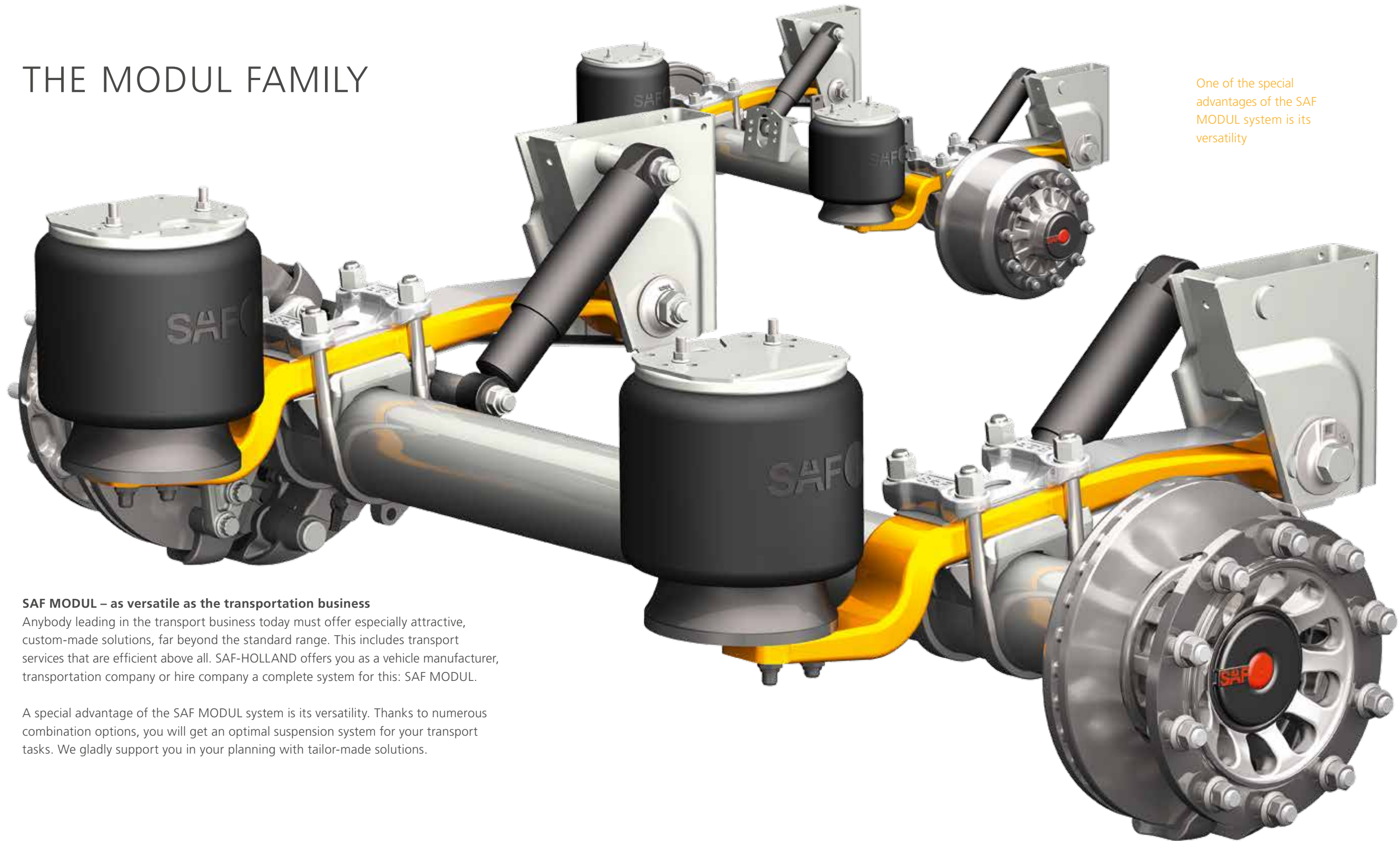


SAF ● MODUL

7-14-t AIR SUSPENSION SYSTEM
WITH DISC AND DRUM BRAKE
17.5", 19.5" AND 22.5"

THE MODUL FAMILY



One of the special advantages of the SAF MODUL system is its versatility

Individual solutions for economical transport services

SAF MODUL – as versatile as the transportation business

Anybody leading in the transport business today must offer especially attractive, custom-made solutions, far beyond the standard range. This includes transport services that are efficient above all. SAF-HOLLAND offers you as a vehicle manufacturer, transportation company or hire company a complete system for this: SAF MODUL.

A special advantage of the SAF MODUL system is its versatility. Thanks to numerous combination options, you will get an optimal suspension system for your transport tasks. We gladly support you in your planning with tailor-made solutions.

