

ZAGRO Group



Formation of ZAGRO Group



Development of forklift truck railcar movers (entry into shunting technology)

1973



Entry **ZWEIWEG**

2006



Entry **GMEINDER LOKOMOTIVEN**

2012

1969

Foundation **ZAGRO** (Construction machines)



1985

Takeover and development of Ries road/rail products



2007

Entry Schörling Rail Tech GmbH (today ZWEIWEG location in Sehnde)



2009

Cooperation with TERBERG



Strong partners in alliance – ZAGRO Group

ZAGRO Bahn- und Baumaschinen GmbH

- General Manager: Wolfgang Zappel
- 96 employees

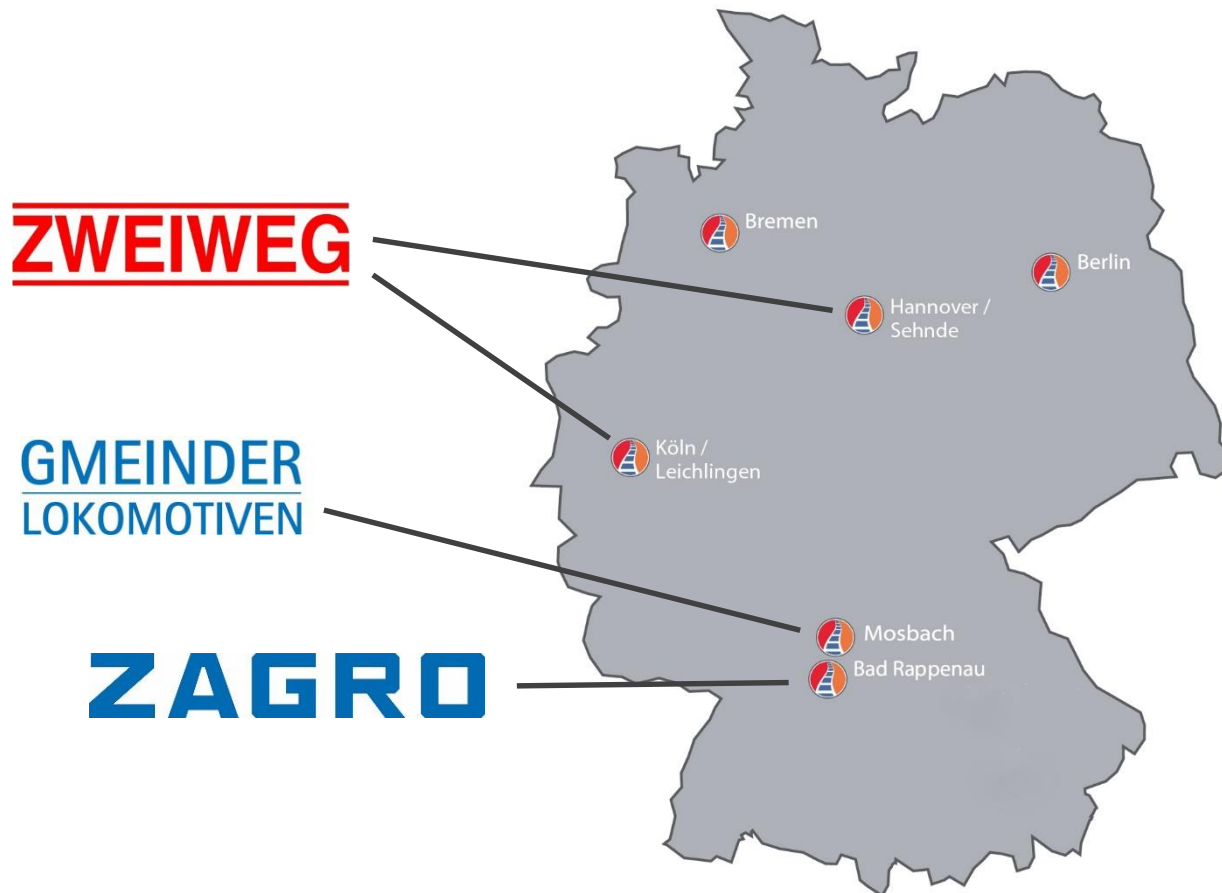
ZWEIWEG International GmbH & Co. KG

- General Manager: Joachim Feuchter
- 75 employees (headquarter in Leichlingen)
35 employees (company location in Sehnde)

GMEINDER LOKOMOTIVEN GmbH

- General Manager: Tim Bertsch
- 72 employees

Service competence – reliable, quick and country wide



ZAGRO

Product examples and references



Road/rail vehicles Mercedes-Benz Sprinter

- Stuttgart Tramway SSB
- Strukton Rail
- VolkerRail
- BAM Infra Rail
- Macedonian Railways



Battery-driven railcar movers ZAGRO E-MAXI

- German Railways
- Austrian Railways ÖBB
- Swiss Railways SBB
- Metro Moscow
- Metro Rio de Janeiro
- Nedtrain



Road/rail vehicles Mercedes-Benz Unimog

- BASF Ludwigshafen
- Bayer Leverkusen
- German Railways
- Austrian Railways ÖBB
- Japan Railways



Road/rail vehicles TERBERG/ZAGRO

- Scholz Recycling
- Evonik Industries
- Holcim Switzerland
- Metro Bahia da Salvador
- LogServ Austria

ZWEIWEG

Product examples and references



Road/rail rescue vehicles

- German Railways
- Belgian Railways SNCB
- Austrian Railways ÖBB
- Metro Istanbul
- Metros in China



Road/rail trucks from 7.5 to 40 tons

- VolkerRail
- Furrer + Frey
- Colas Rail
- Vossloh
- Siemens
- Eurovia
- SPL Powerlines



Road/rail overhead line installation vehicles

- Zurich Transport Corporation VBZ
- Munich Transport Company SWM
- Dortmund Municipal Utilities DSW21
- Brussels Tramway STIB
- DB Bahnbau



Overhead line and groove cleaning vehicles

- City of Calgary
- Zurich Transport Corporation VBZ
- Storebaelt Denmark
- Frankfurt Transport Corporation VGF
- Dresden Transport Corporation DVB

GMEINDER LOKOMOTIVEN

Product examples and references



New built shunting locomotives

- LogServ
- Voestalpine
- RIVA
- Crude Oil Refinery Emsland
- DOW-Chemical
- INEOS Phenol



Locomotive for narrow track gauge (760 mm, 750 kW, max. 80 km/h)

- Austrian Railways ÖBB
- Salzburg Local Rail
- Zillertal Railway Austria



Modernised shunting locomotives

- Sersa Switzerland
- Transmission System Operating Company FBG
- LogServ
- Voestalpine
- Crude Oil Refinery Emsland



Construction of crew cabins and tool cabins

- MAFI Transport Systems
- TREPPEL Airport Equipment
- SCHEUERLE
- Hüntelmann
- SCHOPF Maschinenbau

Certificates

CERTIFICATE · CERTIFICADO · CERTIFICAT · CERTIFIKAT · CERTIFICATE

Management System

in accordance with the standard
DIN EN ISO 9001:2015

It is hereby confirmed that the

ZAGRO Group

for this company:

ZAGRO Bahn- und Baumaschinen GmbH
Mühlstraße 11-15
74906 Bad Rappenau

has fully implemented a management system for the following scope of application:


Manufacturing, construction, and sales of special vehicles and components for rail traffic as well as related services

Date of initial certification: 25.10.2009
Certificate registration no.: 11086292
This certificate is valid until: 24.10.2020
Next certified period: 25.10.2017 - 24.10.2019

Signature
Yonit Certifying Body
Omeritz, 01113017

KO-Zertifizierung GmbH Mühlstraße 3 09127 Chemnitz






Michael Mühling

hat an einem

UNIMOG Fachtraining
UDTU Diagnostechniker Update

vom 07.05.2012 - 08.05.2012

erfolgreich teilgenommen



Me Truck

Signature
Lehrbegleitung

DVS ZERT

CERTIFICATE

Welding of railway vehicles and components according to EN 15085-2

ZE-16083-01-00-EN15085-2016.0247.003

DVS ZERT hereby certifies that the company

ZAGRO Bahn- und Baumaschinen GmbH
Mühlstraße 11 - 15
74906 Bad Rappenau-Grombach
GERMANY

fulfills the requirements for the scope according to

EN 15085-2 certification level CL1

in the range indicated on the reverse.

validity: 21.06.2016 until 05.07.2019

Düsseldorf, 21.06.2017
Place and date of issue

Digitaling Leadschick
Lead Auditor

Signature
head of cert.

