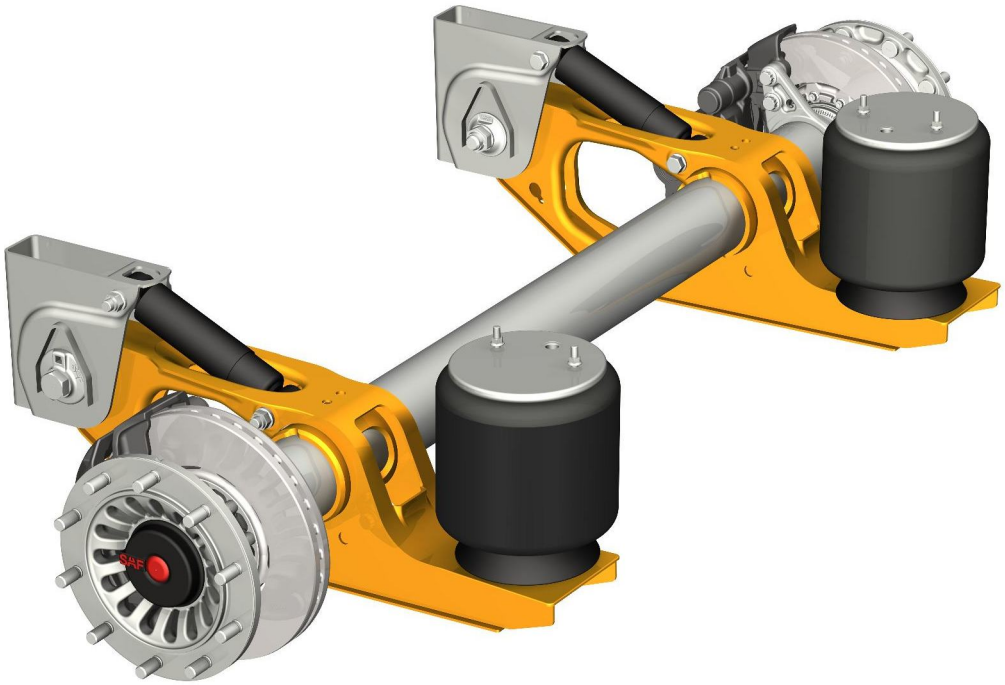
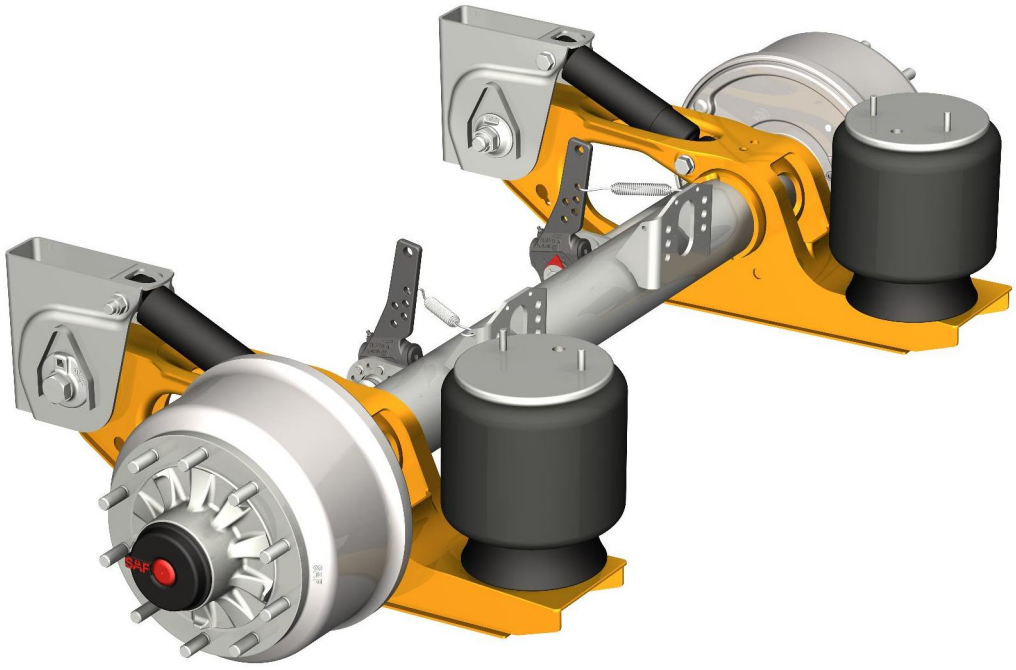
SAF INTRADISC *plus INTEGRAL*



SAF INTRADRUM



Edition 2008-08_EN

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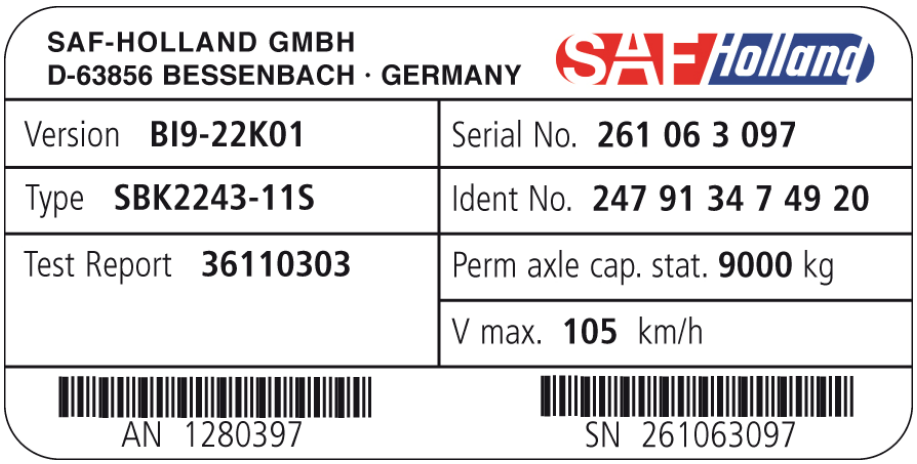
Designations on the type plate

In future, all the relevant designations will correspond to the English terms in the brake test reports, this to rule out the risk of confusion when applying for a type approval.

The main changes in detail are:

	up to week 37/05	from week 38/05
axledesignation:	type	version
brake type:	basic type	type

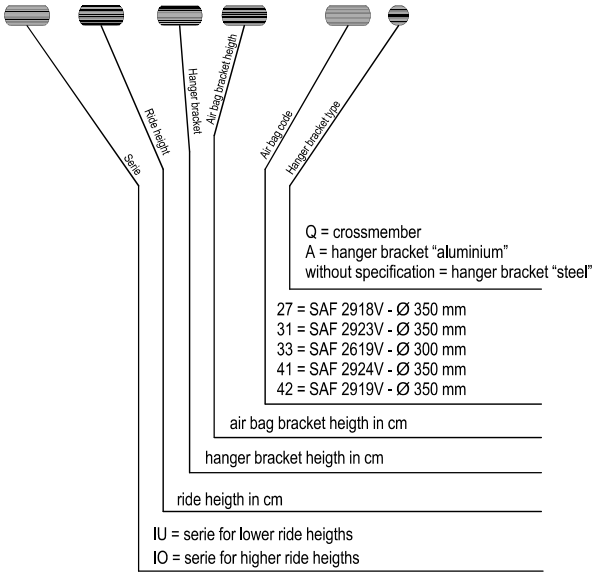
Example:



Type identification for INTRADISC *plus INTEGRAL* and INTRADRUM

Letters are marked with “X”, numbers with “0”
Example:

IU28/2005 33Q
IO44/3000 31
XX00/0000 00X

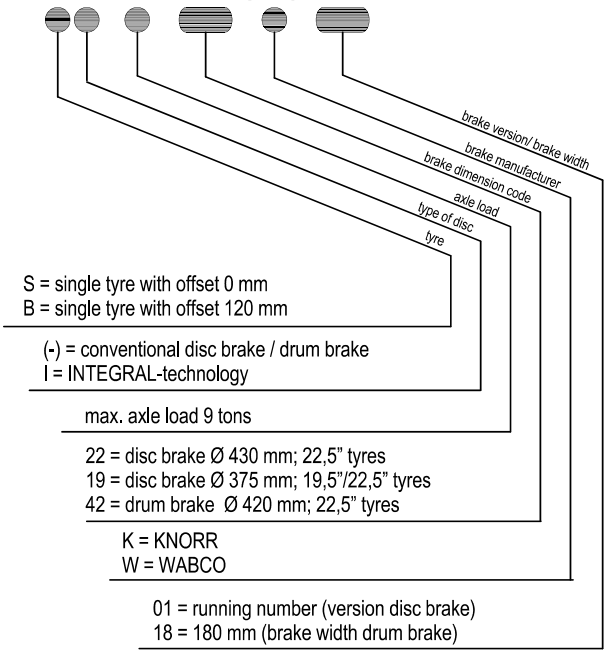


Trailing arm length = distance from pivot bolt centre to axle centre (Standard 500 mm).
La = distance from axle centre to air bag centre (Standard 385 mm).

Type identification for axle generation 06

Letters are with “X”, numbers with “0”
Example:

S 9-42 18
BI 9-22 K 01
XX 9-00(X)00



Key

Summary	Explanation
A	Unsprung mass
AX	Distance wheel attachment faces left to right
B	Total width
BH	Hanger bracket height, distance centre pivot bolt to top side hanger bracket
BL	Hanger bracket length, distance top hanger bracket from front- to backside
BM	Air bag centre, distance air bag centre line between left- and right side
ET	Offset, distance wheel attachment face to centre tyre
DP	Pivot bolt centre (steering axle), distance pivot bolts centre line between left- and right side
F	Nominal ride height, distance centre axle to bottom chassis in driving condition
G	Total axle width
H	Air bag bracket height
H_2	Air bag bracket height at lift air bag
HM	Hanger bracket centre, distance hanger bracket centre line between left- and right side
Hmax	Air bag height maximum
Hmin	Air bag height minimum
i	Ratio
K	Brake chamber centre (with drum brake), centre distance brake chamber bracket between left- and right side
KTL	Cathodic dip coating
L	Trailing arm length (L1), distance centre pivot bolt to centre axle
La	Distance centre axle to centre air bag (L2)
LM	Spring centre, centre distance spring between left- and rightside
Lmax	Shock absorber length maximum
Lmin	Shock absorber length minimum
P	Air pressure in the air bag (bar)
p	Air pressure in the air bag (bar/kg)
Pt	Air pressure in the air bag at partial load (bar)
Q	Axle load on the ground (kg)
Qt	Axle load on the ground at partial load (kg)
S	Track, centre distance tyres between left- and right side
V	Air bag offset, distance centre air bag to centre spring
X	Overall height, distance centre axle to under side of chassis beam when air bags are without air
Y	Installation height of liftarm, when raised.

All measurements are given in mm if not specified otherwise.

Overview of ride heights and weights for INTRADRUM

Air bag type 2619 V (Code: **33**),
Axle version **S9-4218**

air suspenion type	ride height [mm]	hanger bracket [mm]	air bag bracket [mm]	lift/lower [1] [mm]	weight [2] [kg]
IU 25/2000 33	250	200	0	90/90	410
IU 28/2005 33	280	200	50	90/90	415
IU 30/2505 33	300	250	50	90/90	420
IU 33/2510 33	330	250	100	90/90	422
IU 35/3010 33	350	300	100	90/90	425
IO 35/2000 33	355	200	0	90/90	410
IO 37/2500 33	375	250	0	90/90	414
IO 40/2505 33	405	250	50	90/90	419
IO 42/3005 33	425	300	50	90/90	422
IO 45/3010 33	455	300	100	90/90	424
IO 47/3510 33	475	350	100	90/90	427
IO 50/3515 33	505	350	150	90/90	429

Air bag type 2924 V (Code: **41**),
Axle version **S9-4218**

air suspenion type	ride height [mm]	hanger bracket [mm]	air bag bracket [mm]	lift/lower [1] [mm]	weight [2] [kg]
IU 29/2000 41	290	200	0	105/95	418
IU 31/2500 41	310	250	0	105/95	421
IU 34/2505 41	340	250	50	105/95	426
IU 36/3005 41	360	300	50	105/95	430
IU 39/3010 41	390	300	100	105/95	432
IU 42/3015 41	420	300	150	105/95	434
IO 44/3000 41	440	300	0	105/95	424
IO 49/3505 41	490	350	50	105/95	432

1) lowering with unladen trailer, air bags without air.
2) Weight deviations lie within the permited DIN tolerances for the respective manufacturing process. Weight when track/spring centre 2040/1300 with steel hanger brackets and automatic slack adjusters, without wheel nuts.

Further variants on request.

Overview of ride heights and weights for INTRADISC *plus INTEGRAL*

Air bag type 2619 V (Code: **33**)

air suspenion type	ride height [mm]	hanger bracket [mm]	air bag bracket [mm]	lift/lower [1] [mm]	Weight [2] [kg]	
					Axle version BI9-22…	Axle version BI9-19…
IU 25/2000 33	250	200	0	90/90	409	391
IU 28/2005 33	280	200	50	90/90	414	396
IU 30/2505 33	300	250	50	90/90	419	401
IU 33/2510 33	330	250	100	90/90	421	403
IU 35/3010 33	350	300	100	90/90	424	406
IO 35/2000 33	355	200	0	90/90	409	391
IO 37/2500 33	375	250	0	90/90	413	395
IO 40/2505 33	405	250	50	90/90	418	400
IO 42/3005 33	425	300	50	90/90	421	403
IO 45/3010 33	455	300	100	90/90	423	405
IO 47/3510 33	475	350	100	90/90	426	408
IO 50/3515 33	505	350	150	90/90	428	410

Air bag type 2924 V (Code: **41**)

air suspenion type	ride height [mm]	hanger bracket [mm]	air bag bracket [mm]	lift/lower [1] [mm]	Weight [2] [kg]	
					Axle version BI9-22…	Axle version BI9-19…
IU 29/2000 41	290	200	0	105/95	417	399
IU 31/2500 41	310	250	0	105/95	420	402
IU 34/2505 41	340	250	50	105/95	425	407
IU 36/3005 41	360	300	50	105/95	429	411
IU 39/3010 41	390	300	100	105/95	431	413
IU 42/3015 41	420	300	150	105/95	433	415
IO 44/3000 41	440	300	0	105/95	423	405
IO 49/3505 41	490	350	50	105/95	431	413

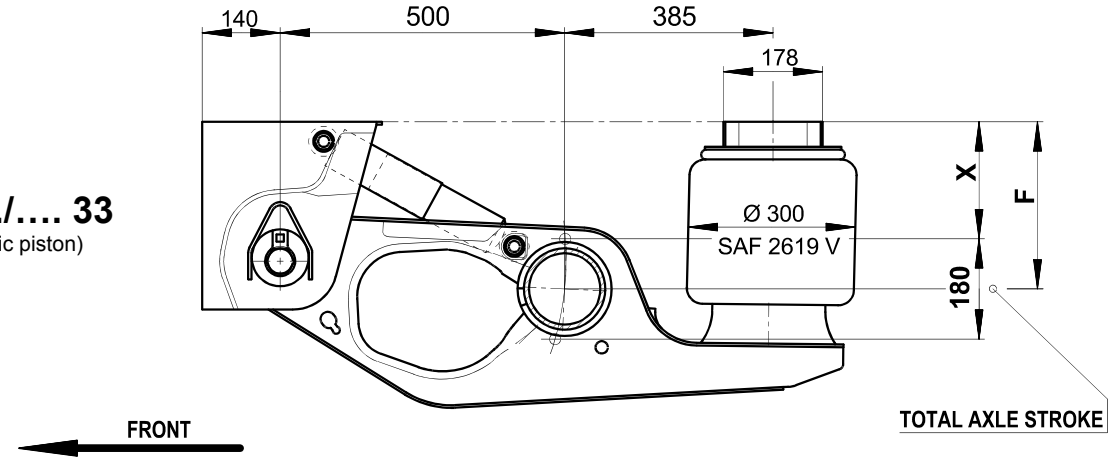
1) lowering with unladen trailer, air bags without air.
2) Weight deviations lie within the permited DIN tolerances for the respective manufacturing process. Weight when track/spring centre 2040/1300 with steel hanger brackets, without wheel nuts.

Further variants on request.

Air suspension type IU with air bag 2619V (33), 2919V (42) or 2918V (27)

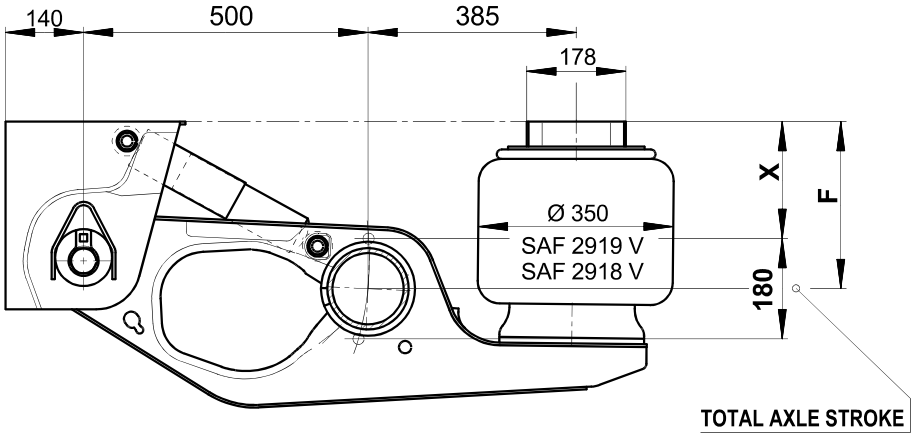
nominal ride height **250** – **350** mm

IU../…. 33
(plastic piston)



IU../…. 42
(plastic piston)

IU../…. 27
(steel piston)



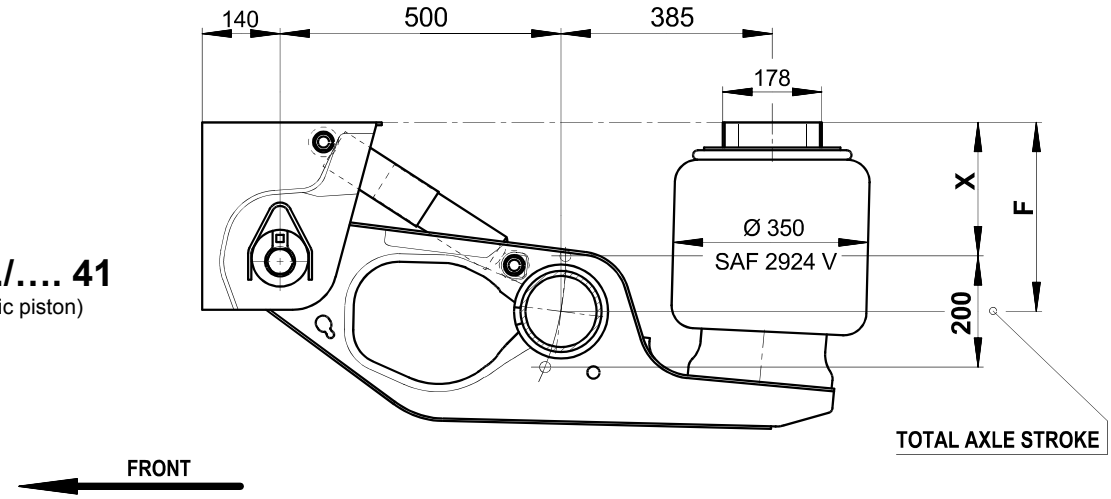
air suspension type		**F**; nominal ride height	ride height range	**X**; overall height unladen without air	**X**; overall height laden without air
IU25/2000	33 42 27	250	230-270	160	145
IU28/2005	33 42 27	280	260-300	190	175
IU30/2505	33 42 27	300	280-320	210	195
IU33/2510	33 42 27	330	310-350	240	225
IU35/3010	33 42 27	350	330-370	260	245

Lengths in mm

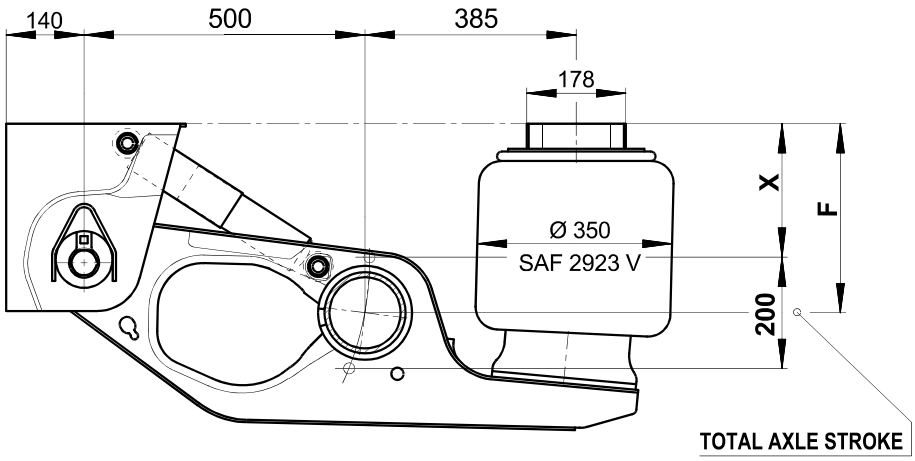
Air suspension type IU with air bag 2924V (41) or 2923V (31)

nominal ride height **290** – **420** mm

IU../…. 41
(plastic piston)



IU../…. 31
(steel piston)



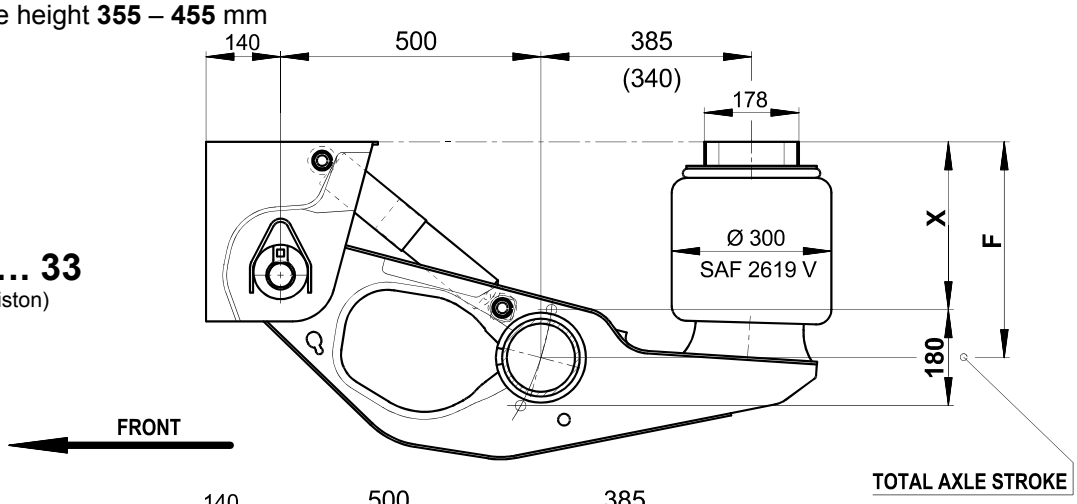
air suspension type	**F**; nominal ride height	ride height range	**X**; overall height unladen without air	**X**; overall height laden without air
IU29/2000 41	290	250-310	180	165
IU31/2500 41	310	270-330	200	185
IU34/2505 41	340	300-360	230	215
IU36/3005 41	360	320-380	250	235
IU39/3010 41	390	350-410	280	265
IU42/3015 41	420	380-440	310	295
IU29/2000 31	290	255-315	185	170
IU31/2500 31	310	275-335	205	190
IU34/2505 31	340	305-365	235	220
IU36/3005 31	360	325-385	255	240
IU39/3010 31	390	355-415	285	270
IU42/3015 31	420	385-445	315	300

Lengths in mm

Air suspension type IO with air bag 2619V (33), 2919V (42) or 2918V (27)

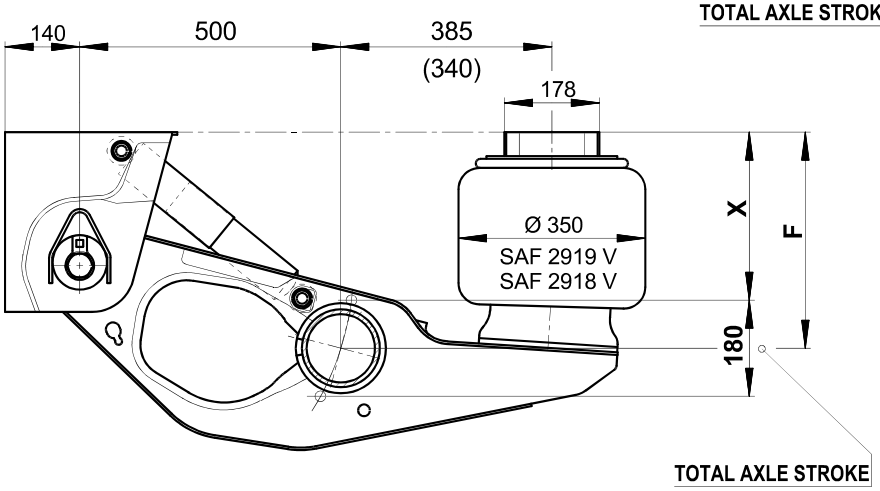
nominal ride height **355** – **455** mm

IO../…. 33
(plastic piston)



IO../…. 42
(plastic piston)

IO../…. 27
(steel piston)



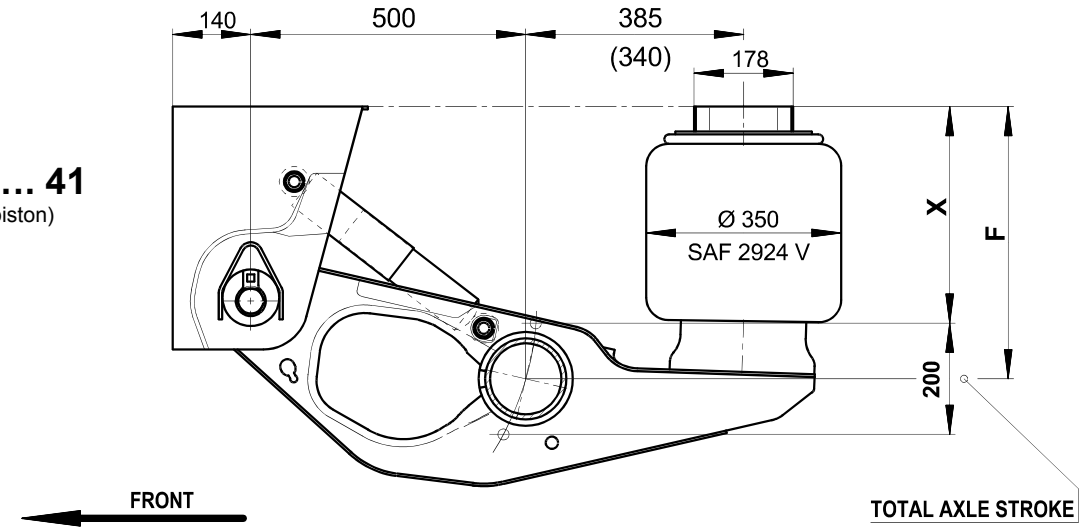
air suspension type		**F**; nominal ride height	ride height range	**X**; overall height unladen without air	**X**; overall height laden without air
IO35/2000	33 42 27	355	335-375	265	250
IO37/2500	33 42 27	375	355-395	285	270
IO40/2505	33 42 27	405	385-425	315	300
IO42/3005	33 42 27	425	405-445	335	320
IO45/3010	33 42 27	455	435-475	365	350
IO47/3510	33 42 27	475	455-495	385	370
IO50/3515	33 42 27	505	485-525	415	400

Lengths in mm

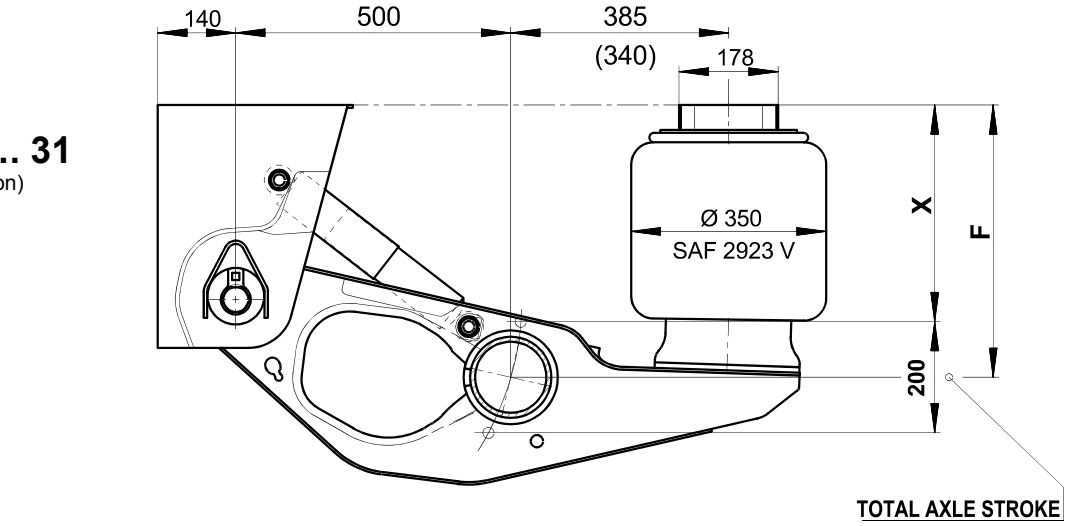
Air suspension type IO with air bag 2924V (41) or 2923V (31)

nominal ride height **440** - **490** mm

IO../…. 41
(plastic piston)



