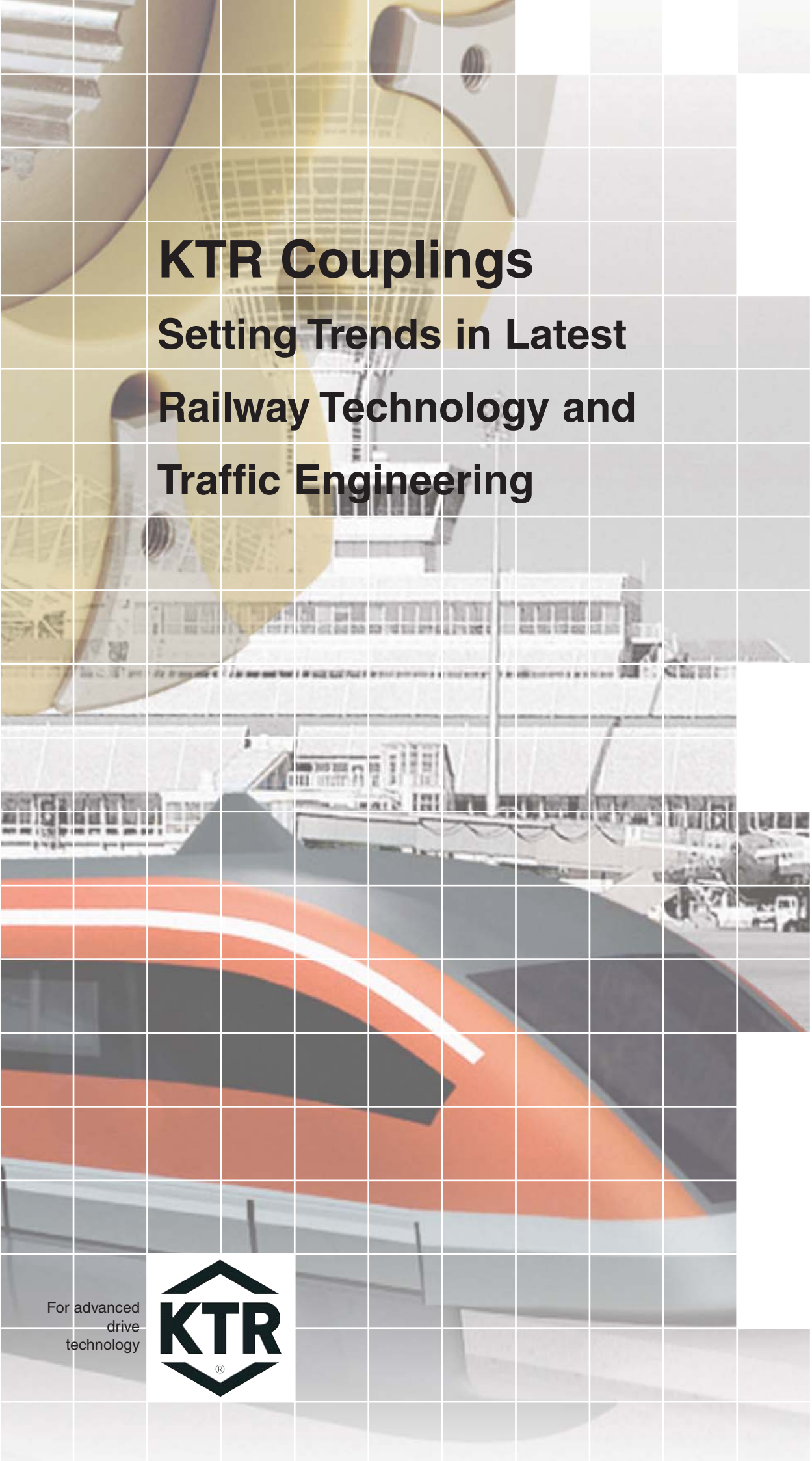


KTR Couplings

Setting Trends in Latest Railway Technology and Traffic Engineering

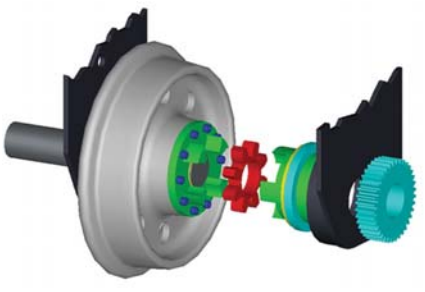
www.ktr.com

For advanced drive technology

KTR®

Setting trends in latest railway technology and traffic engineering

For advanced drive technology KTR



ROTEX® CF spec. direct drive for rail-road vehicles
(e. g. railway track machines, special rail vehicles, ...)