DVS ZERT GmbH, Aachen: Straße 172, 40273 Düsseldorf, GERMANY



Mercedes-Benz Unimog ExpertPartner

ZAGRO
Mühlstraße 11-15, 74906 Bad Rappenau-Grombach,
Deutschland

Gültigkeitszeitraum: von 19.06.2015 bis 19.06.2018

ZAGRO wurde im Rahmen des Unimog Partnerschaftsmodell, einer erweiterten Zusammenarbeit zwischen der Daimler AG und dem Aufbauhersteller, mit dem Partnerschaftslevel Mercedes-Benz Unimog ExpertPartner ausgezeichnet. Der Partner erfüllt damit im höchsten Maße die Anforderungen in den Bereichen Qualität, Vertrieb, Service und Technik, welche Mercedes-Benz Special Trucks an Aufbauhersteller auf dem Gebiet der individuellen Aufbaulösungen stellt.

Wir gratulieren unserem Partner und freuen uns auf eine erfolgreiche Zusammenarbeit.

Wörth, im Juni 2015

Signature
Dr. Axel Förster
Marketing, Sales & Services
Mercedes-Benz Special Trucks

Signature
Kjellur Thomsen
Aufbauhersteller-Management
Mercedes-Benz Special Trucks



Mercedes-Benz
Trucks you can trust

ZAGRO road/rail technology





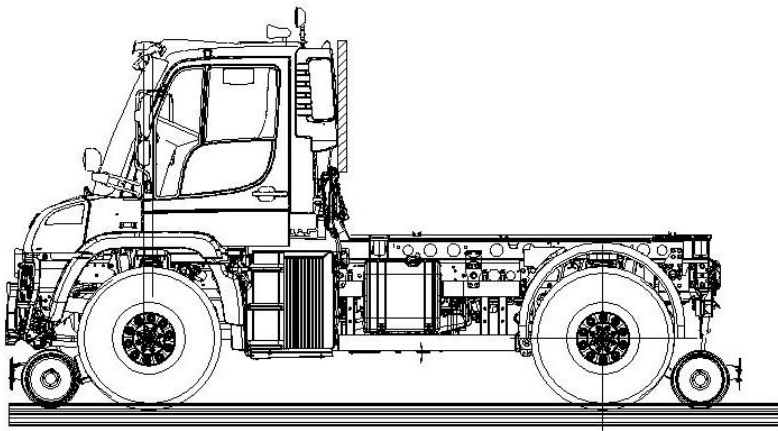
ZAGRO road/rail Unimog



Track guiding system – Type 405

With rail wheel Ø 400 mm:

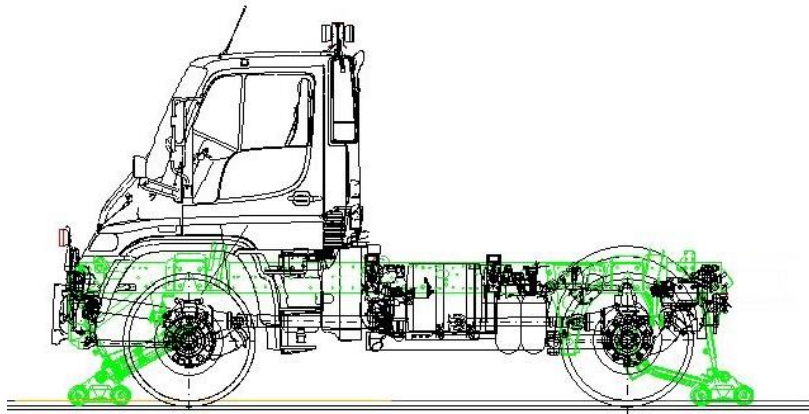
- Minimum curve radius ~50 m (depending on wheel base)
- For track gauges from 1435 to 1676 mm
- Maximum speed on rails = 50 kph



Track guiding system – Type 405

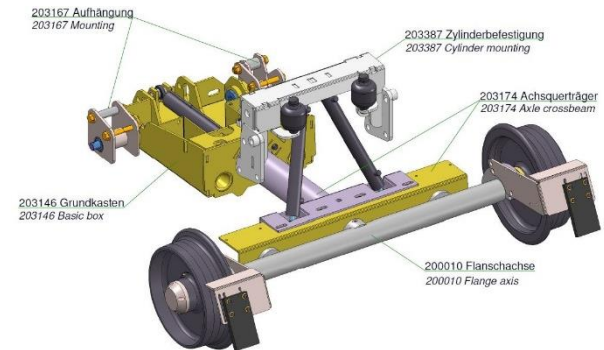
With rail wheel Ø 136 mm:

- Minimum curve radius ~35 m (depending on wheel base)
- For track gauges from 1435 to 1676 mm
- Maximum speed on rails = 50 kph

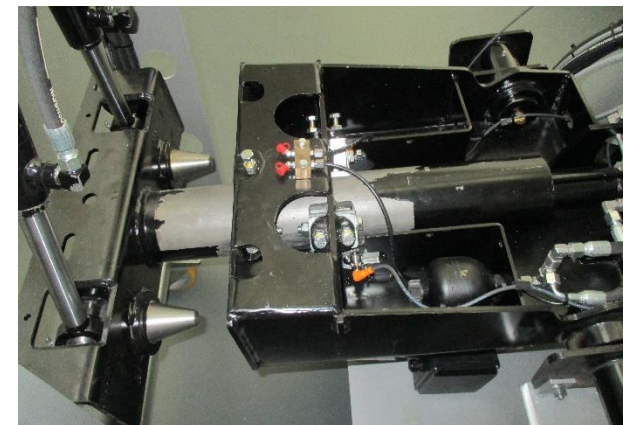


Characteristics and unique selling points

- Patented guiding system
- Front rail axle close to Unimog front axle
- Excellent running characteristics
- High safety against derailment
- Torsion-resistant housing
- Axle-guided and independent of spring dynamics



TGS front - Overview drawing



TGS front – Test station

Operating elements in the cabin

- CAN bus technology
- Central LCD control panel
- Perfect overview by clear symbols
- New failure-safe safety control unit as per EN 50128
- Patented joystick instead of driver brake valve
- Ergonomic position