IO../…. 31
(steel piston)



air suspension type	**F**; nominal ride height	ride height range	**X**; overall height unladen without air	**X**; overall height laden without air
IO44/3000 41	440	395-455	325	310
IO49/3505 41	490	445-505	375	360
IO44/3000 31	440	400-460	330	315
IO49/3505 31	490	450-510	380	365

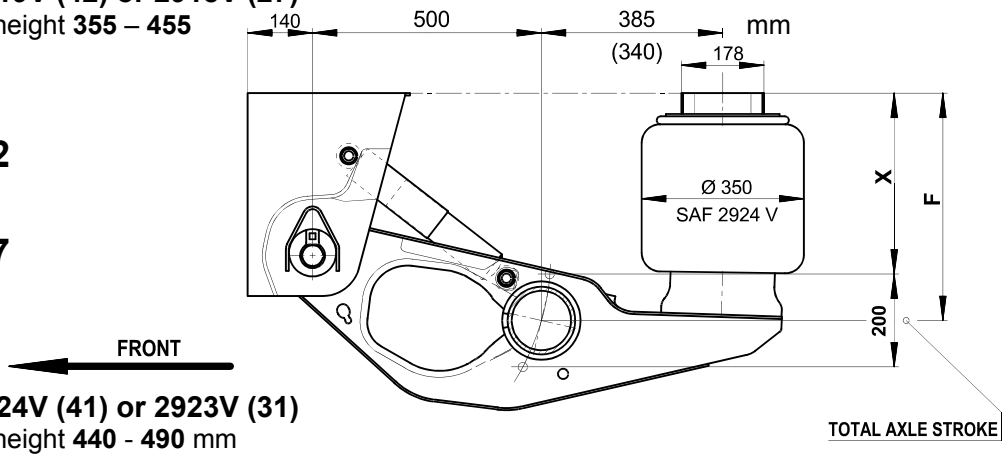
Lengths in mm

Trailing arm in paver serie IO; only HD-Version

with air bag 2919V (42) or 2918V (27)
nominal ride height **355** – **455**

IO../…. 42
(plastic piston)

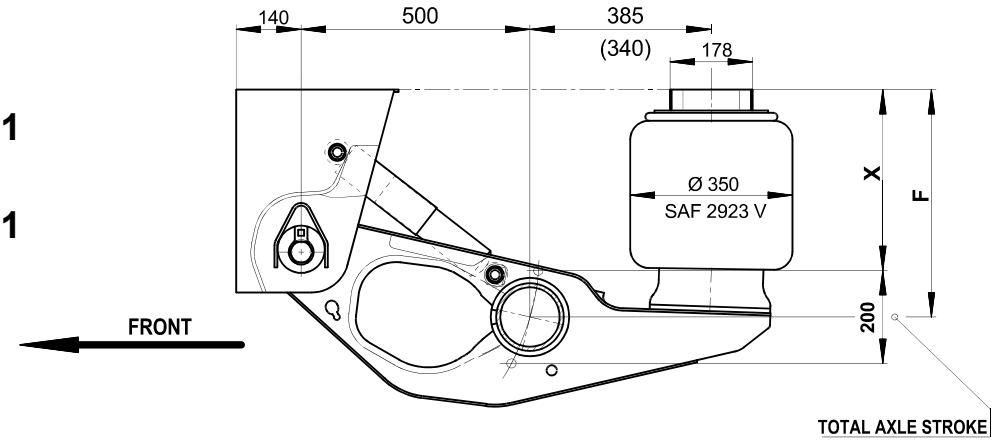
IO../…. 27
(steel piston)



with air bag 2924V (41) or 2923V (31)
nominal ride height **440** - **490** mm

IO../…. 41
(plastic piston)

IO../…. 31
(steel piston)



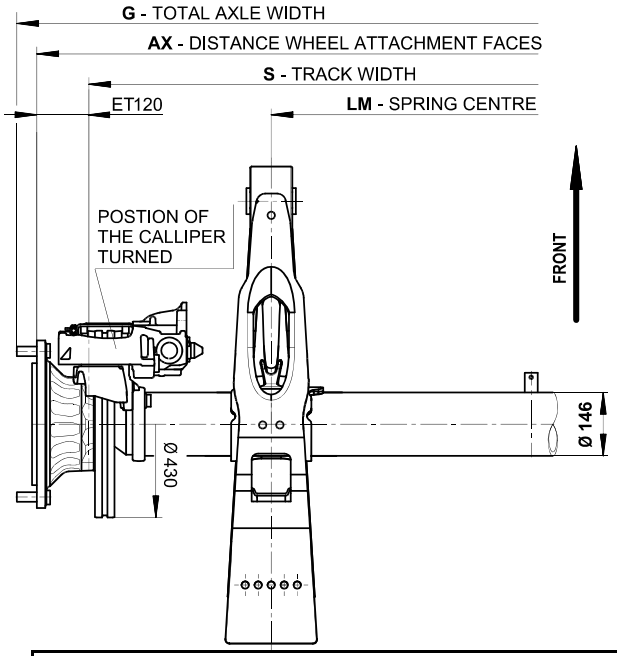
air suspension type		**F**; nominal ride height	ride height range	**X**; overall height unladen without air	**X**; overall height laden without air
IO35/2000	42 27	355	335-375	260	245
IO37/2500	42 27	375	355-395	280	265
IO40/2505	42 27	405	385-425	310	295
IO42/3005	42 27	425	405-445	330	315
IO45/3010	42 27	455	435-475	360	345
IO47/3510	42 27	475	455-495	380	365
IO50/3515	42 27	505	485-525	410	395
IO44/3000	41	440	395-455	320	305
IO49/3505	41	490	445-505	370	355
IO44/3000	31	440	400-460	325	310
IO49/3505	31	490	450-510	375	360

Lengths in mm

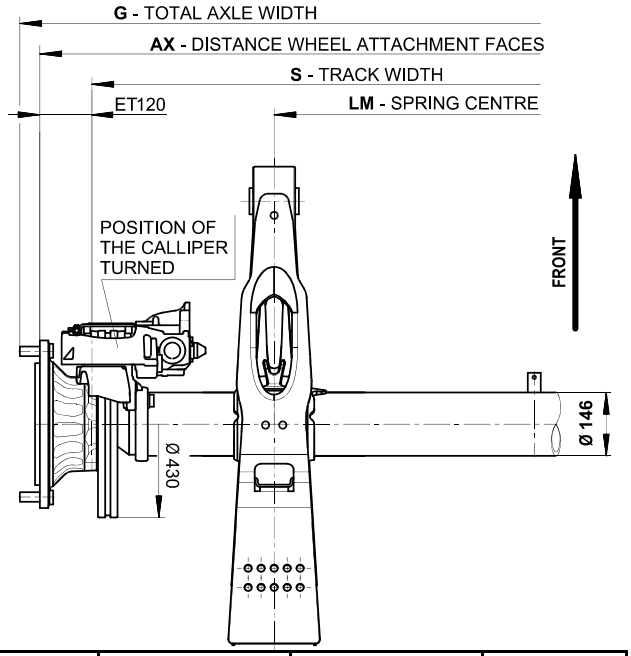
Axle version BI9-22...

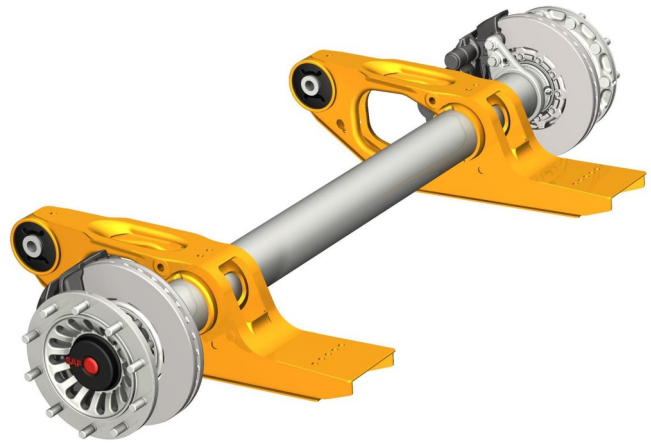
Air bags with diameter **Ø 300** mm and **Ø 350** mm
Wheel fixing: **10 / 280 / 335 / 22x1,5** mm

IU



IO



axle version/ axle load/ brake/ tyre (example)	AX [1]/ LM	S / LM	G [2]
 illustration IU **BI9-22…** / 9.000 kg / SB.2243-11S / 385/65R22,5“	2280/1200	2040/1200	2372
	2280/1300	2040/1300	2372
	2330/1300	2090/1300	2422
	2380/1400	2140/1400	2472

Lengths in mm

1) **AX** = **S** + 2 * **ET** (120 mm)
2) **G** is increased by 20 mm when wheel studs are used for mounting aluminium rims

Note:
To choose the right suspension type the following air bag offsets are possible **V** = **0** / **30** / **60** mm. The free room of motion for the air bag needs to be proved, the clearance between air bag and tyre at the maximum diameter should be at least **25** mm.

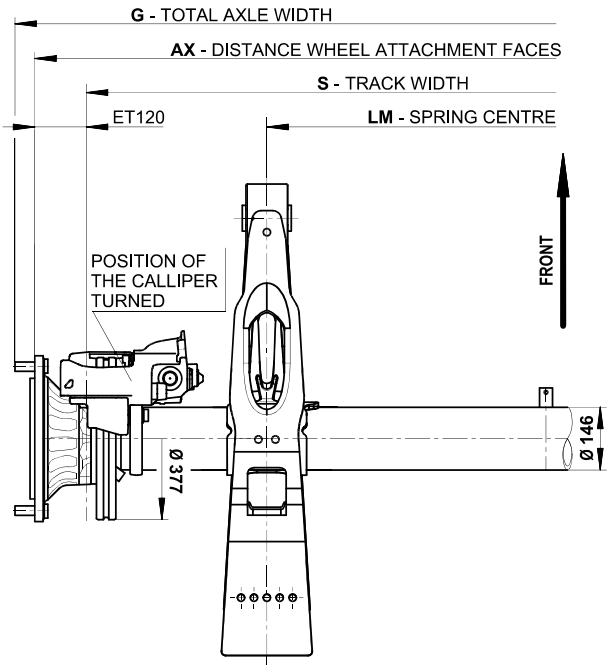
HD-Version (for example **Off-road**-use) available.

Further variants on request.

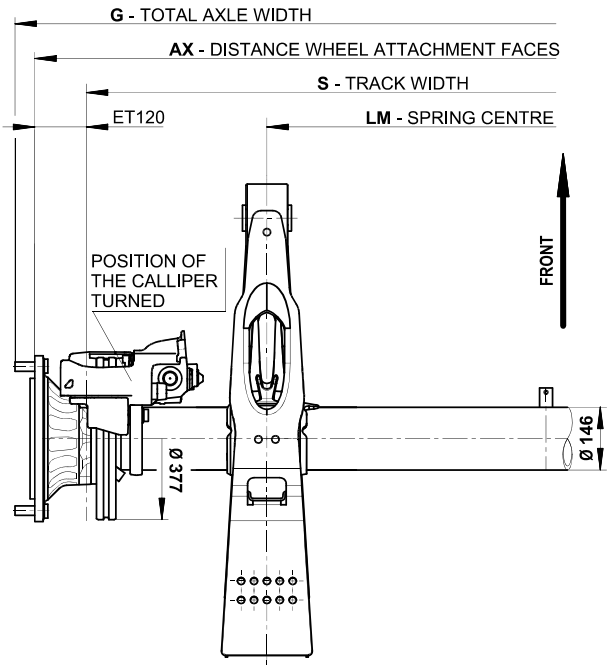
Axle version BI9-19.

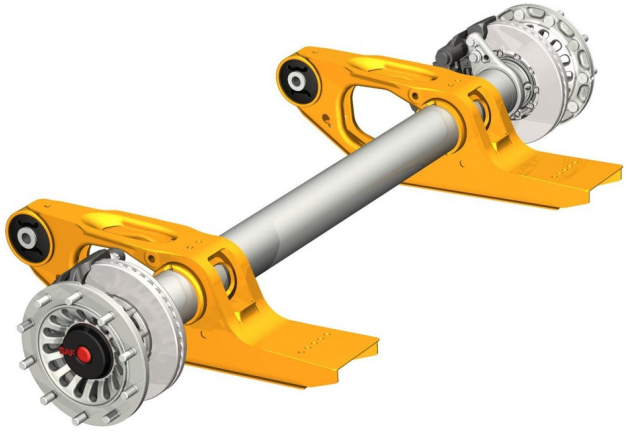
Air bags with diameter **Ø 300** mm and **Ø 350** mm
Wheel fixing: **10 / 280 / 335 / 22x1,5** mm

IU



IO



axle version/ axle load/ brake/ tyre (example)	AX [1]/ LM	S / LM	G [2]
 **illustration IU** **BI9-19.** / 9.000 kg / SB.1937-11S / 425/55R19,5“	2280/1200	2040/1200	2372
	2280/1300	2040/1300	2372
	2330/1300	2090/1300	2422
	2380/1400	2140/1400	2472

Lengths in mm

1) **AX** = **S** + 2 * **ET** (**120** mm)
2) **G** is enhanced by 20 mm when wheel studs are used for mounting aluminium rims

Note:
To choose the right suspension type the following air bag offsets are possible **V** = **0** / **30** / **60** mm. The free room of motion for the air bag needs to be proved, the clearance between air bag and tyre at the maximum diameter should be at least **25** mm.

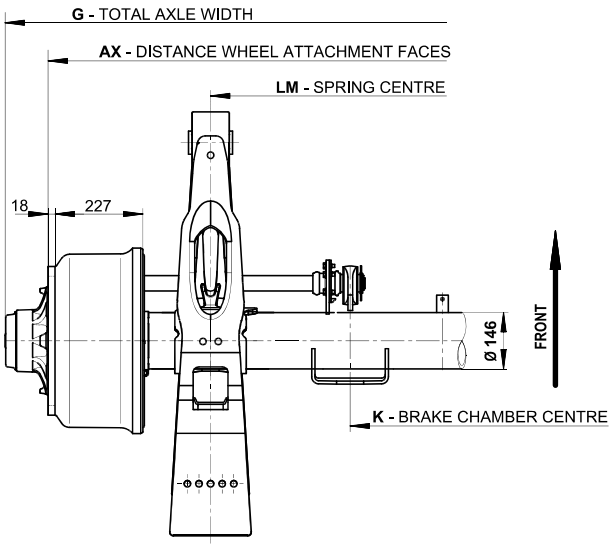
HD-Version (for example **Off-road**-use) available.

Further variants on request.

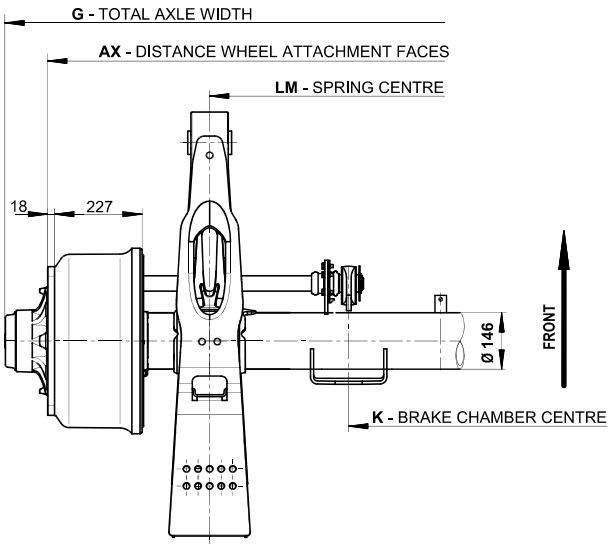
Axle version S9-4218:

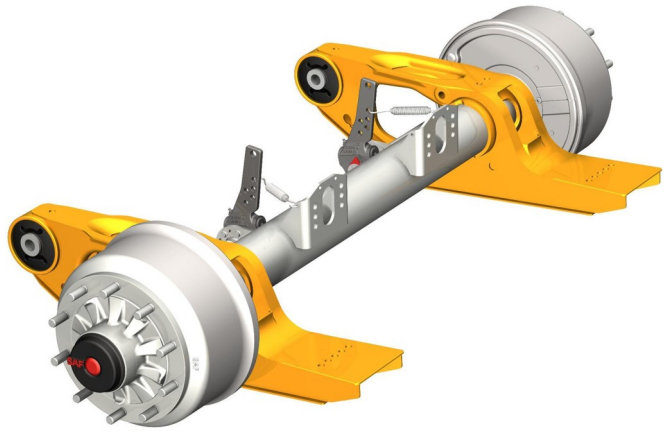
Air bags with diameter **Ø 300** mm and **Ø 350** mm
Wheel fixing: **10 / 280 / 335 / 22x1,5** mm

IU



IO



axle version/ axle load/ brake/ tyre (example)	AX [1]/ LM	G	K
 **illustration IU**	2040/1200	2262	478
	2040/1300	2262	536
	2090/1300	2312	586
S9-4218 / 9.000 kg / SNK420x180 / 385/65R22,5“	2140/1400	2362	636

Lengths in mm

1) **AX** = **S**

Note:
To choose the right suspension type the following air bag offsets are possible **V** = **0** / **30** / **60** mm. The free room of motion for the air bag needs to be proved, the clearance between air bag and tyre at the maximum diameter should be at least **25** mm.

HD-Version (for example **Off-road**-use) available.

Further variants on request.

Geometry hanger bracket „steel“

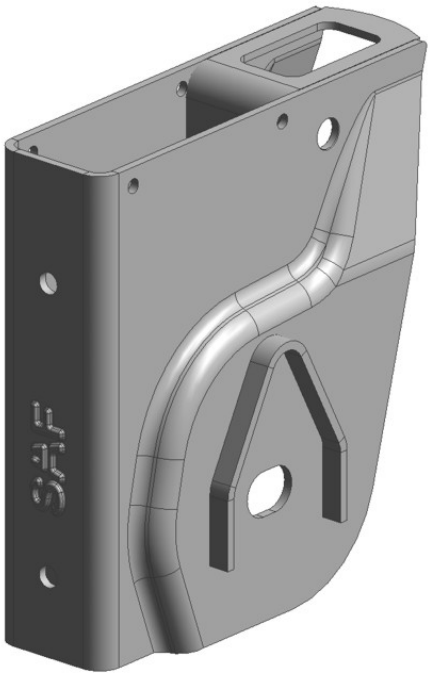
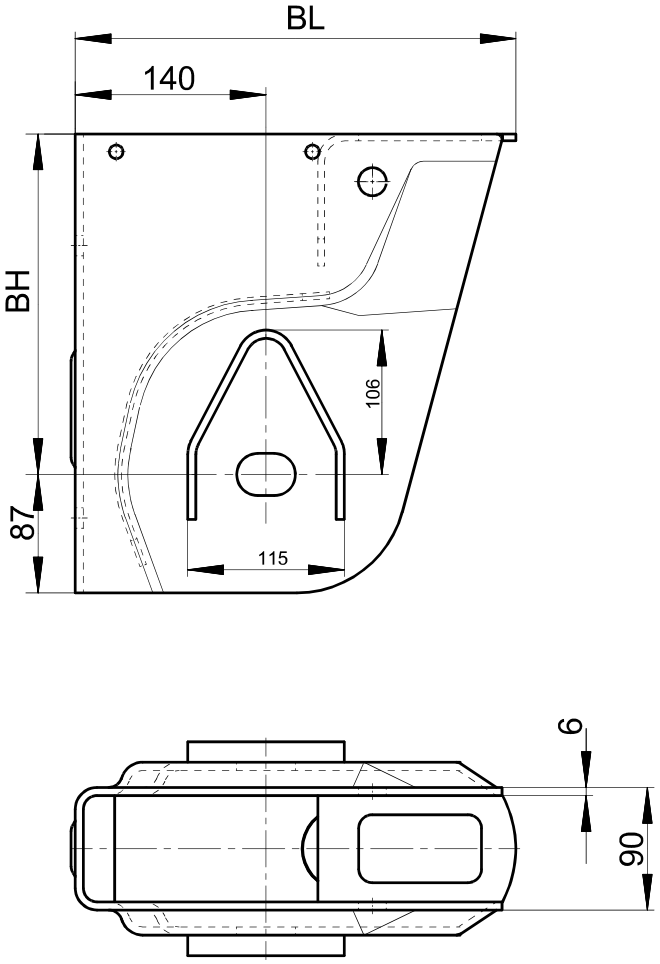


illustration 2 183 0826 00

90 mm frame connection width
Symmetrical hanger brackets
Standard with drain outlet holes



Dimension		Hanger bracket number
BH	BL	
200	310	2 183 0825 00
250	323	2 183 0826 00
300	337	2 183 0827 00
350	350	2 183 0828 00

Geometry cross member, rigid axle

LM = HM

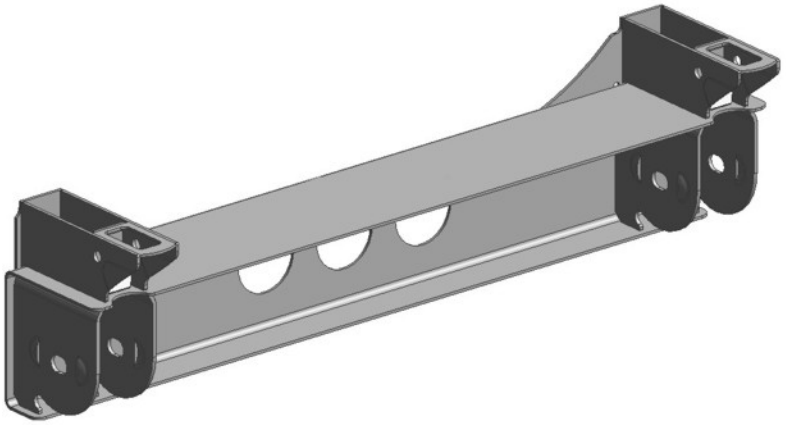
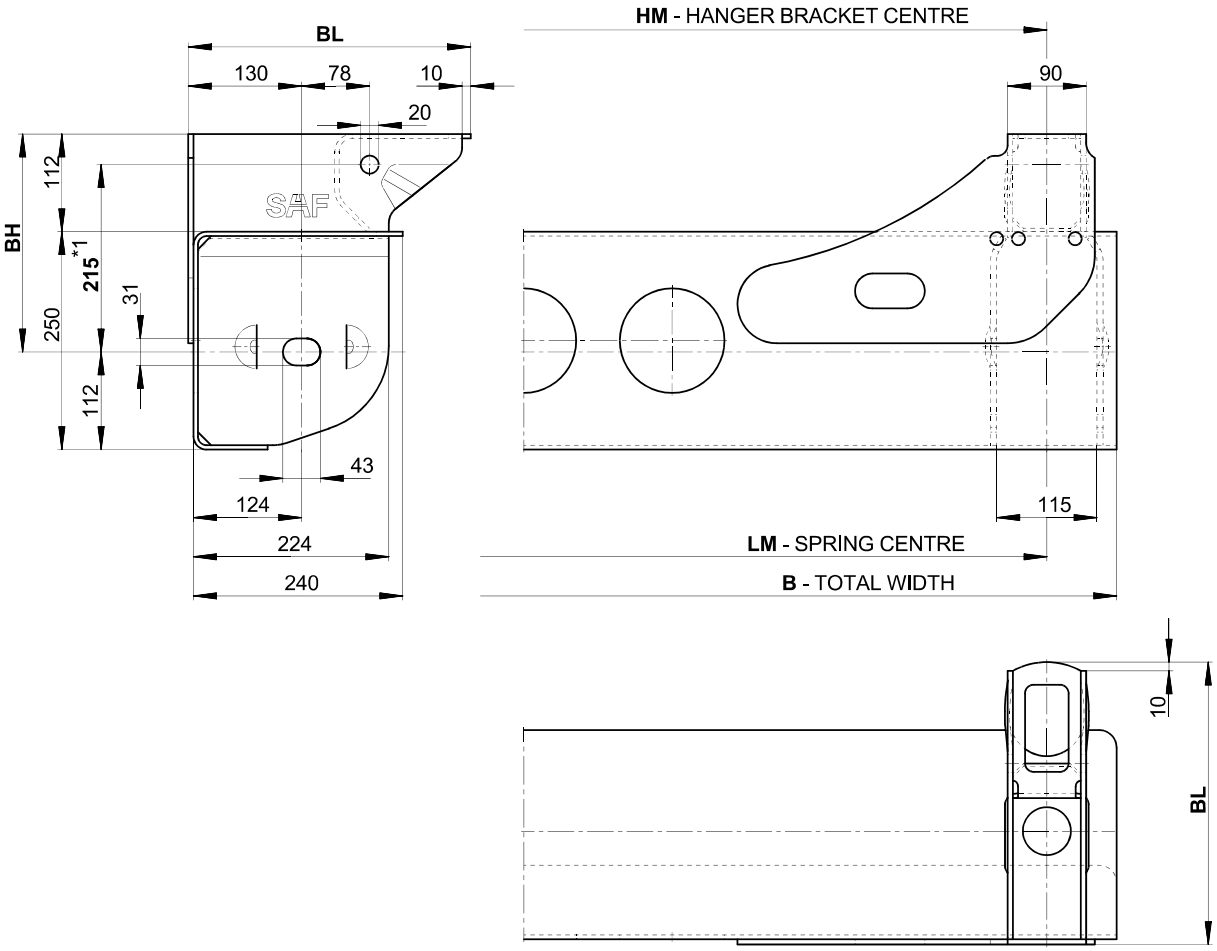


illustration 2 291 0401 00

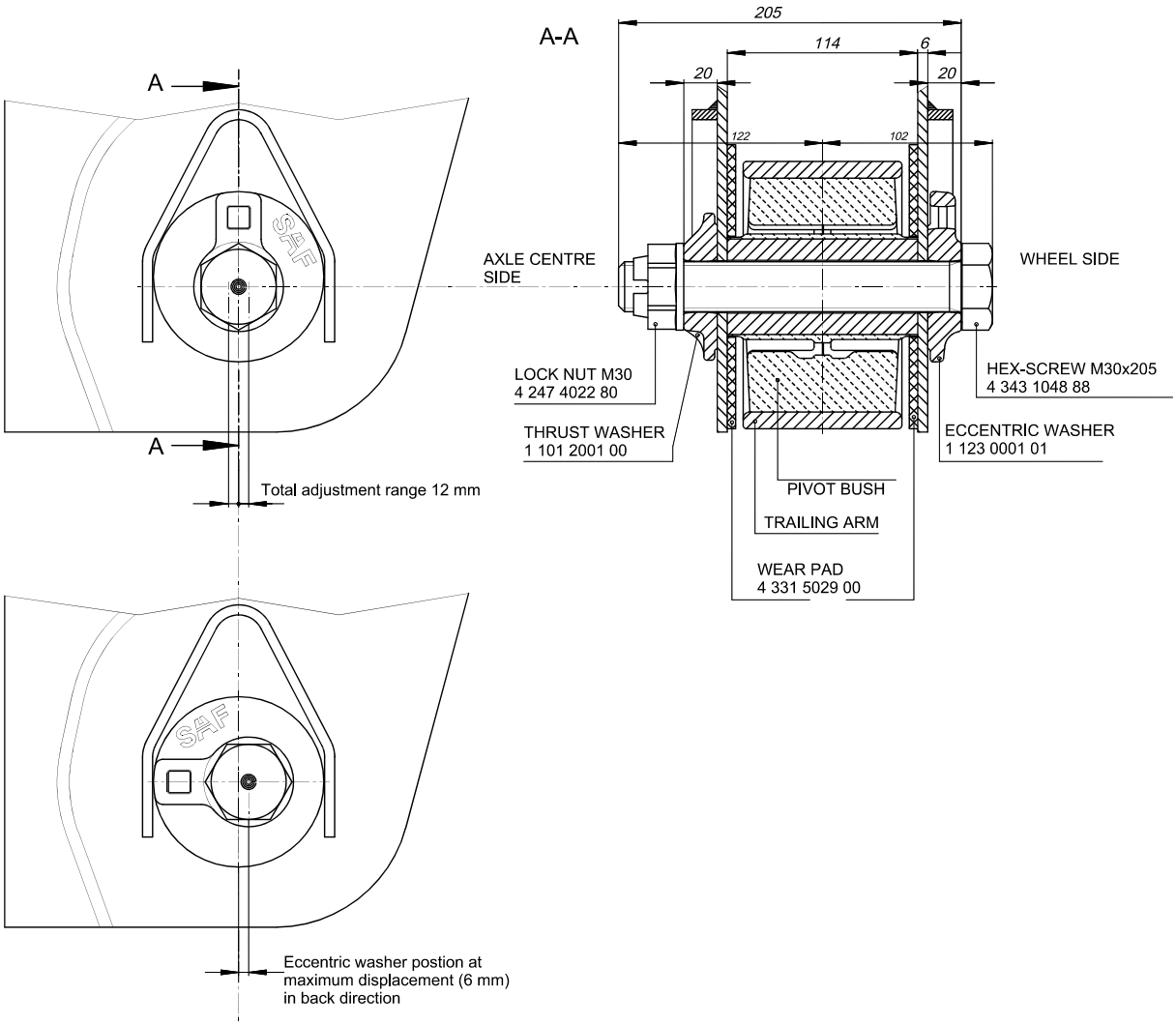


LM	B	BH = 200 mm BL = 324 mm	BH = 250 mm BL = 324 mm	BH = 300 mm BL = 335 mm	BH = 350 mm BL = 335 mm
1200	1360	2 291 0426 00	2 291 0423 00	2 291 0428 00	2 291 0465 00
1300	1460	2 291 0400 00	2 291 0401 00	2 291 0402 00	2 291 0404 00
1400	1560	2 291 0427 00	2 291 0424 00	2 291 0421 00	2 291 0464 00