Successful in railway technology and traffic engineering

With more than 30 years of experience in the field of railway drives and traffic engineering our intention is more than only introducing KTR products: We are obliged to design new products with a further developped technology for the future.
This leaflet serves for providing you with new ideas how to adapt modified "simple" mechanics to high-technology applications.
Different outlines for railway traffic request for different solutions.
When being designed, drive systems are adapted specifically to the power train and its components in cooperation with the customer.

Couplings with integrated fan used in compressors for pressure feeding in rail vehicles (here ICE)

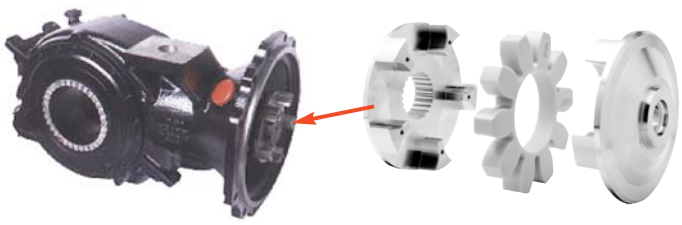
General description

Extraordinary requirements, e. g. higher performance while maintaining the expenses, are necessary to observe in the global market in order to be competitive. Flexibility with high quality is required by all applications in traffic engineering.

Some examples of application: Redesigned KTR couplings are installed in the main drive (bogie) of: tramways, underground trains, trolley cars, mainline locomotives, operating locomotives, railway construction vehicles as well as auxiliary drives for safety systems in doors and steps, current collectors, points setting devices, train tilting technology, etc.

Several problems with rigid combinations have arisen in the field. Rigid shaft connections cause stress and high dynamic reactions to adjacent components. On most vehicles shock and vibration load is caused on the one hand by existing power packs and on the other hand by the way of moving. Elasticity provides for more safety in the power train.

COMBINO driving power pack



Bevel gear with ROTEX® coupling

Setting trends in latest railway technology and traffic engineering

Main drives:

ROTEX® – torsionally flexible jaw couplings

Arguments in favour of using ROTEX® couplings in drive systems:

- Quick axial plug-in assembly
- Reduction of maintenance costs
- Fail-safe
- Elasticity can be adapted
- Reduction of restoring forces
- Noise reduction by structure-borne noise separation
- Torques up to a maximum of 35,000 Nm

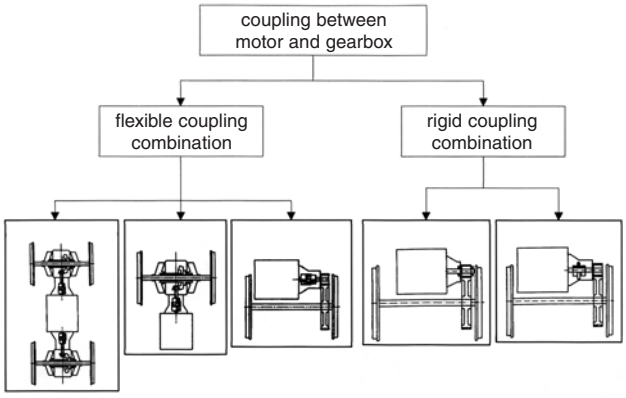
unloaded spider element

loaded spider element

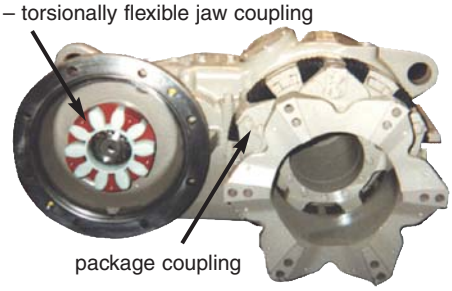
The geometric shapes of a flexible coupling with the optimum involute nylon teeth and concave shape of the cams being loaded are extremely important for the success of such a product. Uniform contacts of the elastomer parts – along with the resulting lower loads – result in smooth running and a considerably longer service life of the drive system.

