

Maintenance manual

Oscillating tandem bogies

Type RZP

Swivel axles



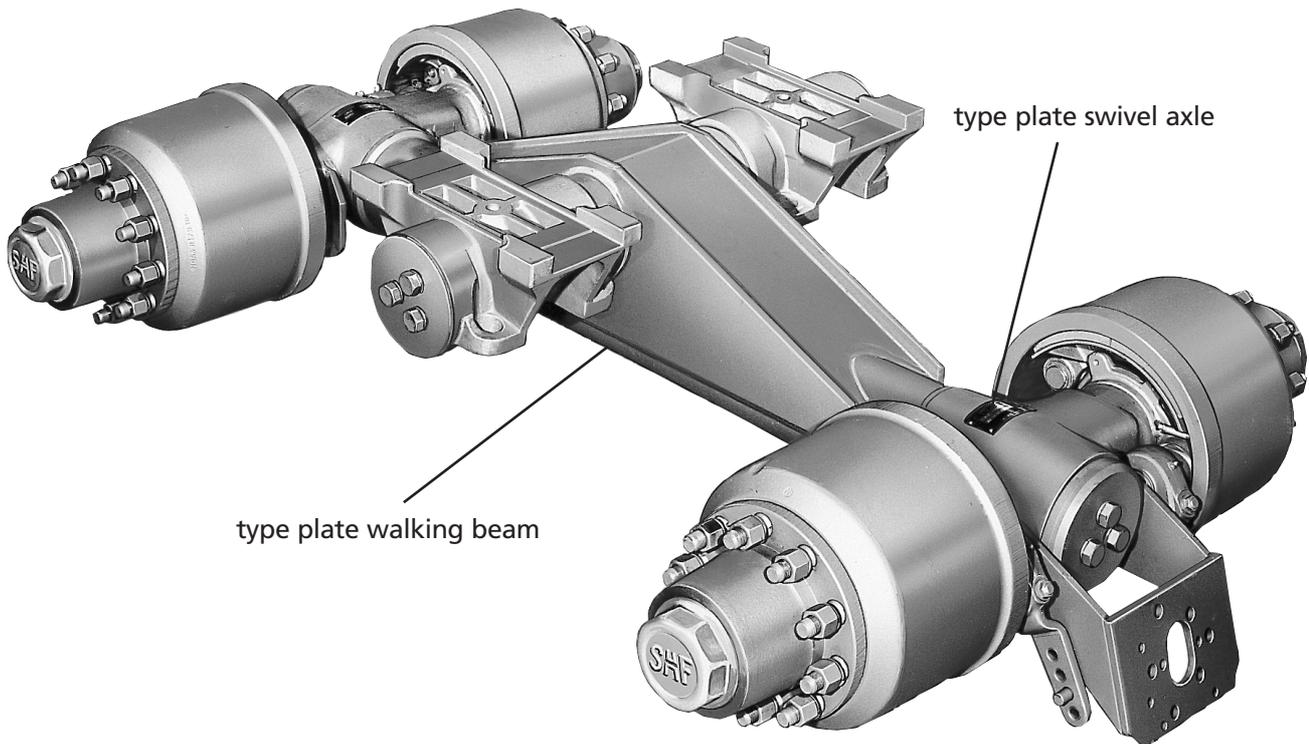
Edition 6/2003



The vehicle owner is responsible for operating the unit within the specified axle load capacities and speed limits.
Refer to axle type plate.

Drive the vehicle at a speed according to road condition.

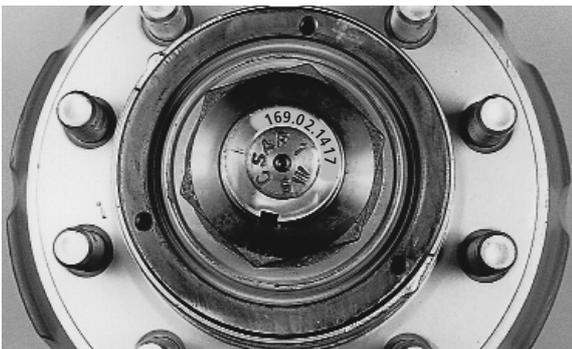
Follow the SAF-instructions for maintenance.
Refer to general maintenance schedule.



Spare parts service for SAF axles and suspension systems

When ordering spare parts, quote correct axle identification serial no., refer to the axle type plate.

Please enter the axle identification figures in the type plates shown below so that correct specifications are available when required.



SAF OTTO SAUER ACHSENFABRIK KEILBERG D-63854 BESSENBACH / G E R M A N Y				
TYP				
Ident.-No. /Prod.-No.				
zul. Last kg perm. cap. charge adm.	<table border="1"> <tr> <td>STAT.</td> <td>TECH.</td> <td>v max. km/h max. speed vitesse maxi.</td> </tr> </table>	STAT.	TECH.	v max. km/h max. speed vitesse maxi.
STAT.	TECH.	v max. km/h max. speed vitesse maxi.		
TDB-No.	Grundtyp			

Identification of axles in case of type plate absence
Serial-No. on spindle end

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This manual is intended for vehicle operators and workshop service engineers for use with the SAF axles and suspensions units.

Always read the entire instructions before operating the trailer or proceeding maintenance and repair works. Failure to comply with this instructions without written permission from SAF will void the axle or suspension warranty.

The maintenance schedules are recommended by SAF, but as operating conditions and milages dictate frequency in servicing, a maintenance schedule to suite each individual operation must be established by the operator.

This manual does not cover all specifications manufactured by SAF. The informations contained herein are general in nature. The parts shown in the illustrations are representative they can vary in some details to your axle / suspension equipment.

Every precaution for accuracy has been taken in the preparation of this manual. However, SAF neither accepts responsibility for any omissions or errors that may appear, nor accepts legal liability for any loss in connection with the information contained within this manuel.

Personal Safety Precautions

Maintain workshop fitters safety precautions to avoid serious personal injury or loss of life. Only qualified personal is permitted to install, operate, maintain or repair brakes, axles and suspension components.

Warning:

On all suspensions a system failure may occure, this can cause the trailer chassis or axle to drop violently down. It is recommended that on air suspensions the system is completely deflated during repair works.

Before jacking up the axle or the trailer, check for solid ground, chock the wheels.

Always firmly secure the chassis and axles on strong support stands. This removes all imposed weight from the suspension and ensures that any work required underneath the trailer is carried out in safety.

for SAF axles and suspension units

1. Instructions and tips for vehicle operation

In order to maintain the operation and road safety of the vehicle, the maintenance operations prescribed by SAF must be carried out regularly at the specified intervals (see "Maintenance instructions").

Furthermore, ensure that

- 1.1 the disc brake is not overheated due to continuous operation as otherwise irreparable damage to the surrounding components – in particular the wheel bearings – cannot be ruled out. This can impair the operational and road safety of the vehicle and represent a serious hazard for man and machine.
- 1.2 the compatibility of the brakes on the truck-trailer combination is checked. For reliable braking and uniform brake lining wear, the brake systems of the two vehicles must be matched to one another before starting operation.
- 1.3 the parking brake is not applied immediately when the brakes are hot as the resulting different stress fields can damage the brake discs / drums
- 1.4 the drum brakes are not overheated as this will result in a dangerous reduction in braking efficiency
- 1.5 the maximum permissible axle loads and speeds are not exceeded
- 1.6 the cargo is evenly distributed over the loading area and safely secured
- 1.7 on vehicles with air suspension, the air bags are always fully inflated before starting a journey
- 1.8 the prescribed wheel rims and tyre sizes are employed
- 1.9 the wheels security and check for accurate wheel locating and fixing. Do not repaint the contact faces neither on wheels or hubs. On the contact surface of the wheel the maximum permissible coating thickness of 50 Micro mm (primer plus paint) must not be exceeded. All attachment faces must be clean with plane smooth surfaces and free from any contamination as dirt, rust, grease, excessive paint and damage. In general refer to wheel manufacturers recommendation, or consult your trailer builder for any wheel fixing details.
- 1.10 the tyres have the prescribed inflation pressure
- 1.11 your driving style is matched to the road conditions
- 1.12 chassis support legs are used when loading/unloading construction machinery
- 1.13 the use of auxiliary trailer braking facilities (trailer underrun brake) is not permitted.

2. Vehicle safety

- 2.1 The daily check of the vehicle for road safety before starting a journey is the responsibility of the driver.
- 2.2 Modifications to the suspension and braking system are strictly forbidden.
- 2.3 Compliance with the specified permissible axle loads, specifications in the vehicle operating permit, vehicle inspection intervals and the regular maintenance intervals is the responsibility of the vehicle owner.
- 2.4 We strongly recommend fitting only SAF approved replacement parts and spare parts which are covered by SAF product liability. These products have been thoroughly tested by SAF for safety, functionality and suitability. Fitting of these parts guarantees not only safety on the roads but satisfies the legal operational requirements. SAF is not in a position to judge whether those products from other companies represent a safety risk for SAF axles and systems.

3. Warranty

- 3.1 Warranty claims will only be accepted as long as the operating and maintenance instructions have been complied with and if SAF approved spare parts have been fitted.
- 3.2 Warranty claims must be reported to SAF before starting the work.
- 3.3 The warranty period is 12 months after the vehicle registration date or after the start of operation of the vehicle.

4. Service and spare parts

A close-knit service network of SAF partner companies is at your disposal for technical advice on SAF axles and suspension systems as well as for supplying approved SAF spare parts (see back cover or brochure "SAF service stations").

In case of repair we strongly recommend fitting only SAF original parts for those reasons mentioned in point 2.4.

SAF axles and suspension units are subject to continuous further development; the data and drawings contained in the manual may therefore differ from the details given in the operating permit.

The contents of the manual does not constitute the basis for a legal claim.

Reprinting, reproduction or translation in whole or in part is not permitted.

The issue of this publication invalidates all earlier maintenance and repair manuals.

for SAF oscillating tandem bogies RZP and swivel axles

Service Schedule	Mileage intervals >	Initial after first 5,000 km	Periodic checks		
			every 60,000 km	every 120,000 km	every 180,000 km
Whichever occurs first	Time intervals >	After first month	every 6 months	every 12 months	every 24 months

Mechanical check

Attention: Torque check wheel nuts after the first 50 km and 150 km to recommended torque setting, also after any removal of the wheel.				
Torque check all bolts and nuts to recommended setting.	●		●	
Inspect hub bearings end-float, reset if necessary.	●		●	
Grease all bushings, e.g. lubrication of camshaft, slack adjuster, suspension pivot bushings.			●	
Renew the hub bearing grease. Inspect the wear condition of the bearings, replace if necessary.				●
Inspect tyre inflation pressure to specification.				
Remove brake drums and brake shoes. Clean the brake shoes and the anchor pins/balls from all dust and corrosion. Lubrication, apply a coating of copper based grease to the components and refit with a new shoe return spring and retaining clamp.				●

Visual and safety inspection readjust, clean, regrease, repair, replace components if necessary

Check all components for wear, cracks, damage. Check brake linings for wear. Check camshafts for free rotation and full retraction. Check brake shoes for free movement and full retraction. Check brake linings / drum for free running clearance. Check slack adjusters for correct function and adjustment stroke. Check brake system for air leaks (brake applied!).		●		
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Safety inspection readjust, clean, regrease, repair, replace components if necessary

Check brakes for correct adjustment and efficiency.	●	●		
Check tyre wear.		●		
Check truck and trailer combination for brake compatibility. Check service brake pressure for recommended setting e.g. load sensing valve setting.	●			●

Special service conditions

Vehicles with long standing periods, service intervals are to be carried out at time intervals.
Vehicles used under extreme conditions, maintenance intervals must be reduced accordingly.

Warranty only applies, when SAF-instructions for maintenance and operation are strictly adhered to, and only genuine SAF-spare parts are used.

Oscillating tandem bogie Type RZP 24 / 26

Tightening torques:

Use only calibrated torque wrenches.

The use of impact wrenches ist not permitted.

The bolts must not be oiled or greased when assembling.