Lengths in mm

*1 dimension is 165 mm at BH = 200 mm

Adjustable pivot bolt for hanger bracket „steel“ and „cross member“

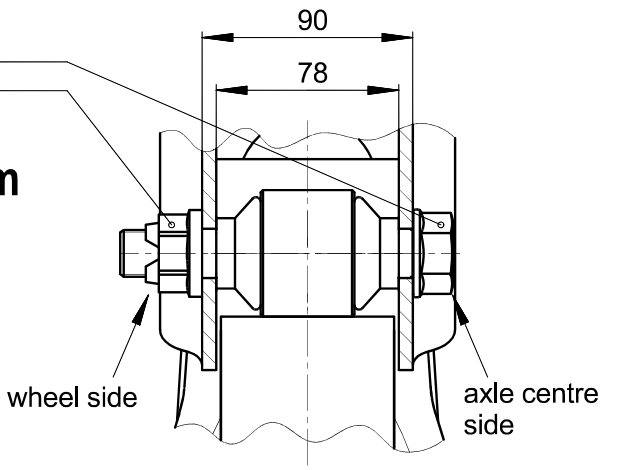


[Tightening torque : 400 Nm + 120°; tightening procedure page 43]

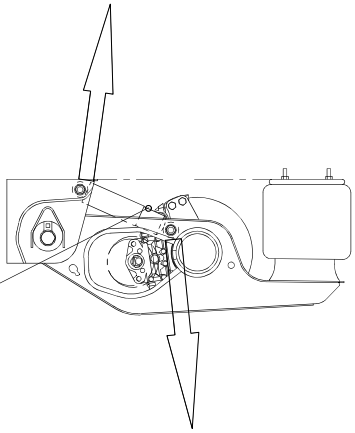
Shock absorber assembly hanger bracket „steel“/cross member - trailing arm

BOLT KIT 3 341 2803 10	
HEXAGON BOLT M20x1,5x125	4 343 2803 10
LOCK NUT M20x1,5	4 247 4044 10

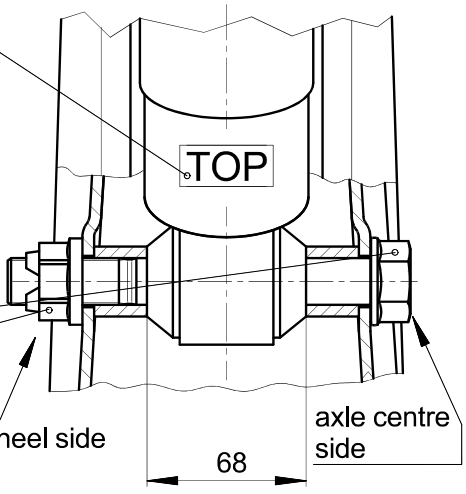
TIGHTENING TORQUE: 600 Nm



view hanger bracket / crossmember



ATTENTION: Mark TOP facing upwards in working position!



BOLT KIT 3 341 2802 10	
HEXAGON BOLT M20x1,5x155	4 343 2802 10
LOCK NUT M20x1,5	4 247 4044 10

TIGHTENING TORQUE: 600 Nm

view trailing arm

Geometry hanger bracket „aluminium“

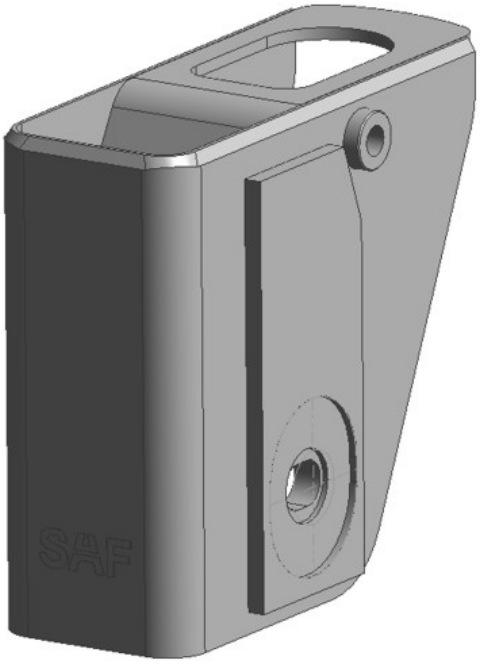
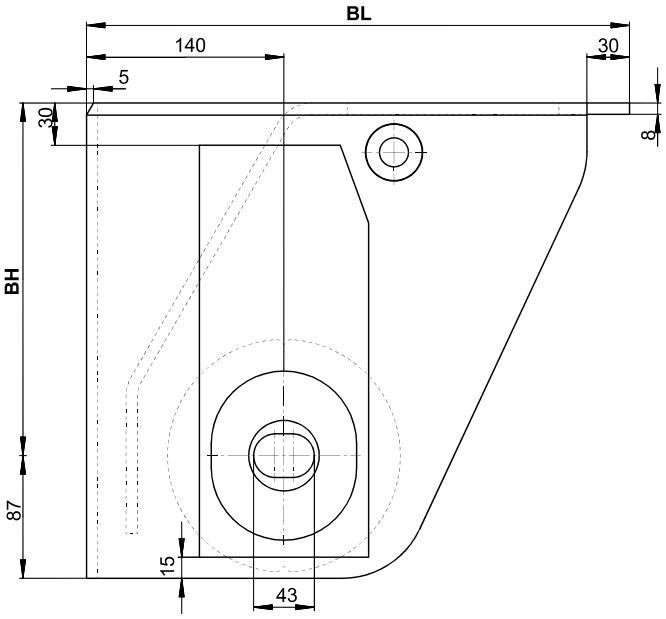
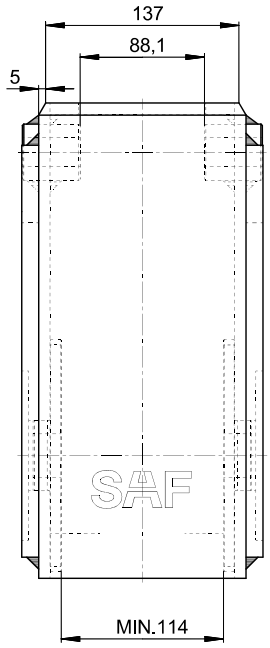
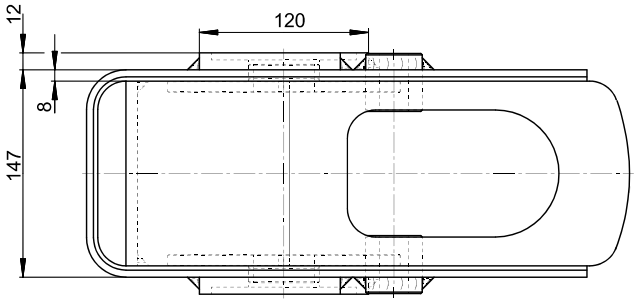


Illustration 2 183 0830 00

Symmetrical hanger brackets

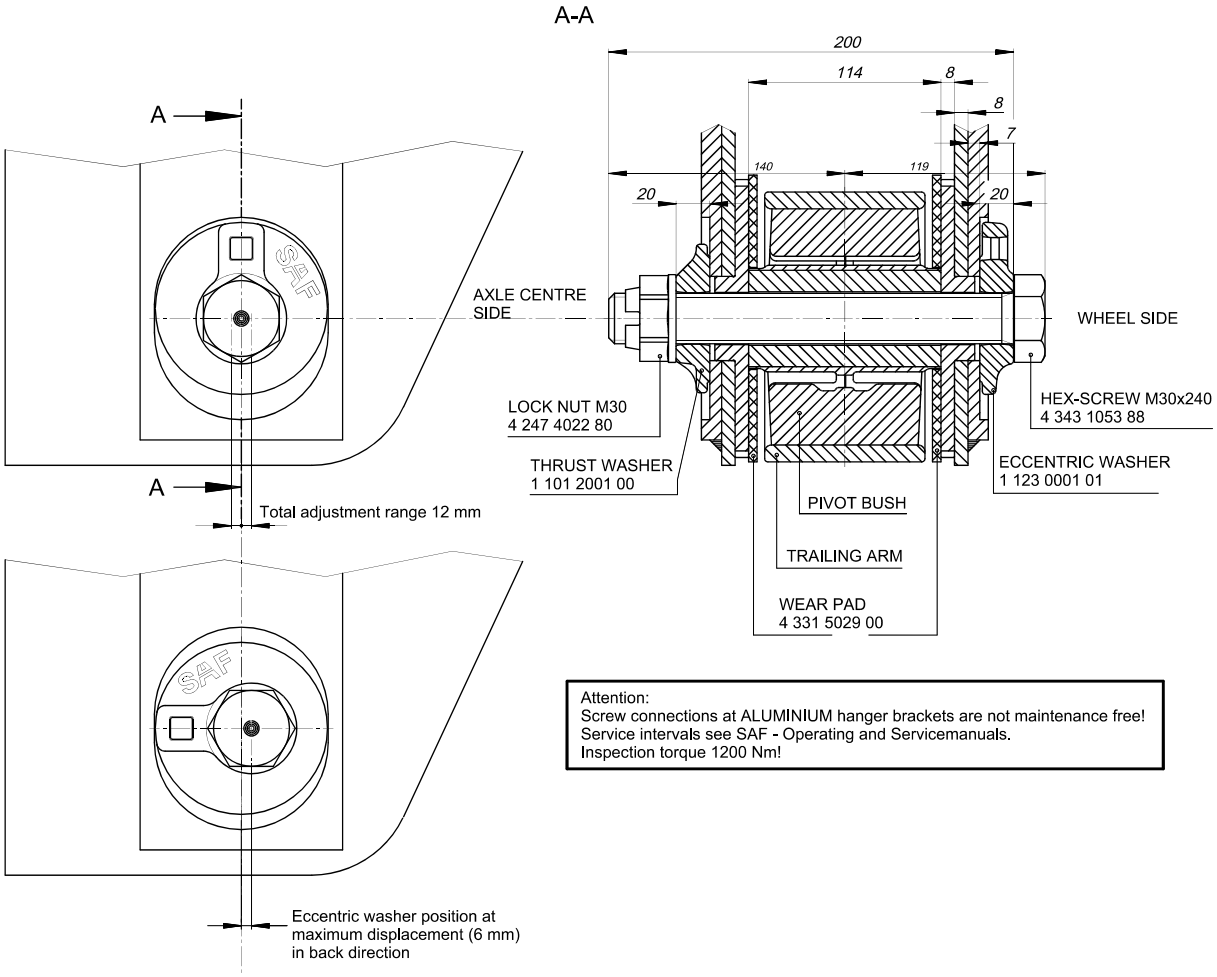






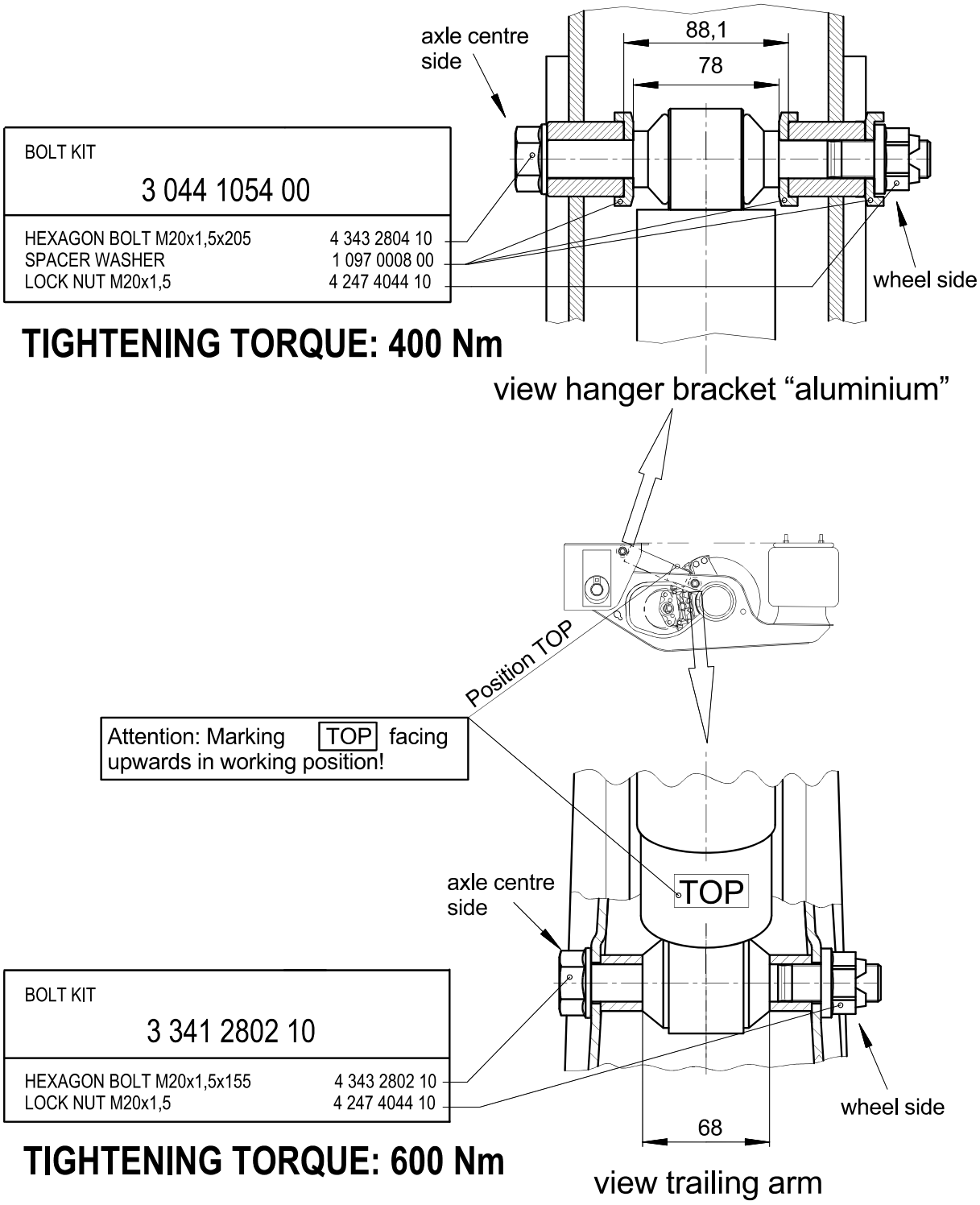
Dimension		Hanger bracket number
BH	BL	
200	360	2 183 0829 00
250	385	2 183 0830 00
300	405	2 183 0831 00
350	430	2 183 0832 00

Adjustable pivot bolt for hanger bracket „aluminium“



[Tightening torque: 400 Nm + 120°; tightening procedure Page 43]

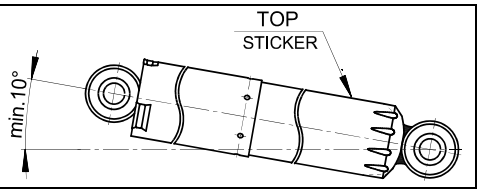
Shock absorber mounting hanger bracket „aluminium“



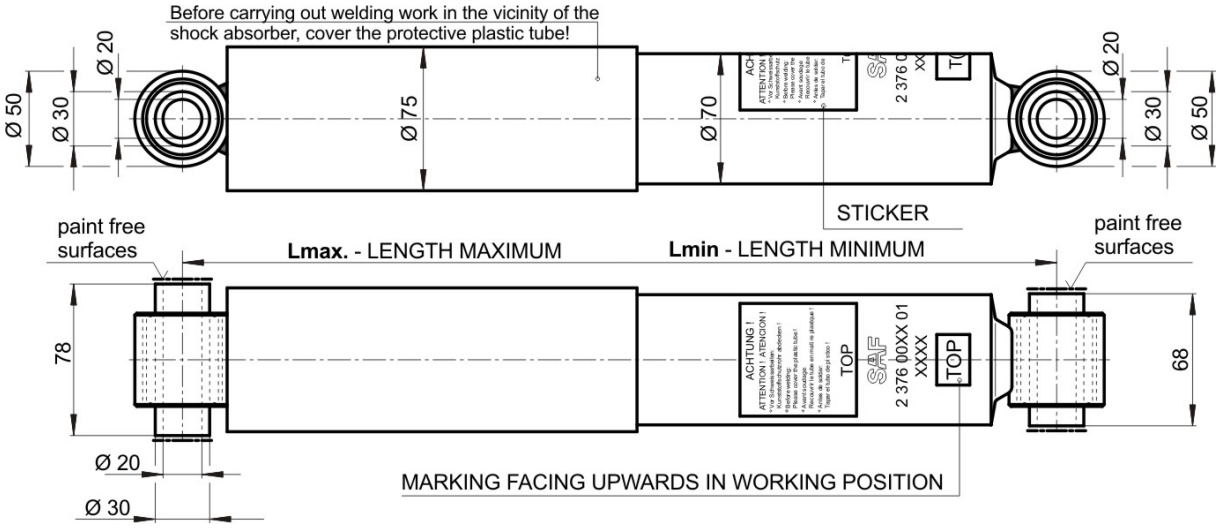
Shock absorber overview

Technical details:

Shock absorber	Lmax.	Lmin.	Stroke
2 376 0070 01	413	278	135
2 376 0071 01	491	315	176
2 376 0072 01	532	335	197



Attention:
Only install shock absorbers from the same manufacturer per axle!



air suspension type	rideheight (mm)	length of shock absorber (mm)			shock absorber
		min.	in ride height	max.	
IU25/2000 33/42/27	250	306	340	380	2 376 0070 01
IU28/2005 33/42/27	280	316	351	390	2 376 0070 01
IU30/2505 33/42/27	300	350	391	437	2 376 0071 01
IU33/2510 33/42/27	330	363	404	447	2 376 0071 01
IU35/3010 33/42/27	350	350	391	437	2 376 0071 01
IO35/2000 33/42/27	355	343	381	421	2 376 0071 01
IO37/2500 33/42/27	375	382	424	470	2 376 0071 01
IO40/2505 33/42/27	405	395	437	482	2 376 0072 01
IO42/3005 33/42/27	425	382	424	470	2 376 0071 01
IO45/3010 33/42/27	455	395	437	482	2 376 0072 01
IO47/3510 33/42/27	475	382	424	470	2 376 0071 01
IO50/3515 33/42/27	505	395	437	482	2 376 0072 01
IU29/2000 31/41	290	316	355	408	2 376 0070 01
IU31/2500 31/41	310	349	395	455	2 376 0071 01
IU34/2505 31/41	340	362	408	466	2 376 0071 01
IU36/3005 31/41	360	349	395	455	2 376 0071 01
IU39/3010 31/41	390	362	408	466	2 376 0071 01
IU42/3015 31/41	420	375	422	476	2 376 0072 01
IO44/3000 31/41	440	380	430	486	2 376 0072 01
IO49/3505 31/41	490	380	430	486	2 376 0072 01

Calculation of clearance between tyre and air bag

The calculated clearance is the distance between tyre and air bag. This must be at least **25** mm.

Calculation formula:

$$\frac{AX - LM - \text{air bag diameter} - \text{tyre width}}{2} + V - ET = \text{Clearance}$$

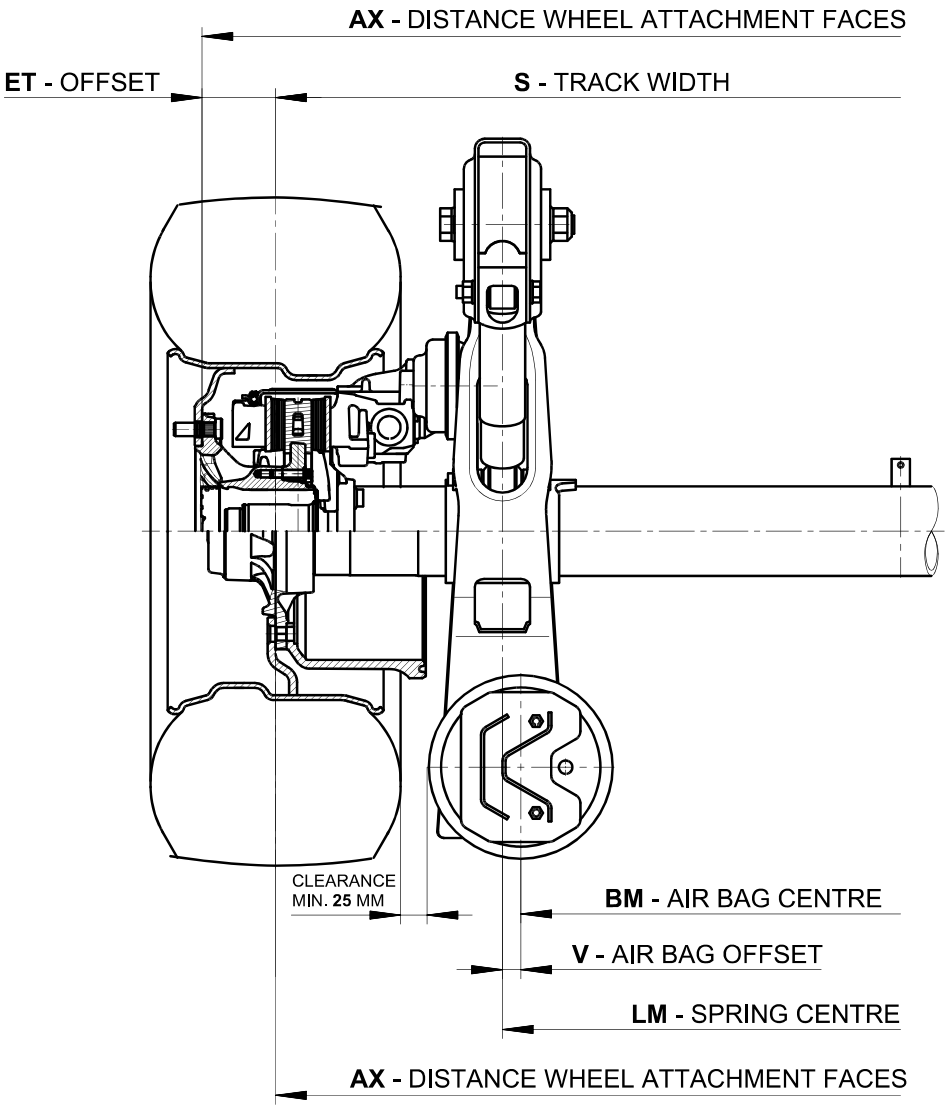
As example the suspensions:

IO35/2000 33 S9-4218
distance wheel attachment faces: 2040 mm
spring centre 1300 mm
air bag diameter 300 mm
mounted tyre 385/65R22,5“
(E.T.R.T.O Norm 405 mm)
air bag offset 30 mm
offset 0 mm

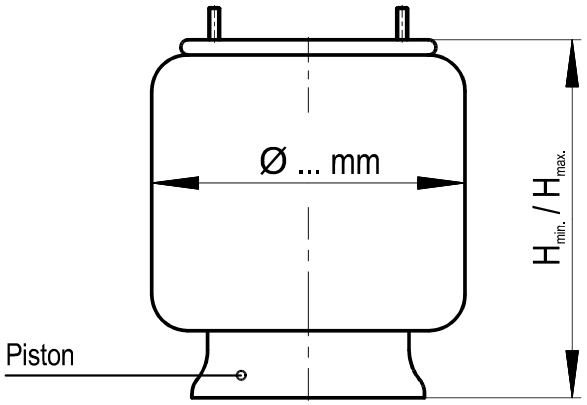
$$\frac{2040 - 1300 - 300 - 405}{2} + 30 - 0 = 47{,}5 \text{ mm}$$

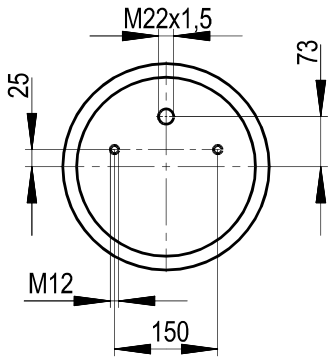
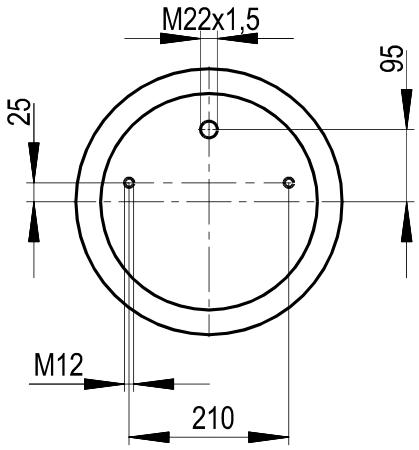
IU34/2505 41 BI9-19W
distance wheel attachment faces: 2330 mm
spring center 1300 mm
air bag diameter 350 mm
mounted tyre 425/55R19,5“
(E.T.R.T.O Norm 438 mm)
air bag offset 30 mm
offset 120 mm

$$\frac{2330 - 1300 - 350 - 438}{2} + 30 - 120 = 31 \text{mm}$$

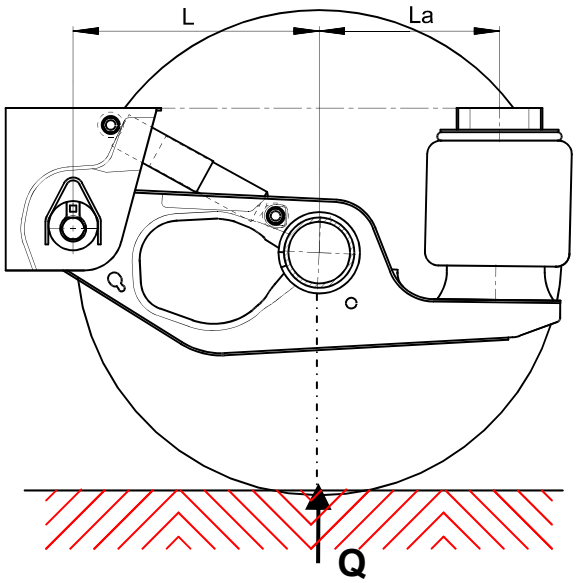


Air bag overview



Description	Article number - code:	Top view
2619V H_{min} = 190 mm H_{max} = 560 mm Ø 300 mm plastic piston	3 228 1033 00 - **33**	
2918V H_{min} = 190 mm H_{max} = 530 mm Ø 350 mm steel piston	3 228 1027 00 - **27**	
2919V H_{min} = 190 mm H_{max} = 560 mm Ø 350 mm plastic piston	3 228 1042 00 - **42**	
2923V H_{min} = 235 mm H_{max} = 630 mm Ø 350 mm steel piston	3 228 1031 00 - **31**	
2924V H_{min} = 235 mm H_{max} = 630 mm Ø 350 mm plastic piston	3 228 1041 00 - **41**	

Calculation of the air bag pressure



Formula to calculate the air pressure when fully laden:

$$P = \frac{(Q - A) * i * p}{2} * 10^5 \text{ Pa} \qquad (1 \text{ bar} = 10^5 \text{ N/m}^2 = 10^5 \text{ Pa} = 0{,}1 \text{ MPa})$$