MODUL SERIES

TRAILING ARM UNDER THE
AXLE

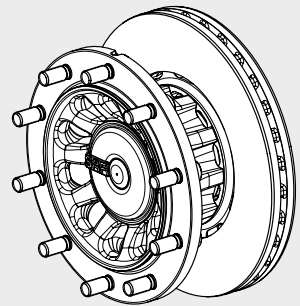
CRANKED TRAILING ARM
OVER THE AXLE

TRAILING ARM OVER THE
AXLE

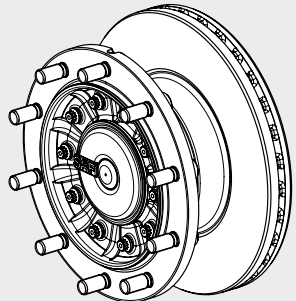
EXTENDED SUSPENSION
ARM TOLERANCE

RIGID AXLES (9–12 t axle load)

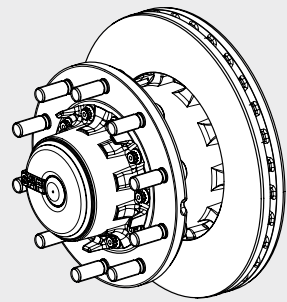
Absolutely flexible use and, at the same time, proven 100,000 times – thanks to the pre-set and therefore maintenance-free wheel bearing technology.



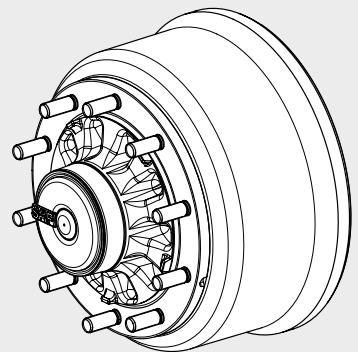
BI series (INTEGRAL head unit) with disc brakes for Single wheels ET120



B series (AirVent head unit) with disc brakes for Single wheels ET120



S and Z series with disc brakes for Single wheels ET0/twin wheels



S and Z series with drum brakes for Single wheels ET0/twin wheels

WITH DISC BRAKES

Axle version	Single	Offset [mm]	Twin wheels	Axle load up to 105 km/h [t]	Brake size [mm]	Brake	Test log*	Number of teeth of exciter ring	Wheels	Tyres
B(l)9-19S	•	120		9	377 x 45	SAF SBS 1918	TDB0870	90	10/280/335/M22x1.5	19.5"/20"/22.5"
B(l)9-19K	•	120		9	377 x 45	KNORR SB6 (ST6)	TDB0605	90	10/280/335/M22x1.5	19.5"/20"/22.5"
SI9-19S	•	0		9	377 x 45	SAF SBS 1918	TDB0870	90	8/220/275/M22x1,5 10/280/335/M22x1,5	19.5"/20"/22.5"
SI9-19K	•	0		9	377 x 45	KNORR SB6 (ST6)	TDB0605	90	8/220/275/M22x1,5 10/280/335/M22x1,5	19.5"/20"/22.5"
ZI9-19S			•	9	377 x 45	SAF SBS 1918	TDB0870 TDB0878	90	8/220/275/M22x1.5	19.5"
ZI9-19K			•	9	377 x 45	KNORR SB6 (ST6)	TDB0606	90	8/220/275/M22x1.5	19.5"
BI10-19S	•	120		10	377 x 45	SAF SBS 1918	TDB0870	90	10/280/335/M22x1.5	19.5"/20"/22.5"
BI10-19K	•	120		10	377 x 45	KNORR SB6 (ST6)	TDB0605	90	10/280/335/M22x1.5	19.5"/20"/22.5"
SI11-19K	•	0		11	377 x 45	KNORR SB6 (ST6)	TDB0605	90	8/220/275/M22x1.5	19.5"
ZI11-19K			•	11	377 x 45	KNORR SB6 (ST6)	TDB0606	90	8/220/275/M22x1.5	19.5"
B(l)9-22S	•	120		9	430 x 45	SAF SBS 2220 (H01)	TDB0843	90	10/280/335/M22x1.5	20"/22.5"
B(l)9-22S01	•	120		9	430 x 45	SAF SBS 2220 (K0)	36102214	90	10/280/335/M22x1.5	20"/22.5"
SI9-22S	•	0		9	430 x 45	SAF SBS 2220 (H01)	TDB0843	90	10/280/335/M22x1.5	20"/22.5"
SI9-22S01	•	0		9	430 x 45	SAF SBS 2220 (K0)	36102214	90	10/280/335/M22x1.5	20"/22.5"
ZI9-22S			•	9	430 x 45	SAF SBS 2220 (H01)	TDB0843	90	10/280/335/M22x1.5	20"/22.5"
ZI9-22S01			•	9	430 x 45	SAF SBS 2220 (K0)	36102214	90	10/280/335/M22x1.5	20"/22.5"
BI10-22S	•	120		10	430 x 45	SAF SBS 2220 (H01)	TDB0843	90	10/280/335/M22x1.5	20"/22.5"
BI10-22S01	•	120		10	430 x 45	SAF SBS 2220 (K0)	36102214	90	10/280/335/M22x1.5	20"/22.5"
SI11-22K11	•	0		11	430 x 45	KNORR SB7 (SK7)	36101814	100	10/280/335/M22x1.5	20"/22.5"
ZI11-22K11			•	11	430 x 45	KNORR SB7 (SK7)	36101814	100	10/280/335/M22x1.5	20"/22.5"
SI12-22K10	•	0		12	430 x 45	KNORR SB7 (SN7)	TDB0590	100	10/280/335/M22x1.5	20"/22.5"
ZI12-22K10			•	12	430 x 45	KNORR SB7 (SN7)	TDB0590	100	10/280/335/M22x1.5	20"/22.5"

