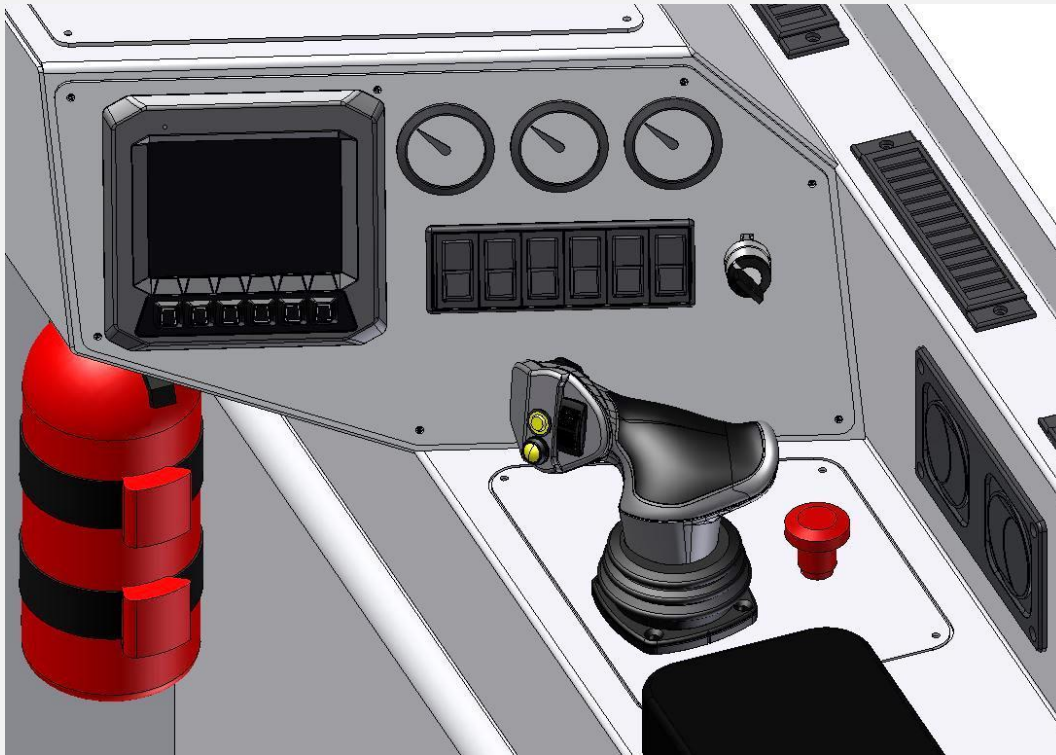
Location of each equipment is well thought out to have the most practical way of reach and operation of the loco.

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.

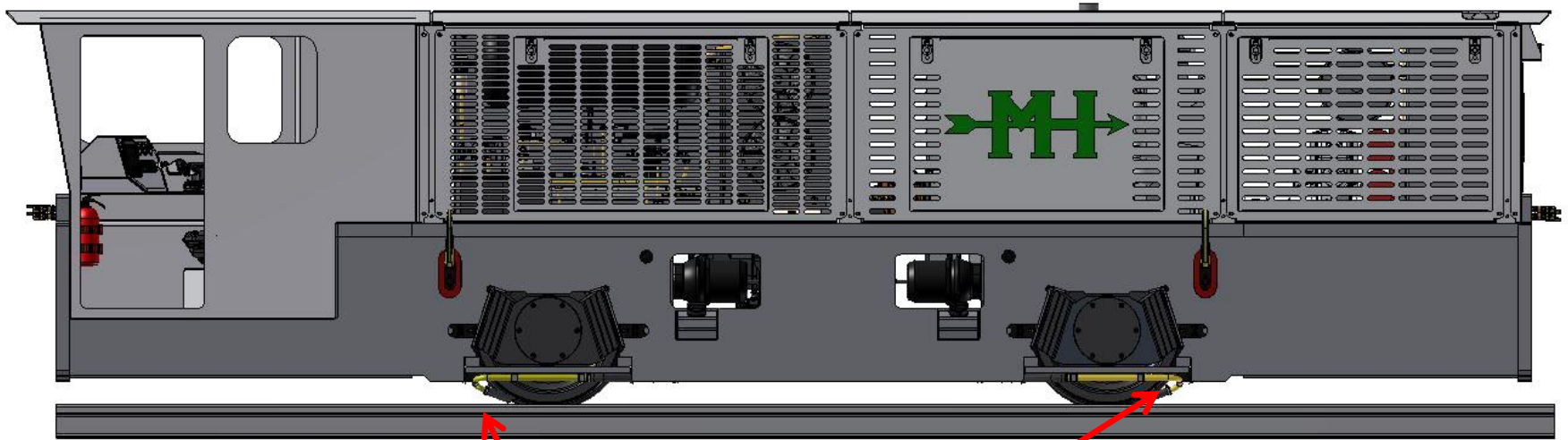
LCD display showing, speed, rpm and engine information. Manometers for reservoir/brake pressure and optional wagon brake.