P = air pressure in the air bag (Pa)
Q = permissible axle load on the ground (kg)
A = unsprung mass (kg) mean value for A = Q × 0,1

i = ratio $\qquad i = \frac{L}{L + La}$

p = air pressure in the air bag per kg load
air bag Ø 300mm (SAF 2619V) $\qquad p = 0{,}00227 * 10^5$ Pa/kg
air bag Ø 350mm (SAF 2919V / 2918V / 2924V /2923V) $\qquad p = 0{,}0018 * 10^5$ Pa/kg

Example:
Air suspension IU30/2505 33 (air bag SAF 2619V)
Q = 9000 kg $\qquad$ A = Q × 0,1 = 900 kg
L = 500 mm, La = 385 mm $\qquad i = \frac{500}{500 + 385} = 0{,}565$
p = 0,00227 *10^5 Pa/kg $\qquad P = \frac{(9000 - 900) * 0{,}565 * 0{,}00227}{2} * 10^5$ Pa

P = 5,2 *10^5 Pa

Formula to calculate the air pressure when partially loaded:

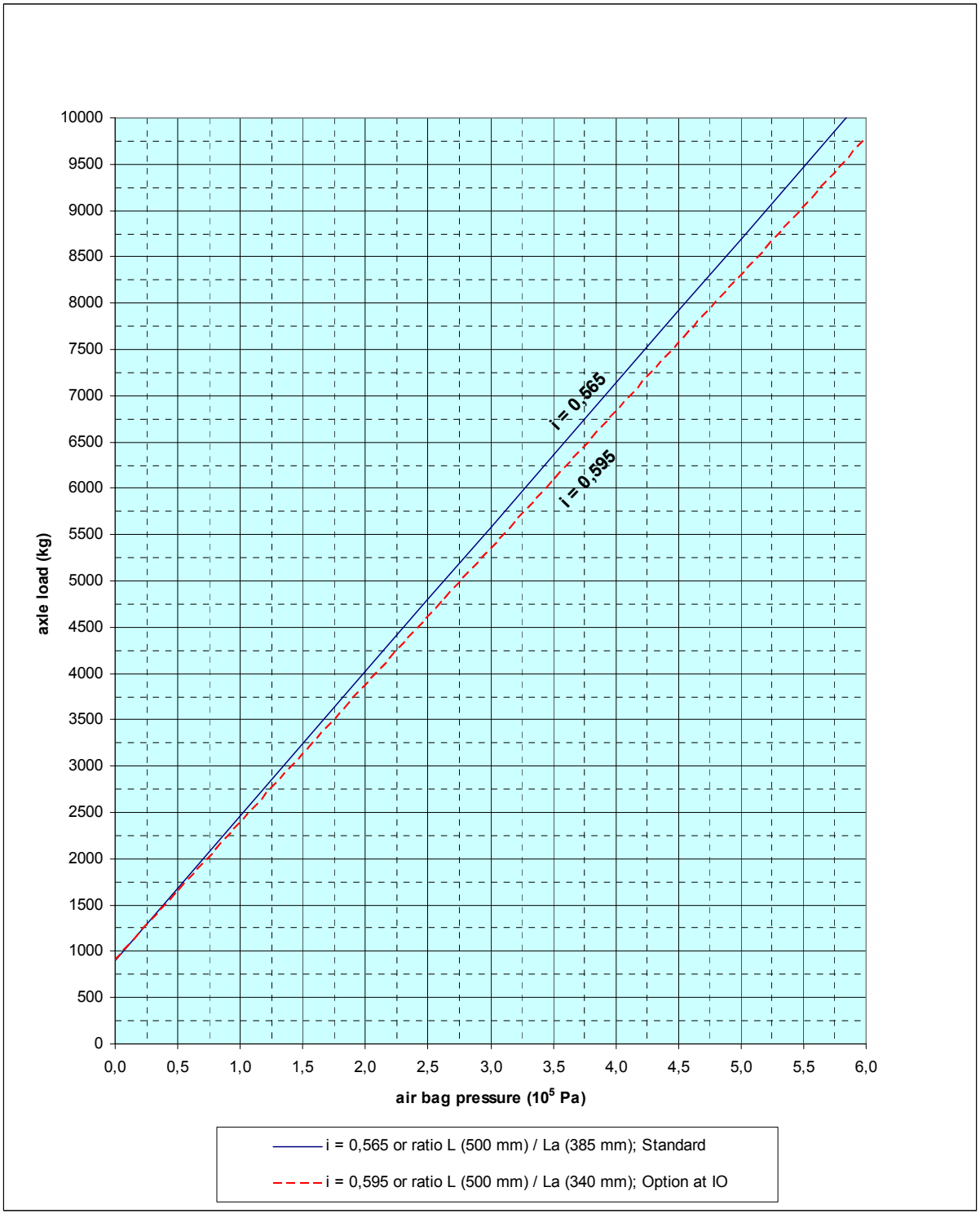
$$P_t = \frac{(Q_t - A) * i * p}{2} * 10^5 \text{ Pa}$$

Q_t = axle load on the ground when partially loaded
Example:
Air suspension IU30/2505 33 (with air bag SAF 2619V)
Q = 9000 kg $\qquad$ A = Q × 0,1 = 900 kg
Q_t = 2100 kg
L = 500 mm, La = 385 mm $\qquad i = \frac{500}{500 + 385} = 0{,}565$
p = 0,00227 *10^5 Pa/kg $\qquad P_t = \frac{(2100 - 900) * 0{,}565 * 0{,}00227}{2} * 10^5$ Pa

P_t =0,77 *10^5 Pa

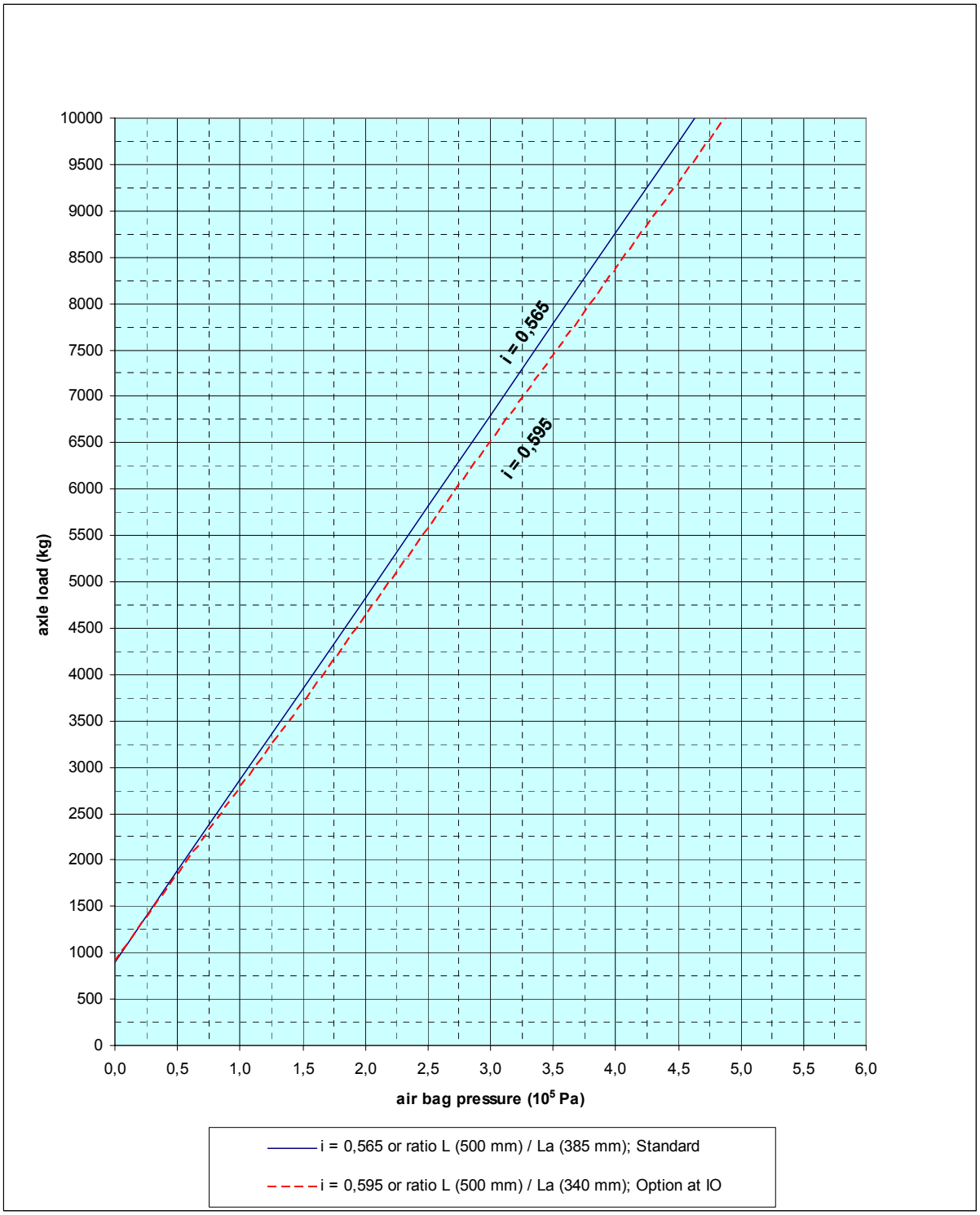
Pressure-force-diagram for air bag with diameter 300 mm

Air bag: SAF 2619V (33)



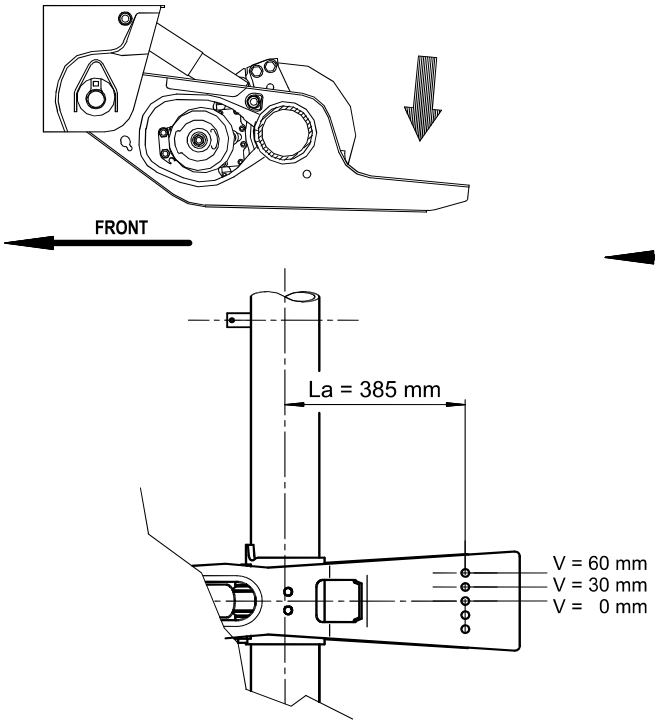
Pressure-force-diagram for air bag with diameter 350 mm

Air bags: **SAF 2918V (27)**
SAF 2923V (31)
SAF 2924V (41)
SAF 2919V (42)

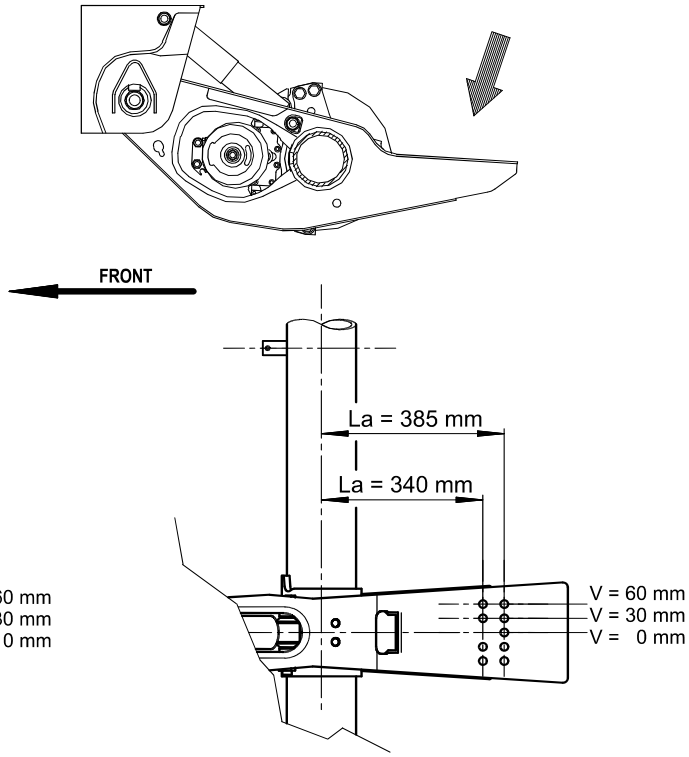


Air bag fixing on trailing arm

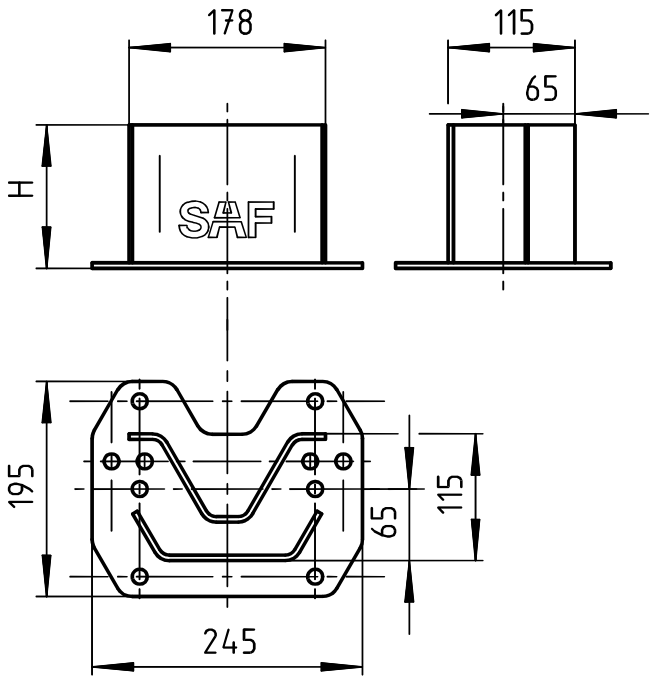
trailing arm IU



trailing arm IO



Overview air bag brackets

article number.:	H (mm)	description	
2 237 0081 01	50	air bag bracket „steel“	
2 237 0080 01	100		
2 237 0082 01	150		

Surface coating of SAF components

Corrosion protection of SAF products:

- Axle beams and trailing arms with cathodic hot-dip coating, alternatively 2-component coating, colour black RAL 9005.
- All bolts and fittings with dacromet coating, colour grey metallic.
- Front hanger brackets with 2-component coating, colour black RAL 9005.
- Wheel attachment face: thin cathodic hot-dip coating, coat thickness max. **30** µm colour black RAL 9005, alternatively transparent temporary corrosion protection (not to remove before mounting of a wheel).

Cathodic dip coating (KTL):

The coat thickness is max. 45 µm.
Features:

- Complete corrosion protection in all areas of the component.
- High surface hardness with uniform coat thickness.
- Can be painted over with all single-component or 2-component top coats.
- Top coat not necessary if finish is not of importance.

2-component-priming

Primer coat for additional top coat.
Coat thickness is max. **45** µm.

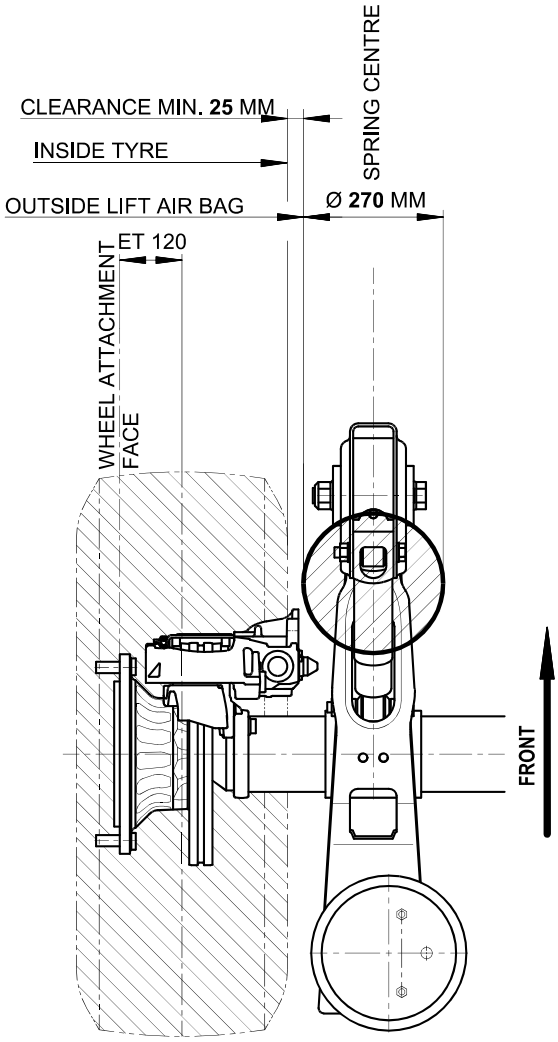
Dacromet coating

Corrosion protection with sliding properties
Protection min. 504 h in salt spray test to DIN 50021

Treatment during axle and suspension installation:

- In principle, dip coating and 2-component primers can be welded. SAF recommends, however, that these coats be removed in the area of weld seams.
- All contact surfaces of the pivot bolts and shock absorbers bolts must not have additional primer or paint coatings.
- Wheel attachment faces must not be painted. The permissible coat thickness (primer + top coat) of the wheel can not be more than **50** µm. The surfaces must be clean and free of grease. In generall the remarks of the wheel manufactures need to be followed.

Two-side axle lift



Calculation of clearance between lift air bag and tyre

The clearance must be at least **25** mm.

Formula:

$$\frac{AX - LM - \text{max. tyre width} - 270}{2} - ET = \text{clearance}$$

Example with: IU25/2000 33 BI9-22K01

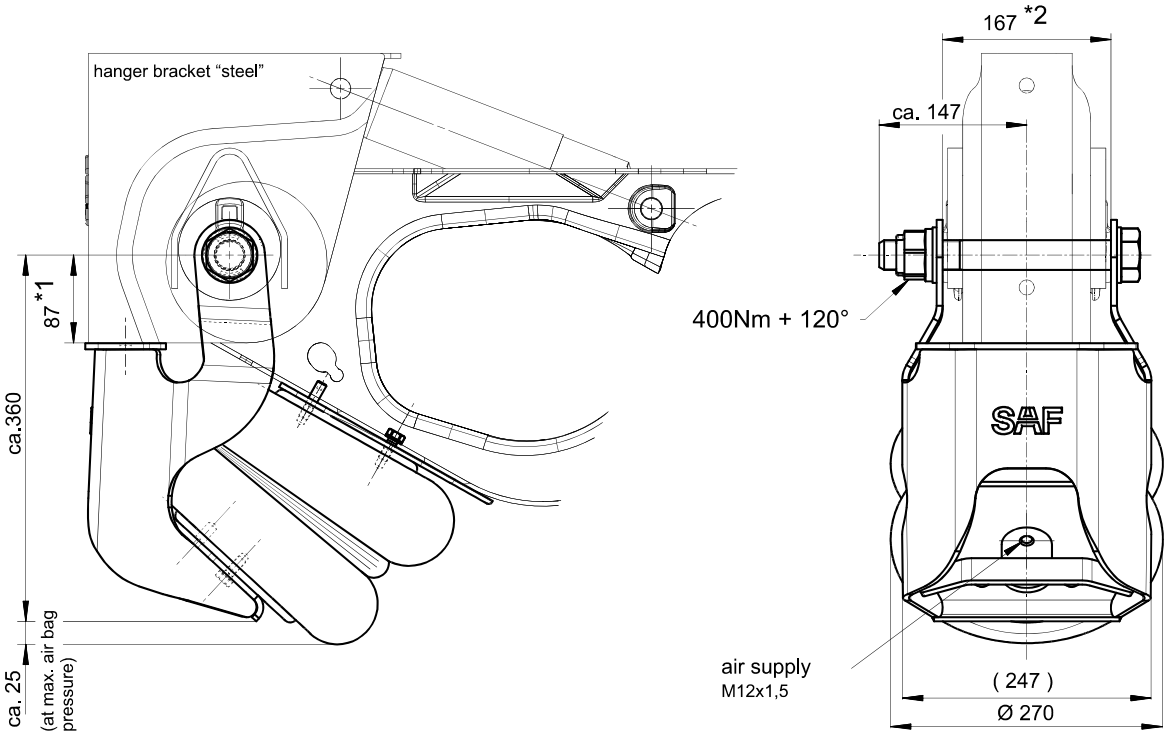
- distance wheel attachment faces: 2280 mm
- spring centre: 1300 mm
- tyre width (max.): 405 mm
  (E.T.R.TO. Norm for tyre size 385/65R22,5“)
- lift air bag diameter max. 270 mm
- offset 120 mm

$$\frac{2280 - 1300 - 405 - 270}{2} - 120 = \text{clearance} = 32{,}5 > 25$$

Types

Following types are obtainable

kitnumber.:	application
3 027 1242 01	for hanger bracket „steel“
3 027 1243 01	for cross member
3 027 1244 01	for hanger bracket „aluminium“

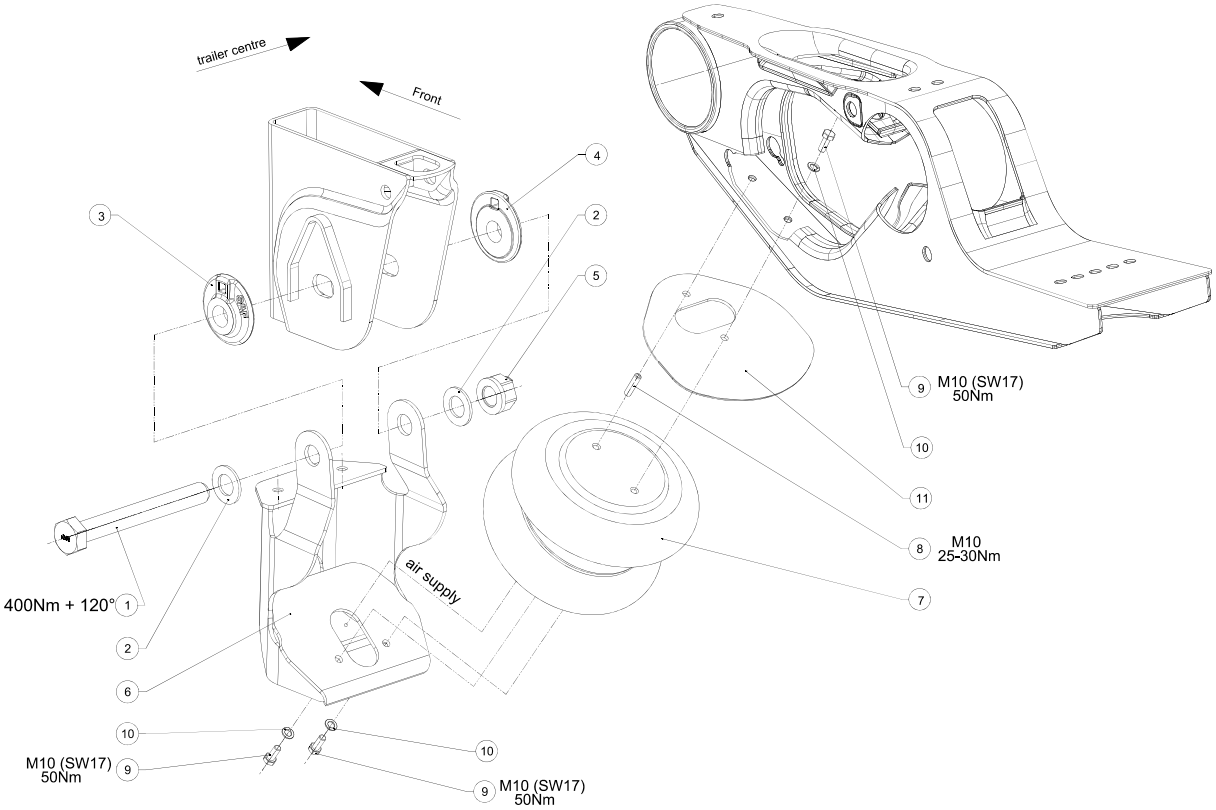


*1 with lift arm for cross member 112 mm
*2 with hanger bracket „aluminium“ 203 mm

Kit-content:

Per axle two kits are needed.

	kitnumber:		hanger bracket "steel" 3 027 1242 01	cross member 3 027 1243 01	hanger bracket "aluminium" 3 027 1244 01
lift arm	Item 6	1x	2 239 0036 00	2 239 0040 00	2 239 0038 00
hexagon screw	Item 1	1x	4 343 1053 88		4 343 1049 88
lock nut	Item 5	1x	4 247 4022 80		
lift air bag	Item 7	1x	4 229 1005 01		
protection plate	Item 11	1x	1 336 0003 00		
washer	Item 2	2x	1 331 0117 00		
hexagon screw	Item 9	3x	4 343 1006 88		
spring washer	Item 10	3x	4 141 0002 00		
threaded bolt	Item 8	1x	4 375 0903 45		



Installation instruction

Installation of the lift arm:

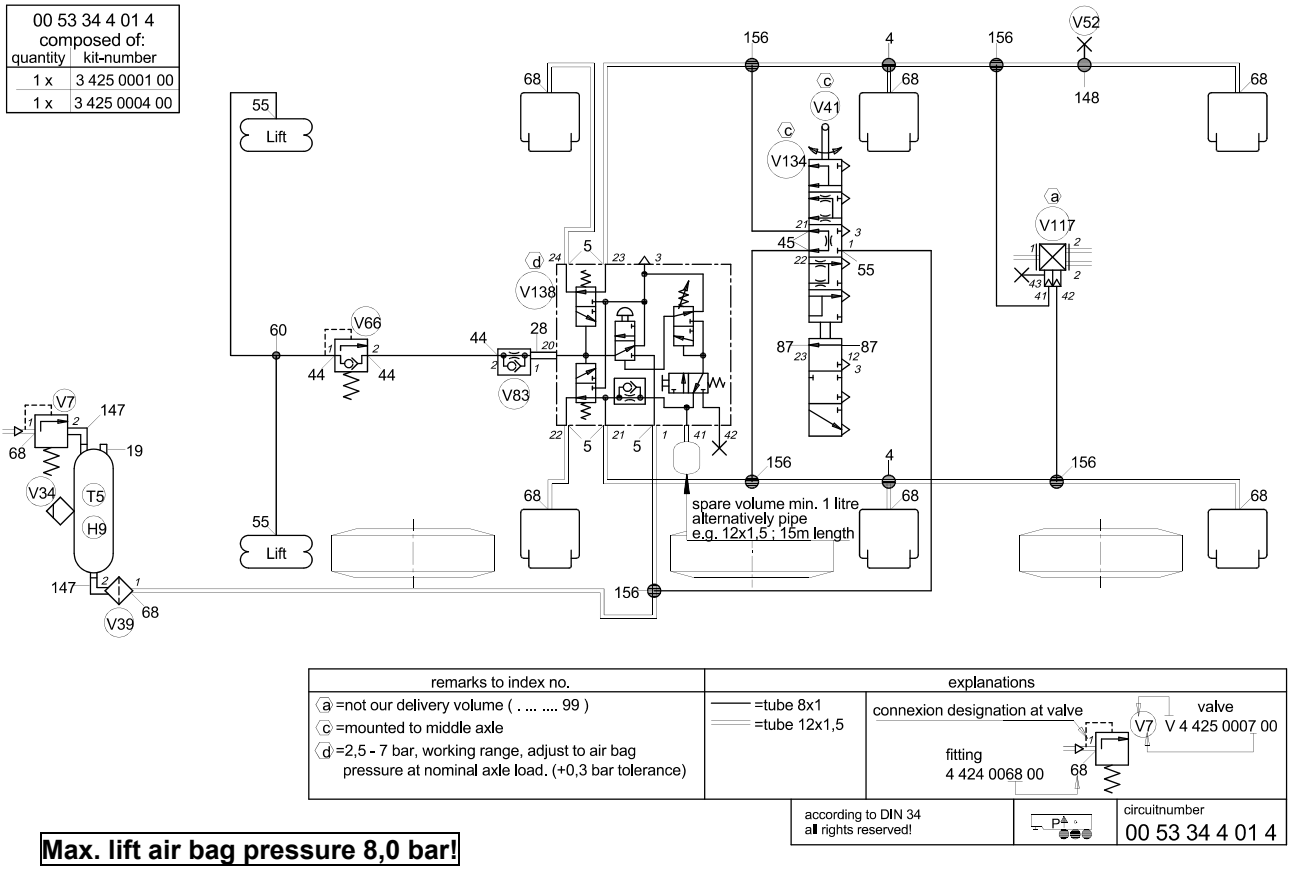
- ✓ Remove the existing suspension mounting bolts (**3-4** re-use)
- ✓ Position the lift arm **(6)** over the hanger bracket or cross member.
- ✓ Mount the pivot bolt according to the illustration, **1, 2 and 5** new from the kit. **3 and 4** re-use.
- ✓ **Important: the pivot bolt must be tightened according to the SAF-HOLLAND torque regulations in the ride height.**
  (400Nm + 120°, siehe Seite 43)