WITH DRUM BRAKES

Axle version	Single	Offset [mm]	Twin wheels	Axle load up to 105 km/h [t]	Brake size [mm]	Brake	Test log*	Number of teeth of exciter ring	Wheels	Tyres
Z9-3020			•	9	300 x 200	SAF SNK	TDB0487	80	10/175/225/M22x1.5	15"/17.5"
Z11-3020			•	11	300 x 200	SAF SNK	TDB0487	80	10/175/225/M22x1.5	15"/17.5"
SKRZ12030S			•	12	300 x 200	SAF SNK	TDB0882	80	10/175/225/M22x1.5	15"/17.5"
S9-3718	•	0		9	367 x 180	SAF SNK	TDB0459	90	8/220/275/M22x1.5 10/280/335/M22x1.5	19.5"
Z9-3720			•	9	367 x 200	SAF SNK	TDB0460	90	8/220/275/M22x1.5 10/175/225/M22x1.5	19.5"
Z11-3720			•	11	367 x 200	SAF SNK	TDB0460	90	8/220/275/M22x1.5 10/175/225/M22x1.5	19.5"
SKRZ12037			•	12	367 x 200	SAF SNK	TDB0460	90	8/220/275/M22x1.5 10/175/225/M22x1.5	19.5"
S9-4218	•	0		9	420 x 180	SAF SNK	TDB0381	90	10/280/335/M22x1.5	20"/22.5"
Z9-4218			•	9	420 x 180	SAF SNK	TDB0483	90	10/280/335/M22x1.5	20"/22.5"
S11-4220S10	•	0		11	420 x 200	SAF SNK	TDB0455	100	10/280/335/M22x1.5	20"/22.5"
Z11-4220S10			•	11	420 x 200	SAF SNK	TDB0455	100	10/280/335/M22x1.5	20"/22.5"
S12-4220S10	•	0		12	420 x 200	SAF SNK	TDB0455	100	10/280/335/M22x1.5	20"/22.5"
Z12-4220S10			•	12	420 x 200	SAF SNK	TDB0455	100	10/280/335/M22x1.5	20"/22.5"

*You will find the brake test reports at: www.safholland.com - Sales - Test Reports

ALL MODUL SERIES AT A GLANCE

<ul style="list-style-type: none"> • Air spring type • Identifier • Diameter • Total suspension travel 	Model series	Features	Trailing arm variants				Nominal height range	2618V	2918V	2923V	2926V	3138
			100 x 52	100 x 43/43	100 x 60	100 x 54/54		29	27	31	30	not available
	U	Trailing arm under the axle	•	•			170 to 380	180 _d	180 _c	200 _c	260 _c	
	M	Cranked trailing arm over the axle	•	•			340 to 530	180 _d	180 _c	200 _c	260 _c	
	MT	Cranked trailing arm over the axle	•				250 to 410	180 _d	180 _c	200 _c		
	O	Trailing arm over the axle	•	•			400 to 600	180 _d	180 _c	200 _c	260 _c	
	EO	Trailing arm over the axle	•	•			390 to 540	190 _b	190 _a	220 _a		
	HU	Trailing arm under the axle, extended arm tolerance			•	•	220 to 315			260	300	
	AR 421	Trailing arm under the axle, extended arm tolerance				•	250 to 500				310	
	AR 421H	Trailing arm under the axle, extended arm tolerance				•	380 to 480					420 with 9 t 400 with 10 t