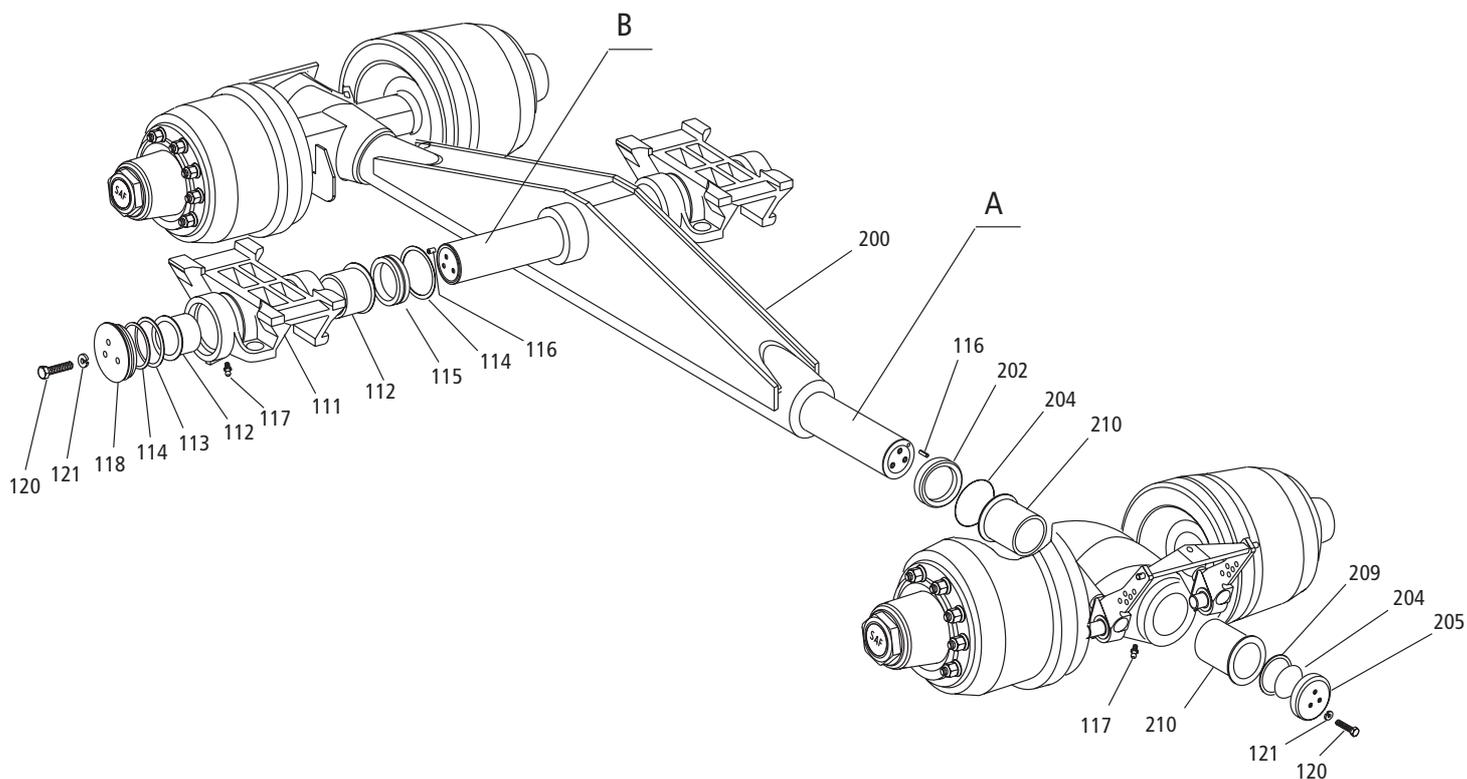
Wheel nuts:

Hub-spigot centred fixing M 22 x 1.5 / 600 Nm

Bolt-cone centred fixing M 22 x 1.5 / 430 Nm

TRILEX spoked wheel M 20 x 2 / 350 Nm

Refer to wheel manufacturers recommendations.



Oscillating tandem bogie Type RZP 24 / 26

Item	Parts designation	Item	Parts designation
111	Pivot bracket	120	Bolt
112	Bronze bush	121	Spring washer
113	Washer spacer	200	Walking beam
114	O-ring	202	Wear sleeve
115	Wear sleeve	204	"V"-Sealring
116	Dowel pin	205	Cover plate
117	Grease nippel	209	Washer spacer
118	Cover plate	210	Bronze bush

A + B Bushing assembly drawing see following pages.

Oscillating tandem bogie Type RZP 28 / 32

Tightening torques:

Use only calibrated torque wrenches.

The use of impact wrenches ist not permitted.

The bolts must not be oiled or greased when assembling.

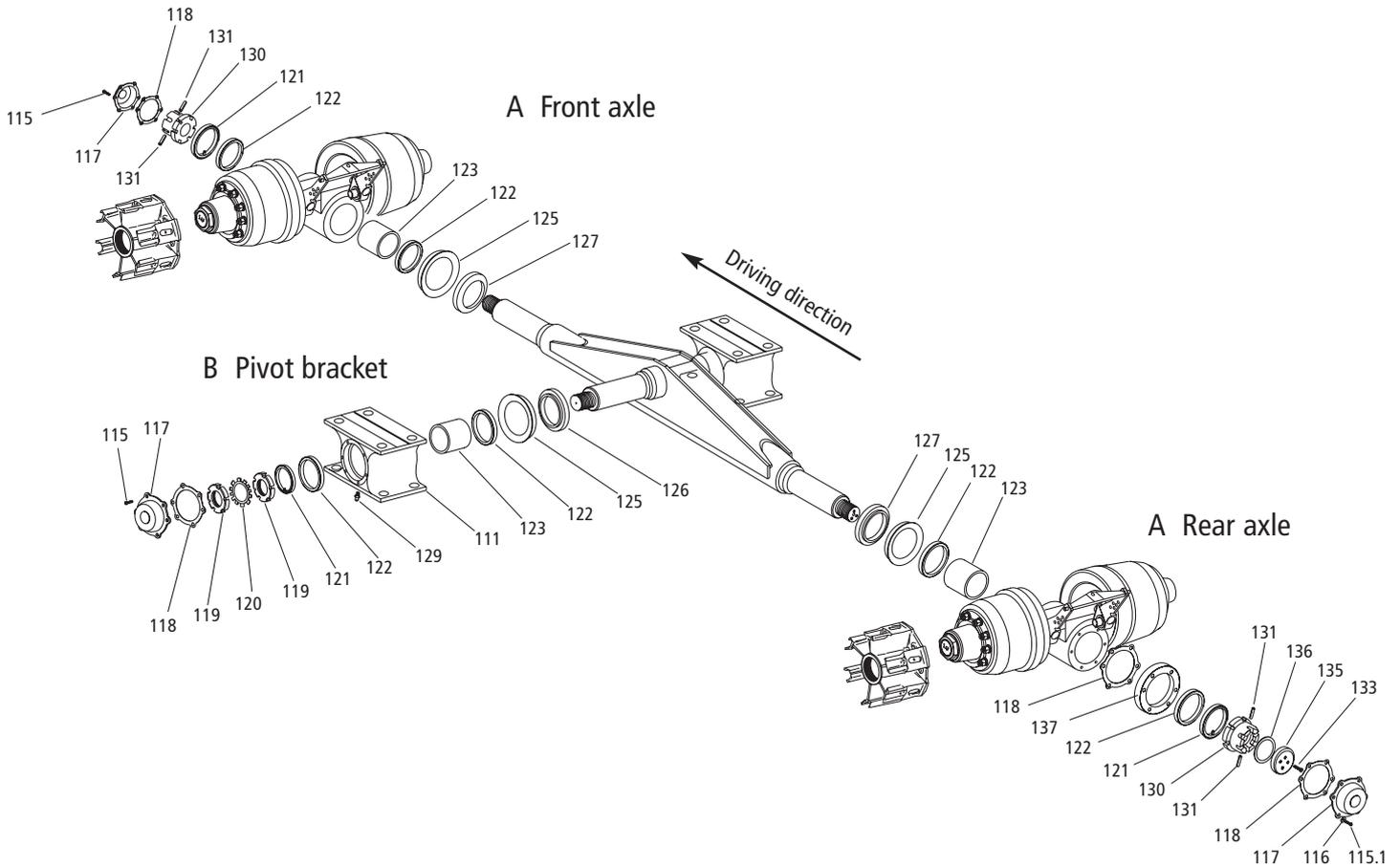
Wheel nuts:

Hub-spigot centred fixing M 22 x 1.5 / 600 Nm

Bolt-cone centred fixing M 22 x 1.5 / 430 Nm

TRILEX spoked wheel M 20 x 2 / 350 Nm

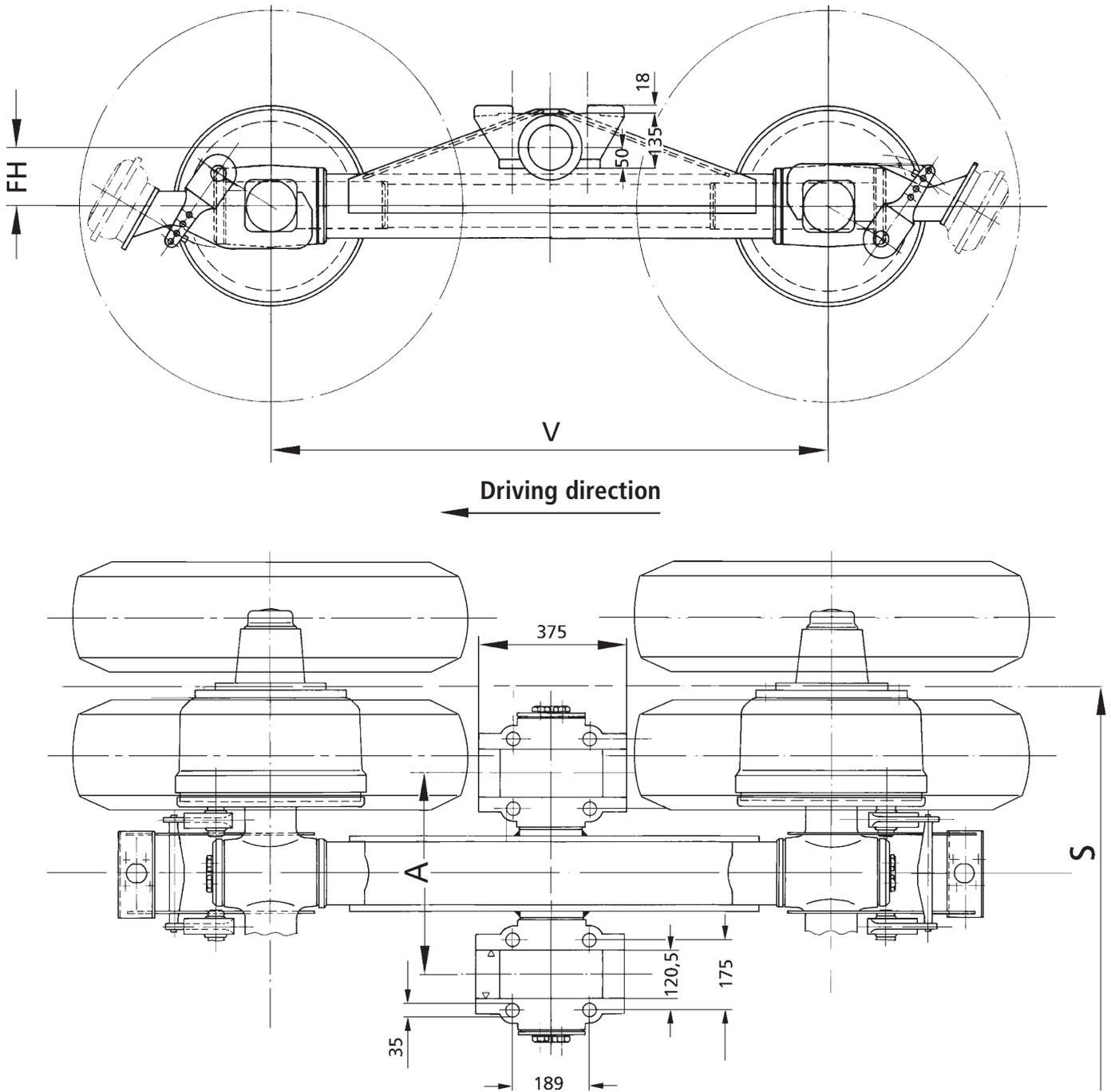
Refer to wheel manufacturers recommendations.



Oscillating tandem bogie Type RZP 28 / 32

Item	Parts designation	Item	Parts designation
	Pivot bracket / bush assy.	129	Grease nipple
111	Pivot bracket		
115	Hex screw	130	Axle nut
115.1	Hex screw	131	Dowel pin
116	Spring washer		
117	Cap	133	Allen-Bolt
118	Gasket		
119	Axle nut	135	Washer
120	Locking plate		
121	Washer with dowel pin	136	Spacer washer 0,3
122	Washer	136	Spacer washer 0,5
123	Pivot bush	136	Spacer washer 1,0
125	Seal	137	Spacer washer
126	Wear sleeve		
127	Wear sleeve		

A + B Bushing assembly drawing see following pages.



- A = Fixing center
- FH = Mounting height
- S = Track
- V = Wheel base

Swivel axle type P 6030/P 8130/P 11030 with Brake SN 300 x 150
Swivel axle type P 9030/P 12030 with Brake SNK 300 x 150

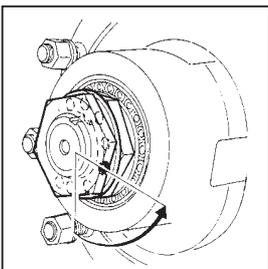
Hub bearing end float setting

Torque tighten the adjusting nut with 150 Nm, at same time rotating the hub/drum to seat the bearings.
 Back off the adjusting nut by 2 1/2 holes of the lock washer.
 Tighten the locknut with 400 Nm.
 Check that hub rotate freely without excessive end float.
 Hub bearing axial end float 0.05 - 0.20 mm, readjust if required.
 Attach the hub cap with a new gasket.

Lubricant specification:

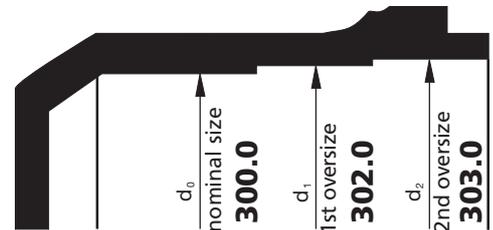
Hub bearings:
 SAF Ref. no. 4 387 0011 05
 Camshaft:
 SAF Ref. no. 4 387 0011 05
 Stub axle:
 SAF Ref. no. 4 387 0015 06
 SAF fitting paste
 Brake shoe anchor ball:
 SAF Ref. no. 4 387 0007 00
 Copper paste

Hub nut setting



When brake shoe relining, lubricate camshaft bushings whilst rotating the camshaft.
 Do not disassemble the hub unit bearings.
 Use a vacuum cleaner to remove brake dust.
 Never use pressurised cleaning devices or washing fluids on the brake drum and hub unit, for reason of this fluid will attack and damage the hub bearing grease lubrication.
 Before refitting the hub unit discard any contamination all around the spindle journals and apply fresh SAF fitting paste.

Never mix different types or grades of grease.



BRAKE type SN / SNK 300

Brake drum diameter, max. permissible machining oversize: 303.0 mm
 Brake drum diameter, max. permissible wear tolerance: 304.0 mm
 Brake linings, always fit only lining material grade approved by SAF.
 Relining brake shoes, fit cam side lining and anchor side lining following the instructions provided with the replacement kit.
 Renew the brake shoe return spring.
 Machine relined brake shoes assembly to brake drum diameter + 0.3 mm to match the drum path radius.