Extra buttons available for free choice options.

# LX - Locomotive

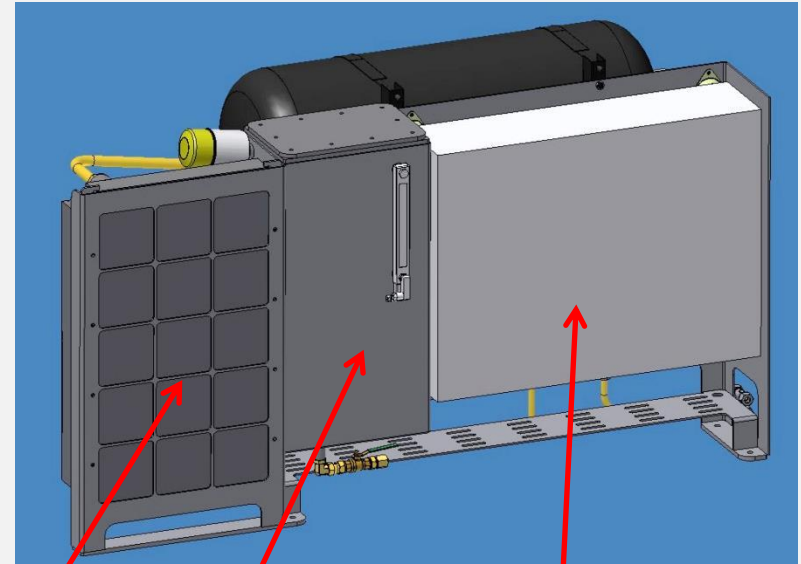
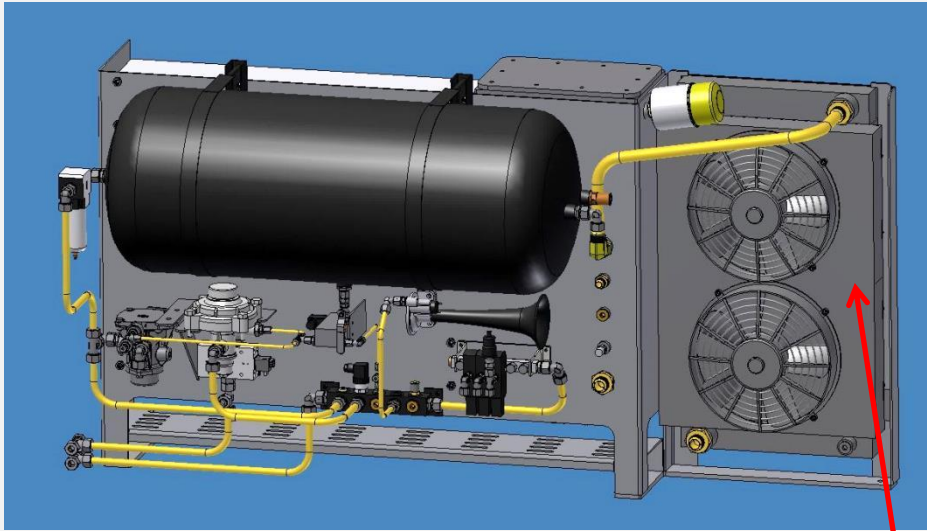
## Sanding device

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
Fuel tank	300L
Axle gear/each	14L

Cooler and oil tank hydraulic system.