All dimensions in mm

*Technical combination options for all air spring diameter 350 mm with composite piston on request

You will find the Design Manual SAF MODUL at: www.safholland.com - Downloads - Literature - Design Manual

a = 04 425 0099 02	b = 04 425 0107 02	c = 04 425 0114 02	d = 04 425 0133 02	Axle load pressure gauge with specifications in [kg]
--------------------	--------------------	--------------------	--------------------	--

WHEEL END UNIT DRUM BRAKE

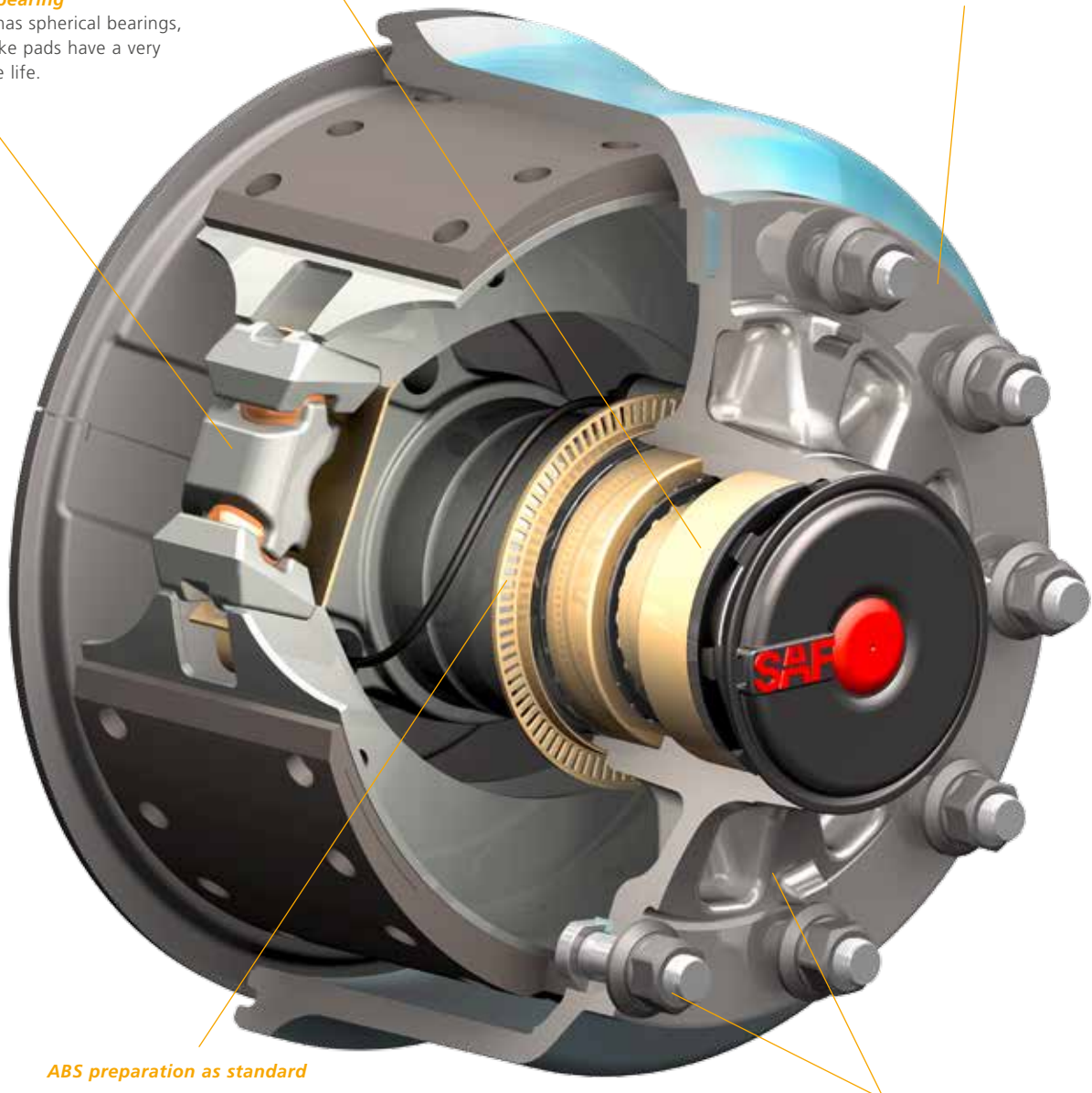
SAF hub unit

The SAF hub unit is a compact unit of the hub and the bearing. It is fully factory-adjusted and encapsulated. The SAF hub unit is maintenance-free.

Spherical bearing

The brake has spherical bearings, i.e. the brake pads have a very long service life.