Brake type	SAF parts no. brake lining Kit	Brake drum / brake lining refacing stages in mm			Brake linings	Rivets	DIN 7338 rivet
		Nominal size	1st oversize	2nd oversize			
SN 300 SNK 300		$d_0-300.0$	$d_1-302.0$	$d_2-303.0$	number per axle		
x 150	3 057 0033 00	15.5 16.5*	16.7 17.7*	17.1 18.1*	4 4	64	B 8 x 15

* Cam side lining

Tools

Hub nut spanner
 Hub puller
 Hub bearing / seal inserter

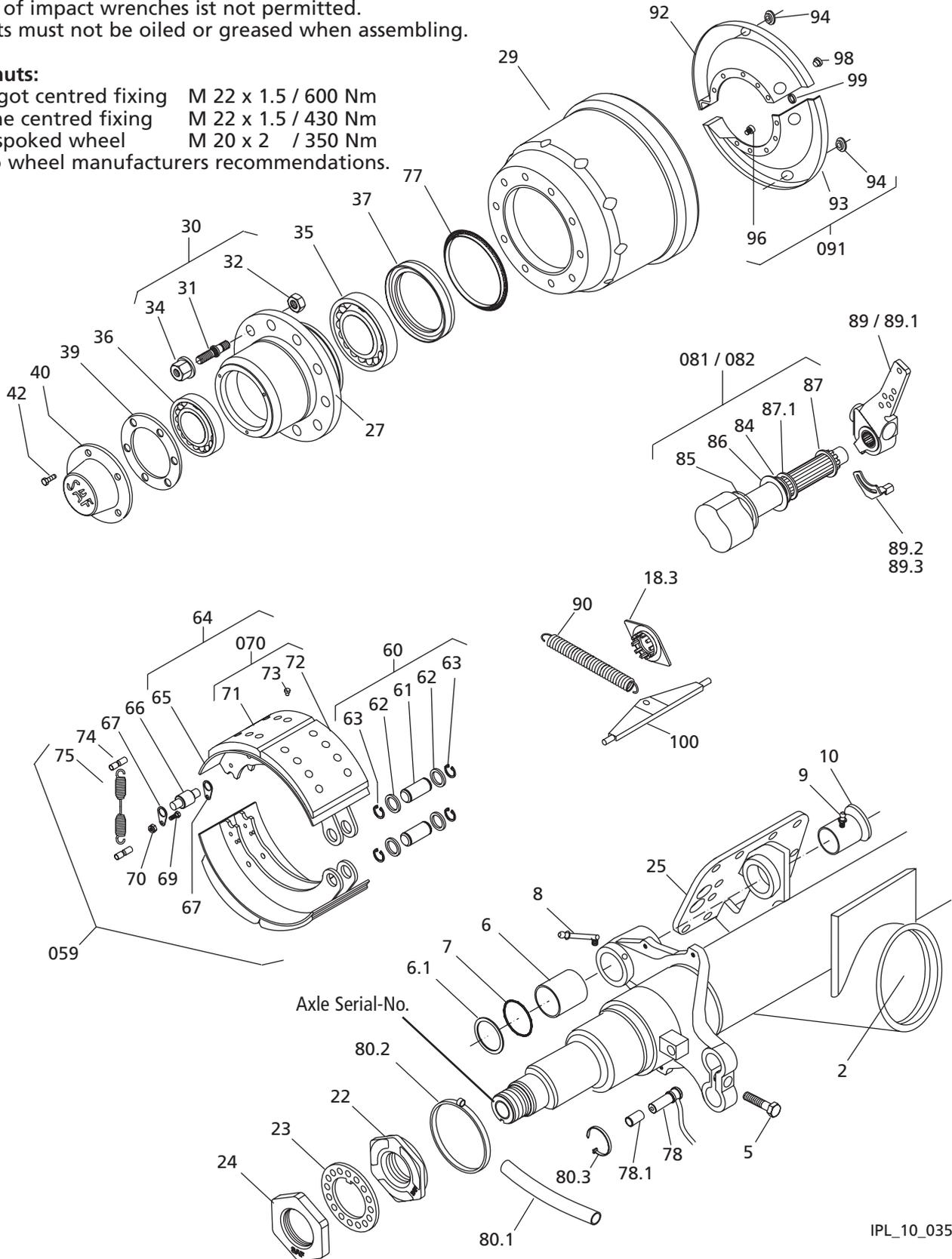
SAF Ref. no.

4 343 3828 00
 3 301 0010 00
 3 434 1014 00

Swivel axle Type P 6030 / P 8130 / P 11030 with Brake type: SN 300 x 150

Tightening torques:
Use only calibrated torque wrenches.
The use of impact wrenches is not permitted.
The bolts must not be oiled or greased when assembling.

Wheel nuts:
Hub-spigot centred fixing M 22 x 1.5 / 600 Nm
Bolt-cone centred fixing M 22 x 1.5 / 430 Nm
TRILEX spoked wheel M 20 x 2 / 350 Nm
Refer to wheel manufacturers recommendations.



Swivel axle

Type P 6030 / P 8130 / P 11030

with Brake type: SN 300 x 150

Item	Parts designation	Item	Parts designation
1	Axle beam	070	Lining + rivet Kit
2	Pivot bush	71	Lining cam side
5	Locking bolt	72	Lining anchor side
6	Cam bush	73	Rivet
6.1	Spacer ring PA	74	Cross pin
7	O-ring	75	Shoe return spring
8	Grease nipple	77	Exciter gear ABS
9	Nut	78	Sensor ABS
10	Camshaft bush	78.1	Retaining sleeve
18.3	Wear indicator lining	80.1	Protective tube
		80.2	Band clamp
		80.3	Fastener ring
22	Hub nut		
23	Lock washer		
24	Lock nut	81	Camshaft RH
25	Bracket brake chamber	82	Camshaft LH
		84	"C" Spring clip
27	Hub	85	Washer
28	Locating pin	86	Bevel washer
29	Brake drum	87	Washer
		87.1	Washer
30	Wheel bolt / nut Kit		
31	Wheel bolt	89	Slack adjuster
32	Nut	89.1	Auto-Slack adjuster
34	Wheel nut	89.2	Anchor bracket LH
		89.3	Anchor bracket RH
35	Hub bearing inner	90	Pull-off spring
36	Hub bearing outer		
37	Unitized hub seal ring	091	Dust cover Kit
39	Gasket	92	Dust cover LH
40	Hub cap	93	Dust cover RH
42	Screw	94	Rubber plug.
		95	Cable clip
60	Anchor pin fitting Kit	96	Screw
61	Anchor pin	98	Rubber plug
62	Washer	99	Rubber grommet
63	Circlip		
64	Lined brake shoe	100	Clevis cross bar
65	Brake shoe		
66	Cam roller		
67	Retaining plate		
69	Screw		
70	Nut self locking		

When ordering spare parts quote correct axle identification serial no., refer to the axle type plate figures.

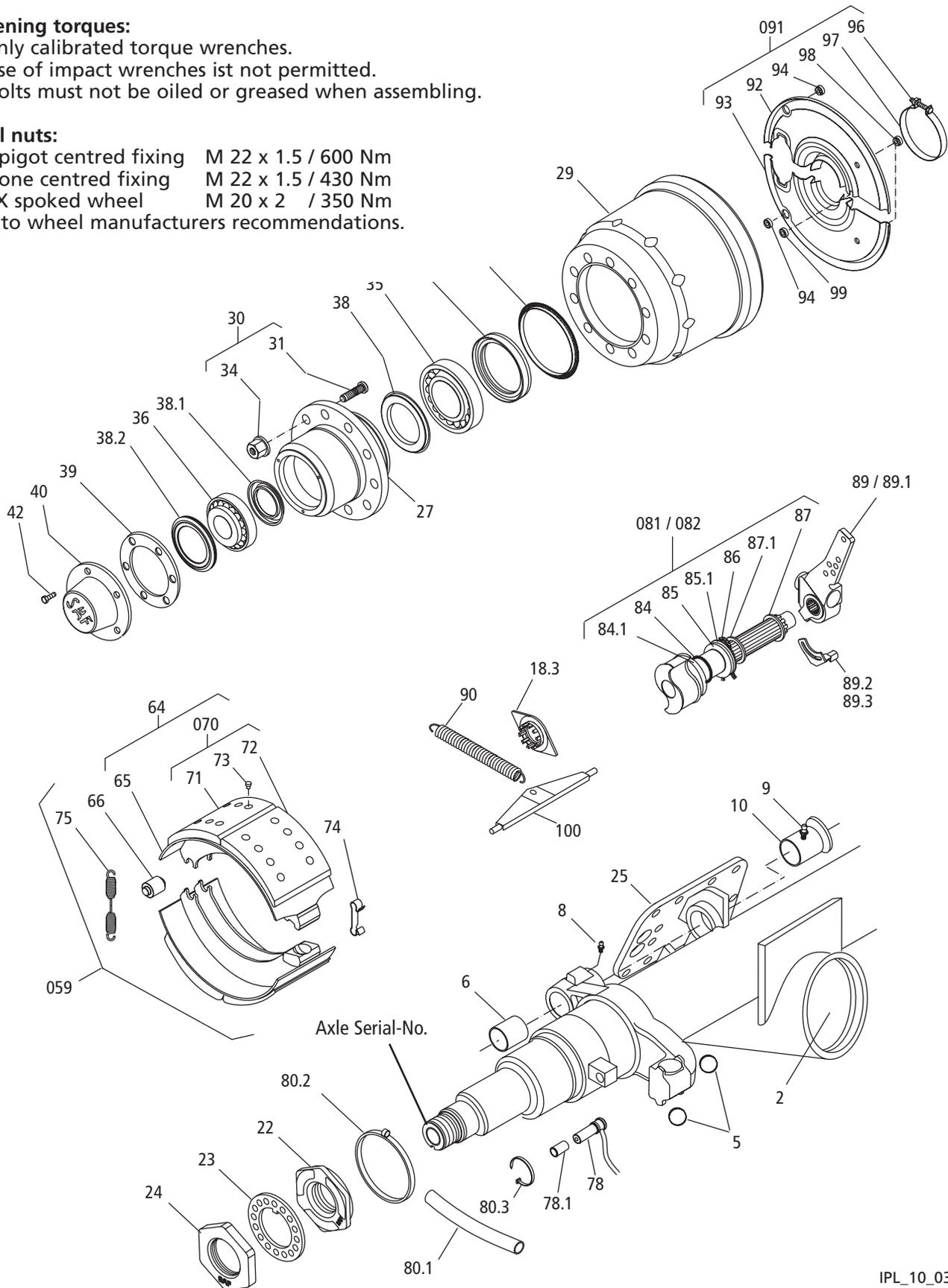
Swivel axle Type P 9030 / P 12030 with Brake type: SNK 300 x 150

Tightening torques:

Use only calibrated torque wrenches.
The use of impact wrenches is not permitted.
The bolts must not be oiled or greased when assembling.

Wheel nuts:

Hub-spigot centred fixing M 22 x 1.5 / 600 Nm
Bolt-cone centred fixing M 22 x 1.5 / 430 Nm
TRILEX spoked wheel M 20 x 2 / 350 Nm
Refer to wheel manufacturers recommendations.



Swivel axle

Type P 9030 / P 12030

with Brake type: SNK 300 x 150

Item	Parts designation	Item	Parts designation
1	Axle beam	77	Exciter gear ABS
2	Pivot bush	78	Sensor ABS
5	Anchor ball	78.1	Retaining sleeve
6	Cam bush	80.1	Protective tube
8	Grease nipple	80.2	Band clamp
10	Camshaft bush	80.3	Fastener ring
18.3	Wear indicator lining	81	Camshaft RH
22	Hub nut	82	Camshaft LH
23	Lock washer	84	Circlip
24	Lock nut	84	O-ring
25	Bracket brake chamber	84.1	Spacer ring PA
27	Hub	85	Seal ring
29	Brake drum	85.1	Bevel washer
		86	Spring clip
		87	Washer
		87.1	Washer
30	Wheel bolt / nut Kit	89	Slack adjuster
31	Wheel bolt	89.1	Auto-Slack adjuster
34	Wheel nut	89.2	Anchor bracket LH
35	Hub bearing inner	89.3	Anchor bracket RH
36	Hub bearing outer	90	Pull-off spring
37	Unitized hub seal ring		
38	Seal cover plate inner		
38.1	Cover washer	091	Dust cover Kit
38.2	Seal cover plate outer	92	Dust cover LH
39	Gasket	93	Dust cover RH
40	Hub cap	94	Rubber plug.
		95	Cable clip
64	Lined brake shoe	97	Band clamp
65	Brake shoe	98	Rubber plug
66	Cam roller	99	Rubber grommet
070	Lining + rivet Kit	100	Clevis cross bar
71	Lining cam side		
72	Lining anchor side		
73	Rivet		
74	Retaining clamp		
75	Shoe return spring		

When ordering spare parts quote correct axle identification serial no., refer to the axle type plate figures.

Swivel axle type P 13130 with Brake SN 300 x 150 / 200 Swivel axle type P 13130 with Brake SNK 300 x 150 / 200

Hub end-float setting

Tighten adjusting nut, whilst hub is rotating, until binding of bearings is felt.

Back off adjusting nut approx. 1/12 of a turn until inserting of the split pin is possible.

Insert hub puller and pull hub back against outer bearing.

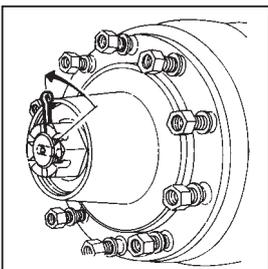
Check that hub rotate freely without excessive end float.

Hub bearing axial end float 0.05 - 0.20 mm, readjust if required.

Lock the adjusting nut.

Fill hub cap with grease and install.

Hub nut setting



When brake shoe relining, lubricate camshaft bushings whilst rotating the camshaft.

