

General Operating and Service Manual

SAF Air suspension systems and axles with drum brakes



SAF SERVICE und ORIGINALTEILE
SAF SERVICE and ORIGINAL PARTS

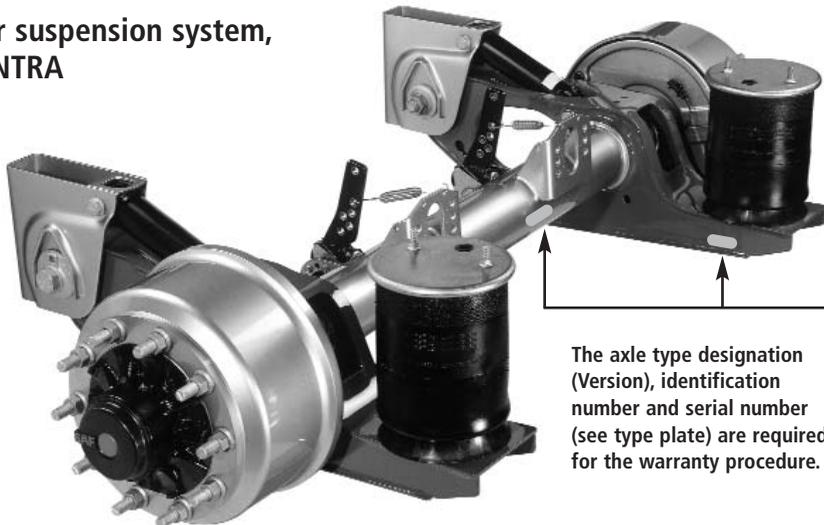
www.saf-axles.com

map & guide
location service

Edition 01/2006

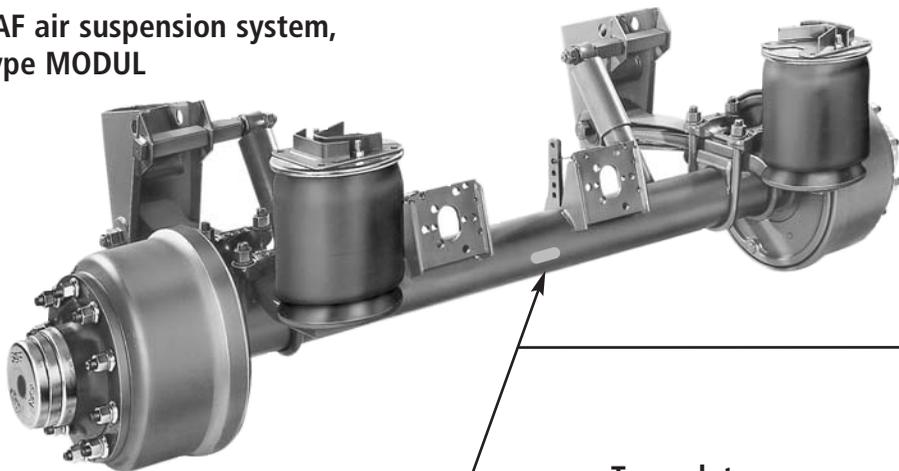


SAF air suspension system, Type INTRA



The axle type designation (Version), identification number and serial number (see type plate) are required for the warranty procedure.

SAF air suspension system, Type MODUL



Type plate

OTTO SAUER ACHSENFABRIK GMBH D-63856 BESSENBACH · GERMANY		SAF
Version S9-4218	Serial No. 284 05 1 007	
Type SNK4218-115	Ident No. 147 84 60 2 58 0	
Test Report TDB0381	Perm axle cap. stat. 9000 kg	
	V max. 105 km/h	
AN 1754524		SN 284051007



Identification if the type plate is missing:
 The Serial No. of the axle is embossed in the axle end on the right-hand side (as seen in the direction of travel).

Trailer manufacturer.....

Body type.....

Chassis No.

Date of delivery/date of registration

Spare parts service for SAF axles and suspension systems

Exact type designations are required for spare parts orders.

Please enter the identification data of the suspension system in the type plate illustrated below so that the correct information is available when necessary.



	Ident. No.	Prod. No. (Serial No.)
Example	147 84 60 2 58 0	284 05 1 007
1st axle		
2nd axle		
3rd axle		
4th axle		
5th axle		

Enter the axle data from the SAF type plate



Identification of SAF axles	2-3
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Service schedule

S9-4218 / SL9-4218 / Z9-4218 / ZL9-4218 / S9-4220 / SL9-4220 / Z9-4220 / ZL9-4220 / S11-4218 / SL11-4218 / SZL11-4218 / Z11-4218 / ZL11-4218 / S11-4220 / SL11-4220 / SZL-4220 / Z11-4220 / ZL11-4220 / ZZLL-4220	8
SK RS / RZ 9042 / 11242	9
Z8-3718 / S9-3718 / SL9-3718 / Z9-3720 / ZL9-3720 / S11-3720 / SL11-3720 / Z11-3720 / ZL11-3720	10
SK RS / RZ 6537 / 9037 / 11037	11
S7-3015 / Z7-3015 / S9-3020 / Z9-3020 / ZL9-3020 / Z11-3020 / ZL11-3020	12
SK RS / RZ 6530 / 9030 / 11030 / RZ 12030	13
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General information

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Please observe the following safety instructions in order to maintain the operational and road safety of your SAF axles and suspension systems:

1. The wheel contact surfaces between the wheel disc and wheel hub and the wheel nut contact surface at the wheel disc must not be additionally painted. The contact surfaces must be clean, smooth and free from grease. Failure to observe this may result in the wheel coming loose. Any additional instructions of the wheel manufacturer must also be observed.
2. Only the wheel and tyre sizes approved by the trailer builder may be used. The tyres must always have the specified inflation pressure.
3. The brake systems of the tractor and the trailer/semi-trailer must be synchronised by means of a tractor/trailer brake synchronisation not later than 5,000 km after the initial start of operation of the trailer/semi-trailer in order to ensure a safe and uniform braking behaviour and uniform brake pad wear. Tractor/trailer brake synchronisations should be carried out by appropriately qualified and equipped brake workshops.
The use of an additional braking system, such as a trailer anti-jackknife brake is forbidden by law on vehicles with type approval after January 1999.
4. Before starting a journey, ensure that the maximum permissible axle load is not exceeded and that the load is distributed equally and uniformly.
5. On trailers with air suspension, ensure that the air bags are completely filled with air before starting the journey. Incompletely filled air bags may result in damage to axles, suspension, frame and superstructure and impair road safety.
6. Ensure that the brakes are not overheated by continuous operation.
With drum brakes, overheating can result in a hazardous deterioration in the braking efficiency.
With disc brakes, overheating can result in damage to surrounding components – in particular the wheel bearings. This can result in a significant deterioration in road safety, e.g. failure of wheel bearings.
7. The parking brake must not be immediately applied when the brakes are hot, as the brake discs and brake drums may be damaged by different stress fields during cooling.
8. Use the supports provided when loading and unloading in order to avoid damage to the axle.
9. Observe the operating recommendation of the trailer builder for off-road operation of the installed axles and suspension systems.
The SAF definition of OFF-ROAD means driving on non-asphalted / non-concreted routes, such as e.g. gravel roads, agricultural and forestry tracks, on construction sites and in gravel pits.
Off-road operation of SAF axles and suspension systems not designed for the purpose may result in damage and hence to an impairment of road safety.
10. SAF axles and suspension systems require continuous care, service and maintenance in order to maintain operational and road safety and to be able to recognise natural wear and defects in good time.
The daily inspection of the trailer for road safety before starting the journey is one of the driver's obligations. SAF recommends that at least the inspections and maintenance operations described on page 6 should be carried out.

