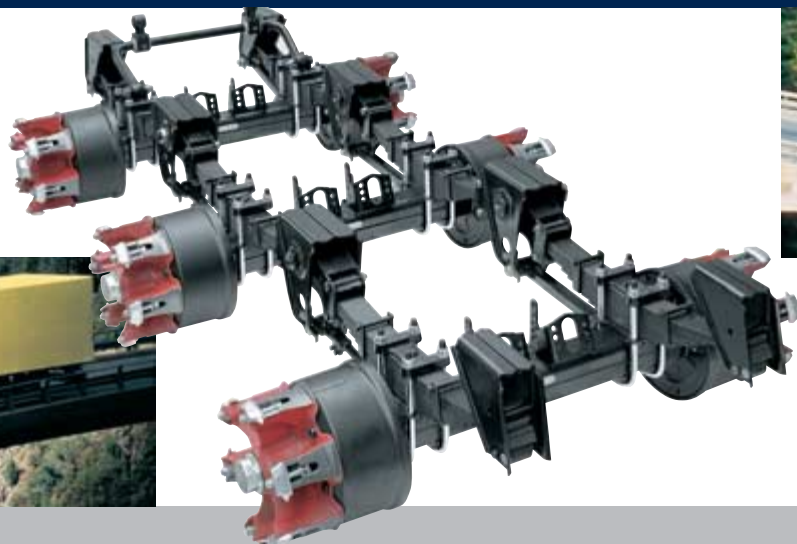




**BPW axle units
with mechanical suspension
for drawbar trailers and semi-trailers
VB and W-series**



Standard range

Technical data, order specification

Dimensions

The track widths, spring centres, support centres and wheel bases are standard dimensions and correspond to general practice in the commercial vehicle industry. Versions with larger spring centres are to be particularly recommended due to their higher roll stability.

The axles do not have any toe-in or toe-out.

The axle camber is 0.5% (H-series).

Axle loads

The specified axle loads are maximum values on the ground up to 105 km/h (65 mph). In vehicles with a slower permitted maximum speed, the following axle load increases are possible:

- V max. 40 km/h + 10%
- V max. 25 km/h + 25%
- V max. 10 km/h + 40%

Reinforced leaf springs must be used if the axle load is increased by more than 10%.

Wheel brakes

S-cam brakes correspond to the generally applicable national and international regulations. A compilation of international certificates can be viewed in Technical Information BPW-TI-Bremsg-00/d and on the Internet at www.bpw.de (brake certificates).

Wheel connections

The axles are supplied with the following options:

With hubs and wheel studs

- for disc wheels with stud centring according to DIN 74361 part 1
- for disc wheels with hub centring according to DIN 74361 part 3
- for alloy wheels (specify configuration and stud hole diameter when ordering)
- for ..F... axle types, wheel nuts are delivered separately for either stud or hub centring (please specify when ordering)

with spider wheels

- for TRILEX rims

Steering axles

BPW ..LL.. series self-steering axles are used for axle loads up to 14 t in conjunction with VB axle suspension systems; the steering axles must be equipped with a steering damper if the axle load ratio (rigid axle to steering axle) is 1:1.

Standard version

- Slack adjusters and air cylinder brackets, suitable for pneumatic diaphragm and spring-type cylinders. Please contact BPW before using spring-type cylinders in W-suspension units.
- Axles equipped with proven, longlife BPW bearing systems.

Additional equipment

- ECO-Master automatic slack adjuster for axles up to 14,000 kg axle load.
- Installed sensors and pole wheels for anti-lock brake system (ABS).

Order information

• Axle, suspension version:

- Single axle, tandem axle suspension, tri-axle suspension
- Suspension type (e.g. HSFVB 3/10010 ME ECO)
- Design index

• Axle load (e.g. 3 x 10,000 kg)

• SN ... brake

• With steering axle, type ...

• Track (SP) ...

• Spring centre (FM) ...

• Support centre (AM) ...

• High mounting bracket

• Wheel base (RS) ...

• Ride height (FH) ...

• Brake application:

- Diaphragm cylinder
- Spring-type cylinder
- GSK manual slack adjuster
- ECO-Master automatic slack adjuster

• Wheel connection:

- Stud centring
- Hub centring
- For alloy wheels (stud hole Ø)
- Offset, tyre size

• ECO hub system

• Vehicle type:

- Drawbar trailer, semi-trailer, tipper, etc.
- Special operational conditions

• Design acc. to

- Code number
- Drawing number
- Offer ...