Installation of the lift air bag:

- ✓ Fix the lift air bag **(7)** from underneath with two bolts enclosed **(9)** and washers **(10)** to the lift arm. **(torque moment 50Nm)**
- ✓ The air connection of the lift air bag **must,** point down to the lift arm **(6),** as illustrated.
- ✓ Screw the threaded bolt **(8)** to the upper bag plate as illustrated **(torque moment 25-30Nm)**
- ✓ Lift air bag **(7)** and protection plate **(11)** are locked by the threaded bolt **(8)** and fixed with bolt **(9)** as well as the washer **(10)** from the inner side of the trailing arm.
  (torque moment 50Nm)

Circuit diagram

Triaxle with two-side lift with lift axle control valve (pneumatically controlled)



remarks to index no.	explanations
(a) =not our delivery volume (. ... . 99) (c) =mounted to middle axle (d) =2,5 - 7 bar, working range, adjust to air bag pressure at nominal axle load. (+0,3 bar tolerance)	=tube 8x1 =tube 12x1,5 connexion designation at valve valve V7 V 4 425 0007 00 fitting 4 424 0068 00 68
according to DIN 34 all rights reserved!	circuitnumber 00 53 34 4 01 4

Max. lift air bag pressure 8,0 bar!

reference no. ⇨ **00 53 34 4 01 4** ⇨ **composed of:**

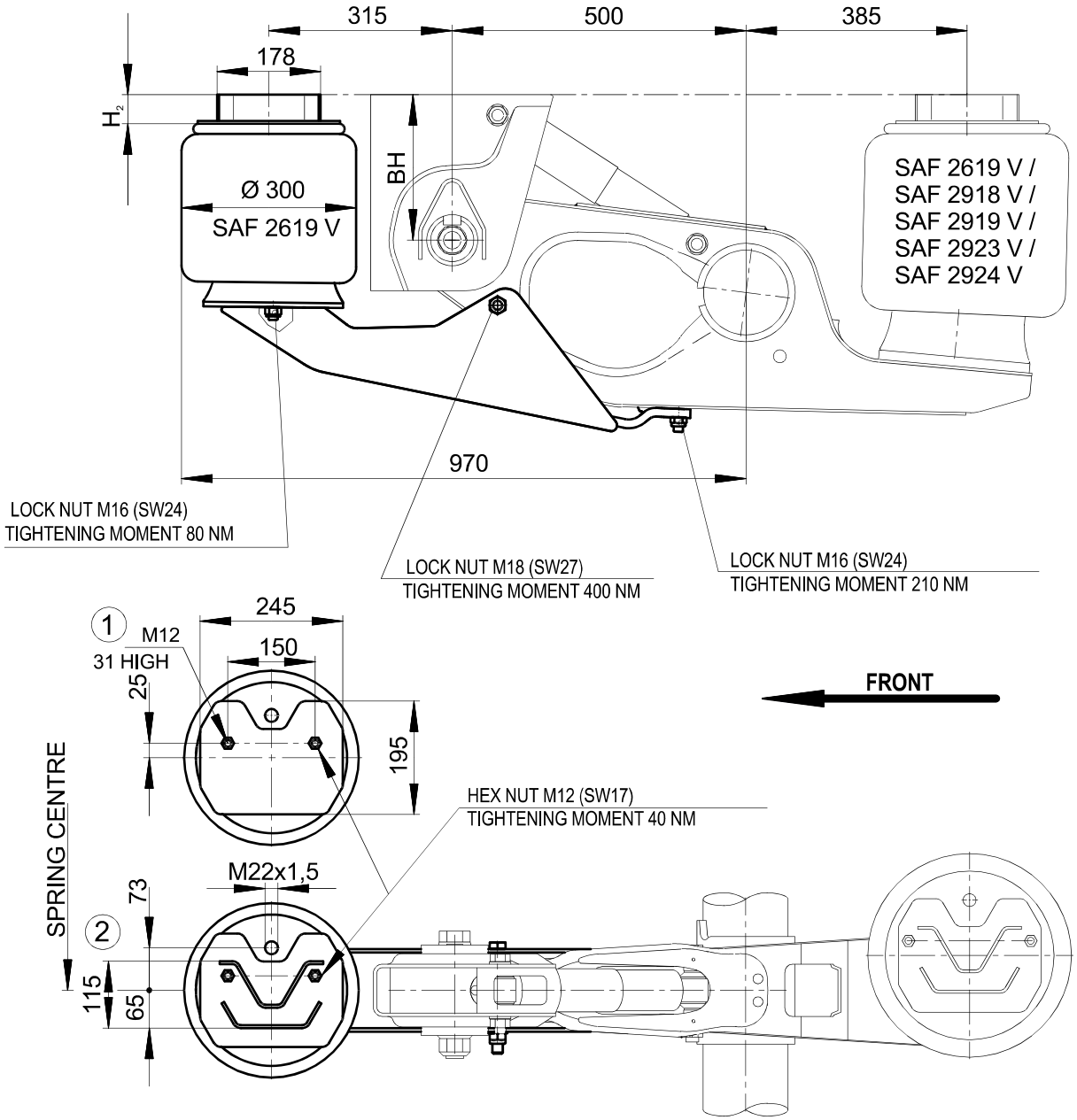
SAF-KIT-Basic 3 425 0001 00	1x	SAF-KIT-2SL 3 425 0004 00	1x

SAF reference	quantity	SAF reference	quantity	description	dimensions	WABCO ref.
4.424.0004.40	2	4.424.0004.40	1	EQUAL TEE COUPLING	D12/12/12	893 861 450 0
		4.424.0005.40	5	STRAIGHT MALE STUD COUPLING	M16x1,5/D12	893 803 430 0
4.424.0019.40	1			MALE PLUG	M22x1,5	893 022 009 4
		4.424.0028.40	1	DOUBLE CONNECTOR	M22x1,5	893 890 440 0
4.424.0044.40	1	4.424.0044.40	3	STRAIGHT MALE STUD COUPLING	M22x1,5/D8	893 803 400 0
4.424.0045.40	2			STRAIGHT MALE STUD COUPLING	M12x1,5/D8	893 803 490 0
4.424.0055.40	1	4.424.0055.40	2	MALE STUD ELBOW COUPLING	M12x1,5/D8	893 831 240 0
		4.424.0060.40	1	EQUAL TEE COUPLING	D8/8/8	893 862 010 0
4.424.0068.40	7	4.424.0068.40	1	STRAIGHT MALE STUD COUPLING	M22x1,5/D12	893 803 440 0
4.424.0087.40	2			MALE PLUG	M16x1,5	893 022 008 4
4.424.0147.40	2			ELBOW WITH LOCK NUT	M22x1,5	893 890 641 0
4.424.0148.40	1			MALE STUD TEE COUPLING	M22x1,5/D12/D12	893 850 970 0
4.424.0156.40	4	4.424.0156.40	1	EQUAL TEE COUPLING	D12/8/12	
V 4.425.0007.00	1			CHARGING VALVE WITHOUT RETURN FLOW 6,0 BAR	M22x1,5	434 100 125 0
V 4.425.0034.40	1			DRAIN VALVE	M22x1,5	934 300 001 0
V 4.425.0039.00	1			LINE FILTER	M22x1,5	432 500 020 0
V 4.425.0041.00	1			LINK CONNECTION FOR LEVELLING VALVE	M8/D6	433 401 003 0
V 4.425.0052.00	1			TEST COUPLING	M22x1,5	463 703 117 0
		V 4.425.0066.00	1	CHARGING VALVE WITH RETURN FLOW 0,5 BAR	M22x1,5	434 100 027 0
		V 4.425.0083.00	1	CHECK VALVE CONSTANT THROTTING D1	M22x1,5	434 014 001 0
V 4.425.0117.99	(1)□			LOAD SENSING VALVE		475 714 500 0
V 4.425.0134.00	1			LEVELLING VALVE	M12x1,5/M16x1,5	464 006 100 0
		V 4.425.0138.00	1	LIFT AXLE CONTROL VALVE	M16x1,5/M22x1,5	463 084 000 0
T 4.105.0005.00	1△			AIR RESERVOIR 60 LTR	D276x1100	950 760 002 0
H 4.405.0009.00	2△			HOLDER (AIR RESERVOIR) 40/60 LTR	D276	451 999 276 2

□ = not SAF delivery volume.
△ = do not belong to a SAF-KIT.

One-side axle lift

Types



Also suitable for steering axles.
Axle lift may be mounted on the left or right hand side.
Lift air bag offset is not permissible.
We recommend a minimum of 100 mm lift travel when setting the ride height.

Air suspension type		BH	H_2	article no.	weight complete
IU../20.. XX	IO../20.. XX	200	5	3 027 1257 00	approx. 30,5 kg
IU../25.. XX	IO../25.. XX	250	50	3 027 1258 00	approx. 31,4 kg
IU../30.. XX	IO../30.. XX	300	100	3 027 1259 00	approx. 32,3 kg
IU../35.. XX	IO../35.. XX	350	150	3 027 1260 00	approx. 33,2 kg

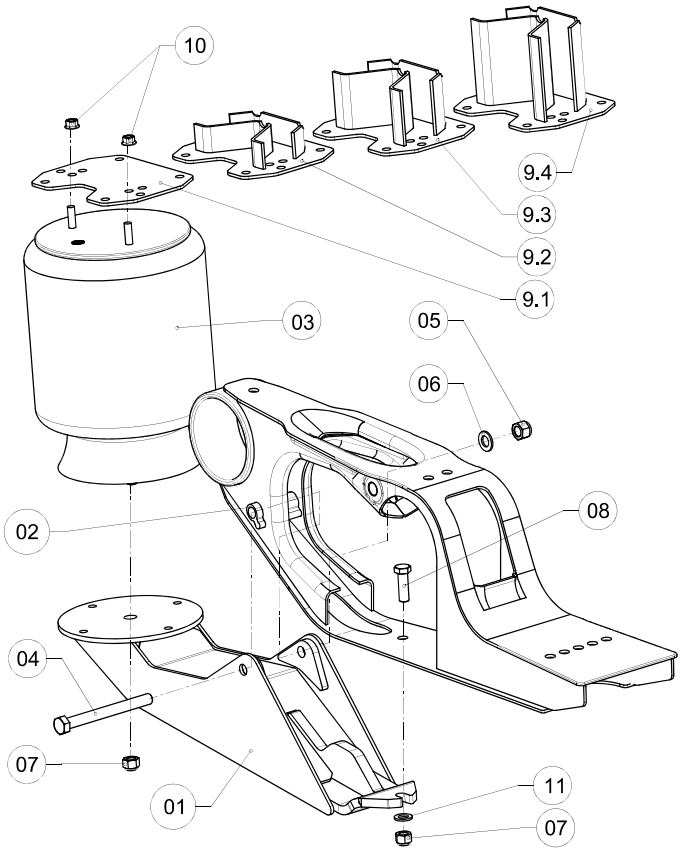
XX = „Standard“ air bag SAF 2619V, SAF 2918V, SAF 2919V, SAF 2923V, SAF 2924V

For instance, the one-side lift for air suspension type: IO40/2505 33 is the article no. 3 027 1258 00.

Kit content:

Per axle one kit is needed.

			at:	BH 200	BH 250	BH 300	BH 350
			kitnummer:	3 027 1257 00	3 027 1258 00	3 027 1259 00	3 027 1260 00
air bag bracket (H_2)	Pos. 9.*	1x		1 043 0261 01	2 237 0081 01	2 237 0080 01	2 237 0082 01
lift arm	Pos. 1	1x		2 239 0042 00			
guide	Pos. 2	1x		1 148 0010 00			
lift air bag	Pos. 3	1x		3 229 0033 00			
hexagon bolt	Pos. 4	1x		4 343 0151 10			
lock nut	Pos. 5	1x		4 247 4026 10			
washer	Pos. 6	1x		4 348 1021 00			
lock nut	Pos. 7	2x		4 247 4007 80			
hexagon bolt	Pos. 8	1x		4 343 1010 88			
hexagon nut	Pos. 10	2x		4 247 4047 10			
spring washer	Pos. 11	1x		4 331 1004 00			



Installation instruction

Lift arm installation:

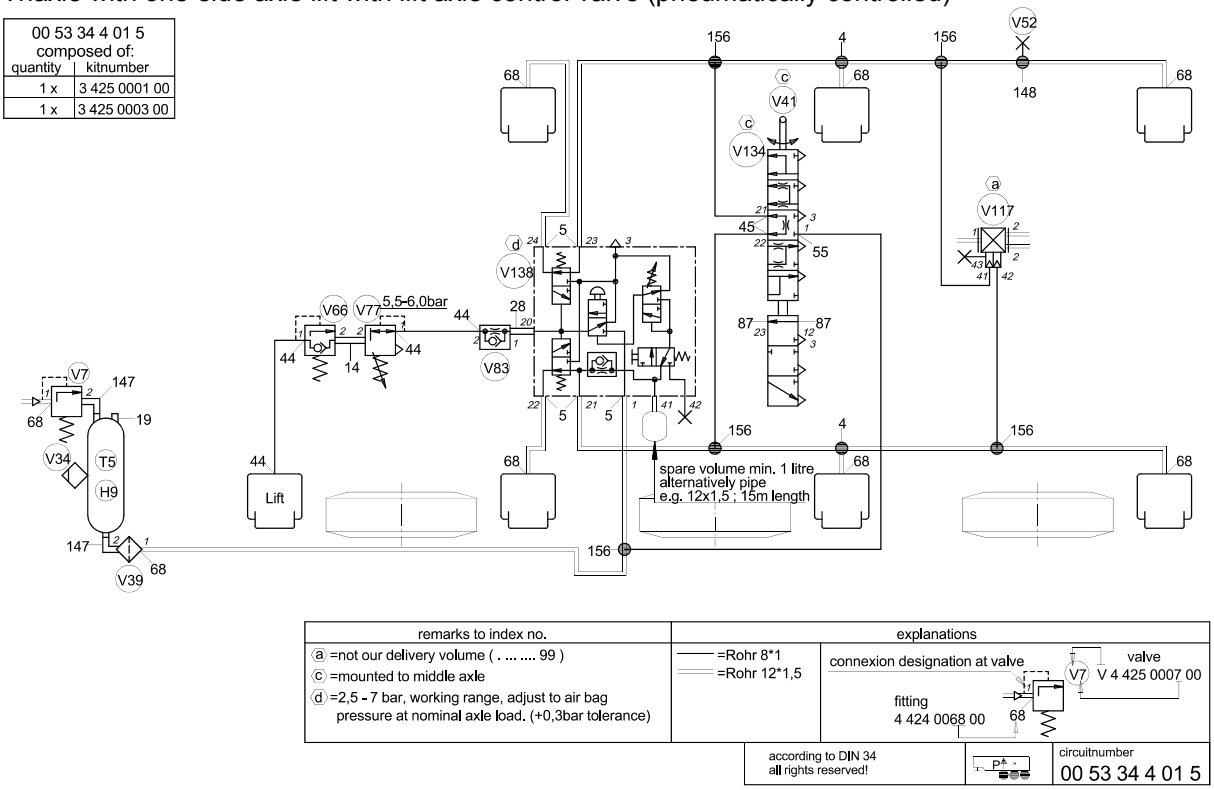
- ✓ Position guide **(2)** in the gap in the trailing arm
- ✓ Place lift arm **(1)** in the guide **(2)** using bolt (**4**), nut **(5)**, and washer **(6)** as in the illustration
- ✓ Fix the lift arm **(1)** to the under side of the trailing arm with bolt **(Tightening moment 400Nm)** (**8**), washer **(11)** and nut **(7)** **(Tightening moment 210Nm)**

Lift air bag installation:

- ✓ Fix the lift air bag bracket **(9.1/9.4)** to the chassis as per illustration page 41
- ✓ Screw lift air bag **(3)** with nut **(7)** to lift arm **(1)** **(Tightening moment 80Nm)**
- ✓ Screw the dowel pins of the air bag plate to the air bag bracket **(9.1/9.4)** using nut **(10)** **(Tightening moment 40Nm)**
- ✓ The air supply of the lift air bag **(3) must** lie in the cut out position of the lift air bag bracket **(9.1/9.4)**.
- ✓ Tighten according to the illustration on page 35

Circuit diagram

Triaxle with one-side axle lift with lift axle control valve (pneumatically controlled)



Max. lift air bag pressure 6,0 bar!

Reference no. ⇨ **00 53 34 4 01 5** ⇨ **composed of**

SAF KIT Basic 3 425 0001 00	1x	SAF KIT 1SL 3 425 0003 00	1x			
SAF reference	quantity	SAF reference	quantity	description	dimensions	WABCO ref.
4.424.0004.40	2	4.424.0004.40	1	EQUAL TEE COUPLING	D12/12/12	893 861 450 0
		4.424.0005.40	5	STRAIGHT MALE STUD COUPLING	M16x1,5/D12	893 803 430 0
		4.424.0014.40	1	DOUBLE CONNECTOR WITH LOCK NUT	M22x1,5	893 890 440 0
4.424.0019.40	1			MALE PLUG	M22x1,5	893 022 009 4
		4.424.0028.40	1	DOUBLE CONNECTOR	M22x1,5	893 890 440 0
4.424.0044.40	1	4.424.0044.40	4	STRAIGHT MALE STUD COUPLING	M22x1,5/D8	893 803 400 0
4.424.0045.40	2			STRAIGHT MALE STUD COUPLING	M12x1,5/D8	893 803 490 0
4.424.0055.40	1			MALE STUD ELBOW COUPLING	M12x1,5/D8	893 831 240 0
4.424.0068.40	7	4.424.0068.40	1	STRAIGHT MALE STUD COUPLING	M22x1,5/D12	893 803 440 0
4.424.0087.40	2			MALE PLUG	M16x1,5	893 022 008 4
4.424.0147.40	2			ELBOW WITH LOCK NUT	M22x1,5	893 890 641 0
4.424.0148.40	1			MALE STUD TEE COUPLING	M22x1,5/D12/D12	893 850 970 0
4.424.0156.40	4	4.424.0156.40	1	EQUAL TEE COUPLING	D12/8/12	
V 4.425.0007.00	1			CHARGING VALVE WITHOUT RETURN FLOW 6,0 BAR	M22x1,5	434 100 125 0
V 4.425.0034.40	1			DRAIN VALVE	M22x1,5	934 300 001 0
V 4.425.0039.00	1			LINE FILTER	M22x1,5	432 500 020 0
V 4.425.0041.00	1			LINK CONNECTION FOR LEVELLING VALVE	M8/D6	433 401 003 0
V 4.425.0052.00	1			TEST COUPLING	M22x1,5	463 703 117 0
		V 4.425.0066.00	1	CHARGING VALVE WITH RETURN FLOW 0,5 BAR	M22x1,5	434 100 027 0
		V 4.425.0077.00	1	PRESSURE LIMITING VALVE 1,8 BAR	M22x1,5	475 010 307 0
		V 4.425.0083.00	1	CHECK VALVE CONSTANT THROTTING D1	M22x1,5	434 014 001 0
V 4.425.0117.99	(1)□			LOAD SENSING VALVE		475 714 500 0
V 4.425.0134.00	1			LEVELLING VALVE	M12x1,5/M16x1,5	464 006 100 0
		V 4.425.0138.00	1	LIFT AXLE CONTROL VALVE	M16x1,5/M22x1,5	463 084 000 0
T 4.105.0005.00	1△			AIR RESERVOIR 60 LTR	D276x1100	950 760 002 0
H 4.405.0009.00	2△			HOLDER (AIR RESERVOIR) 40/60 LTR	D276	451 999 276 2

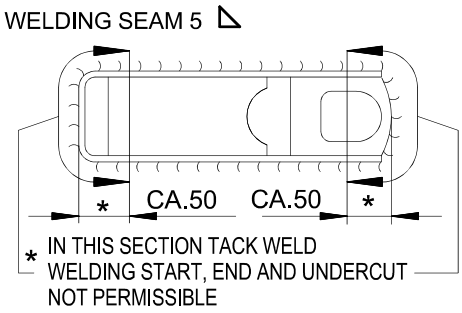
□ = not SAF delivery volume.
△ = do not belong to a SAF-KIT.

Welding instruction for hanger bracket „steel“

Note
Cover the trailing arm to protect it from flying sparks. Welding and connecting the welding equipment ground cable to the trailing arm is not permissible. In order to avoid bearing damage, the welding equipment ground cable must also not be connected either to the wheel, wheelhub or wheelflange.

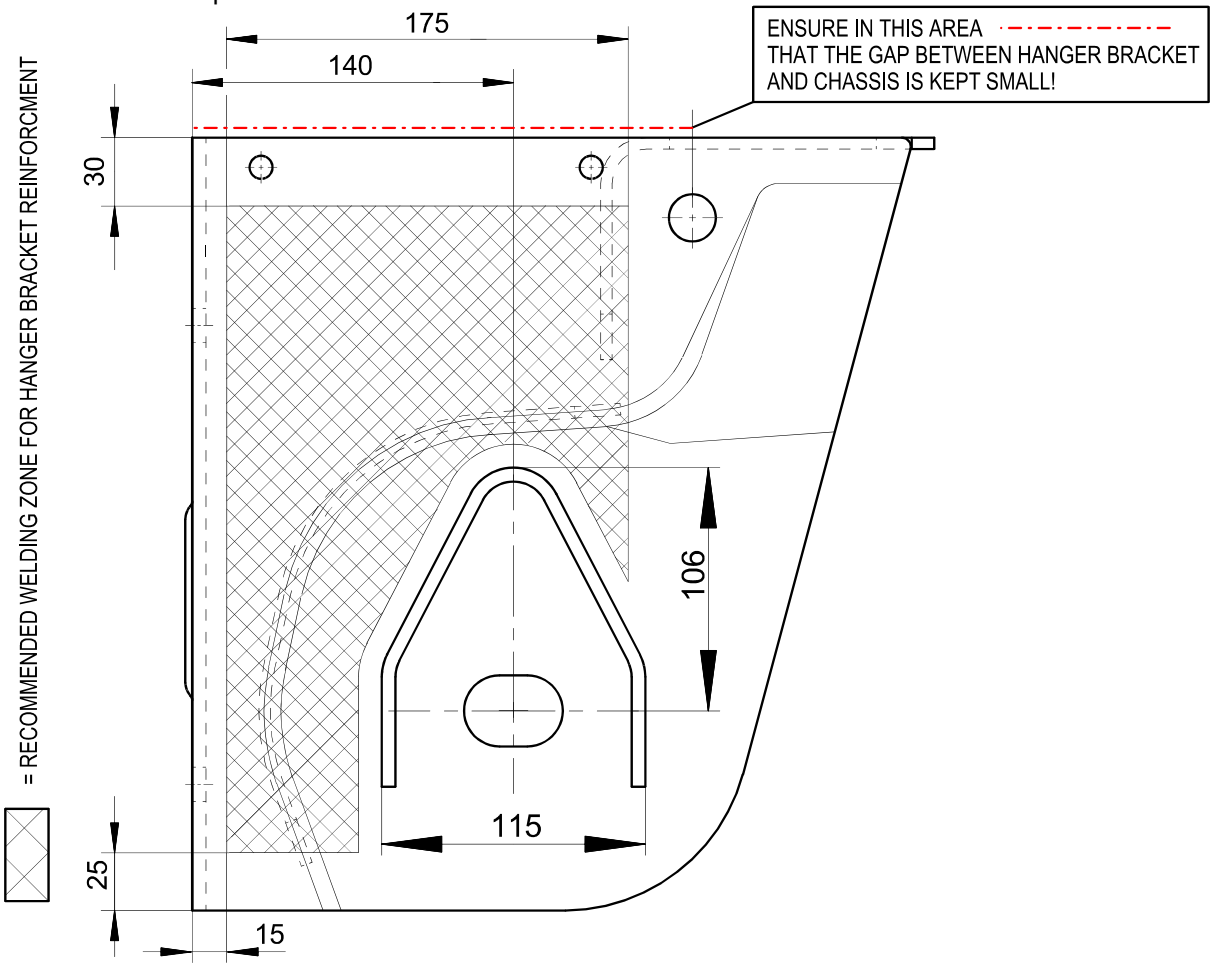
Welding recommendation
The high tensile steel used for the hanger brackets with a carbon content C of max. 0,2 % can be easily welded. Special welding electrodes are therefore not required.

Design information
The chassis must be reinforced so that it can absorb the forces to which it is exposed. The hanger brackets need an additional reinforcement.



Recommendation for lateral reinforcement of the hanger brackets

Overlapping of the lateral brace (gusset plate) and inner brace plate of the hanger bracket is necessary to avoid any diaphragm effect. The use of a cross member can replace the lateral brace, but this doesn't replace a crossmember in the chassis.



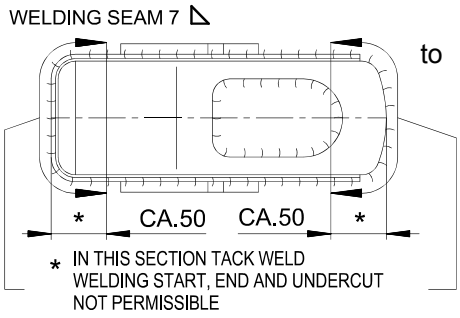
Welding instruction for hanger bracket „aluminium“

Note
Cover the trailing arm to protect it from flying sparks. Welding and connecting the welding equipment ground cable to the trailing arm is not permissible. In order to avoid bearing damage, the welding equipment ground cable must also not be connected either to the wheel, wheelhub or wheelflange.

Material
Al Mg 4,5 Mn W 28 (W=soft; 28=tensile strength Rm min. 275 N/mm max. 350 N/mm)

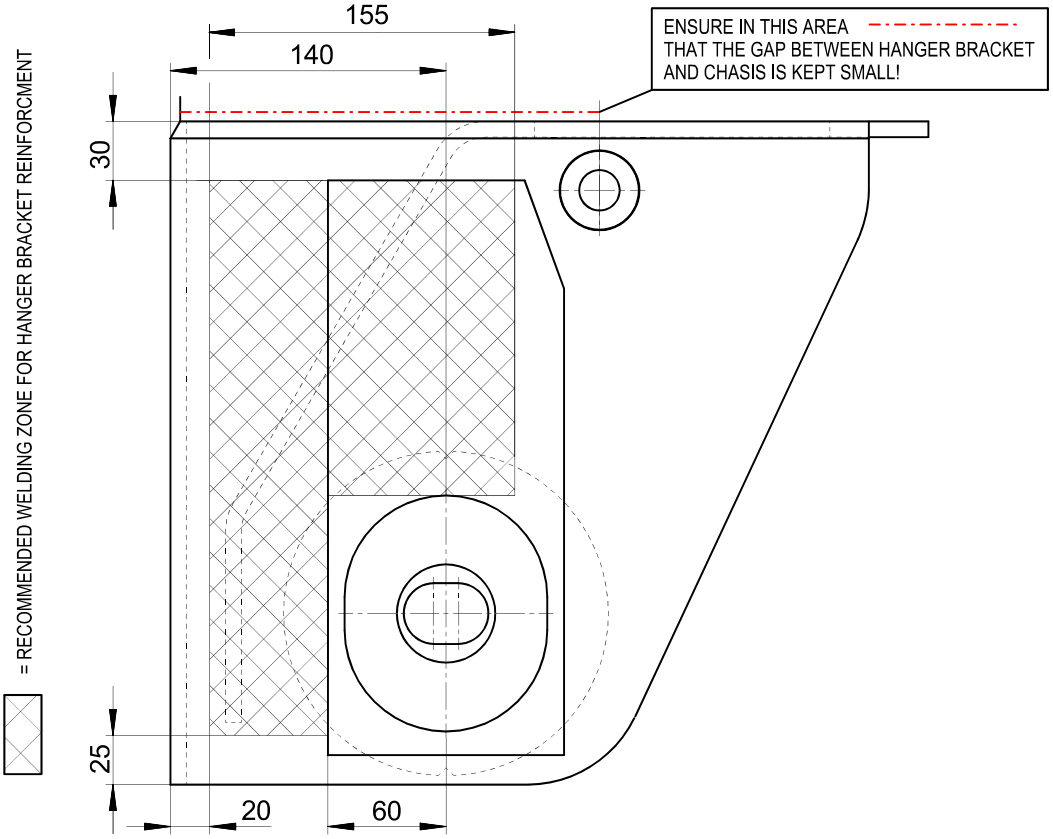
Welding recommendation
Pre-treat welding edges with steel brush (Brushes with CrNi-steel). They should not be polished (misguides the arc). The welding seam should be kept as narrow as possible (SAF recommends a = 7 mm, chamfer 5 x 30°), to minimise the heat-induced distortion and tension.
SAF uses the MIG – welding process with the additive material SG – Al Mg 4,5 Mn according to DIN EN ISO 18273 with the inert gas Argon according to DIN EN ISO 14175.

