edition february 2023

SMB

USE AND MAINTENANCE MANUAL


SMB

RUNNING GEAR IDENTIFICATION

Transporter	Vehicle manufacturer

Vehicle identification number: _____

Vehicle commissioning date: _____

Axles references:	Identification N°:	Axle type:
Axle n°1:		
Axle n°2:		
Axle n°3:		
Axle n°4:		
Axle n°5:		

Suspension type: _____

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TERMS OF THE WARRANTY

The SAE-SMB INDUSTRIES company provides a warranty to users of SAE-SMB INDUSTRIES axles and suspensions systems, under the terms set out below:

1- Limitation of liability

Our warranty covers parts incontestably displaying a defect in terms of material or workmanship, proven to have occurred to the product during the warranty period. In addition to the legal warranty obligations of the seller, the warranty consists of the contract of sale concluded with the first end customer without exception.

the warranty covers the damaged parts. Unless otherwise agreed with SAE-SMB INDUSTRIES, the warranty does not cover labour or workshop costs for dismounting, mounting and inspecting parts.
The warranty applies only to damage to SAE-SMB INDUSTRIES products. Damage resulting from a defect, in particular repair and towing costs, replacement vehicle costs, and claims for lost profits and damages are excluded from the warranty.
No exception shall be made for any liability beyond the mandatory provisions of the law.

2- Exclusions of liability

Damage due to the following is excluded from the warranty:

> non-compliant mounting of SAE-SMB INDUSTRIES axle systems
> lack of vehicle brake adjustment
> mechanical damage due to year accident, fall or impact
> involuntary or intentional destruction or fire
> misuse of the vehicle (i.e. overload, overheating, use under abnormal conditions)
> a maintenance defect, in particular a breach of the service intervals specified in the SAE-SMB INDUSTRIES maintenance manual
> alteration of parts or modifications to the SAE-SMB INDUSTRIES axle systems
> the use of foreign parts instead of original SAE-SMB INDUSTRIES parts, lubricants or non-compliant products

Also excluded from the guarantee are phenomena such as noise, odour, vibration or oil leakages with no influence on the operating ability of SAE-SMB INDUSTRIES axle systems.

TERMS OF THE WARRANTY

3- Warranty period

The warranty begins on the day of delivery of the vehicle to the first end customer, as certified on the maintenance logbook. The length of the warranty depends on the tables below, showing the various SAE-SMB INDUSTRIES axle systems.
It is limited to the mileage indicated when this limit is reached by the vehicle before the expiry of the warranty, for OFF-ROAD use: 1 year or 100,000 km for all parts.
The warranty period depends on the type of vehicle use, that is to say ON-ROAD or OFF-ROAD use.
For classification in either the ON-ROAD or OFF-ROAD category, it is important to know if the vehicle is only in circulation on roads with solid coating (ON-ROAD use) or on construction sites, in quarries, on farms, for military purposes, or on rough roads (OFF-ROAD use). However, for specific vehicles with brief periods of OFF-ROAD use, such as 3-axle tippers and low loaders approaching construction sites, SAE-SMB INDUSTRIES may grant ON-ROAD warranty terms. Use in zone 3 countries as shown in the table (page A5) is always considered OFF-ROAD. The warranty period for OFF-ROAD use is 1 year or 100,000 km for all parts.

4- Claiming under the warranty

All warranty claims shall be made by sending a warranty request to SAE-SMB INDUSTRIES (see attached form or the use www.sae-smb.com website). This request shall specify the defects found and must include a copy of the first page of the maintenance manual, fully completed, and the brake adjustment report.
All warranty claims shall be made immediately to SAE-SMB INDUSTRIES, no later than two weeks after the defect is found.
Non-compliant dismounted parts shall be retained and shall not be removed without the express agreement of SAE-SMB INDUSTRIES.
SAE-SMB INDUSTRIES may send year invoice for costs incurred by unjustified warranty claims.

The act of claiming under the warranty does not extend the warranty period. For parts replaced under warranty, the warranty period is a minimum of 6 months or is equivalent to the initial warranty period.
The maintenance instructions for the SAE-SMB INDUSTRIES axle systems are year integral part of the warranty. To ensure complete operating availability and safety, subsequent maintenance work must be carried out at the intervals stated.
Only original SAE-SMB INDUSTRIES spare parts or parts authorised by SAE-SMB INDUSTRIES may be used, to ensure that the validity of the operating licence of our axle systems is maintained.
Repairing of defects found and exchange of worn components must be performed by a professional workshop.


SMB

TERMS OF THE WARRANTY

- Identification

SAE - SMB Industries
08090 Ham-Les-Moines - France

Ident. No / Prod. No	221000612 - S15-2022
DSOKH7 09010 4345K2 2140 1400 SO SAO	
ID1 - D222 / ID2 - 4345K2 / ID3 - 10006	

Charge statique adm. perm. Static. axle capacity (Kg) **9000** — Vitesse maxi Max. speed (Km/h) **105** — ID4 - Homologation Test report **361-043-16**

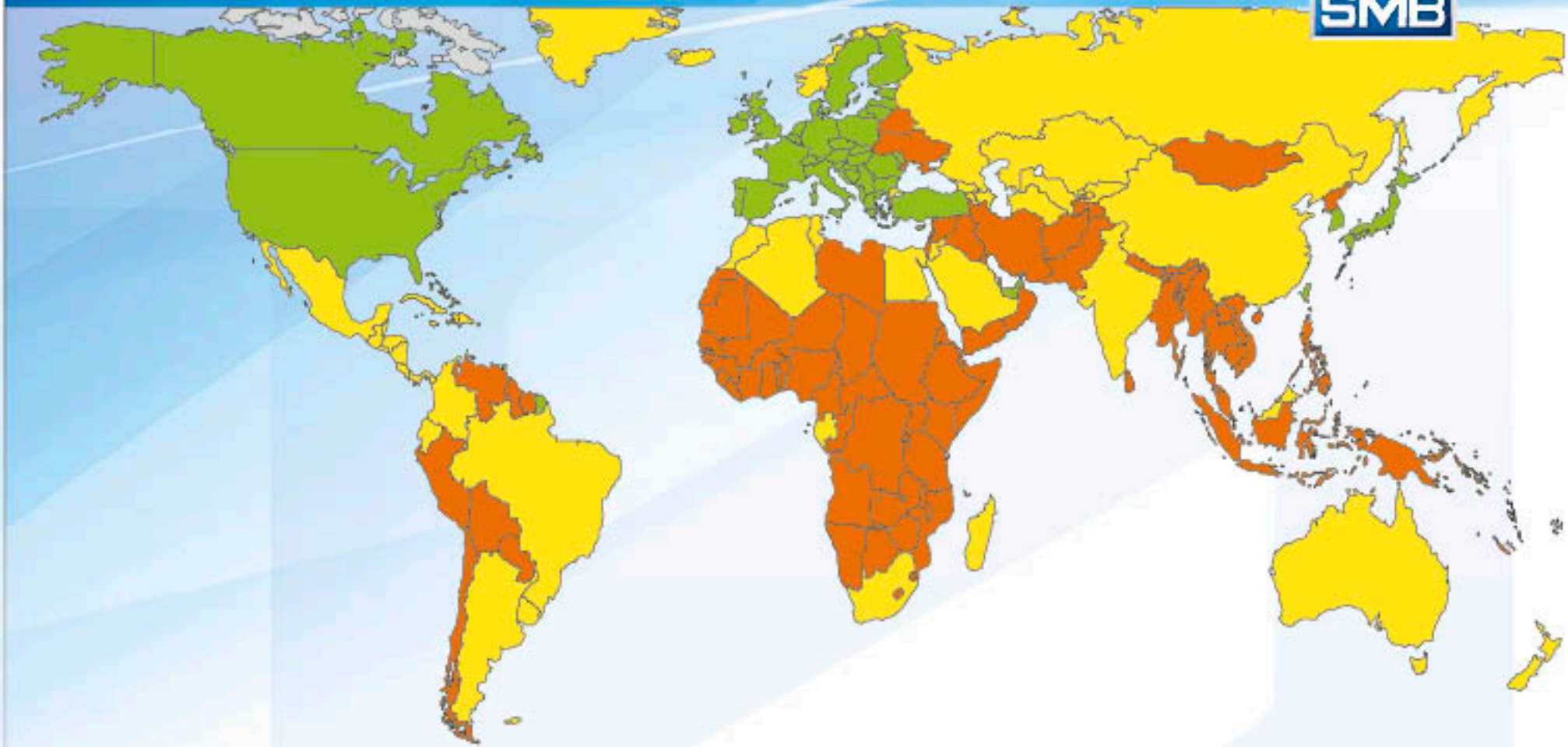
N° Serie : 220223049

Made in France

221000612 item no.
S15-2022 manufacturing date
DSOKH7 09010 4345K2 2140 1400 SO SAO item reference
ID1 - D222 / ID2 - 4345K2 / ID3 - 10006 identifiers following ECE R13
9000 admissible static load (Kg)
105 max. admissible speed (Km/h)

TERMS OF THE WARRANTY

- Warranty zones



ZONE 1	standard warranty terms
ZONE 2	warranty terms to be defined with SAE-SMB INDUSTRIES depending on cases of application
ZONE 3	OFF-ROAD warranty terms, regardless of application

TERMS OF THE WARRANTY

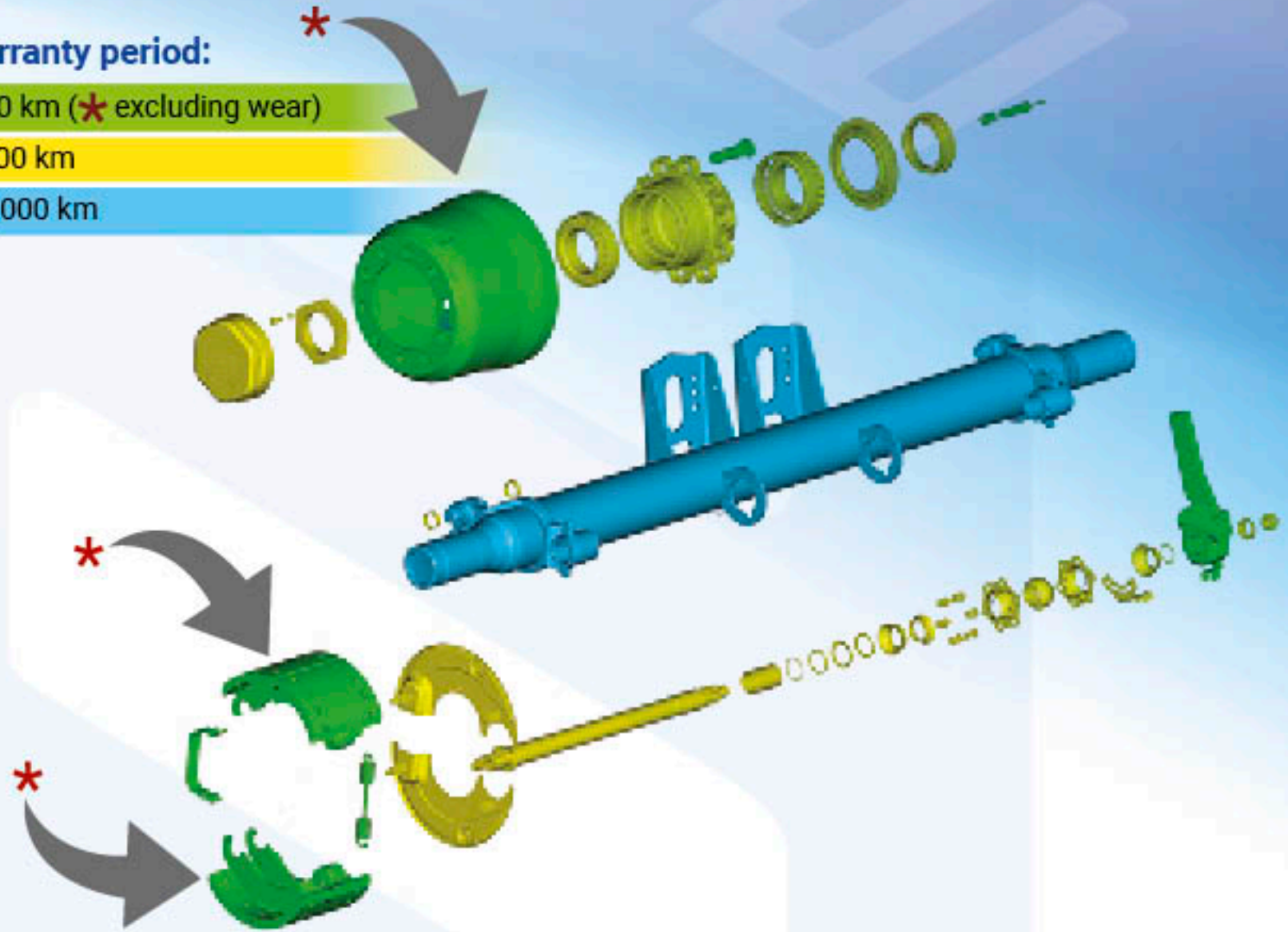
- SH7 3010 / 3015 / 3020 / 3620 / 4218 / 4220 type axles

ON-ROAD warranty period:

1 year or 100,000 km (* excluding wear)

3 years or 500,000 km

6 years or 1,000,000 km



TERMS OF THE WARRANTY

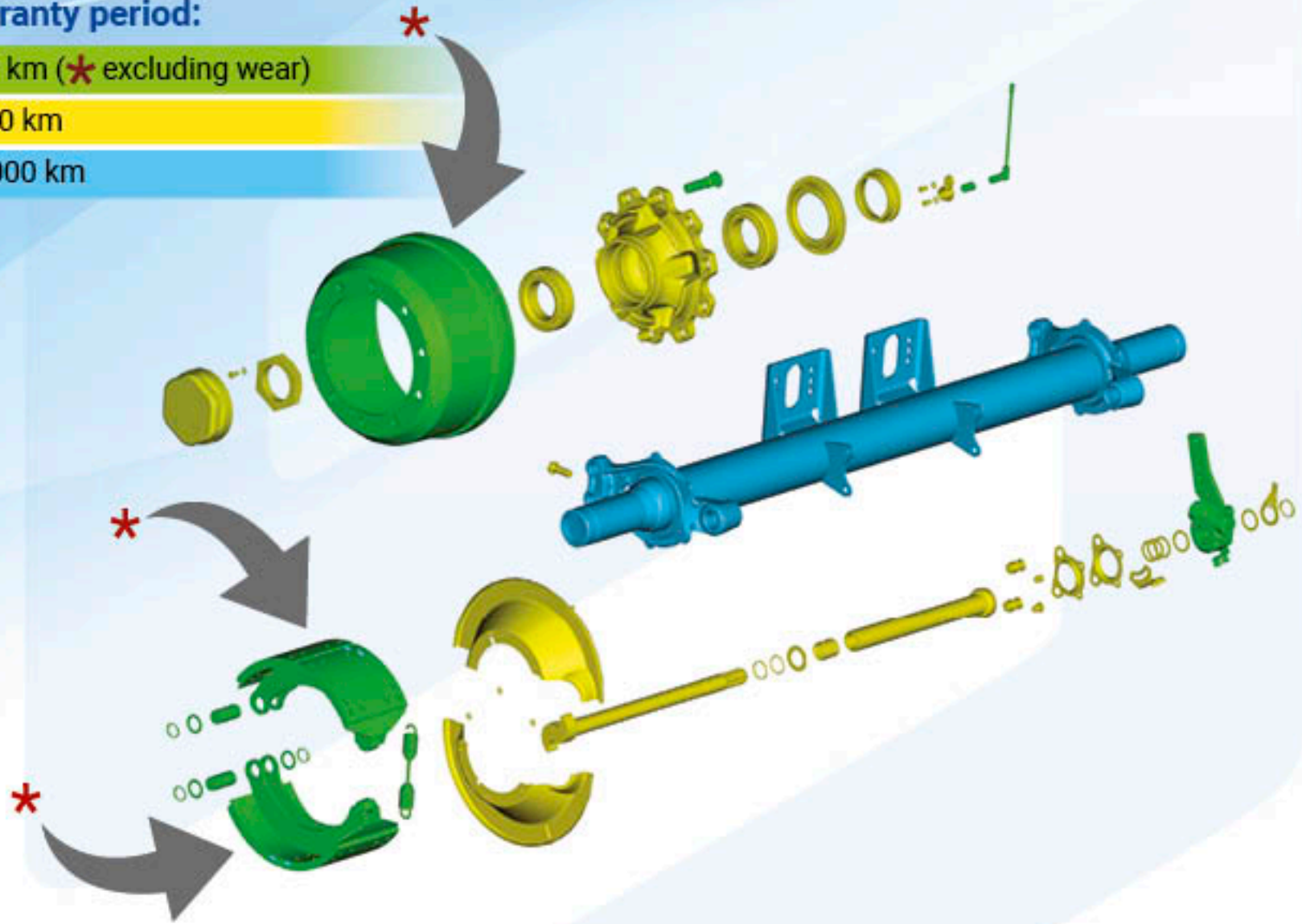
- SH7 4220C1 / C113-SMB type axles

ON-ROAD warranty period:

1 year or 100,000 km (* excluding wear)

3 years or 500,000 km

6 years or 1,000,000 km



TERMS OF THE WARRANTY

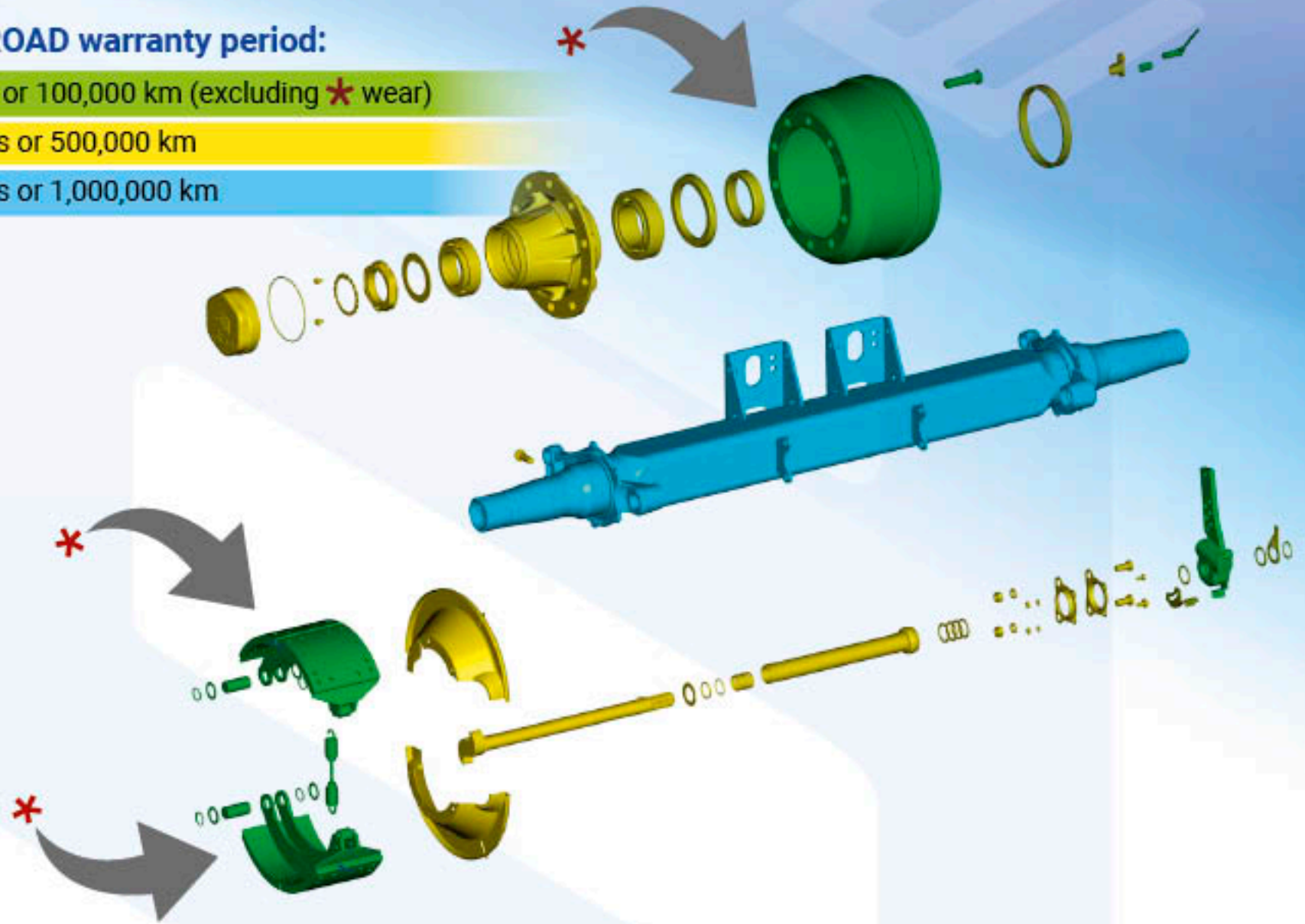
- P12 / P14 / P16 / P18 / P20 type axles

ON-ROAD warranty period:

1 year or 100,000 km (excluding * wear)

3 years or 500,000 km

6 years or 1,000,000 km



TERMS OF THE WARRANTY

- DSOKH2 or DSOKH7 type axles

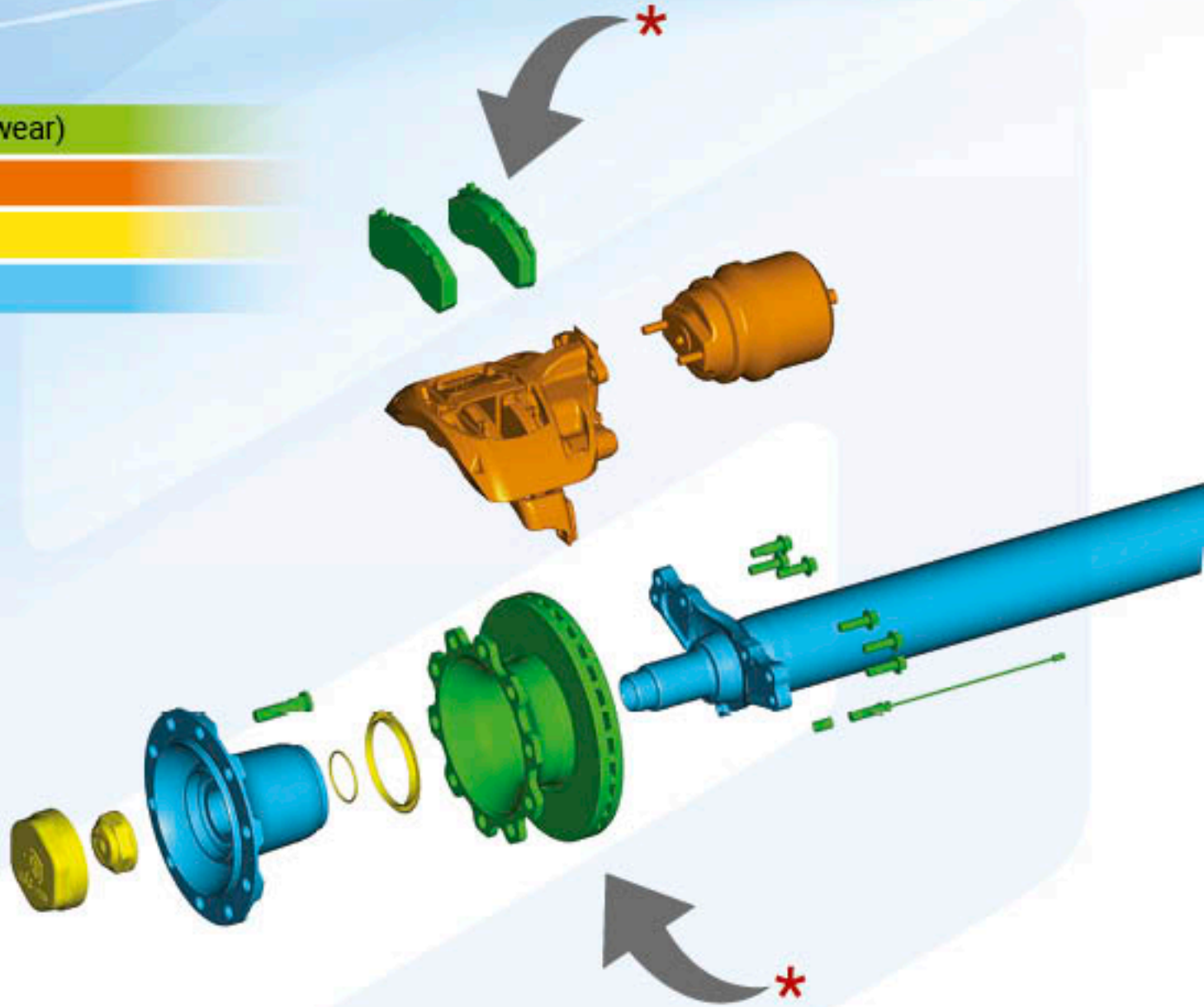
ON-ROAD warranty period:

1 year or 100,000 km (excluding * wear)

2 years or 200,000 km

3 years or 500,000 km

6 years or 1,000,000 km



TERMS OF THE WARRANTY

- DSH7 3334 / 3745 / 4345 type axles

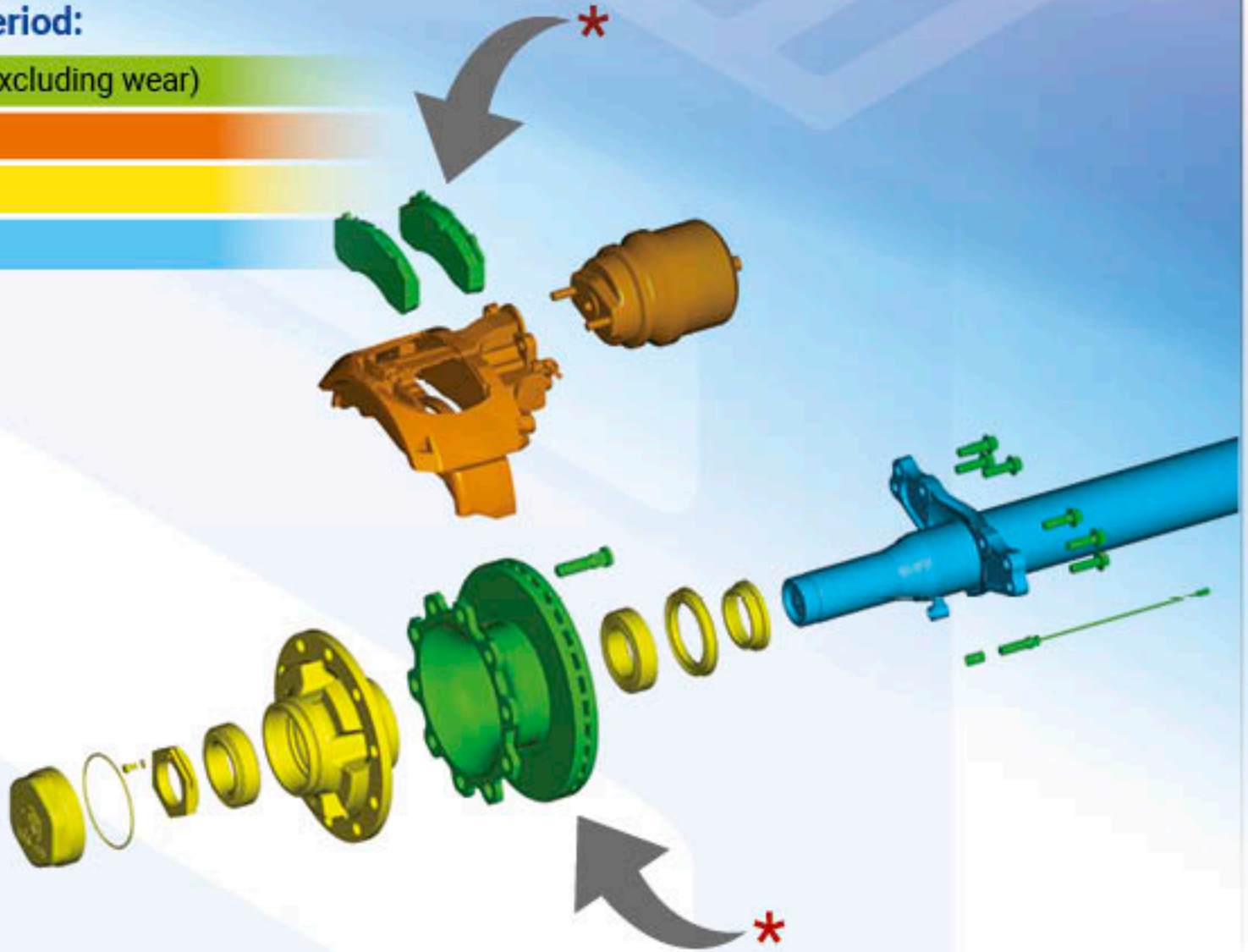
ON-ROAD warranty period:

1 year or 100,000 km (* excluding wear)