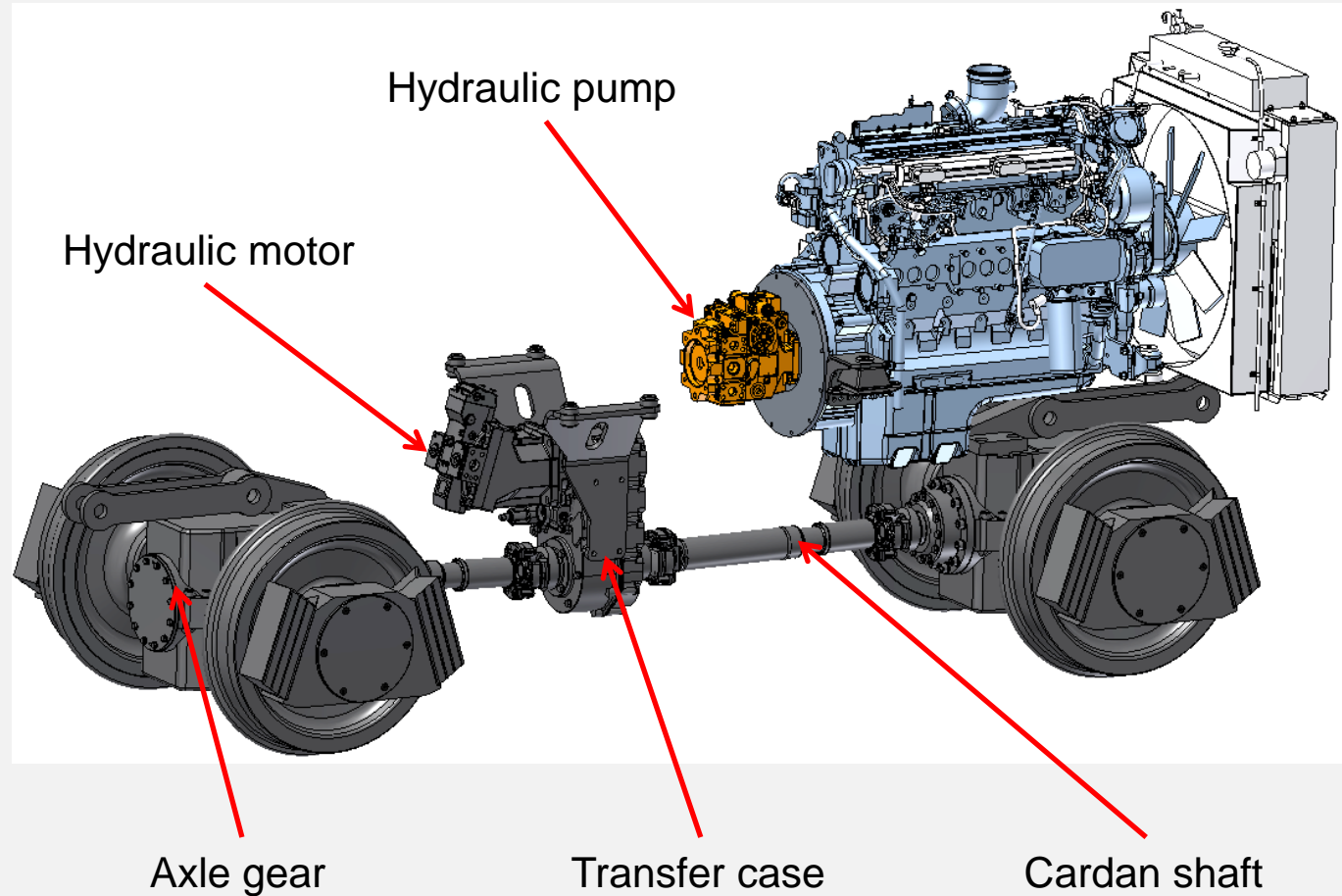
Electric system/cabinet incl. Switch control box with contactor relays etc.