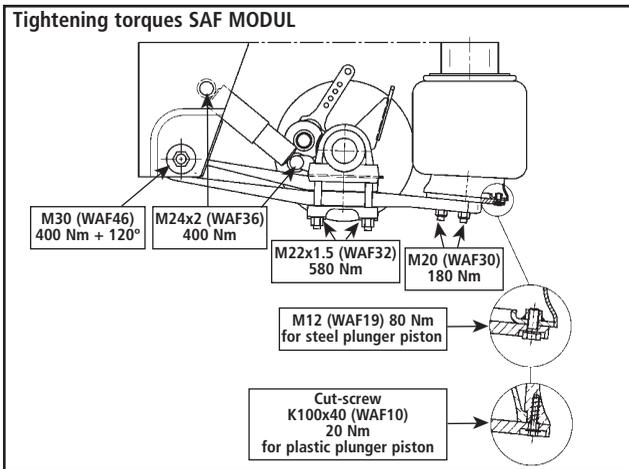
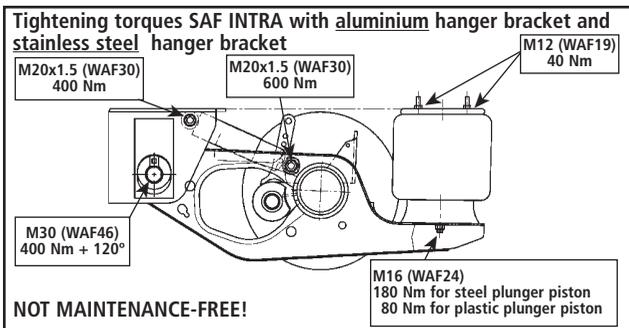
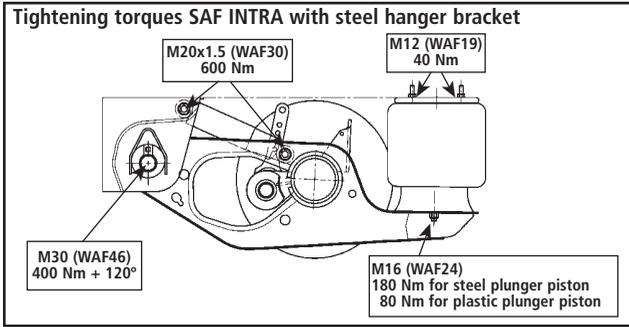
We recommend the use of original SAF spare parts.

A close-knit service network of SAF partner companies is available for the technical support of the SAF axles and suspension systems and for the supply of original SAF spare parts (see rear cover or on the Internet under www.saf-axles.com).

Updates will be published as necessary on the Internet under www.saf-axles.com.

- **Caution:** After every wheel change, always retighten the wheel nuts to the prescribed torque after 50 km and again after 150 km.
- Check the brake lining thickness at regular intervals.
- Carry out general visual inspections of the brakes, tyres and all suspension components at regular intervals and check for proper attachment, wear, leaks, corrosion and damage.
- Carry out regular visual inspections of the wheel bearing unit for grease leaks and axial clearance. Wheel bearing grease change, see pages 9, 11, 13, 14 and 15.
- Regularly check the camshaft for smooth return and the slack adjuster for proper function.
- Lubricate the camshaft at regular intervals.
- Inspect the brake drum for wear* and cracking at every brake lining change. Minimum wear limits*, see pages 8 to 15.
- Replace the brake shoe return springs at every brake lining change.
- Check the air suspension ride height at regular intervals in accordance with the trailer builder's specifications and adjust as described on page 25.
- With aluminium and stainless steel hanger brackets, check that the bolts of the spring brackets and shock absorbers are tightened to the prescribed torques as described on page 7.
- On all units, check that the bolts of the U-brackets are tightened to the prescribed torques as described on page 7.
- For steering axles, observe also the points on pages 16 and 17.
- Carry out a general safety check in accordance with the statutory provisions.
- We recommend the use of original SAF spare parts.

* We recommend that a general safety check is carried out when the minimum wear limit is reached.



Attention!

- Threads not to be oiled or greased!
- Pivot bolt on steel hanger brackets maintenance-free.
- Service intervals for aluminium hanger brackets and stainless steel hanger brackets: first check after 500 km, further check after every 6 months
Spring eye bolt: Inspection torque 1,200 Nm
Shock absorber bolt: Inspection torque 400 Nm

Axle types

S9-4218 / SL9-4218 / Z9-4218 / ZL9-4218 / S9-4220 / SL9-4220 / Z9-4220 / ZL9-4220 / S11-4218 / SL11-4218 / SZL11-4218 / Z11-4218 / ZL11-4218 / S11-4220 / SL11-4220 / SZL11-4220 / Z11-4220 / ZL11-4220 / ZZL11-4220

Wheel bearing play, wheel bearing grease

Adjustment of wheel bearing play not necessary.

Note during brake repairs:

Lubricate the camshafts, rotating the camshaft through 360° several times.

Use a vacuum cleaner to remove brake dust.

Use of a high-pressure cleaner or liquid cleanser is not permitted on the brake drum and brake hub.

Remove old grease from the stub axle and regrease.

Replace the O-ring.

Replace the brake shoe return springs at every brake pad change.

Grease specifications

For camshaft

SAF Part No. 5 387 0011 05

For axle stub end:

SAF mounting paste

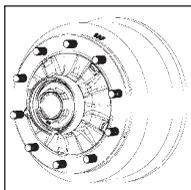
SAF Part No. 5 387 0021 05

For ball in brake carrier:

Copper paste

SAF Part No. 5 387 0014 01

Tighten axle nuts



On left-hand side in direction of travel:

Left-hand thread

On right-hand side in direction of travel:

Right-hand thread

Pretightening: 150 Nm, then turn the hub unit

slowly by 5 revolutions.

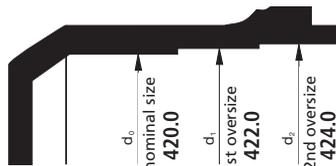
Final tightening: Retighten by 1 increment (30°)

Marking of the nuts with left-hand thread:

Milled groove on outside of hexagon.

Max. permissible axial backlash of hub unit:

0 - 0.20 mm



BRAKE SNK 420

Max. admissible brake drum machining diameter:

Max. admissible brake drum wear diameter:

Brake lining qualities recommended and approved by SAF:

Machine new brake linings to diameter + 0.3 mm of the brake drum.

When riveting on, observe the lining form (see instructions in the pack).

424.0 mm

425.0 mm

SAF 396, BREMSKERL 6386

Brake size	SAF Part No. Brake lining	Brake drum / brake lining Repair stages in mm			Brake lining	Rivet	Rivet DIN 7338
		Normal dimension	1st repair stage	2nd repair stage			
		d ₀ -420.0	d ₁ -422.0	d ₂ -424.0			
x 180	3 057 3960 00	20.6 20.0	21.6 21.0	22.6 22.0	4 4	64	B 8 x 15
x 200	3 057 3966 00	20.6 20.0	21.6 21.0	22.6 22.0	4 4	64	B 8 x 15

Assembly tools

Axle nut wrench

Brake shoe tensioner

Puller for wheel hub

SAF Part No.