2 years or 200,000 km

3 years or 500,000 km

6 years or 1,000,000 km



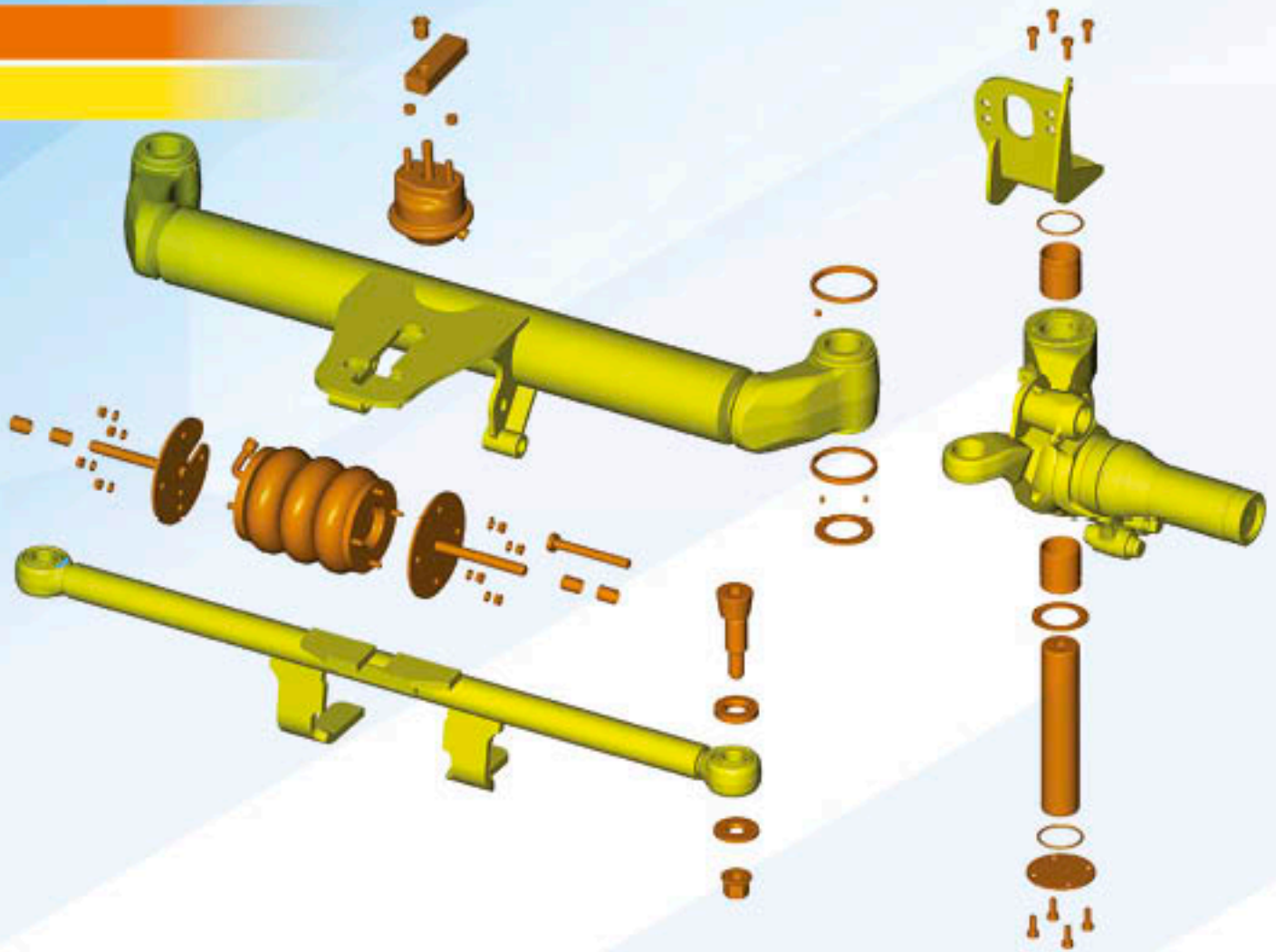
TERMS OF THE WARRANTY

- SNH7 / DSNH7 Self-steering axle beam

ON-ROAD warranty period:

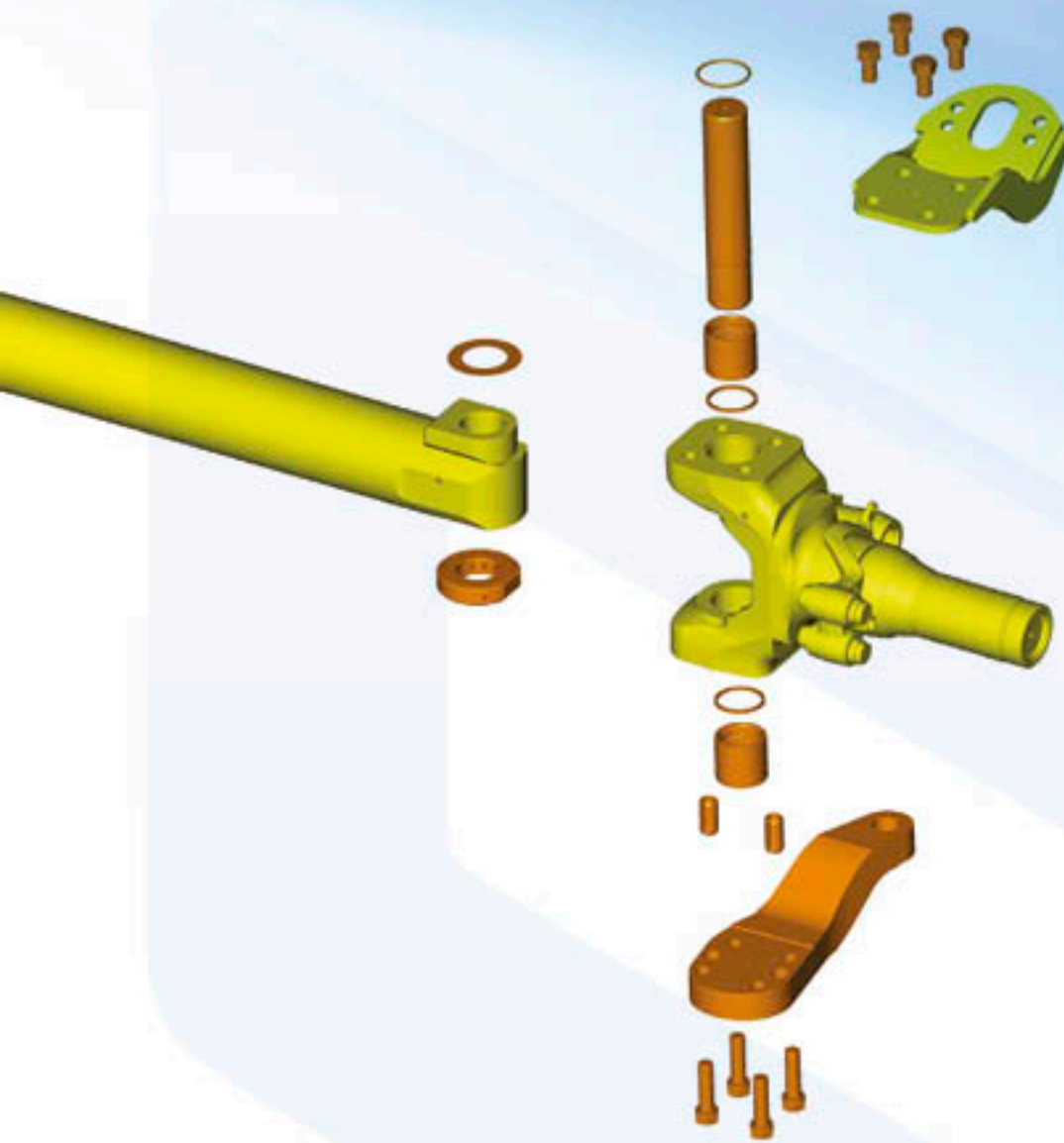
2 years or 200,000 km

3 years or 500,000 km



TERMS OF THE WARRANTY

- SZH7 / DSZH7 Steering axle beam



ON-ROAD warranty period:

2 years or 200,000 km
3 years or 500,000 km

TERMS OF THE WARRANTY

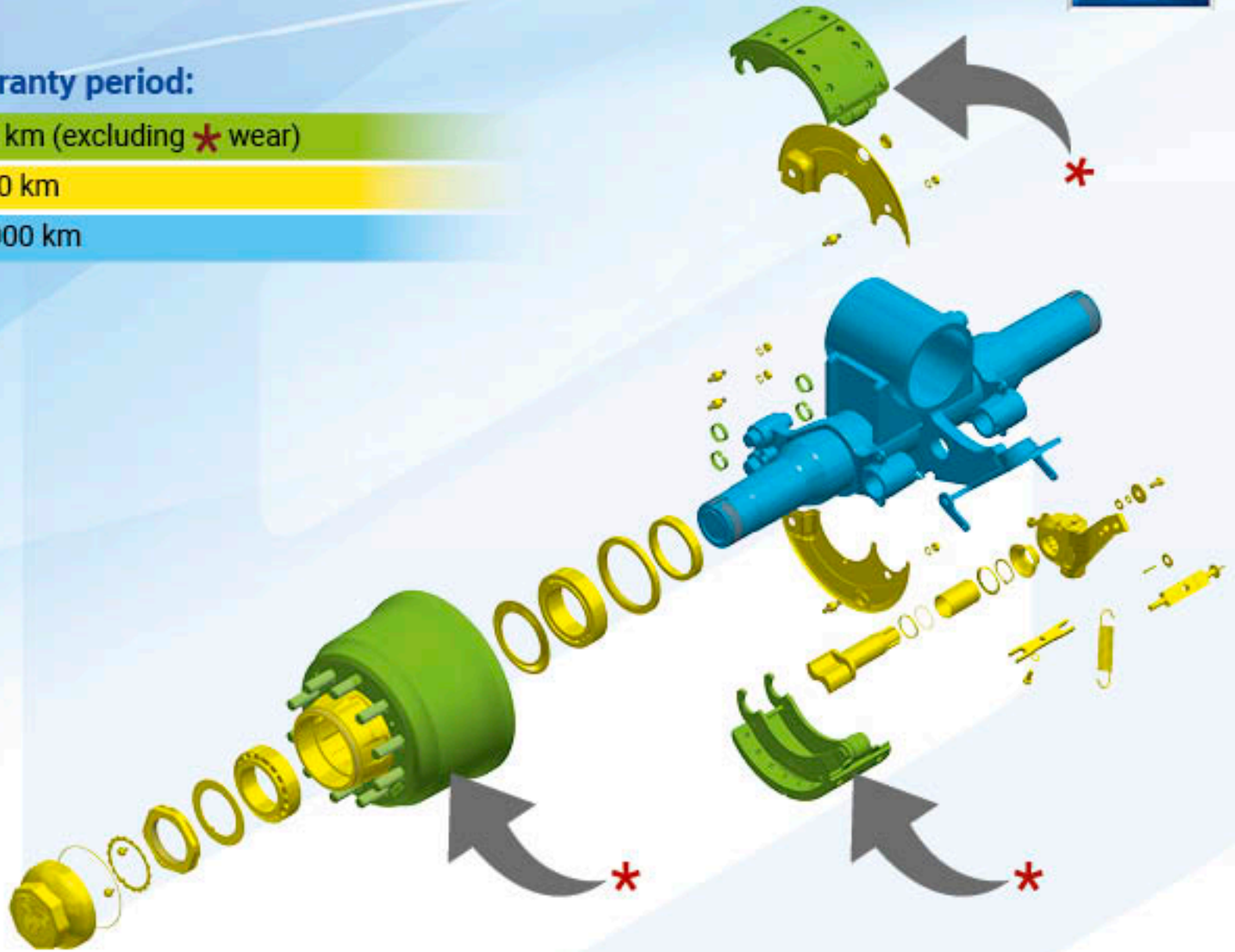
- SPS-SPV pendular axles

ON-ROAD warranty period:

1 year or 100,000 km (excluding * wear)

3 years or 500,000 km

6 years or 1,000,000 km



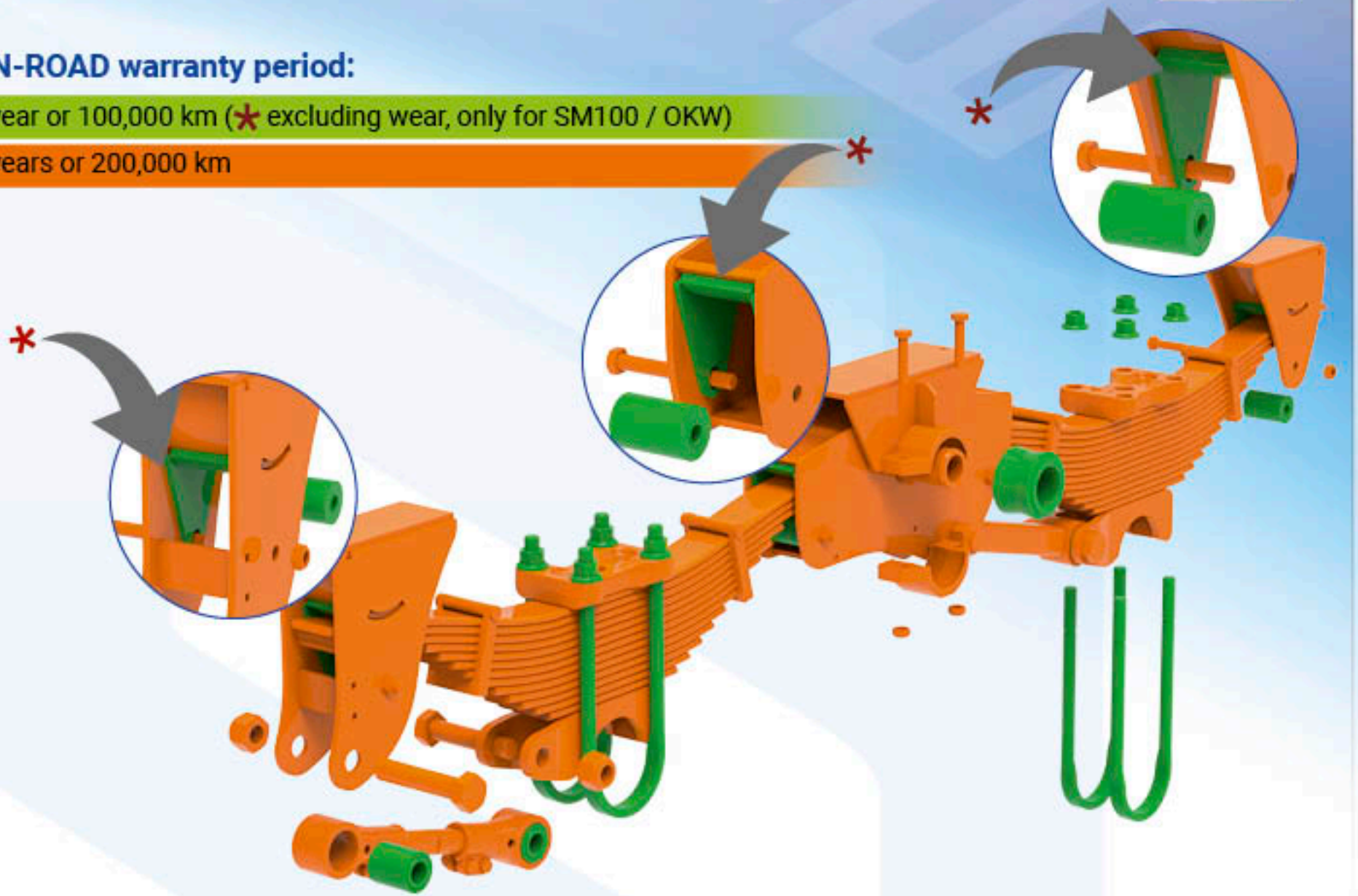
TERMS OF THE WARRANTY

- SM / OKE / OKW mechanical suspensions

ON-ROAD warranty period:

1 year or 100,000 km (* excluding wear, only for SM100 / OKW)

2 years or 200,000 km



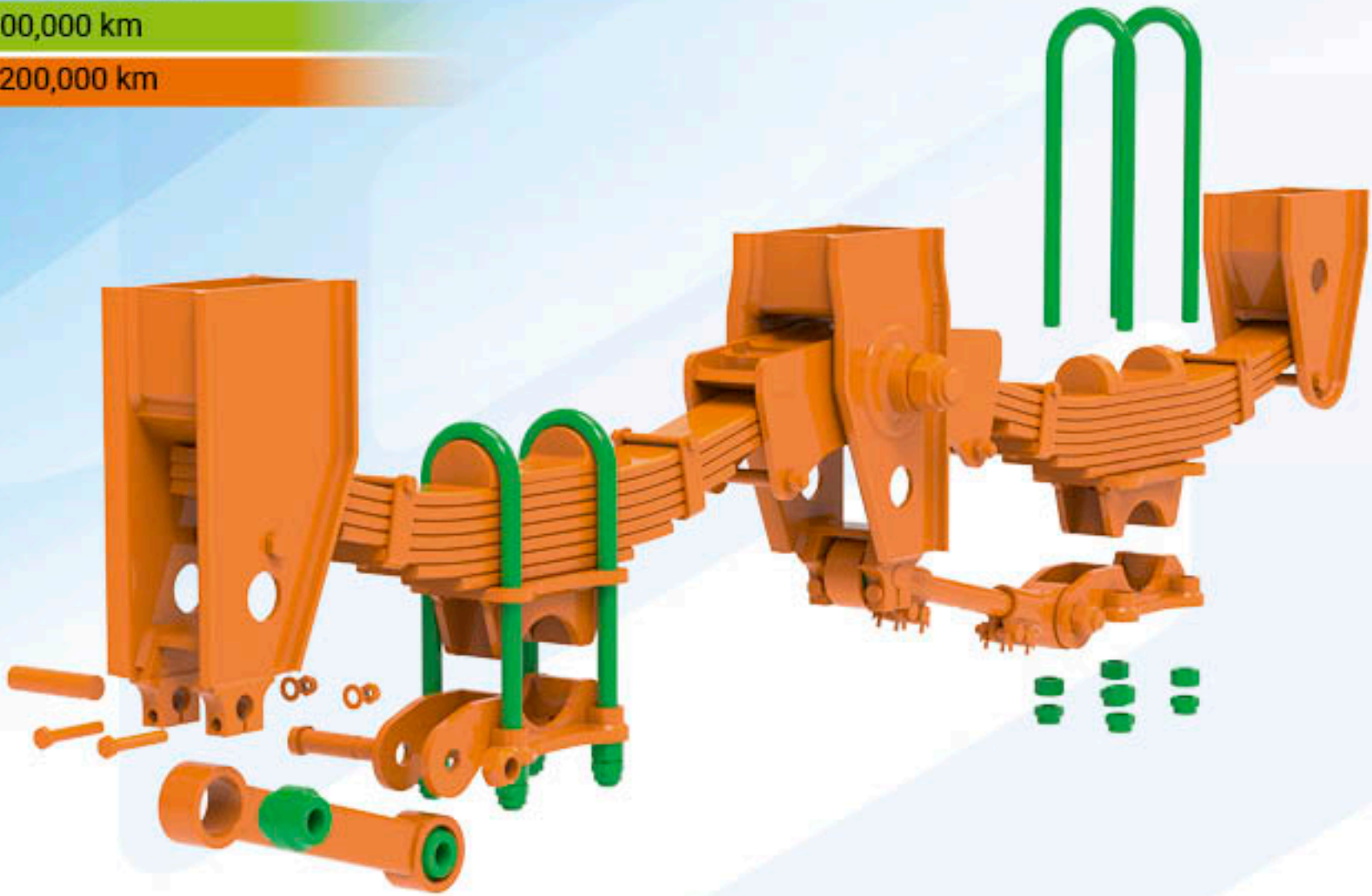
TERMS OF THE WARRANTY

- OKP mechanical suspensions

ON-ROAD warranty period:

1 year or 100,000 km

2 years or 200,000 km



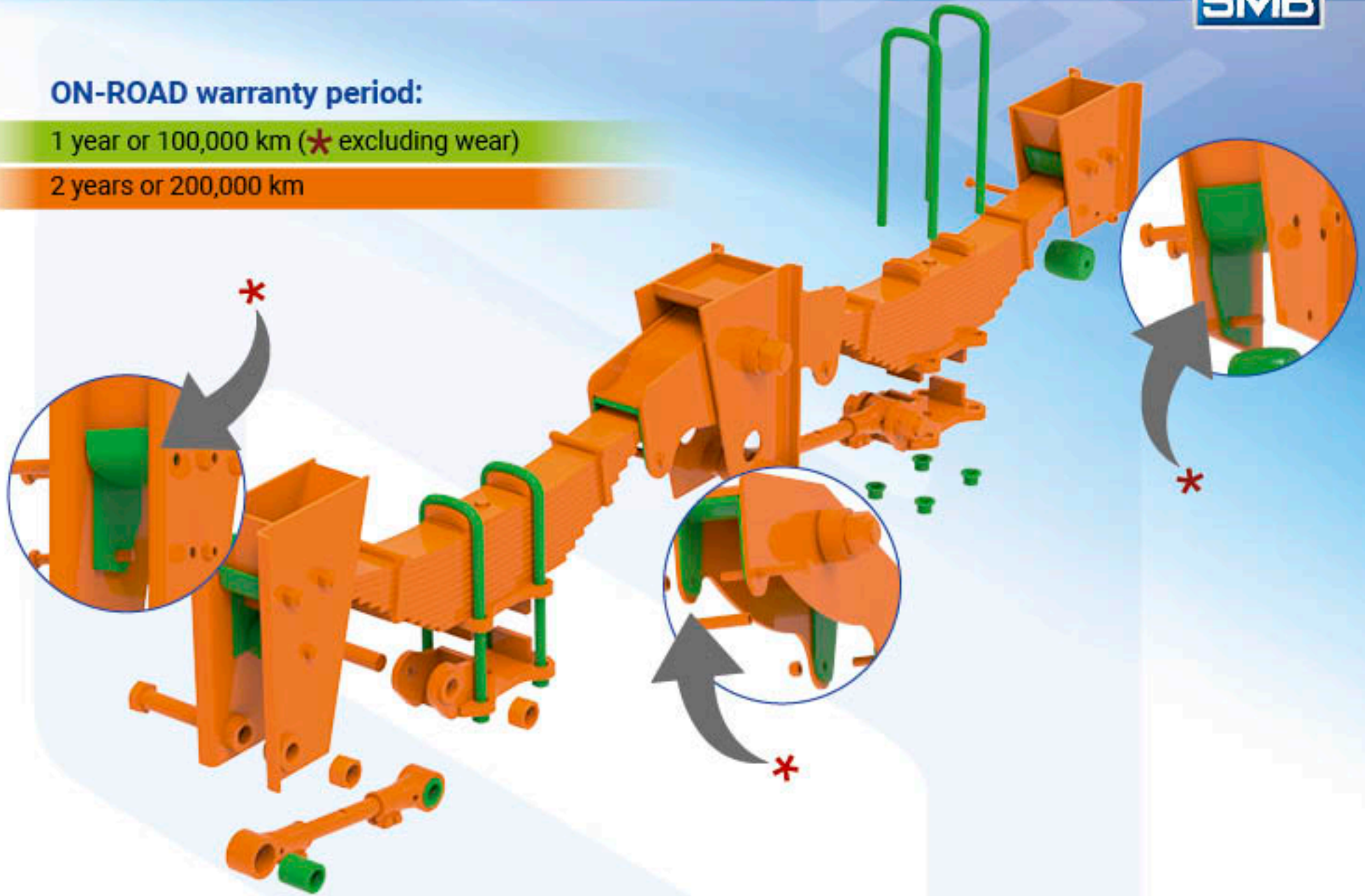
TERMS OF THE WARRANTY

- SM HD / OKZ mechanical suspensions

ON-ROAD warranty period:

1 year or 100,000 km (* excluding wear)

2 years or 200,000 km



TERMS OF THE WARRANTY

- SP / OKQ pneumatic suspensions

ON-ROAD warranty period:

1 year or 100,000 km

2 years or 200,000 km

Type Weweler® suspension

Type SAE-SMB suspension

TERMS OF THE WARRANTY

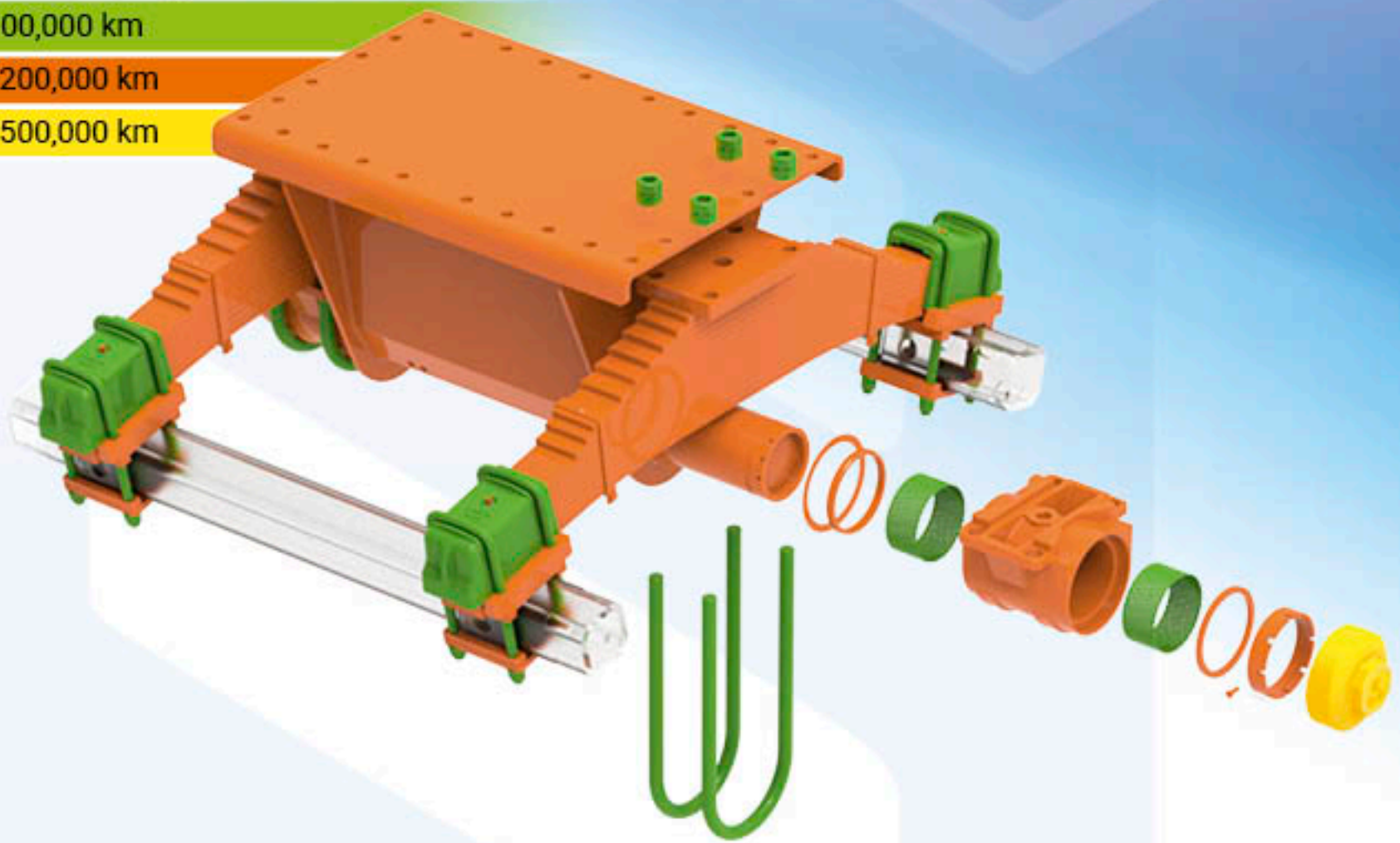
- SBI / SBZ / OG Bogies

ON-ROAD warranty period:

1 year or 100,000 km

2 years or 200,000 km

3 years or 500,000 km



PRODUCTS MAINTENANCE

- Safety instructions

Any intervention on the vehicle must be carried out **by trained and authorized persons.**

Intervention that requires welding must be executed by certified personnel only.

If you have to immobilize and lift the vehicle, carry out this operation with the vehicle unladen using **suitable immobilizing and lifting equipment.** **Always ensure the stability of the vehicle**.

If you have to replace a mechanical or pneumatic component, ensure beforehand that **there is no longer any pressure in the suspension and braking pneumatic circuits**.

After intervention, always carry out an operating test of the various parts of the vehicle.