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

# LX Locomotives - Powertrain

## LX-H

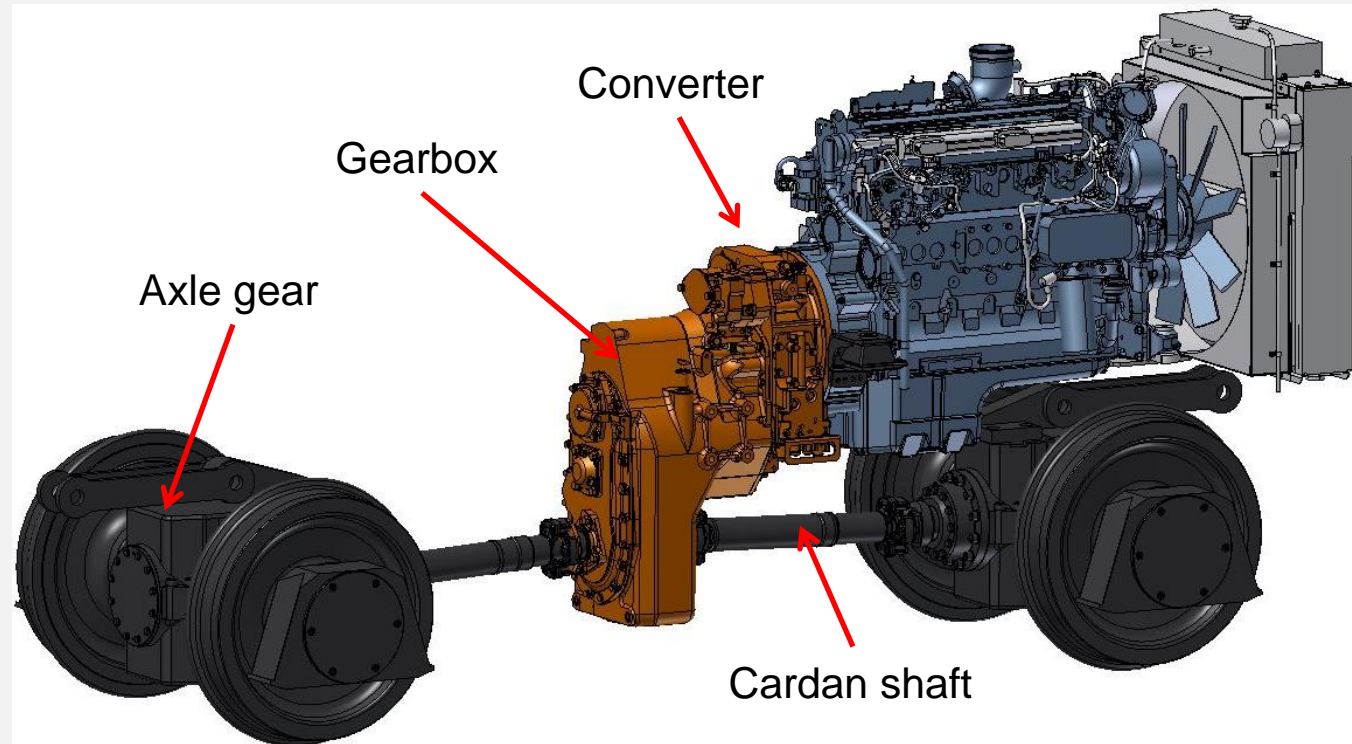
Transmission in reliable hydrostat solution for smooth and well controlled speed regulation mainly consisting of hydraulic pump, valve arrangement, hoses, hydraulic motor and transfer case to enable high and low speed.



# LX Locomotives – Powertrain

## For LX-G

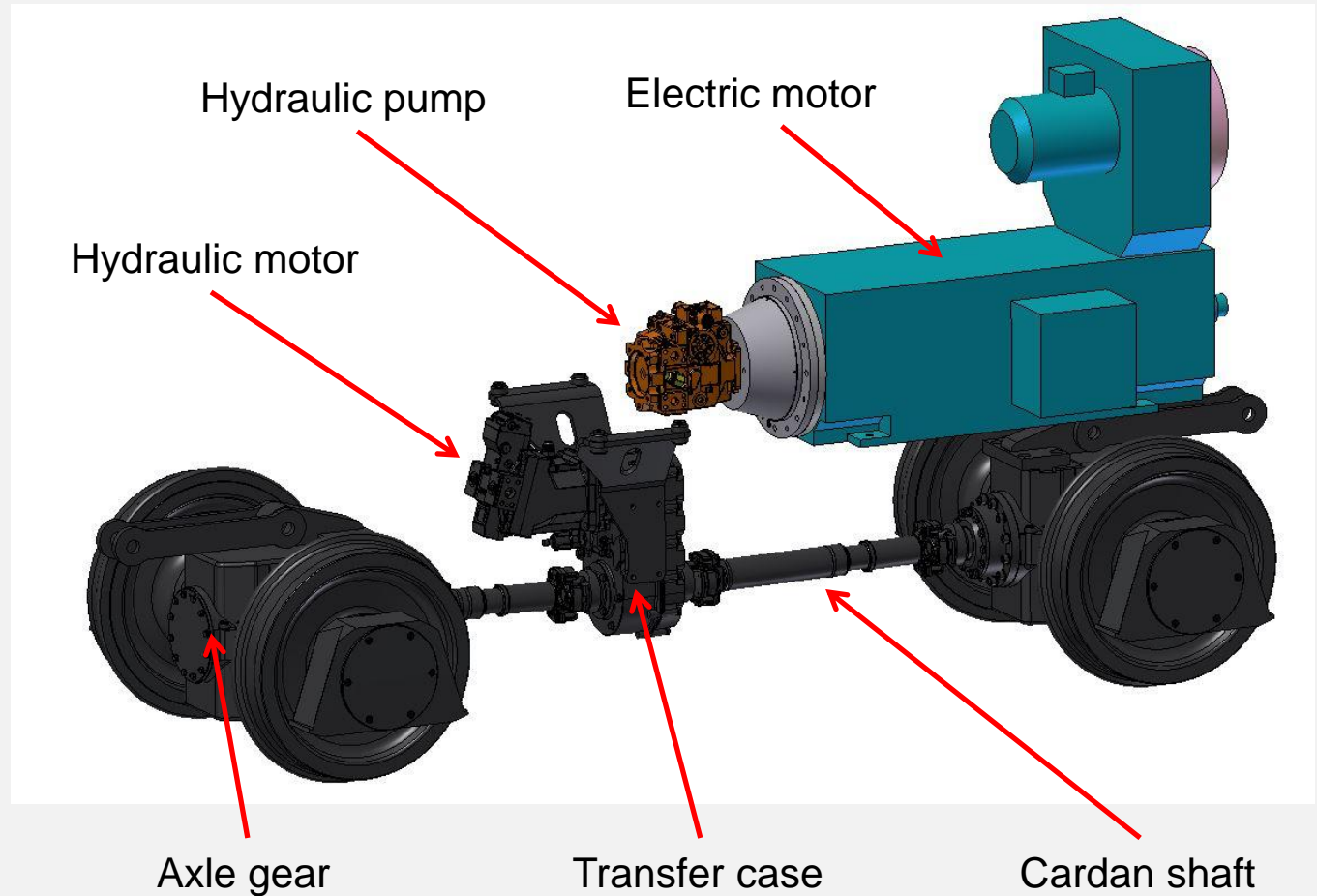
The transmission have been specially designed for the most versatile applications in heavy duty work. By optimum matching of transmission hardware and electronic control the unit assure soft 3 gears shift.