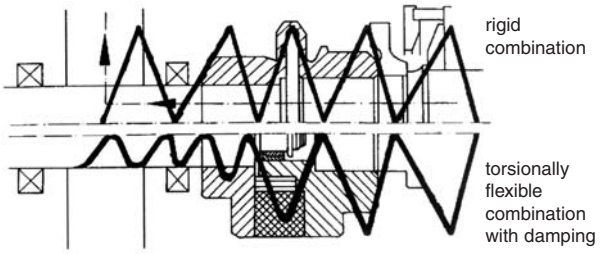
The dynamic reactions between mechanical rigid combinations are increasing. The drives of rail vehicles are becoming more compact, at the same time having higher capacities. As a result the power train is subject to high loads and the shaft couplings damping vibrations between electric motor and gearbox are of special importance.

Here the plug-in ROTEX® coupling has proven its worth. The damping in the main drive prevents early wear on the driving components. The overall driving comfort is increased.



ROTEX® – torsionally flexible jaw coupling

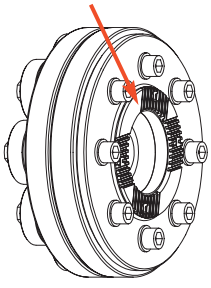




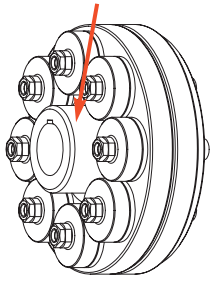
Insulating couplings for trolley busses (passenger protection)

Drive component serving as an insulation between traction motor and the cardan shaft system in busses with electric power supply from overhead wires.

cardan shaft connection



taper hub for motor shaft



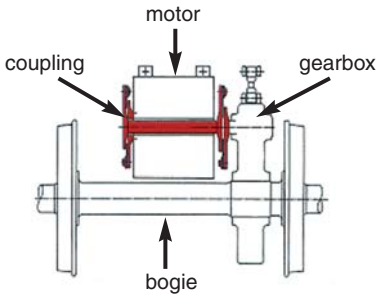
Setting trends in latest railway technology and traffic engineering

For advanced drive technology KTR

Main drives:

RIGIFLEX®
Steel lamina couplings

Various sizes of RIGIFLEX® couplings are used on the bogie of trains. The couplings are installed between motor and gearbox as a hollow shaft combination.



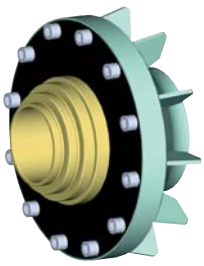
drive with hollow shaft motor

RIGIFLEX®
Steel lamina couplings

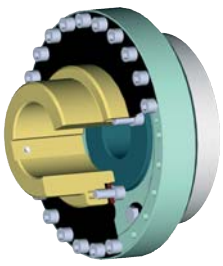
RIGIFLEX® spec. is used between motor and gearbox of tramways. Here the lamina set is particularly suitable to compensate for high misalignments.

The RADEX®-MK membrane coupling is used between single bearing motors and gearboxes of train drives. The membranes from highly stiff spring steel compensate for axial and angular displacements. At the same time the coupling serves as a bearing for the motor armature.
A redesigned slipping unit protects the drive, for example in case of short circuits of the motor, against extremely high torque peaks. The slipping torque is set by the manufacturer. Special friction linings provide for a long service life and a high repeating accuracy even with frequent load peaks.

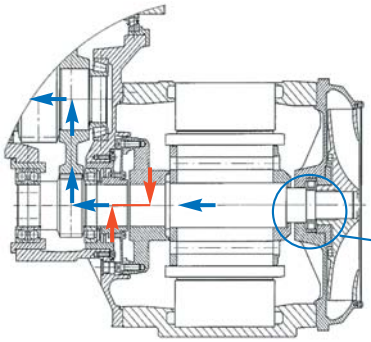
RADEX®-MK with fan



RADEX®-MK with overload unit

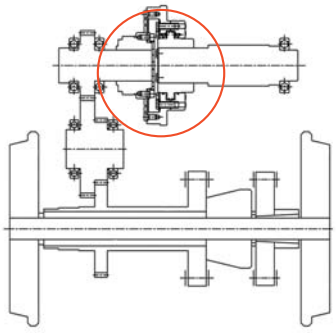


Single bearing motor



The motor armature has a bearing on one side only.