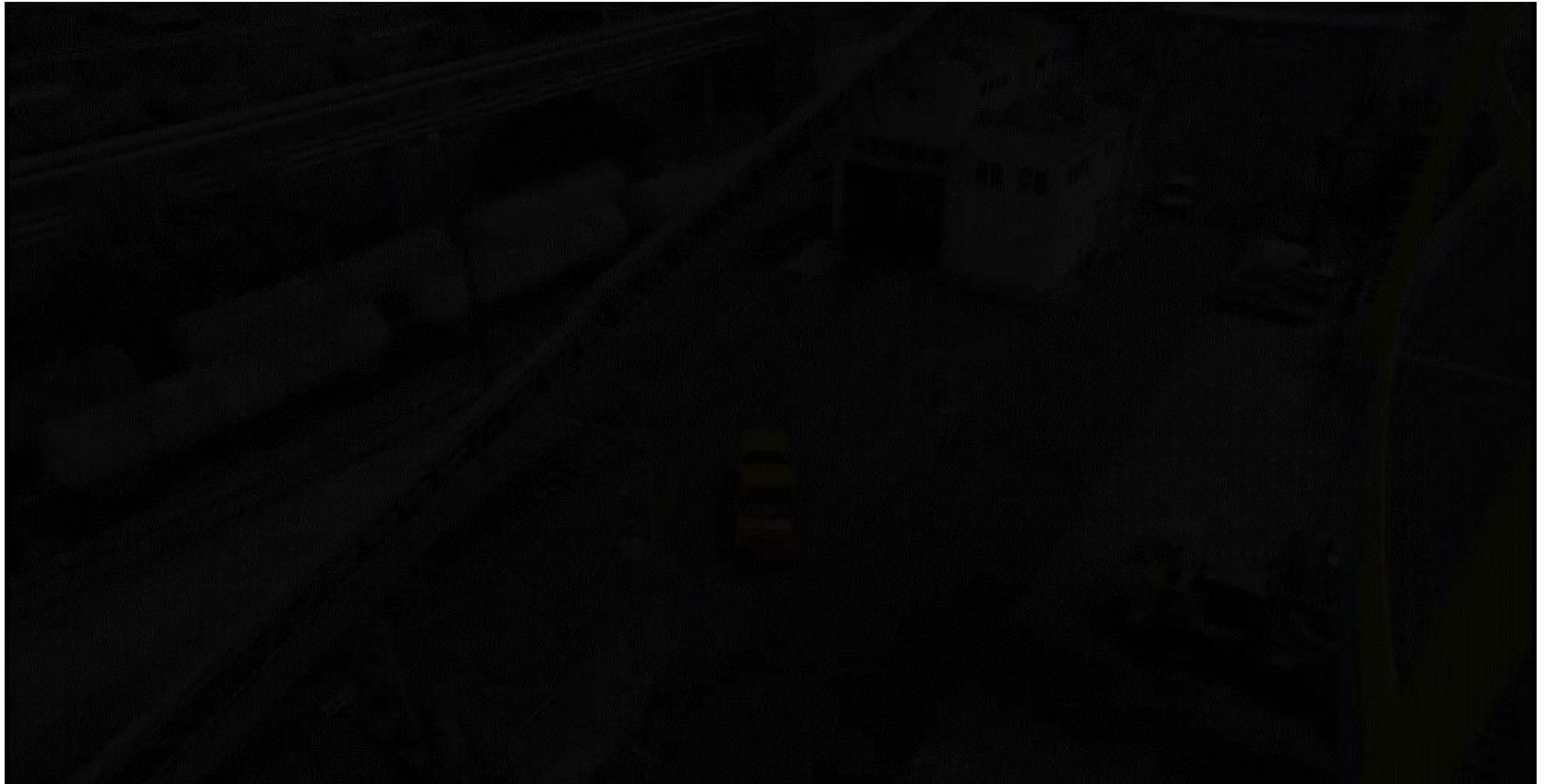


LCD colour display with clear symbols



Arrangement of operating elements

On-tracking procedure



Vehicle configurations – Shunter



AGRO Terminal (Dresden, Germany)



Vehicle configurations – Shunter



armasuisse (Switzerland)

Vehicle configurations – Shunter



Lemonnier (France)

Vehicle configurations – Shunter with crane



GVB (Public Transport Company of Amsterdam, Netherlands)

Vehicle configurations – Maintenance vehicle



Pilot project for VR (Finnish State Railway)



Vehicle configurations – Construction vehicle



Pilot project with 3 identical vehicles for DB (German Railways)

Double traction



Unimog U 423 double traction – running order for Japan



Vehicle configurations – Working vehicle



9 identical vehicles for MÁV (Hungarian State Railway) with swap bodies (here: crane and grinding unit)



MÁV (Hungarian State Railway)



Vehicle configurations – Working vehicle



MÁV (Hungarian State Railway)



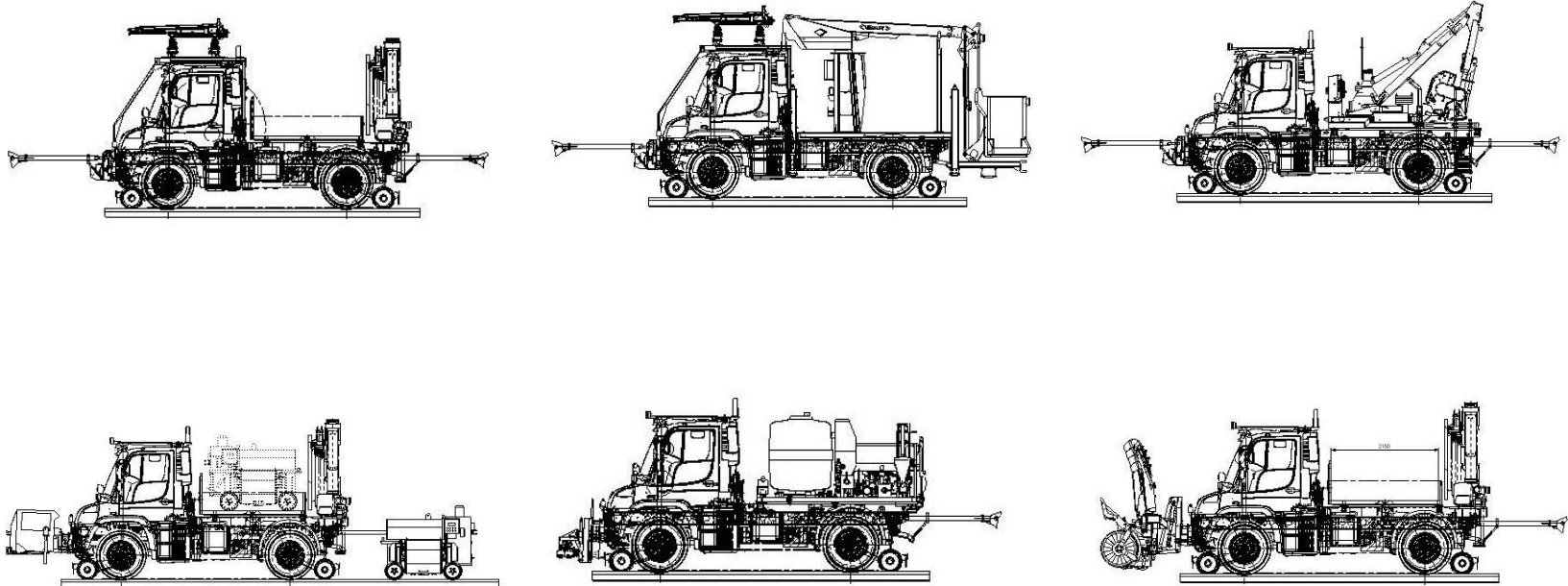
Vehicle configurations – Working vehicle



MÁV (Hungarian State Railway)

Multiple implements vehicles

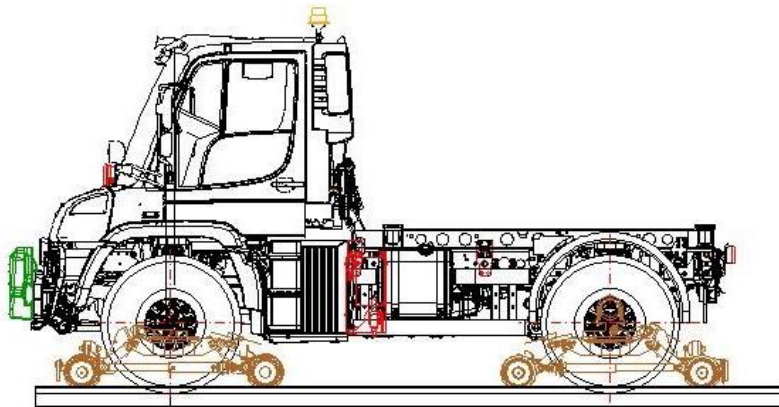
Possible vehicle configurations



Track guiding system – Type 407

With rail wheel Ø 230 mm:

- Minimum curve radius ~17 m
(independent of wheel base due to centry pivot system)
→ requires higher guiding pressure which leads to lower traction force
- For track gauges from 1435 to 1676 mm
- Maximum speed on rails = 50 kph



Vehicle configurations – Rerailing vehicle



Vienna Lines (Austria)

Vehicle configurations – Maintenance vehicle



Demonstration in Sehnde (Germany)