Do not disassemble the hub unit bearings.

Use a vacuum cleaner to remove brake dust.

Never use pressurised cleaning devices or washing fluids on the brake drum and hub unit, for reason of this fluid will attack and damage the hub bearing grease lubrication.

Before refitting the hub unit discard any contamination all around the spindle journals and apply fresh SAF fitting paste.

Lubricant specification:

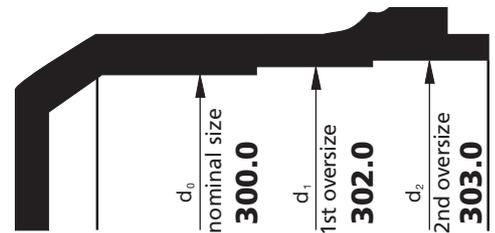
Hub bearings:
SAF Ref. no. 4 387 0011 05

Camshaft:
SAF Ref. no. 4 387 0011 05

Stub axle:
SAF Ref. no. 4 387 0015 06
SAF fitting paste

Brake shoe anchor ball:
SAF Ref. no. 4 387 0007 00
Copper paste

Never mix different types or grades of grease.



BRAKE type SN / SNK 300

Brake drum diameter, max. permissible machining oversize:

303.0 mm

Brake drum diameter, max. permissible wear tolerance:

304.0 mm

Brake linings, always fit only lining material grade approved by SAF.

Relining brake shoes, fit cam side lining and anchor side lining following the instructions provided with the replacement kit.

Renew the brake shoe return spring.

Machine relined brake shoes assembly to brake drum diameter + 0.3 mm to match the drum path radius.

Brake type	SAF parts no. brake lining Kit	Brake drum / brake lining refacing stages in mm			Brake linings	Rivets	DIN 7338 rivet
		Nominal size	1st oversize	2nd oversize			
		d ₀ -300.0	d ₁ -302.0	d ₂ -303.0	number per axle		
SN 300 SNK 300	3 057 0033 00	15.5	16.7	17.1	4	64	B 8 x 15
		16.5*	17.7*	18.1*			
x 150	3 057 0024 00	15.5	16.7	17.1	4	64	B 8 x 15
		16.5*	17.7*	18.1*			

* Cam side lining

Tools

Hub puller

Hub nut spanner

Hub bearing cone / seal inserter

SAF Ref. no.

3 301 0006 02

1 012 0017 00

3 434 3306 00

Swivel axle Type P 13130

with Brake type: SN 300 x 150 / 200

Tightening torques:

Use only calibrated torque wrenches.

The use of impact wrenches ist not permitted.

The bolts must not be oiled or greased when assembling.

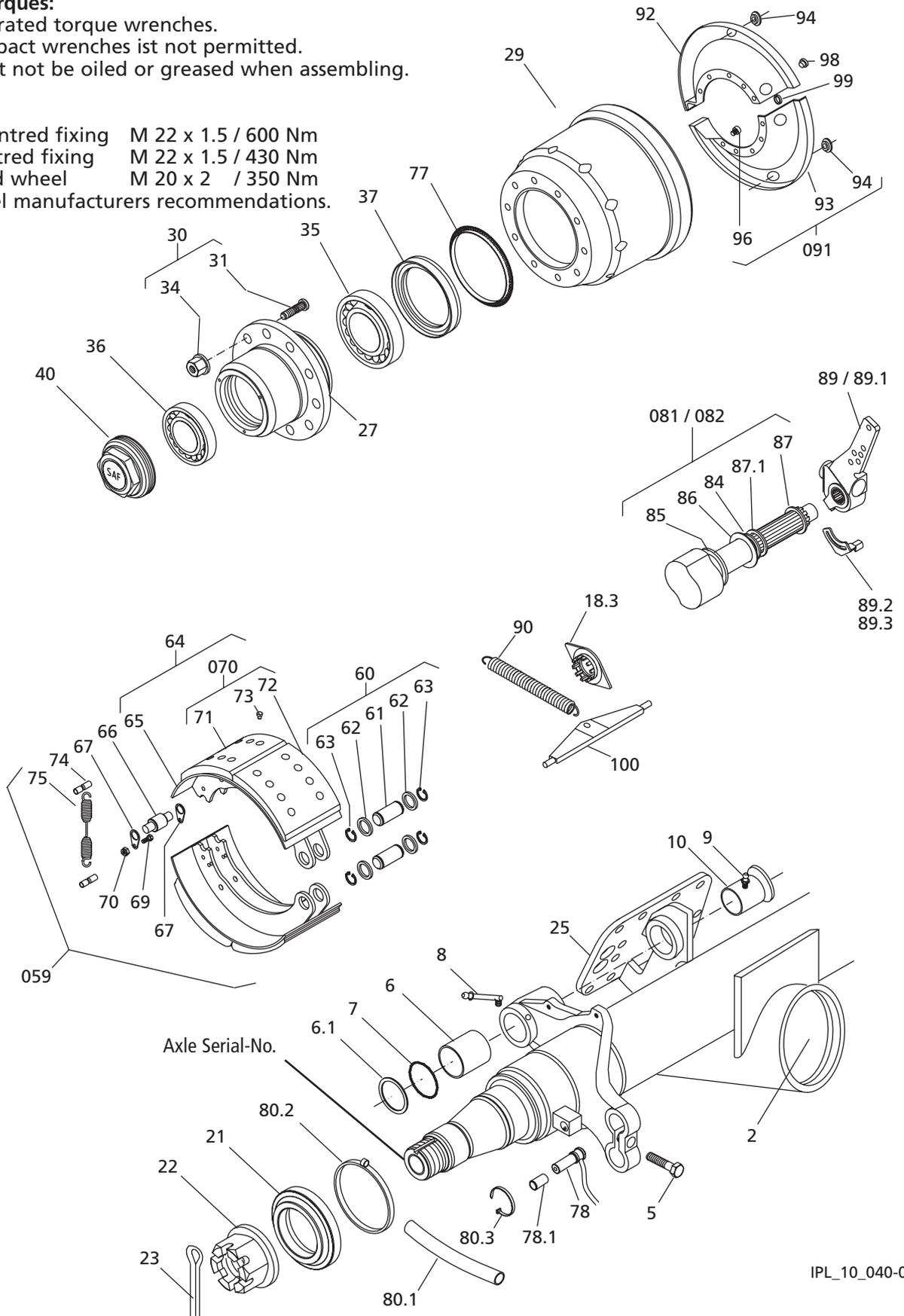
Wheel nuts:

Hub-spigot centred fixing M 22 x 1.5 / 600 Nm

Bolt-cone centred fixing M 22 x 1.5 / 430 Nm

TRILEX spoked wheel M 20 x 2 / 350 Nm

Refer to wheel manufacturers recommendations.



Swivel axle Type P 13130

with Brake type: SN 300 x 150 / 200

Item	Parts designation	Item	Parts designation
1	Axle beam	070	Lining + rivet Kit
2	Pivot bush	71	Lining cam side
5	Locking bolt	72	Lining anchor side
6	Cam bush	73	Rivet
6.1	Spacer ring PA	74	Cross pin
7	O-ring	75	Shoe return spring
8	Grease nipple	77	Exciter gear ABS
9	Nut	78	Sensor ABS
10	Camshaft bush	78.1	Retaining sleeve
18.3	Wear indicator lining	80.1	Protective tube
		80.2	Band clamp
		80.3	Fastener ring
21	Wear sleeve		
22	Hub nut		
23	Split pin	81	Camshaft RH
25	Bracket brake chamber	82	Camshaft LH
		84	"C" Spring clip
27	Hub	85	Washer
29	Brake drum	86	Bevel washer
		87	Washer
30	Wheel bolt / nut Kit	87.1	Washer
31	Wheel bolt		
34	Wheel nut	89	Slack adjuster
35	Hub bearing inner	89.1	Auto-Slack adjuster
36	Hub bearing outer	89.2	Anchor bracket LH
37	Hub seal ring	89.3	Anchor bracket RH
40	Hub cap	90	Pull-off spring
59	Brake shoe kit	091	Dust cover Kit
		92	Dust cover LH
60	Anchor pin fitting Kit	93	Dust cover RH
61	Anchor pin	94	Rubber plug.
62	Washer	95	Cable clip
63	Circlip	96	Screw
64	Lined brake shoe	98	Rubber plug
65	Brake shoe	99	Rubber grommet
66	Cam roller		
67	Retaining plate	100	Clevis cross bar
69	Screw		
70	Nut self locking		

When ordering spare parts quote correct axle identification serial no., refer to the axle type plate figures.

Swivel axle Type P 13130

with Brake type: SNK 300 x 150 / 200

Tightening torques:

Use only calibrated torque wrenches.

The use of impact wrenches ist not permitted.

The bolts must not be oiled or greased when assembling.

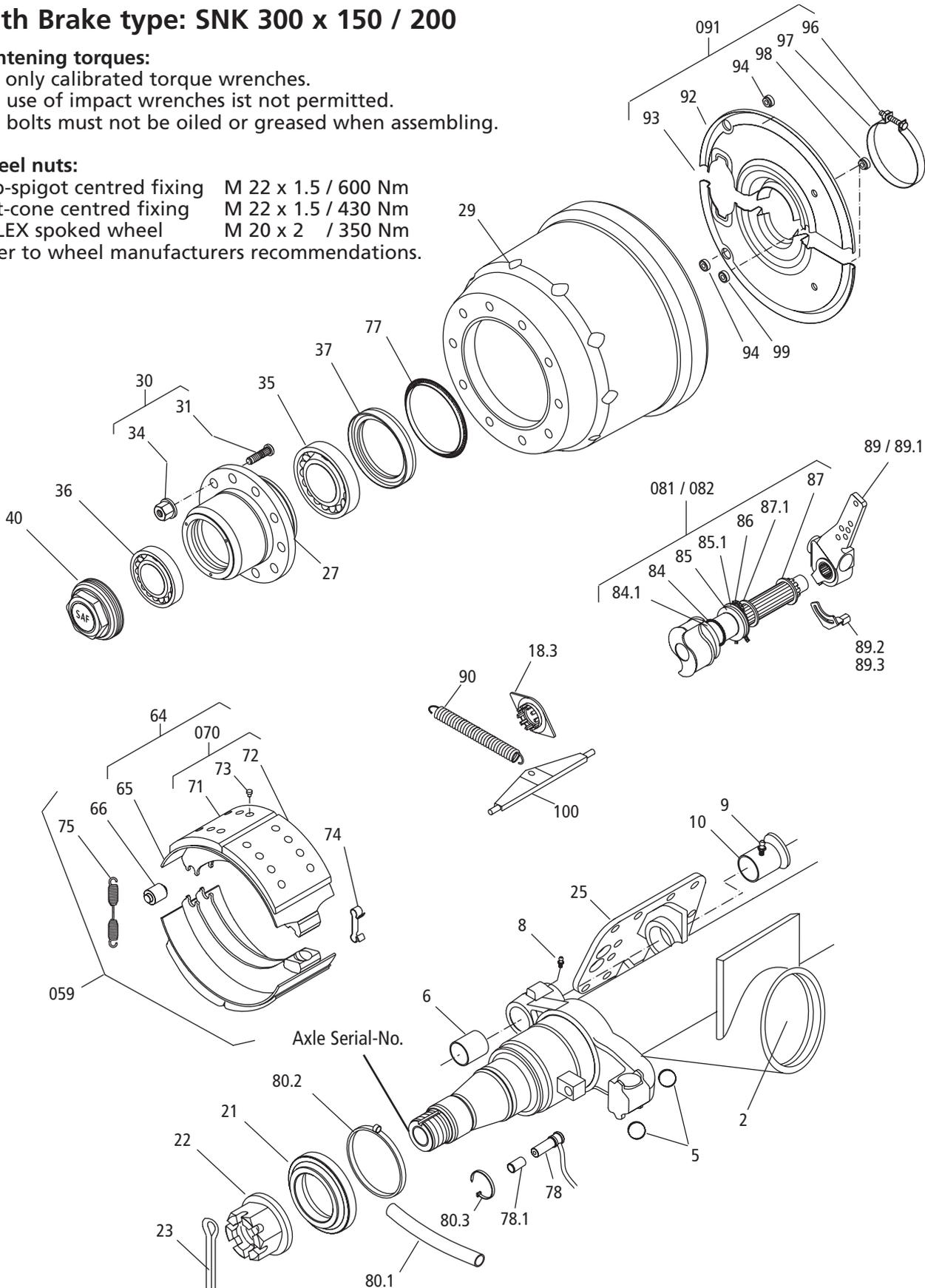
Wheel nuts:

Hub-spigot centred fixing M 22 x 1.5 / 600 Nm

Bolt-cone centred fixing M 22 x 1.5 / 430 Nm

TRILEX spoked wheel M 20 x 2 / 350 Nm

Refer to wheel manufacturers recommendations.



Swivel axle Type P 13130

with Brake type: SNK 300 x 150 / 200

Item	Parts designation	Item	Parts designation
1	Axle beam	77	Exciter gear ABS
2	Pivot bush	78	Sensor ABS
5	Anchor ball	78.1	Retaining sleeve
6	Cam bush	80.1	Protective tube
8	Grease nipple	80.2	Band clamp
10	Camshaft bush	80.3	Fastener ring
18.3	Wear indicator lining	81	Camshaft RH
21	Wear sleeve	82	Camshaft LH
22	Hub nut	84	Circlip
23	Split pin	84	O-ring
25	Bracket brake chamber	84.1	Spacer ring PA
27	Hub	85	Seal ring
29	Brake drum	85.1	Bevel washer
30	Wheel bolt / nut Kit	86	Spring clip
31	Wheel bolt	87	Washer
34	Wheel nut	87.1	Washer
35	Hub bearing inner	89	Slack adjuster
36	Hub bearing outer	89.1	Auto-Slack adjuster
37	Hub sealring	89.2	Anchor bracket LH
40	Hub cap	89.3	Anchor bracket RH
64	Lined brake shoe	90	Pull-off spring
65	Brake shoe	091	Dust cover Kit
66	Cam roller	92	Dust cover LH
070	Lining + rivet Kit	93	Dust cover RH
71	Lining cam side	94	Rubber plug.
72	Lining anchor side	95	Cable clip
73	Rivet	97	Band clamp
74	Retaining clamp	98	Rubber plug
75	Shoe return spring	99	Rubber grommet
		100	Clevis cross bar

When ordering spare parts quote correct axle identification serial no., refer to the axle type plate figures.