PRODUCTS MAINTENANCE

- Service schedule

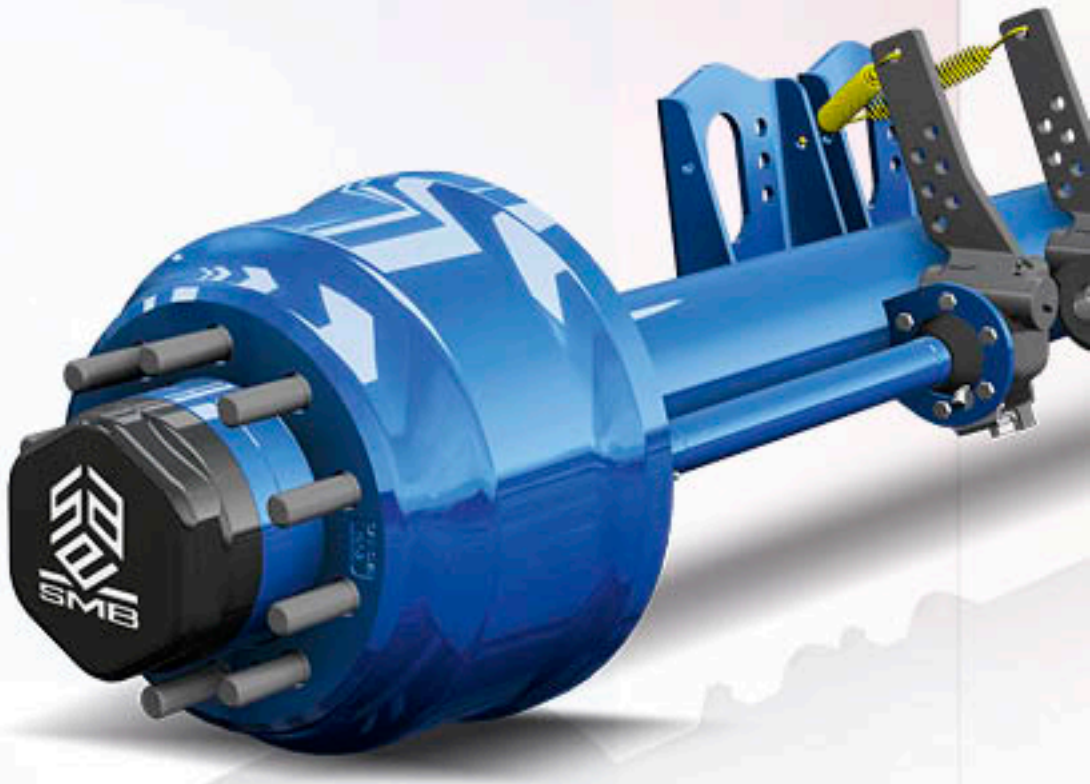
After the first 1,000 km
(after the first loaded journey)

Every 3 month
or every 50,000 km

Every 6 months
or every 100,000 km

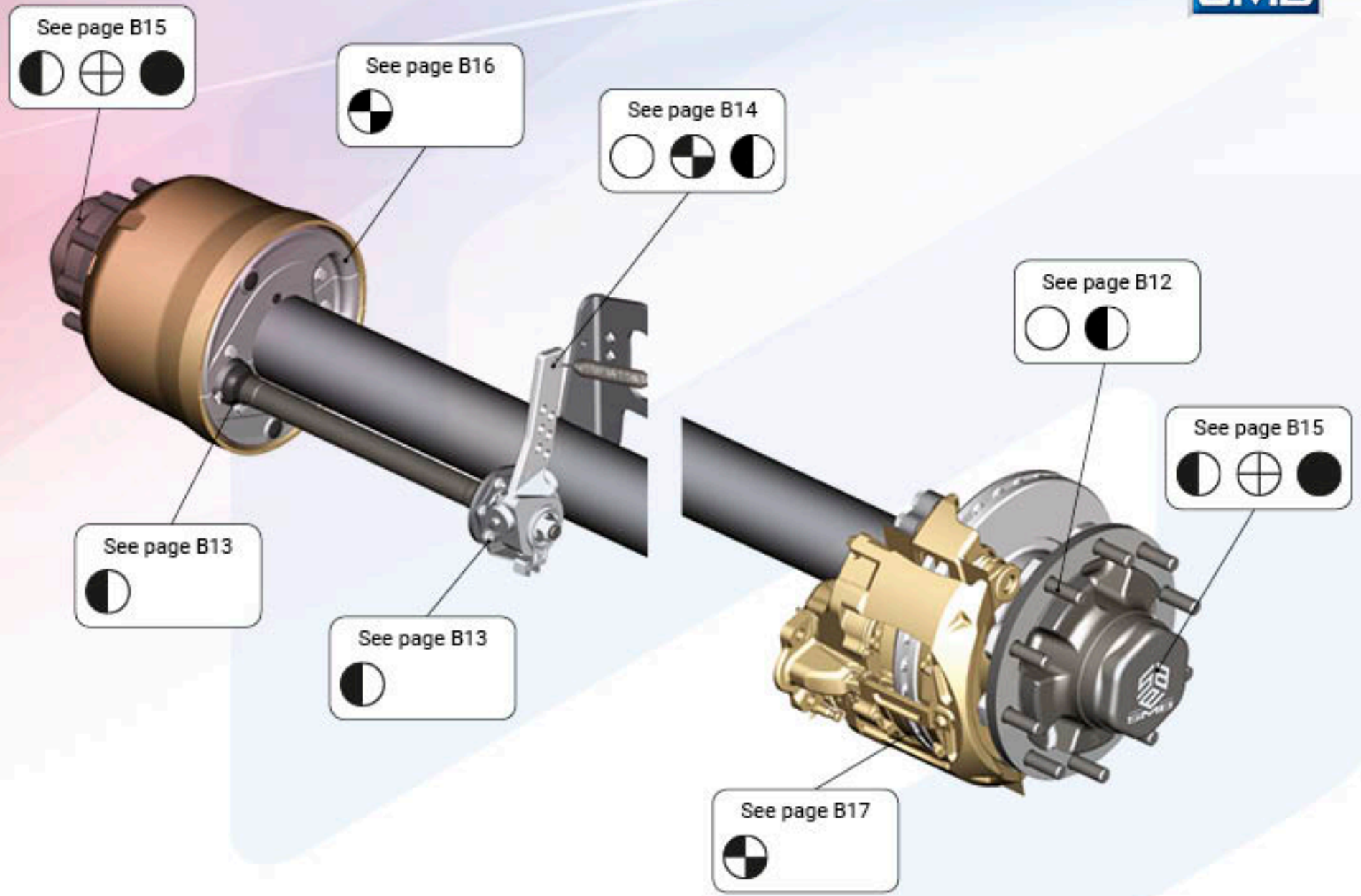
After 1 year
or every 200,000 km

After 3 years
or after 500,000 km
or after intensive use
(for example, work on a construction site)



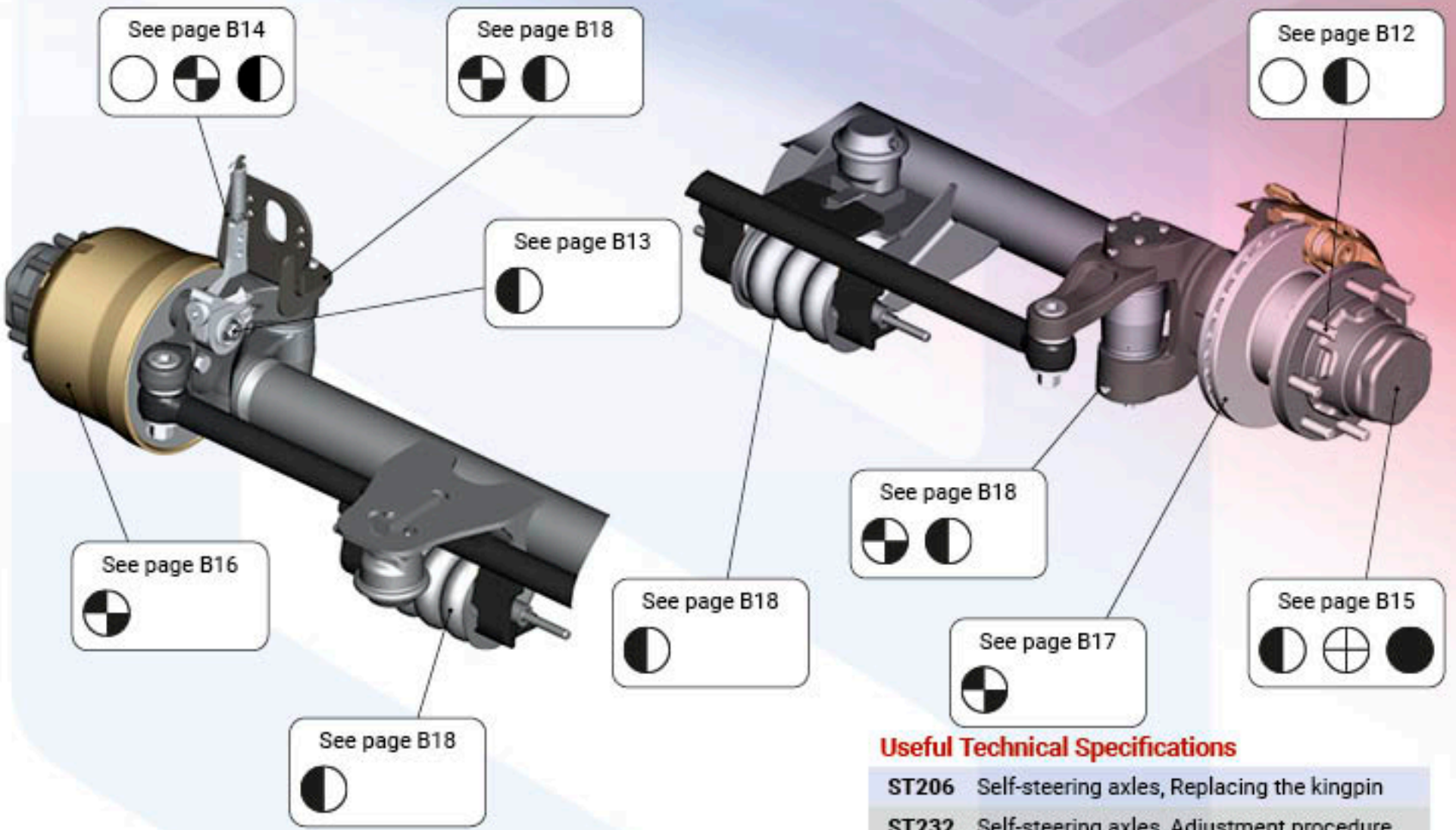
PRODUCTS MAINTENANCE

- Maintenance schedule for rigid axles



PRODUCTS MAINTENANCE

- Maintenance schedule for self-steering axles

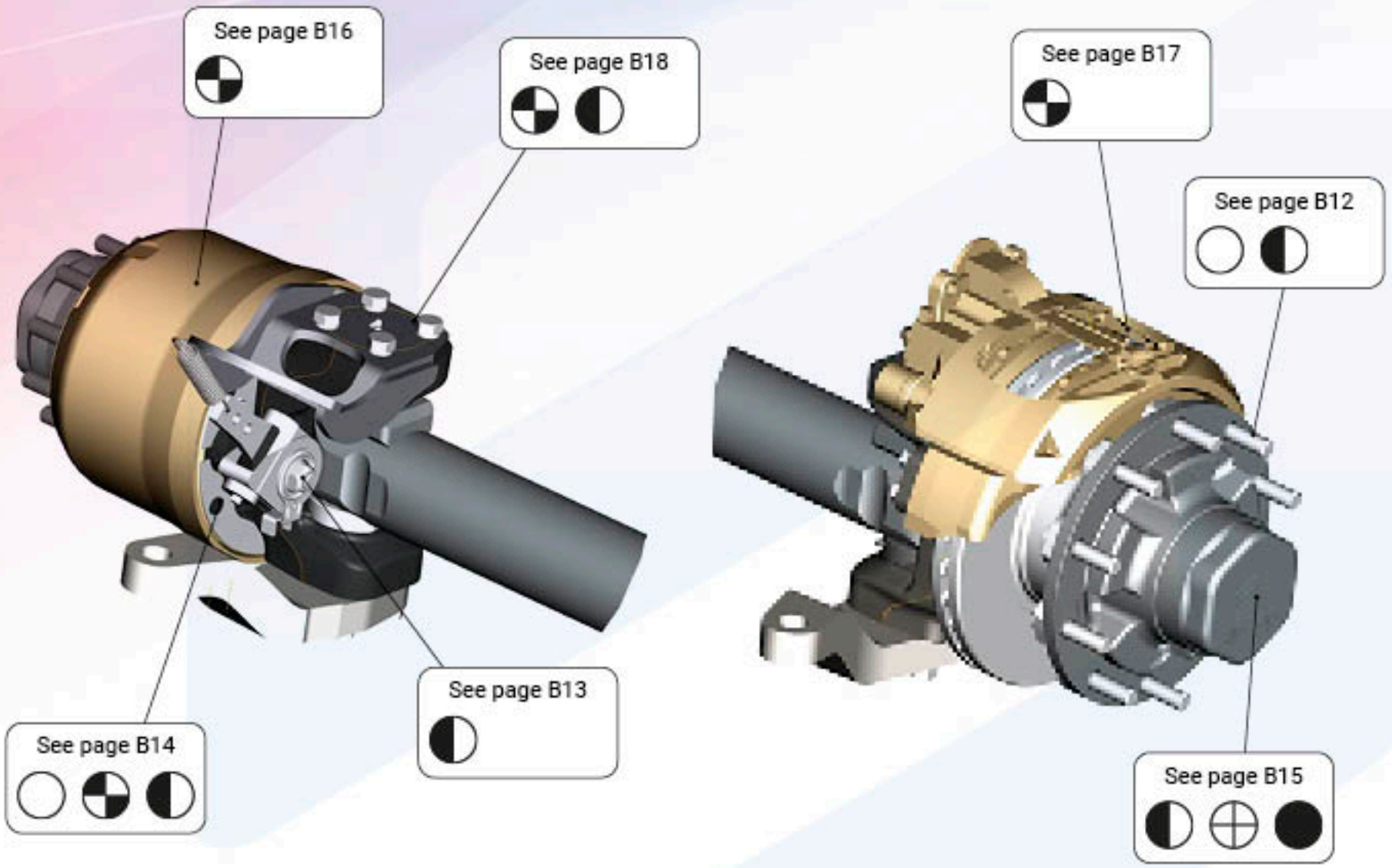


Useful Technical Specifications

ST206	Self-steering axles, Replacing the kingpin
ST232	Self-steering axles, Adjustment procedure

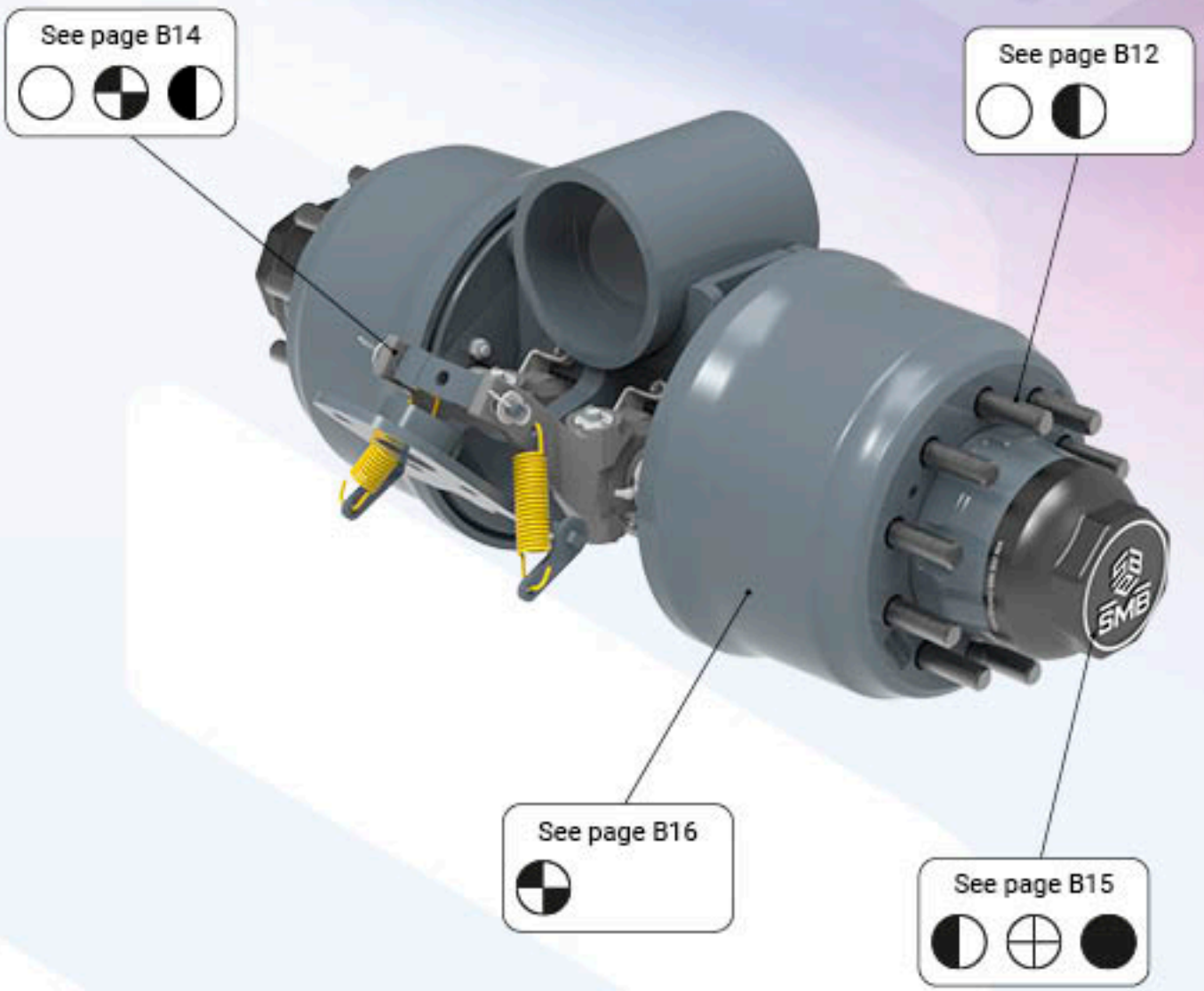
PRODUCTS MAINTENANCE

- Maintenance schedule for steering axles



PRODUCTS MAINTENANCE

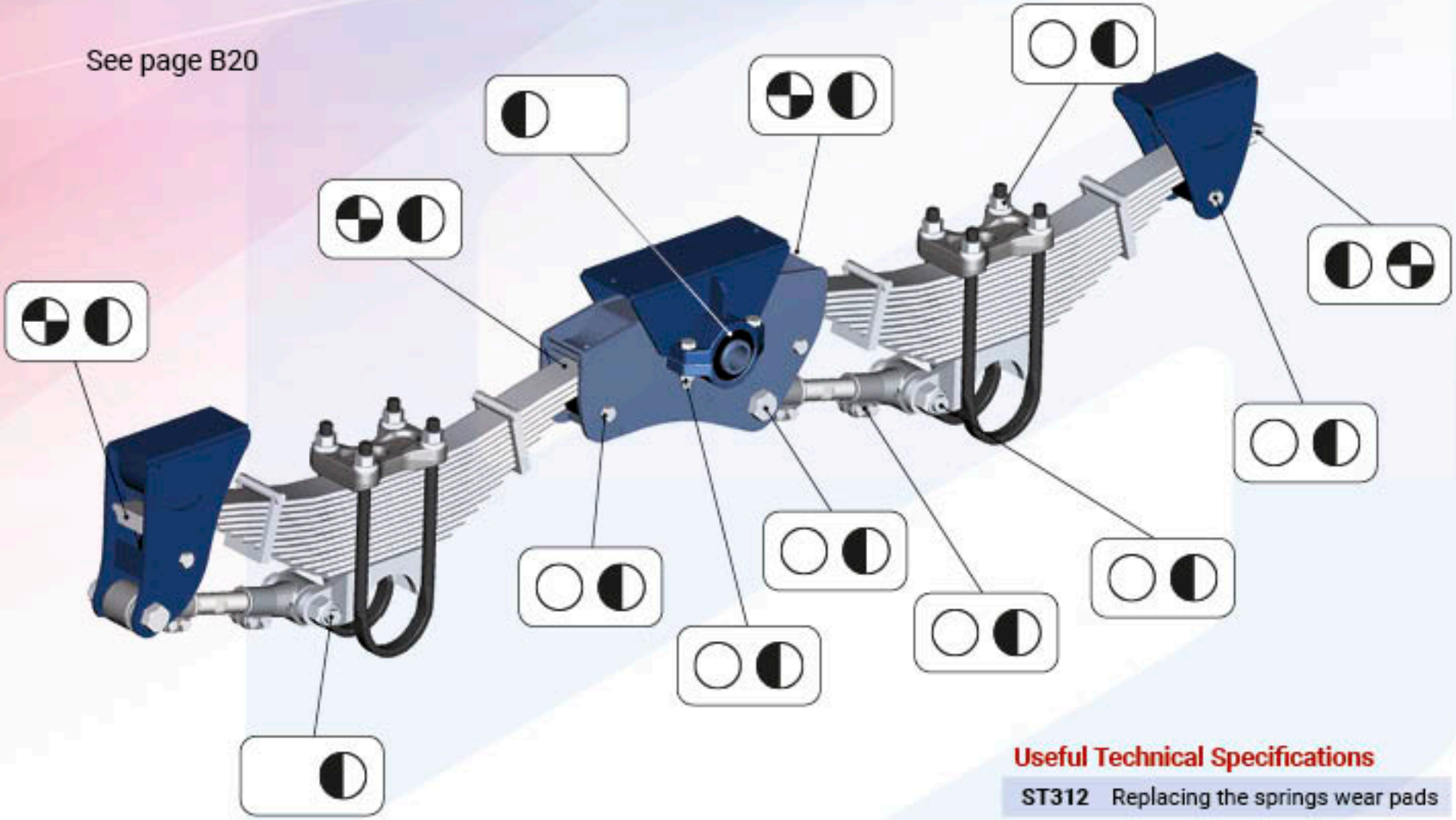
- Maintenance schedule for pendular axles