Vehicle configurations – Rail cleaning vehicle

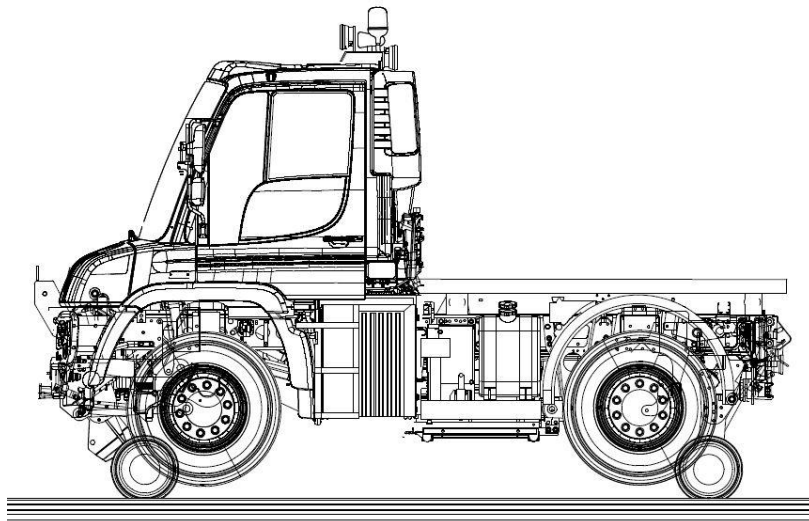


Metro Debrecen (Hungary)

Friction drive system – Type 404

With rail wheel Ø 400 mm:

- Minimum curve radius ~35 m (depending on wheel base)
→ traction force lower due to friction value steel/steel
- For track gauges from 1000 to 1435 mm
- Maximum speed on rails = 30 kph



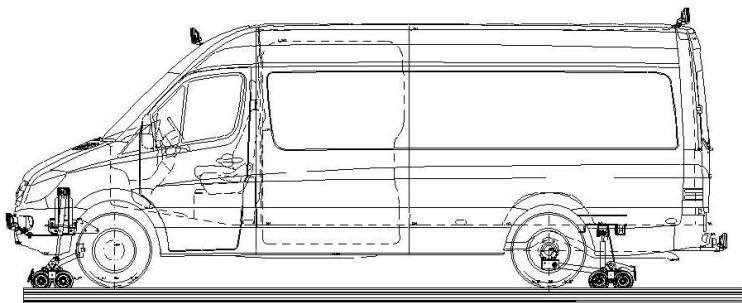
Road/rail Sprinter



Track guiding system – Type 476

With rail wheel Ø 136 mm:

- Minimum curve radius ~45 m (depending on wheel base)
- For track gauges from 1435 to 1676 mm
- Maximum speed on rails = 50 kph



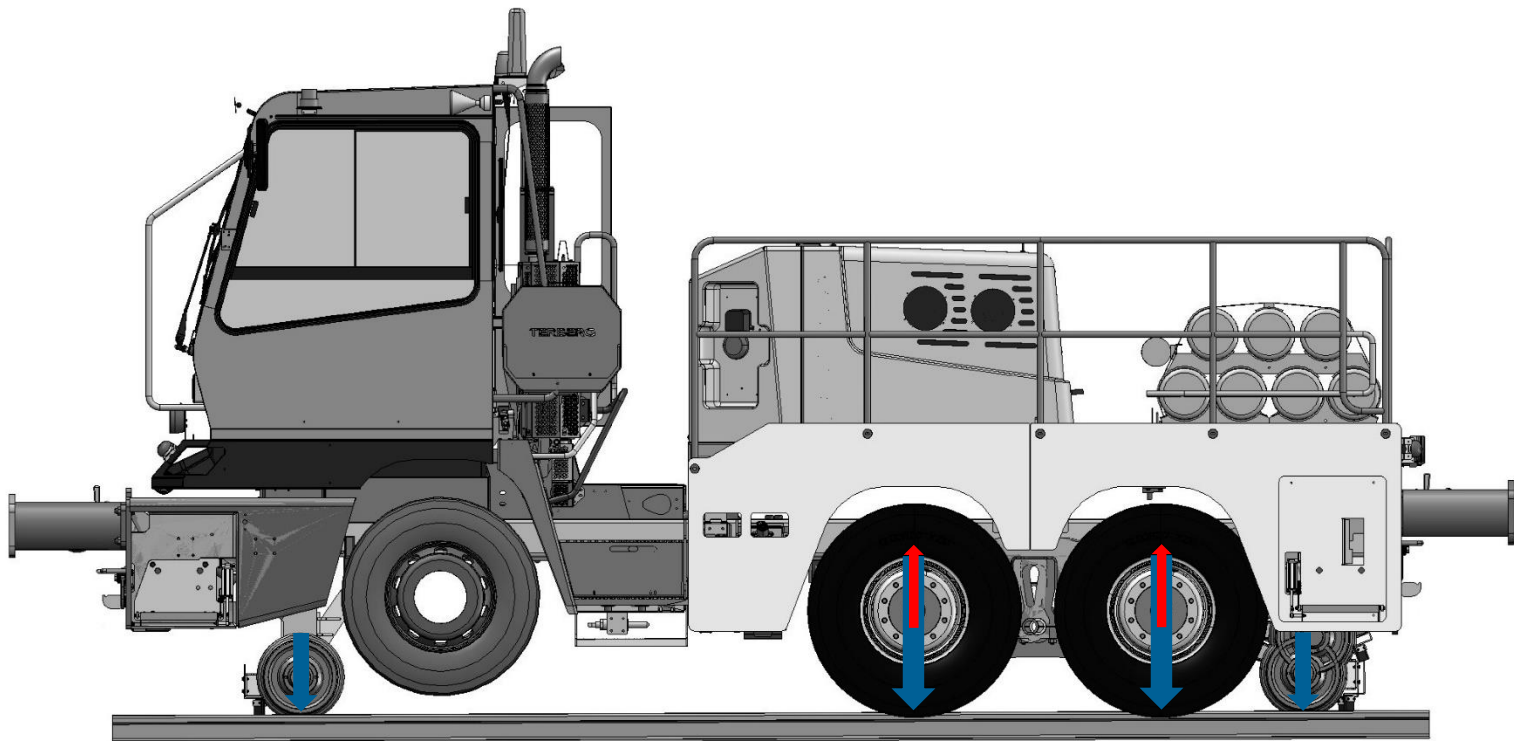
Sprinter in operation



TERBERG/ZAGRO Truck



Vehicle configurations – Shunter



TERBERG/ZAGRO Truck RR282/222 6x4

- Towing capacity up to 2800 tons
- Small turning radius of 13.5 meters on road
- For track gauges from 1435 to 1676 mm
- Full body-width cabin (1+1)
- High-capacity wagon brake system
- Low operating and maintenance costs
- Reliable high-quality parts

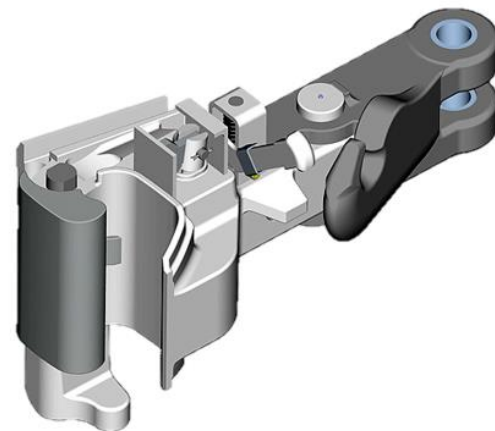
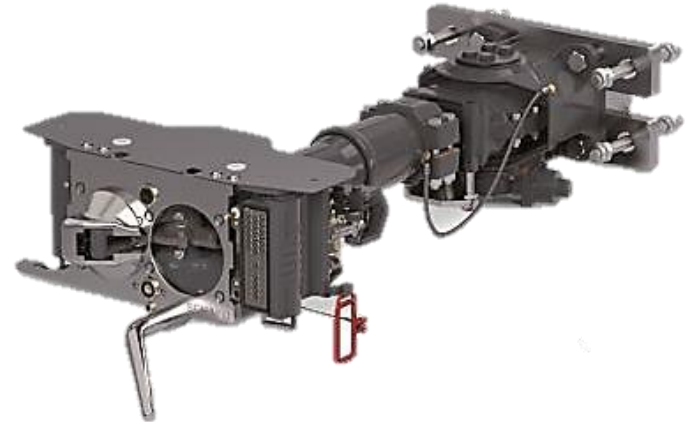