Design information
The chassis must be reinforced so that it can absorb the forces which it is exposed. The hanger brackets need an additional reinforcement.



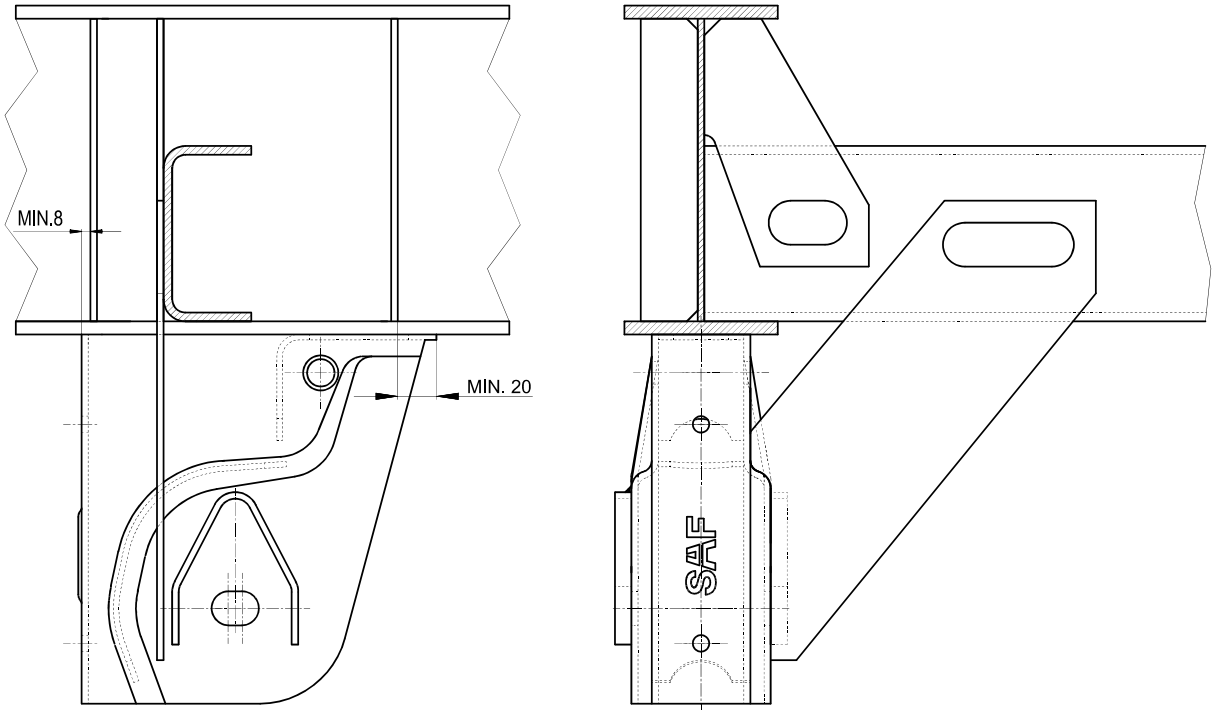
Recommendation for lateral reinforcement of the hanger brackets

Overlapping of the lateral brace (gusset plate) and inner brace plate of the hanger bracket is necessary to avoid any diaphragm effect. The use of a cross member can replace the lateral brace, but this doesn’t replace a crossmember in the chassis.

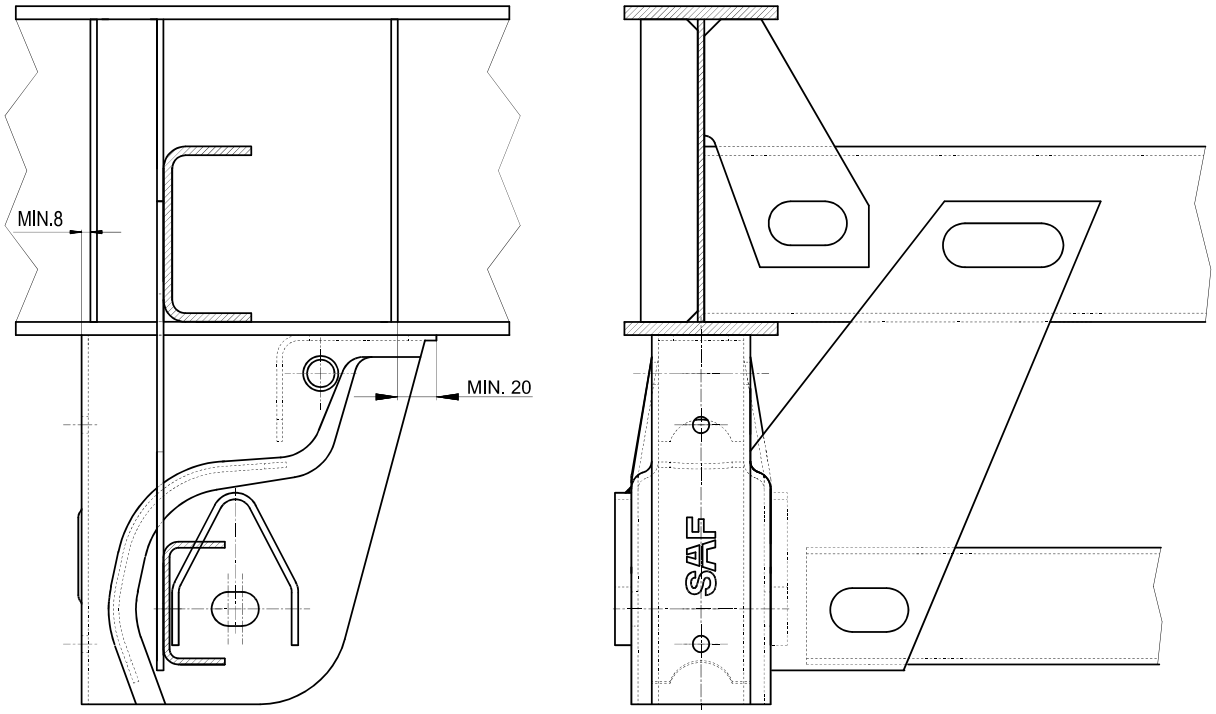


Recommendation for hanger bracket „steel“ lateral reinforcement

for torsionally flexibel chassis



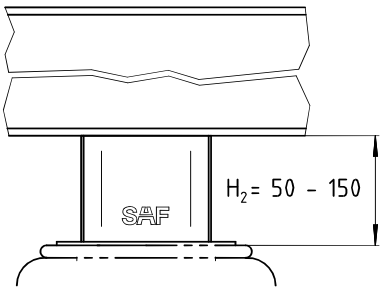
for torsionally stiff chassis

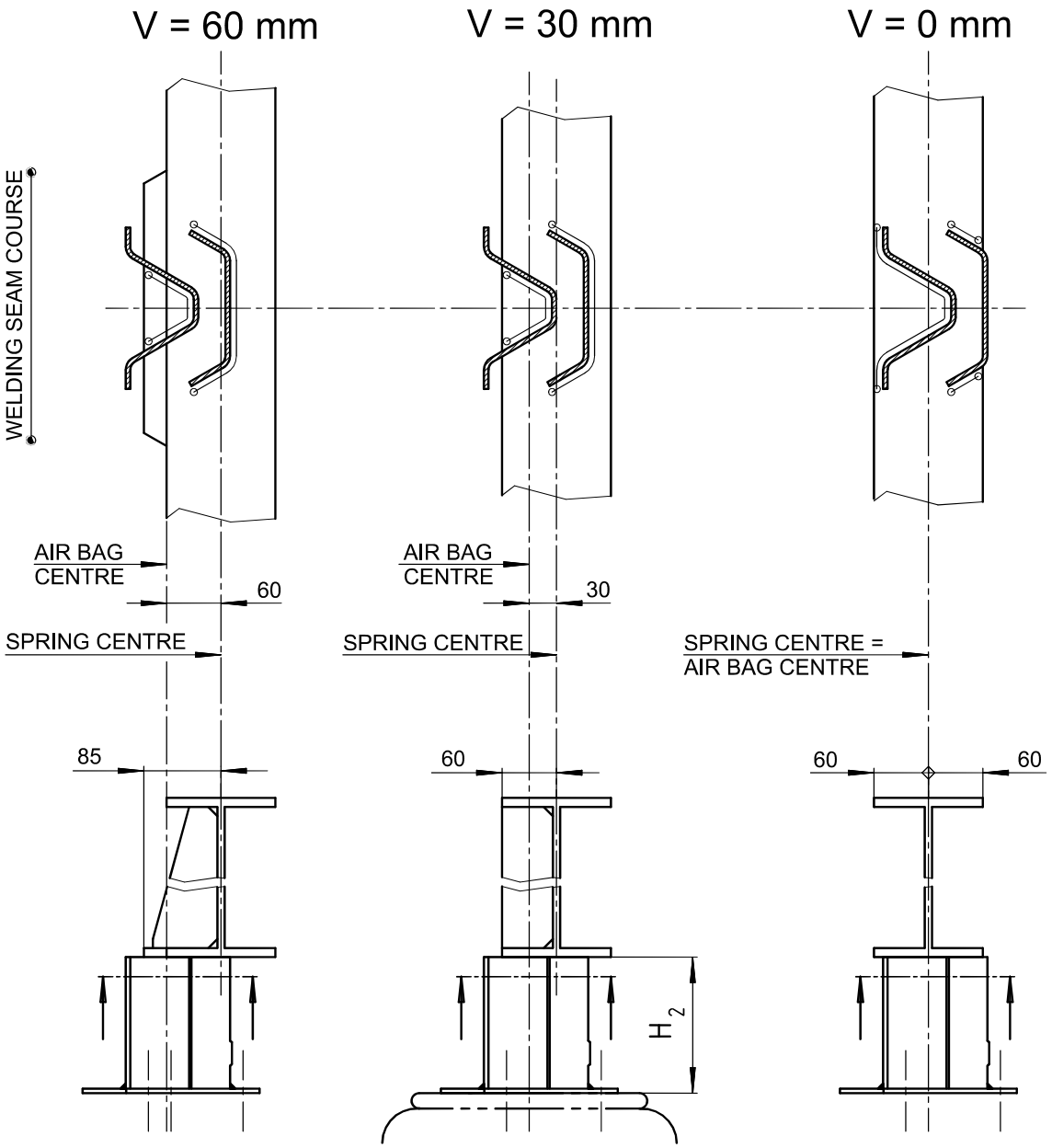


Hanger bracket welding instruction see page 38.
The design and dimensioning of the hanger bracket reinforcement is the responsibility of the vehicle manufacturer, allowing for the type and operating conditions of the vehicle.

Welding recommendation for air bag bracket

Welding seam course and bracing are SAF-recommendations. Dimensions, design and implementation are under responsibility of the vehicle manufacturer.

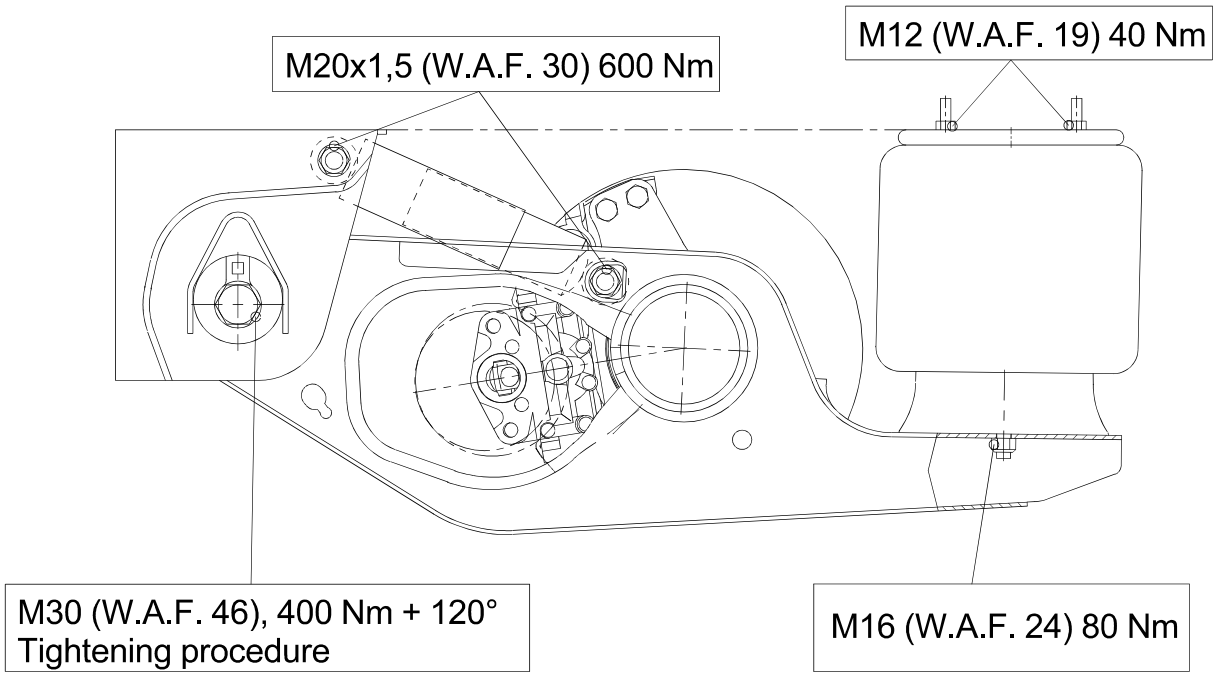




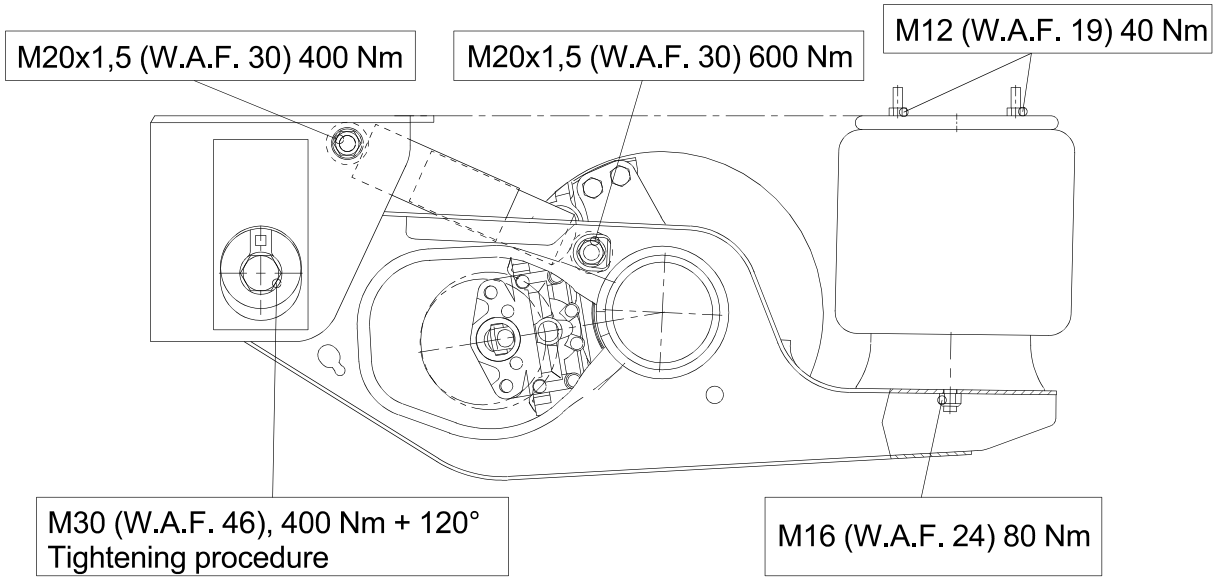
Tightening torques

The max. coating thickness on the contact surfaces (interfaces) of the trailing arm and shock absorber bolts must nor surpass **45** µm!

Hanger bracket „steel“ – trailing arm – shock absorber – air bag

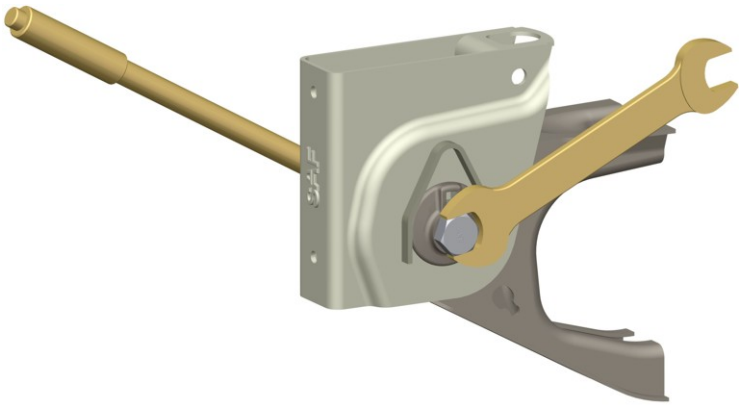


Hanger bracket „aluminium“ – trailing arm – shock absorber – air bag



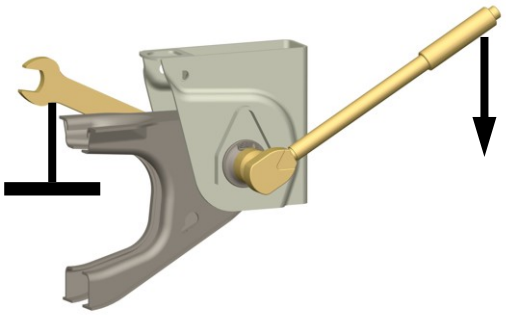
Tightening instructions for adjustable pivot bolt

Attention always within the specified ride height range!
No paint residues between eccentric washer and hanger bracket!

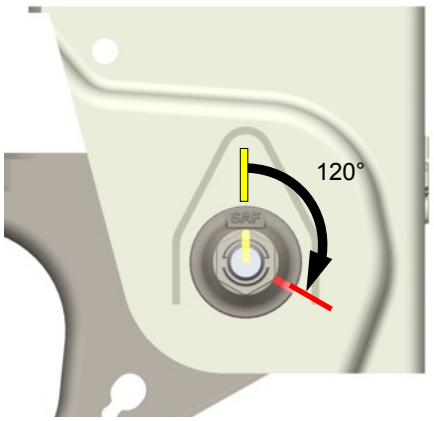


Bolt head always on the eccentric washer side

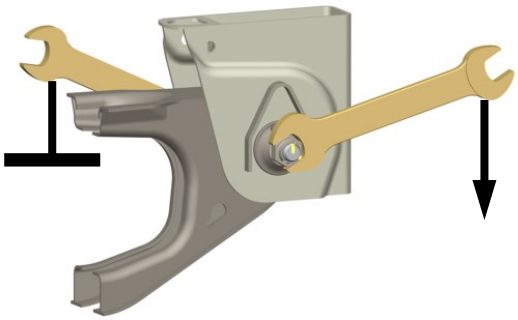
Pre tightening **400** Nm
Use torque wrench



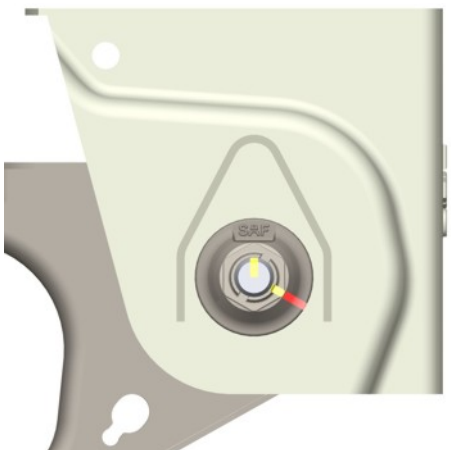
Marking for angle tightening



Angle tightening **120°**
Use impact wrench or extend lever
to 2,5 Meter

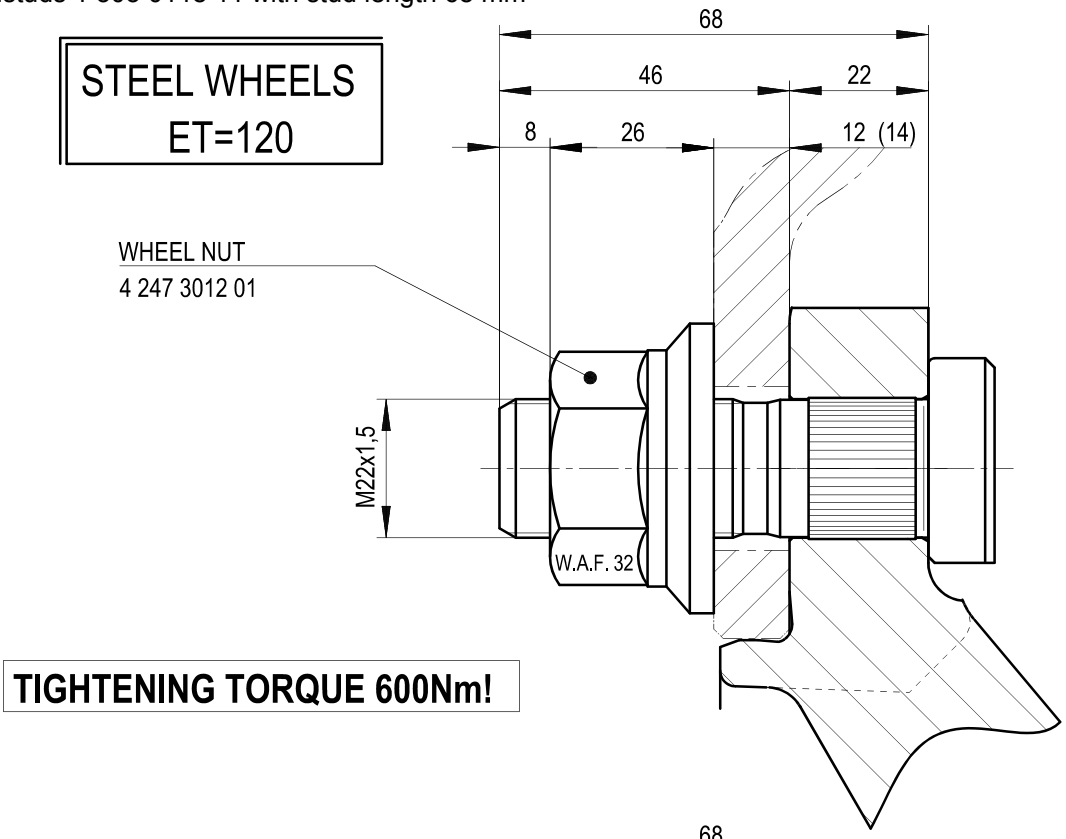


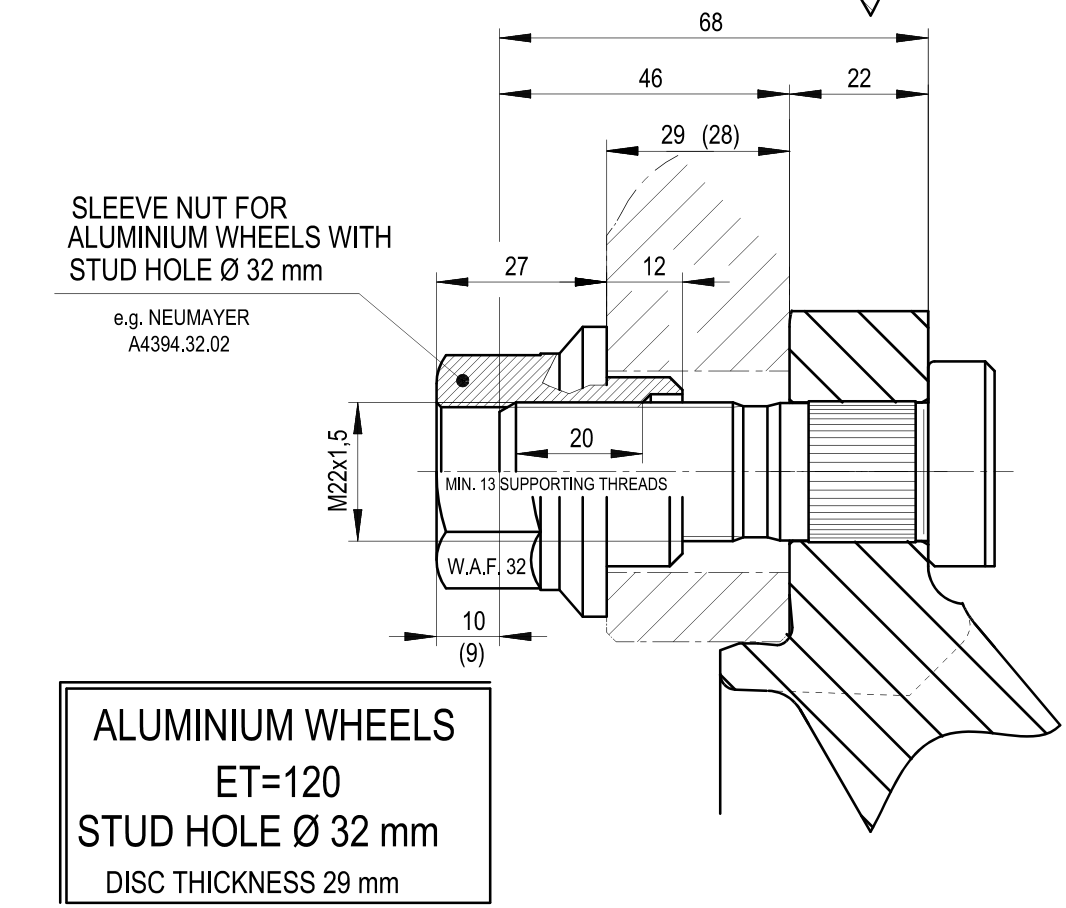
Visual inspection



Wheel fixing – Standard 22,5“, disc brake (code 48)

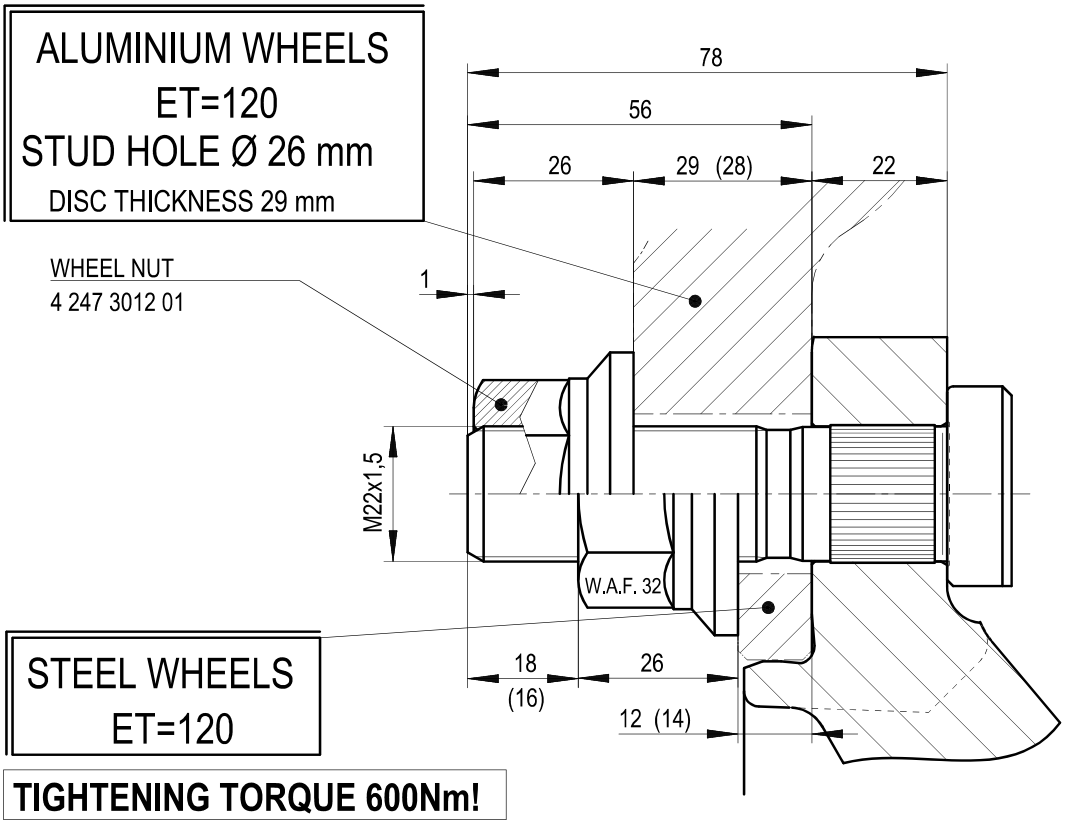
Axle versions: BI9-22. / BI9-19.
Single tyre with ET 120 mm,
Wheelstuds 1 303 0118 11 with stud length 68 mm