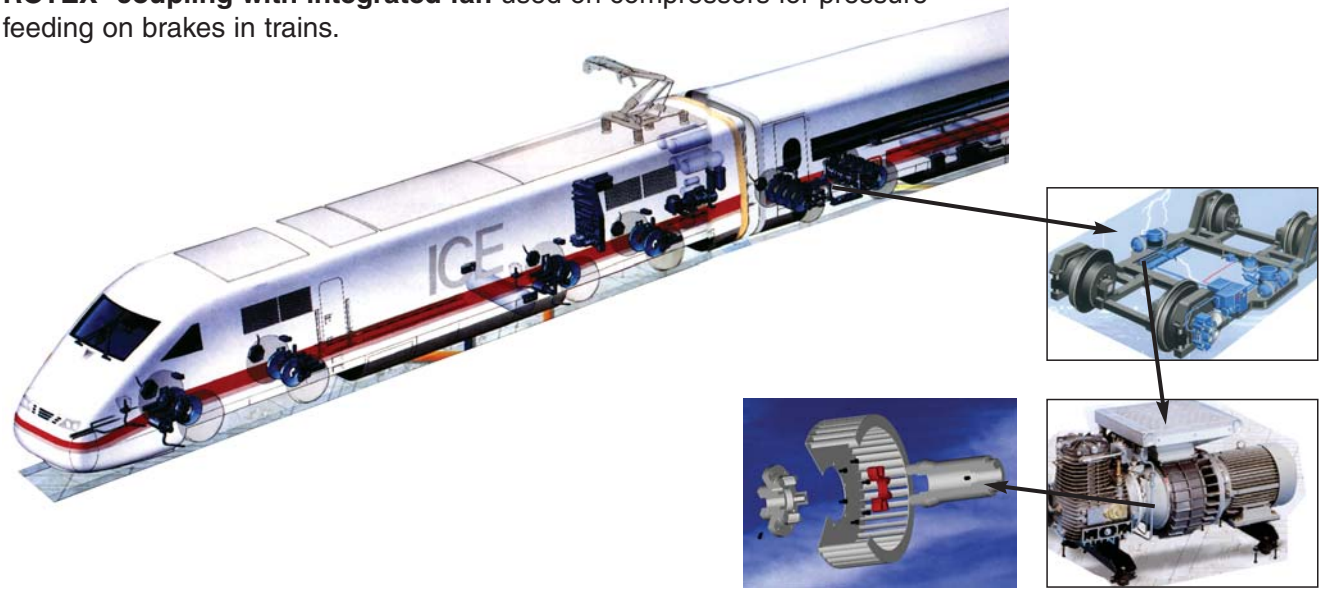
Sketch of the operating principle of the drive with RADEX®-MK



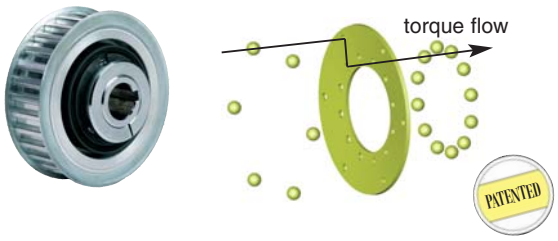
Setting trends in latest railway technology and traffic engineering

Other ranges of application:

ROTEX® coupling with integrated fan used on compressors for pressure feeding on brakes in trains.



SYNTEX® – backlash-free overload system used on sliding doors and locking systems for rail vehicles to separate the shock vibrations when opening or locking, respectively.



ROTEX® with RUFLEX® – torque limiter used on a diesel electric locomotive between gearbox and electric motor.

A special high-quality friction lining provides for damping the short circuit torques in the power train. The pre-set overload unit allows more frequent slipping with higher reproducibility of the slipping torque (no slip-stick effect).