Serviceability



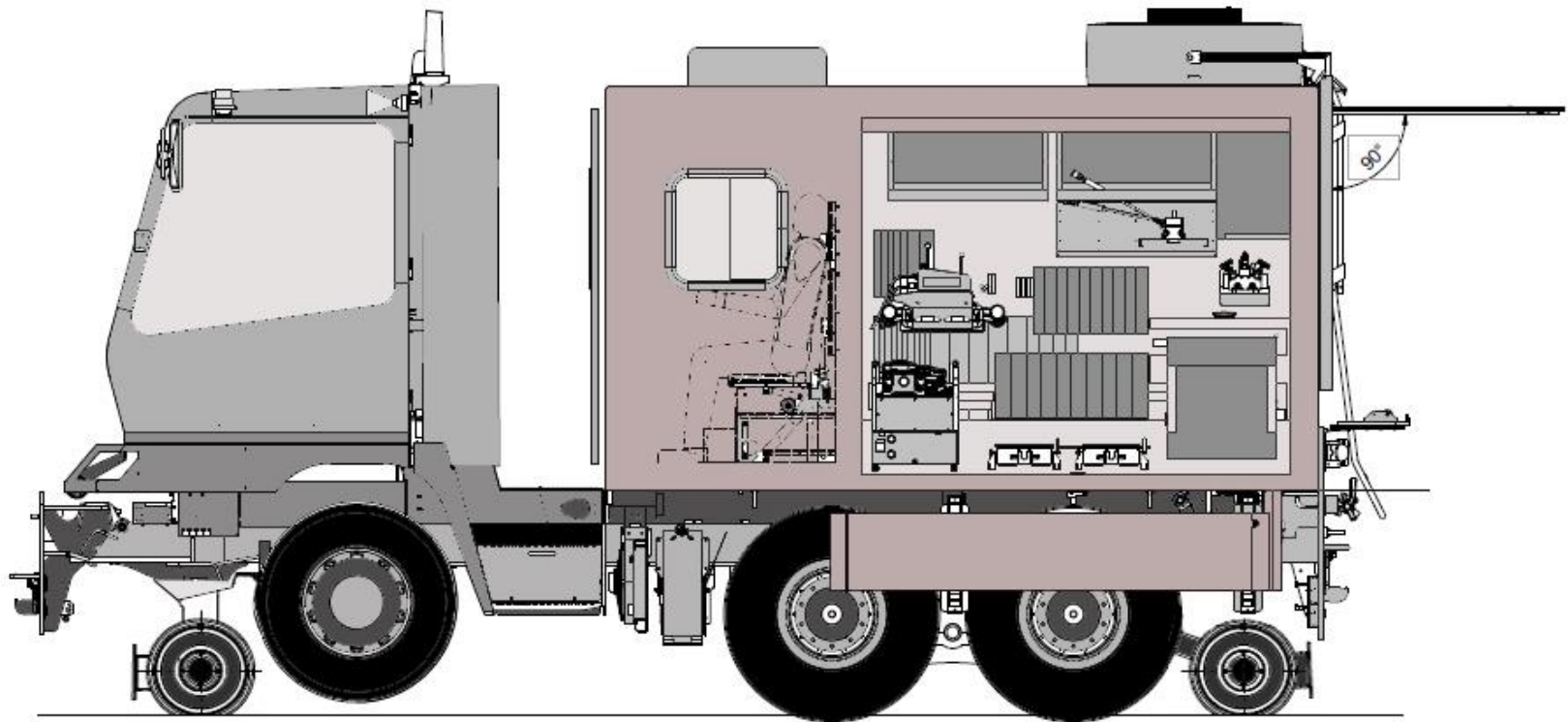
Cabin with two operating stands

Various coupler types

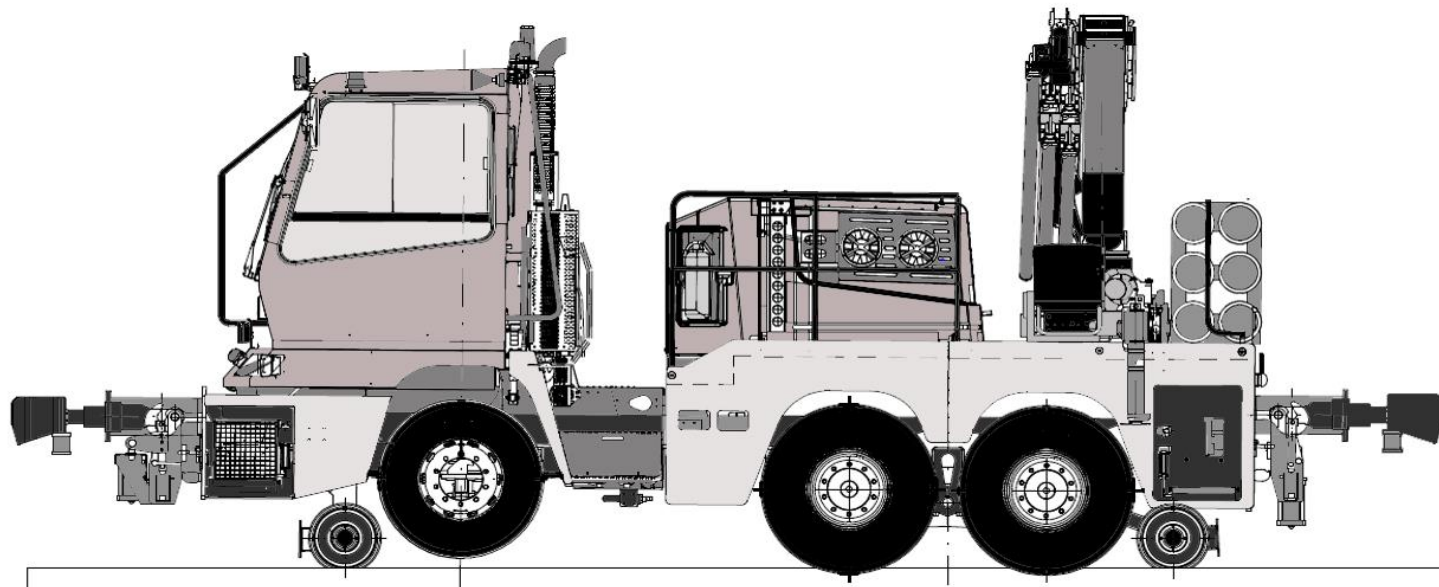




Vehicle configurations – Rescue vehicle



Vehicle configurations – Shunter with crane





Demonstration VPS (Salzgitter, Germany)



Harsco Steel (Dunkirk, France)



Evonik Industries (Herne, Germany)



railCare AG (Lausanne, Switzerland)



Logistik Service GmbH (Linz, Austria)



Port of Trelleborg (Trelleborg, Sweden)



Metro Salvador da Bahia (Brazil)