Continuous rim system



ABS preparation as standard

Corrosion protection

Targeted long-term corrosion protection on the hub, hub caps and screw connections, wheel bolts and nuts.

DRUM BRAKE

WELL THOUGHT-OUT AND SOPHISTICATED MECHANICS

What counts is the quality: Regardless of whether you want to equip the SAF MODUL suspension system with a drum brake or disc brake – what you always get is the safety of prime quality.

This is why SAF-HOLLAND has been working closely and exclusively with recognised and internationally successful supply partners. This ensures that with SAF-HOLLAND you not only drive a particularly economic air suspension system but a comfortably safe one, to boot.



Inner S-camshaft compact bearing

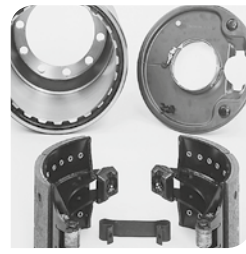
Outer S-camshaft compact bearing

S-camshaft compact bearing

As a pre-assembled unit with no individual parts – and thanks to its compact dimensions – the S-camshaft compact bearing can be replaced easily and quickly at any time. The bearing comes with permanent corrosion protection, merely requiring lubrication at regular intervals. You save on time, money – and weight.

SAF brake pads

SAF brake pads are asymmetrically shaped by computer modelling and are subject to strict production control on an ongoing basis. Special material mixes and the unique form are convincing arguments in actual practice due to their long service life and best possible safety. SAF-HOLLAND quality pays off: If the pads must be replaced, the use of SAF-HOLLAND original parts is highly recommended.



Fewer parts

The SAF drum brake saves space in storage and considerably reduces the effort involved in maintenance and repair.



Spherical bearing

The brake shoes on the SAF axle are mounted around a spherical head. Thanks to their unique geometry, the shoes can move in all directions, distributing the force more evenly across the pads, which therefore can be used much longer.



Replacing brake shoes in seconds

For the SAF axle, all you need is a screwdriver and a steady hand – thus replacing the brake shoes is ingeniously simple and done in a matter of seconds.



Precise cam roller guide

The precision-machined S-cams precisely control the movement of the brake shoes and the contact pressure to guarantee optimum braking.



Finish-ground contoured brake lining

Machining is not necessary even after repair. After the very first drum rotation, you can rely again on the full braking power of your SAF axle.



WHEEL END UNIT DISC BRAKE

INTEGRAL advantage 1

Compared to a design with one-piece brake disc and closed wheel flange, now 100 % more heat-emitting surface.

INTEGRAL advantage 2

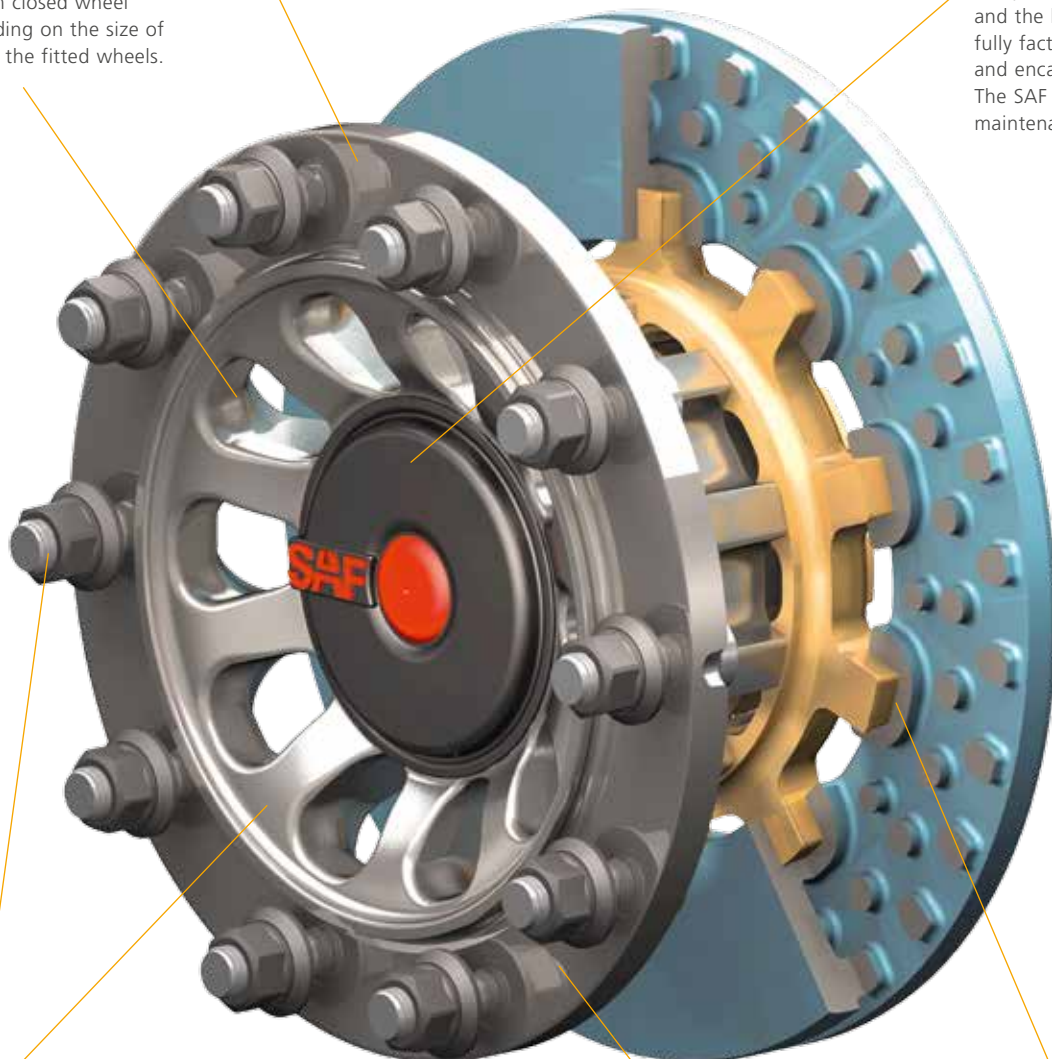
With 10 large radiator-like ventilation cross-sections in the wheel flange, the *INTEGRAL* achieves at least 60 % more ventilation cross-section compared to a design with closed wheel flange – depending on the size of the openings in the fitted wheels.