# LX-T Locomotives - Powertrain

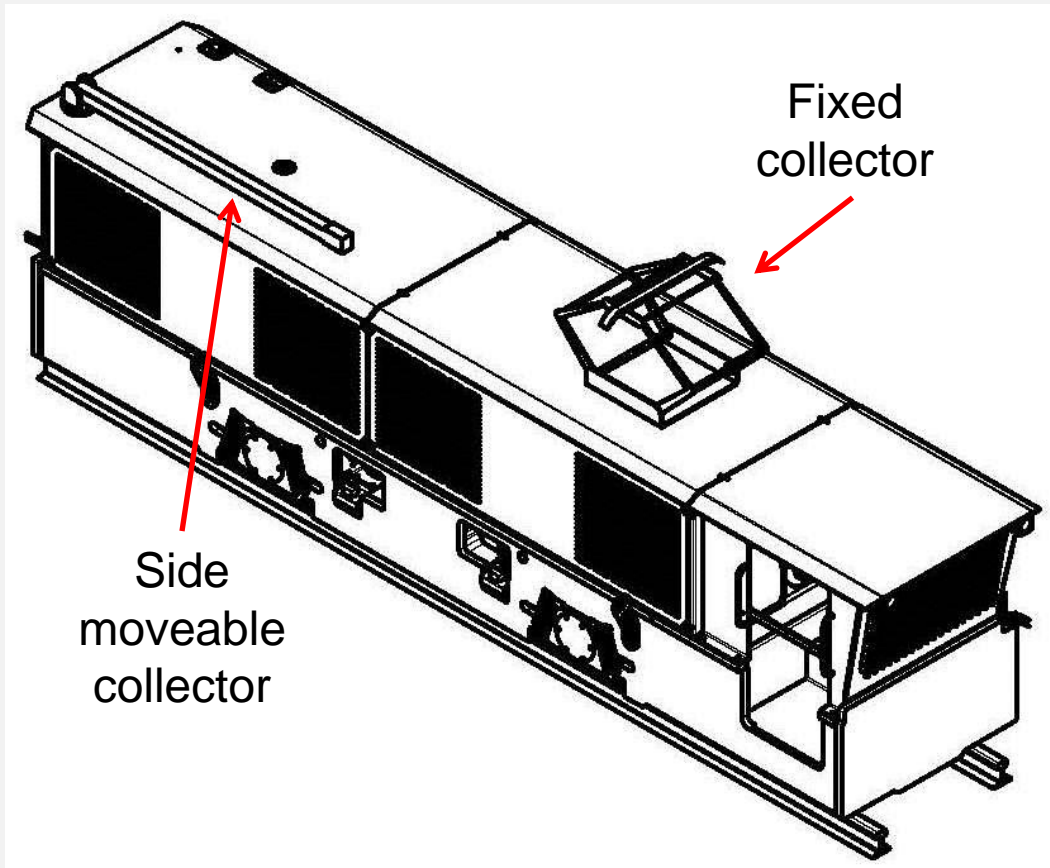
## For LX-T

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 – 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 Locomotives - Components