PRODUCTS MAINTENANCE

- Maintenance schedule for mechanical suspensions SM / OKE / OKW

See page B20



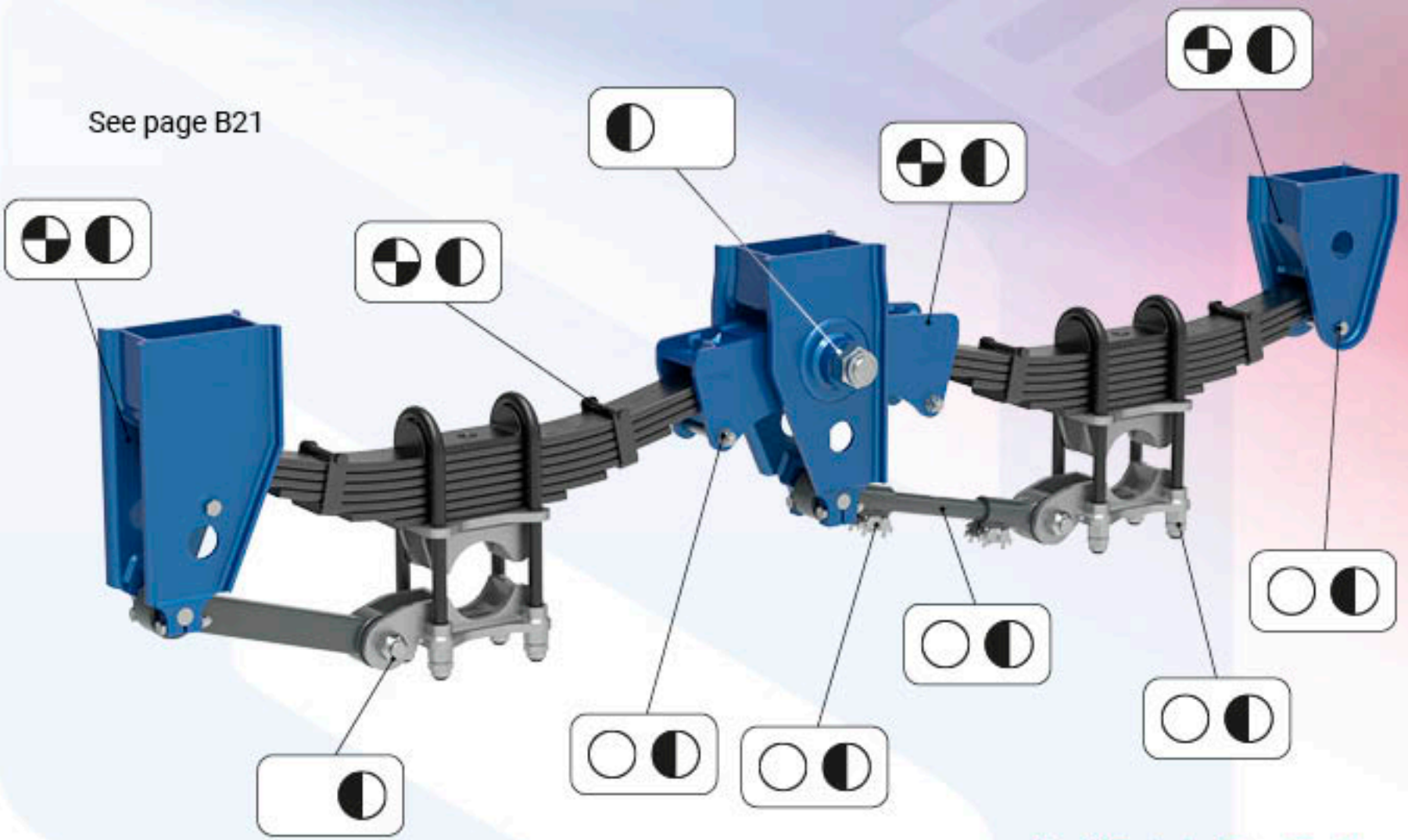
Useful Technical Specifications

ST312	Replacing the springs wear pads
ST313	Replacing the silentblocs

PRODUCTS MAINTENANCE

- Maintenance schedule for mechanical suspensions OKP

See page B21



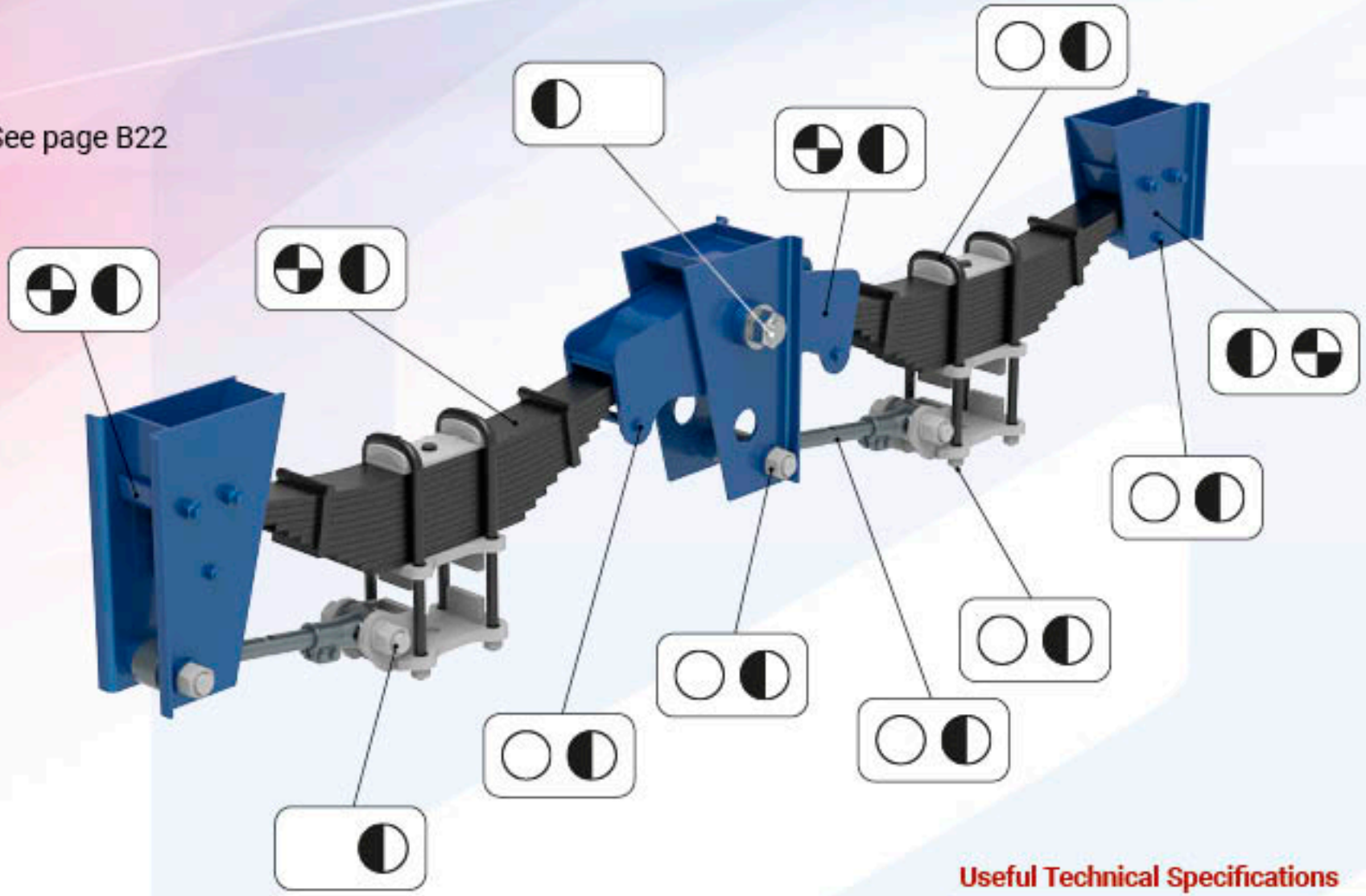
Useful Technical Specifications

ST411 Track alignment

PRODUCTS MAINTENANCE

- Maintenance schedule for mechanical suspensions SM HD / OKZ

See page B22

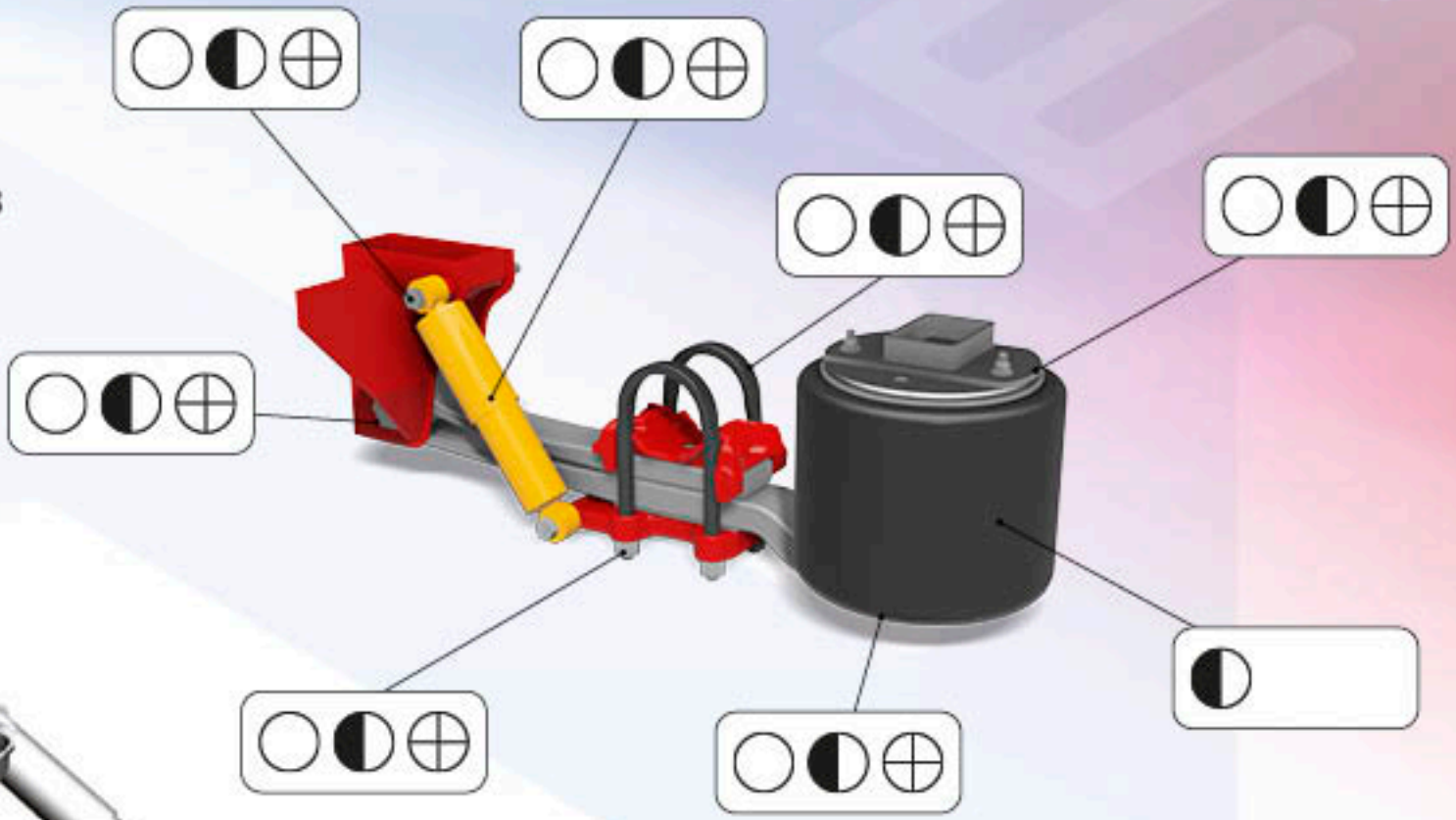


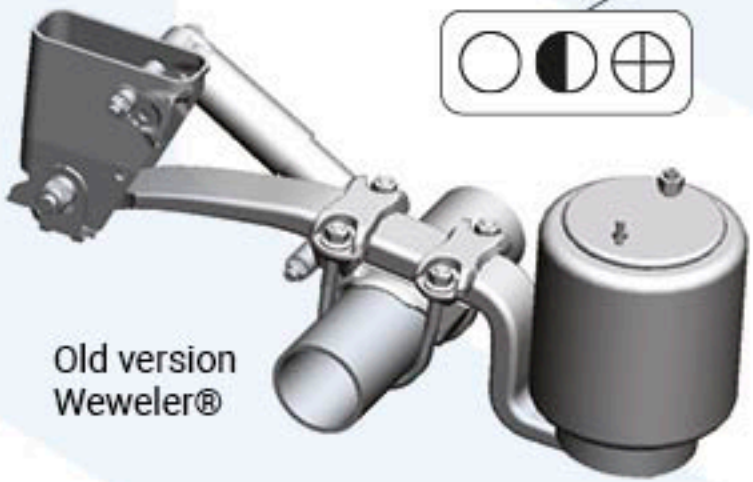
Useful Technical Specifications

ST411 Track alignment

- Maintenance schedule for pneumatic suspensions SP / OKQ

See page B23





Old version
Weweler®

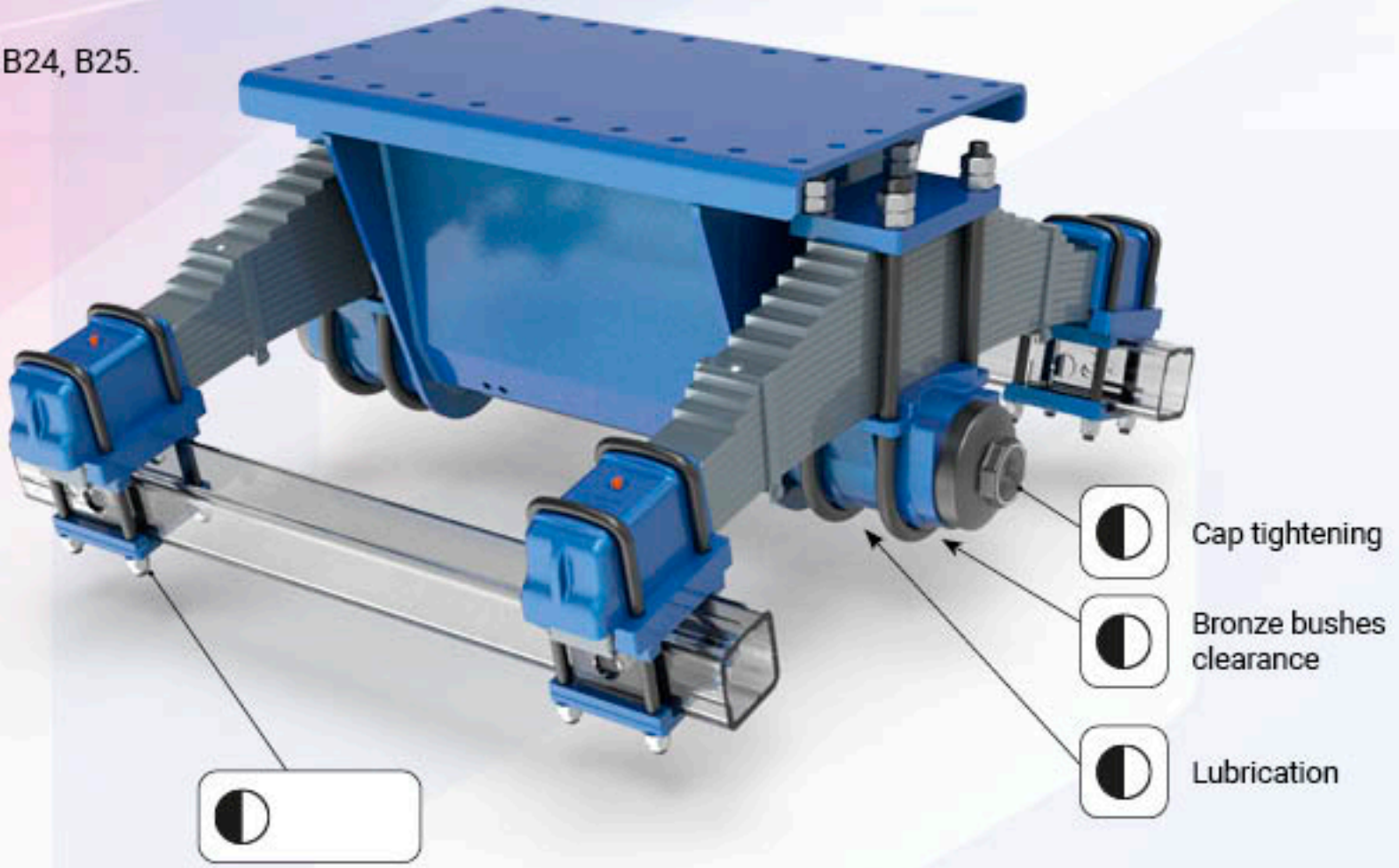
Useful Technical Specifications

ST428 Replacing the silentbloc

PRODUCTS MAINTENANCE

- Maintenance schedule for SBI / SBZ / OG Bogies

See pages B24, B25.



Useful Technical Specifications

ST463	Bushings replacement

PRODUCTS MAINTENANCE

- Mounting the wheels

- Before mounting, the surfaces in contact (on the wheel, hub or drum) and the wheel studs must be clean and free of corrosion.
- Lightly oil the wheel stud threads (no lubricant).
- Put the wheel in place, centring the stud holes with the studs. The wheel is centred on the hub (M assembly).

DIN assembly (centring via the wheel studs) is impossible and is prohibited.

- Check that the wheel nuts are properly tightened (tightened diagonally with a torque wrench following the diagram below):

AT THE FIRST TIME OF USE
AFTER EVERY WHEEL CHANGE
EVERY 6 MONTHS OR 100,000 Km

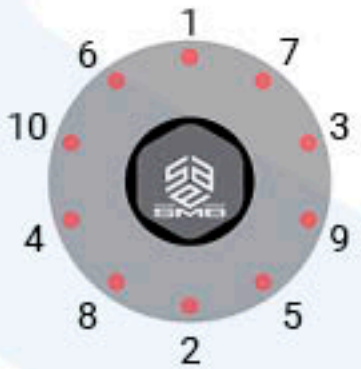
Wheel nut tightening torques:

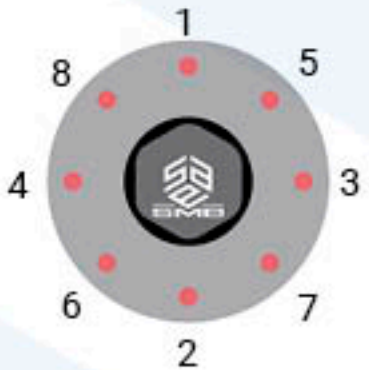
M18 x 1.5	**305-335 Nm**
M22 x 1.5	**570-630 Nm**
M22 x 2.5	**570-630 Nm**
M24 x 1.5	**700-800 Nm**

Spoke wheel type tightening torques:

M20 x 2	**330-360 Nm**

Note: For specific models or specific applications (OFF-ROAD) some studs may be fitted with a pre-centring bush: See **ST251**.





PRODUCTS MAINTENANCE

- Camshaft bearings

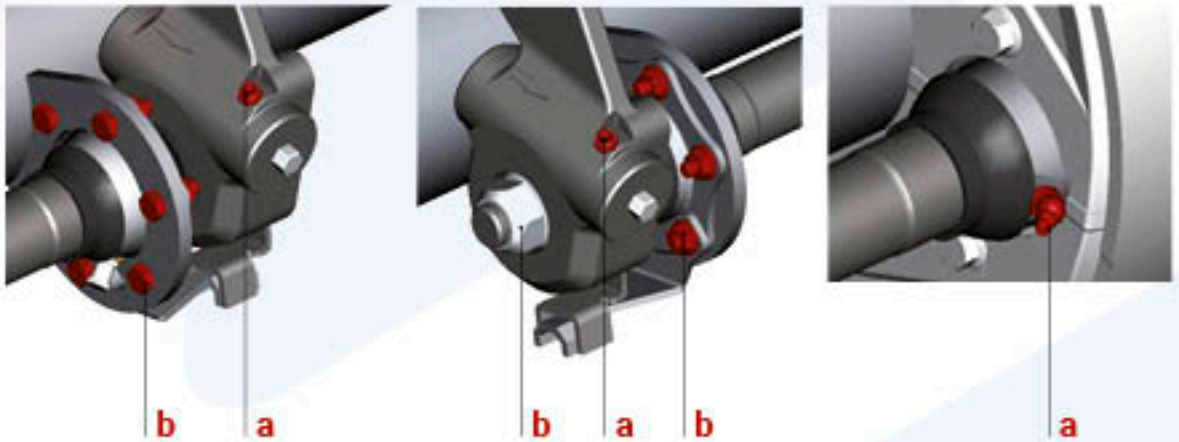
Every 6 months or 100,000 km, each time the lining is changed, before activation after a long period of immobilisation:

a) lubricate the camshafts and automatic brake levers:
- using the grease nipples, fill with grease until the fresh grease comes out of the bearings

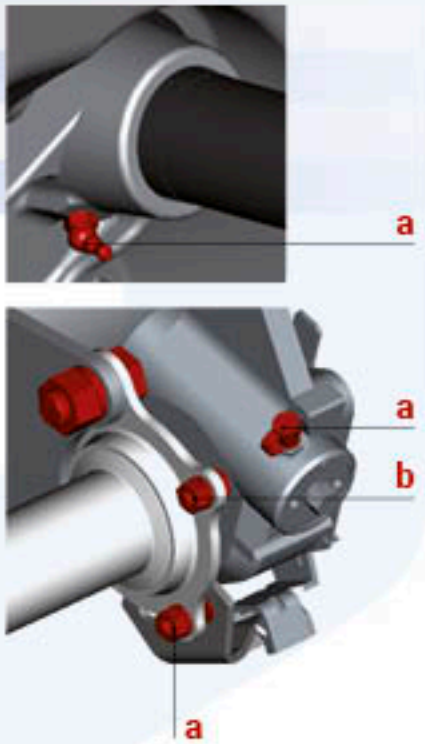
b) screws and nuts fastening the bearings and brake levers:
- check the tightening torques.

M8	**20-25 Nm**
M10	**40-46 Nm**
M12	**75-80 Nm**
M16	**100-120 Nm**
M22	**60-70 Nm**

SAE-SMB BRAKE



4220C1 / C113-SMB BRAKE



A Manual brake slack adjuster

After the first loaded journey and at least every 3 months, check the brake lining clearance:

- Manually activate the brake slack adjuster in the direction of pressure to put the brake linings in contact with the drum.
- When the slack adjuster travel (dimension E) exceeds 35 mm, the brake slack adjuster must be adjusted again.

Adjusting the slack adjuster: **ST306**

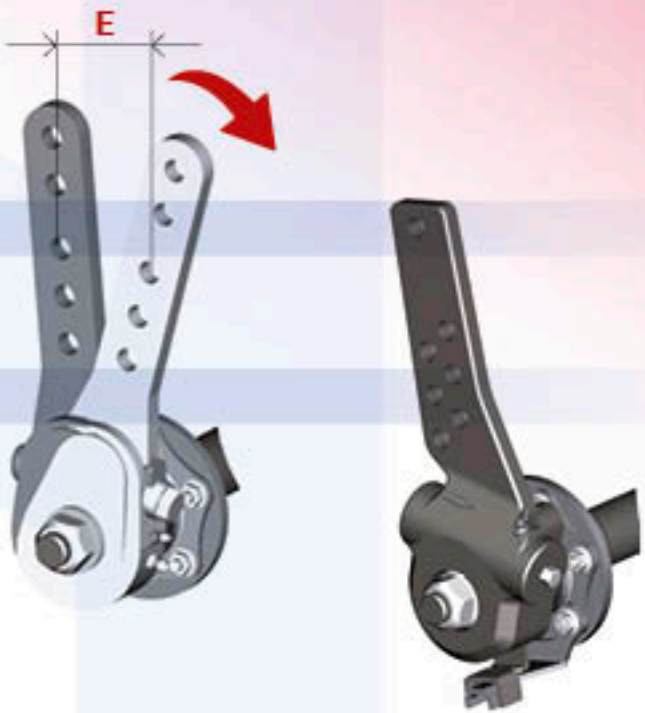
B Automatic Slack Adjuster

After the first loaded journey and at least every 6 months, check the slack adjuster clearance:

See point 5 of: **ST310**

Replacing the automatic slack adjuster:

See: **ST310**



PRODUCTS MAINTENANCE

- Axle roller bearings

Every 6 months or 100,000 km, check the roller bearing clearance:

Lift the axle until the tyres no longer touch the ground. Using levers between the tyres and the ground (see picture below), check the clearance. If there is a high degree of clearance, check the roller bearing settings and rectify them if possible (see ST referenced below).

Perform another inspection after 15 days' use.
When there is once more a high degree of clearance, the roller bearings must be changed.

SH7 / DSH7 05506 axles type (5.5 t)

Adjusting the roller bearings see:	**ST435**
Lubricating and replacing the roller bearings see:	**ST408 & ST435**

SH7/DSH7 07506 axles type (7.5 t)

Adjusting the roller bearings see:	**ST438**
Lubricating and replacing the roller bearings see:	**ST296 & ST438**

DSOKH7 (AIRMAX: 9 t) axles type, compact bearing

Adjusting the roller bearings see:	**ST362**

When changing the brake linings however, it is important to check there is no lubricant leakage through the compact roller bearing seals. If a high degree of leakage is found, contact the SAE-SMB after-sales department.

SH7 / DSH7 axles type (9 to 13 t)

Adjusting the roller bearings see:	**ST297**
Lubricating and replacing the roller bearings see:	**ST296 & ST297**

P14, P16 and P18 axles type (14 to 18 t)

Adjusting the roller bearings see:	**ST375**
Lubricating and replacing the roller bearings see:	**ST296 & ST375**

P20 (20 t)

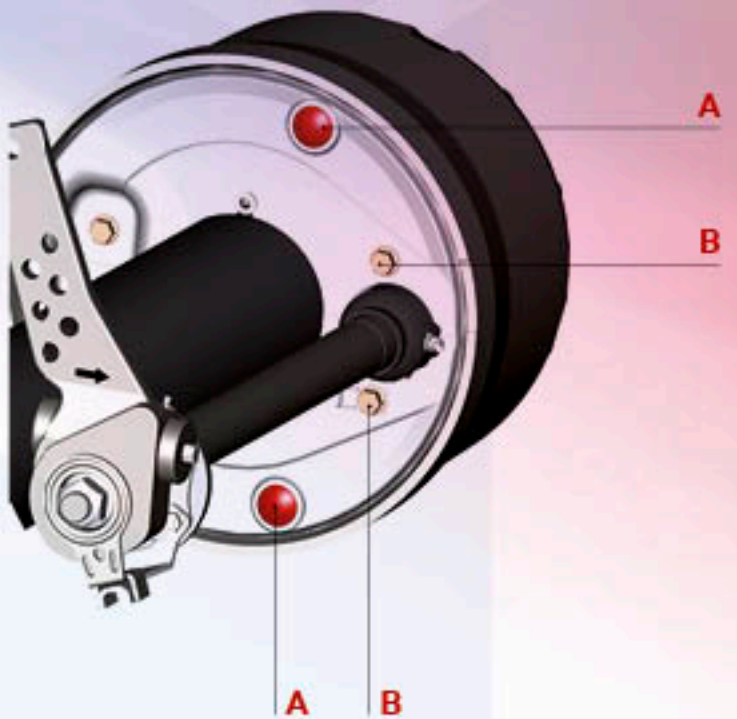
Adjusting the roller bearings see:	**ST440**
Lubricating and replacing the roller bearings see:	**ST439 & ST440**

PRODUCTS MAINTENANCE
- Brake drums and linings

Every 3 months or 50,000 km:

1 Checking the brake lining thickness

- Remove one rubber plug (**A**) from each dust-covers.
- Check the residual thickness of the linings: if the linings are less than5 mm thick, they must be changed.
- After inspection, put the plugs back on the dust-covers.



2 Checking the drum diameter

- After dismounting the dust-covers using a sliding calliper, check the drum diameter: if this diameter is equal or superior to Dmax, the drum must be changed.

Brake	Type	Dmax
300x100 / 150 / 200	3010S2 / 3015S2 / 3020S2	305
360x200	3620S2	365
420x180 / 200	4218S2 / 4220S2	425
419x203	4220C1	424

3 Checking that the dust-covers are properly fastened

- Checking the tightening torques of the fixing screws (**B**) on the mudguards:

M8	20-25 Nm
M10	40-46 Nm

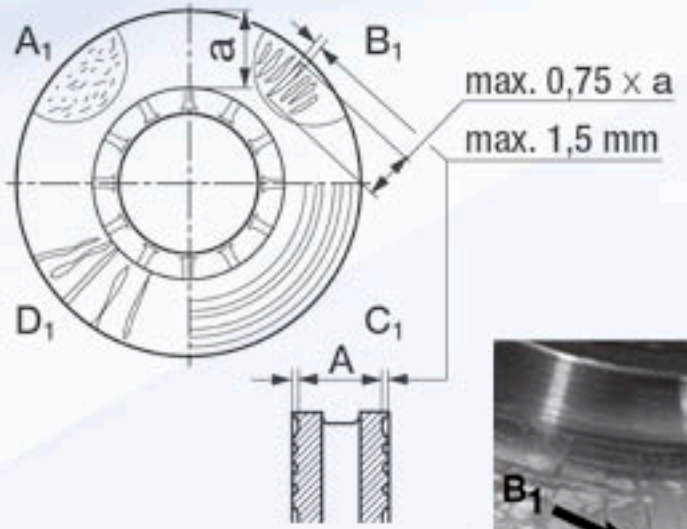
- Drum brake maintenance see: **ST266** & **ST406**

PRODUCTS MAINTENANCE
- Brake drums and linings

Every 3 months or 50,000 km:

1 Checking the lining thickness

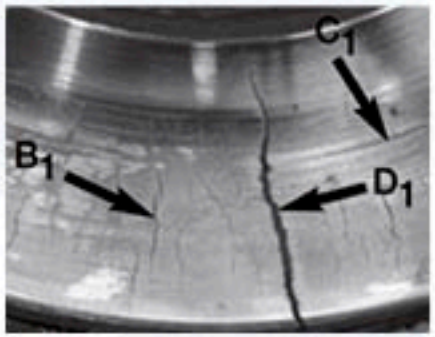
- Check the residual lining thickness: if the linings are less than 2 mm thick, they must be changed.



2 Checking the disc thickness

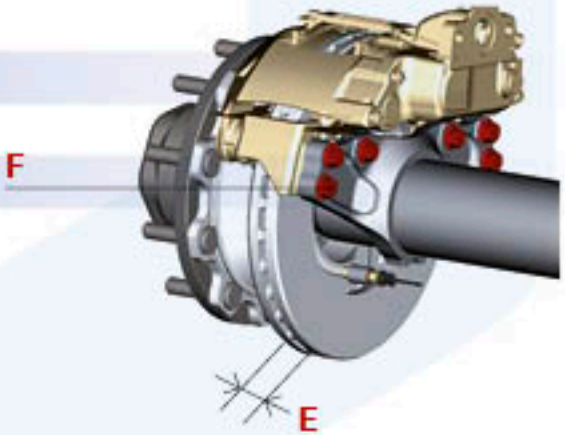
- Check the residual disc thickness. If the discs are less than Min. E thick, they must be changed.

Brake	E (mm)	E min
3334	34	28
3745	45	37
4345	45	37



3 Checking the disc surfaces

	Defects	Decision
A1	Reticulated cracking	Admissible
B1	Cracks in the central part	Admissible
C1	Concentric streaks (Depth < 1.5 mm)	Admissible
D1	Continuous radial cracks	INADMISSIBLE



4 Checking that the brakes are properly fastened

- Check the tightening torques of the fixing screws (F) on the brake callipers

M16x1,5: **270-300 Nm**

PRODUCTS MAINTENANCE

- SNH7 / DSNH7 / OC Self-steering axles

Every 3 months or 50,000 km and before activation after a long period of immobilisation:

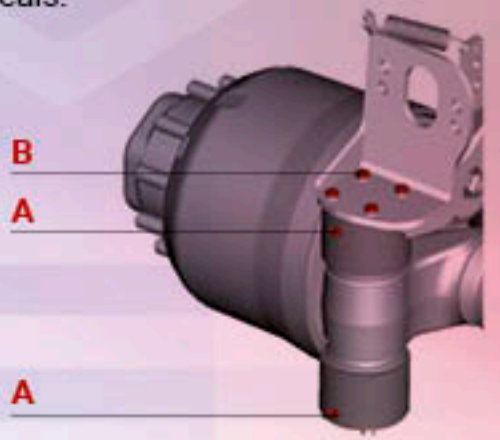
- Lubricating the steering pins:

Using the grease nipples (A), lubricate until the fresh grease comes out through the central seals.

Every 6 months or 100,000 km:

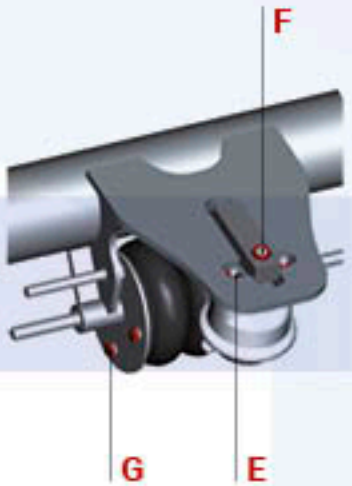
1 Checking fastenings

Fixing screws for the brake cylinder brackets (B)	M10	40-46 Nm
Stop screw (C)	M20 x 1.5	180-200 Nm
Eccentric bolt for the radius rod (D)	M24 x 2	550-600 Nm
Fixing screw for the central locking cylinder (E)	M12 x 1.5	45-80 Nm
Fixing nut for the locking flat (F)	M22 x 1.5	200-250 Nm
Fixing nut for the central air bellow brackets (G)	M10	40-46 Nm



2 Checking central air bellow

- Change it if signs of damage are apparent.



Useful Technical Specifications

ST206: Replacing the pivot kits
ST232: Self-steering axles, Adjustment procedure
ST309: Mounting the central bolt kit

PRODUCTS MAINTENANCE

- SZH7 / DSZH7 Steering axles

Every 3 months or 50,000 km:

- Lubricating the steering pins:

Using the grease nipples (**A**), lubricate until the fresh grease comes out.

Every 6 months or 100,000 km:

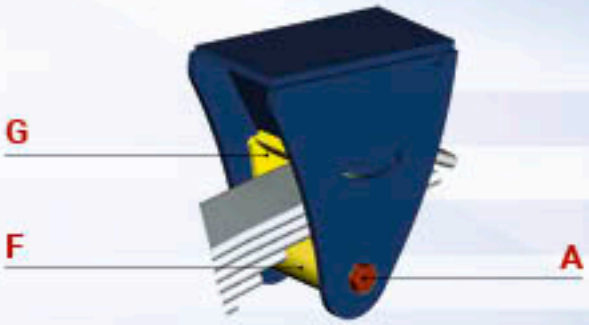
- Check that the cylinder brackets and steering levers are properly fastened:

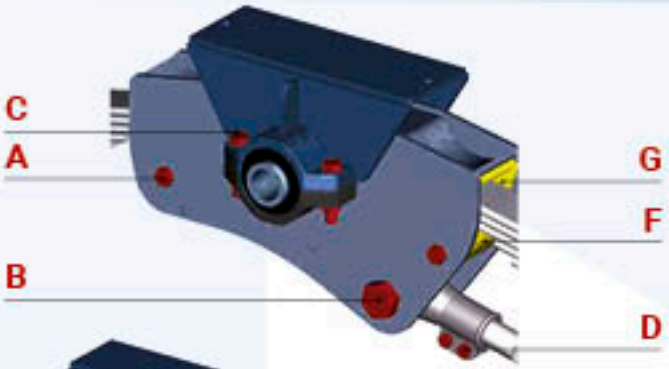
Check the tightening torque of the screws (**B**).

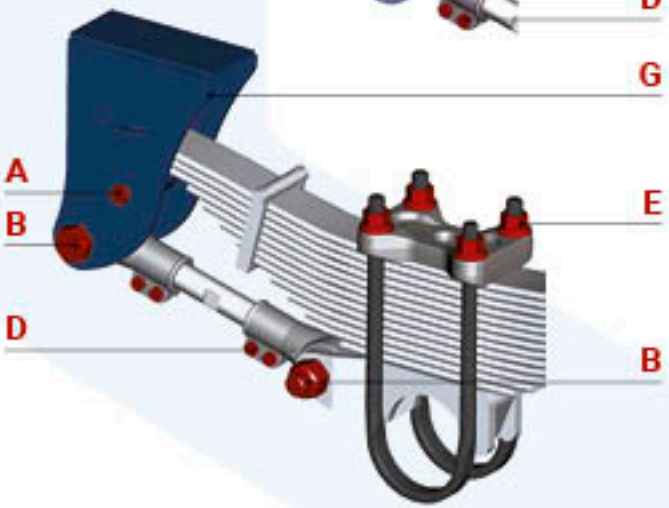
M20x1,5: **400-430 Nm**

PRODUCTS MAINTENANCE

- SM / OKE mechanical suspensions maintenance







After the first loaded journey and every 6 months or 100,000 km, check the tightening torques:

ref. **A**	M16 x 2	170-190 Nm
ref. **B**	M30 x 3.5	750-800 Nm
ref. **C**	M16 x 2	170-190 Nm
ref. **D**	M12 x 1.75	70-80 Nm
ref. **E**	M22 x 1.5	600-650 Nm

Important note
Nuts ref. E: tighten them for each U-bolt, in several stages.

- Every 3 months or 50,000 km, check the extremities of the spring leaves for wear, and if necessary change the leaves and lubricate the leaf tips.
- Check the springs' rubber stop rollers (**F**), and change if damaged.
- Every 6 months or 100,000 km, check the springs' friction blocks (**G**), for wear, and change if seriously damaged.

Replacing the springs' friction blocks:

see **ST312** (SM100 / SM75)

- Every 6 months or 100,000 km, check the rubber joints of the equaliser and torque arms for wear.

Replacing the rubber joints:

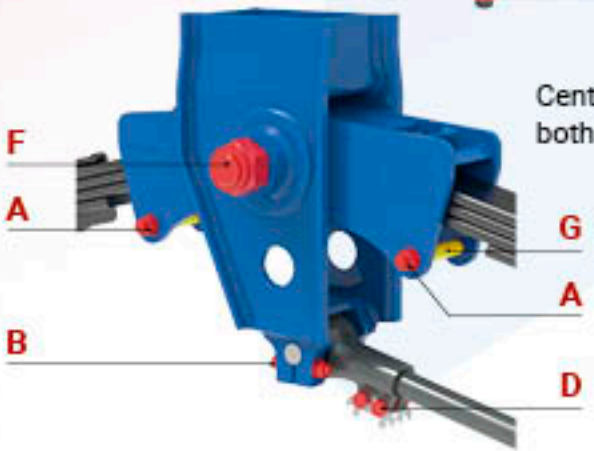
see **ST313** (SM100 / SM75)

PRODUCTS MAINTENANCE

- OKP mechanical suspensions maintenance

Front support for standard mounting

Front support for underslung mounting



Central & rear supports for both versions.