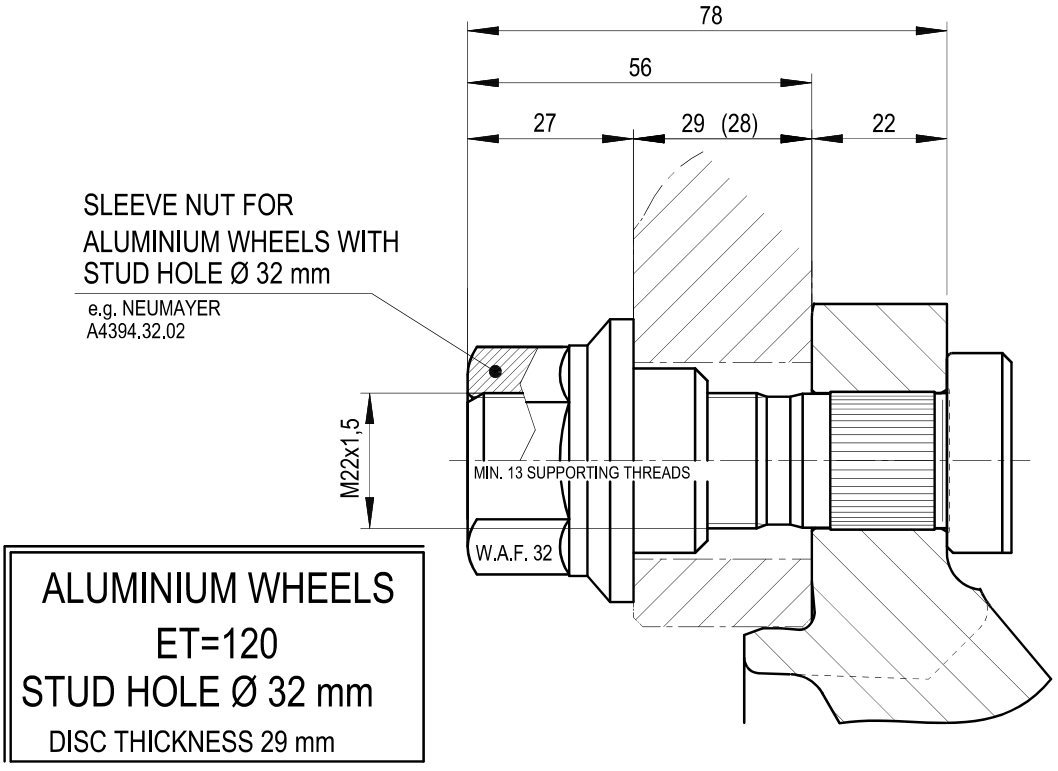




Wheel fixing – Aluminium 22,5“, disc brake (code 49)

Axle versions: BI9-22. / BI9-19.
Single tyre with ET 120 mm
Wheelstuds 1 303 0120 10 with stud length 78 mm

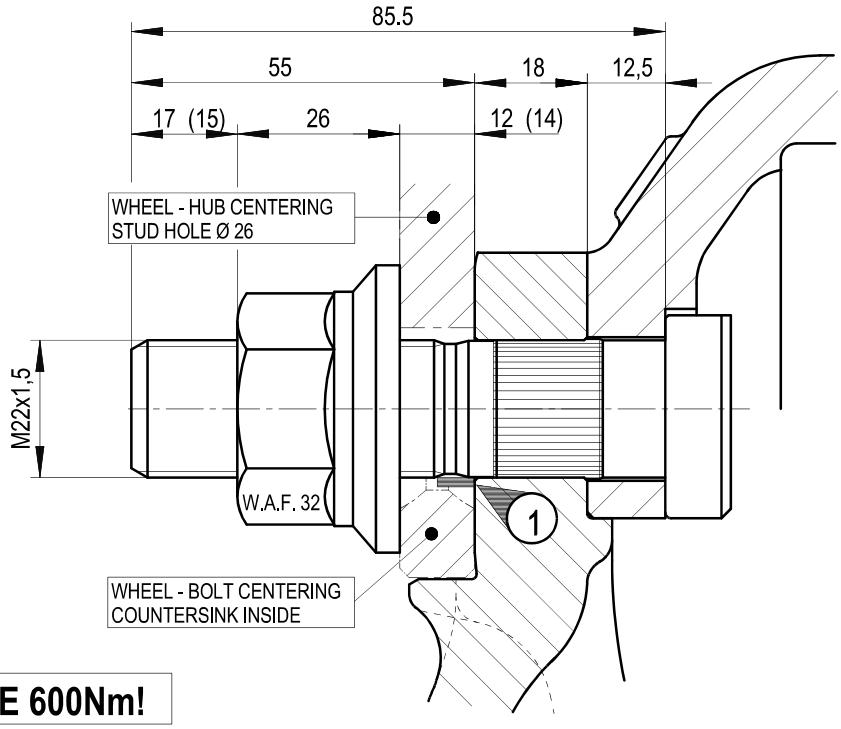




Wheel fixing – Standard 22,5“, drum brake (code 58)

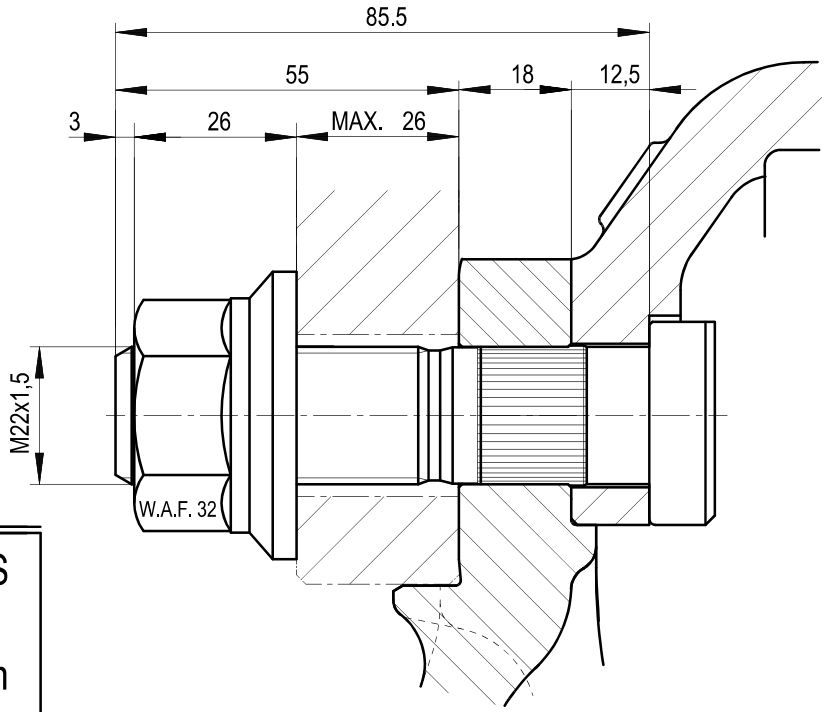
Axle version: S9-4218
Single tyre with ET 0 mm
Wheelstud 1 303 1074 14 with stud length 85,5 mm
Wheel nut 4 247 3012 01

STEEL WHEELS
ET=0



DISTANCE RINGS -SEE POS 1
PART NO.: 1 095 1040 01
ABSOLUTELY NECESSARY FORI
WHEELS WITH BOLT CENTERING
MOUNTING: 2 RINGS PER
HUB IN OPPOSITION

TIGHTENING TORQUE 600Nm!



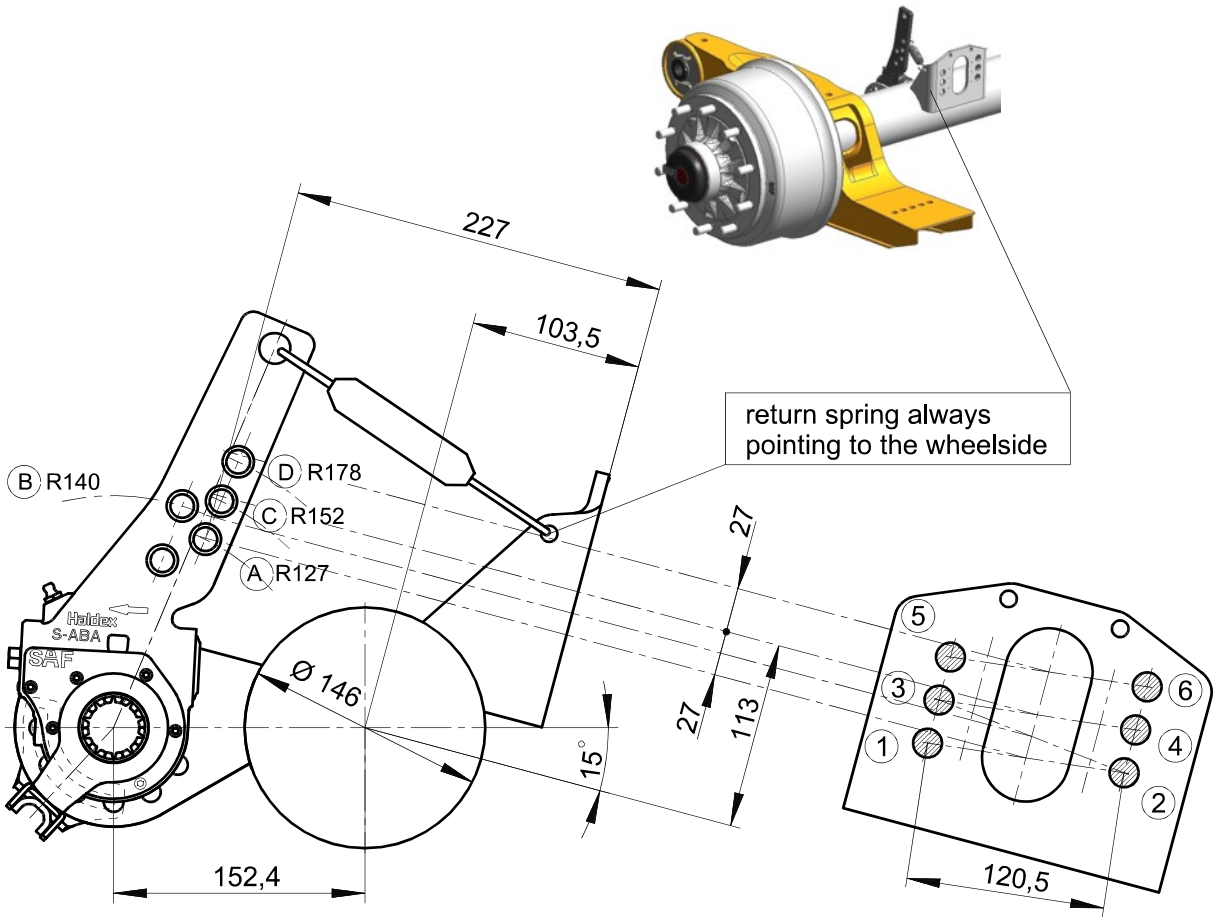
ALUMINIUM WHEELS
ET=0
STUD HOLE Ø 26 mm
DISC THICKNESS max. 26 mm

Brake chamber bracket

The flatness of the brackets when new complies with the specifications of the brake chamber manufacturers.

Observe the installation instructions of the brake chamber manufacturers! A major factor for the functionality is compliance with the specified tightening torques and regular checking of this torque.

Design with SNK 420



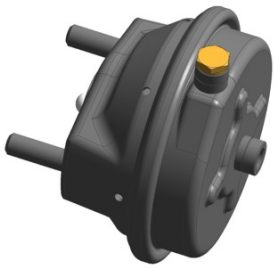
lever length of slack adjuster	code	brake chamber mounting position on the bracket
178 mm	D	5 – 6
152 mm	C	3 – 4
140 mm	B	2 – 3
127 mm	A	1 – 2

Brake chamber positions on the bracket are valid for manual and automatic slack adjusters!

Overview SAF-HOLLAND brake chambers

The brake chambers can be combined with all axle versions produced by SAF-HOLLAND.

The brake chambers in overview:

	disc brake	**drum brake** with piston rod length 227 mm
diaphragm brake chamber		
double diaphragm brake chamber		

For axles with disc brake 22,5“ and 19,5“
The versions in the table are available in both OEM and spare parts:

model	size	partnumber[1] brake chamber	
		INTRA ALL-IN	INTRADISC *plus INTEGRAL*
diaphragm brake chamber	16“	3 454 1065 60	
	18“	3 454 1066 60	
	20“	3 454 1067 60	
	22“	3 454 1068 60	
	24“	3 454 1069 60	
double diaphragm brake chamber	16“/24“	3 454 1077 64	
	18“/24“	3 454 1074 64	
	20“/24“	3 454 1079 64	

[1] **partnumbers include the fixing nut for mounting the brake chamber**

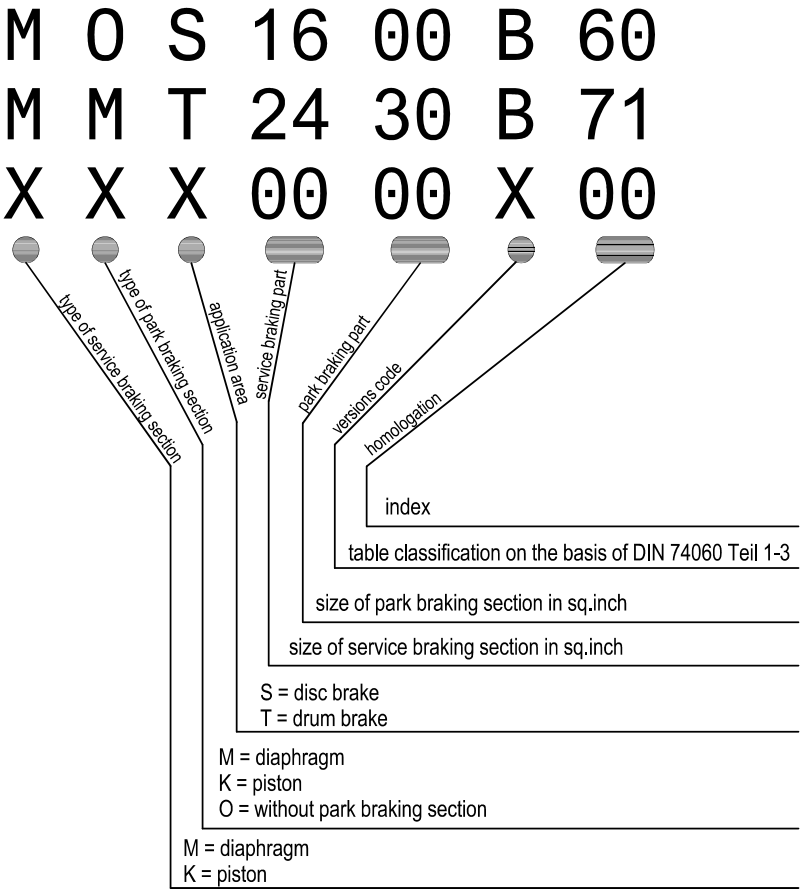
For axles with drum brake and piston rod length 227 mm
The versions in the table are available in both OEM and spare parts:

model	size	partnumber[1] brake chamber
		INTRADRUM
diaphragm brake chamber	20“	3 454 1089 70
	24“	3 454 1090 70
double diaphragm brake chamber	20“/30“	3 454 1091 70
	24“/30“	3 454 1092 70

[1] **partnumbers include the fixing nut for mounting the brake chamber**

Typ identification for SAF-HOLLAND brake chambers

Letters are marked with “X”, numbers with “0”
Example:



Technical data

For axles with disc brake 22,5“ and 19,5“

model	size	type	test report	max. stroke s_{max} [mm]	service brake force [N] at 6,5 bar	parking brake force [N] bei 30 mm Hub
diaphragm brake chamber	16“	MOS1600B60	BC 0060.0	64	6590	-
	18“	MOS1800B60	BC 0061.0	64	6960	-
	20“	MOS2000B60	BC 0062.0	65	7564	-
	22“	MOS2200B60	BC 0063.0	65	8055	-
	24“	MOS2400B60	BC 0064.0	65	9374	-
double diaphragm brake chamber	16“/24“	MMS1624B60	BC 0044.0	63	6452	6160
	18“/24“	MMS1824B60	BC 0045.0	63	6960	5911
	20“/24“	MMS2024B60	BC 0046.0	63	7564	6160

For axles with drum brake and piston rod length 227 mm

model	size	type	test report	max. stroke s_{max}	piston rod length	service brake:	parking brake:
						force [N]	
				[mm]	[mm]	at 6,5 bar	at 30 mm Hub
diaphragm brake chamber	20“	MOT2000B70	BC 0047.0	77	227	7659	-
	24“	MOT2400B70	BC 0048.0	77	227	9234	-
double diaphragm brake chamber	20“/30“	MMT2030B71	BC 0049.1	73	227	7658	6440
	24“/30“	MMT2430B71	BC 0050.1	74	227	9175	6440

Further technical data can be found on the referenced test reports or can be provided by SAF-HOLLAND. Brake calculations with SAF-HOLLAND brake chambers can be provided by the brake manufactures WABCO, KNORR and HALDEX. The new test reports are in according with ECE R13 and will require an update of the trailer type approval. Please notice that due to the new test procedure the output force characteristics of the brake chambers have changed.

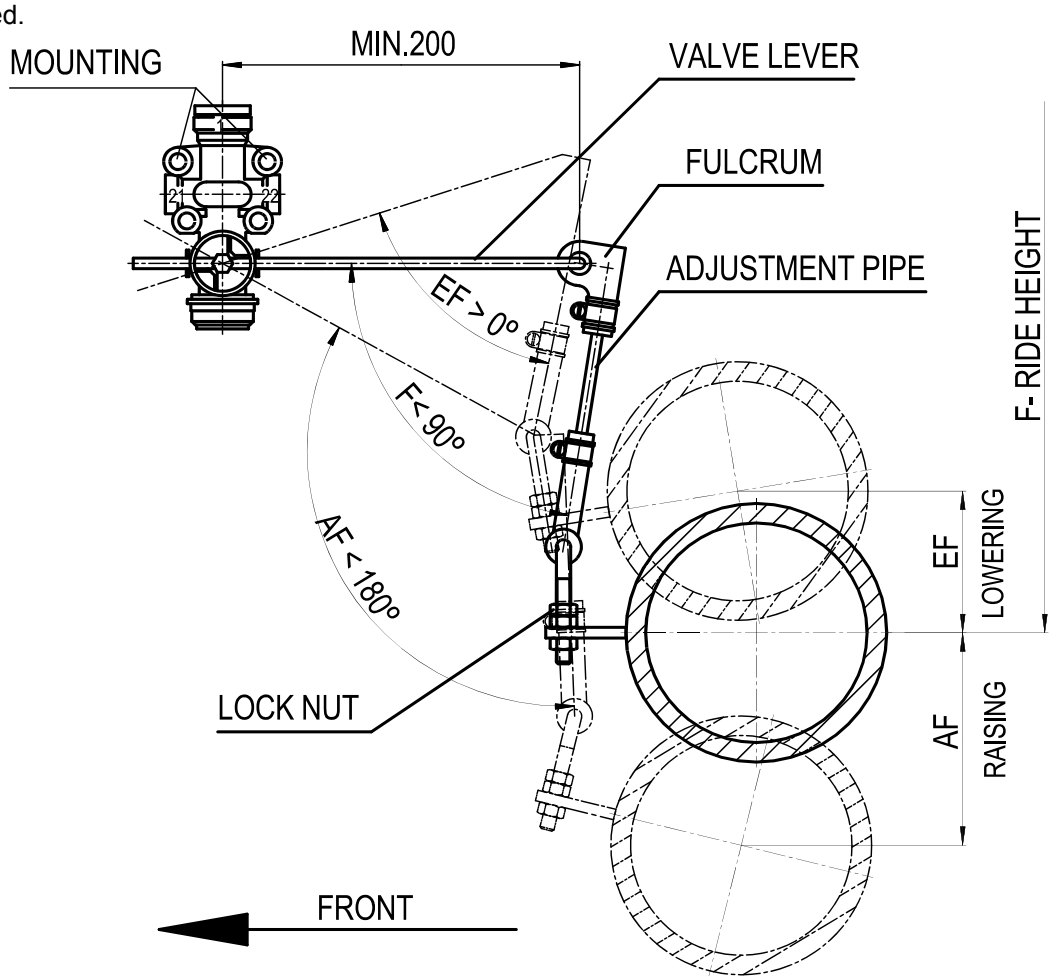
Adjustment of the air suspension ride height

Air suspension valve

As standard, SAF-HOLLAND air suspension system require only one air suspension valve. The air suspension valve controls the air bag pressure in relation to the trailer load in order to maintain a constant ride height (F) in every load condition.

The air suspension valve is fastened to the trailer frame with screws and connected to the axle via the pivot joint (valve lever and adjustment pipe). On tri-axle trailers, the system is generally connected to the middle axle (normally in the middle of the axle), and on twin-axle trailers to the rear axle. In special cases (e.g. large trailer tilt angle), the air suspension valve can be installed on the rear axle.

For trailers with axle lifting system, the axle to which the system is connected depends on the axle to be lifted.



Installation

The valve lever should be at least 200 mm long and is horizontal when the trailer is in the driving position. As a function check, move the lever down slightly. Air must now escape via the venting cap into the atmosphere. If air flows into the air bags when the lever is pushed down, the valve lever has to be turned through 180°. For this the valve lever has to be disconnected. The ride height is set by adjusting the adjustment pipe in the fulcrums and by turning the lock nuts. The adjustment must be carried out with the trailer standing on level ground. It can be carried out with the trailer either empty or loaded.

Note

For a final check, the air suspension system should be lowered to the suspension stop or raised to the limit (shock absorbers, stop ropes, air bag length). During this process, the specified angle between valve lever and adjustment pipe must not be exceeded in order that the valve lever does not move in the wrong direction.

Ride heights

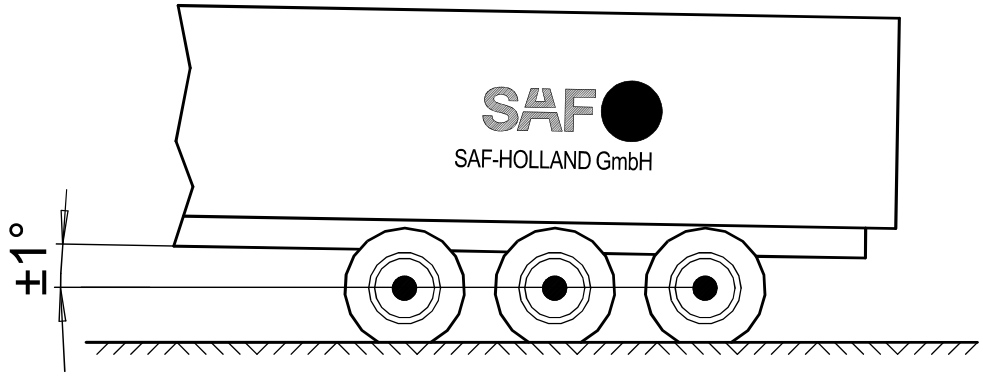
Adjust the ride height of the air suspension to the permissible range indicated in the corresponding SAF-HOLLAND documents

In standard cases the following values need to be considerd: with air bag 2619V, 2918V, 2919V a lowering of **90** mm with air bag 2923V, 2924V a lowering of **100** mm

With single axles, allow for a minimum suspension travel of **60** mm.
With multiple axles, allow for a minimum suspension travel of **70** mm.

Exception:
For multi-axle trailers with lift axles, the minimum suspension travel at the lift axle should not be less than **100** mm in order to ensure an adequate ground clearance

Semi-trailer tilt angle



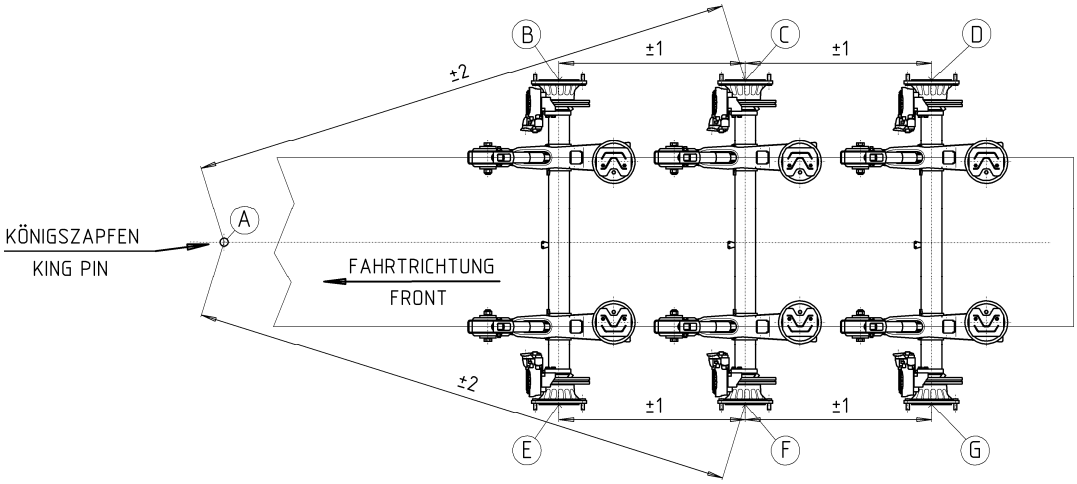
The maximum tilt angle of the semi-trailer can not be more than ±1°.

Axle alignment

General
In order to compensate for production tolerances, an axle alignment and, if necessary, a correction should be carried out. The maximum permissible deviations (tolerances) of the alignment values are specified by the tyre manufacturer.
The maximum possible wheelbase correction per axle is ± 6 mm

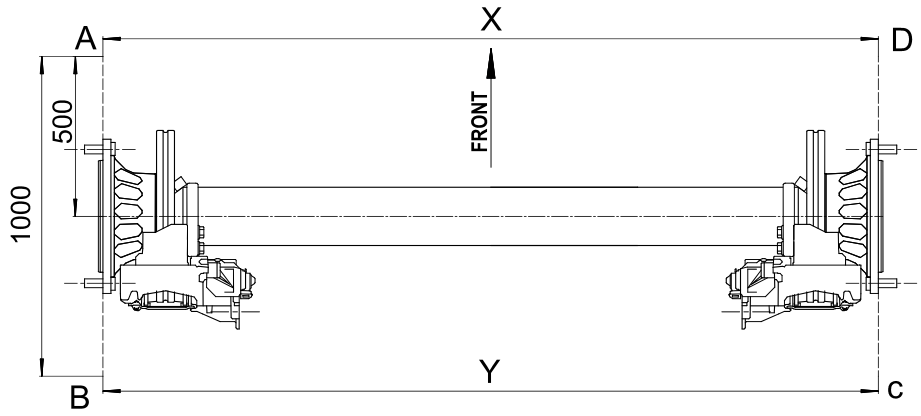
Basic condition
The axle alignment must be done in unladen situation. With air suspension the trailer has to be adjusted in the right ride height.

Permissible values:



Procedure:
Determine the lengths of the diagonals **A** - **C** and **A** - **F** for the middle axle (reference axle) by comparison measurements, observing the tolerances (± **2,0** mm).
Check the wheelbases **B** – **C** and **E** – **F** for the front axle and **C** – **D** and **F** – **G** for the rear axle and correct, if necessary, observing the tolerances (± **1,0** mm).