Swivel axle type P 11242 with Brake SNF 420 x 120 / 180 / 200

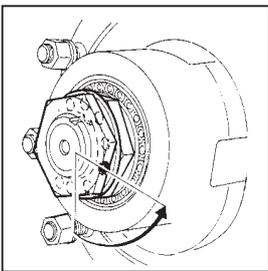
Hub bearing end float setting

Torque tighten the adjusting nut with 150 Nm, at same time rotating the hub/drum to seat the bearings.
 Back off the adjusting nut by 2 1/2 holes of the lock washer.
 Tighten the locknut with 400 Nm.
 Check that hub rotate freely without excessive end float.
 Hub bearing axial end float 0.05 - 0.20 mm, readjust if required.
 Attach the hub cap with a new gasket.

Lubricant specification:

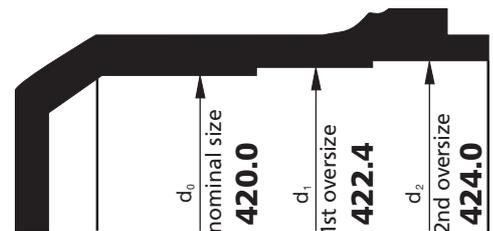
Hub bearings:
 SAF Ref. no. 4 387 0011 05
 Camshaft:
 SAF Ref. no. 4 387 0011 05
 Stub axle:
 SAF Ref. no. 4 387 0015 06
 SAF fitting paste
 Brake shoe anchor ball:
 SAF Ref. no. 4 387 0007 00
 Copper paste

Hub nut setting



When brake shoe relining, lubricate camshaft bushings whilst rotating the camshaft.
 Do not disassemble the hub unit bearings.
 Use a vacuum cleaner to remove brake dust.
 Never use pressurised cleaning devices or washing fluids on the brake drum and hub unit, for reason of this fluid will attack and damage the hub bearing grease lubrication.
 Before refitting the hub unit discard any contamination all around the spindle journals and apply fresh SAF fitting paste.

Never mix different types or grades of grease.



BRAKE type SNF 420

Brake drum diameter, max. permissible machining oversize: 424.0 mm
 Brake drum diameter, max. permissible wear tolerance: 425.0 mm
 Brake linings, always fit only lining material grade approved by SAF.
 Relining brake shoes, fit cam side lining and anchor side lining following the instructions provided with the replacement kit.
 Renew the brake shoe return spring.
 Machine relined brake shoes assembly to brake drum diameter + 0.3 mm to match the drum path radius.

Brake type	SAF parts no. brake lining Kit	Brake drum / brake lining refacing stages in mm			Brake linings	Rivets	DIN 7338 rivet
		Nominal size	1st oversize	2nd oversize			
		d ₀ -420.0	d ₁ -422.4	d ₂ -424.0			
x 120	1 057 0010 00	17.5	19.0	20.0	8	64	B 8 x 15
x 180	1 057 0012 00	17.5	19.0	20.0	8	80	
x 200	1 057 0013 00	17.5	19.0	20.0			

Tools

Hub nut spanner
 Hub puller
 Hub bearing cone inserter
 Camshaft bushing tool

SAF Ref. no.

4 343 3828 00
 3 301 0010 01
 3 434 1014 00
 3 434 1020 00

Swivel axle Type P 11242

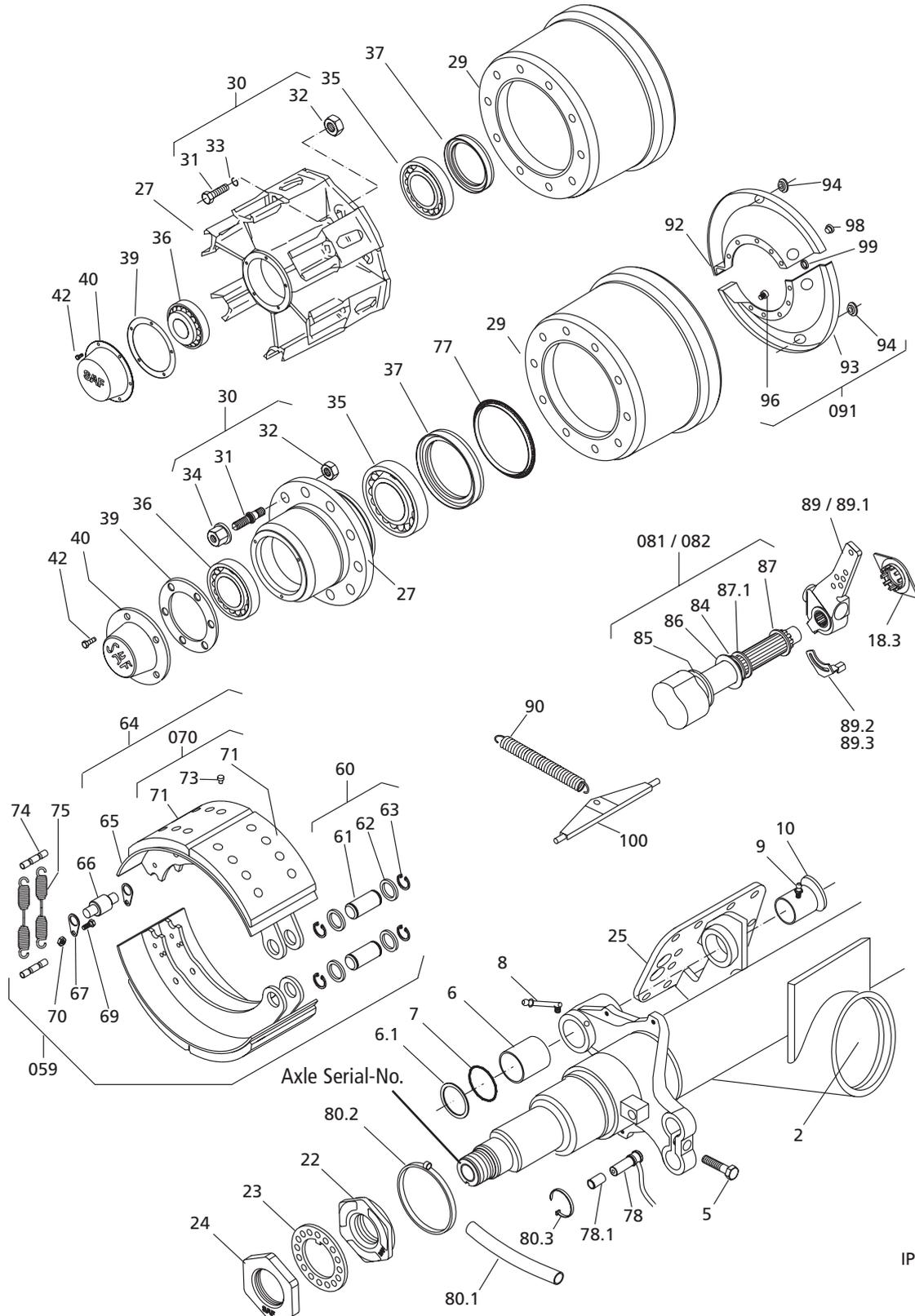
with Brake type: SNF 420 x 120 / 180 / 200

Tightening torques:

Use only calibrated torque wrenches.
The use of impact wrenches ist not permitted.
The bolts must not be oiled or greased when assembling.

Wheel nuts:

Hub-spigot centred fixing M 22 x 1.5 / 600 Nm
Bolt-cone centred fixing M 22 x 1.5 / 430 Nm
TRILEX spoked wheel M 20 x 2 / 350 Nm
Refer to wheel manufacturers recommendations.



Swivel axle Type P 11242

with Brake type: SNF 420 x 120 / 180 / 200

Item	Parts designation	Item	Parts designation
1	Axle beam	070	Lining + rivet Kit
2	Pivot bush	71	Lining cam side
5	Locking bolt	72	Lining anchor side
6	Cam bush	73	Rivet
6.1	Spacer ring PA	74	Cross pin
7	O-ring	75	Shoe return spring
8	Grease nipple	77	Exciter gear ABS
9	Nut	78	Sensor ABS
10	Camshaft bush	78.1	Retaining sleeve
18.3	Wear indicator lining	80.1	Protective tube
		80.2	Band clamp
		80.3	Fastener ring
22	Hub nut		
23	Lock washer		
24	Lock nut	81	Camshaft RH
25	Bracket brake chamber	82	Camshaft LH
		84	"C" Spring clip
27	Hub	85	Washer
28	Locating pin	86	Bevel washer
29	Brake drum	87	Washer
		87.1	Washer
30	Wheel bolt / nut Kit		
31	Wheel bolt	89	Slack adjuster
32	Nut	89.1	Auto-Slack adjuster
34	Wheel nut	89.2	Anchor bracket LH
		89.3	Anchor bracket RH
35	Hub bearing inner	90	Pull-off spring
36	Hub bearing outer		
37	Unitized hub seal ring	091	Dust cover Kit
39	Gasket	92	Dust cover LH
40	Hub cap	93	Dust cover RH
42	Screw	94	Rubber plug.
		95	Cable clip
60	Anchor pin fitting Kit	96	Screw
61	Anchor pin	98	Rubber plug
62	Washer	99	Rubber grommet
63	Circlip		
64	Lined brake shoe	100	Clevis cross bar
65	Brake shoe		
66	Cam roller		
67	Retaining plate		
69	Screw		
70	Nut self locking		

When ordering spare parts quote correct axle identification serial no., refer to the axle type plate figures.

Swivel axle type P 16242 with Brake SNF 420 x 180 / 200

Hub end-float setting

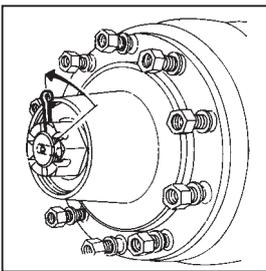
Tighten adjusting nut, whilst hub is rotating, until binding of bearings is felt.
 Back off adjusting nut approx. 1/12 of a turn until inserting of the split pin is possible.
 Insert hub puller and pull hub back against outer bearing.
 Check that hub rotate freely without excessive end float.
 Hub bearing axial end float 0.05 - 0.20 mm, readjust if required.
 Lock the adjusting nut.
 Fill hub cap with grease and install.

Lubricant specification:

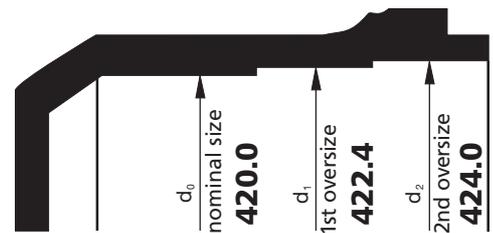
Hub bearings:
 SAF Ref. no. 4 387 0011 05
 Camshaft:
 SAF Ref. no. 4 387 0011 05
 Stub axle:
 SAF Ref. no. 4 387 0015 06
 SAF fitting paste
 Brake shoe anchor ball:
 SAF Ref. no. 4 387 0007 00
 Copper paste

Never mix different types or grades of grease.

Hub nut setting



When brake shoe relining, lubricate camshaft bushings whilst rotating the camshaft.
 Do not disassemble the hub unit bearings.
 Use a vacuum cleaner to remove brake dust.
 Never use pressurised cleaning devices or washing fluids on the brake drum and hub unit, for reason of this fluid will attack and damage the hub bearing grease lubrication.
 Before refitting the hub unit discard any contamination all around the spindle journals and apply fresh SAF fitting paste.



BRAKE type SNF 420

Brake drum diameter, max. permissible machining oversize: 424.0 mm
 Brake drum diameter, max. permissible wear tolerance: 425.0 mm
 Brake linings, always fit only lining material grade approved by SAF.
 Relining brake shoes, fit cam side lining and anchor side lining following the instructions provided with the replacement kit.
 Renew the brake shoe return spring.
 Machine relined brake shoes assembly to brake drum diameter + 0.3 mm to match the drum path radius.

Brake type	SAF parts no. brake lining Kit	Brake drum / brake lining refacing stages in mm			Brake linings	Rivets	DIN 7338 rivet
		Nominal size	1st oversize	2nd oversize			
		d ₀ -420.0	d ₁ -422.4	d ₂ -424.0			
x 180	1 057 0012 00	17.5	19.0	20.0	8	80	B 8 x 15
x 200	1 057 0013 00	17.5	19.0	20.0			

Tools

Hub nut spanner and cap spanner
 Hub puller
 Universal hub puller
 Bearing inner race inserter
 Wheel bearing and seal inserter
 Camshaft bushing tool

SAF Ref. no.

1 012 0013 00 B
 3 301 0007 01
 4 434 3822 00
 4 434 3816 00
 3 434 3301 00
 3 434 1020 00

Swivel axle Type P 16242

with Brake type: SNF 420 x 180 / 200

Tightening torques:

Use only calibrated torque wrenches.

The use of impact wrenches ist not permitted.

The bolts must not be oiled or greased when assembling.