Key to types

Example:											Trailer axle		
H	S	F	VB	U	LL	3/	10010	/12°	M	ECO	Series	Brake	Tyres
H											H □	SN 420	20" / 22.5" / 24"
	S										For single wheels, wheels without offset (ET=0)		
	Z										For twin wheels		
	IZ										Wheel spiders for TRILEX rims, twin wheels		
		F									M22 x 1.5 wheel studs without wheel nuts; order wheel nuts for stud or hub centring separately		
		M									For hub centring with wheel nuts installed M22 x 1.5		
			VB								Suspension series		
			VBT								VB spring suspension, leaf springs over the axle		
			W								VBT as above, however with leaf springs under the axle		
				U							W W-tandem axle suspension, with two leaf springs and trunnion axle, mounting brackets between the leaf springs		
					LL						With U-stabiliser (VB-series only)		
						—					Self-steering axle, LL -series		
						2/					Single axle		
						3					Tandem axle suspension		
							9010 to 20010				Tri-axle suspension		
								12°			Axle load in kg + number of wheel studs per wheel		
									HD		Steering angle of the steering axle		
									HDE		Equaliser bearing with rubber/steel bushes up to 14 t		
									M		Equaliser bearing with bronze bushes 14 to 20 t		
									ME		Equaliser bearing with rubber bushes 9 to 12 t		
									ECO		Equaliser bearing with bronze bushes 9 to 12 t		
										ECO	ECO hub system		

BPW axle suspension systems, VB-series

Axle loads 9,000 - 12,000 kg

Recommended applications:

For transporting less sensitive goods.
For semi-trailers and drawbar trailers used for local or long-distance haulage.
On- and off-road.

VB suspension systems are equipped with multi-leaf and parabolic springs (up to 12 t) and are available as suspension systems with 1 to 3 axles (up to 4 axles in exceptional cases). They can be used with either disc or TRILEX wheels. The standard axle load equalisation is performed using equalising beams. These beams are mounted in maintenance-free rubber/steel bushes (M-series) or in high-quality bronze bushes (ME-series). Replaceable spring slides with optimised wear properties are located in the suspension supports and at the ends of the equalising beams.

Precise axle control is achieved thanks to horizontal swinging arms (torque arms) which are mounted in rubber/steel bushes and do not require maintenance. The swinging arms are located between the axles and the front and centre suspension

supports. They are fixed on one wheel side and adjustable on the other, thereby allowing the axles to be aligned in relation to one another and to the centre of the vehicle. Equalising beam studs and bolts are equipped with anti-rotation locks as standard.

Delivery: In modules (axles, supports, springs)

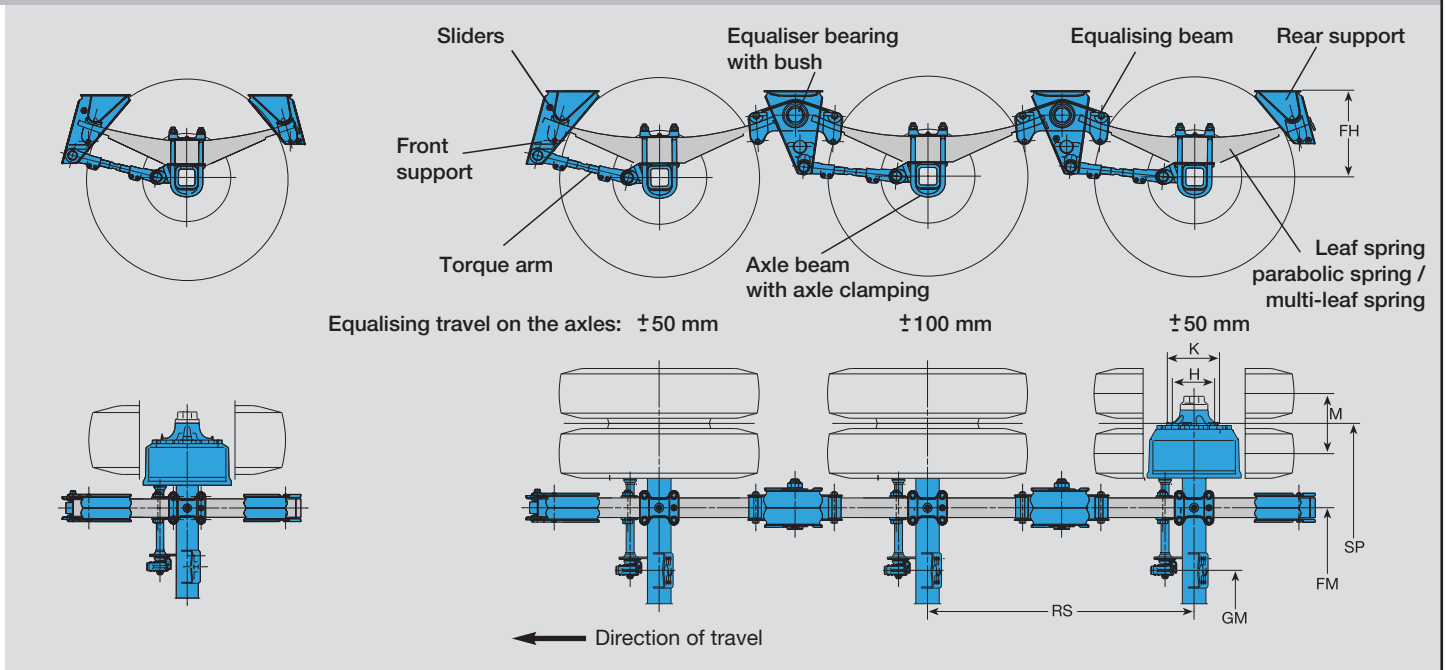
Can be combined with BPW LL self-steering axle
- Tandem and tri-axle suspension systems with a self-steering axle
- Four-axle suspension systems are available with one or two self-steering axles and valve installation for steering lock