SAF INTEGRAL [ET 120]

The figure shows the disc brake *INTEGRAL* [ET 120]. For disc brakes with an 9-t axle load for Single ET 120 wheels, the SAF AirVent head unit with optimised disc brake technology is available at a great price-performance ratio (axle versions B9-19 and B9-22).

SAF hub unit

The SAF hub unit is a compact unit of the hub and the bearing. It is fully factory-adjusted and encapsulated. The SAF hub unit is maintenance-free.



Corrosion protection

Targeted long-term corrosion protection on the hub, hub caps and screw connections, wheel bolts and nuts.

Continuous rim system

INTEGRAL advantage 3

Significantly lower heat transfer due to small contact areas between the *INTEGRAL* disc and wheel hub.

DISC BRAKE TARGETED AND INNOVATIVE *INTEGRAL* TECHNOLOGY

Unique in the world for use in disc-brake trailers –
SAF INTEGRAL DISC.

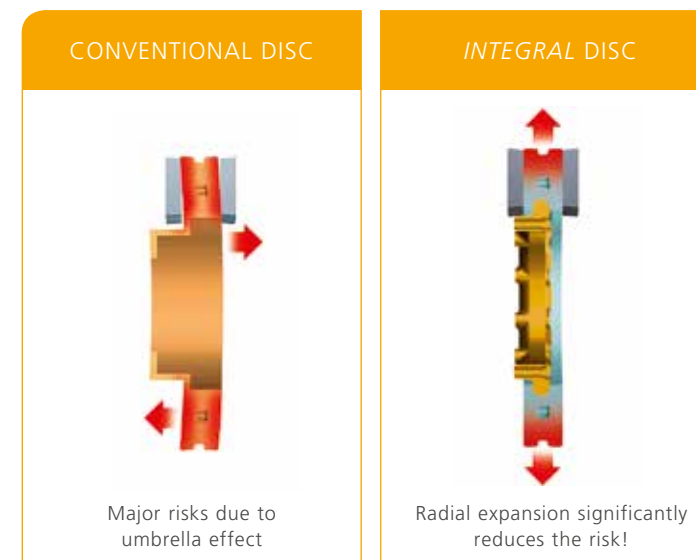
Disc brakes technology has stood the test in the commercial vehicle segment. As a pioneer in this field, SAF-HOLLAND has systematically and consistently developed its advantages for actual practical use: The patented *INTEGRAL TECHNOLOGY* from SAF-HOLLAND is unique in the industry, safe and at the same time economic.