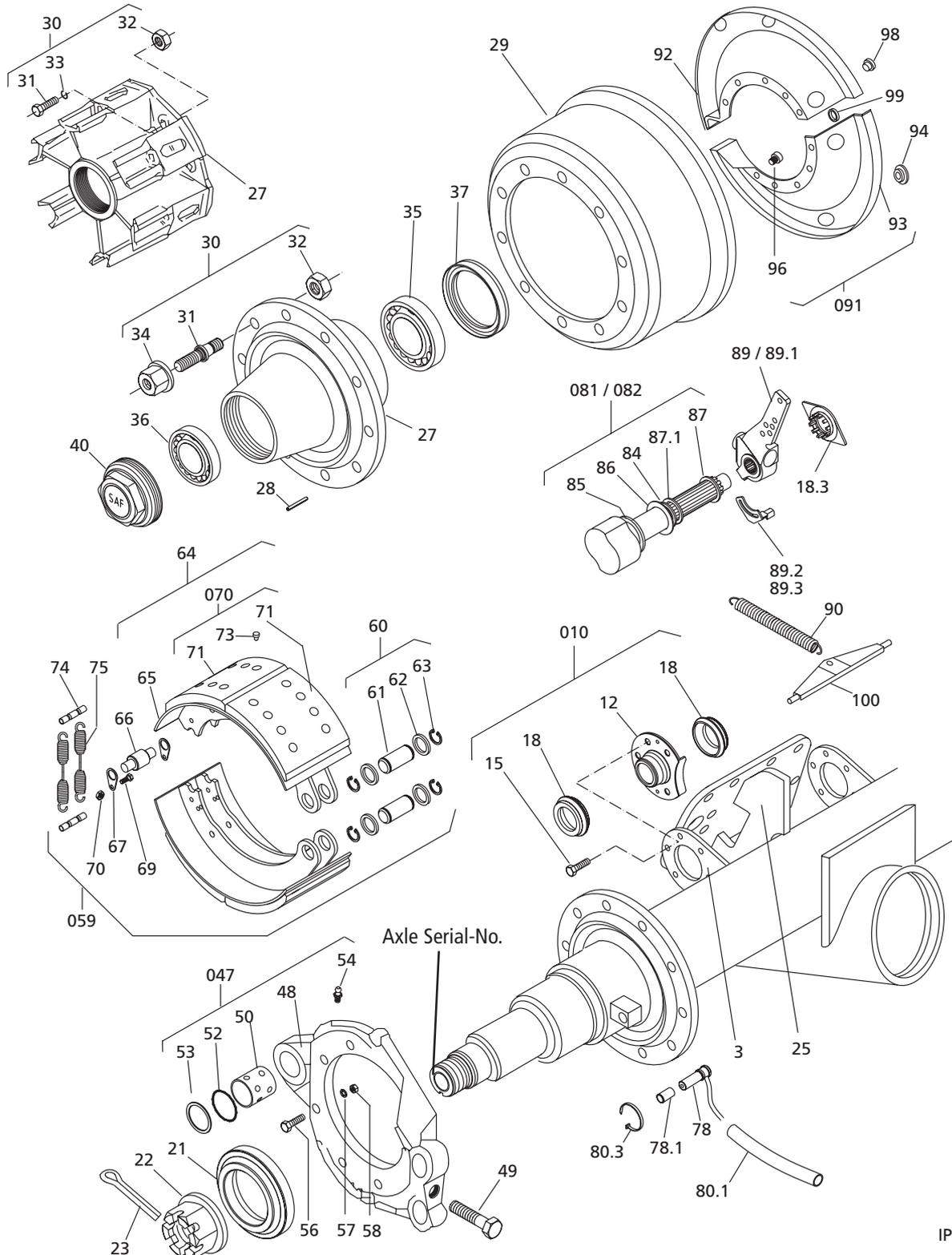
Wheel nuts:

Hub-spigot centred fixing M 22 x 1.5 / 600 Nm

Bolt-cone centred fixing M 22 x 1.5 / 430 Nm

TRILEX spoked wheel M 20 x 2 / 350 Nm

Refer to wheel manufacturers recommendations.



Swivel axle Type P 16242

with Brake type: SNF 420 x 180 / 200

Item	Parts designation	Item	Parts designation
1	Axle beam	070	Lining + rivet Kit
		71	Lining cam side
2	Pivot bush	72	Lining anchor side
10	Camshaft bush	73	Rivet
15	Bolt	74	Cross pin
18	Rubber boot	75	Shoe return spring
18.3	Wear indicator lining		
		77	Exciter gear ABS
21	Wear sleeve	78	Sensor ABS
22	Hub nut	78.1	Retaining sleeve
23	Split pin	80.1	Protective tube
25	Bracket brake chamber	80.2	Band clamp
		80.3	Fastener ring
27	Hub		
29	Brake drum	81	Camshaft RH
		82	Camshaft LH
30	Wheel bolt / nut Kit	84	"C" Spring clip
31	Wheel bolt	85	Washer
34	Wheel nut	86	Bevel washer
35	Hub bearing inner	87	Washer
36	Hub bearing outer	87.1	Washer
37	Hub seal ring		
40	Hub cap	89	Slack adjuster
		89.1	Auto-Slack adjuster
48	Brake shoe carrier	89.2	Anchor bracket LH
49	Locking bolt	89.3	Anchor bracket RH
50	Cam bush	90	Pull-off spring
52	O-ring		
53	Spacer ring PA	091	Dust cover Kit
54	Grease nipple	92	Dust cover LH
56	Bolt	93	Dust cover RH
57	Washer	94	Rubber plug.
58	Nut	95	Cable clip
		96	Screw
59	Brake shoe Kit	98	Rubber plug
		99	Rubber grommet
60	Anchor pin fitting Kit		
61	Anchor pin	100	Clevis cross bar
62	Washer		
63	Circlip		
64	Lined brake shoe		
65	Brake shoe		
66	Cam roller		
67	Retaining plate		
69	Screw		
70	Nut self locking		

When ordering spare parts quote correct axle identification serial no., refer to the axle type plate figures.

Swivel axle type P 16242 with Brake SNK 420 x 180 / 200

Hub end-float setting

Tighten adjusting nut, whilst hub is rotating, until binding of bearings is felt.

Back off adjusting nut approx. 1/12 of a turn until inserting of the split pin is possible.

Insert hub puller and pull hub back against outer bearing.

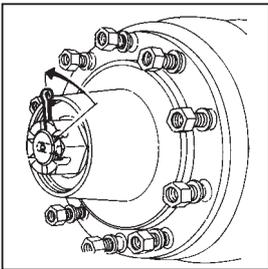
Check that hub rotate freely without excessive end float.

Hub bearing axial end float 0.05 - 0.20 mm, readjust if required.

Lock the adjusting nut.

Fill hub cap with grease and install.

Hub nut setting



When brake shoe relining, lubricate camshaft bushings whilst rotating the camshaft.

Do not disassemble the hub unit bearings.

Use a vacuum cleaner to remove brake dust.

Never use pressurised cleaning devices or washing fluids on the brake drum and hub unit, for reason of this fluid will attack and damage the hub bearing grease lubrication.

Before refitting the hub unit discard any contamination all around the spindle journals and apply fresh SAF fitting paste.

Lubricant specification:

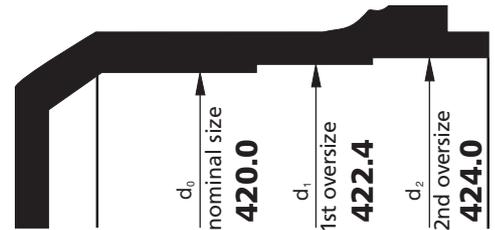
Hub bearings:
SAF Ref. no. 4 387 0011 05

Camshaft:
SAF Ref. no. 4 387 0011 05

Stub axle:
SAF Ref. no. 4 387 0015 06
SAF fitting paste

Brake shoe anchor ball:
SAF Ref. no. 4 387 0007 00
Copper paste

Never mix different types or grades of grease.



424.0 mm
425.0 mm

BRAKE type SNK 420

Brake drum diameter, max. permissible machining oversize:

Brake drum diameter, max. permissible wear tolerance:

Brake linings, always fit only lining material grade approved by SAF.

Relining brake shoes, fit cam side lining and anchor side lining following the instructions provided with the replacement kit.

Renew the brake shoe return spring.

Machine relined brake shoes assembly to brake drum diameter + 0.3 mm to match the drum path radius.

Brake type	SAF parts no. brake lining Kit	Brake drum / brake lining refacing stages in mm			Brake linings	Rivets	DIN 7338 rivet
		Nominal size	1st oversize	2nd oversize			
		d ₀ -420.0	d ₁ -422.0	d ₂ -424.0			
x 180	3 057 0060 00	20.6* 20.0	21.6* 21.0	22.6* 22.0	4 4	64	B 8 x 15
x 200	3 057 0066 00	20.6* 20.0	21.6* 21.0	22.6* 22.0	4 4		

* Cam side lining

Tools

Hub nut spanner and cap spanner

Hub puller

Universal hub puller

Bearing inner race inserter

Wheel bearing and seal inserter

Brake shoe clamping device

Camshaft bushing tool

SAF Ref. no.

1 012 0013 00 B

3 301 0007 01

4 434 3822 00

4 434 3816 00

3 434 3301 00

3 349 1001 00

1 434 1056 00

Swivel axle Type P 16242

with Brake type: SNK 420 x 180 / 200

Tightening torques:

Use only calibrated torque wrenches.

The use of impact wrenches ist not permitted.

The bolts must not be oiled or greased when assembling.

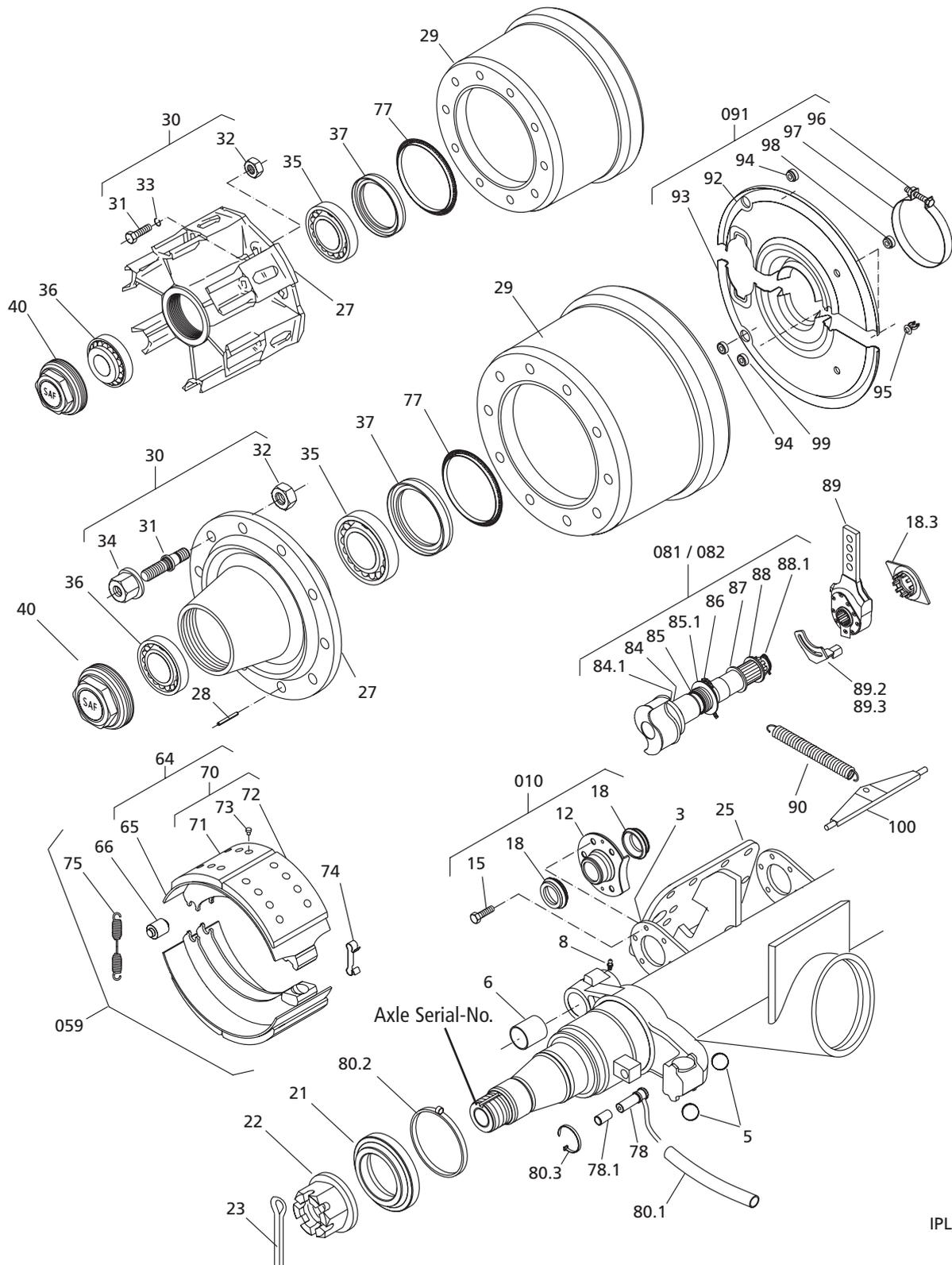
Wheel nuts:

Hub-spigot centred fixing M 22 x 1.5 / 600 Nm

Bolt-cone centred fixing M 22 x 1.5 / 430 Nm

TRILEX spoked wheel M 20 x 2 / 350 Nm

Refer to wheel manufacturers recommendations.