After the first loaded journey and every 6 months or 100,000 km, check the tightening torques:

ref. **A**			M16 x 2	170-190 Nm
ref. **B**			M14 x 2	120-140 Nm
ref. **C**	Standard mounting	Round	M27 x 1.5	650-700 Nm
		Square	M14 x 2	120-140 Nm
	Underslung mounting		M24 x 1.5	550-600 Nm
ref. **D**			M14 x 2	120-140 Nm
ref. **E**			M24 x 2	625-675 Nm
ref. **F**			M42 x 3	900-1000 Nm

Important note

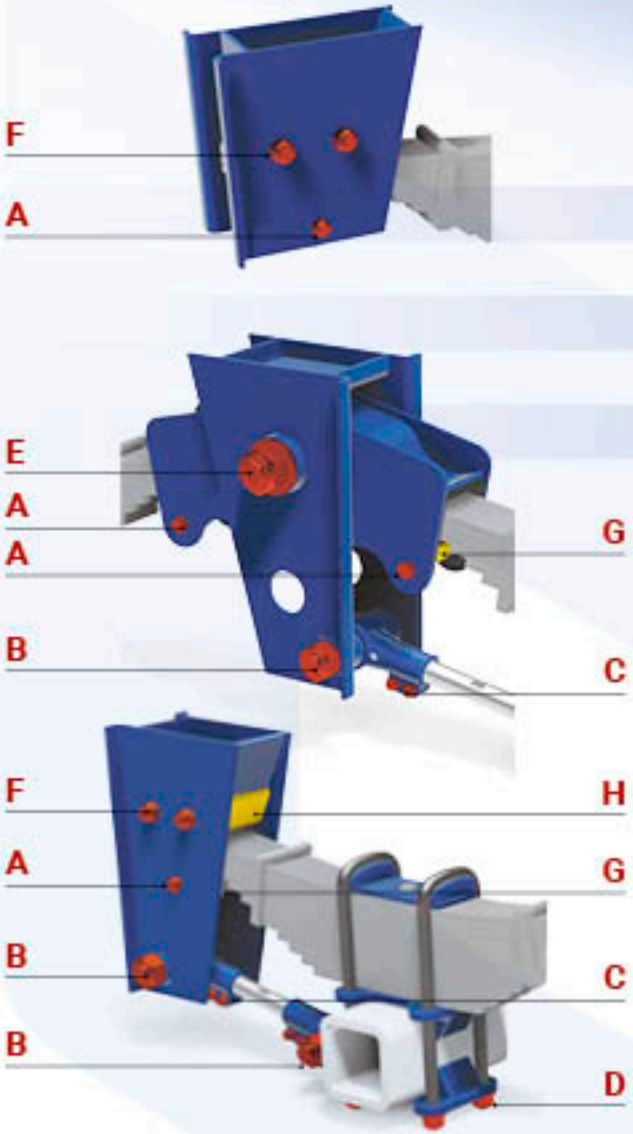
Nuts ref. E: tighten them for each U-bolt, in several stages.

- Every 3 months or 50,000 km, check the extremities of the spring leaves for wear, and if necessary change the leaves and lubricate the leaf tips.

- Check the springs stop rollers (G), and change if damaged.

PRODUCTS MAINTENANCE

- SM HD / OKZ mechanical suspensions maintenance



After the first loaded journey and every 6 months or 100,000 km, check the tightening torques:

ref. **A**	M14 x 2	120-140 Nm
ref. **B**	M36 x 3	1400-1500 Nm
ref. **C**	M12 x 1.75	70-80 Nm
ref. **D**	M24 x 1.5	800-850 Nm
ref. **E**	M48 x 3	1100-1200 Nm
ref. **F**	M20 x 2.5	325-375 Nm

Important note
Nuts ref. E: tighten them for each U-bolt, in several stages.

- Every 3 months or 50,000 km, check the extremities of the spring leaves for wear, and if necessary change the leaves and lubricate the leaf tips.
- Check the springs' rubber stop rollers (**G**), and change if damaged.
- Every 6 months or 100,000 km, check the springs' friction blocks (**H**), for wear, and change if seriously damaged.

PRODUCTS MAINTENANCE

- SP / OKQ pneumatic suspensions maintenance

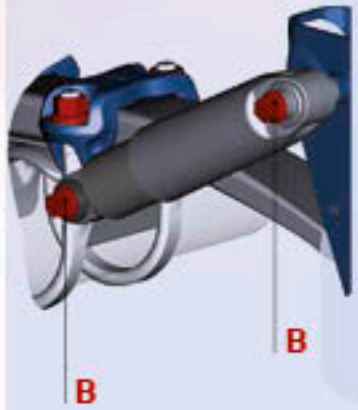
Every 6 months or 100,000 km, inspect the suspension bellows (**A**).
Change them if there are any fissures, cracks or abrasion.

Under ON-ROAD use conditions: After first 1000 km and every years or 200,000 km
Under OFF-ROAD use conditions: After first 1000 km and every 6 months or 100,000 km:

CHECK THE TIGHTENING TORQUES BELOW:

Schock absorber fastening:
Screw (B) Weweler®
M20: 500-550 Nm

Screw (B) SAE-SMB
M20: 370-400 Nm

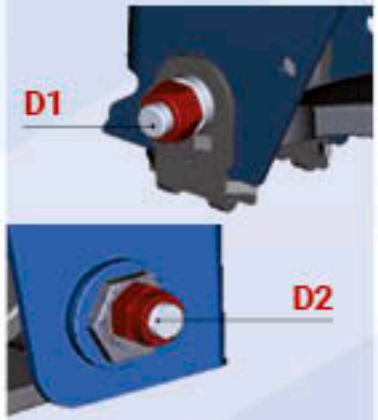


Fastening by U-bolts:
Nuts (C)

M22: 600-650 Nm
M24: 800-850 Nm

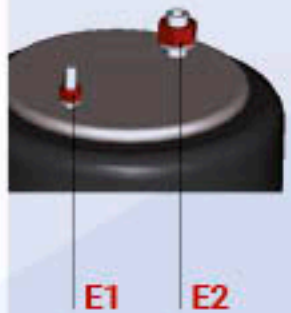
Central articulation:
Screw:
(D1) (Weweler®)
M27 x 2: 1000 Nm

(D2)
(SAE-SMB with eccentric)
M27 x 1,5: 550-600 Nm



Fastening to the bellow chassis:
(E1)
M12: 30-40 Nm

(E2)
M22 x 1,5: 50-66 Nm



Fastening to the bellow spring: (F)

M12: 50-66 Nm

PRODUCTS MAINTENANCE

- SBI / SBZ / OG mechanical bogie maintenance

- Every 6 months check the tightness of:

1 Central cap

Octagonal cap SW120,
Tightening torque: 750-850 Nm

2 Axles U-bolts

Nuts M24
Tightening torque: 580-650 Nm

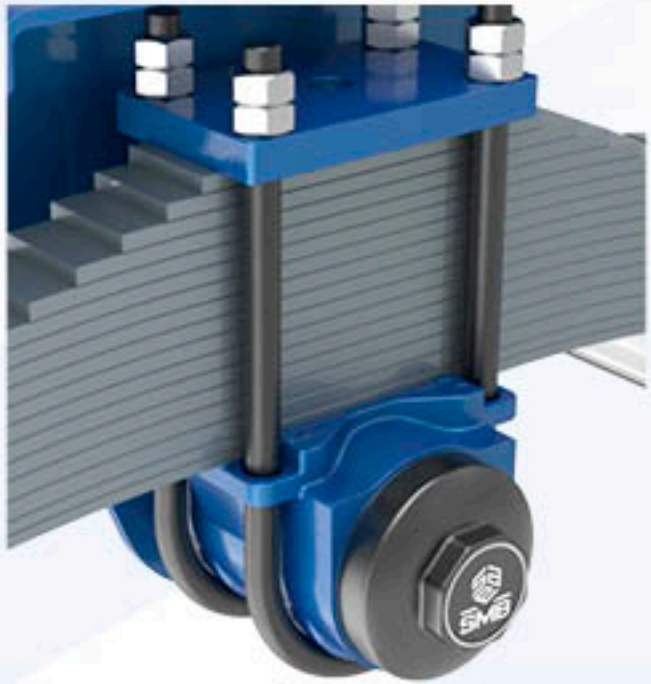
3 Central support U-bolts

Nuts M36x3
Tightening torque: 1550-1700 Nm

PRODUCTS MAINTENANCE

- SBI / SBZ / OG mechanical bogie maintenance

- Every 6 months check the clearance of the bronze rings:



IMPORTANT:

If bronze bushings have radial and/or axial play bigger than 1 mm, they must be replaced (Use of gauge for verification can be necessary)

See **ST463**, to control and to replace them if necessary.

- Every 6 months, or before starting up after a long period of immobilization, lubricate the oscillation bearings using the grease nipples (**A**) in the picture opposite, until the grease "cool" exits through the side seals:

Use special SAE-SMB bearing grease.

www.sae-smb.com

Instruction sheets

INSTRUCTION SHEETS

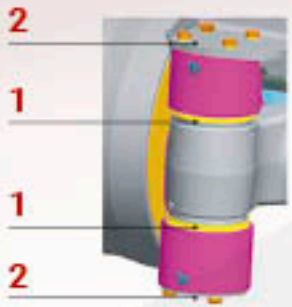
- ST206-3: SNH7 / DSNH7 Self-steering axles, Replacing the kingpin

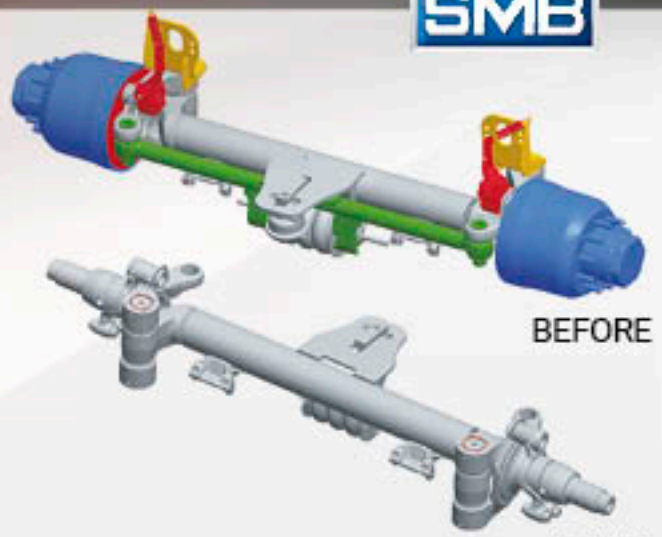
Instruction valid also for models: GNKH2 / DNKH2

1 Removing the axle

- Remove the hub assembly, the brake and the track-rod pivot (fig. 1)
- Cut the V-ring seals (1).
- Remove the seal covers (2) and remove the O-rings.
- Degrease the pivot.

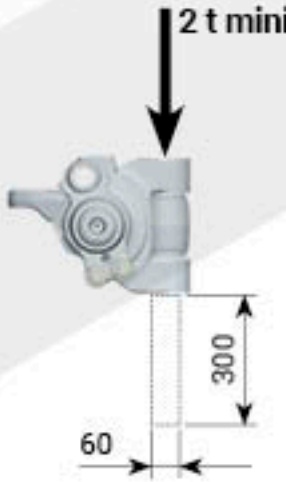
fig. 1





2 Extracting the kingpin

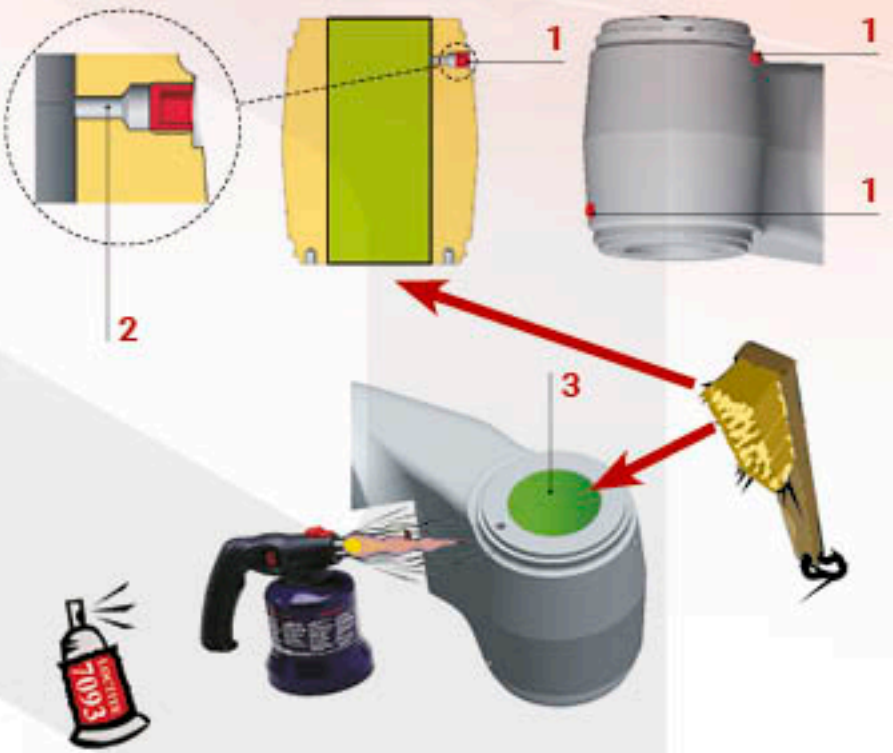
- Position the assembly on a press
Press capacity: 2 t min.
- Support the axle beam.



- Heat the Pivot Head around the whole circumference to destroy the retaining compound.

Heating time: approx. 5 minutes.

- Extract the kingpin with the press.



3 Cleaning the kingpin housing

- Unscrew the two G 1/8 plugs (1).
- Unblock the 2 orifices (2) using a Ø3.5 max tool.
- Thoroughly clean the inside of the bore (3) mechanically.

If there are residues, burn them off at 300°C max.

4 Replacing the bushings on stub axle.

- See SAE-SMB **ST227** procedure.
(Contact the after sale service)

INSTRUCTION SHEETS

- ST206-3: SNH7 / DSNH7 Self-steering axles, Replacing the kingpin

5 Assembling the stub axle

- Insert the pins, references 0240041. (1) (fig. 1).
- Place the V-ring, reference 02505095, in their preliminary position (Temporary position).(2) (fig. 1).
- Position the washers 09369053. (3) (fig. 1).
- Insert the washers 09228052. (4) (fig. 2).

fig. 1

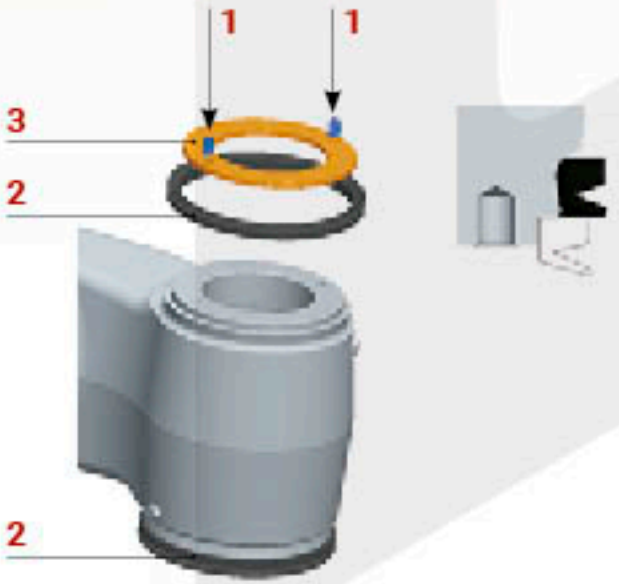
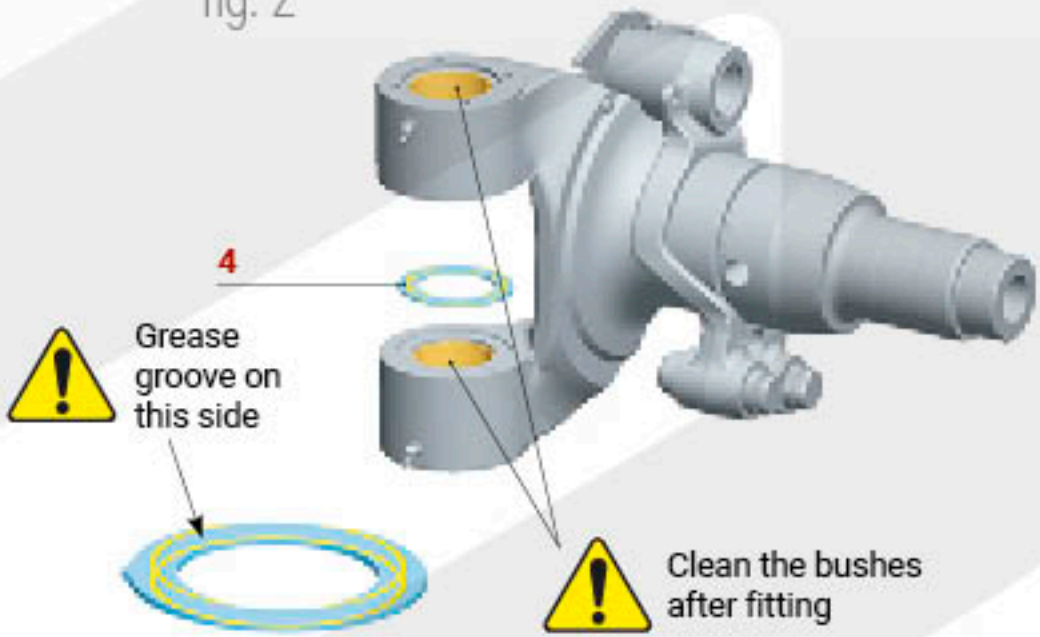


fig. 2



- Align the axle spindle holder with the body (fig. 3).
- Insert a pre-centring dummy pin (5) (fig. 4).
- Insert the previously degreased kingpin, reference 09226065 (6) (fig. 4) pushing the dummy pin.
- The axle can be mounted in 2 ways:
  1) using a press with a capacity of 2 t
  2) using a hammer. In this case, fit a Hm20 screw (7) (fig. 4) on the pin to protect it from impacts.
- Leave 2mm of clearance (fig. 5).
- Replace the chamber bracket (8) (fig. 6), the cover (fig. 6, ref.9) and the O-ring seals (10) (fig. 6).
- Slide the V-ring seals into their final position (11) (fig. 6).

fig. 3

fig. 4

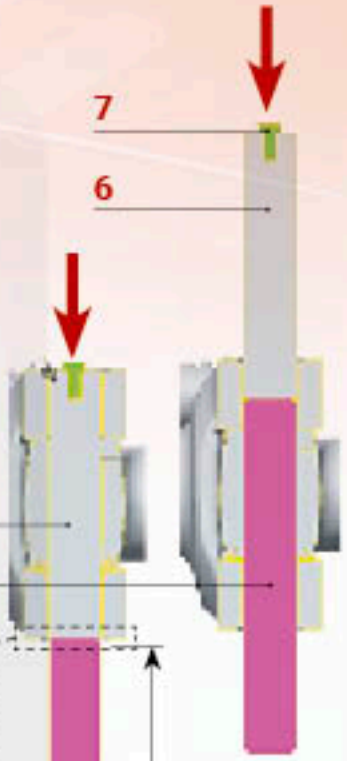
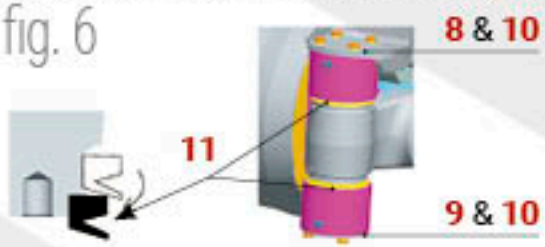


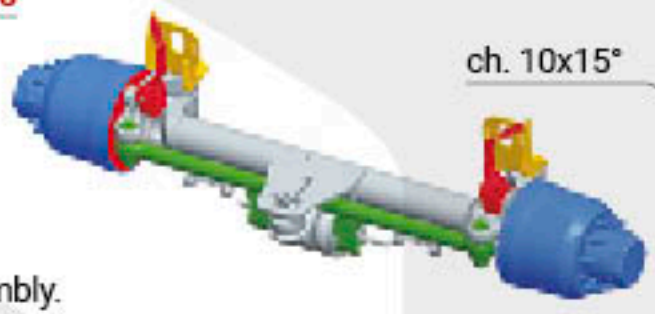
fig. 5

fig. 6



6 Final assembly

- Reinstall the track-rod, the brake and the hub assembly following the assembly and adjusting procedures.
- Do not grease the kingpin at this stage of assembly.



INSTRUCTION SHEETS

- ST206-3: SNH7 / DSNH7 Self-steering axles, Replacing the kingpin

Obtain the GLUE KIT, reference 09317938, containing 2 Syringes with connector 2 Bottles of LOCTITE® 648 10ml

7 Gluing the kingpin

40°c
15°c

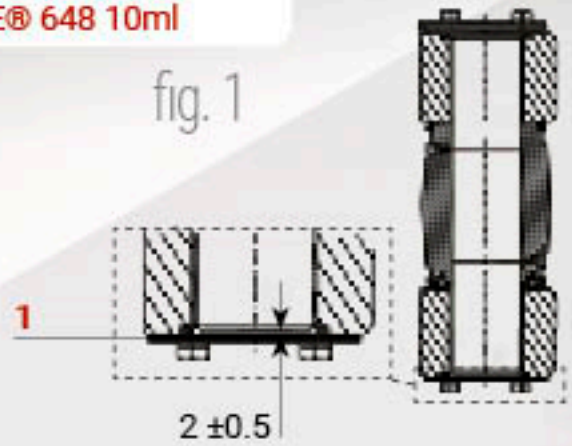
Temperature of parts in contact with the retaining compound:
- 15°c minimum
- Heat if necessary (40°c maxi).

- Positioning the axle

The kingpin must be in vertical position and the axle placed so that the thrust washers are under pressure (as on the road). (as in drive position).

- Check the play of 2 mm (2) between the kingpin and the sealing plate at the bottom of the axle (1) (fig. 1).

fig. 1



- Collage

- Connect the syringe to the bottom orifice (1) (fig. 2).
- Pour the bottle of Loctite® 648 (10 ml) into the syringe.
- Inject the retaining compound in a single stroke and hold the pressure until glue escapes from the opposite hole (2) (fig. 2).
- Replace the 2 plugs (1) (fig. 3).

fig. 3

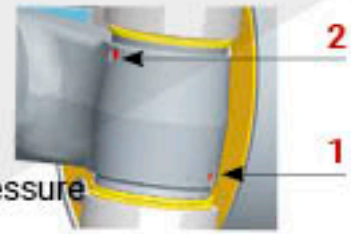
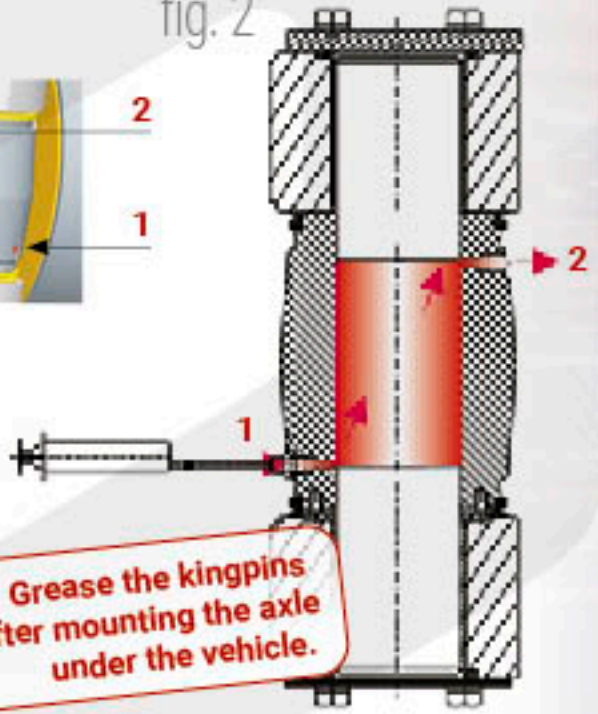


fig. 2



- Wait 30 minutes before handling.
- Wait 24 h before fitting to the vehicle (retaining compound curing time).

Grease the kingpins after mounting the axle under the vehicle.

INSTRUCTION SHEETS

- ST232-3: SNH7 / DSNH7 Self-steering axles, Adjustment procedure

Instruction valid also for models: GNKH2 / DNKH2

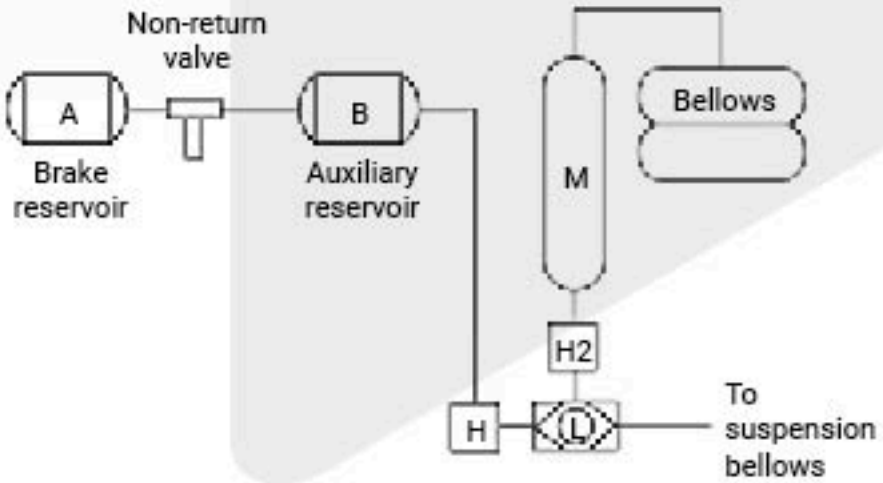
Description of the pneumatic stabilization system.

The axle is fitted with a stabilizer bellows which brings the wheels back to a Straight ahead position after negotiating a bend and stabilizes them into a straight alignment.
The pressure in the stabilizer bellows must take into account ground friction forces, depending on the load on the axle (empty, 1/2 laden or fully laden vehicle).

- Operating pressure range: 1 Bar min. and thereafter proportional to load.

Max. operating pressure of 8.0 Bars.

DIAGRAM OF PRESSURE REGULATING DEVICE IN THE BELLOWS



Important notes

The stability of a vehicle equipped with (a) self-steering axle(s) depends on the pressure delivered to the stabilizer bellow. The higher the risk of loss of stability (high centre of gravity of the vehicle above the axles, for example), the higher this pressure must be.
On the other hand, a very important parameter is also the ratio of the mass on straight axles divided by the mass on the steering axles.
If this ratio is less than 1. 6, EEC directive 70 /311 modified by directive 1997/7 or regulation ONU79 series 01 requires vehicle tests verifying and certifying their stability and road handling

1 "Semi-automatic" pressure regulation: without 2-way valve L, H is a pressure regulator.

- Vehicle equipped with mechanical suspension: this pressure regulator is controlled by a control arm, itself connected to the axle. Deflection of the suspension springs directly acts on the arm, varying the pressure in the stabilizer bellow.

- Vehicle equipped with pneumatic suspension: this pressure regulator is controlled by the pressure in the suspension bellows.

2 "Automatic" pressure regulation: with 2-way valve L, H is a pressure limiter at 1.5 bars.

- The pressure in the stabilizer bellow is either that in the suspension bellows (suspension bellows pressure > 1 bar up to 8 bars max.) or that delivered by the pressure limiter H (bellows pressure < 1 bar). H2 limits the pressure to 8 bars max.

- In some cases where the pressure in the bellows (unladen and laden) is always between the values required by the stabilizer bellow, the pressure limiting valve H, H2, the 2-way valve L and the reservoir M may be omitted. The stabilizer bellow is directly connected to pneumatic suspension bellows.

Note: automatic pressure regulation applies more particularly to vehicles with a "mass on straight axles/mass on steering axles" ratio greater than 1.6. SAE-SMB INDUSTRIES recommends always checking the behaviour of the axle on unladen and laden vehicles.

INSTRUCTION SHEETS

- ST232-3: SNH7 / DSNH7 Self-steering axles, Adjustment procedure

Description of the locking system

Before using the vehicle in reverse gear, the operator must lock the self-steering axle in straight ahead position to avoid any veering.
To do this, the self-steering axle is equipped with a blocking cylinder or lock, which locks or unlocks the axle.
This lock is on when pressure is low, i.e. it must be supplied with air to be unlocked.
The pressure must be between 6 and 8 bars.
(Note: above 8 bars the lock may be damaged).

Forward drive: Unlocked= Supplied with air.
Reverse drive: Locked= Not supplied with air.
To lock the steering axle, the vehicle must be directed straight ahead, then the locking control actuated.

From the auxiliary reservoir B, the air arrives at the solenoid EL. This is Normally closed, i.e. when there is no current, air passes through the solenoid feeding the lock.
Example: Triggering via the reversing light.

When the driver goes into reverse, the reversing light contactor supplying the powered solenoid closes.
A warning lamp in the cab comes on and the locking cylinder spring exerts a pressure on the locking wedge putting it into locking position; the locking cylinder is then depressurized. A flow limiter (LD) slows the locking cylinder stroke to avoid damaging the mechanism, (when the axle is not directed straight ahead) during a collision between the locking wedge and the bar.