SAF-HOLLAND PATENT

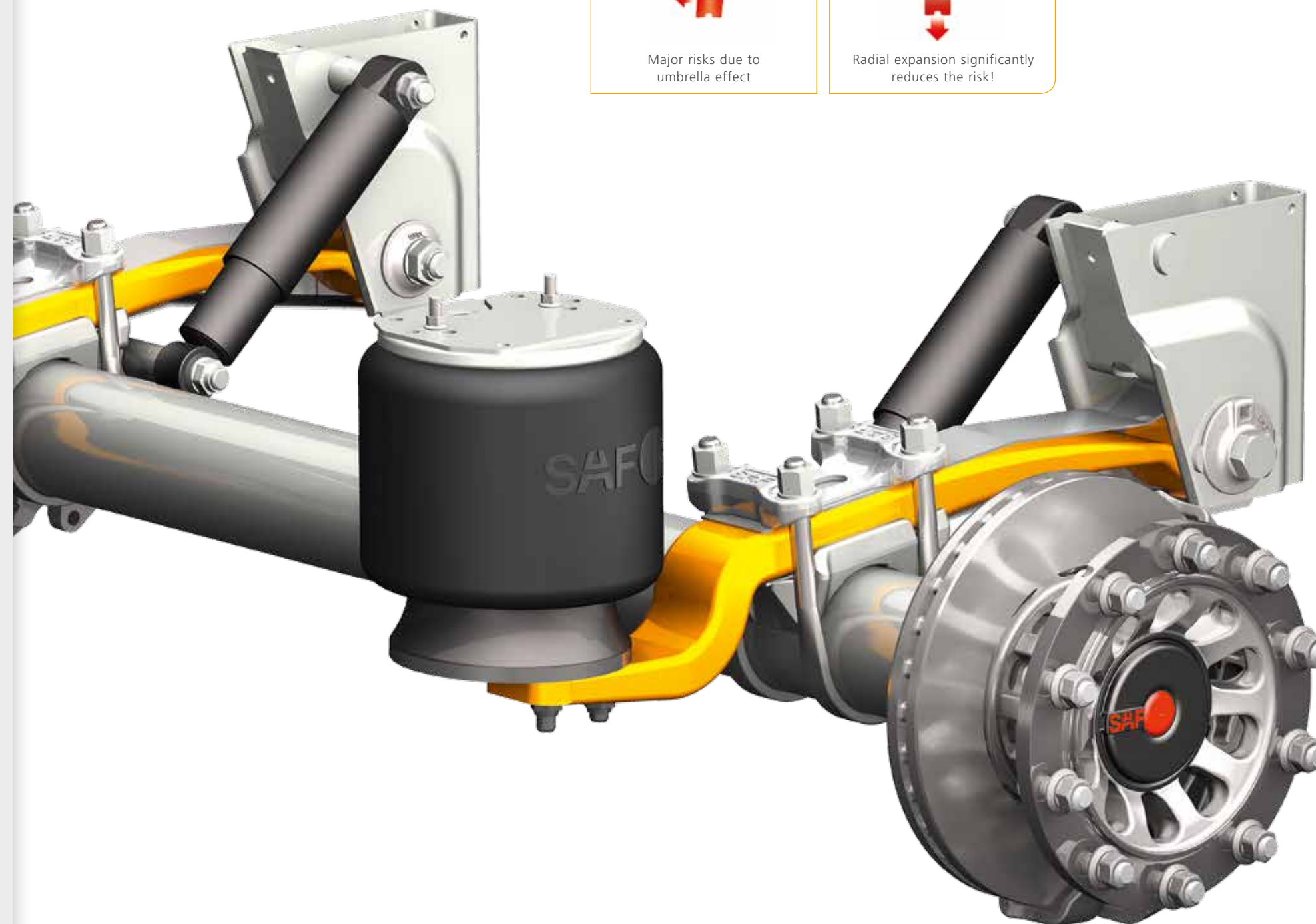


THE SOLUTION: *INTEGRAL TECHNOLOGY*

The *INTEGRAL* disc is cast onto a splined high-tensile adapter ring and bolted to the wheel hub as a unit. The connection between the adapter ring and the brake disc has absolutely no play – without the two parts being fused together. This is the advantage: By composite casting of disc and adapter, the disc can expand radially and contract again during cooling down.



Optimum temperature distribution
The dreaded hot spots in conventional brake discs, which could result in stresses in the material and possible cracks up to the failure of the disc, are avoided – and: Since the braking surfaces in every operating state stay absolutely flat, the pads also last much longer.