Swivel axle Type P 16242

with Brake type: SNK 420 x 180 / 200

Item	Parts designation	Item	Parts designation
1	Axle beam	77	Exciter gear ABS
2	Pivot bush	78	Sensor ABS
5	Anchor ball	78.1	Retaining sleeve
6	Cam bush	80.1	Protective tube
8	Grease nipple	80.2	Band clamp
9	Nut	80.3	Fastener ring
10	Camshaft bush	81	Camshaft RH
15	Bolt	82	Camshaft LH
18	Rubber boot	84	O-ring
18.3	Wear indicator lining	84.1	Spacer ring PA
21	Wear sleeve	85	Seal ring
22	Hub nut	85.1	Bevel washer
23	Split pin	86	Spring clip
25	Bracket brake chamber	87	Washer
27	Hub	88	Washer
28	Locating pin	88.1	Spring clip
29	Brake drum	89	Slack adjuster
30	Wheel bolt / nut Kit	89.1	Auto-Slack adjuster
31	Wheel bolt	89.2	Anchor bracket LH
32	Nut	89.3	Anchor bracket RH
34	Wheel nut	90	Pull-off spring
35	Hub bearing inner	091	Dust cover Kit
36	Hub bearing outer	92	Dust cover LH
37	Hub seal ring	93	Dust cover RH
40	Hub cap	94	Rubber plug.
64	Lined brake shoe	95	Cable clip
65	Brake shoe	96	Bolt
66	Cam roller	97	Band clamp
070	Lining + rivet Kit	98	Rubber plug
71	Lining cam side	99	Rubber grommet
72	Lining anchor side	100	Clevis cross bar
73	Rivet		
74	Retaining clamp		
75	Shoe return spring		

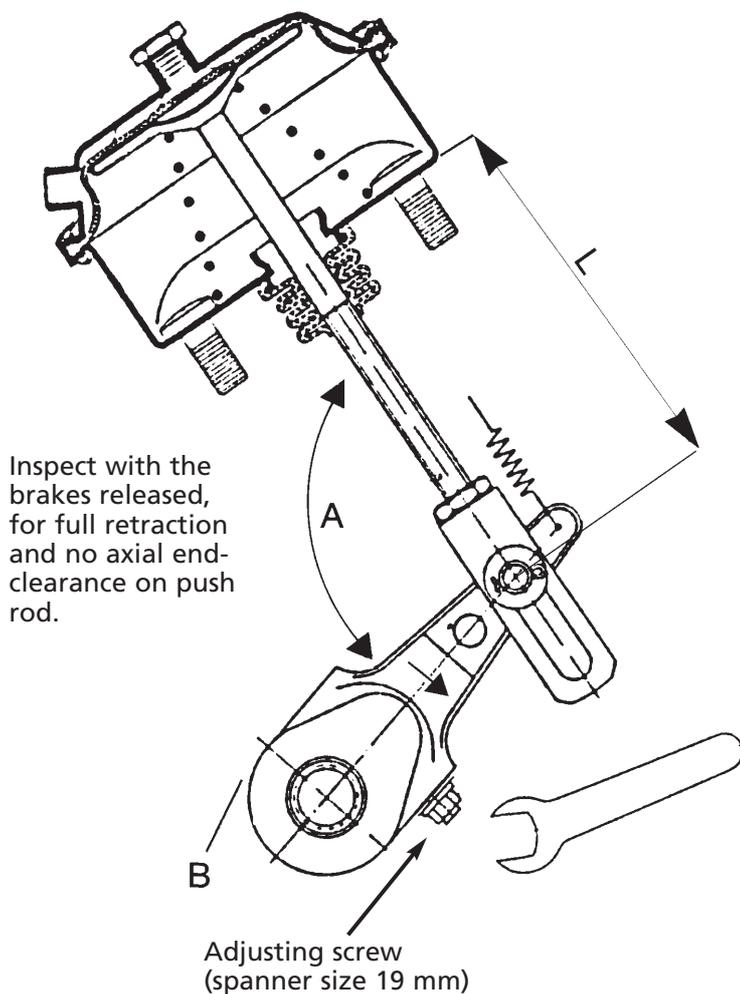
When ordering spare parts quote correct axle identification serial no., refer to the axle type plate figures.

S-cam brakes with manual slack adjusters

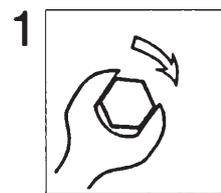
Due to brake drum and lining wear the brakes must be regularly readjusted in order to maintain the full brake performance. The drum / lining running clearance must be kept to an absolute minimum. Inspect the push rod travel by applying and releasing the brakes, the clevis should not move more than 35 mm during brake application.

When lining wear causes an increase to the permissible stroke limit of 35 mm the brakes need readjustment. Readjust slack adjusters to obtain a push rod movement of 10 to 15 mm.

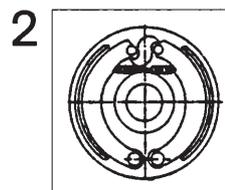
Repeat check drum / lining for free running clearance.



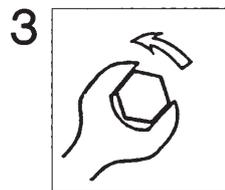
Inspect with the brakes released, for full retraction and no axial end-clearance on push rod.



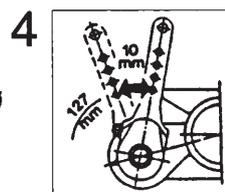
Turn adjusting screw to the right until...



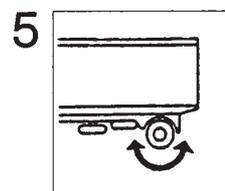
... the brake shoes fit closely to the brake drum.



Turn adjusting screw to the left, until...



... the no-load stroke at the slack adjuster (at 127 mm) is approx. 10 - 15 mm long.



The wheel must rotate freely with no grating noise.

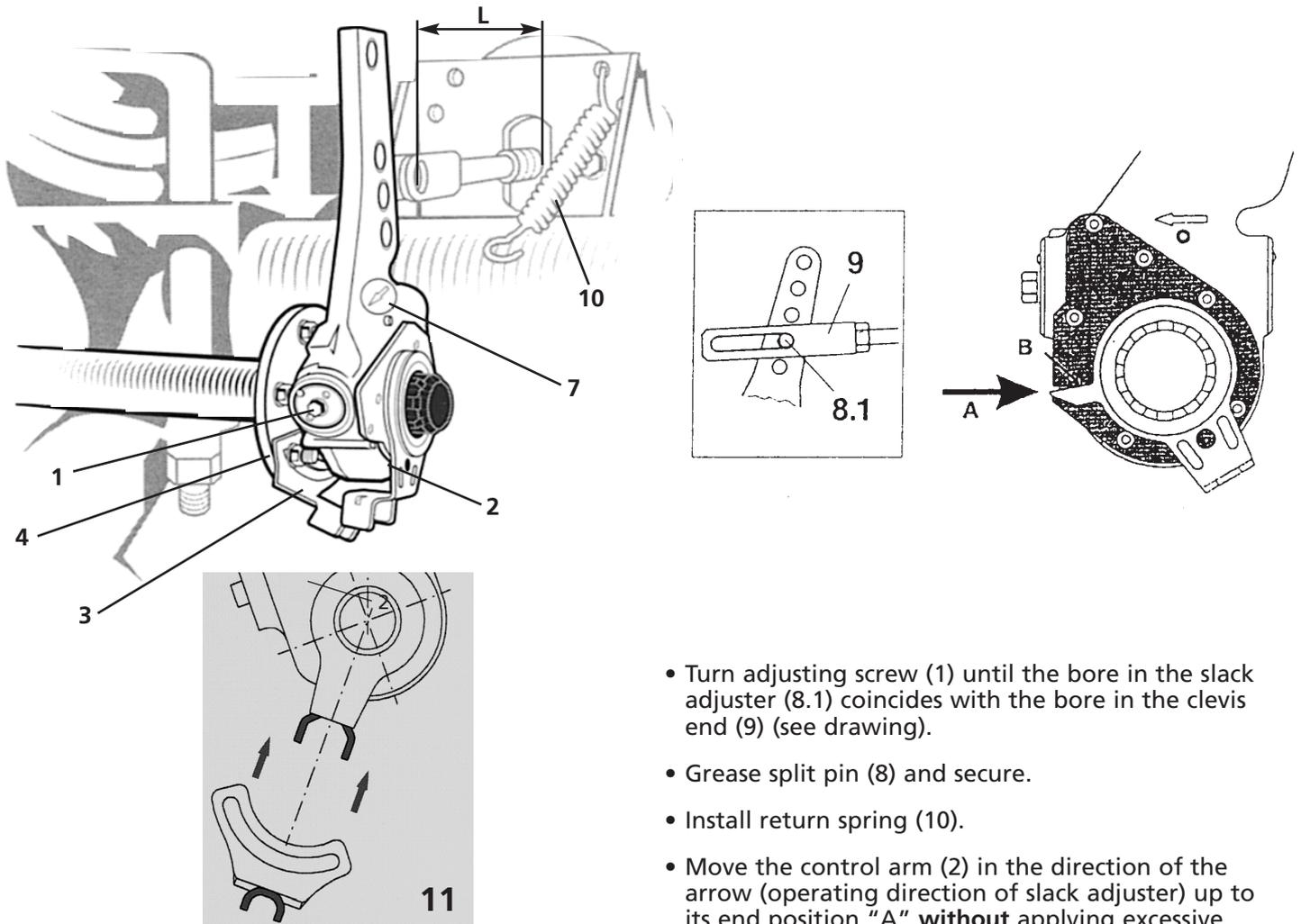
A = Inspect the angle formed by the slack adjuster arm and brake chamber push rod. The angle must remain greater than 90° both with brakes applied and released. A lesser angle is an indication that the brakes need readjusting.

B = Inspect for satisfactory clearance, with the brakes applied the slack adjuster housing must not make contact with the axle beam.

L = Inspect that push rod length is according to recommended SAF specification.

A, B, C In case not to obtain this settings, it is imperative to consult the trailer manufacturer for required corrections.

Automatic slack adjuster – Type HALDEX



- Set cams and brake shoes to full retracted position.

- Observe the correct push rod length "L" as indicated in the SAF specifications.

• Membrane brake chamber

Before installing the automatic slack adjuster, ensure that the brake chamber push rod is in retracted position.

- By contrast, **spring brake chambers** must be under full operating pressure (min. 6.5 bar) to retract the push rod.

IMPORTANT: If this is not maintained properly, the basic setting will be wrong, with critical effect of overheating the brakes.

- Grease the camshaft.
- Install anchor bracket (3), being sure to use two fixing bolts (4), do not yet tighten the bolts.
- Install the slack adjuster on the camshaft.
- The arrow (7) points in the braking direction.

- Turn adjusting screw (1) until the bore in the slack adjuster (8.1) coincides with the bore in the clevis end (9) (see drawing).

- Grease split pin (8) and secure.

- Install return spring (10).

- Move the control arm (2) in the direction of the arrow (operating direction of slack adjuster) up to its end position "A" **without** applying excessive force.

- When control arm (2) is in its end position "A", tighten the fixing bolts (4).

- For the anchor bracket mounting (11), ensure that the 2 U-profiles engage firmly together.

- Fit slack adjuster retaining clip on camshaft.

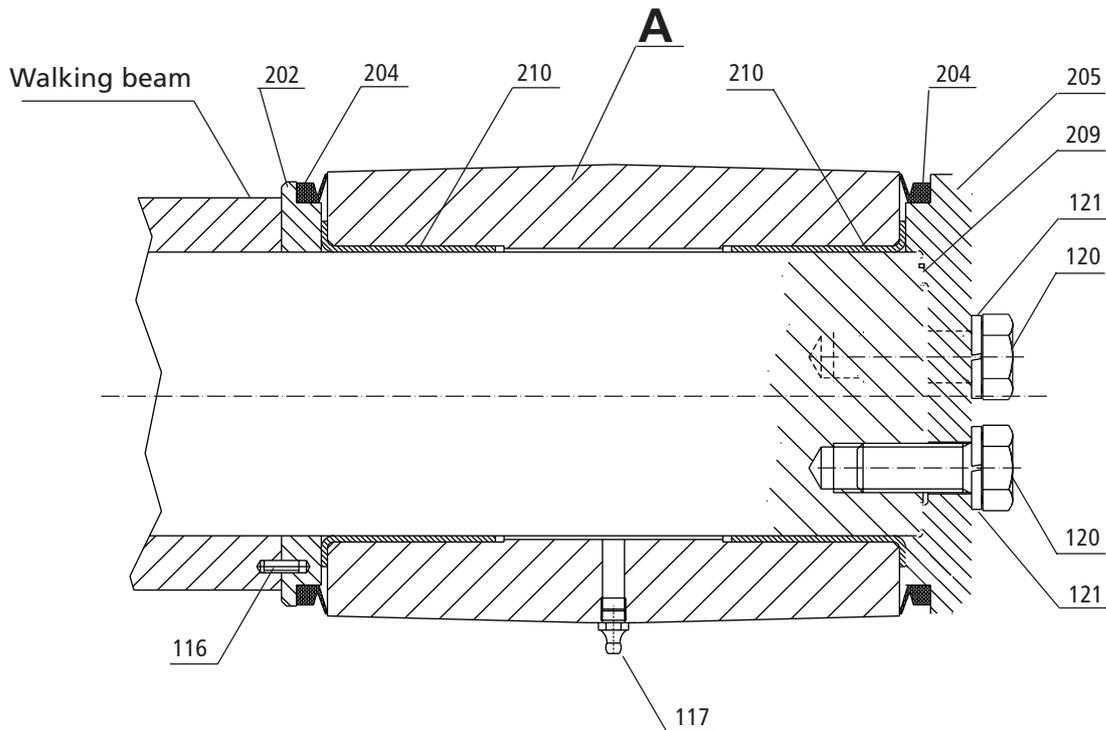
- Axial clearance: Adjust 0.5 - 2 mm using shims.

