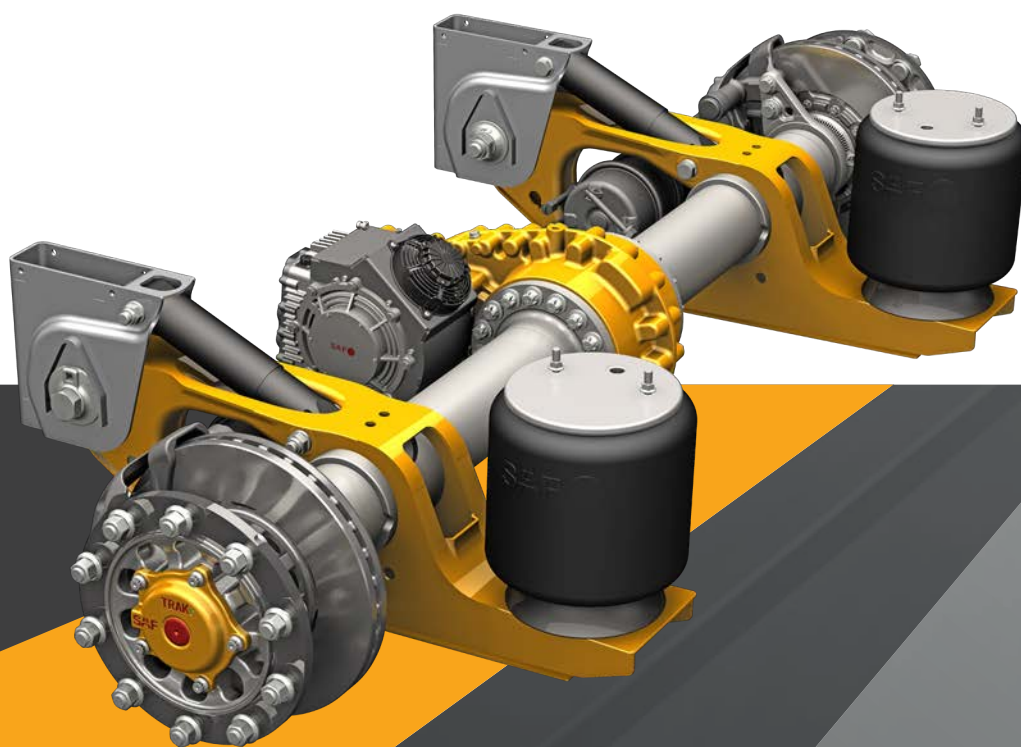


E-axle family from SAF

Powerful e-axles for heavy-load traffic



Towards e-mobility with SAF-HOLLAND.

Heavy-load traffic will be electric,
green and quiet.

The future runs on electricity.

Stricter CO2 legislation and bans on diesel-operated vehicles in inner cities; in addition, according to Europe-wide directives, new trucks must have significantly lower CO2 emissions. By 2050, all traffic is supposed to be emission-free. So there is an urgent need for vehicle manufacturers and fleet managers to act.

Electromobility as a technology changer.

Electrification is the game changer and future enabler for the commercial vehicle industry. This is because electromobility provides emission-free commercial vehicles and sustainable eco-friendly logistics and transport processes through innovative technologies.

Join us in pushing the electrical transformation.
The electrified trailer axles from SAF-HOLLAND prepare heavy-load traffic for the future.



Powerful e-axles for heavy-load traffic.



Convert your vehicles
with SAF-HOLLAND,
the leader in this technology.

SAF-HOLLAND pioneers e-axles for heavy-load traffic. As a leading global supplier for the commercial vehicle industry, we develop innovative solutions for an optimized and resource-friendly world of transport. Our vision is to shape the industry with sustainable and future-proof solutions. After all: every saved litre of diesel counts.

Our e-axle systems were specially developed in dialogue with our customers to meet the stringent demands of heavy-load traffic. The e-axle family from SAF for large trailers makes commercial vehicles greener, quieter and more efficient.

Sustainable. Economical. Future-proof.