4 434 3828 00

3 349 1001 00

4 434 3822 00

Axle types SK RS/RZ 9042/11242

Wheel bearing play, wheel bearing grease

Adjustment of wheel bearing play not necessary.

Change the wheel bearing grease after 500,000 km or 50 months.

Inspect taper roller bearing for serviceability at grease changes.

Replace the O-ring and fit the wheel cap.

Note during brake repairs:

Lubricate the camshafts, rotating the camshaft through 360° several times.

Do not dismantle the wheel bearing unit.

Use a vacuum cleaner to remove brake dust.

Use of a high-pressure cleaner or liquid cleanser is not permitted on the brake drum and brake hub.

Remove old grease from the stub axle and regrease.

Replace the brake shoe return springs at every brake pad change.

Grease specifications

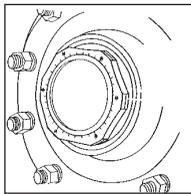
For wheel bearings:
SAF Part No. 5 387 0011 05

For camshaft
SAF Part No. 5 387 0011 05

For axle stub end:
SAF mounting paste
SAF Part No. 5 387 0021 05

For ball in brake carrier:
Copper paste
SAF Part No. 5 387 0014 01

Tighten axle nuts



On left-hand side in direction of travel:

Left-hand thread

On right-hand side in direction of travel:

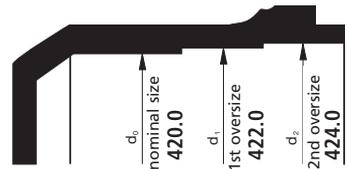
Right-hand thread

Tightening torque 900 Nm. Each hub unit must be rotated smoothly at least twice while tightening the bolts.

Marking of the nuts with left-hand thread:

Milled groove on outside of hexagon.

**Max. permissible axial backlash of hub unit:
0 - 0.20 mm**



d_0
nominal size
420.0

d_1
1st oversize
422.0

d_2
2nd oversize
424.0

BRAKE SNK 420

Max. admissible brake drum machining diameter:

Max. admissible brake drum wear diameter:

Brake lining qualities recommended and approved by SAF:

Machine new brake linings to diameter + 0.3 mm of the brake drum.

When riveting on, observe the lining form (see instructions in the pack).

424.0 mm

425.0 mm

SAF 396, BREMSKERL 6386

Brake size	SAF Part No. Brake lining	Brake drum / brake lining Repair stages in mm			Brake lining	Rivet	Rivet DIN 7338
		Normal dimension	1st repair stage	2nd repair stage			
		d_0 -420.0	d_1 -422.0	d_2 -424.0			
x 180	3 057 3960 00	20.6	21.6	22.6	4	64	B 8 x 15
		20.0	21.0	22.0	4		
x 200	3 057 3966 00	20.6	21.6	22.6	4	64	B 8 x 15
		20.0	21.0	22.0	4		

Assembly tools

Axle nut wrench

Brake shoe tensioner

Brake drum mounting flanges

Wheel bearing mounting mandrel

Puller for wheel hub

SAF Part No.

1 012 0024 00

3 349 1001 00

3 434 1040 01

3 434 1043 00

4 434 3822 00

Axle types

Z8-3718 / S9-3718 / SL9-3718 / Z9-3720 / ZL9-3720 / S11-3720 / SL11-3720 / Z11-3720 / ZL11-3720

Wheel bearing play, wheel bearing grease

Adjustment of wheel bearing play not necessary.

Note during brake repairs:

Lubricate the camshafts, rotating the camshaft through 360° several times.

Use a vacuum cleaner to remove brake dust.

Use of a high-pressure cleaner or liquid cleanser is not permitted on the brake drum and brake hub.

Remove old grease from the stub axle and regrease.

Replace the O-ring.

Replace the brake shoe return springs at every brake pad change.

Grease specifications

For camshaft

SAF Part No. 5 387 0011 05

For axle stub end:

SAF mounting paste

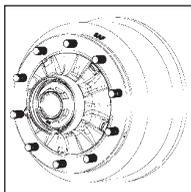
SAF Part No. 5 387 0021 05

For ball in brake carrier:

Copper paste

SAF Part No. 5 387 0014 01

Tighten axle nuts



On left-hand side in direction of travel:

Left-hand thread

On right-hand side in direction of travel:

Right-hand thread

Pretightening: 150 Nm, then turn the hub unit

slowly by 5 revolutions.

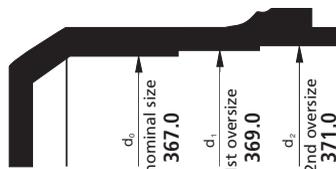
Final tightening: Retighten by 1 increment (30°)

Marking of the nuts with left-hand thread:

Milled groove on outside of hexagon.

Max. permissible axial backlash of hub unit:

0 - 0.20 mm



BRAKE SNK 367

Max. admissible brake drum machining diameter:

Max. admissible brake drum wear diameter:

Brake lining qualities recommended and approved by SAF:

Machine new brake linings to diameter + 0.3 mm of the brake drum.

When riveting on, observe the lining form (see instructions in the pack).

371.0 mm

372.0 mm

SAF 396, BREMSKERL 6386

Brake size	SAF Part No. Brake lining	Brake drum / brake lining Repair stages in mm			Brake lining	Rivet	Rivet DIN 7338
		Normal dimension	1st repair stage	2nd repair stage			
SNK 367		d_0 -367.0	d_1 -369.0	d_2 -371.0	Number per axle		
x 180	3 057 3168 00	21.1	22.1	23.1	4	64	B 8 x 15
		20.5	21.5	22.5	4		
x 200	3 057 3170 00	21.1	22.1	23.1	4	64	B 8 x 15
		20.5	21.5	22.5	4		

Assembly tools

Axle nut wrench

Brake shoe tensioner

Brake drum mounting flanges

Puller for wheel hub

SAF Part No.

4 434 3828 00

3 349 1001 00

3 434 1040 01

4 434 3822 00

Axle types SK RS/RZ 6537 / 9037 / 11037

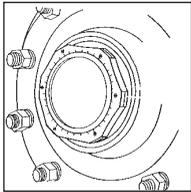
Wheel bearing play, wheel bearing grease

- Adjustment of wheel bearing play not necessary.
- Change the wheel bearing grease after 500,000 km or 50 months.
- Inspect taper roller bearing for serviceability at grease changes.
- Replace the O-ring and fit the wheel cap.

Note during brake repairs:

- Lubricate the camshafts, rotating the camshaft through 360° several times.
- Do not dismantle the wheel bearing unit.
- Use a vacuum cleaner to remove brake dust.
- Use of a high-pressure cleaner or liquid cleanser is not permitted on the brake drum and brake hub.
- Remove old grease from the stub axle and regrease.
- Replace the brake shoe return springs at every brake pad change.