RECOMMENDATIONS FOR SAF MODUL

ZONE A: Europe

APPLICATION [axle load in t up to 105 km/h]	container, tanker, silo	walking floor	curtain, box, cooler, platform, lafette	tipper, wood	low-loader
INTRA [9]	S	–	S	–	–
INTRA CD [9]	O	S	O	S	–
MODUL [9]	O	O	O	O	S
MODUL [10-14]	S	S	S	S	S

ZONE B: Turkey

APPLICATION [axle load in t up to 105 km/h]	container, tanker, silo	walking floor	curtain, box, cooler, platform, lafette	tipper, wood	low-loader
INTRA [9]	–	–	S	–	–
INTRA CD [9]	S	S	O	–	–
MODUL [9]	O	O	O	S	S
MODUL [10-14]	S	S	S	S	S

ZONE C: European part of Russia incl. Ural, excl. Asian part of Russia

APPLICATION [axle load in t up to 105 km/h]	container, tanker, silo	walking floor	curtain, box, cooler, platform, lafette	tipper, wood	low-loader
INTRA CD [9]	S	S	S	–	–
MODUL [9]	O	O	O	S	S
MODUL [10-14]	S	S	S	S	S

ZONE D: South Africa

APPLICATION [axle load in t up to 105 km/h]	container, tanker, silo	walking floor	curtain, box, cooler, platform, lafette	tipper, wood	low-loader
INTRA CD [9]	S	S	S	O*	–
MODUL [9]	O	O	O	S	S
MODUL [10-14]	S	S	S	S	S

ZONE E: Middle East and Africa

APPLICATION [axle load in t up to 105 km/h]	container, tanker, silo	walking floor	curtain, box, cooler, platform, lafette	tipper, wood	low-loader
INTRA CD [9]	S	S	S	–	–
MODUL [9]	O	O	O	S	S
MODUL [10-14]	S	S	S	S	S

S = standard / O = optional / O* = not for side tippers

Detailed information about SAF INTRA could be found in the accompanying brochure.

For selecting a suspension system that is optimal for your application, please ask your SAF-HOLLAND representative or your vehicle manufacturer.

OPTIONS FOR THE AIR SUSPENSIONS



SAF TWO-SIDE AND ROCKER LIFT

- customised solution for each and every purpose
- very simple retrofit
- optional axle lift variants available on request



SAF CROSS MEMBER

- allows for a constant spacing between longitudinal chassis members even with the combination of rigid and steering axles



SAF ADJUSTABLE HANGER BRACKET

- considerable simplification of the wheel alignment
- drain hole for frame dip coating
- also available in stainless steel
- bolt-on versions available



SAF ALUMINIUM HANGER BRACKET

- for vehicles with aluminium frame

OPTIONS FOR THE AXLES



SAF ABS SENSING

- exciter ring and sensor holder (as standard/pre-assembled)
- can be activated using simple and reliable plug connections



SAF HUBODOMETER

- measures the exact mileage of trailers
- simple retrofit
- quick and reliable mounting



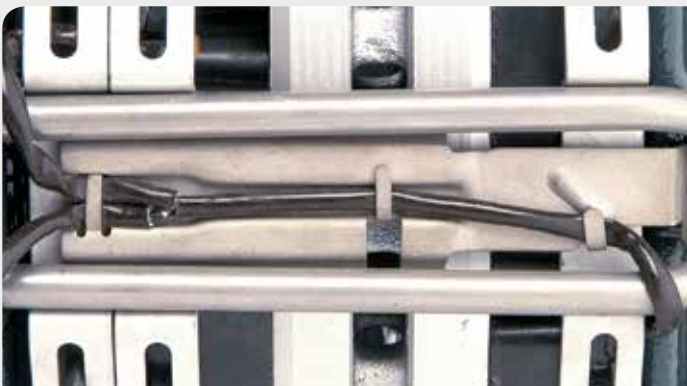
SAF SLACK ADJUSTER

- automatically adjusted
- robust, stable and low-maintenance
- simple, reliable and rapid installation
- range of installation positions due to flexible control arm



SAF BRAKE CHAMBERS

- complete surface coating
- high-quality internal components
- fully integrated air connections



SAF WEAR SENSOR PADS

- simple retrofit
- can be connected to the Trailer EBS or to a separate control and display unit

Also available:

- axles with 7 t axle load
- axles with 13-14 t axle load
- friction-steered axles
- axles for forced steering



SAF TIRE PILOT

- tyre-inflating system for trailers and semi-trailers

SHOULD YOU HAVE ANY QUESTIONS ABOUT TECHNICAL COMBINATION OPTIONS, PLEASE CONTACT YOUR SAF-HOLLAND REPRESENTATIVE OR YOUR VEHICLE MANUFACTURER.



TRAILER AXLES AND
SUSPENSION SYSTEMS



COUPLING AND LIFTING
TECHNOLOGIES



SUSPENSIONS FOR
TRUCKS AND BUSES



SUSPENSIONS AND COMPONENTS
FOR COMMERCIAL VEHICLES



V. ORLANDI

COUPLING AND LIFTING
TECHNOLOGIES



TRAILER AXLES AND
SUSPENSIONS SYSTEMS