With drawbar connection for trailer front axles

Special versions are available on request for aircraft refuelling tankers

Stabilisers must be fitted on vehicles with a high centre of gravity

Type ¹⁾	Single axle	Tandem axle suspension	Tri-axle suspension	Version ²⁾	Axle beam	S-cam brake Ø x width	Track SP	Spring centre FM mm	GM mm	Wheel base RS mm	Tyre ³⁾ example
HSFVB	9010	2/9010	3/9010	M ME	vkt.120	SN 420x180	2010	1200	385	1360	385/55 R22.5 385/65 R22.5
							2040	1200	415		
							2040	1300	415		
							2095	1400	470		
HZFVB	9010	2/9010	3/9010	M ME	vkt.120	SN 420x180	1820	980	341	1360	275/70 R22.5
							1820	900	341		
							1880	980	325		
HSFVB	10010	2/10010	3/10010	M ME	vkt.150	SN 420x200	2040	1300	365	1360	425/65 R22.5
							2000	1200	325		
HZFVB	10010	2/10010	3/10010	M ME	vkt.150	SN 420x200	1820	900	261	1360	275/70 R22.5
							1820	980	261		
							1850	980	241		
HZFVB		2/10010		M ME	vkt.150	SN 420x200	1820	900	261	1820	275/70 R22.5
							1820	980	261		
							1850	980	241		
HSFVB	12010	2/12010	3/12010	M ME	vkt.150	SN 420x200	2040	1300	365	1360	445/65 R22.5
							2000	1200	325		
HZFVB	12010	2/12010	3/12010	M ME	vkt.150	SN 420x200	1820	900	261	1360	295/80 R22.5
							1820	980	261		
							1850	980	241		
HZFVB		2/12010		M ME	vkt.150	SN 420x200	1820	900	261	1820	295/80 R22.5
							1820	980	365		
							1850	980	241		



M=Centre-to-centre distance ET=Offset	Overall width across the tyres mm	Wheel connection		Ride height FH with multi-leaf springs / with parabolic springs				Suspension weights kg (Version M with parabolic springs)		
		Wheel stud	Ø H / K (mm)	laden ¹⁾	unladen	laden ¹⁾	unladen	Single axle	Tandem axle suspension	Tri-axle suspension
ET=0	2405	10 x M22x1.5	280.8 / 335	382	424	378	413	496 kg	1035 kg	1545 kg
	2435							497 kg	1037 kg	1548 kg
	2435							497 kg	1037 kg	1548 kg
	2490							499 kg	1041 kg	1554 kg
M=320	2432	10 x M22x1.5	280.8 / 335	382	424	378	413	505 kg	1053 kg	1572 kg
	2432							505 kg	1053 kg	1572 kg
	2492							508 kg	1059 kg	1581 kg
ET=0	2475	10 x M22x1.5	280.8 / 335	397	439	406	429	545 kg	1114 kg	1693 kg
	2435							543 kg	1110 kg	1687 kg
M=320	2432	10 x M22x1.5	280.8 / 335	397	439	406	429	545 kg	1114 kg	1693 kg
	2432							545 kg	1114 kg	1693 kg
	2462							547 kg	1118 kg	1699 kg
M=320	2432	10 x M22x1.5	280.8 / 335	397	439	406	429		1148 kg	
	2432								1148 kg	
	2462								1152 kg	
ET=0	2505	10 x M22x1.5	280.8 / 335	394	436	417	444	540 kg	1097 kg	1660 kg
	2465							538 kg	1093 kg	1654 kg
M=330	2465	10 x M22x1.5	280.8 / 335	394	436	417	444	540 kg	1097 kg	1660 kg
	2465							540 kg	1097 kg	1660 kg
	2495							542 kg	1101 kg	1666 kg
M=330	2465	10 x M22x1.5	280.8 / 335	394	436	417	444		1136 kg	
	2465								1136 kg	
	2495								1140 kg	

¹⁾ TRILEX versions: Type designation HIZVB ... The track widths vary depending on the tyre size and spacer ring; ²⁾ M: Equaliser bearing in rubber/steel bushes / ME: Equaliser bearing in bronze bushes / 40 mm lower versions ..MN / ..MNE with shortened supports on request; ³⁾ Note the tyre manufacturer's information regarding load index and dimensions; ⁴⁾ Take account of the clearance for dynamic upward travel and equalising distance on suspension axles; ⁵⁾ Weight without wheels and tyres; weight deviations are within the permitted DIN tolerances for the corresponding production processes

BPW axle suspension systems, VB-series

Axle loads 14,000 - 20,000 kg

Recommended applications:

For transporting less sensitive goods.
For semi-trailers and drawbar trailers used for local or long-distance haulage.
On- and off-road.