Tighten axle nuts



- On left-hand side in direction of travel:
Left-hand thread
- On right-hand side in direction of travel:
Right-hand thread
- Tightening torque 900 Nm. Each hub unit must be rotated smoothly at least twice while tightening the bolts.
- Marking of the nuts with left-hand thread:
Milled groove on outside of hexagon.
- Max. permissible axial backlash of hub unit:
0 - 0.20 mm

Grease specifications

- For wheel bearings:
SAF Part No. 5 387 0011 05
- For camshaft
SAF Part No. 5 387 0011 05
- For axle stub end:
SAF mounting paste
SAF Part No. 5 387 0021 01
- For ball in brake carrier:
Copper paste
SAF Part No. 5 387 0014 01



BRAKE SNK 367

- Max. admissible brake drum machining diameter:
- Max. admissible brake drum wear diameter:
- Brake lining qualities recommended and approved by SAF:
- Machine new brake linings to diameter + 0.3 mm of the brake drum.
- When riveting on, observe the lining form (see instructions in the pack).

- 371.0 mm
- 372.0 mm
- SAF 396, BREMSKERL 6386

Brake size	SAF Part No. Brake lining	Brake drum / brake lining Repair stages in mm			Brake lining	Rivet	Rivet DIN 7338
		Normal dimension	1st repair stage	2nd repair stage			
SNK 367		d ₀ -367.0	d ₁ -369.0	d ₂ -371.0			
x 150	3 057 3174 00	21.1 20.5	22.1 21.5	23.1 22.5	4 4	64	B 8 x 15
x 180	3 057 3168 00	21.1 20.5	22.1 21.5	23.1 22.5	4 4	64	B 8 x 15
x 200	3 057 3170 00	21.1 20.5	22.1 21.5	23.1 22.5	4 4	64	B 8 x 15

Assembly tools

- Axle nut wrench
- Brake shoe tensioner
- Brake drum mounting flanges
- Wheel bearing mounting mandrel
- Brass bush mounting device
- Brass bush mounting mandrel
- Puller for wheel hub

SAF Part No.

- 1 012 0024 00
- 3 349 1001 00
- 3 434 1040 01
- 3 434 1058 00
- 1 434 1056 00
- 1 434 1055 00
- 4 434 3822 00

Axle types

S7-3015 / Z7-3015 / S9-3020 / SL9-3020 / Z9-3020 / ZL9-3020 / Z11-3020 / ZL11-3020

Wheel bearing play, wheel bearing grease

Adjustment of wheel bearing play not necessary.

Note during brake repairs:

Lubricate the camshafts, rotating the camshaft through 360° several times.

Use a vacuum cleaner to remove brake dust.

Use of a high-pressure cleaner or liquid cleanser is not permitted on the brake drum and brake hub.

Remove old grease from the stub axle and regrease.

Replace the O-ring.

Replace the brake shoe return springs at every brake pad change.

Grease specifications

For camshaft

SAF Part No. 5 387 0011 05

For axle stub end:

SAF mounting paste

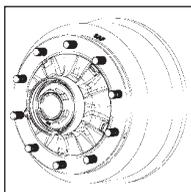
SAF Part No. 5 387 0021 05

For ball in brake carrier:

Copper paste

SAF Part No. 5 387 0014 01

Tighten axle nuts



On left-hand side in direction of travel:

Left-hand thread

On right-hand side in direction of travel: Right-

hand thread

Pretightening: 150 Nm, then turn the hub unit slowly by 5 revolutions.

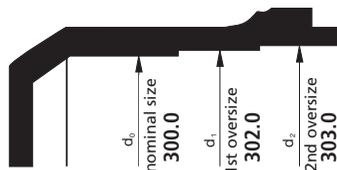
Final tightening: Retighten by 1 increment (30°)

Marking of the nuts with left-hand thread:

Milled groove on outside of hexagon.

Max. permissible axial backlash of hub unit:

0 - 0.20 mm



BRAKE SNK 300

Max. admissible brake drum machining diameter:

303.0 mm

Max. admissible brake drum wear diameter:

304.0 mm

Brake lining qualities recommended and approved by SAF:

SAF 396, BREMSKERL 6386

Machine new brake linings to diameter + 0.3 mm of the brake drum.

When riveting on, observe the lining form (see instructions in the pack).

Brake size	SAF Part No. Brake lining	Brake drum / brake lining Repair stages in mm			Brake lining	Rivet	Rivet DIN 7338
		Normal dimension	1st repair stage	2nd repair stage			
		d ₀ -300.0	d ₁ -302.0	d ₂ -303.0			
x 150	3 057 3133 00	15.5 16.5	16.7 17.7	17.1 18.1	4 4	64	B 8 x 15
x 200	3 057 3124 00	15.5 16.5	16.7 17.7	17.1 18.1	4 4	64	B 8 x 15

Assembly tools

Axle nut wrench

Puller for wheel hub

Puller for wheel hub

SAF Part No.

4 434 3828 00

3 301 0010 00

4 434 3822 00

Axle types

SK RS/RZ 6530 / 9030 / 11030 / RZ 12030

Adjust wheel bearing clearance:

Tighten the WAF 85 axle nut to 150 Nm, turning the wheel hub at the same time.

Turn back the axle nut by 2 1/2 holes of the lock washer.

Push on the lock washer and secure the axle nut with the locking pin.

Tighten the lock nut to 400 Nm.

Check the running and rock of the wheel bearing.

The wheel must turn without resistance and no rock may be felt at the wheel rim. Correct the adjustment, if necessary.

Replace the O-ring and fit the wheel cap.

Replace the brake shoe return springs at every brake pad change.

Grease specifications

For wheel bearings:

SAF Part No. 5 387 0011 05

For camshaft:

SAF Part No. 5 387 0011 05

For axle stub end:

SAF mounting paste

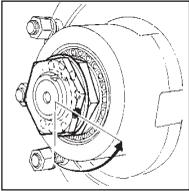
SAF Part No. 5 387 0021 01

For ball in brake carrier:

Copper paste

SAF Part No. 5 387 0014 01

Tighten axle nuts



Note during brake repairs:

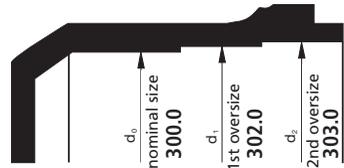
Lubricate the camshafts, rotating the camshaft through 360° several times.

Use a vacuum cleaner to remove brake dust.

Use of a high-pressure cleaner or liquid cleanser is not permitted on the brake drum and brake hub.

Remove old grease from the stub axle and regrease.

Max. permissible axial backlash of hub unit:
0 - 0.20 mm



BRAKE SNK 300

Max. admissible brake drum machining diameter:

Max. admissible brake drum wear diameter:

Brake lining qualities recommended and approved by SAF:

Machine new brake linings to diameter + 0.3 mm of the brake drum.

When riveting on, observe the lining form (see instructions in the pack).

303.0 mm

304.0 mm

SAF 396, BREMSKERL 6386

Brake size	SAF Part No. Brake lining	Brake drum / brake lining Repair stages in mm			Brake lining	Rivet	Rivet DIN 7338
		Normal dimension	1st repair stage	2nd repair stage			
		d_0 -300.0	d_1 -302.0	d_2 -303.0			
x 150	3 057 3133 00	15.5	16.7	17.1	4	64	B 8 x 15
		16.5	17.7	18.1	4		
x 200	3 057 3124 00	15.5	16.7	17.1	4	64	B 8 x 15
		16.5	17.7	18.1	4		

Assembly tools

Axle nut wrench

Puller for wheel hub

Fitting mandrel for wheel bearing and seal ring

Fitting mandrel for wheel bearing

Brass bush mounting mandrel

Brass bush mounting device

SAF Part No.