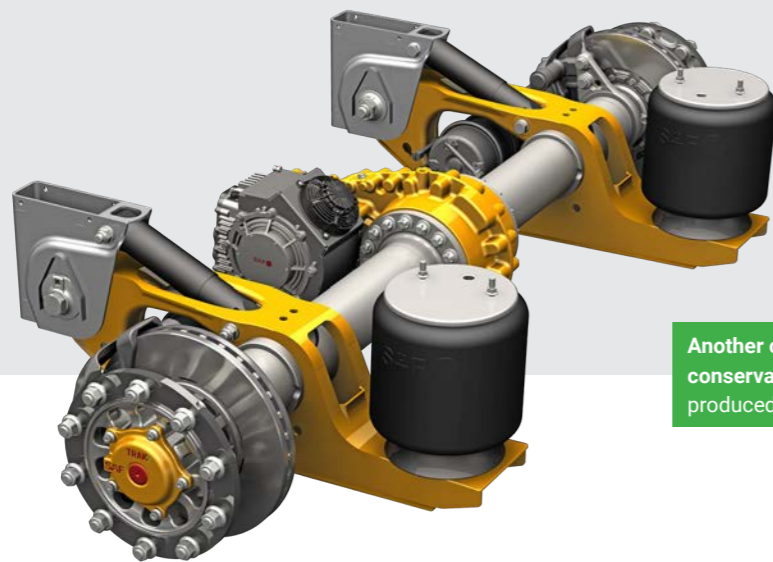
The future of e-transport.

The e-axle family from SAF:
powerful e-axles for large trailers.



Electrification

E-axle family from SAF
@ SAF-HOLLAND



Another contribution towards resource conservation: The TRAKr generator is produced without rare earth metals.

Advantages at a glance



Lower fuel consumption, fewer CO₂ emissions

The e-axle family from SAF uses kinetic energy of the vehicle to generate additional energy that relieves the vehicle and its units on the road. This lowers fuel consumption and carbon emissions and thus makes a valuable contribution towards achieving the emission targets



Noise protection through noise reduction

The quiet e-axles reduce the noise of refrigerated trucks and similar vehicles on the road and reduce noise emissions to below the limits that will apply in future. This means that SAF TRAKr and TRAKe meet the ever more stringent noise protection standards for harbours, airports and night or inner-city traffic



Reliable compliance with legislation

CO₂ reduction, noise reduction, diesel travel bans and other laws to protect inner cities and high-density areas are among an increasing number of challenges facing the world of transport. Electrified axles help you meet strict legal requirements.



Fewer particulates for clean air

Diesel-powered commercial vehicles are among the biggest producers of particulate matter. The clean electric engines of e-axles significantly reduce the particulate and soot emissions of the entire truck. This ensures compliance with nitrogen oxide and particulate limits and simultaneously improves air quality.



Efficient and future-proof transport processes

The e-axles from SAF-HOLLAND ensure greater availability, efficiency and sustainability: They save fuel, avoid exhaust emissions, and comply with legal regulations. The generated energy also reduces downtimes considerably.

E-axle family from SAF.

Converting movement into energy.



The e-axle family from SAF uses recuperation for energy recovery. This reduces fuel consumption as well as carbon and particulate emissions and makes commercial vehicles more eco-friendly.

SAF TRAKr: Electrical recuperation. Generating power on the move.

During braking or acceleration phases, the centrally located high-voltage generator unit of the SAF TRAKr converts the kinetic energy of the vehicle into electrical energy. This energy is stored in a Li-ion battery of the proven electrical system from CARRIER/ADDVOLT – or can supply auxiliary consumers in the trailer such

as cooling units, heaters or hydraulic platforms while the vehicle is moving. The SAF TRAKr is favoured for use in refrigerated trucks, where the cooling units can be operated in fully electrical mode.

Generates energy.
For operating a cooling unit, for example.



Main applications:

- Refrigerated trailer
- Food tanker
- Silos

Generator: max. 20 kW peak (at 20 °C ambient temperature)

SAF TRAKe: Electrical recuperation and traction support. More power thanks to an additional electric drive.