HD/HDE versions of VB suspension systems are equipped with multi-leaf springs and are available as suspension systems with 1 to 3 axles (up to 4 axles in exceptional cases). They can be used with either disc or TRILEX wheels.

The suspension supports are produced using high-quality, fine-grained steel with excellent welding properties. The standard axle load equalisation is performed using equalising beams. These beams are mounted in maintenance-free, high volume rubber/steel bushes (HD-series) or in longlife, generously sized bronze bushes (HDE-series). Replaceable, thick-walled spring slides made from a wear-resistant steel alloy are located in the suspension supports and at the ends of the equalising beams.

Precise axle control is achieved thanks to horizontal swinging arms (torque arms) which are mounted between the axles and the front and centre suspension supports. They are equipped with zero-maintenance bearings in rubber/steel bushes.

The swinging arms are fixed on one wheel side and adjustable on the other, thereby allowing the axles to be aligned in relation to one another and to the centre of the vehicle's longitudinal axis.

Equalising beam bearing studs and bolts are equipped with anti-rotation locks as standard.

Delivery: In modules (axles, supports, springs).

Can be combined with BPW LL self-steering axle

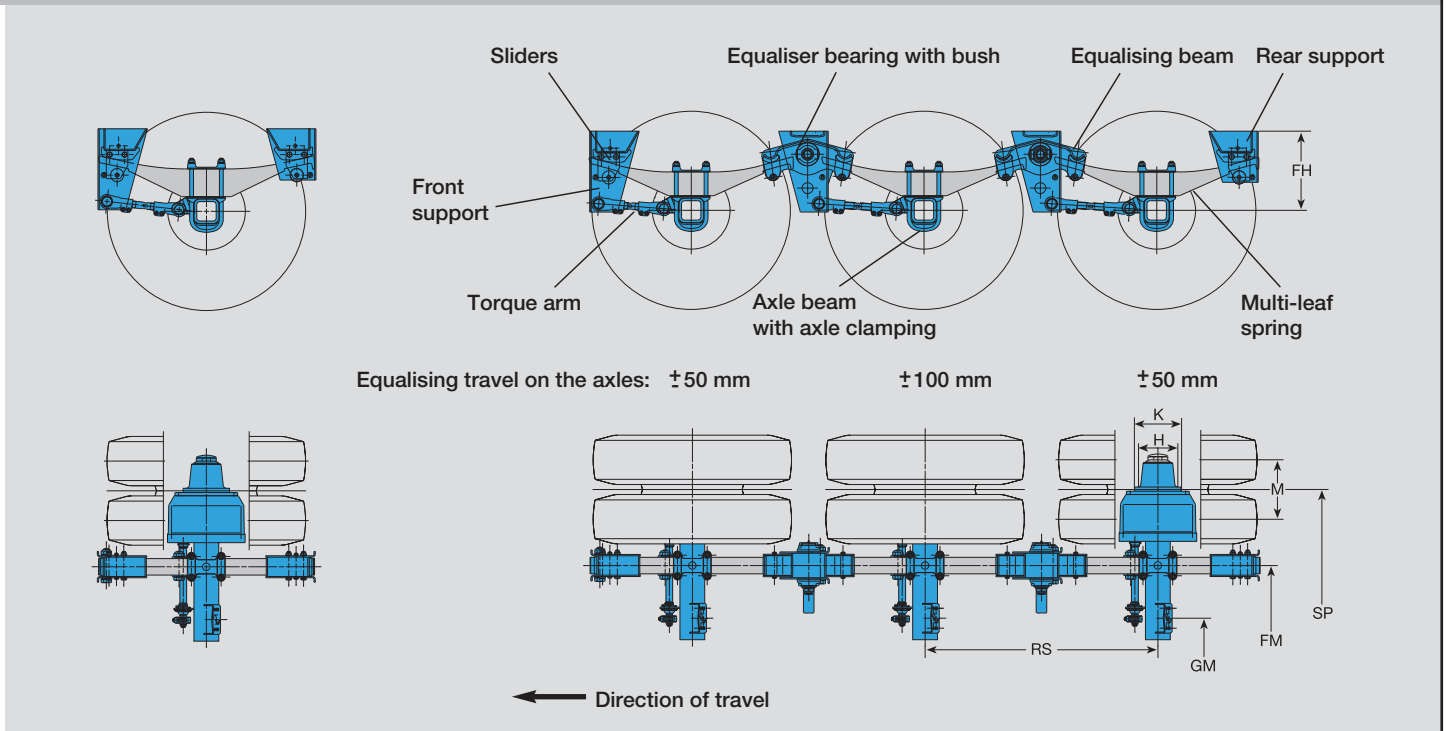
- Tandem and tri-axle suspension systems with a self-steering axle
- Four-axle suspension systems are available with one or two self-steering axles, complete with valve installation for steering lock