4 434 3828 00

3 301 0010 00

3 434 1014 00

3 434 3308 00

1 434 1055 00

1 434 1056 00

Axle types SK RS/RZ 12242

Adjust wheel bearing clearance:

Tighten the WAF 85 axle nut to 150 Nm, turning the wheel hub at the same time.

Turn back the axle nut by 2 1/2 holes of the lock washer.

Push on the lock washer and secure the axle nut with the locking pin.

Tighten the lock nut to 400 Nm.

Check the running and rock of the wheel bearing.

The wheel must turn without resistance and no rock may be felt at the wheel rim. Correct the adjustment, if necessary.

Replace the O-ring and fit the wheel cap.

Replace the brake shoe return springs at every brake pad change.

Grease specifications

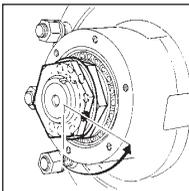
For wheel bearings:
SAF Part No. 5 387 0011 05

For camshaft
SAF Part No. 5 387 0011 05

For axle stub end:
SAF mounting paste
SAF Part No. 5 387 0021 01

For ball in brake carrier:
Copper paste
SAF Part No. 5 387 0014 01

Tighten axle nuts



Note during brake repairs:

Lubricate the camshafts, rotating the camshaft through 360° several times.

Do not dismantle the wheel bearing unit.

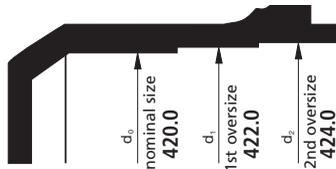
Use a vacuum cleaner to remove brake dust.

Use of a high-pressure cleaner or liquid cleanser is not permitted on the brake drum and brake hub.

Remove old grease from the stub axle and regrease.

Max. permissible axial backlash of hub unit:

0 - 0.20 mm



424.0 mm
425.0 mm
SAF 396, BREMSKERL 6386

BRAKE SNK 420

Max. admissible brake drum machining diameter:

Max. admissible brake drum wear diameter:

Brake lining qualities recommended and approved by SAF:

Machine new brake linings to diameter + 0.3 mm of the brake drum.

When riveting on, observe the lining form (see instructions in the pack).

Brake size	SAF Part No. Brake lining	Brake drum / brake lining Repair stages in mm			Brake lining	Rivet	Rivet DIN 7338
		Normal dimension	1st repair stage	2nd repair stage			
		d ₀ -420.0	d ₁ -422.0	d ₂ -424.0			
x 180	3 057 3960 00	20.6 20.0	21.6 21.0	22.6 22.0	4 4	64	B 8 x 15
x 200	3 057 3966 00	20.6 20.0	21.6 21.0	22.6 22.0	4 4	64	B 8 x 15

Assembly tools

Axle types 12242

Axle nut wrench	4 434 3828 00
Puller for wheel hub	3 301 0010 00
Universal puller for wheel hub	4 434 3822 00
Fitting mandrel for wheel bearing and seal ring	3 434 3320 00
Fitting mandrel for cassette seal ring	3 434 1036 00
Brake shoe tensioner	3 349 1001 00

SAF Part No.

Axle types

K RS/RZ 14242/16242

Adjust wheel bearing clearance:

Tighten the axle nut, turning the wheel hub until a slight resistance is felt.

Turn back the axle nut by 1/12 turn to the next locking possibility.

Lock the axle nut with the cotter pin.

Turn back the wheel hub slightly against the front bearing with the wheel hub puller.

Seal the thread of the wheel cap.

Screw on the wheel cap.

Check the running and rock of the wheel bearing.

The wheel must turn without resistance and no rock may be felt at the wheel rim. Correct the adjustment, if necessary.

Replace the brake shoe return springs at every brake pad change.

Grease specifications

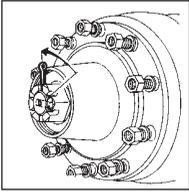
For wheel bearings:
SAF Part No. 5 387 0011 05

For camshaft
SAF Part No. 5 387 0011 05

For axle stub end:
SAF mounting paste
SAF Part No. 5 387 0021 01

For ball in brake carrier:
Copper paste
SAF Part No. 5 387 0014 01

Tighten axle nuts



Note during brake repairs:

Lubricate the camshafts, rotating the camshaft through 360° several times.

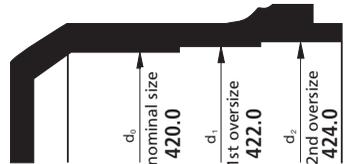
Do not dismantle the wheel bearing unit.

Use a vacuum cleaner to remove brake dust.

Use of a high-pressure cleaner or liquid cleanser is not permitted on the brake drum and brake hub.

Remove old grease from the stub axle and regrease.

Max. permissible axial backlash of wheel bearing:
0 - 0.20 mm



BRAKE SNK 420

Max. admissible brake drum machining diameter:

Max. admissible brake drum wear diameter:

Brake lining qualities recommended and approved by SAF:

Machine new brake linings to diameter + 0.3 mm of the brake drum.

When riveting on, observe the lining form (see instructions in the pack).

424.0 mm

425.0 mm

SAF 396, BREMSKERL 6386

Brake size	SAF Part No. Brake lining	Brake drum / brake lining Repair stages in mm			Brake lining	Rivet	Rivet DIN 7338
		Normal dimension	1st repair stage	2nd repair stage			
		d_0 -420.0	d_1 -422.0	d_2 -424.0			
x 180	3 057 3960 00	20.6 20.0	21.6 21.0	22.6 22.0	4 4	64	B 8 x 15
x 200	3 057 3966 00	20.6 20.0	21.6 21.0	22.6 22.0	4 4	64	B 8 x 15

Assembly tools

Axle types

Axle nut wrench

Puller for wheel hub

Universal puller for wheel hub

Fitting mandrel for wheel bearing and seal ring

Brake shoe tensioner

46 mm dia. brass bush driver mandrel

50/46 mm and 42/38 mm dia. mounting mandrel

SAF Part No.