- Adjust running clearance between brake lining and drum by turning adjusting screw (1) in clockwise direction until the linings locking against the drum. Then back off adjusting screw (1) by 3/4 turn. **Do not use impact wrenches!**

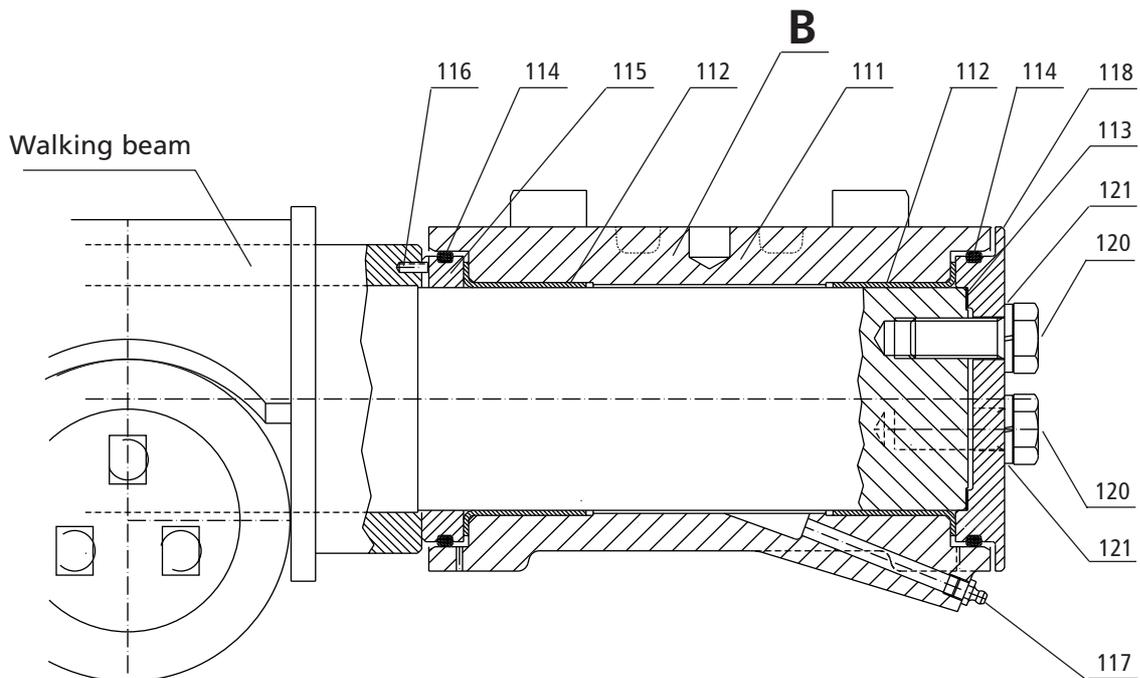
FUNCTION CHECK

- If the self adjuster is functioning correctly, then a minimum torque of 18 Nm must be felt and a grating noise must be heard when adjusting screw (1) is backed off.
- Operate the footbrake several times. Check whether the brake drum rotates freely, check the lining clearance and repeat adjustment procedure if necessary.

Oscillating tandem Bogie Type RZP

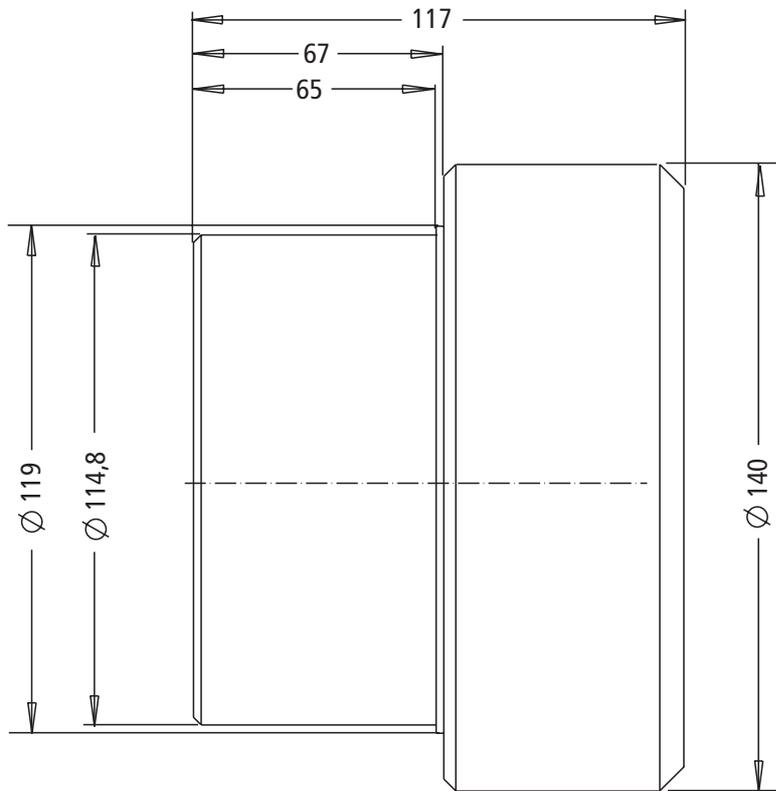
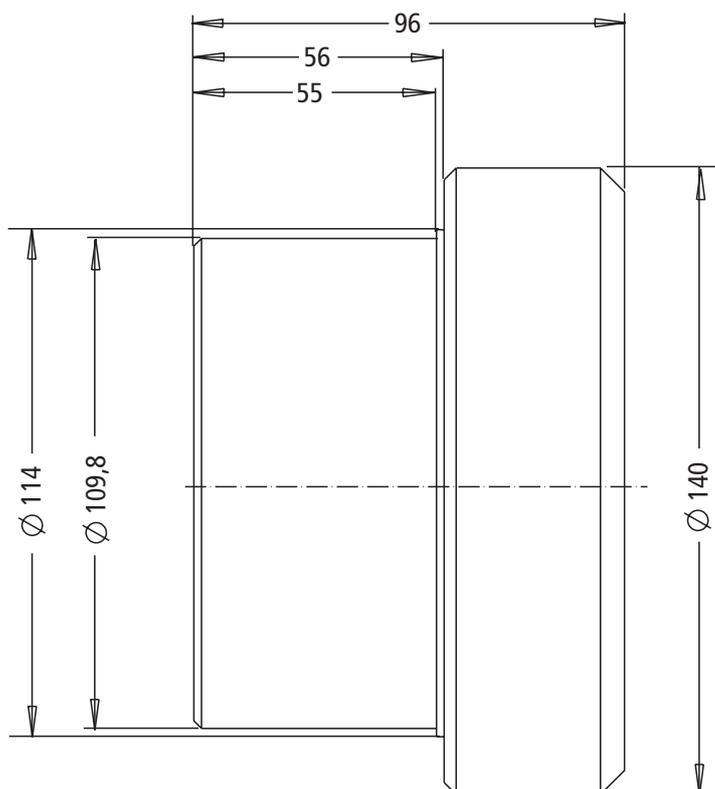


- A Swivel axel**
 202 Wear sleeve heat to 120° C when fitting
 210 Bronze bush fitting by hydraulic press use inserter tool (see following pages).



- B Pivot bracket**
 115 Wear sleeve heat to 120° C when fitting
 112 Bronze bush fitting by hydraulic press use inserter tool (see following pages).

Proposed bushing inserters

**A****Bronze bush inserter
Swivel axle****B****Bronze bush inserter
Pivot bracket**

SAF Bolt / Nut tightening torques

The following tightening torques are only valid if no other values are given in the axle maintenance chart.

Torque wrenches settings, impact wrench not permissible.
The bolts must not be oiled or greased when assembling.

Thread	 W.A.F. (Spanner size)	Material		
		8,8	10,9	12,9
M 8	W.A.F. 13	25	35	41
M 8 x 1		27	38	45
M 10	W.A.F. 17 / 16	49	69	83
M 10 x 1		52	73	88
M 12	W.A.F. 19 / 18	86	120	145
M 12 x 1.5		90	125	150
M 14	W.A.F. 22 / 21	135	190	230
M 14 x 1.5		150	210	250
M 16	W.A.F. 24	210	300	355
M 16 x 1.5		225	315	380
M 18	W.A.F. 27	300	405	485
M 18 x 1.5		325	460	550
M 20	W.A.F. 30	410	580	690
M 20 x 1.5		460	640	770
M 22	W.A.F. 32	550	780	930
M 22 x 1.5		610	860	1050
M 24	W.A.F. 36	710	1000	1200
M 24 x 2		780	1100	1300
M 27	W.A.F. 41	1050	1500	1800
M 27 x 2		1150	1600	1950
M 30	W.A.F. 46	1450	2000	2400
M 30 x 2		1600	2250	2700
M 36 x 2	W.A.F. 55	2450	3450	4150

Wheel fixing:

Wheels see appropriate axle maintenance chart.

TRILEX spoked wheels	M 18 x 2	270 - 300 Nm
	M 20 x 2	320 - 350 Nm

SAF

Agents / Service Stations / Points Service

Africa	Otto Sauer Achsenfabrik Keilberg KG	(+3 86) 530 - 292 13
Albania	SAF Hering-Rad Ges.m.b.H.	(+43) 22 36 - 64 65 0-0
Armenia	SAF-INTCOM	(+07) 095 - 5 79 94 00
Australia	HDTE-Heavy Duty Transport Equipment Pty. Ltd.	(+61) 3 - 93 69 08 56
Austria	SAF Hering-Rad Ges.m.b.H.	(+43) 22 36 - 64 65 0-0
Azerbaijan	SAF-INTCOM	(+07) 095 - 5 79 94 00
Belgium	SAF Benelux B.V.	(+31) (0) 3 42 - 49 78 89
Belorussia	SAF Representative Office	(+375) 17 - 2 84 48 68
Bosnia-Herzegovina, Rep.	SAF Hering-Rad Ges.m.b.H.	(+43) 22 36 - 64 65 0-0
Bulgaria	SAF Trade Bulgarien EOOD	(+359) 58 690 260
Chile	Union Tecnica Automotriz S.A.C.	(+56) 2 - 6 23 48 51
Croatia	SAF Hering-Rad Ges.m.b.H.	(+43) 22 36 - 64 65 0-0
Czech Republic	SAF Trade, spol. s.r.o.	(+4 20) 572 540 900
Denmark	Transport-Komponenter A/S	(+45) 75 52 00 80
Egypt	Egyptian Co. for Trading & Construction	(+20) 2 - 2 15 23 09
Estonia	SAF POLSKA Sp.z.o.o.	(+48) 672 16 65 60 & 70
Finland	Oy Arne Stara AB	(+3 58) 67 81 87 50
France	SAF France S.A.	(+33) 1 - 30 88 09 00
Georgia	SAF-INTCOM	(+07) 095 - 5 79 94 00
Germany	Otto Sauer Achsenfabrik Keilberg KG	(+49) (0) 60 95 - 3 01-0
Great Britain	I.M.S. Ltd.	(+44) 15 09 - 60 01 85
Greece	Otto Sauer Achsenfabrik Keilberg KG	(+49) (0) 60 95 - 3 01-0
Hungary	L.V. Technik Kft.	(+36) 76 - 49 35 07
Iceland	Stilling	(+3 54) 5 - 88 97 97
India	Otto Sauer Achsenfabrik Keilberg KG	(+3 86) 530 - 292 13
Iran	Otto Sauer Achsenfabrik Keilberg KG	(+49) (0) 60 95 - 3 01-0
Ireland	I.M.S. Ltd.	(+44) 15 09 - 60 01 85
Israel	M.N. Systems Ltd.	(+9 72) 9 - 8 62 60 30
Italy	SAF Italia S.r.l.	(+39) 0 45 - 82 50 56 0
Kazakhstan	SAF-INTCOM	(+07) 095 - 5 79 94 00
Kyrgyzstan	SAF-INTCOM	(+07) 095 - 5 79 94 00
Korea, Rep.	JB Enterprises	(+82) 32 422 - 0301
Latvia	SAF POLSKA Sp.z.o.o.	(+48) 672 16 65 60 & 70
Lithuania	SAF POLSKA Sp.z.o.o.	(+48) 672 16 65 60 & 70
Luxembourg	SAF Benelux B.V.	(+31) (0) 3 42 - 49 78 89
Macedonia	SAF Hering-Rad Ges.m.b.H.	(+43) 22 36 - 64 65 0-0
Malaysia	Quality Trailer Parts	(+60) 3 - 61 85 82 92
Middle East	Otto Sauer Achsenfabrik Keilberg KG	(+3 86) 530 - 292 13
Moldova	SAF TRADE RO S.R.L.	(+40) 268 25 88 30
Netherlands	SAF Benelux B.V.	(+31) (0) 3 42 - 49 78 89
New Zealand	Transport Specialties Ltd.	(+64) 9 - 9 80 73 22
Norway	MoRek a.s.	(+47) 67 06 35 00
People's Republic of China	Jinan SAF Axle Co. Ltd.	(+86) 5 31 - 8 87 62 54
Poland	SAF POLSKA Sp.z.o.o.	(+48) 672 16 65 60 & 70
Portugal	Suspartes Lda.	(+3 51) 1 - 2 13 47 10
Romania	SAF TRADE RO S.R.L.	(+40) 268 25 88 30
Russia	SAF-INTCOM	(+7) 095 - 5 79 94 00
Slovakia, Rep.	SAF Trade spol s.r.o.	(+4 21) 38 - 7 60 18 34
Slovenia	SAF Hering-Rad Ges.m.b.H.	(+43) 22 36 - 64 65 0-0
Spain	SAF Otto Sauer Achsenfabrik Espana S.L.	(+34) 93 - 8 46 81 11
Sweden	Trailax AB	(+46) 36 - 16 97 00
Switzerland	Willy Erny AG	(+41) 52 - 3 37 21 21
Tadzhikistan	SAF-INTCOM	(+7) 095 - 5 79 94 00
Taiwan	JB Enterprises	(+82) 32 422 - 0301
Thailand	Kamanasan. Co., Ltd.	(+66) 27 48 21 21
Turkey	INTERMOBIL A.S.	(+90) 2 12 - 2 85 43 64
Turkmenistan	SAF-INTCOM	(+7) 095 - 5 79 94 00
Ukraine	SAF POLSKA Sp.z.o.o.	(+48) 672 16 65 60 & 70
Uzbekistan	SAF-INTCOM	(+7) 095 - 5 79 94 00
Yugoslavia	SAF Representative Office	(+3 81) 13 52 04 27