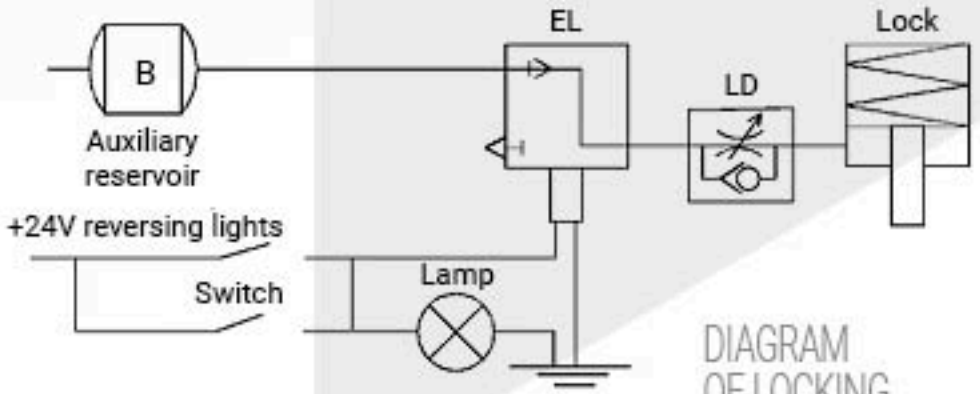


DIAGRAM OF LOCKING SYSTEM

Note: this principle is fail-safe, i.e. if the pressure in the reservoir drops or if the lock's supply hose is ruptured, the axle will always be locked and can be used as a straight axle.

It is also recommended to place a switch in parallel with the reversing light contactor in order to avoid continuous locking/unlocking when repeating manoeuvres.

In case of electrical failure (broken wires or coil out of service), the axle can be locked by manually actuating the solenoid (emergency button).

Toe-in adjustment

The toe-in of every self-steering axle delivered is factory-set.
If nevertheless alignment is subsequently necessary (e.g.: after mounting axles or after a repair), it is essential to respect the following points:

1 Fill the pneumatic stabilizer with air up to a minimum pressure of 3 bars. The axle will then centre automatically.

2 Make sure the wheels on the axle are not in contact with the ground, and that the special device for reverse drive (for the self-steering axle) is not engaged.

3 Loosen the nuts (1) by ½ turn (see fig. 2). Hit the pin, (2), from bottom to top to un-stick the taper.

4 The toe-in is obtained by turning the pin (2) using an SW22 Allen wrench.
Respect the angular range of +/-90° (see fig. 3).
Toe-in value: 4-6 mm (see fig. 1).

5 After carrying out this preparation, re-tighten the bolts (1) in two steps:
1st step: tighten using a 5/10 Nm wrench to avoid losing the adjustment.
2nd step: tighten to 550/600 Nm using a torque wrench.

fig. 1

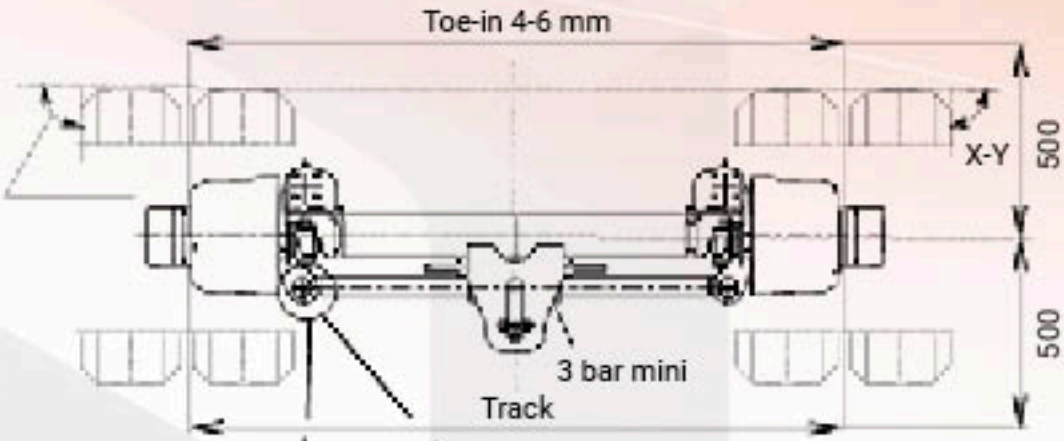


fig. 2

fig. 3

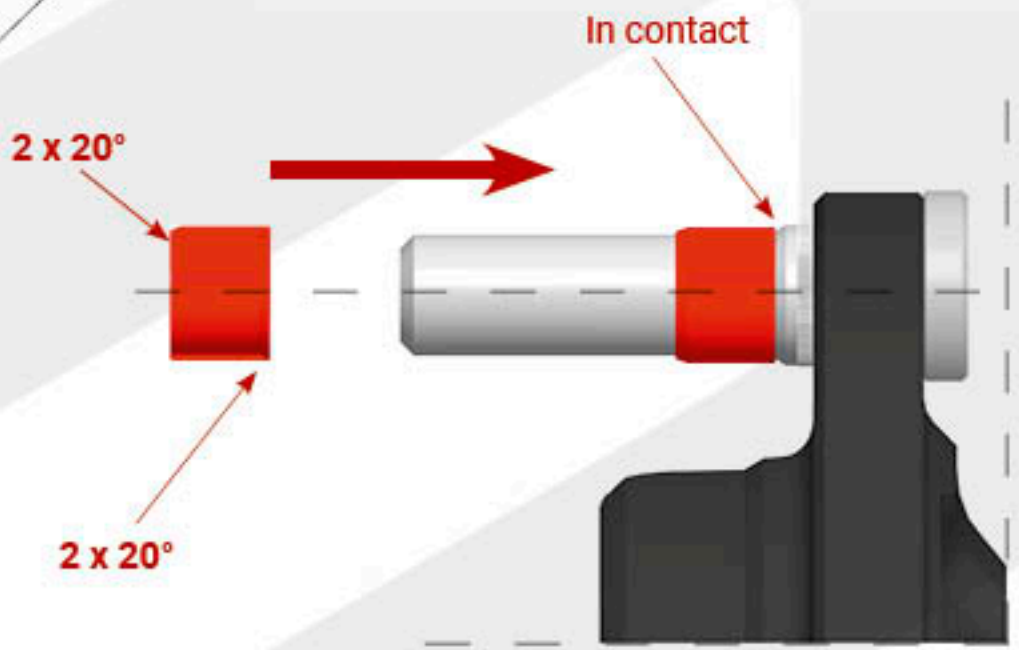
Note: after adjusting the toe-in, adjust the parallelism and triangulation for the fixed axles.

INSTRUCTION SHEETS

- ST251-1: Mounting the drum centring sleeves

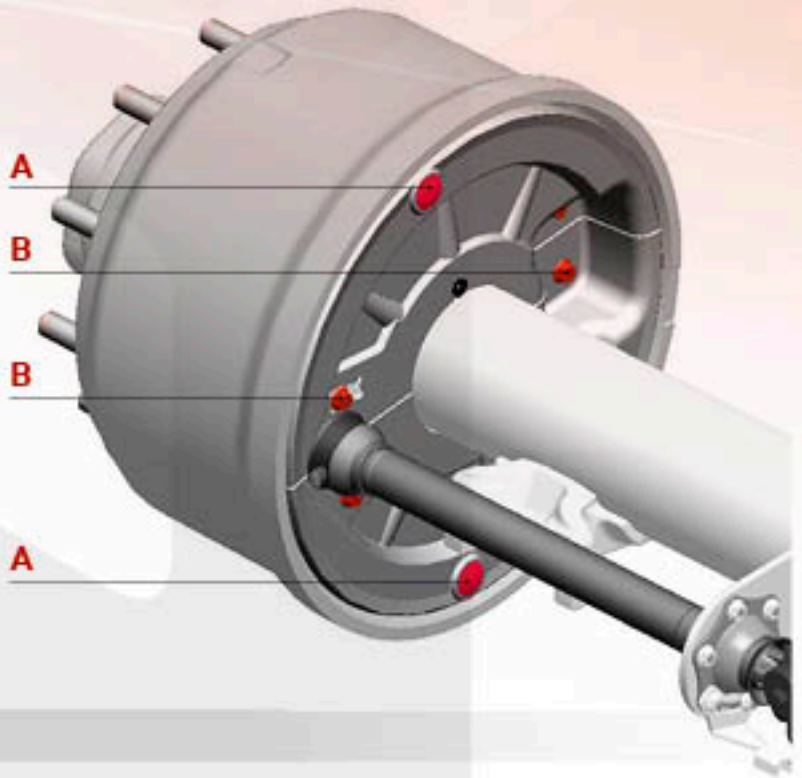
To verify use of centring sleeves refer to documentation provided with axle or contact the after sales service.

2 x 09268001 or 2 x 57H222 sleeves
Mounted diametrically opposite



Check the brake drum and linings (For brake 4220C1 / C113 see **ST406**)

Every 3 months or 50,000 km:



1 Brake lining thickness check

- Remove the rubber plug (**A**) on each mud shield.
- Check the remaining thickness of the lining: if this thickness is less than 5 mm, the linings must be changed.
- Once checked, replace the plugs on the mudguards.

2 Check the drum diameter

- After removing the dust covers and using a calliper gauge, check the drum diameter: if it is equal to or greater than Dmax, the drum must be changed.

Brake	Type	Dmax.
300x100 / 150 / 200	3010S2 / 3015S2 / 3020S2	305
360x200	3620S2	365
420x180 / 200	4218S2 / 4220S2	425

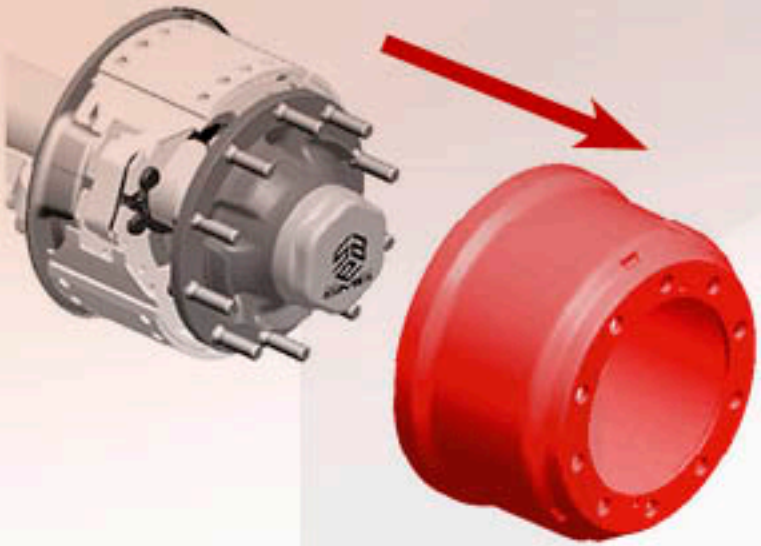
3 Check the mudguard fixing

- Check the tightening torques of the mud-shield fixing screws (**B**):

M8:	20-25 Nm
M10:	40-46 Nm

INSTRUCTION SHEETS

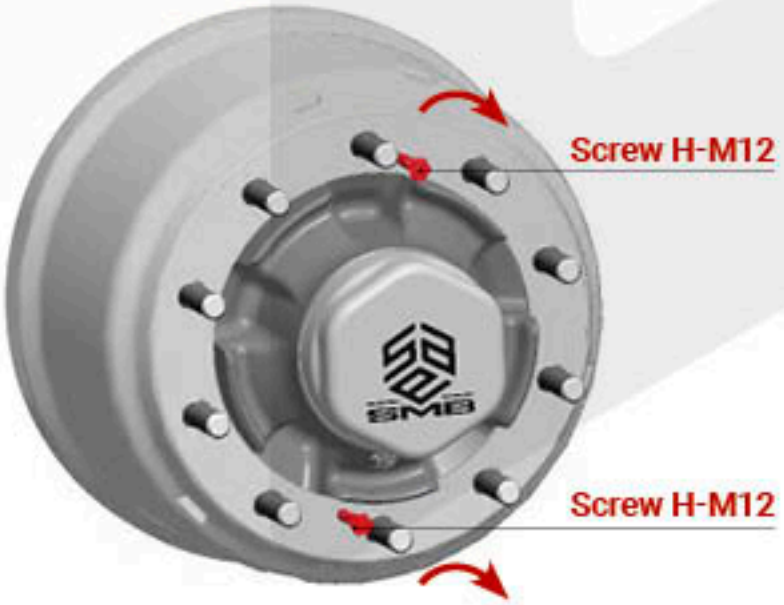
- ST266-3: SH7 / P axles, Brake drum inspection



Replacing the brake drum outboard

- Remove the wheels.
- Put the brake in its initial position (brakes not applied)..
- Remove the drum by sliding it along its axis.

- If the brake drum will not come off the axle, put 2 H-M12 screws (SW19 wrench) in the holes provided and tighten them alternately until the drum is freed from the axle.



- Thoroughly clean the centring and the drum bearing surface on the hub and fit the new drum on the hub.
- Replace the wheels and check the brake adjustment. (See **ST306** & **ST310**).
- Check braking efficiency (preferably on a brake test bench).

Replacing brake drums Inboard

- Remove the wheels.
- Put the brake in its initial position (brakes not applied).

- Remove the hub & drum assembly by unscrewing the hub cap and the spindle nut following the procedures below:
  - Axles type SH7 05506 3010 / DSH7 05506 3334: see **ST435**
  - Axles type P14 / P16 / P18: see **ST375**
  - Axles type P20: see **ST440**
  - Axles type OA-OC Series 40: see **ST461**
  - Axles type OA 40-41W: see **ST464**

- Extract the wheel stud by knocking on a wheel nut to avoid damaging the stud thread

- Thoroughly clean the centring and the drum bearing surface on the hub and fit the new drum on the hub.

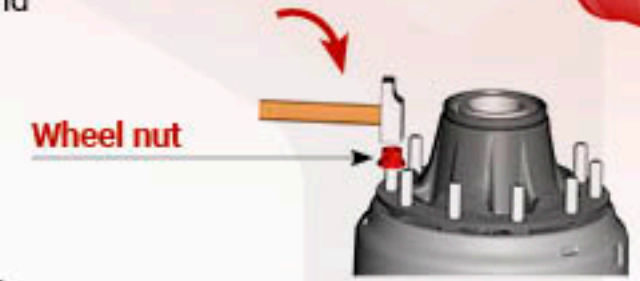
- Fit the wheel stud using a press or with the help of a socket and a wheel nut.

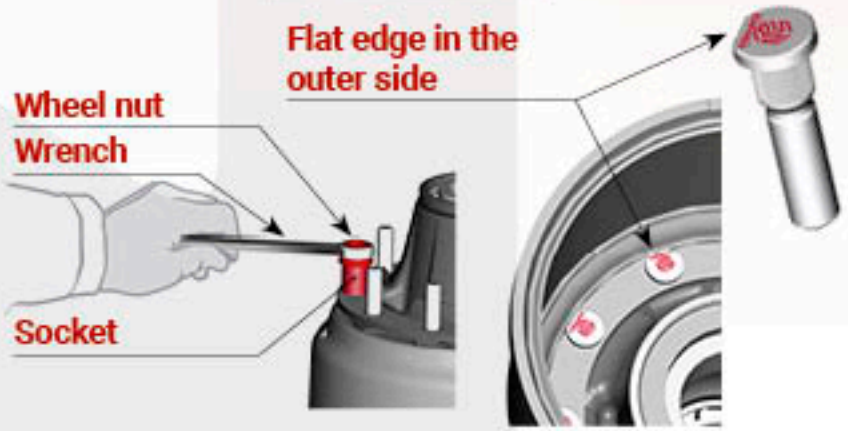
- Check the orientation of the cut on the head of the wheel stud in the drum

- Reassemble the hub assembly following the procedures below:
  - Axles type SH7 05506 3010 / DSH7 05506 3334: see **ST435**
  - Axles type P16 / P18: see **ST375**
  - Axles type P20: see **ST440**
  - Axles type OA-OC Series 40: see **ST461**
  - Axles type OA 40-41W: see **ST464**

- Replace the wheels and check the brake adjustment. (See **ST310**)

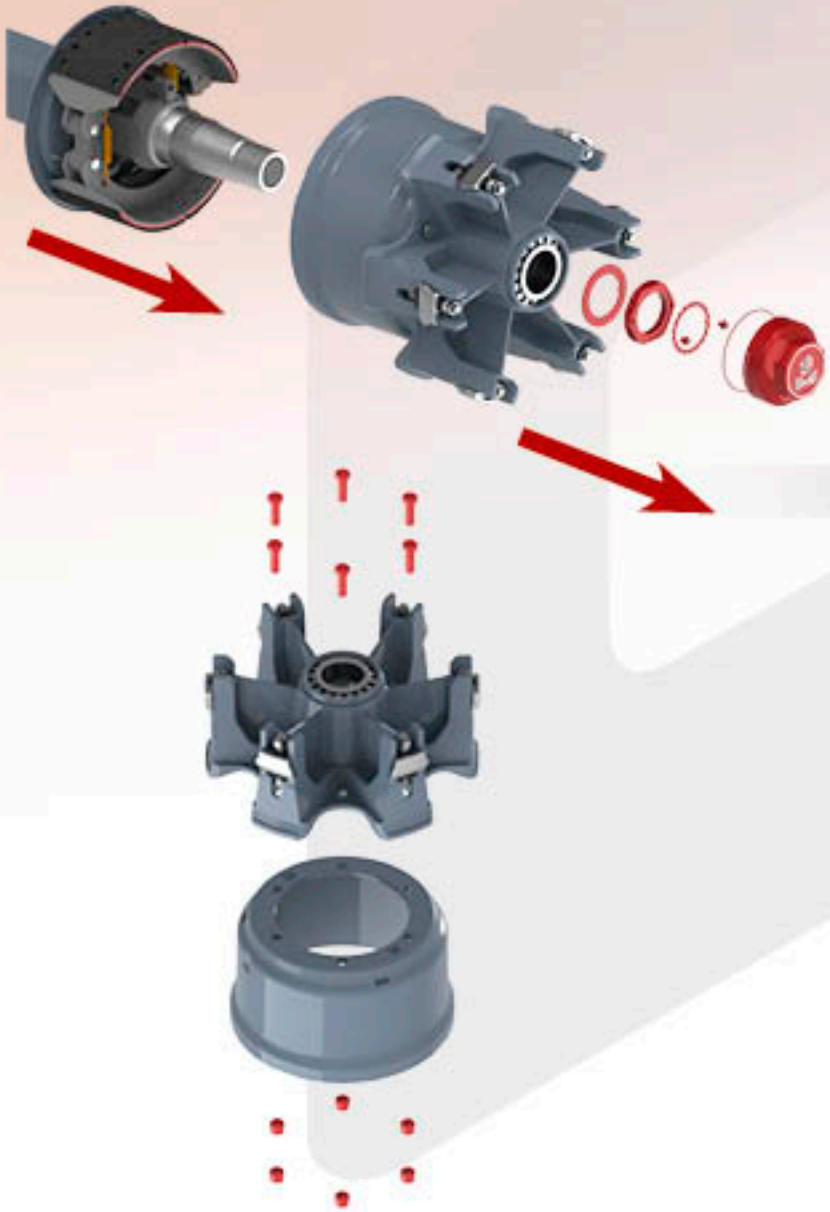
- Check braking efficiency (preferably on a brake test bench)





INSTRUCTION SHEETS

- ST266-3: SH7 / P axles, Brake drum inspection



Replacing the brake drums - spoke wheel type

- Remove the wheels.
- Put the brake in its initial position (brakes not applied).
- Remove the spoken hub & drum assembly by unscrewing the hub cap and the spindle nut following the procedures below:

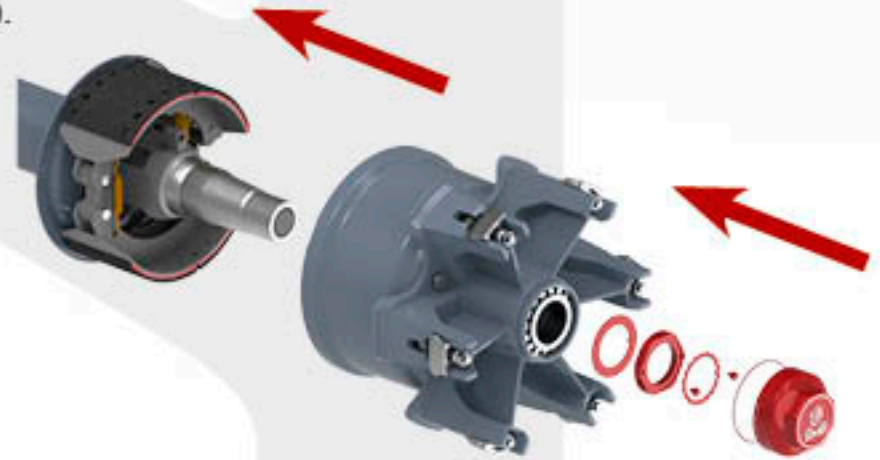
Brake	Procedure
OA-OC Series 40	**ST461**

- Unmount the spoken hub by unscrewing the six bolts and self-locking nuts M20x2,5 (SW30)
- Thoroughly clean the centring and the drum bearing surface on the hub and fit the new drum on the spoken hub.
- Tighten the six bolts with new self-locking nuts applying a coupling torque of 330-360 Nm. Check that the wheel nuts are properly tightened (tightened diagonally with a torque wrench following the diagram below).

- Reassemble the hub assembly following the procedures below:

Brake	Procedure
OA-OC Series 40	**ST461**

- Replace the wheels and check the brake adjustment (see **ST310**).
- Check braking efficiency (preferably on a brake test bench)



INSTRUCTION SHEETS

- ST266-3: SH7 / P axles, Brake drum inspection

Replacing the brake linings

1 Remove the wheels and brake drum.

2 Lift up the brake spring on the "fixed point" side with a thin cylindrical tool (such as a screwdriver) and remove it.

3 To remove the brake shoes, raise them on the fixed side and pivot them about half a turn (180°) on the cam shaft.

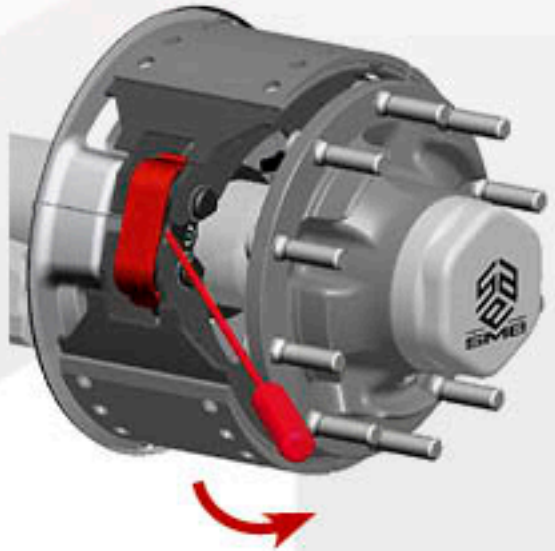
4 Unhook the return spring.

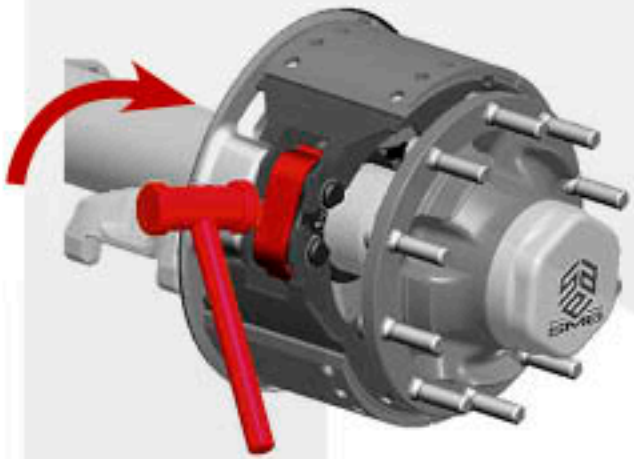
5 **Examine the brake shoes:**

- if they are damaged (worn rollers, deformation, etc.), replace them systematically by an original SAE-SMB set of shoes and linings.
- or change the brake linings:

  - Un-rivet the old brake linings and thoroughly clean the shoes. (The lining bearing surfaces must be totally free of rust and any other irregularities).

  - Rivet the new original SAE-SMB linings following the riveting order as in the diagram below (riveting force from **1800 to 2300 DaN**).





6 Visually check the riveting; it is essential that there be:

- No play between the lining and the shoe.
- No cracks in the linings.

7 Examine the camshaft. If there is wear or play, replace the camshaft and its housing (bronze bushes and seals).

8 Check the return spring for corrosion and elongation (no play allowed between the coils of the spring). Always replace it if it is damaged.

9 Mount the brake shoes in the reverse order to removal.

10 Fit the spring on the "fixed point" side using a mallet.

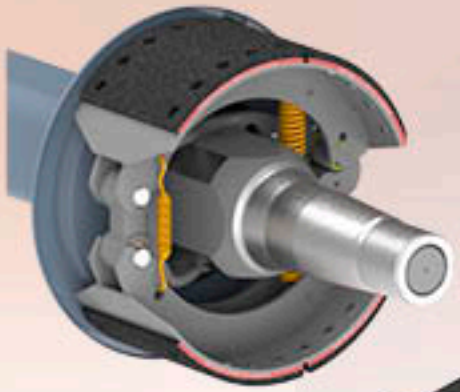
11 Mount the drum and the wheels.

12 Check the brake adjustment (see **ST310**).

13 Check braking efficiency (preferably on a braking test bench).

INSTRUCTION SHEETS

- ST266-3: SH7 / P axles, Brake drum inspection



Brake	Type
406x120 / 140	412E / 414E
420x180 / 200	4218E / 4220E

Replacing the brake linings

1 Remove the wheels and brake drum & hub.

2 Unmount the rear protection cover by removing the 4x M8 nuts (A) (SW 13).

3 Remove the two brake springs on the "fixed point" (B) side with a thin cylindrical tool (such as a screwdriver), and remove it.

4 To remove the brake shoes, raise them on the fixed side and pivot them about half a turn (180°) on the cam shaft.

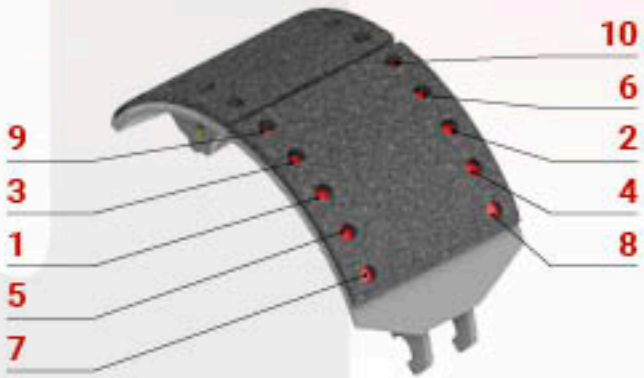
5 Unhook the return spring.

6 **Examine the brake shoes:**

- if they are damaged (worn rollers, deformation, etc.), replace them systematically by an original SAE-SMB set of shoes and linings.
- or change the brake linings:
  - Un-rivet the old brake linings and thoroughly clean the shoes. (The lining bearing surfaces must be totally free of rust and any other irregularities).
  - Rivet the new original SAE-SMB linings following the riveting order as in the diagram below (riveting force from **1800 to 2300 DaN**).

7 Visually check the riveting; it is essential that there be:

- No play between the lining and the shoe.
- No cracks in the linings.



8 Examine the camshaft. If there is wear or play, replace the camshaft and its housing (bronze bushes and seals).

9 Check the return spring for corrosion and elongation (no play allowed between the coils of the spring). Always replace it if it is damaged.

10 Mount the brake shoes in the reverse order to removal.

11 Mount the rear protection cover.

12 Mount the drum and the wheels.

13 Check the brake adjustment (see **ST310**).

14 Check braking efficiency (preferably on a braking test bench).

INSTRUCTION SHEETS

- ST296-5: SH7 / DSH7 / P axles, Lubrication procedure

For specific models:

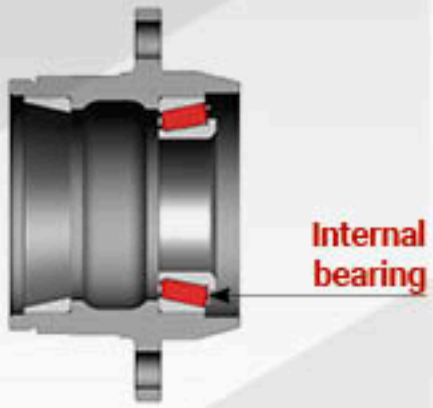
- P20 see **ST439** - **ST440**

1 Press-mount the external cages of the roller bearing into the hub.

2 On the roller bearings without external cages: coat the free spaces between the rollers with lubricant.

Grease type: SAE-SMB
Approximately 50 to 70 g of grease per bearing.

3 Mount the internal roller bearing into the hub.

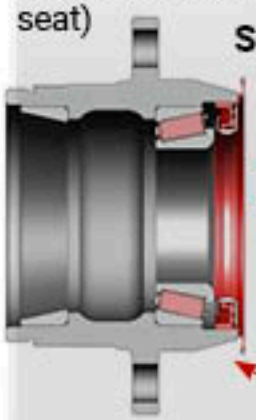


4a Fill the seal's hollow with lubricant to 75% of its capacity before mounting it into the hub, using the appropriate tool, while visually checking for concentricity between the two parts.

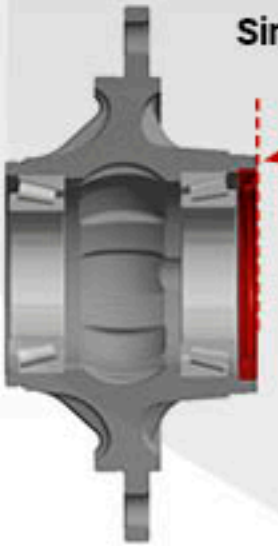
Grease type: SAE-SMB

4b Press mount the seal into the hub. (Seals with perforated ring base must be pressed against the hub across the entire surface; simple seals must be pressed inside the hub seat)

Seal with ring:



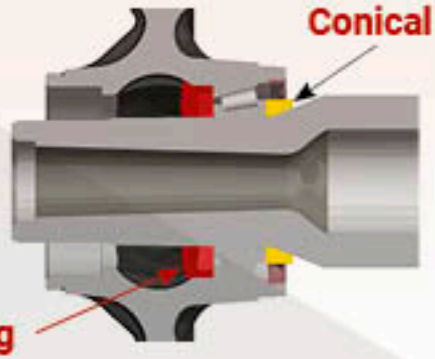
Simple seal:



5 Carefully assemble the hub and the conical ring onto the spindle, avoiding damaging the gasket and spindle thread.
To simplify operation, conical ring can be pre-assembled on hub. Place a 20-30 mm wide grease layer in contact with the inner bearing.