14242

16242

1 012 0013 00

3 301 0007 01

4 434 3822 00

4 434 3301 00

3 349 1001 00

1 434 1056 00

1 434 1055 00

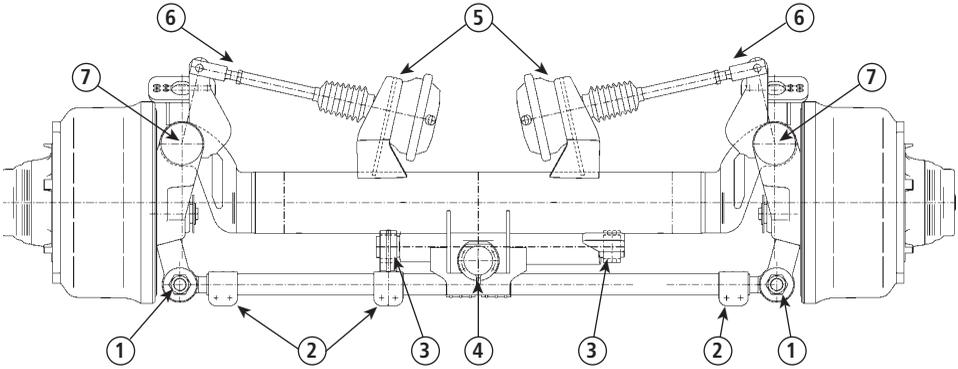
4 434 3822 00

3 434 3301 00

1 434 1056 00

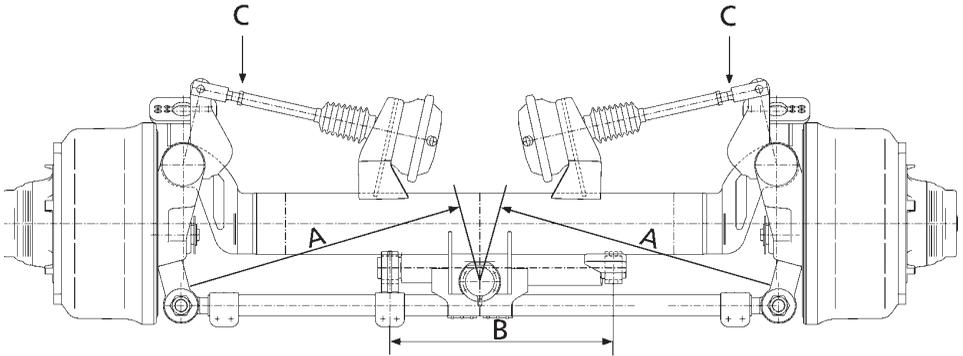
1 434 1056 00

1 434 1055 00



Tightening torques

No.	Designation	Number per axle	Tightening torque
1	Ball joint screw	2	M30 (340 Nm)
2	Retaining clamp screw	10	M12 (80 - 90 Nm)
3	Steering damper screw	2	M24 (600 - 660 Nm)
4	Lock cylinder screw	4	M6 (8 - 10 Nm)
5	Stabilising cylinder screw	4	M16 (180 ± 30 Nm)
6	Lock nut	2	M20 (is locked against the thrust rod)
7	Cover plate screw	6	M8 (25 - 30 Nm)



- Dimension "A" must be the same; observe the toe-in (approx. 4.0 mm/m)
- Dimension "B" is 537 mm; engage the reversing lock
- On versions with pneumatic stabilisation, a steering damper must be used.
- On versions without pneumatic stabilisation, a steering damper must be used.
- Check: Backlash-free seating of the piston rods of the stabilising cylinders. Apply stabilising pressure (min. 2 bar) to the cylinders. Piston and pressure rods must then be backlash-free (under slight pressure); otherwise adjust at "C".
- When setting the track width on the trailer, the cylinders must be under stabilising pressure and the correct ride height of the air suspension system must have been set.
- Tighten all bolts to the prescribed torque and lock the nuts or insert the cotter pin.

Note:

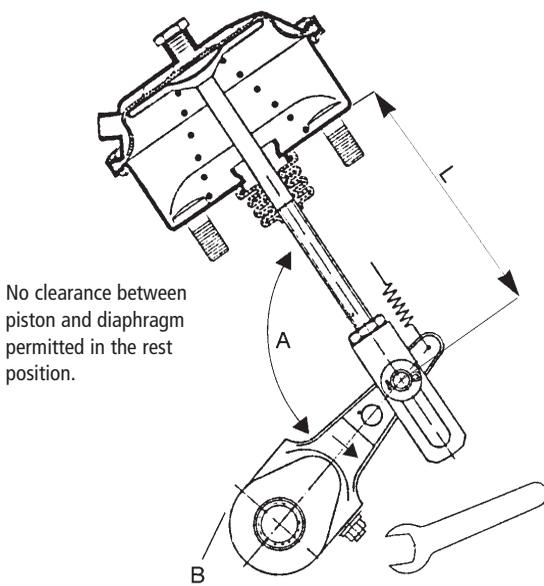
During lubrication work on the steering pin bearing, the axle must be relieved (raised).

Lubrication at the bearing points of the king pin bolt for the first time after 1 month, then every 6 months

Check the brake setting

Adjustment of S-cam brakes with manual slack adjusters

The natural wear of the brake drum and brake lining necessitate frequent adjustment of the wheel brakes in order to maintain the maximum stroke of the brake cylinders. In order to achieve good braking, it is essential to minimise the clearance between the brake drum and brake lining. In order to check the clearance, the service brake is applied with full pressure and the stroke of the brake cylinder checked. If the stroke at the yoke end is more than 2/3 of the maximum cylinder stroke, the brake must be urgently adjusted. If the brakes are correctly adjusted, it should not be possible to move the piston rod more than 15 mm by hand.



No clearance between piston and diaphragm permitted in the rest position.

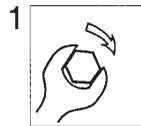
Adjustment is performed at the adjustment screw (WAF 19)

Special instructions apply for automatic slack adjusters (see adjustment procedure on the following pages).

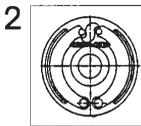
A = Angle must not exceed 90° at 1/2 stroke.

B = No contact permissible between slack adjuster and axle beam during emergency braking.

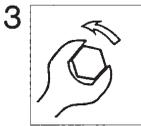
L = Observe piston rod length as per the SAF specifications.



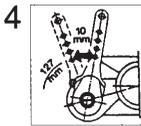
Turn the adjusting screw to the right until the



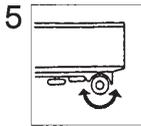
brake shoes are firmly up against the brake drum.



Turn the adjusting screw to the left until



the free travel of the slack adjuster (at 127 mm) is approx. 10 - 15 mm.



It must be possible to turn the wheel freely without braking (without scraping noises).

HALDEX automatic slack adjuster

Note when changing over from mechanical slack adjuster to automatic slack adjuster:

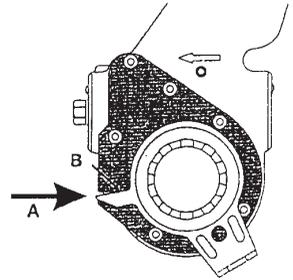
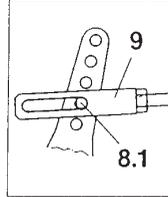
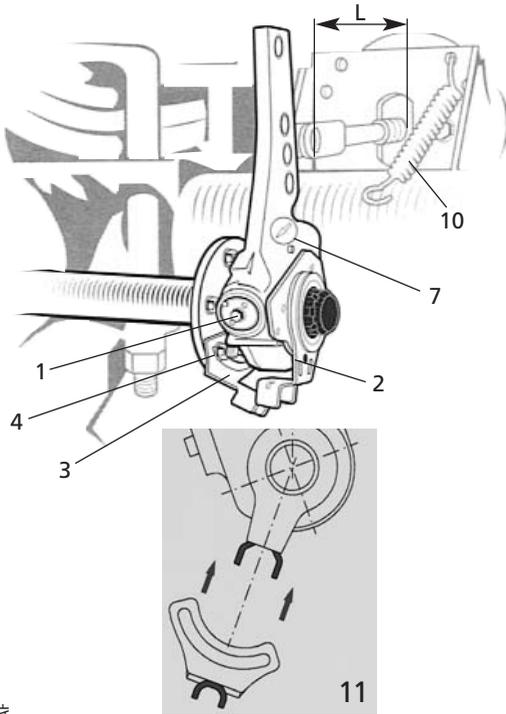
In order to avoid damage to the wheel brake, install only the automatic slack adjuster with the prescribed adjustment gate and corresponding mounting point strap approved by SAF for the respective axle type.