The SAF TRAKe goes one further: As well as using recuperation to generate energy, it operates with a more powerful high-voltage e-machine with a higher output. With this additional power, the SAF TRAKe helps power the truck and supports the main engine when the vehicle pulls away and accelerates. Especially in challenging road conditions and on slopes, the SAF TRAKe provides greater traction and stability for the articulated truck and provides valuable assistance, for example in site traffic.

The obtained energy is stored in a Li-ion battery here as well. Depending on the operating mode, the energy can be used to operate units or to support the main engine of the truck.

Additional drive.
More traction during acceleration and when driving up inclines.

Saves fuel and protects the environment.



Main applications:

- Refrigerated trailer
- Dump trailer
- Food tanker
- Silos
- ... and many more – get in touch!

E-machine: max. 120 kW peak, max. 320 Nm peak

1 Gearbox unit

- General design: 1-speed with differential
- Gearbox is part of the axle structure
- Specially designed and developed for SAF-HOLLAND
- SAF TRAKr: Ratio $i = 1 : 14.0$
- SAF TRAKe: Ratio $i = 1 : 12.08$

7 Axle

- Half axles with one central gearbox unit and e-machine
- Can be combined with INTRA or MODUL air suspension
- SAF TRAKr: Additional weight incl. generator: approx. +150 kg
- SAF TRAKe: Additional weight incl. e-machine: approx. +300 kg

2 E-machine (SAF TRAKr & TRAKe)

SAF TRAKr:

- Air-cooled switched reluctance motor (SRM)
- Max. power: 20 kW peak, 17 kW cont. (at 20 °C ambient temperature)

SAF TRAKe:

- Liquid-cooled permanent magnet synchronous motor (PSM)
- Max. power: 120 kW peak / 60 kW cont.
- Max. torque: 320 Nm peak -> 1,933 Nm per wheel

6 Axle load

- INTRA: max. 9.0 t
- MODUL: max. 10.0 t

5 Disc brakes

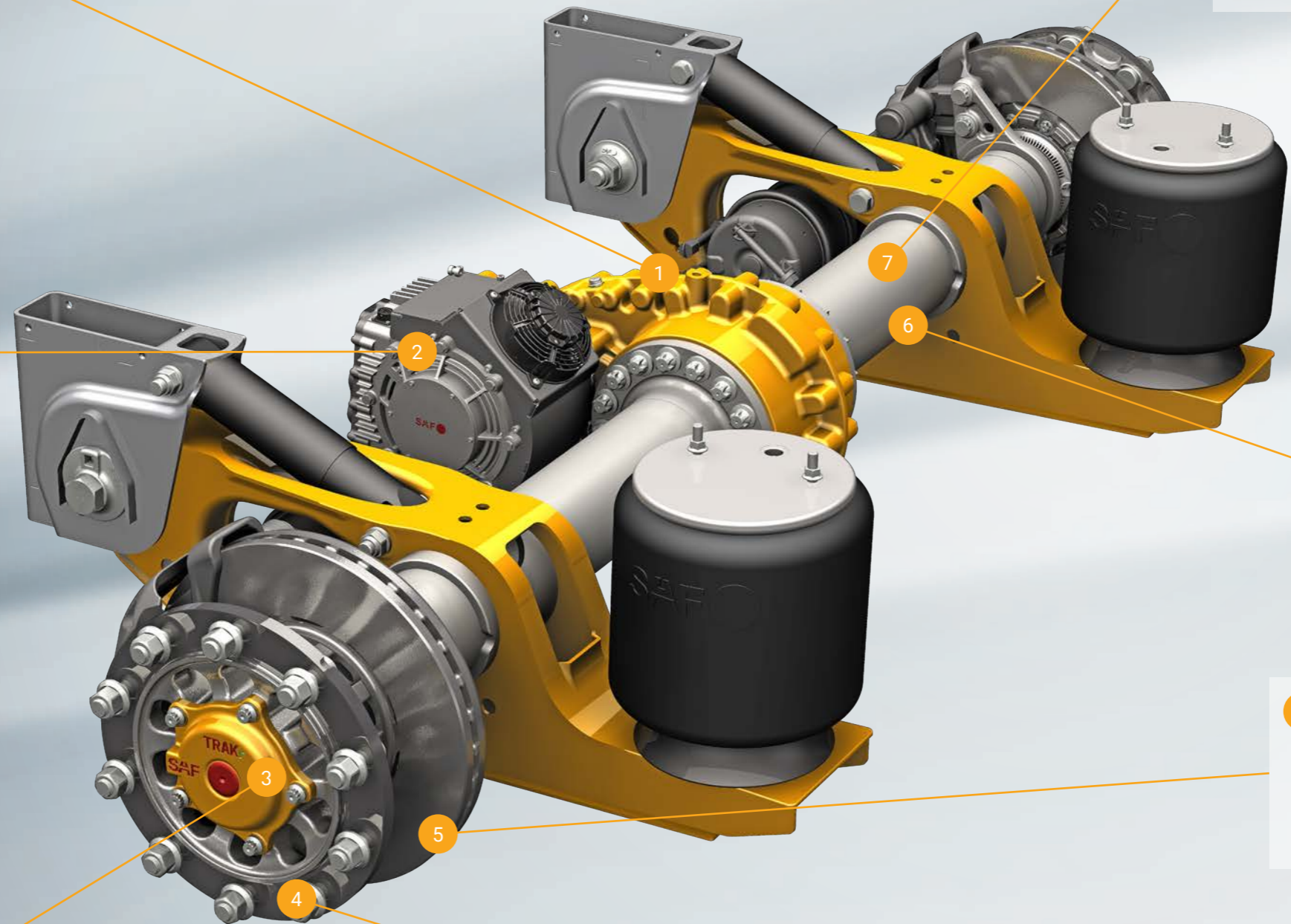
- 19.5" and 22.5" disc brakes identical to those in non-electrified axles
- Spare parts (pads, rotors etc.) identical to those for non-electrified axles
- Identical test reports