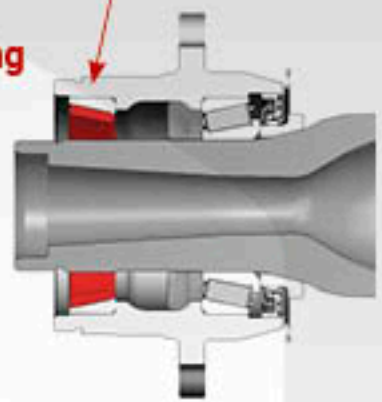
Grease type: SAE-SMB

P / SH7 / DSH7 types:	
17.5" / 19.5"	200-250 g
22.5"	250-300 g

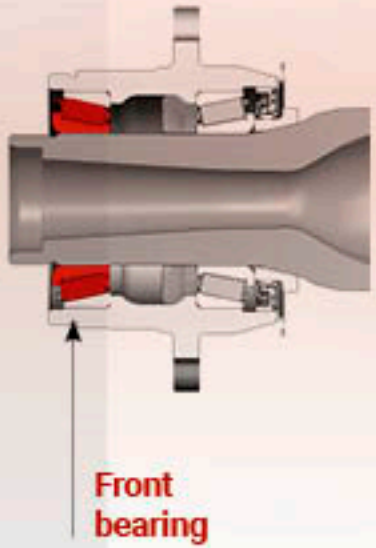


6 Mount the front roller bearing before checking that there is adequate lubrication. (The lubricant must come out between all the rollers of the front roller bearing.)

Grease type: SAE-SMB



7 Fitting the front bearing



8 End of assembly and adjustment of the following bearings:
SH7 / DSH7 see: **ST297**
SH7 / DSH7 05506 see: **ST435**
SH7 07506 3015 see: **ST438**
P14 / P16 / P18 see: **ST375**

INSTRUCTION SHEETS

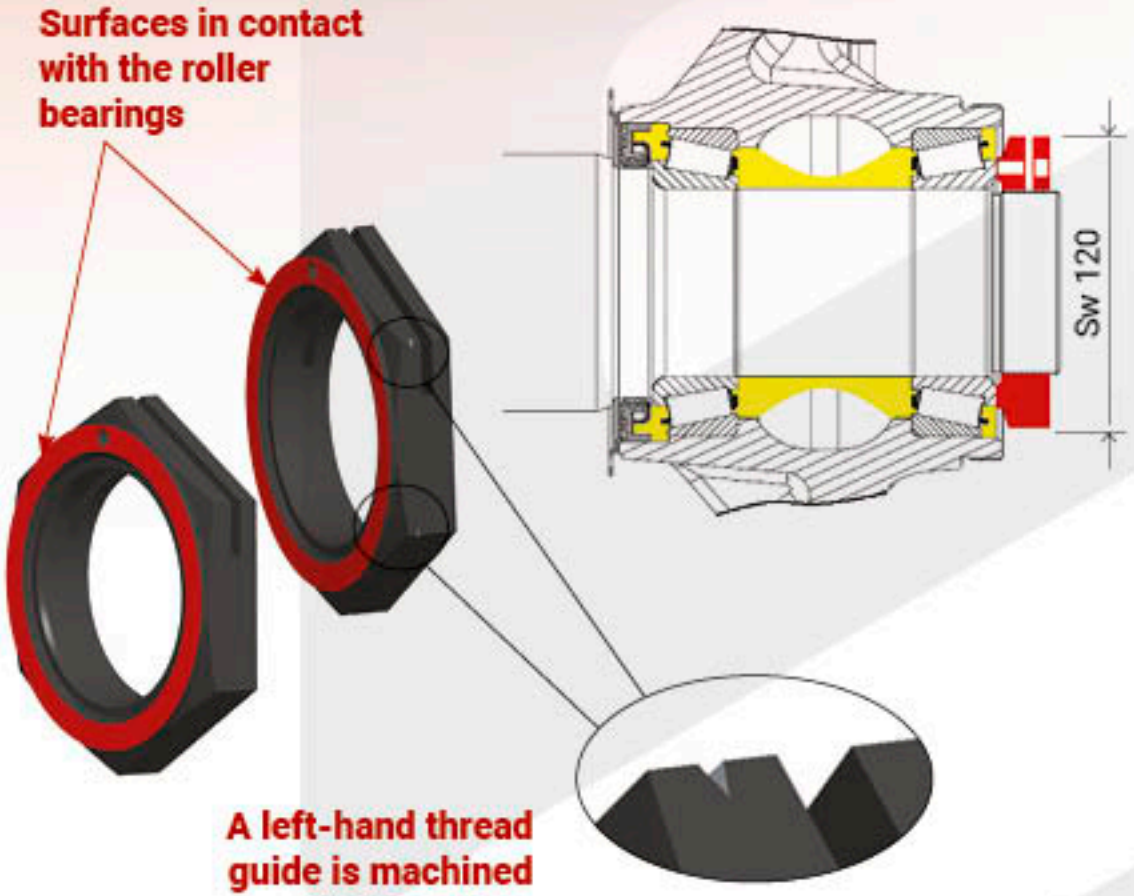
- ST297-3: SH7 / DSH7 axles, Roller bearing adjustment procedure

1 Mounting and lubricating the hub following ST296

2 Mounting the spindle nut

TAKE CARE TO MOUNT THE NUT IN THE RIGHT DIRECTION, THE MACHINED SURFACE MUST BE IN CONTACT WITH THE ROLLER BEARING

LEFT-HAND THREAD GUIDE ON THE LEFT, NO GUIDE ON THE RIGHT



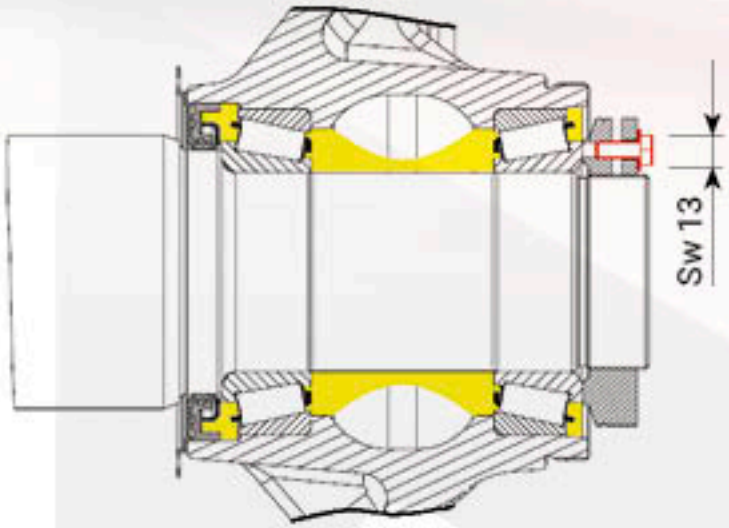
2a Gradually tighten the SW120 spindle nut from 300-400 Nm while turning the hub (20 turns min.).

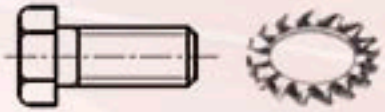
2b Totally loosen the spindle nut.

2c Tighten the spindle nut gradually from 110-130 Nm while turning the hub (20 turns min. to ensure proper contact with the roller bearing surfaces).

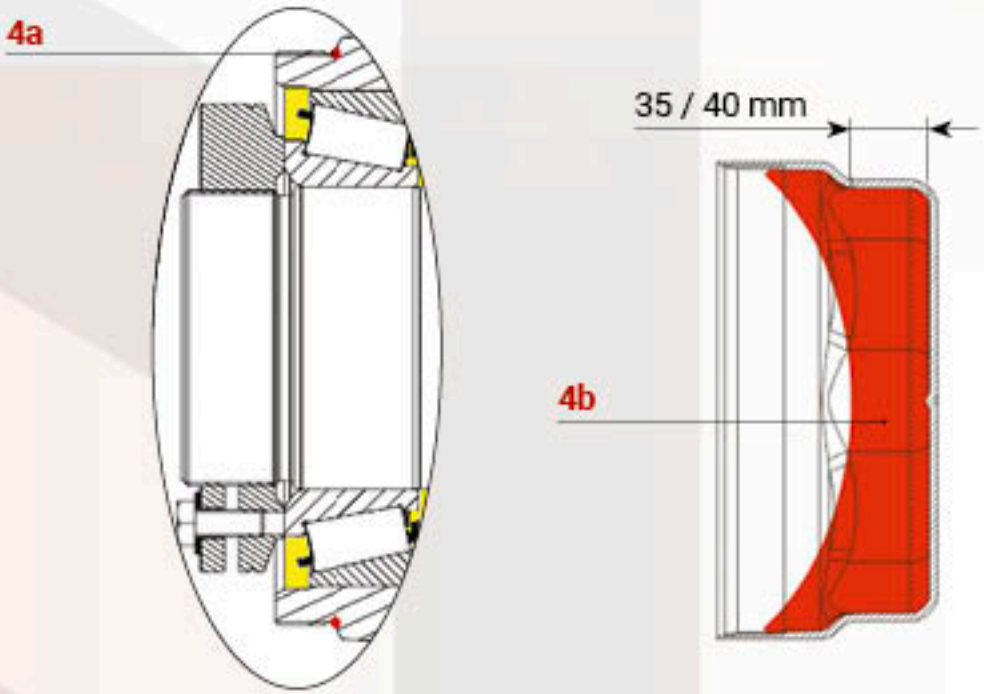
INSTRUCTION SHEETS

- ST297-3: SH7 / DSH7 axles, Roller bearing adjustment procedure





3 **Mount and tighten the torque from 20 to 25 Nm** on the HM8 screw (class 8.8 min.) fitted with its DEC M8 washer.



4 **Seal and cap assembly:**

4a Ensure that the O-ring seal is properly in place.

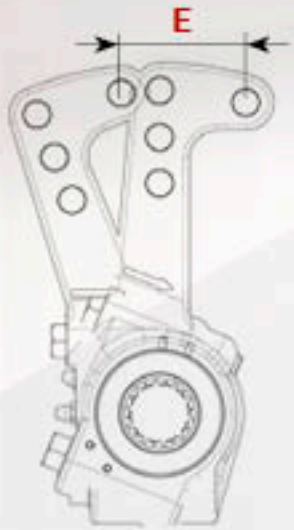
4b Fill the hub cap with SAE-SMB grease (Thickness 35-40 mm; 550 to 600 gr)

4c Screw the SW160 seal onto the hub and tighten it using a torque wrench to **750 Nm +/- 50 Nm**

4d Check that the O-ring seal is not pinched.

FICHES D'INSTRUCTION

- ST306-1: Manual brake levers, Adjustment procedure



1 Check the brake lining clearance regularly (every 15 days):

- Manually activate the brake lever in the direction of pressure to put the brake linings in contact with the drum.
- When the lever travel (dimension **E**) exceeds 35 mm, the brake levers must be adjusted again.

2 Adjusting the clearance:

Adjustment is carried out using the worm screw (**B**) which can be found on the lever.

- Unlock the clamping screw (**A**).
- Turn the worm screw (**B**) until the brake is locked in the drum.
- Loosen the screw (**B**) to obtain clearance between the brake linings and the drum, characterised by a dimension (**E**) of 15 to 20 mm.
- Lock the clamping screw (**A**)
(HM12 screw: tightening torque of **70 to 80 Nm**).

Note: The lever depicted here is model 923. SAE-SMB also uses other types of levers and screws in which (A) and (B) can sometimes be the other way round. However, the adjustment procedure remains the same.

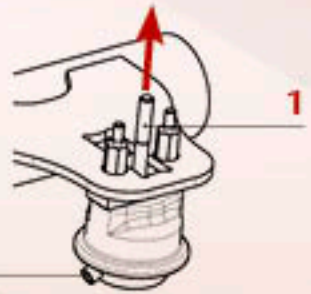
INSTRUCTION SHEETS

- ST309-3: SNH7 / DSNH7 Self-steering axles, Mounting the locking kit

1 Fitting the cylinder (1) with the spacer (2).
Tightening torque : **70 Nm +/- 16**

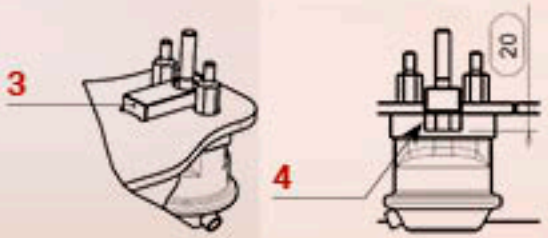
2 Pressure the cylinder (1) to move the rod out.

Pressure max: **6 bar**



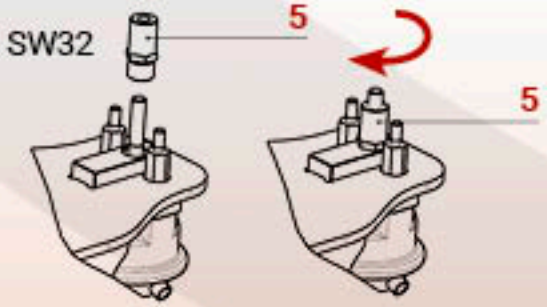
3 Fitting the locking plate (3) in Place.
Use a wedge to respect the dimension 20 mm.

Pay attention: the big chamfer (4) towards the cylinder.

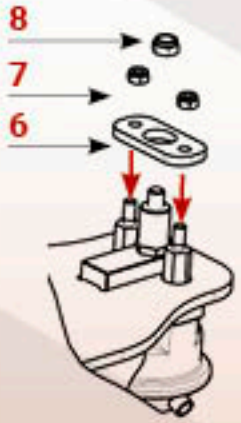


4 Tighten the nut of guidance (5) on the rod and then the locking plate.

Tightening torque: **200/250 Nm**



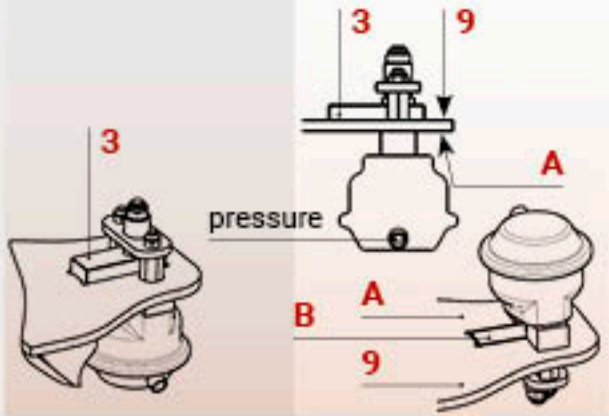
5 Fitting the guidance plate (6). Remove the pression in the cylinder if necessary. Tighten the 2 nuts M12 (7) and one M16x1.5 (8).



M12 (SW19):
Torque: **40/50 Nm**

M16x1.5 (SW24):
Torque: **80/90 Nm**

6 Check with cylinder under pressure:
The lock plate (3) must be guided in the groove of the plate (9).
The surface **B** of the lock plate (3) must be aligned with the surface **A** of the plate (9)

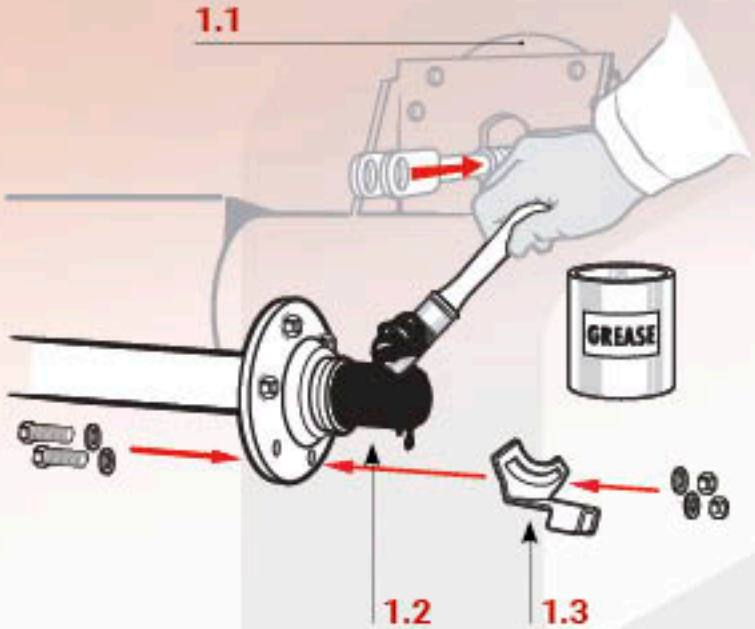


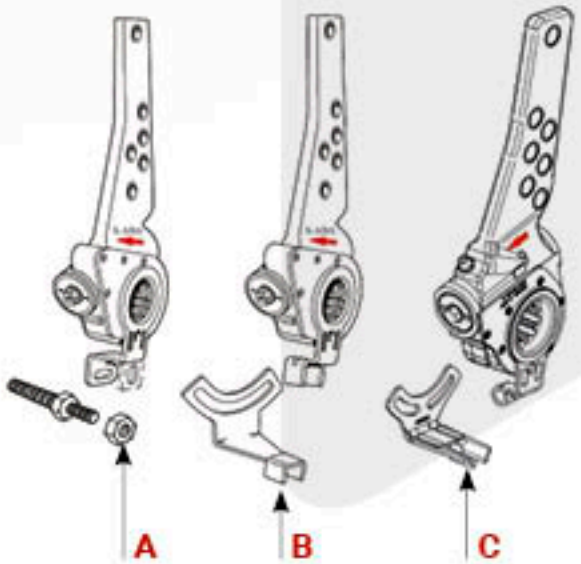
ST309-3

C26

INSTRUCTION SHEETS

- ST310-3: Self-adjusting brake levers, Adjustment procedure





1 Mounting the lever

1.1 Mount the brake cylinder (following the manufacturer's instructions), with the cylinder rod retracted.

1.2 Clean down the splines on the camshaft and lubricate them.

1.3 Mount the anchor bracket, observing the required tightening torques.

- M8: **20 Nm**
- M10: **35 Nm**

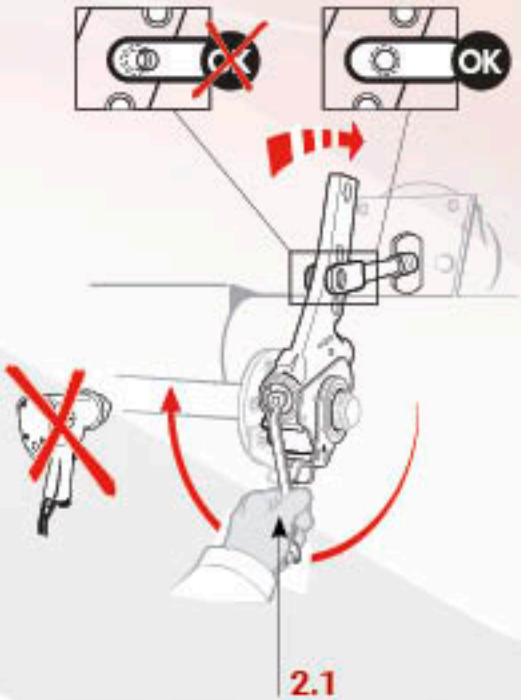
IMPORTANT
The anchor bracket has no specific position but must be in the acceptable zone ("OK" zone)

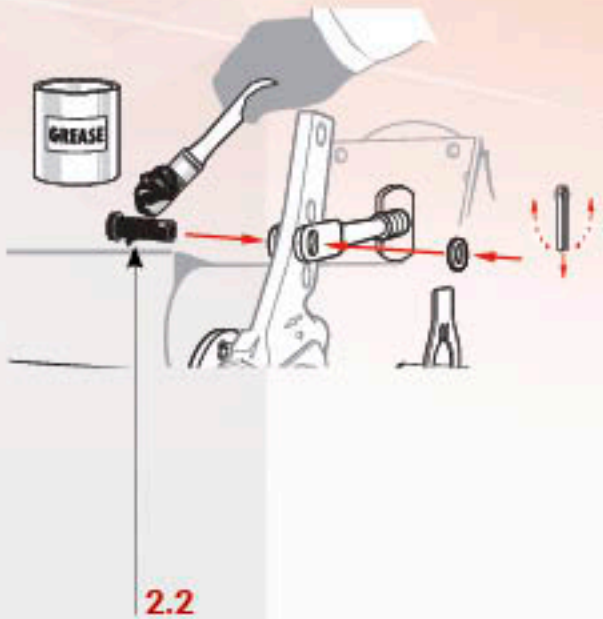
Note: SAE-SMB uses 3 types of anchor pin:
- "S" bracket (A) (Old generation)
- "U" bracket (B)
- "I" bracket (C)

2 Lever assembly - Brake rod

2.1 Using the lever adjusting screw, align the hole of the chosen lever with those of the brake cylinder's rod clevis.

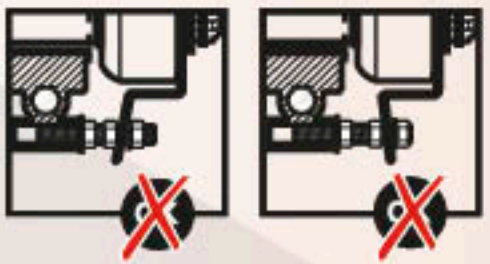
2.2 Lubricate and mount the clevis pin.

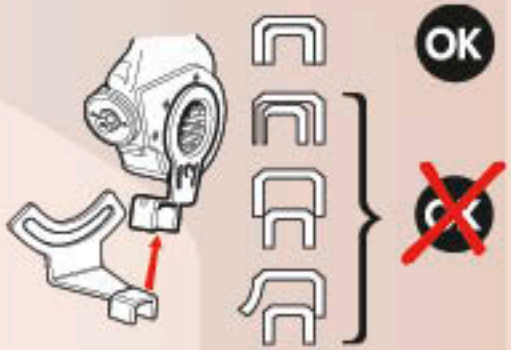




3 Checking the anchor pin

Check that the anchor bracket has been mounted correctly, and if not, start again.



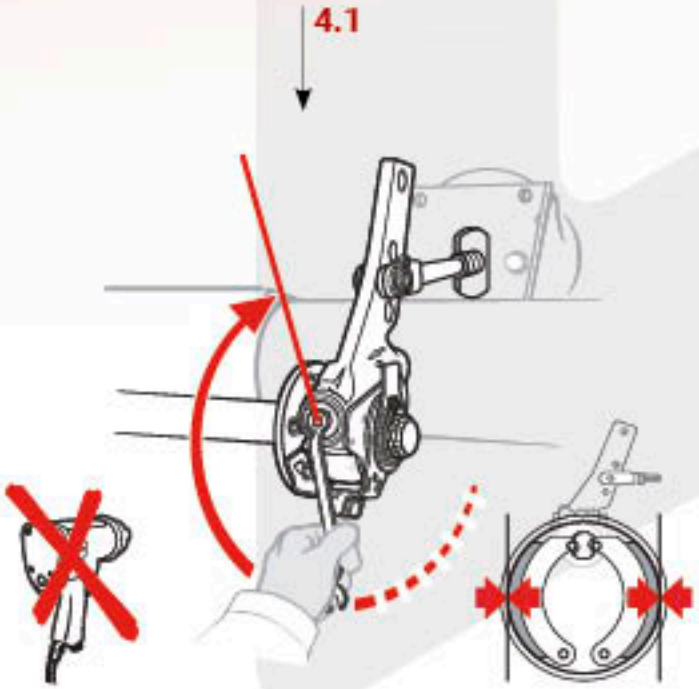


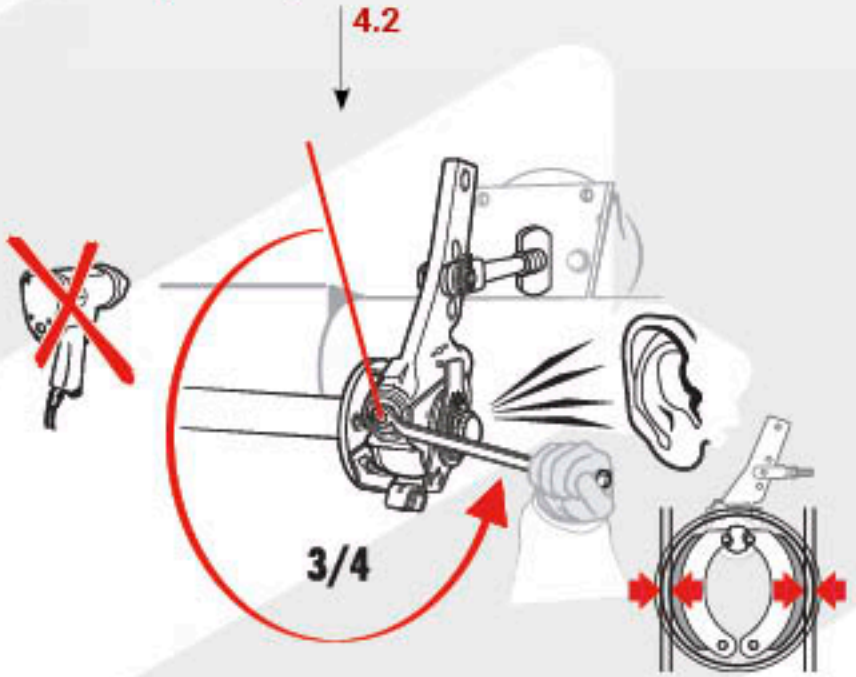
4 Lever adjustment

4.1 Put the brake linings in contact with the drum using the brake lever's adjusting screw.

4.2 Loosen the lever's adjusting screw by approximately 3/4 of a turn in order to create the necessary clearance between the brake lining and the drum.

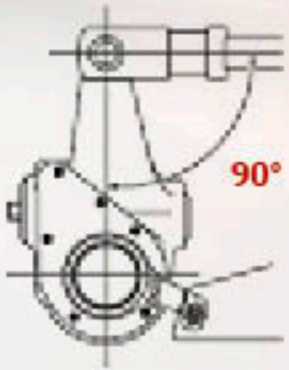
This clearance is very important and ensures the proper functioning of the self-adjusting lever (effectiveness of backlash adjustment).





INSTRUCTION SHEETS

- ST310-3: Self-adjusting brake levers, Adjustment procedure



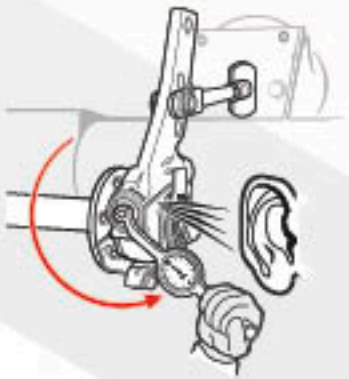
4.3 Checking the angle of the cylinder rod when braking

- Put the air chamber in pression (p = **2 to 5 bars**) in order to bring the brake linings into contact with the drum.
- Check the angle of the cylinder rod and lever: **it must be close to 90° (0, +10°).**

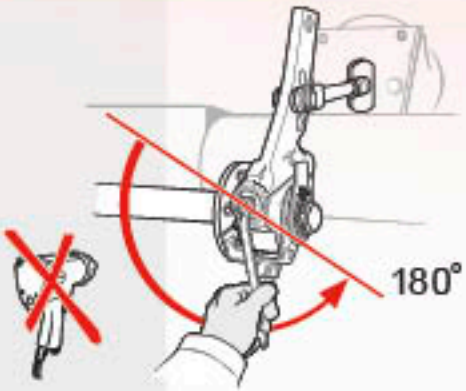
This angle is very important: for effective braking, the angle must be close to 90° when braking. If need be, modify the length of the cylinder rod.

5 Other important checks

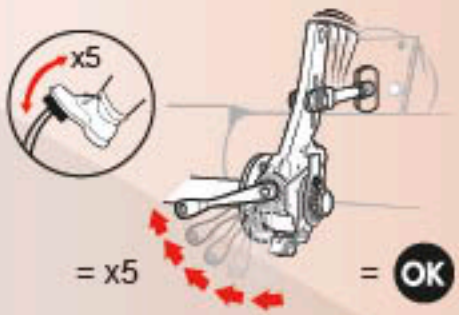
5.1 Slightly loosen the lever's adjusting screw with a torque wrench. If the loosening torque is less than 18Nm, the lever is out of order and must be changed.



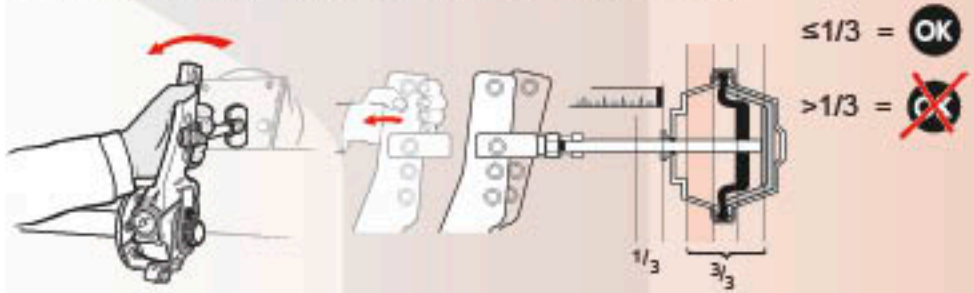
5.2 With a spanner, loosen the lever's adjusting screw by about half a turn (180°).