Hydraulic pump and motors



Gearboxes



**SPICER®**

*Off-Highway Systems*

Gearboxes



**NAF**

Driven by Innovation

Gearboxes



Diesel Engines

**SIEMENS**

Electric Motors

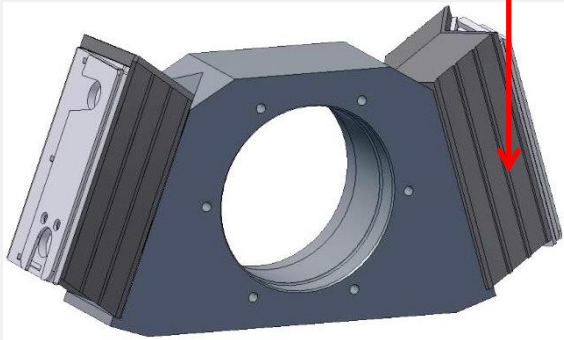
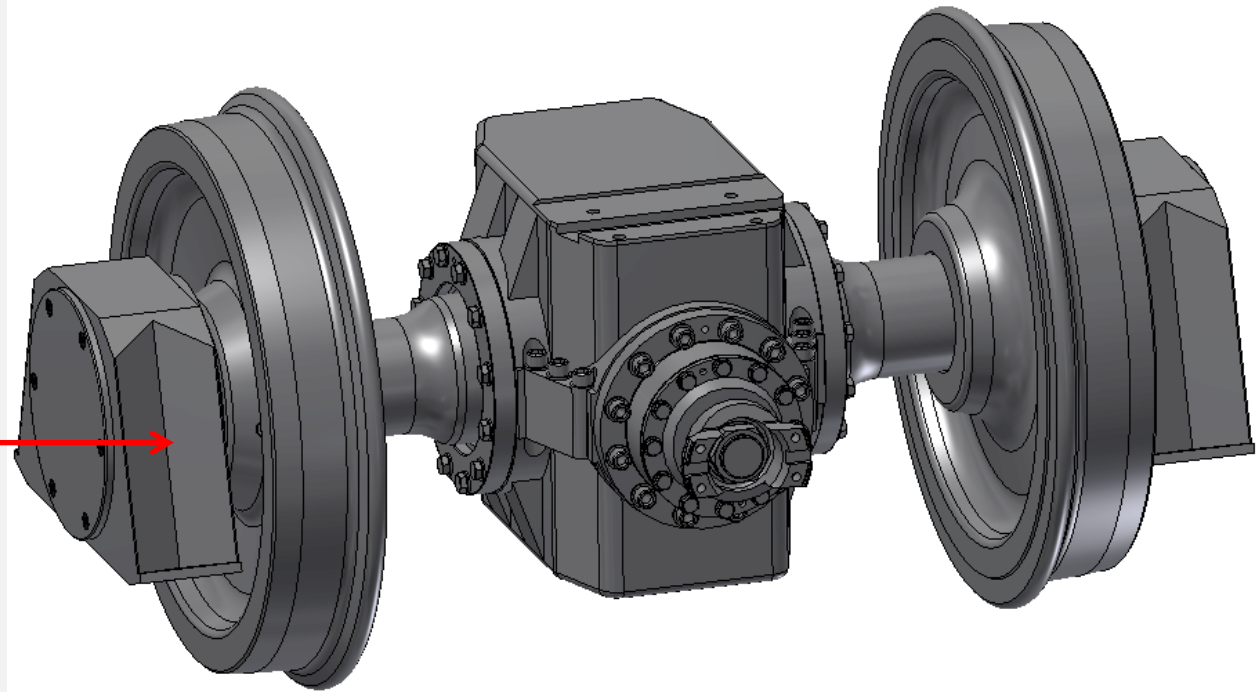
**VOLVO  
PENTA**