3 Wheel head

- Maintenance-free wheel bearing technology identical to that in non-electrified axles
- $\varnothing 335$ 10-hole offset depth 120 or $\varnothing 275$ 8-hole offset depth 0

4 Axle types

- SAF TRAKr: BIR9 -... / BIR10 -... / ZIR9 -... / ZIR10
- SAF TRAKe: BIE9 -... / BIE10 -... / ZIE9 -... / ZIE10





Increased availability thanks to internal charging.

Charge the battery while driving and avoid expensive downtimes: The energy generation of the e-axle family from SAF enables the battery to be charged internally while the vehicle is in operation. This reduces the downtimes for external charging processes and increases truck availability. The battery system is utilised perfectly, which provides real added value during daily operations.

SAF TRAKr and TRAKe:
External charging time:

no external charging time necessary*

Other systems:
External charging time for a system with 68 kWh:

at least 4 h 57 min



Optimised and economic driving. With the powerful e-axle family from SAF.

Conversion of existing vehicles is subsidised by the state.

The e-axle family from SAF optimises transport and logistics processes drastically and sustainably. Right from the start, it excels thanks to its outstanding battery system, which provides considerable assistance to the driver, the vehicle and the units in their everyday work.

The e-axles are not just quiet and emission-free, they are also economical. This is because they improve vehicle efficiency, reduce fuel costs and require less maintenance. State subsidies provide assistance to those purchasing and retrofitting electrical solutions for trucks. As a result, e-axles pay for themselves after just a few years of operation – for an optimised TCO for heavy commercial vehicles.

* only for battery balancing

Even tyre wear.

SAF TRAKr and SAF TRAKe tap the same torque from both tyres. Advantage: even wear makes it easier for fleet managers to plan tyre changes and reduces maintenance costs.

Sustainable power for your transports.

Powerful support for heavy-load traffic.



In long-haul traffic and urban spaces, on slopes and in demanding road conditions, heavy trucks and trailers receive optimal support in every setting with the e-axle family from SAF.