ZAGRO E-MAXI



ZAGRO E-MAXI benefits

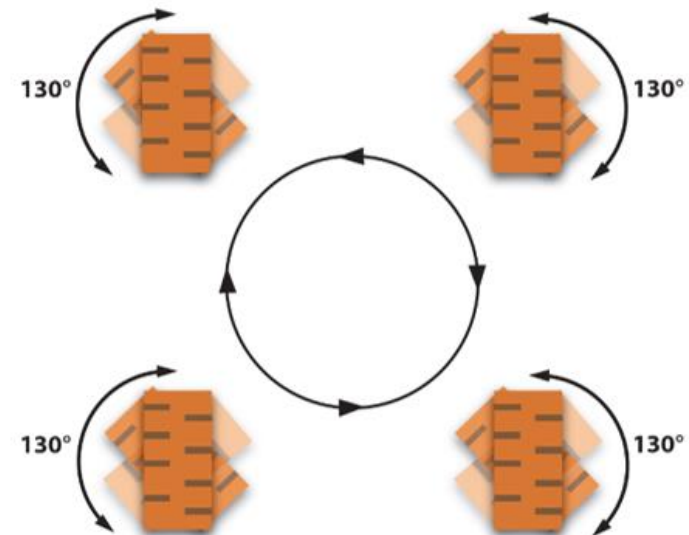
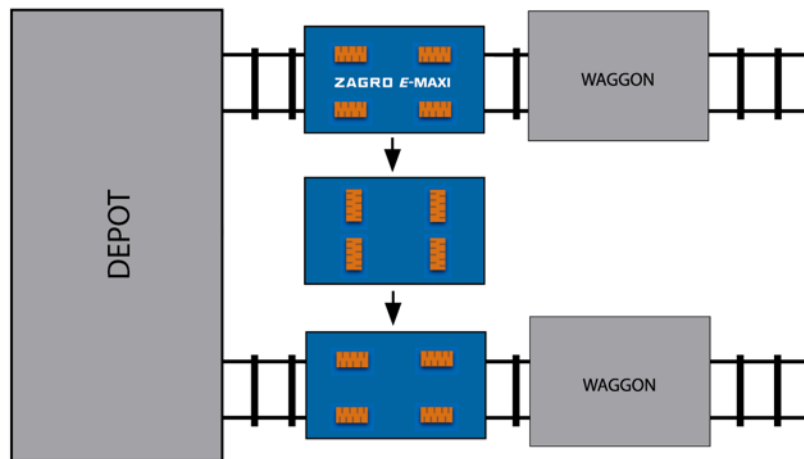