Diesel Engines



# LX Locomotives – Axle gear

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

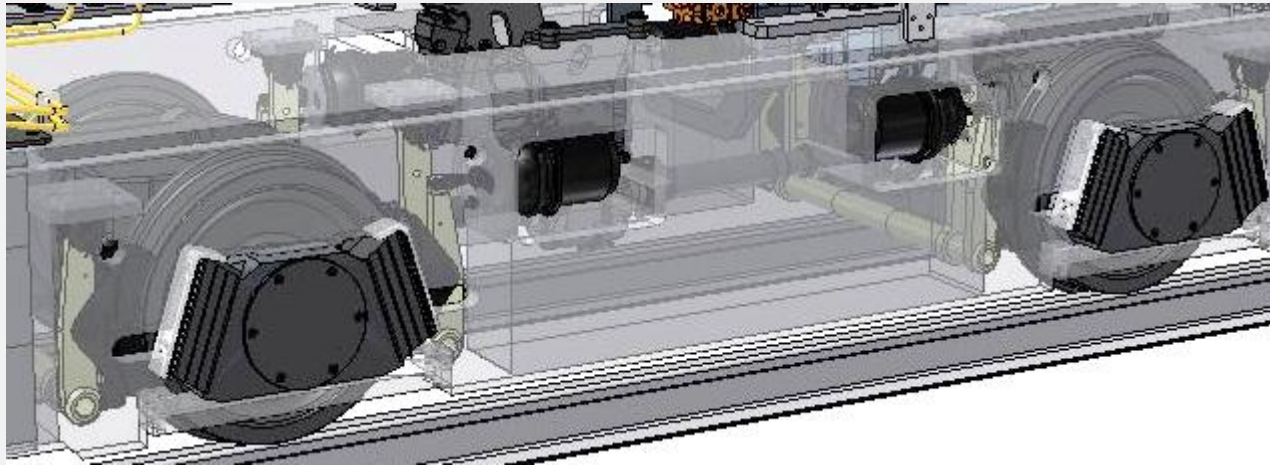


## Axle gear

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

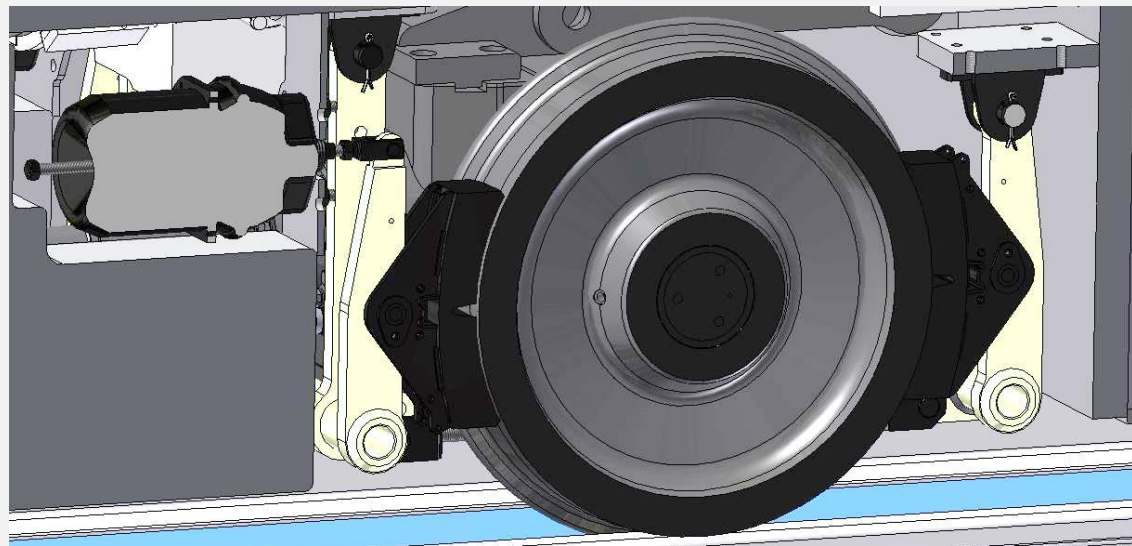
Wheel  $\varnothing$  660 mm.

# LX Locomotives - Brake system



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

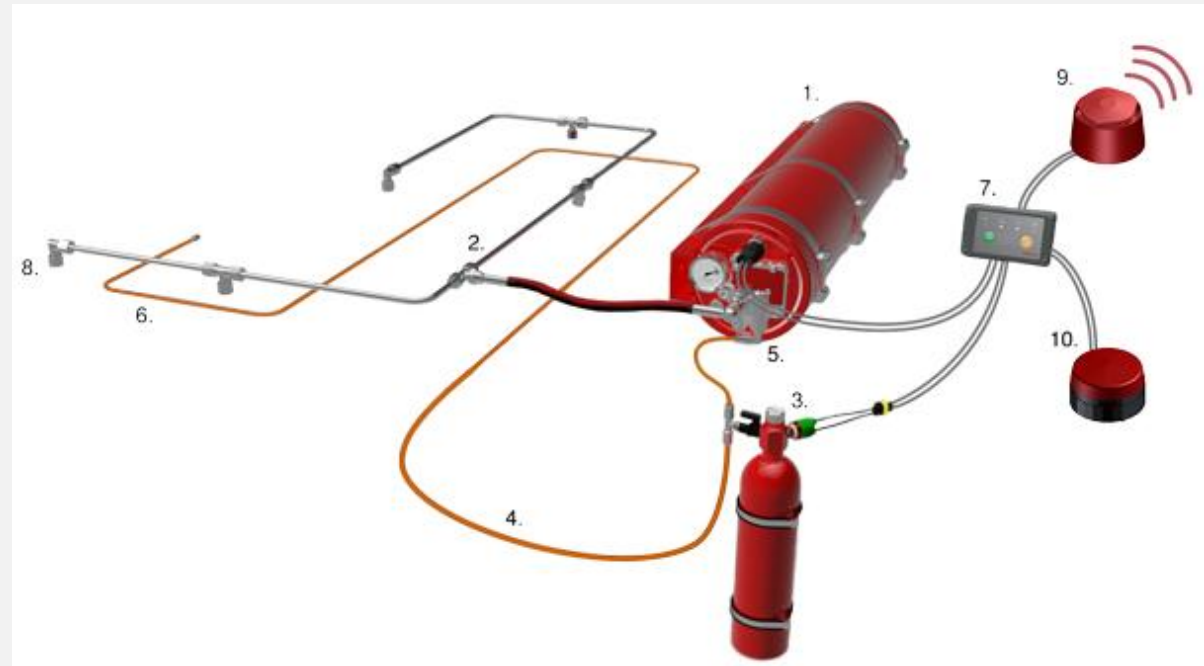
Spring suspended parking/emergency brake of safety type automatic applied when air pressure falls.