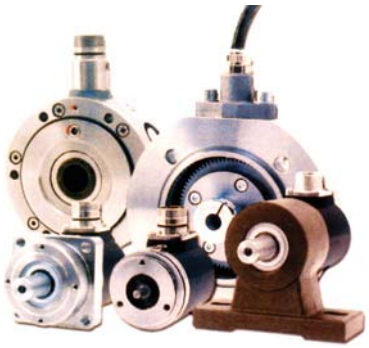
integrated slipping unit
for smooth starting

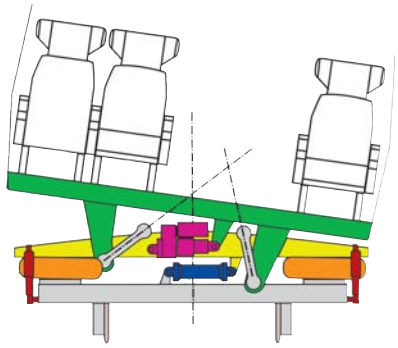
Other ranges of application:

Rail and track construction machinery

Use of KTR couplings in, as an example: points setting devices, point controls, signal machines, workshop controls

ROTEX® GS couplings



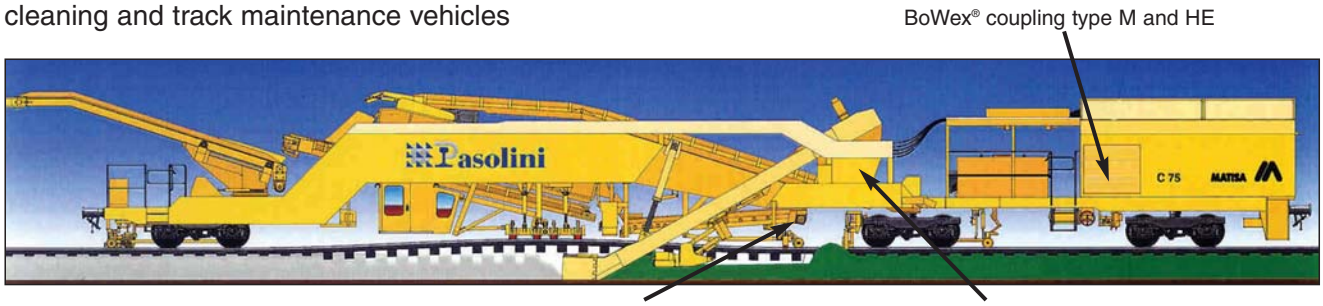


ROTEX® couplings in tilting technology

The coupling reduces the shock vibration and accelerating power which is produced on the bogie. Due to the use of our coupling the tilting drive has a very long service life with reduced maintenance expenses.

ROTEX® GS couplings in electromechanic tilting technology
(servo motor drives, gear shaft with concave transmission cams)

KTR power transmission components in ballast-cleaning and track maintenance vehicles



Comparison between positive locking and frictionally engaged systems

Disadvantages of feather key connections:

- Supply of material for big shaft and hub lengthes
- Expensive production processes
- Axial fixing of the power transmission components necessary
- Backlash in the feather key, wear and damage on the shaft and hub keyway

Frictionally engaged combination for modern drive systems:

- Saving of material
- Accurate shaft combination free from wear
- High alternating loads

CLAMPEX®
frictionally engaged shaft-hub-connection

Other ranges of application:

Hydrostatically driven monorail conveyor with **BoWex-ELASTIC®** used between I.C.-engine and hydraulic pump.
Benefit: good damping features and ability to compensate for high misalignments.

Couplings used on special vehicles, e. g. **BoWex® spec. I** used on the movable steering in the latest generation of Unimog by Mercedes-Benz.

Use of the flange coupling **BoWex® FLE-PA** in mobile hydraulics, e. g. in rail-road excavators.

A mobile rail-road excavator with an operating weight of approx. 17.5 t. Its special rail drive similar to the wheel and disk drive allows to cross train protection devices without problem.

References

SIEMENS · BOMBARDIER TRANSPORTATION · VOITH TURBO ANTRIEBSTECHNIK · Gardner Denver · WESTINGHOUSE platform screen doors · ZF · ALSTOM · STADLER Clevere Lösungen auf der Schiene · vossloh Electrical Systems · KNORR-BREMSE Systeme für Schienenfahrzeuge GmbH · WATTEEUW · Stagecoach · traktionssysteme austria · FLENDER · PFAFF silberblau · ELIN EBG Traction

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