With drawbar connection for trailer front axles

Special versions are available on request for aircraft refuelling tankers

Stabilisers must be fitted on vehicles with a high centre of gravity

Type ¹⁾	Single axle	Tandem axle suspension	Tri-axle suspension	Version ²⁾	S-cam brake Ø x width	Track SP mm	Spring centre FM mm	GM mm	Wheel ³⁾ base RS mm	Tyre ⁴⁾ example
HZFVB		2/14010	3/14010	HD/HDE	SN 420 x 200	1820	900	266	1360	12.00 R 20
								1410	12.00 R 24	
	14010					1820	900	266	1500	
HZMVB		2/16010	3/16010	HDE	SN 420 x 200	1820	900	261	1360	12.00 R 20
						1950	900	281	1410	12.00 R 24
						2250	1200	505	1500	
						1820	900	261		
HZMVB	18010	2/18010	3/18010	HDE	SN 420 x 200	1820	900	261	1500	12.00 R 24
						1950	900	281		14.00 R 20
						2320	1200	407		
HZMVB	20010	2/20010	3/20010	HDE	SN 420 x 200	1950	900	278	1500	14.00 R 20
						2200	1100	354		
						2400	1300	554		



M=Centre-to-centre distance	Overall width across the tyres mm	Wheel connection		Ride height FH		Suspension weights ^{§)}		
		Wheel stud	Ø H / K (mm)	laden ^{§)} mm	unladen mm	Single axle kg	Tandem axle suspension kg	Tri-axle suspension kg
M=350	2496	10 x M22x1.5	280.8 / 335	430	475		1527 kg	2300 kg
M=360	2509			435	480		1548 kg	2331 kg
	2509			455	500	814 kg	1592 kg	2432 kg
M=350	2496	10 x M22x1.5	280.8 / 335	475	500		1640 kg	2469 kg
M=360	2639			460	495		1678 kg	2525 kg
	2939			490	530		1767 kg	2659 kg
	2509					864 kg	1715 kg	2581 kg
M=360	2496	10 x M22x1.5	280.8 / 335	460	480		1735 kg	2612 kg
M=428	2776						1757 kg	2645 kg
	3146					940 kg	1817 kg	2735 kg
M=428	2776	10 x M24x1.5	280.8 / 335	455	480		1885 kg	2837 kg
	3026						1931 kg	2906 kg
	3226					1015 kg	1967 kg	2960 kg

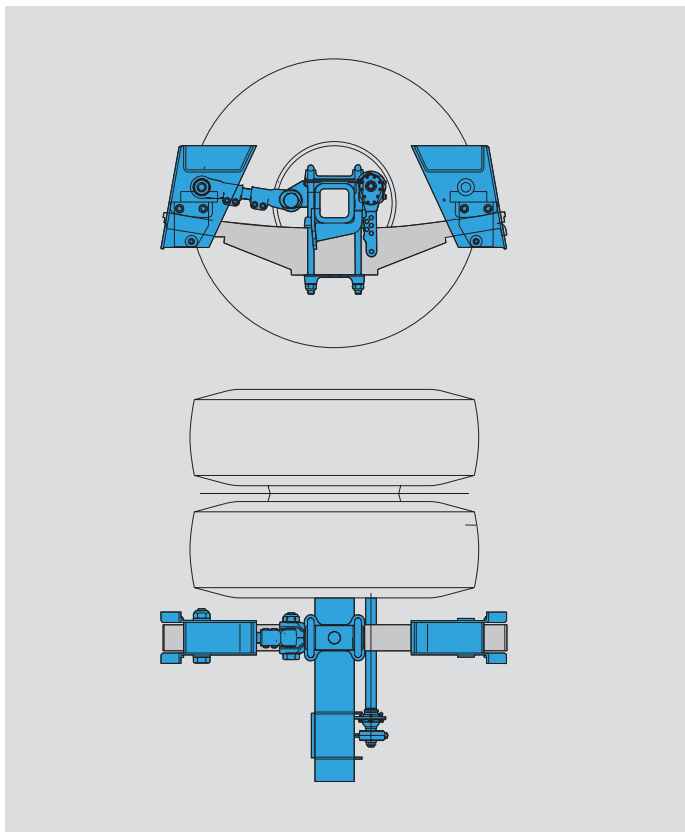
Also available as TRILEX version

¹⁾ TRILEX versions: Type designation HIZVB ... The track widths vary depending on the tyre size and spacer ring; ²⁾ HD: Equaliser bearing in rubber/steel bushes / HDE: Equaliser bearing in bronze bushes; ³⁾ Wheel base 2050 on request; ⁴⁾ Note the tyre manufacturer's information regarding load index and dimensions; ⁵⁾ Take account of the clearance for dynamic upward travel and equalising distance on suspension axles; ⁶⁾ Weight without wheels and tyres; weight deviations are within the permitted DIN tolerances for the corresponding production processes