That's because the energy generated by the e-axles is used where it is generated: It supplies the vehicle and its electrical components with power during the journey, relieves the main motor, and increases climbing power on challenging routes. Thanks to emis-

sion-free driving, e-axles enable night transports in high-density urban areas. In short: SAF TRAKr and SAF TRAKe provide sustainable power for your transport processes



A diverse range of possible applications.

SAF TRAKr & SAF TRAKe.



Cooler

Cooling units are operated temporarily in fully electric mode thanks to the recuperation of SAF TRAKr and SAF TRAKe. This safety backup reliably protects highly sensitive goods during transport.



Silo and tanker

The electrical compressor is powered by the energy of the e-axles and independently of the truck. This saves energy and ensures additional protection for the liquid transport or bulk goods.



Moving-floor trailers

The hydraulically controlled floor system or moving sliding panel is electrically operated by SAF TRAKr and SAF TRAKe and helps the driver load goods safely and without leaving residues.



Trailer with lift gates

Thanks to the electrical drive solution, the electrical pump for hydraulic tailgates (lifting door) is powered by the vehicle without dependence on the axles.



Transportable e-forklift

With the e-axle family from SAF, e-forklifts can be charged during the trip, so they are ready for use as soon as the vehicle stops.

The future of e-mobility:

SAF TRAKr and SAF TRAKe for heavy-load trailers

Standardised, modular, flexible.

- Standardised system: same design as standard axles
- Modular design for different versions
- Plug & Play thanks to standardised interfaces
- Retrofitting possible
- Independent of trailer or cooling system manufacturers

Service-friendly.

- Standard wear parts for a simplified spare parts supply
- Simple maintenance tasks: Tyres, wheel heads and brakes can be serviced without dismantling the system
- Large global service network
- Fully automatic operating system

Driver-friendly and easy to operate.

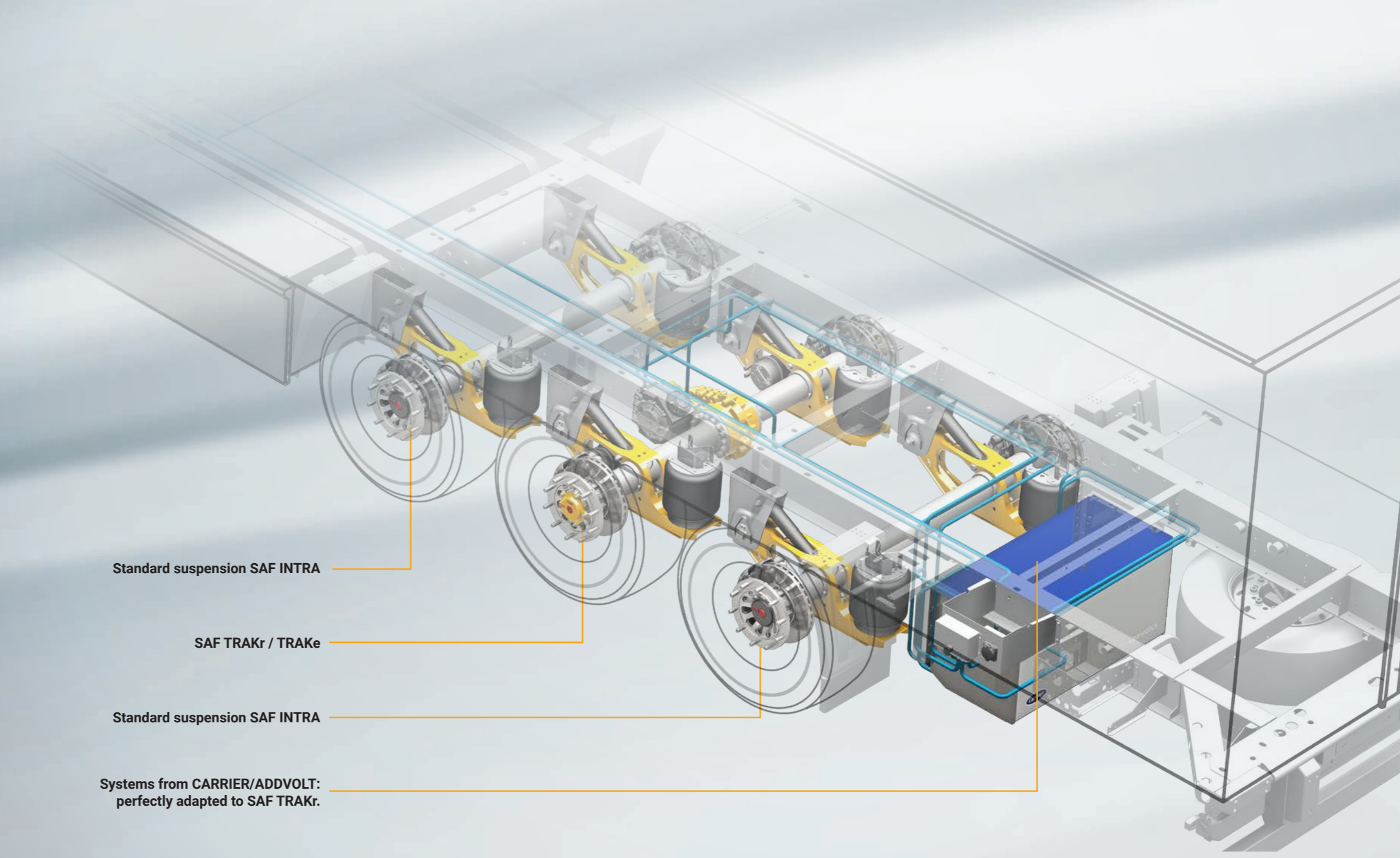
- Fully automatic operating system
- Little training and instruction required (no prior knowledge required!)
- Easy handling
- Less background noise during the trip
- Greater efficiency thanks to short loading and downtimes