Toe-in/ toe-out:



Permissible deviations rigid axle:

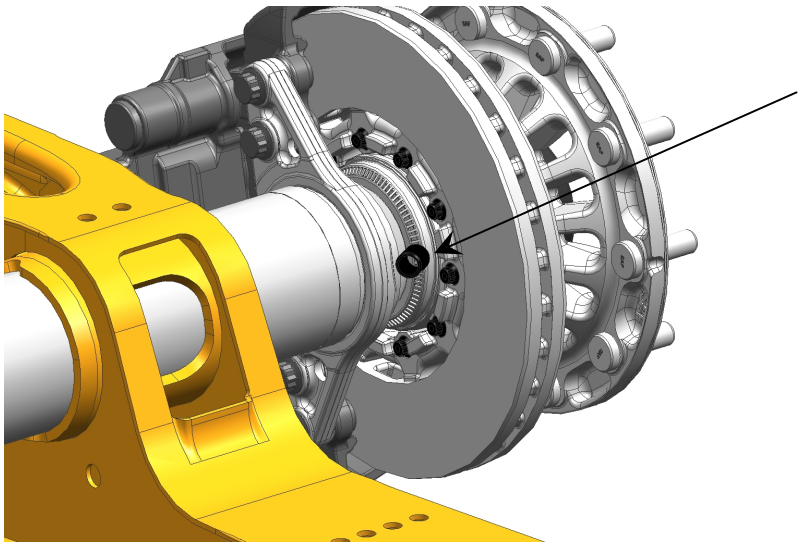
Toe-in: +0 to +12' = max. + 3,5 mm/m (Example: Y – X = 0 mm to +3,5 mm)
Camber: ± 12' = ± 3,5 mm/m
Measuring the axle geometry: Deviations in the distances **AC** – **BD** ≤ 3 mm

Classification of exciter ring teeth

With the launch of the axle generation 06, SAF will be supplies the exciter ring and sensor bracket as standard and preinstalled. The number of teeth is now dependent on the wheel mounting, tyre size installed and their dynamic rolling circumference have been taken into consideration.

axle generation SK						axle generation 06	
no. of teeth	axle version	tyre size	wheel fixing			axle version	no. of teeth
			bolt pitch circle	centre bore	no. of bolts		
90	SK RB 9019	19,5"/ 22,5"	335	280	10	BI9-19	90
	SK RB 9022	22,5"				BI9-22	
100	SK RS 9042					S9-4218	

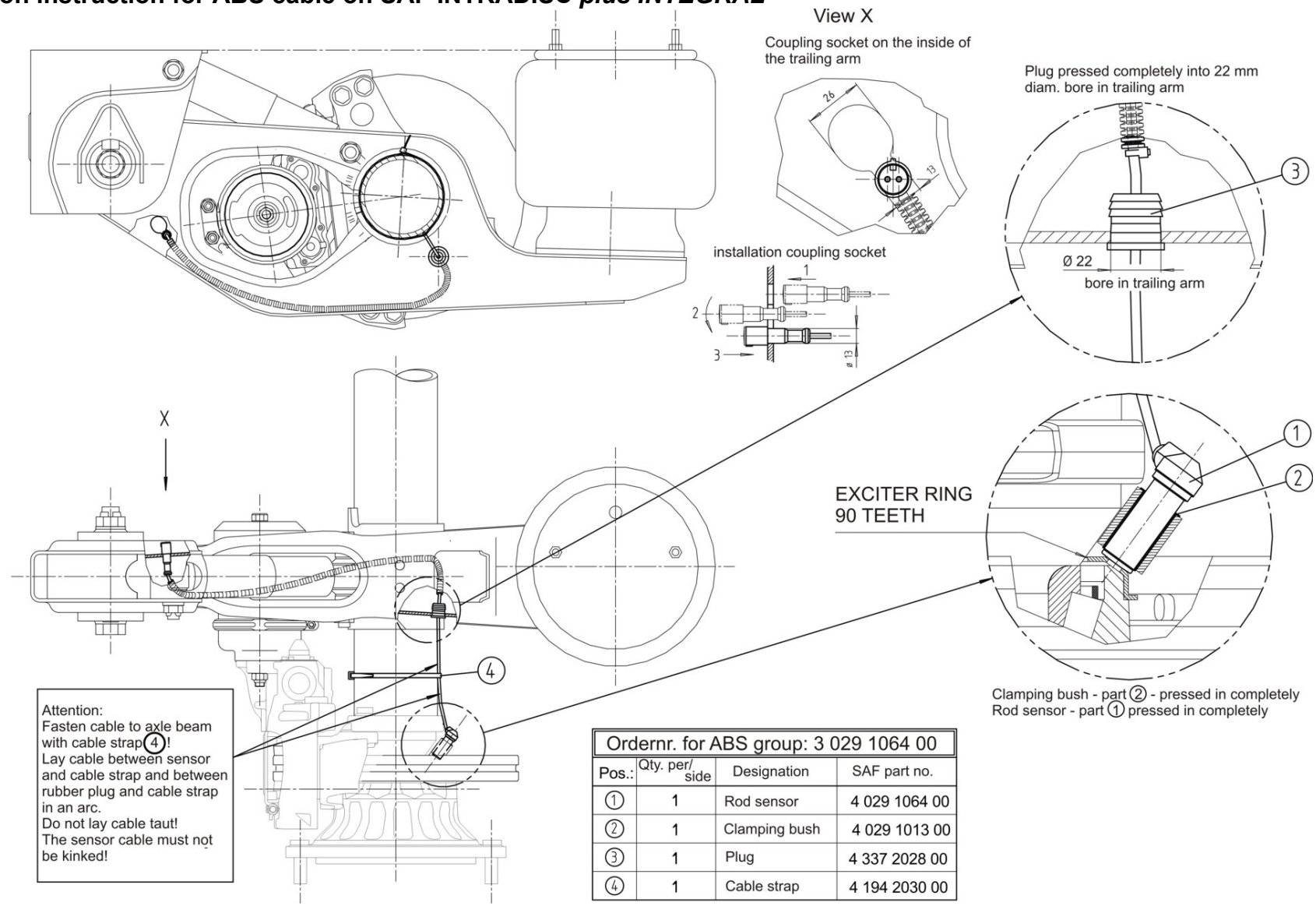
Note:
On the SAF axle generation 06 (B-, S- and Z-serie) the position of the exciter ring is on the inside of the wheel hub, irrespective of the type of brake (disc or drum).



sensor holder for ABS mounting

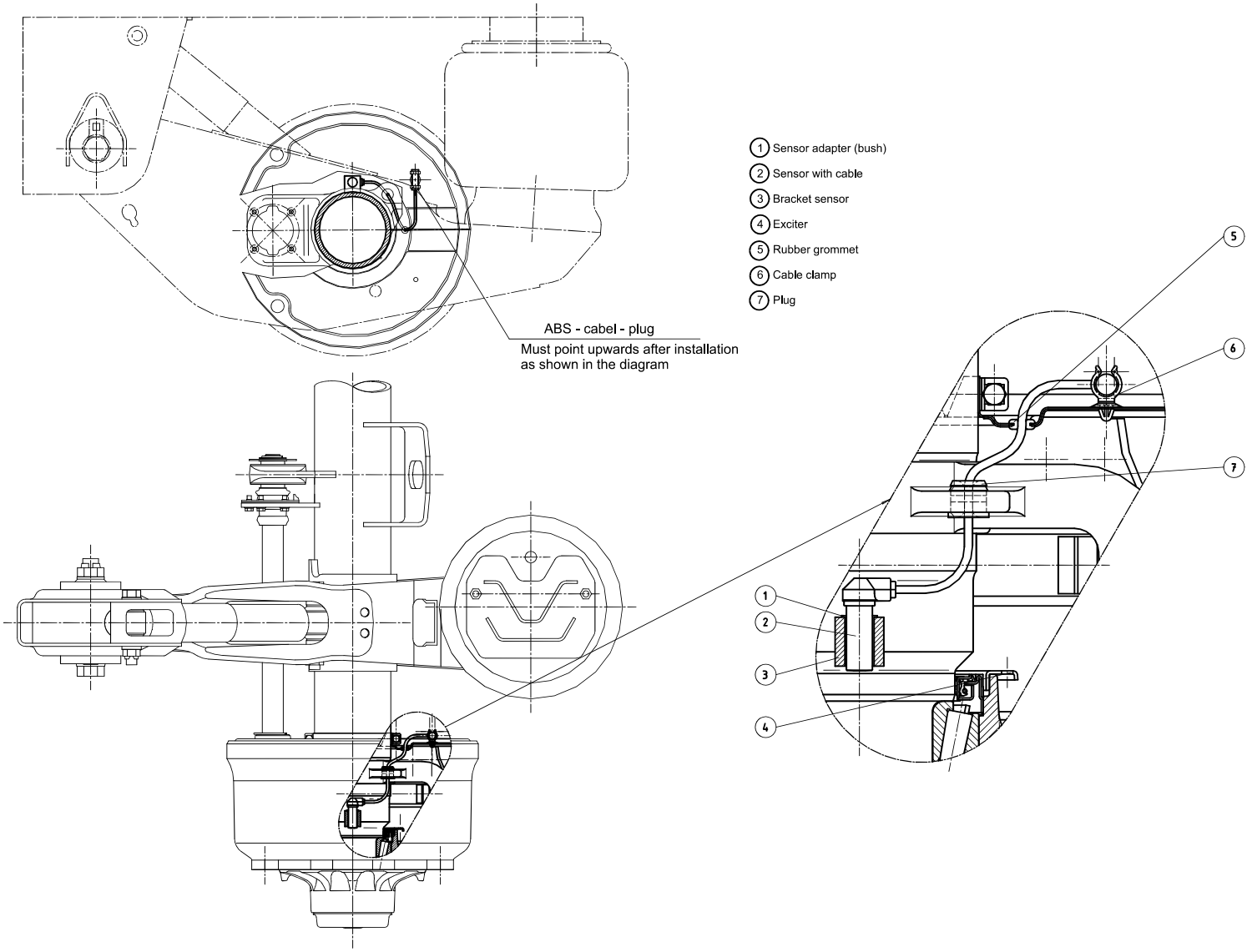
illustration IU-BI9-22…

Installation instruction for ABS cable on SAF INTRADISC *plus INTEGRAL*

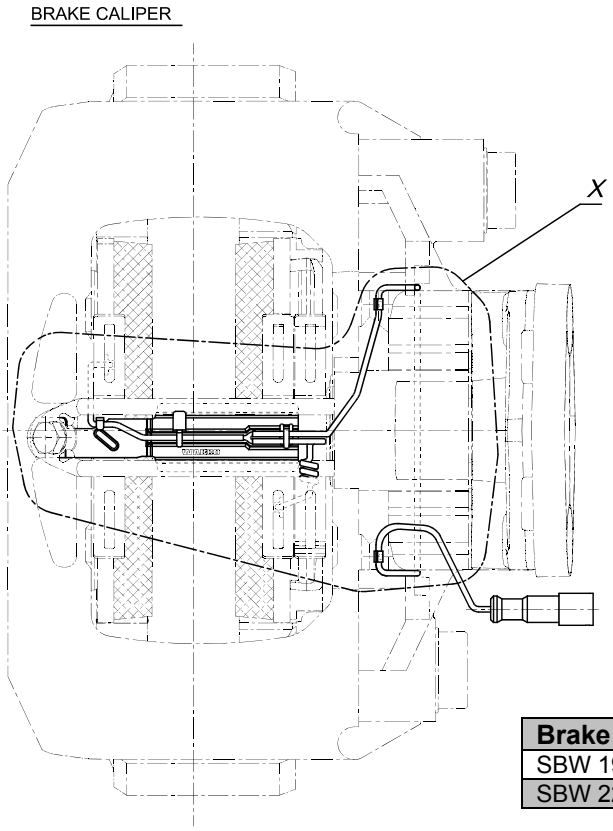


Ordernr. for ABS group: 3 029 1064 00			
Pos.:	Qty. per/ side	Designation	SAF part no.
①	1	Rod sensor	4 029 1064 00
②	1	Clamping bush	4 029 1013 00
③	1	Plug	4 337 2028 00
④	1	Cable strap	4 194 2030 00

Installation instruction for ABS cable on INTRADRUM

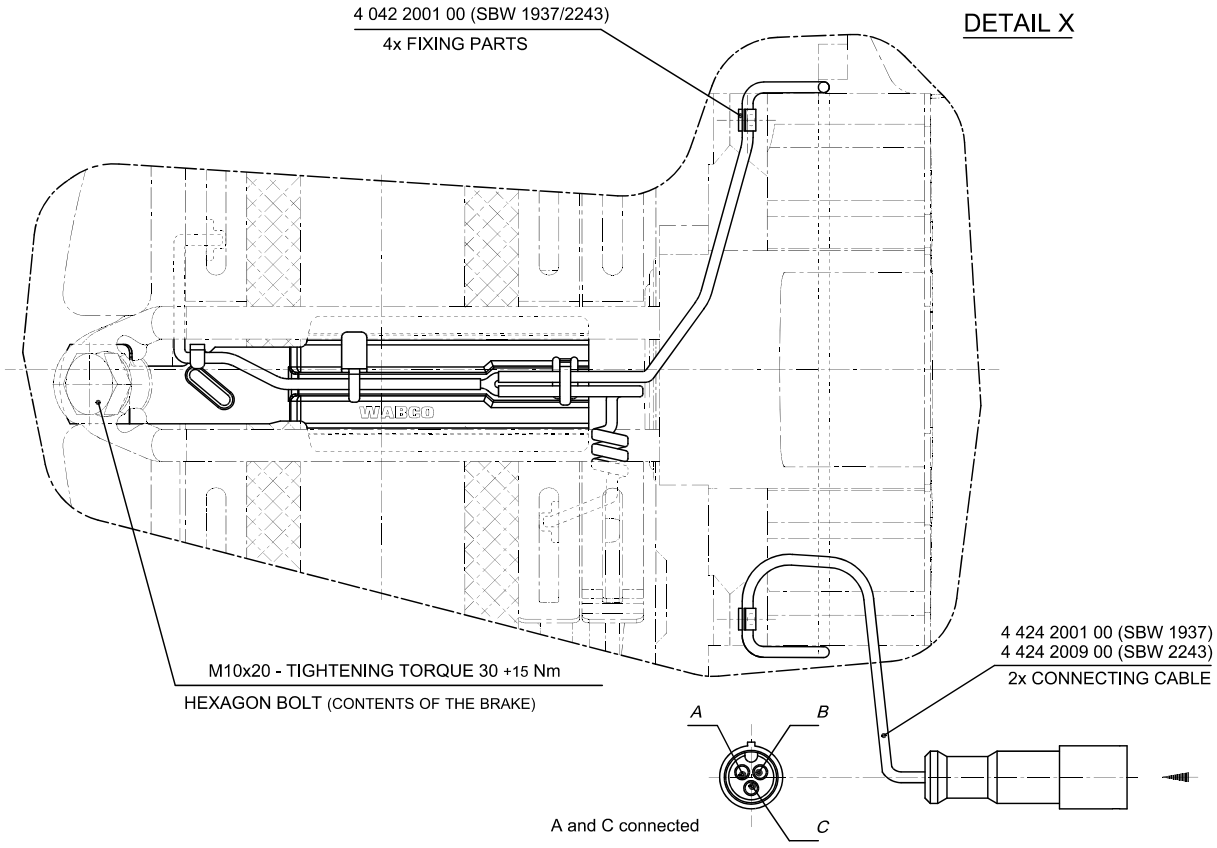


Cable kit for WABCO elektric wear indicator

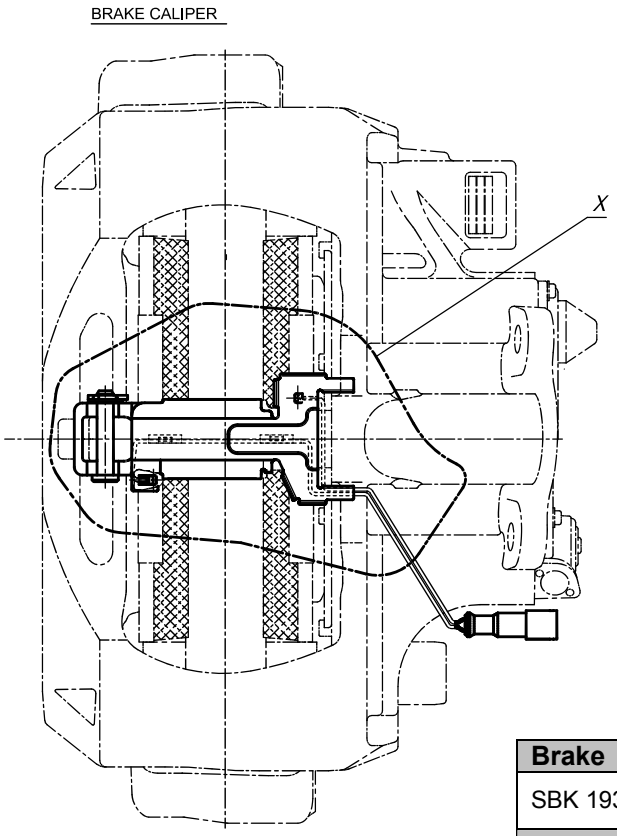


Note:
1 connecting cable kit per axle

Brake	Type	Connecting cable kit
SBW 1937	PAN 19-1 / PAN 19-1+	3 424 2001 00
SBW 2243	PAN 22-1	3 424 2009 00

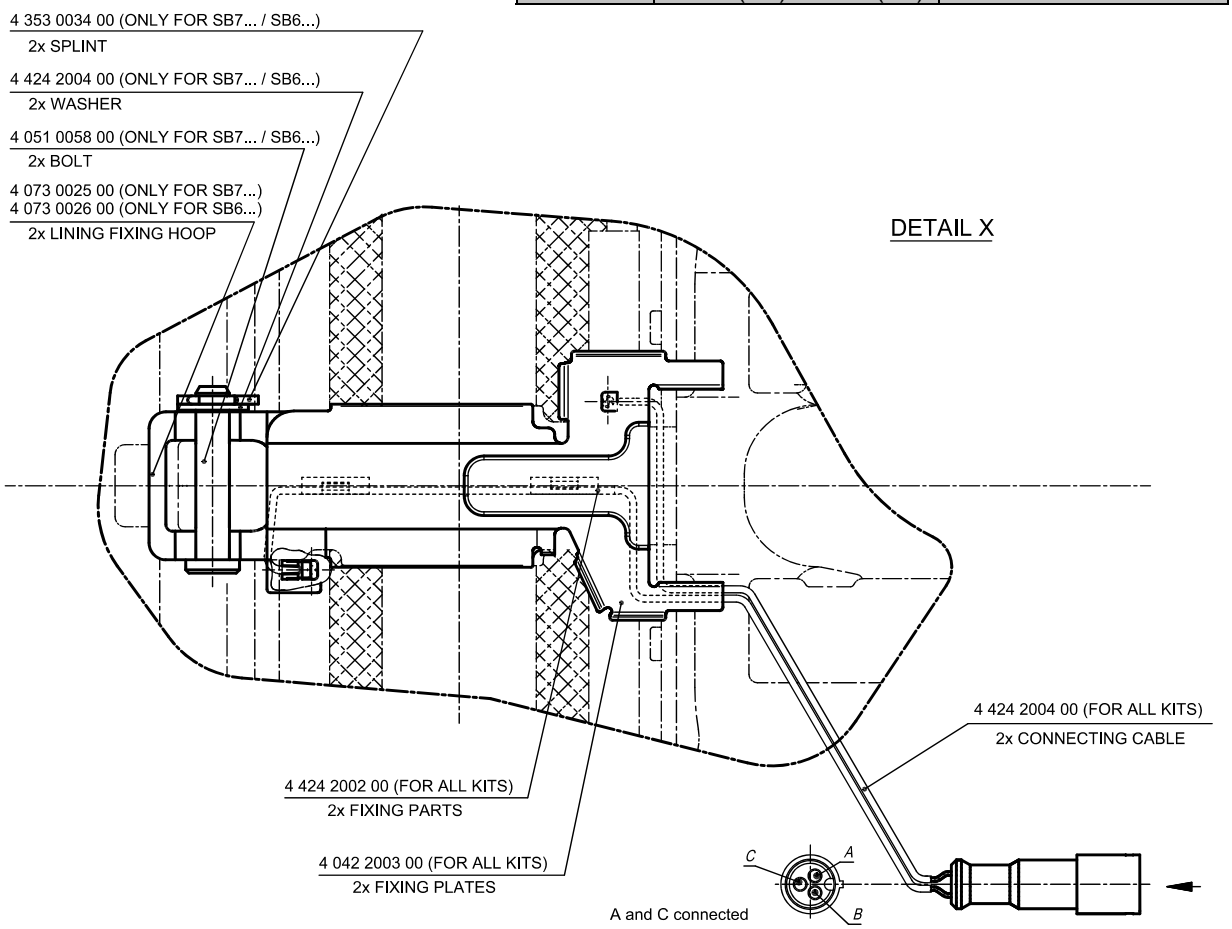


Cable kit for KNORR electric wear indicator



Note:
1 connecting cable kit per axle

Brake	Type	Connecting cable kit
SBK 1937	SB6…	3 424 2005 00
	SB6…(SN)	3 424 2008 00
SBK 2243	SB7…	3 424 2004 00
	SB7…(SN)/ SB7…(SK)	3 424 2008 00



SAF-O-Meter

Designation:

Rolling circumference range:	SAF-O-meter orderno.:	Tyre example:
2360 – 2455 mm	4 388 0241 00	245/70R17,5“ or 235/75R17,5“
2590 – 2690 mm	4 388 0264 00	265/70R19,5“
2655 – 2765 mm	4 388 0271 00	445/45R19,5“
2850 – 2970 mm	4 388 0291 00	425/55R19,5“
2980 – 3100 mm	4 388 0304 00	385/55R22,5“
3125 – 3250 mm	4 388 0319 00	11R22,5“ or 295/80R22,5“
3185 – 3315 mm	4 388 0325 00	385/65R22,5“
3420 – 3560 mm	4 388 0349 00	425/65R22,5“

For example:
Tyre: 385/65R22,5“ with rolling circumference (E.T.R.T.O Norm): 3248 mm
This rolling circumference fits best to the range 3185 - 3315 mm so:

- SAF-O-Meter 4 388 0325 00
- Hub cap 4 304 0103 01.

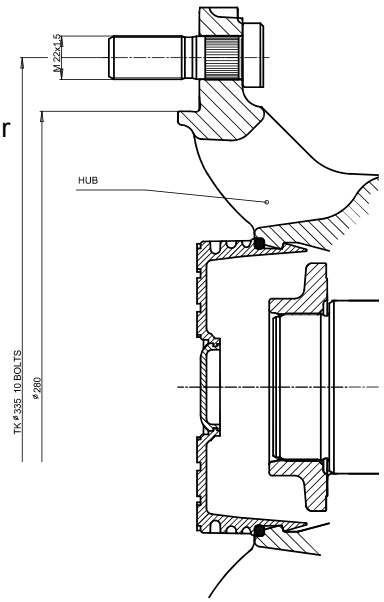
Installation

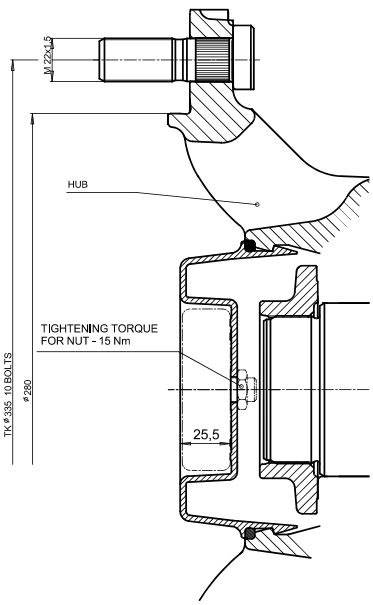
Please check before fitting whether you have received the right SAF-O-meter suitable to your tyre size

standard hub cap
4 304 0102 00

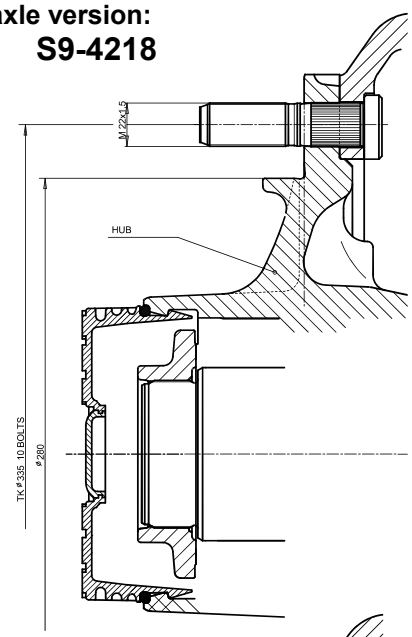
hub cap for SAF-O-meter
4 304 0103 01

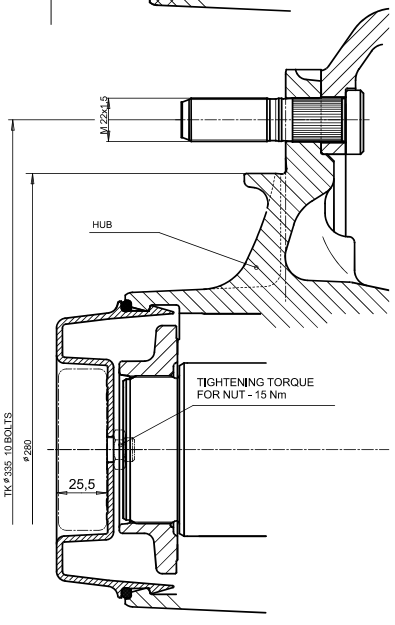
axle versions:
BI9-22.. and BI9-19..





axle version:
S9-4218





The sketches show, irrelevant of the axle types, how the SAF-O-Meter is fitted in the hub caps. It is not important on which side of the vehicle it is fitted, as the counter functions independently of the direction of rotation.

SAF Guarantee of Competence

We assume the following manufacturer's warranty for the durability of the air suspension unit (hereinafter: the Unit).

SAF INTRADISC *plus INTEGRAL* and SAF INTRADISC

Self-steering axle
Type IU / IO for 9 t axle load with single tires.

The beneficiary of the warranty is the party which operates a vehicle equipped with the Unit, for its own purpose (final customer).

Term and Scope of Warranty
SAF HOLLAND warrants to the final customer that the Unit will run without defects for 1 million km during a maximum period of 6 years as of the first registration of the vehicle equipped with the Unit, but not longer than 6.5 years from the date of manufacture of the Unit. (The date of manufacture can be determined by the serial number. This is located on the type plate of the Unit. From July 2009 the serial number has 11 digits. The year of production (by decade) results from the 3rd and 4th digit of the serial number. The three-digit date of manufacture (= current calendar day) results from the 5th, 6th and 7th digit. The serial number had 9 digits prior to July 2009. The three-digit production date (= current calendar day) results from the 1st and 2nd and 3rd digit; the year of production (by decade) results from the 4th and 5th digit of the serial number.). Pending an assessment of the preconditions and approval by SAF-HOLLAND, the claims under this warranty are restricted to the repair free of charge or, at the discretion of SAF-HOLLAND, replacement of the Unit free of charge at the workshop of an SAF-HOLLAND Competence Partner (Germany) or a specialist workshop authorized by SAF-HOLLAND or the local SAF-HOLLAND country representative (other countries). SAF-HOLLAND shall be entitled to read and analyze the "Operating Conditions Protocol" from the EBS brake system of the trailer/semi-trailer. More extensive claims, especially claims for damages, may not be derived from the warranty. In particular, SAF-HOLLAND shall not be liable under this warranty for the reimbursement of transport and towing costs, or for loss of profits, loss of use, etc. Any more extensive claims against the seller shall remain unaffected by this warranty.

The guarantee is valid for the operation of vehicles in geographical Europe up to the Ural mountains and Turkey.

Defects Excluded
Defects caused by the application of external force, by operating errors, off-road use (driving on non-asphalted/non-concrete routes, e.g. on ballast-coated roads, agricultural or forestry tracks, on construction sites or gravel pit terrain), by use in races or for military purposes as well as by failure to observe operating, maintenance or installation instructions and by the use of spare parts not released by SAF-HOLLAND, are excluded from the manufacturer's warranty. Natural wear and tear of working parts such as, in particular, brake disks, pads, air springs, brake chambers, steering shock absorbers, tie rod ends, blocking cylinders and steering bolt groups with bearings, does not fall within the manufacturer's warranty.

Processing of Warranty
Claims under this warranty have to be made in writing to SAF-HOLLAND (SAF-HOLLAND GmbH, Hauptstraße 26, 63856 Bessenbach, Fax No. +49 (0) 60 95 - 301 259) without undue delay following the occurrence of a defect and no later than one month after expiry of the warranty period. Instead, the final customer may address an SAF-HOLLAND Competence Partner (Germany) or the local SAF-HOLLAND representative (other countries) in writing or in person. A list of SAF-HOLLAND Competence Partners and of the local SAF-HOLLAND country representatives can be obtained on the Internet at the website www.safholland.com, or at SAF-HOLLAND (see the above-mentioned address or telephone number +49 (0) 60 95 - 301 602). Parts replaced within the context of performance under this warranty shall become the property of SAF-HOLLAND. Insofar as SAF-HOLLAND performs under this warranty and the customer has reimbursement claims against third parties, such claims shall be assigned to SAF-HOLLAND.

This warranty is governed by German law. Place of exclusive jurisdiction is Aschaffenburg.