BPW axle suspension systems, VB-series

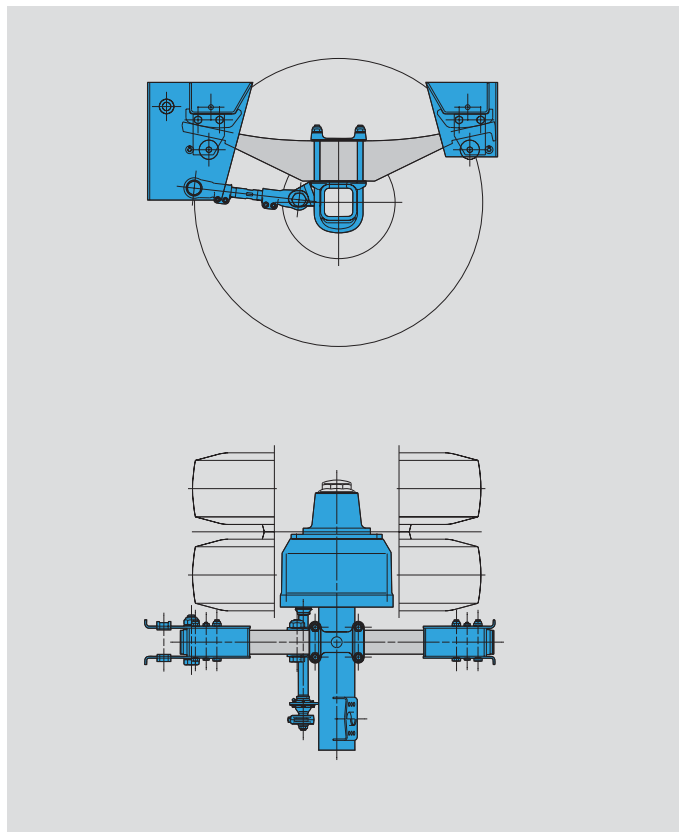
Special versions

Axle suspension systems for low vehicles



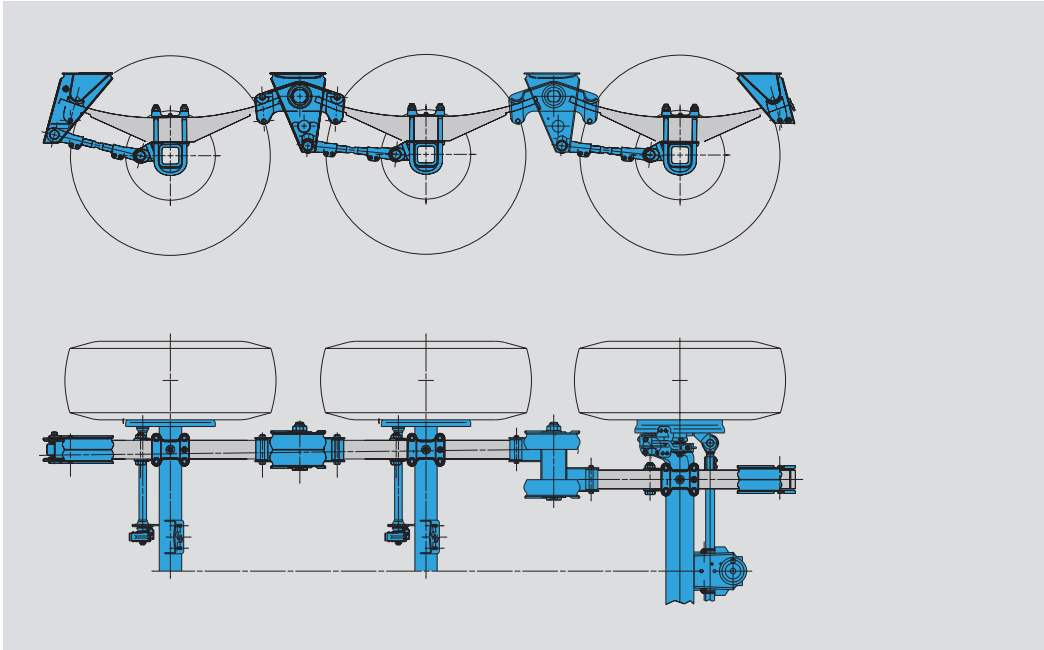
BPW suspension series ...VBT with underslung springs