Changes to the effective brake lever lengths are not admissible.

The field installation of automatic slack adjusters does not require type approval so that no inspection by the technical inspection authorities (TÜV) is necessary.

Technical information on SAF spare part numbers and correspondence of slack adjusters and axle types can be obtained from the SAF service partners.

Adjustment of HALDEX automatic slack adjusters



- Cams and brake shoes are in the zero position.
- Observe the correct piston rod length "L" as given in the SAF specifications.

• Brake chambers

Before installation, ensure that the brake chamber is in its starting position.

- **Spring brake chambers**, on the other hand, must be under full working pressure (min. 6 bar).

IMPORTANT: If this is not observed, the basic setting will be wrong!

- Grease the camshaft.
- Install mounting point strap (3); be sure to use two mounting bolts (4).
- Install the slack adjuster on the camshaft.
- The arrow mark (7) points in the braking direction.
- Turn adjusting screw (1) until the bore in the slack adjuster (8.1) is aligned with the bore in the yoke end (9) (see figure).

- Grease cotter pin (8) and secure.
- Hook in return spring (10).
- Turn the control arm in the direction of the arrow (working direction of the slack adjuster) into its end position **without** using force
- In this end position of control arm (2), tighten mounting bolts (4).

- With the fixed mounting point (11), ensure that the 2 U-profiles engage correctly in one another.

NOTE FOR SELF-STEERING AXLES:

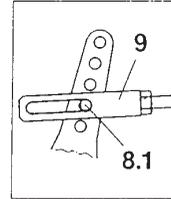
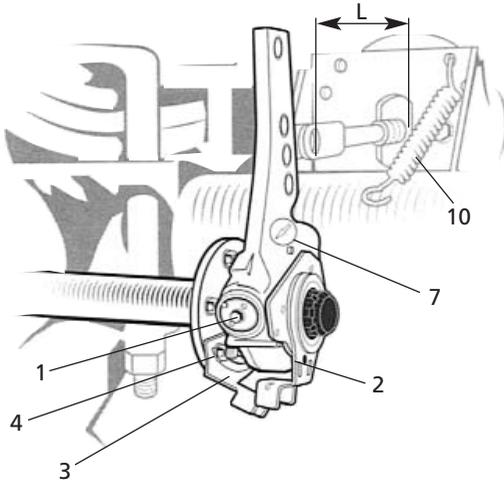
- Weld on mounting point strap (3) in this position.
- Fix the slack adjuster on the camshaft.
- Axial clearance: Adjust the nominal value of 0.5 - 2 mm using shims.
- Adjust the clearance of the brake lining by turning adjusting screw (1) in clock-wise direction until the brake lining is in contact with the brake drum. Then back off adjusting screw (1) by 3/4 turn.

Do not use an impact wrench!

FUNCTION CHECK

- If the adjustment coupling is functioning correctly, a torque of at least 18 Nm must be felt when backing off adjusting screw (1); a ratchet noise should also be clearly audible.
- Actuate the service brake several times, check the free running of the brake drum, check the clearance. If necessary, repeat the adjustment of the slack adjuster.

Adjustment of S-ABA automatic slack adjusters



- Cams and brake shoes are in the zero position.
- Observe the correct piston rod length "L" as given in the SAF specifications.
- **Brake chambers**
Before installation, ensure that the brake chamber is in its starting position.
- **Spring brake chambers**, on the other hand, must be under full working pressure (min. 6 bar).
IMPORTANT: If this is not observed, the basic setting will be wrong!
- Grease the camshaft.
- Install mounting point strap (3); be sure to use two mounting bolts (4).
- Install the slack adjuster on the camshaft.
- The arrow mark (7) points in the braking direction.
- Turn adjusting screw (1) until the bore in the slack adjuster (8.1) is aligned with the bore in the yoke end (9) (see figure).
- With the fixed mounting point, ensure that the 2 U-profiles engage correctly in one another.
- Grease cotter pin (8) and secure.
- Hook in return spring (10).
- Fix the slack adjuster on the camshaft.

- Axial clearance: Adjust the nominal value of 0.5 - 2 mm using shims.
- Adjust the control arm.
- Observe the possible setting range for the control lever position.

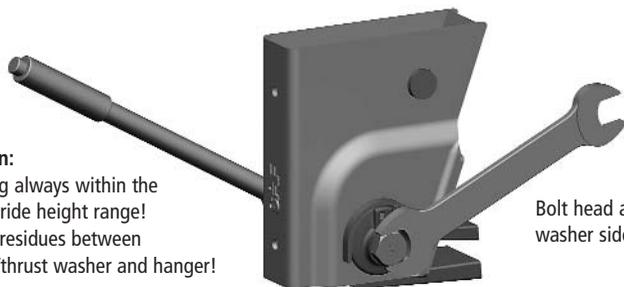


- Adjust the clearance of the brake lining by turning adjusting screw (1) in clock-wise direction until the brake lining is in contact with the brake drum. Then back off adjusting screw (1) by 3/4 turn.
Do not use an impact wrench!
- FUNCTION CHECK**
- If the adjustment coupling is functioning correctly, a torque of at least 18 Nm must be felt when backing off adjusting screw (1); a ratchet noise should also be clearly audible.
 - Actuate the service brake several times, check the free running of the brake drum, check the clearance. If necessary, repeat the adjustment of the slack adjuster.

Tightening instructions for adjustable pivot bolt

Attention:

Tightening always within the specified ride height range!
No paint residues between eccentric/thrust washer and hanger!



Bolt head always on the eccentric washer side.

Pretightening 400 Nm
Use Torque wrench



Marking for angle tightening



Angle tightening 120°
Use impact wrench or extend lever to 2.5 m



Visual inspection



Semi-trailer tilt angle

Ride heights

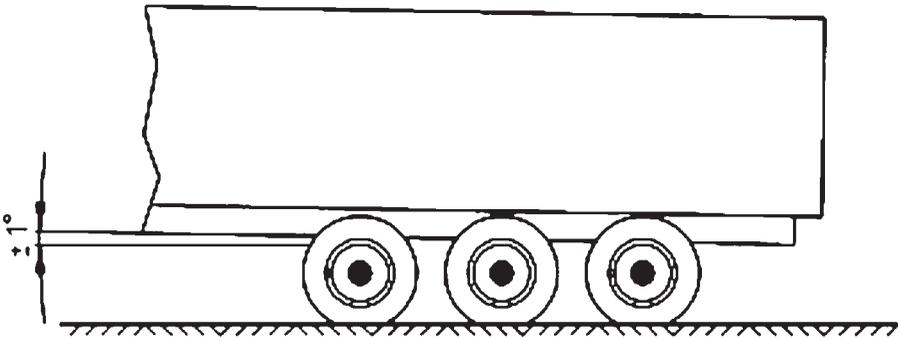
Adjust the ride height of the air suspension axles to the permissible range indicated in the corresponding SAF documents.

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

For trailers with multiple axles, allow for a minimum suspension travel of 70 mm.