# LX 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.

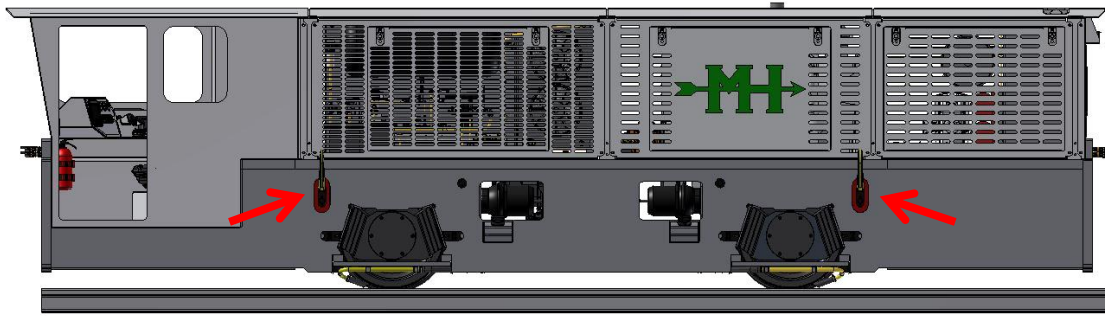


7. The pressure switch warns the driver via the alarm panel, sound- (9) and light signals (10). The extinguishing fluid is pressed through the distribution system's nozzles and a water mist is spread in the protected compartment (8).

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

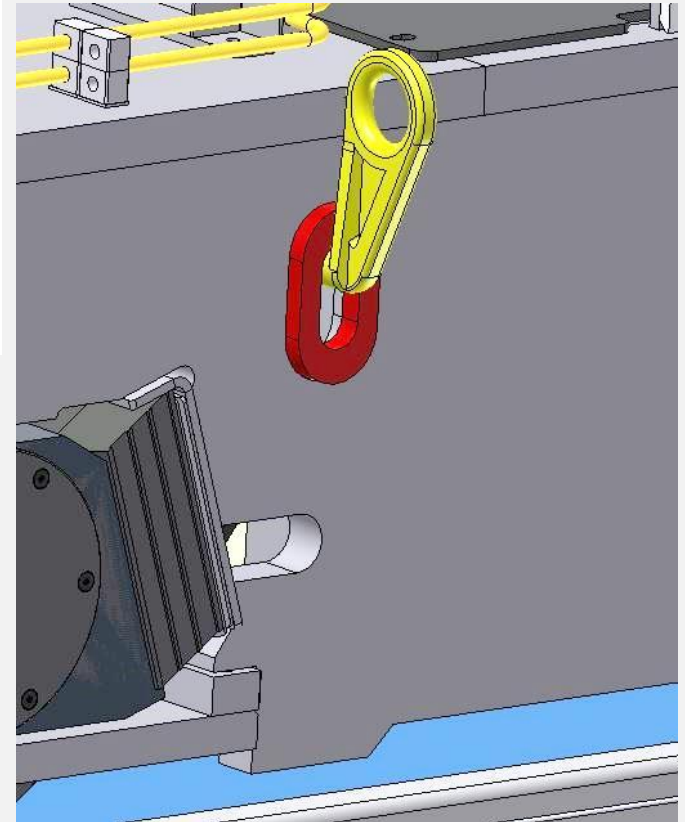
**ANSUL** available as option.

# 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***