Axle suspension systems for trailer front axles



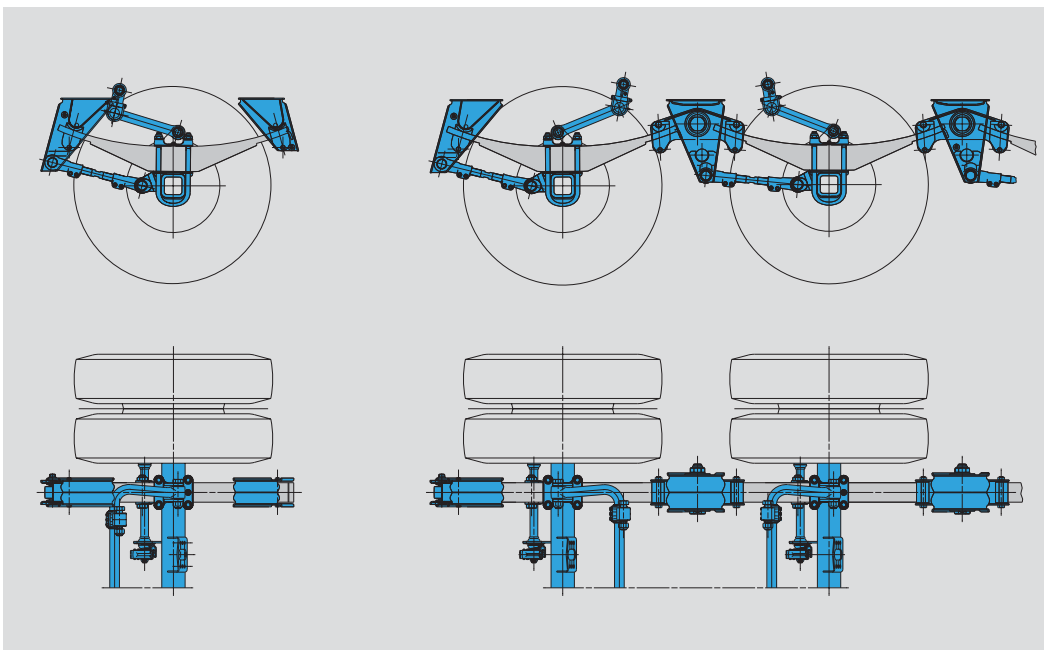
BPW suspension with drawbar connection for trailer front axles

Suspension combinations with BPW LL self-steering axle



In suspension combinations with an LL self-steering axle (max. 14 t axle load), the spring centre difference is equalised using equalising beams offset to the side.

Axle units for vehicles with a high centre of gravity



For vehicles with a high centre of gravity, the U-stabiliser version is required

BPW axle suspension systems, W-series suspension load 20,000 to 40,000 kg

Recommended applications:

Tandem axle suspension systems for transporting robust goods under harsh conditions on-road, off-road and on construction sites. For off-road application in the tropics and the arctic.

Available as ready-to-install, completely pre-assembled suspension for either disc or TRILEX wheels. W-series axle units are equipped with robust and longlife multi-leaf springs. The main spring layers are angled at both ends to control the track of the axles. They are clamped onto the axle beams using spring housings with rubber elements.