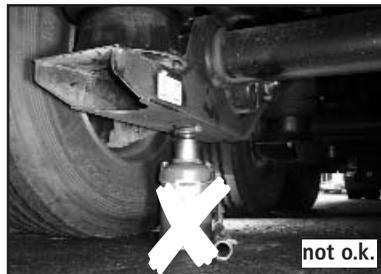
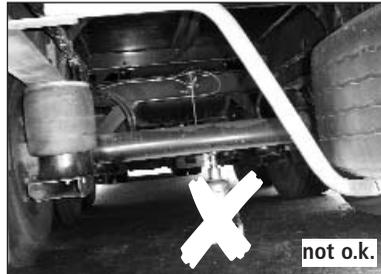
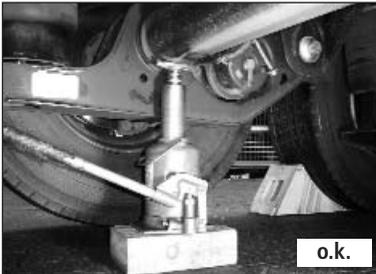
Exception:

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.



Tyre changing on fully loaded trailer with INTRA axle

Jack positioning points:



Adjustment of the air suspension system ride height

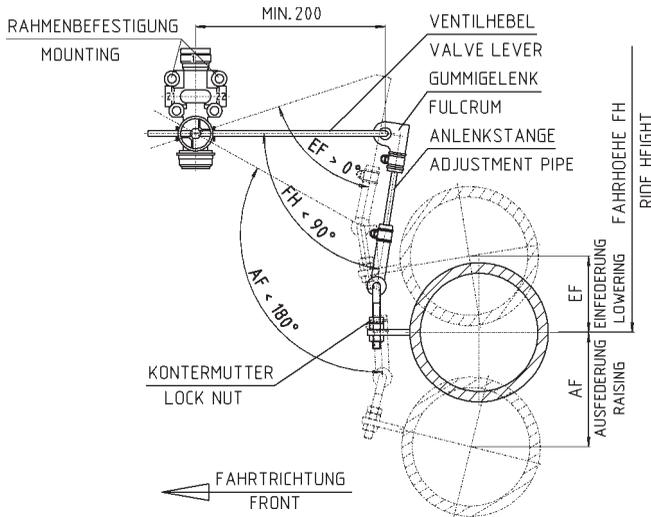
Air suspension valve

As standard, SAF air suspension axles and 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 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 triple-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 in 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.

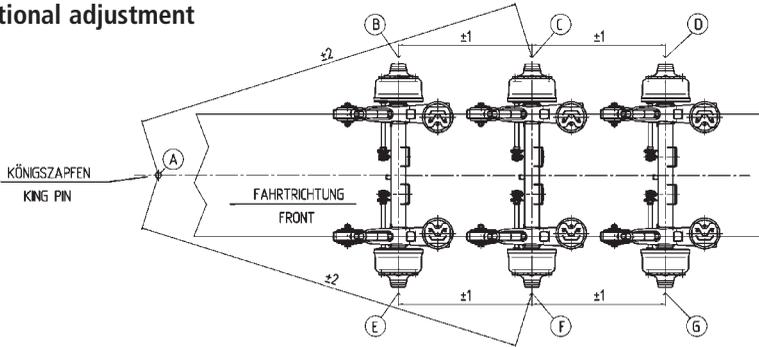
Note

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.

SAF Axle alignment

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.

Conventional adjustment



Determine the lengths of the diagonals A - C and A - F for the middle axle (reference axle) by comparison measurements, observing the tolerances.

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.

Optical adjustment

Observe the operating and setting instructions of the measuring system manufacturer.

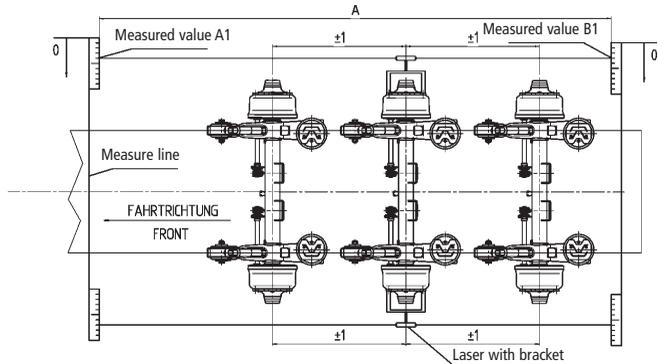
Calculation of the toe-in and toe-out values:

$$A1 - B1 \text{ (mm)}$$

$$\frac{\quad}{A \text{ (m)}} = S$$

S = positive value = Toe-in

S = negative value = Toe-out



Notes

- In order to avoid tyre wear, we recommend that an axle alignment is performed at regular intervals.
- We recommend the use of an optical measuring system for carrying out the axle alignment.
- For alignment, only the centres of the middle of the wheel cap or the middle of the axle stub end are of interest as reference points.
- Possible causes of deviations in the axle alignment are:
 - Loose U-bolts
 - Wear of the spring guide bearing
 - Deformation of the axle assembly components due to improper use

Soforthilfe im Pannenfall

NonStopService 24

Support in the case of service

- Im Servicefall wählen Sie bitte **immer** die Rufnummer Ihres **Heimatlandes**.
- In the case of service please **always** dial the number of your **own country**.

Inland home country		Vom Ausland from abroad
03 62 27 23 21	A	+43 3 62 27 23 21
0 59 33 07 07	B	+32 59 33 07 07
+30 21 09 40 19 80	BG	+30 21 09 40 19 80
+386 26 16 58 35	BIH	+386 26 16 58 35
0 19 08 64 90	CH	+41 19 08 64 90
2 61 10 45 06	CZ	+42 02 61 10 45 06
0800 72 37 37 84 / 0 73 33 80 81 58	D	00800 72 37 37 84 / +49 73 33 80 81 58
75 72 74 74	DK	+45 75 72 74 74
9 02 18 19 92	E	+34 9 13 82 68 41
697 91 96	EST	+372 697 91 96
03 88 72 06 43	F	+33 3 88 72 06 43
0 93 51 31 33	FIN	+35 8 93 51 31 33
+41 19 08 64 90	FL	+41 19 08 64 90
0 87 02 42 02 37	GB	+44 87 02 42 02 37
21 09 40 19 80	GR	+30 21 09 40 19 80
06 13 45 17 27	H	+36 13 45 17 27
+386 26 16 58 35	HR	+386 26 16 58 35
02 66 16 55 74	I	+39 02 66 16 55 74
+44 87 02 42 02 37	IRL	+44 87 02 42 02 37
+32 59 33 07 07	L	+32 59 33 07 07
+372 697 91 96	LT	+372 697 91 96
+372 697 91 96	LV	+372 697 91 96
+33 3 88 72 06 43	MC	+33 3 88 72 06 43
+386 26 16 58 35	MK	+386 26 16 58 35
+45 75 72 74 74	N	+45 75 72 74 74
+32 59 33 07 07	NL	+32 59 33 07 07
+34 9 13 82 68 41	P	+34 9 13 82 68 41
06 18 31 98 70	PL	+48 6 18 31 98 70
02 12 50 02 60	RO	+40 2 12 50 02 60
+39 02 66 16 55 74	RSM	+39 02 66 16 55 74
+45 75 72 74 74	S	+45 75 72 74 74
+42 02 61 10 45 06	SK	+42 02 61 10 45 06
0 26 16 58 35	SLO	+386 26 16 58 35
0 21 22 75 13 21	TR	+90 21 22 75 13 21
+386 26 16 58 35	YU	+386 26 16 58 35

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