ZAGRO E-MAXI benefits

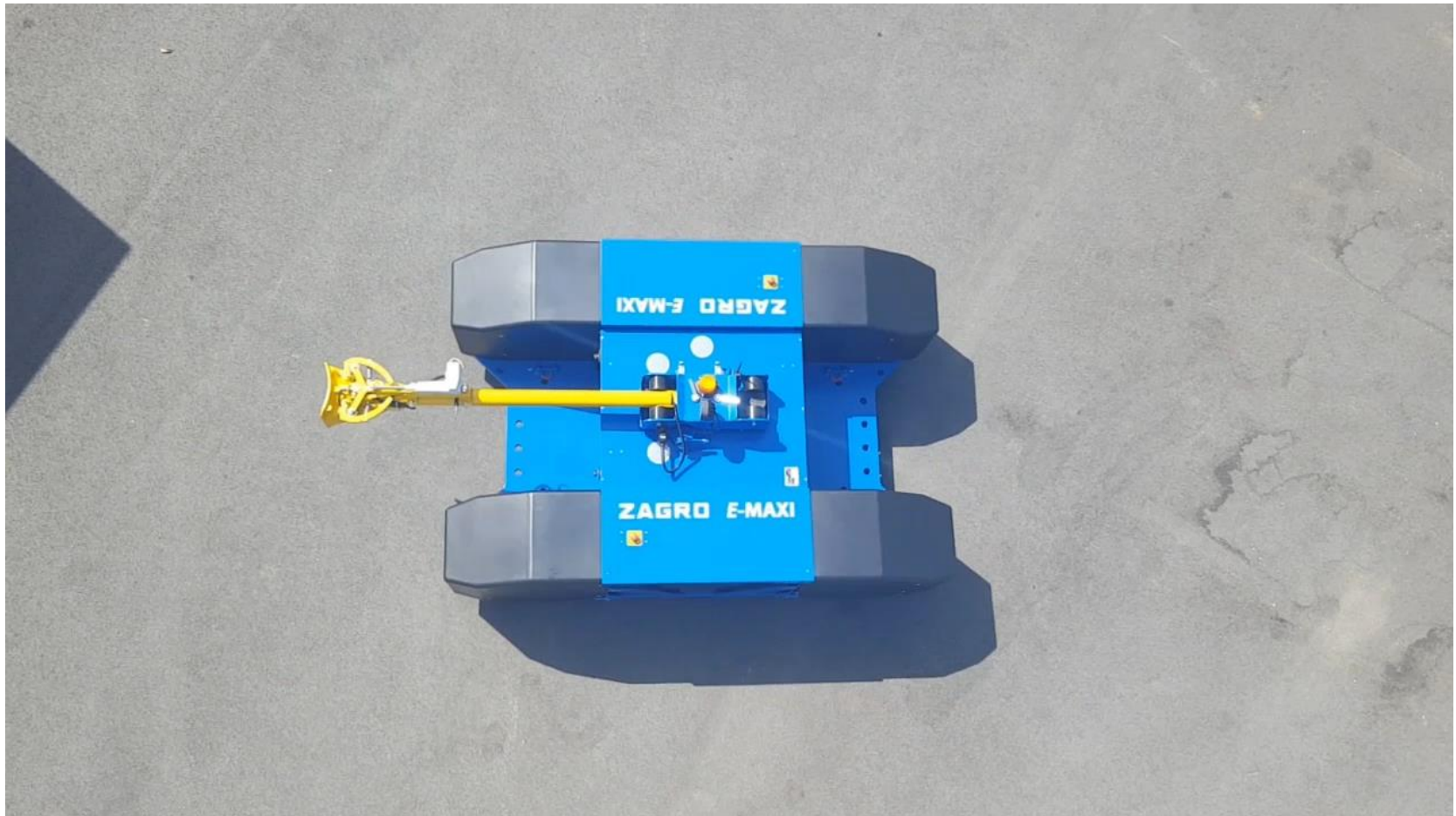
All-wheel steering

- Diagonal drive

- Turn on the spot



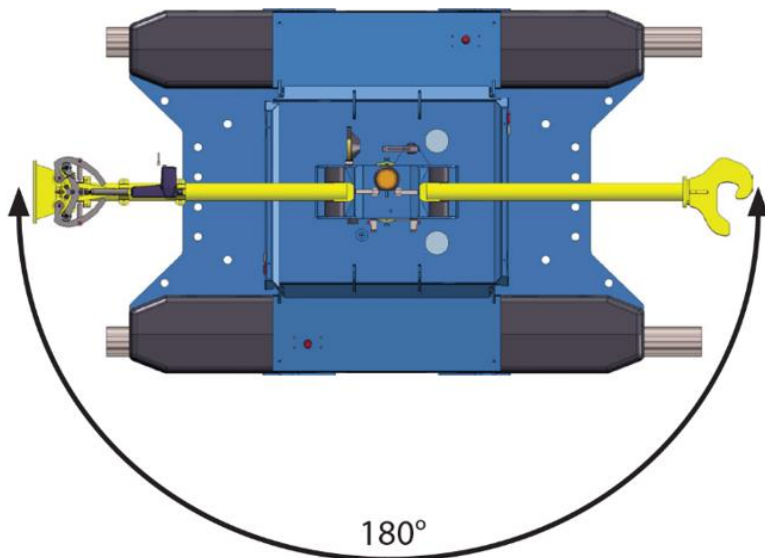
ZAGRO E-MAXI benefits



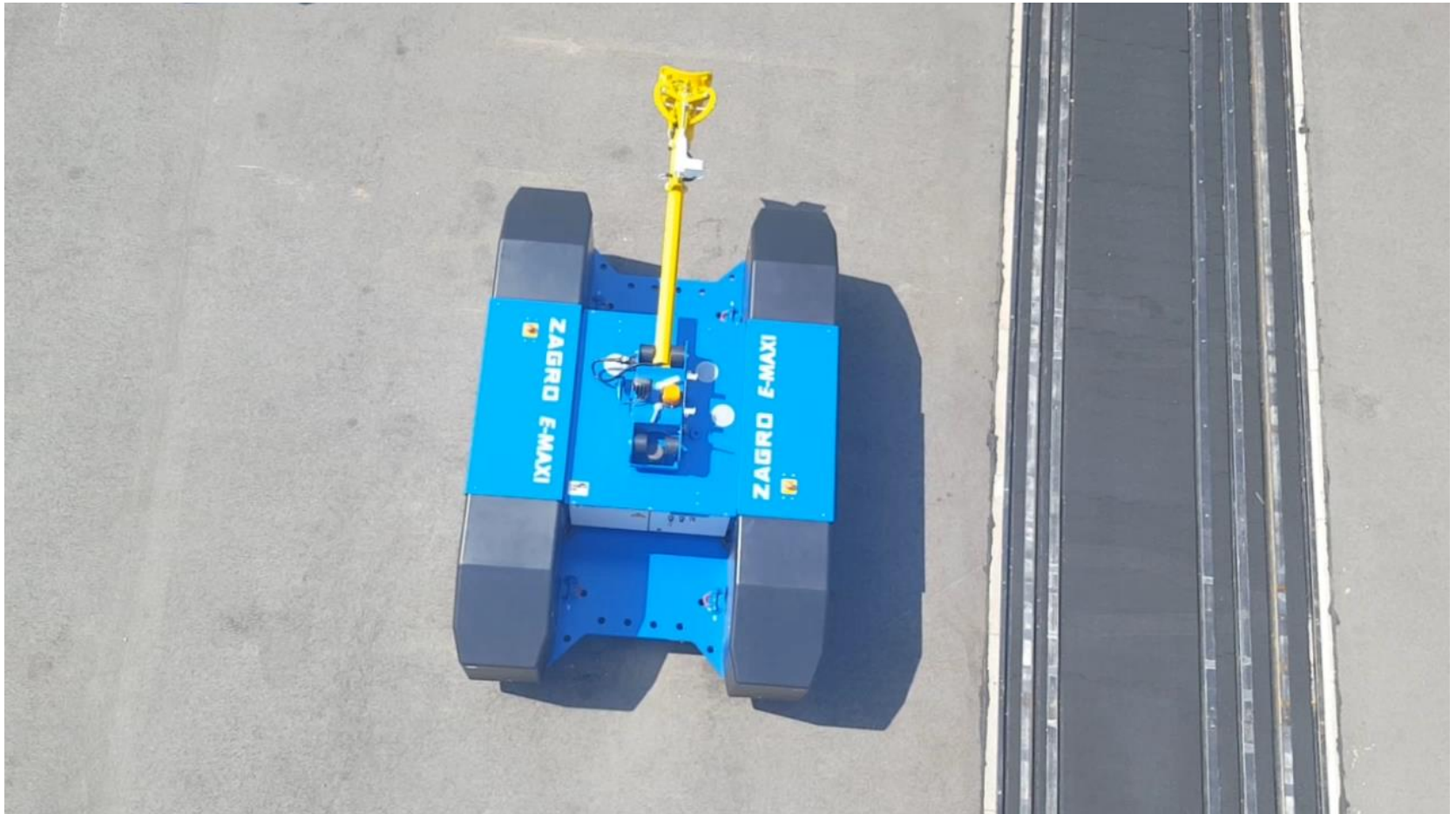
ZAGRO E-MAXI benefits

Twin-type coupling bar receiver

- Two different couplers possible
- Swivelling by 180°

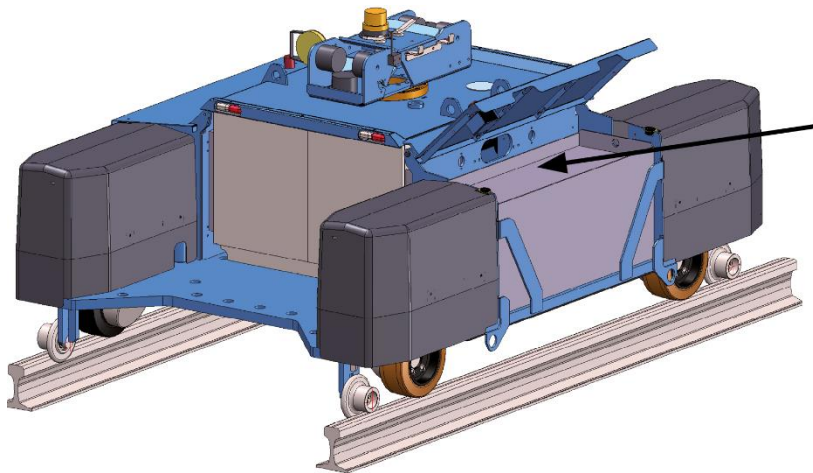


ZAGRO E-MAXI benefits



ZAGRO E-MAXI benefits

- Battery charger on board
- Easy maintenance of batteries
- No tools needed



ZAGRO E-MAXI benefits



- One-man operation with radio remote control
- No driver license needed
- Reduced lifecycle costs
- Saves money



ZAGRO E-MAXI benefits

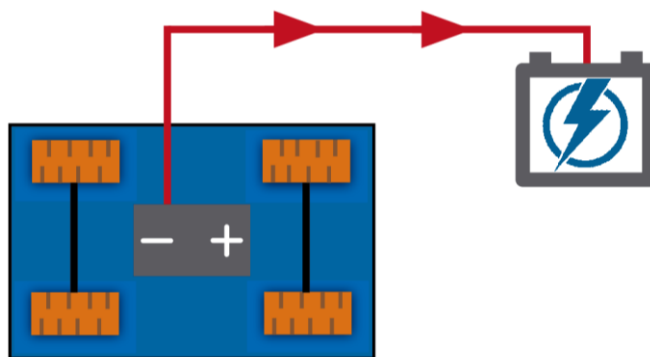
- Simple intuitive operation



ZAGRO E-MAXI benefits

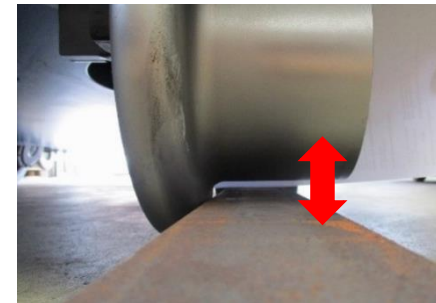
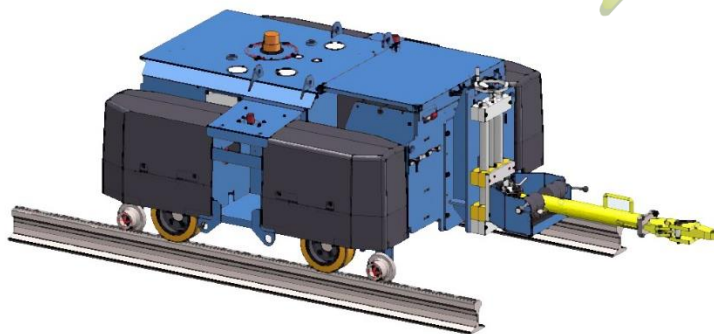
- Energy recirculation during the braking
- Failsafe electro-magnetic brake for emergency stop and parking

- For all weather use

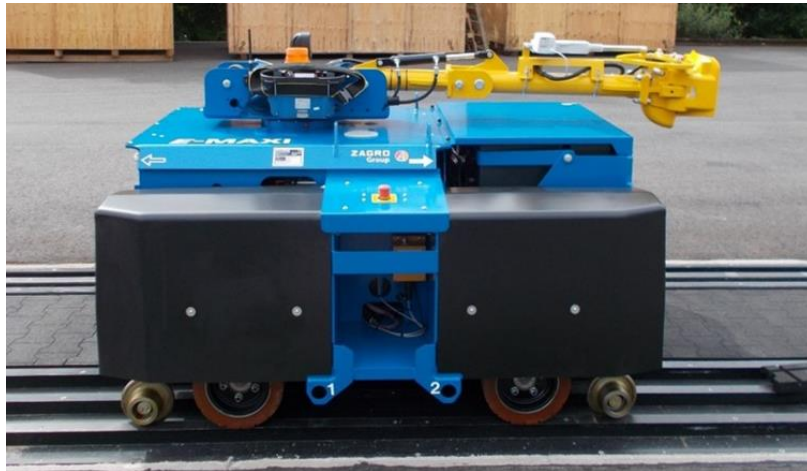


ZAGRO *E-MAXI M SHORT*

- 3400 kg weight
- 150 tons towing capacity
- Track gauge 1435 mm
- Rail wheels are not pressed to the rails