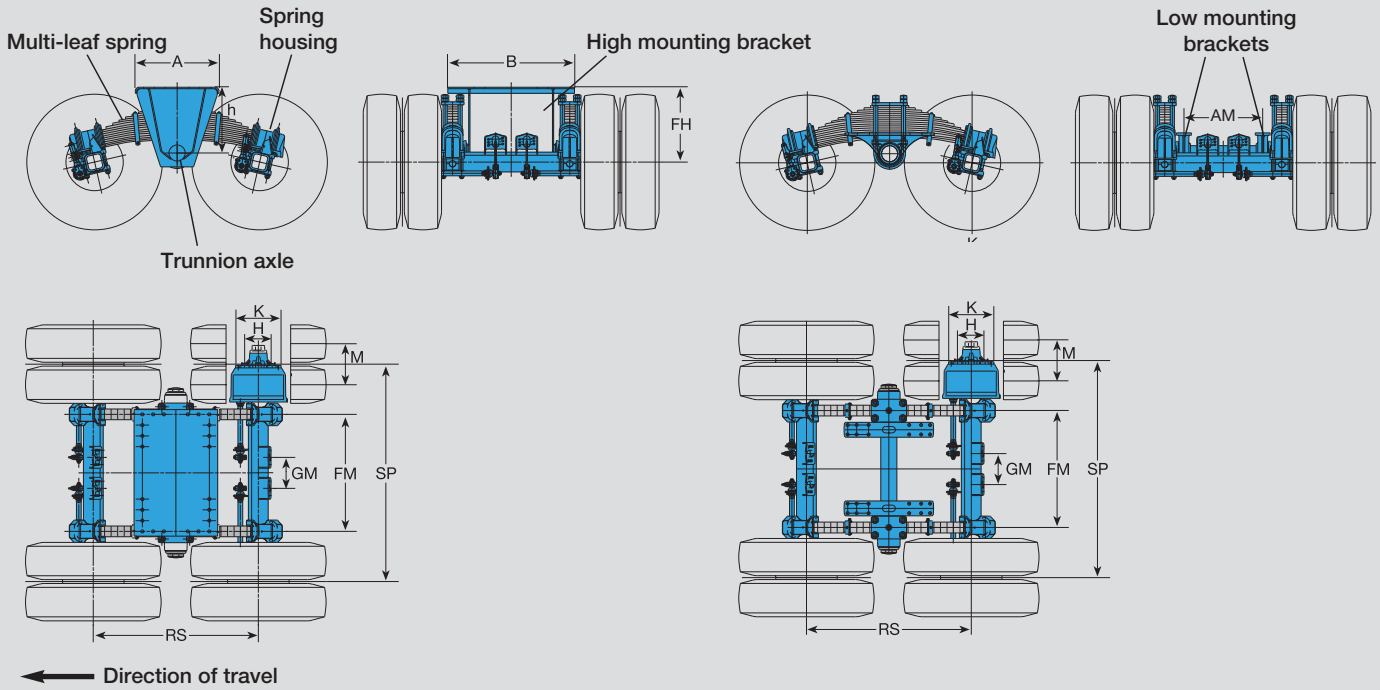
Longlife bronze bushes are used for mounting the spring packs on the shared central trunnion axle.

It is possible to select between one high mounting bracket or two low mounting brackets for directly attaching the suspension onto the vehicle frame.

The design is characterised by high lateral stability and very long axle load equalisation distances. It is unaffected by semi-trailer tilt.

W-suspension systems have proved their worth over decades in demanding off-road and tipper applications.

Type	Suspension load up to 105 km/h kg	S-cam brake Ø x width	Track SP mm	Spring centre mm	GM mm	Support centre AM mm	High mounting bracket AxBxh mm	Wheel base RS mm	
HZFW 2/10010	20000	SN 420x200	1820	980	261	660		1400	
			1820	980	261		700x1060x550		
HZFW 2/12010 B ¹⁾	24000	SN 420x200	1820	980	261	660		1400	
			1820	980	261		700x1060x600		
HZFW 2/12010 C ²⁾	24000	SN 420x200	1820	980	261	660		1500	
			1820	980	261		700x1060x600		
HZ(M)W 2/14010-1	28000	SN 420x200	1820	900	266	520		1500	
			1820	900	266		800x980x600		
			1920	900	290	520			1650
			1920	900	290		800x980x600		
HZMW 2/16010	32000	SN 420x200	1800	900	241	520		1550	
			1800	900	241		800x980x600		
			2150	1150	367	770			
			2150	1150	367		800x1230x600		
HZMW 2/18010	36000	SN 420x200	1800	900	241	520		1550	
			1800	900	241		800x980x600		
			2150	1150	367	770			
			2150	1150	367		800x1230x600		
HZMW 2/20010	40000	SN 420x200	1900	900	278		800x980x700	1550	
			2100	1150	254	770			



Ride height		Wheel connection		Tyre ³⁾ example	Centre-to-centre distance M	Overall width across the tyres mm	Weight of suspension ⁴⁾ kg			
laden FH mm	unladen FH mm	Wheel stud	Ø H / K (mm)							
253	213	10 x M22x1.5	280.8 / 335	11.00 R 20	M = 348	2482	1650			
628	588						1840			
253	213	10 x M22x1.5	280.8 / 335	12.00 R 20	M = 350	2496	1710			
678	638						1862			
253	207	10 x M22x1.5	280.8 / 335	12.00 R 24	M = 360	2509	1650			
675	630						1820			
191	262	10 x M22x1.5	280.8 / 335	12.00 R 20	M = 350	2496	2073			
605	661						2262			
262	191			14.00 R 20	M = 428	2746	2203			
591	662						2385			
212	259	10 x M22x1.5	280.8 / 335	12.00 R 24	M = 350	2489	2385			
610	657						2575			
210	257	10 x M22x1.5	280.8 / 335	12.00 R 24	M = 350	2489	2457			
610	660						2638			
212	259						14.00 R 20	M = 428	2976	2507
612	659									2619
712	759	10 x M24x1.5	280.8 / 335	14.00 R 20	M = 428	2726	2737			
212	259						2926	2577		

Also available as TRILEX version

¹⁾ Version for heavy-duty application; ²⁾ Version for on-road use; ³⁾ Note the tyre manufacturer's information regarding load index and dimensions; ⁴⁾ Weight without wheels and tyres; weight deviations are within the permitted DIN tolerances for the corresponding production processes



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