Identical wear and spare parts.

- INTEGRAL brake disc
- Brake calliper
- Brake cylinder
- Brake pads
- Airbag
- Shock absorber
- 3D bushing

Quick and easy to install.

Total system with e-axle, control electronics, battery system and control unit with standard interfaces for smooth integration and flawless operation.



Standard suspension SAF INTRA

SAF TRAKr / TRAKe

Standard suspension SAF INTRA

Systems from CARRIER/ADDVOLT:
perfectly adapted to SAF TRAKr.

Convert to e-axles from SAF-HOLLAND now

And push forward with e-mobility.

Thanks to lower fuel consumption, fewer exhaust emissions and reduced noise emissions, electrified axles are a sustainable solution for future-proof transport and logistics processes. With our modular SAF TRAKr and SAF TRAKe e-axles, we offer powerful technologies that were specially developed to meet the challenging requirements in heavy-load traffic.

A perfect solution for your vehicles.

The e-axle family from SAF is characterised by uncompromising quality, high functional reliability and cost-effectiveness. It's the perfect solution for retrofitting diesel-operated vehicles and equipping new vehicles.

Let's push the electrical revolution of the commercial vehicle industry together.

**E-axles from
SAF-HOLLAND:**
Greener,
more economical,
future-proof.

**Do you have any questions about our e-axles?
We are happy to help and look forward
to hearing from you.**

Your contact

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Tel. + 49 6095 301-0
Michael.Neuberger@safholland.de

Arrange an appointment for consultation now!

Rent a test vehicle!

Would you like to test our e-axles?
Then book one of our test vehicles
today.

Engineering Your Road to Success

The SAF-HOLLAND Group is one of the leading international manufacturers of suspension-related assemblies and components for trailers, trucks and buses. Our innovative products increase the efficiency, safety and environmental friendliness of commercial vehicles, contribute to the success of our customers. With around 3,000 employees worldwide, we are at the forefront of shaping the future of the transportation industry.



Trailer Axles and
Suspension Systems



Coupling and Lifting
Technologies



Coupling and Lifting
Technologies



Trailer
Telematics



Suspensions for
Trucks and Buses



Suspensions and Components
for Commercial Vehicles



Trailer Axles and
Suspensions Systems

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