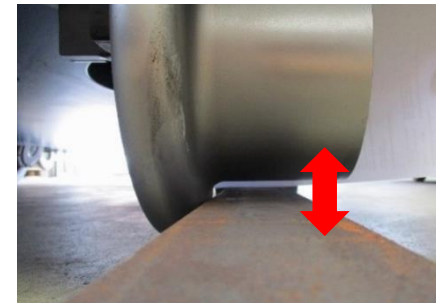
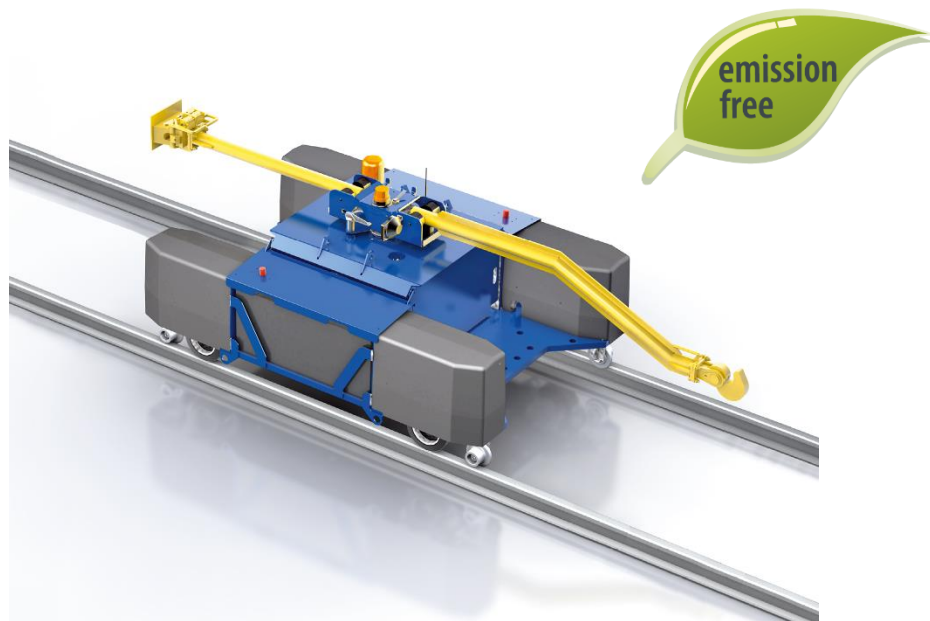


ZAGRO E-MAXI M SHORT



ZAGRO E-MAXI M

- 3500 kg / 4500 kg weight
- 200 tons towing capacity
- Track gauge 760 mm - 1676 mm
- Rail wheels are not pressed to the rails

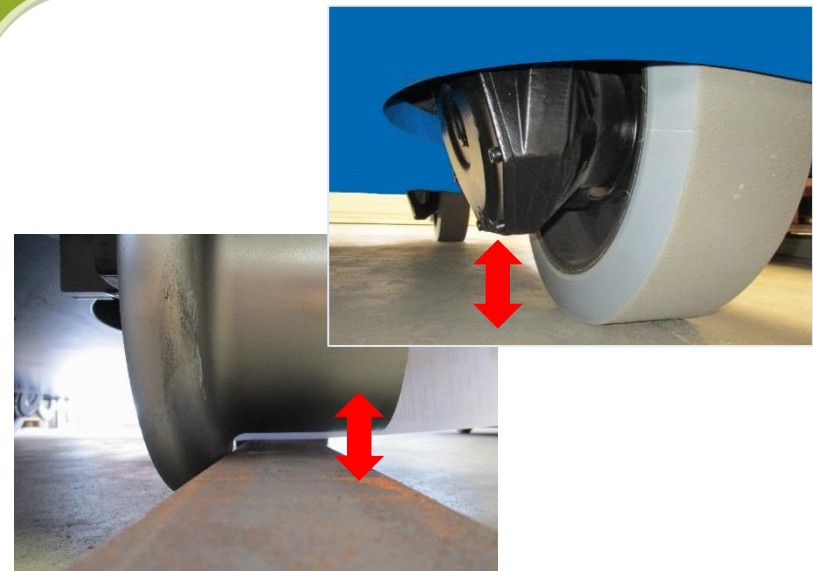
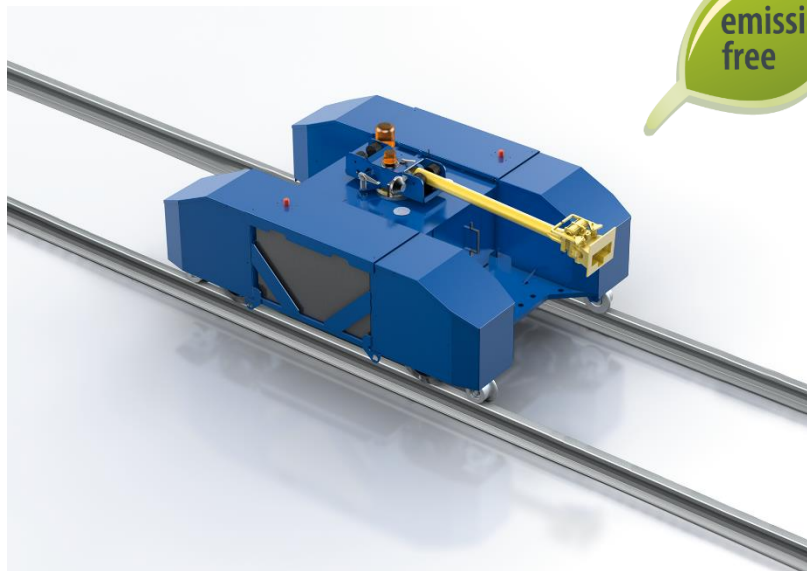


ZAGRO E-MAXI M



ZAGRO E-MAXI L

- 5100 kg / 6500 kg weight
- 350 tons towing capacity
- Track gauge 1435 mm - 1676 mm
- Rail wheels are not pressed to the rails



ZAGRO E-MAXI L



ZAGRO E-MAXI L



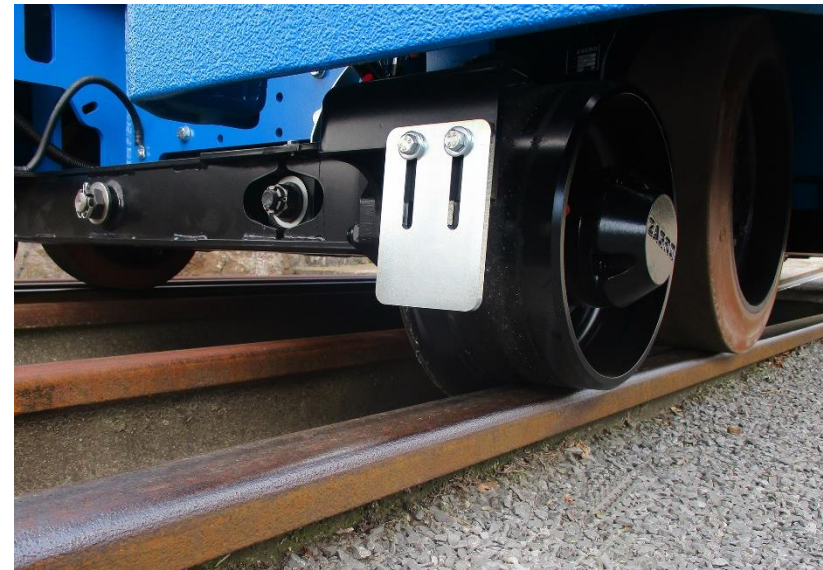
ZAGRO E-MAXI L



ZAGRO E-MAXI XL

- 10 tons – 15 tons weight
- 700 tons towing capacity
- Track gauge 1000 mm - 1676 mm
- Track guiding with axle, pressured on the rail

emission
free



ZAGRO E-MAXI XL





Abellio (Hagen, Germany)



BASF (Ludwigshafen, Germany)

Do you have any questions?

Many thanks for your kind attention.