5.3 Activate the tractor's brake pedal about 5 times. If the spanner "returns", the backlash adjustment is effective. Otherwise, check the installation of the lever and change the lever if necessary.



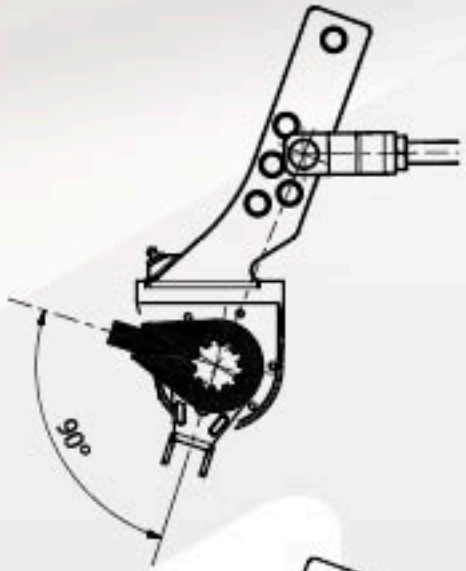
5.4 Manually activate the lever in order to put the brake linings in contact with the drum. The necessary stroke of the cylinder rod must be less than 1/3 of the cylinder's total stroke.



6 Lining wear indicator.

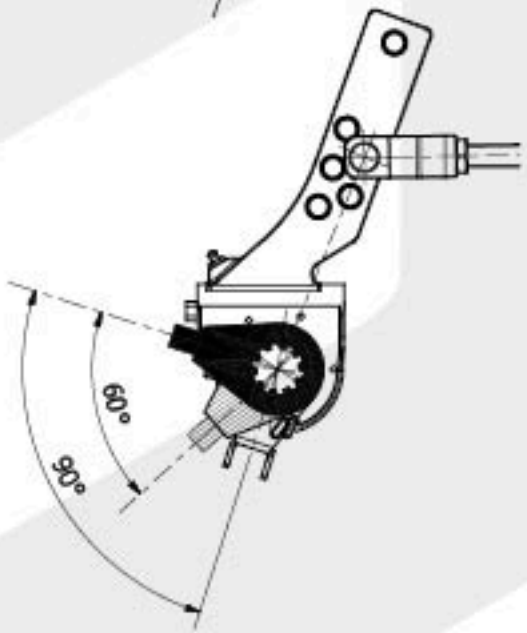
6.1 Assembly with new linings.

Adjust the brakes with the correct "dead distance". Install the washer and wear indicator on the camshaft next to the brake lever (the index finger of the indicator forming as much as possible a 90 ° angle with the lever body). Secure with the Circlip.
The wear indicator is "set". As the linings wear, the indicator gradually rotates as the brakes are adjusted.



6.2 When the index has rotated 90°, the linings are worn and need to be replaced.

If the indicator has been correctly set at the start, the wear of the linings will not have reached the level of the rivets and serious damage to the drum will be avoided.
Carry out a visual inspection of the linings as soon as the indicator has moved 60 °. (Position less than 30 ° from the axis of the lever body)



1 Preparing the axle spindle:

1.1 Clean the axle spindles with a clean dry rag.

1.2 Fit the O-ring seal, ref.: 02500084 or 53108401.

1.3 Grease the axle spindles using a brush with MOLYKOTE® TP42 paste (white paste).

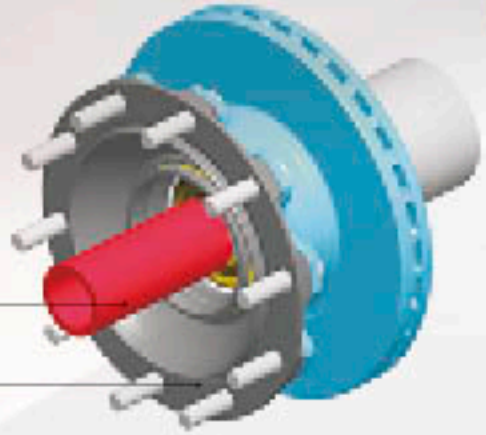
1.4 Screw the fitting sleeve by hand onto the end of the axle spindle, ref.: 09297005 or 990811.

INSTRUCTION SHEETS

- ST311-1: DS0KH2 axles, Fitting hub assembly

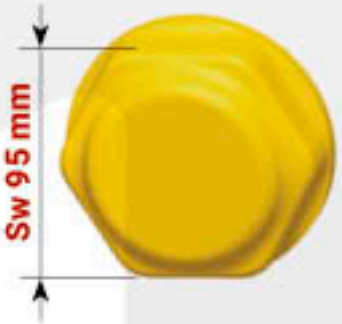
2 Fitting the hub assembly:

2.1 Fit the hub concentrically onto the centring sleeve and push. The assembly is pushed as far as it will go on the axle spindle.



3 Fitting the spindle nuts:

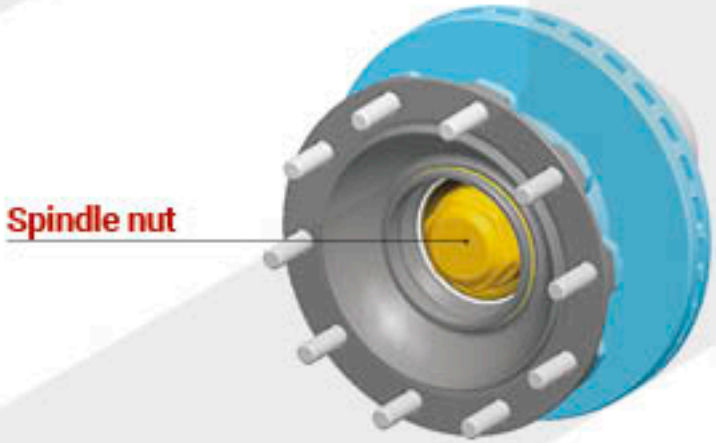
3.1 Lightly grease the nut thread and the bearing face of the nut with MOLYKOTE® TP42 grease.



3.2 Screw on the spindle nut: (diameter across flats: SW 95, **attention RH thread on the right, LH thread on the left!**)

a) Screw the nut up to contact with the bearing with a manual wrench
Never use a slogging wrench!

b) Tighten the nut with a torque wrench
TT = **700 Nm +/- 25 Nm**



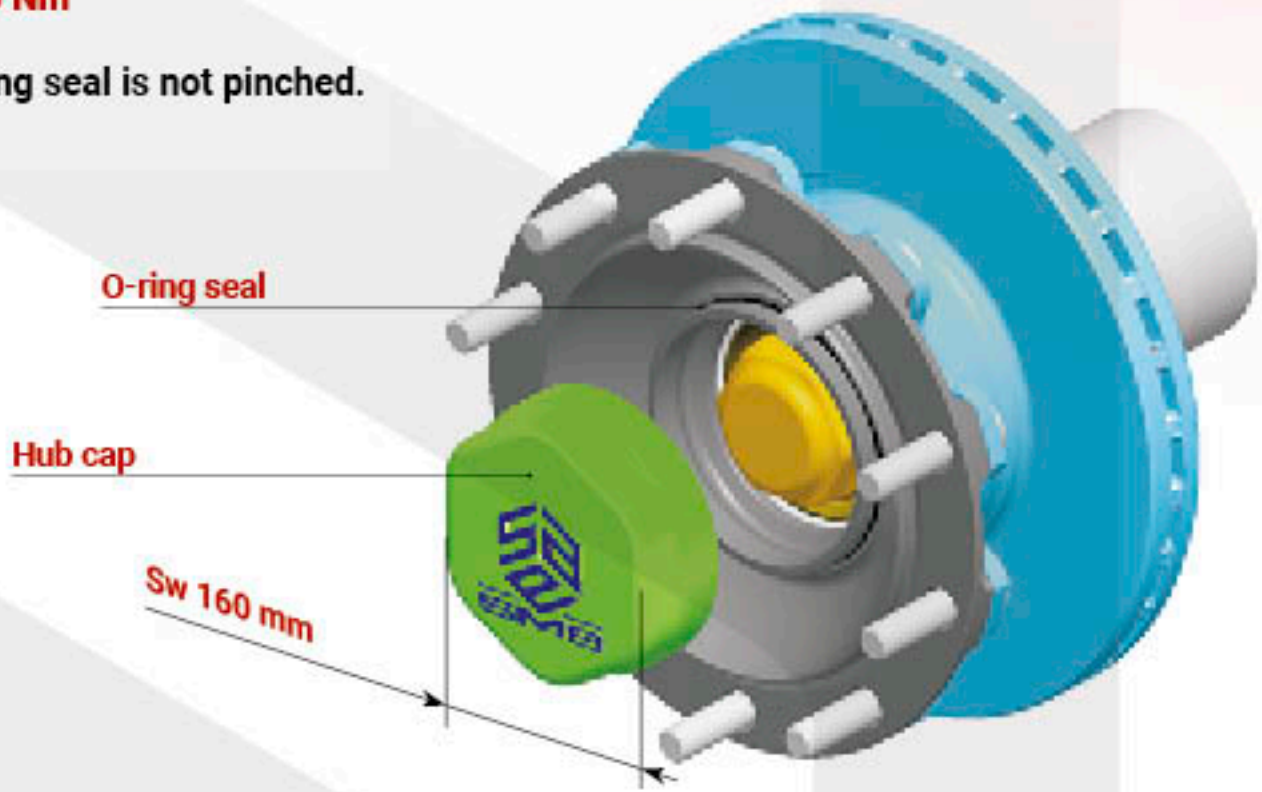
4 Fitting the hub cap:

4.1 Make sure the O-ring seal is correctly in place.

4.2 Screw the cap onto the hub and tighten it with a torque wrench to a torque of

TT = **750 Nm +/- 50 Nm**

Check that the O-ring seal is not pinched.



INSTRUCTION SHEETS

- ST312-1: SM / OKE / OKW suspensions, Replacing the springs wear pads (France version only)

Remove the old wear pads:

For the seats (2): Remove the springs (4), the connecting rods (5) and the rubber stops (6) (fig. 1).

For the equalizer (3):
Also remove the equalizer from its bracket (fig. 2).

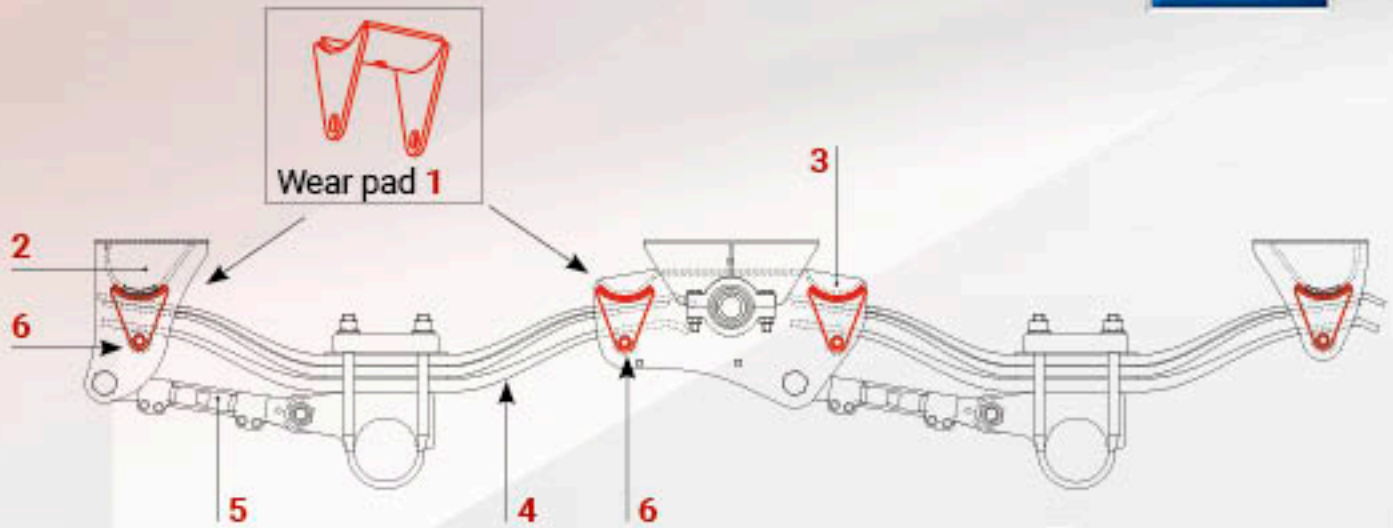
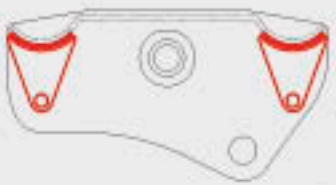


fig. 1

fig. 2



Grind away the 3 weld seams (7) (fig. 3) and remove the wear pad (fig. 4).

fig. 3

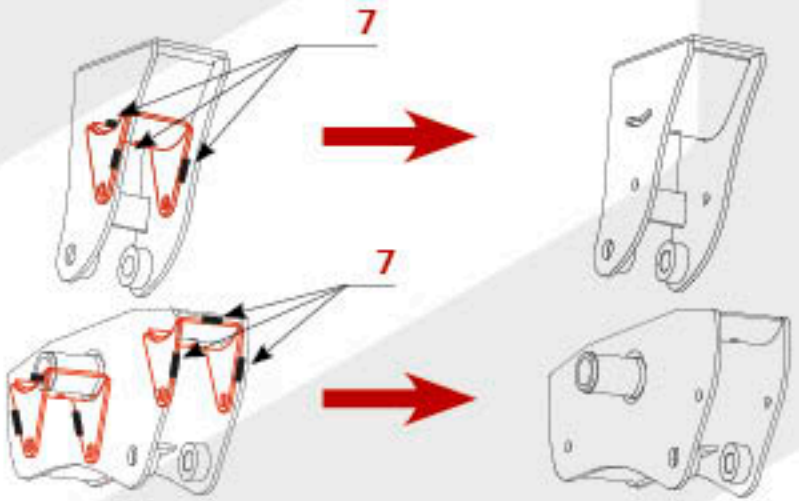


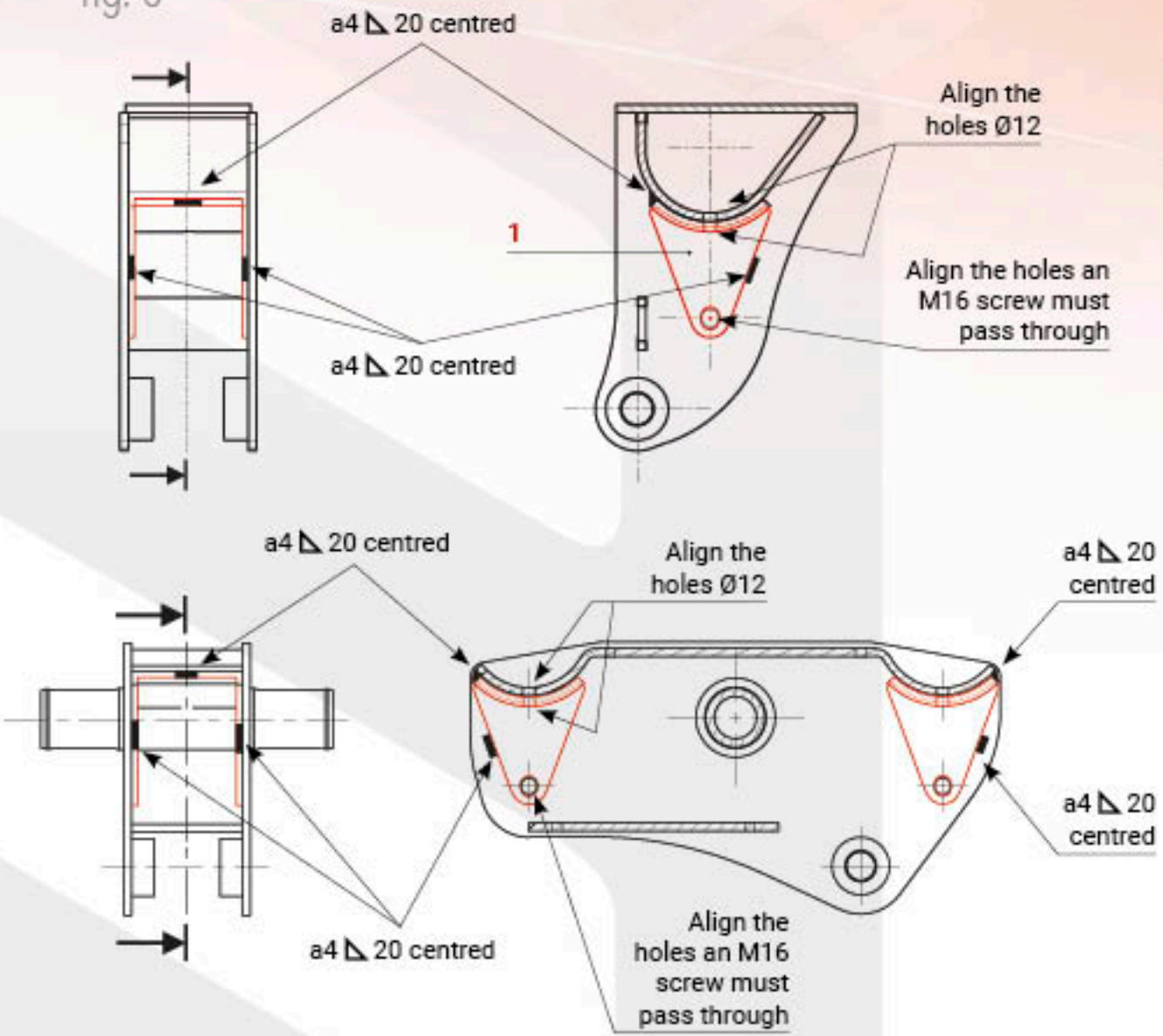
fig. 4

Fitting the new wear pads:

Assemble the new wear pads (1) and weld in accordance with the following instructions (fig. 5).

Wear pad references:
See spare parts list.

fig. 5



INSTRUCTION SHEETS

- ST313-1: SM / OKE / OKW suspensions, Replacing the silentblocs

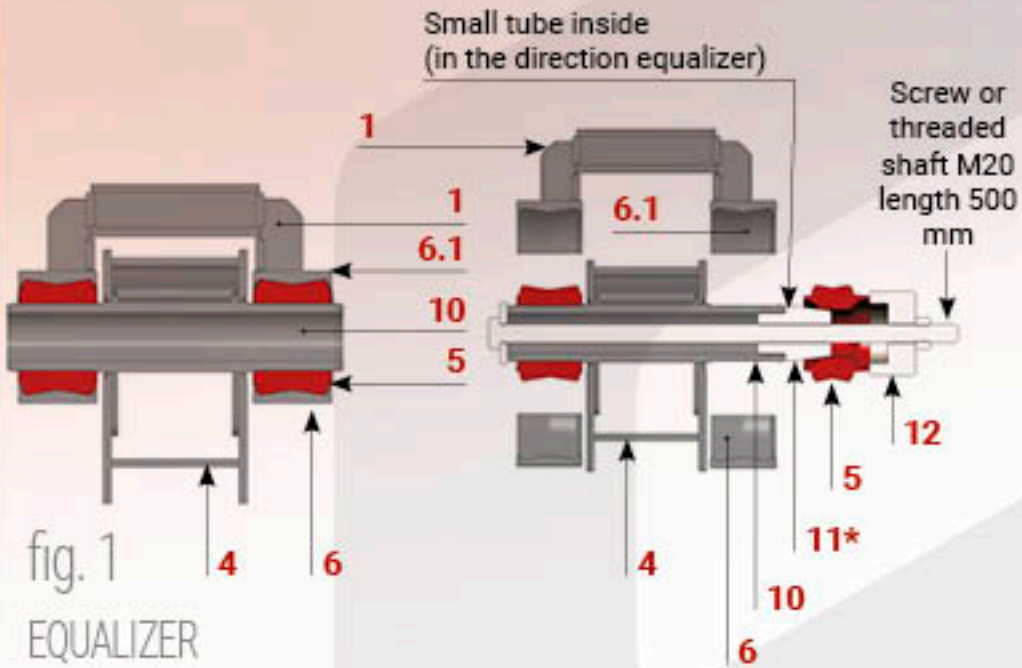


fig. 1
EQUALIZER

* Tool of assembly (11), ref.: 092971001 or 990809-1

Procedure:

Place the jack under the chassis and raise the vehicle until the equalizer bushes (1) are relieved and the ends of the spring are free.

Loosen the clamp and remove the lower clamp (6).
Take out the equalizer (4) from below until the rubber bearing ring (5) s released from the upper clamp (6.1).

Remove the rubber bush (5) from the tube (10).
Clean the tube (10) and the clamps (6.1) with emery cloth and wipe them.
Immerse the rubber bush in lubricant and mount it on the tube (10) using a fitting cone (11) and a forcing-in cup (12) (fig. 2).

Ref. of the SM75 and SM100 balance silentbloc mounting tool: **097141134** or **990809.**

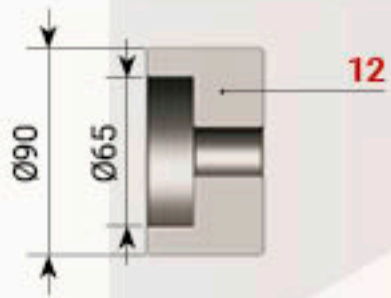


fig. 2
ASSEMBLY OF SILENTBLOC

Next screw the equalizer(4) with the rubber joints under the central seat (1) using the clamps (6).
The clamps (6) must be tightened uniformly using sufficient lubricant. The lubricant used should be a special product for rubber, water or water with dish-washing liquid
Do not use oil!

The equalizer (4) should be held horizontally.
The clamps (M16 screws) must be sufficiently tightened for the junction.
Tightening torque: **170-190 Nm**

INSTRUCTION SHEETS

- ST362-3: DSOKH7 axles, Fitting the hub assembly

1 Preparing the steering knuckle:

1.1 Clean the steering knuckle with a clean dry cloth.

1.2 Install the O-ring 84x4 (ref. Part SAE-SMB: 02500084)

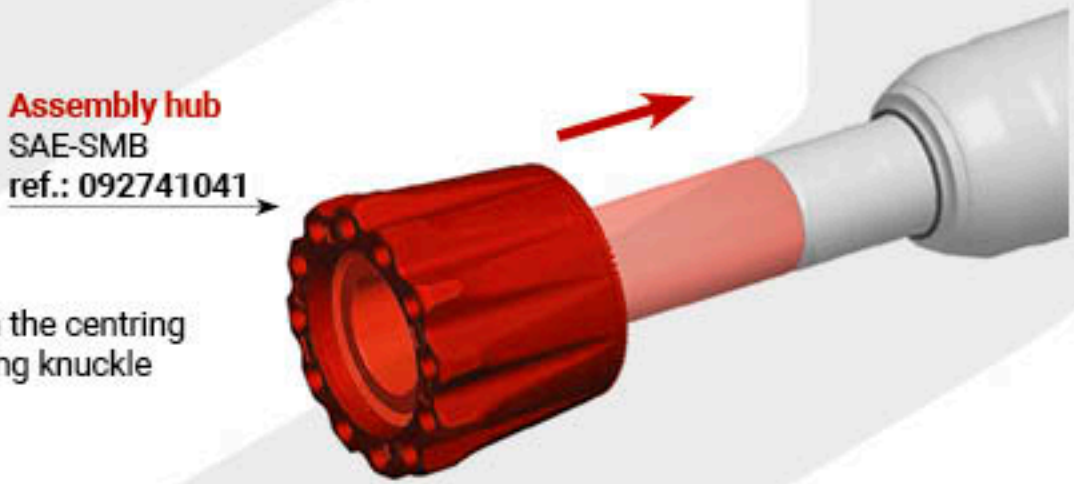
1.3 Using a paint brush grease the steering knuckle with Molykote© TP42 (White paste)

1.4 Screw the centring mandrel (ref. SAE-SMB: 09297005) onto the end of the stub axle with the fingers.

Warning:
right side: M68x1,5 right-hand thread,
left side: M68x1,5 left-hand thread!

2 Fitting the hub assembly:

Fit the assembly hub (SAE-SMB ref.: 092741041) on the centring mandrel and push the assembly hub onto the steering knuckle shoulder



3 Fitting the steering knuckle nuts:

3.1 Grease the threads and the contact face of the nut lightly with molykote TP42.

3.2 Screw the stub axle nut (SW95 AF)

Warning: RH thread on the right and LH thread on the left!

Screw the nut up the bearing with a hand wrench, SAE-SMB ref.: 09251040
Never use a pneumatic wrench!

3.3 Tighten with a **torque wrench**.

TT = **700 Nm +/- 25 Nm**

Spindle nut
M68x1,5 SW95 AF
Right side: RH thread
SAE-SMB ref.: 09400554

Spindle nut
M68x1,5 SW95 AF
Left side: LH thread
SAE-SMB ref.: 09400555

INSTRUCTION SHEETS

- ST362-3: DSOKH7 axles, Fitting the hub assembly

4 Fitting brake disk and wheel hub

Wheel hub
SAE-SMB
ref.: 092811004

Brake disc
SAE-SMB
ref.: 092671002

12x screw Torx
M18x1,5 SAE-SMB
ref.: 09400532

4.1 Fitting brake disc:

Place the brake disc (SAE-SMB ref.: 092671002) on the assembly hub 092741041.

4.2 Fitting wheel hub:

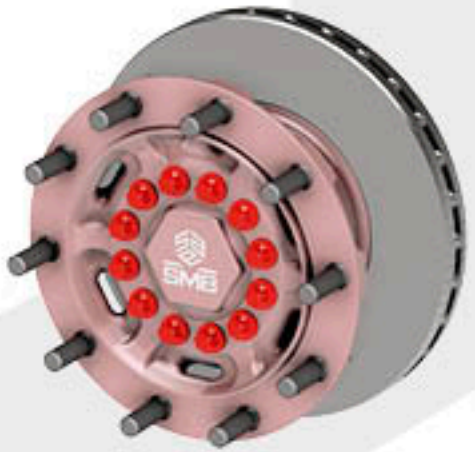
Place the wheel hub (SAE-SMB ref.: 092811004) on the brake disc 092671002.

4.3 Screw the 12 Torx bolts M18x1,5 (SAE-SMB ref.: 09400532) up the wheel hub with a **hand wrench**

Never use a pneumatic wrench!

4.4 Tighten the 12 Torx bolts M18x1,5 crossed with a **torque wrench:**

TT = **450 Nm +/- 20 Nm**

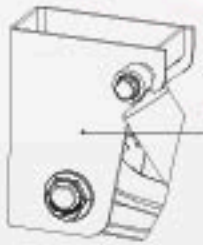


INSTRUCTION SHEETS

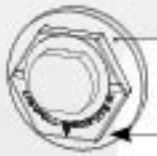
- ST364-1: SP / OKQ Air suspensions, Track alignment with eccentric

Before welding of air suspension brackets, the axle must be positioned as exactly as possible.
In order to compensate the tolerances of manufacturing, the parallelism adjustment should be carried out by using the eccentric bush (see schema 1) Attention you have to look for that the both eccentric bushes of one air suspension bracket are in the same angle position and the marking point are exactly opposite each other

fig. 1



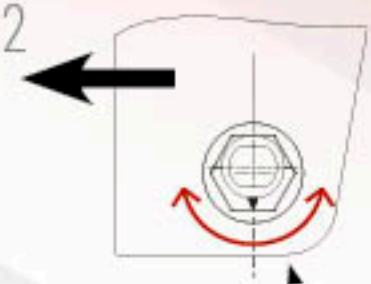
Bracket



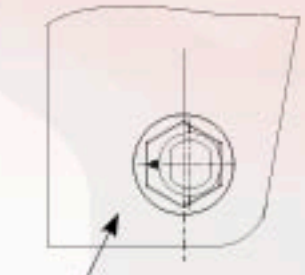
Eccentric bush

Marking at the eccentric bus: **point 0**

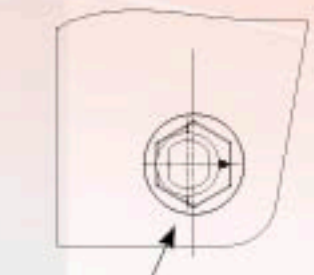
fig. 2



Point zero
Before the adjusting alignment.



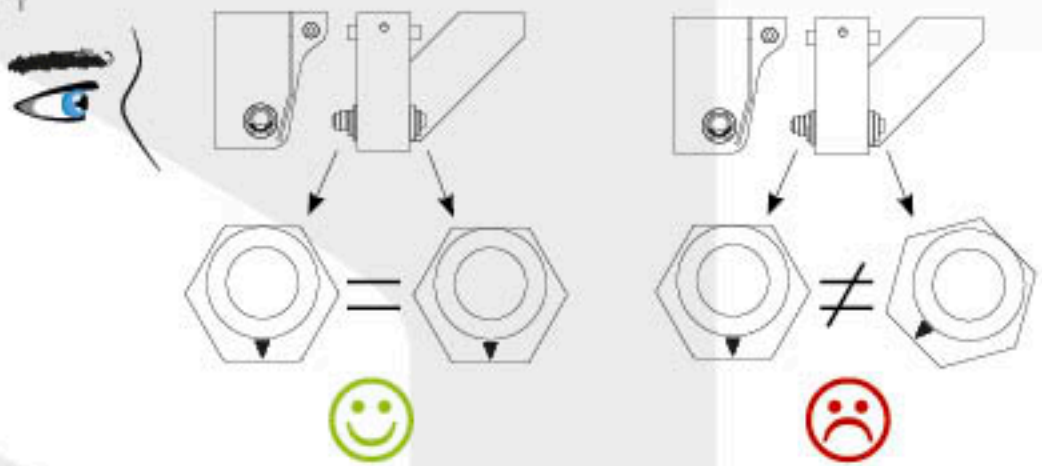
Back shift
Maximum axle displacement of 5 mm backward



Front shift
Maximum axle displacement of 5 mm forward

fig. 3

fig. 4

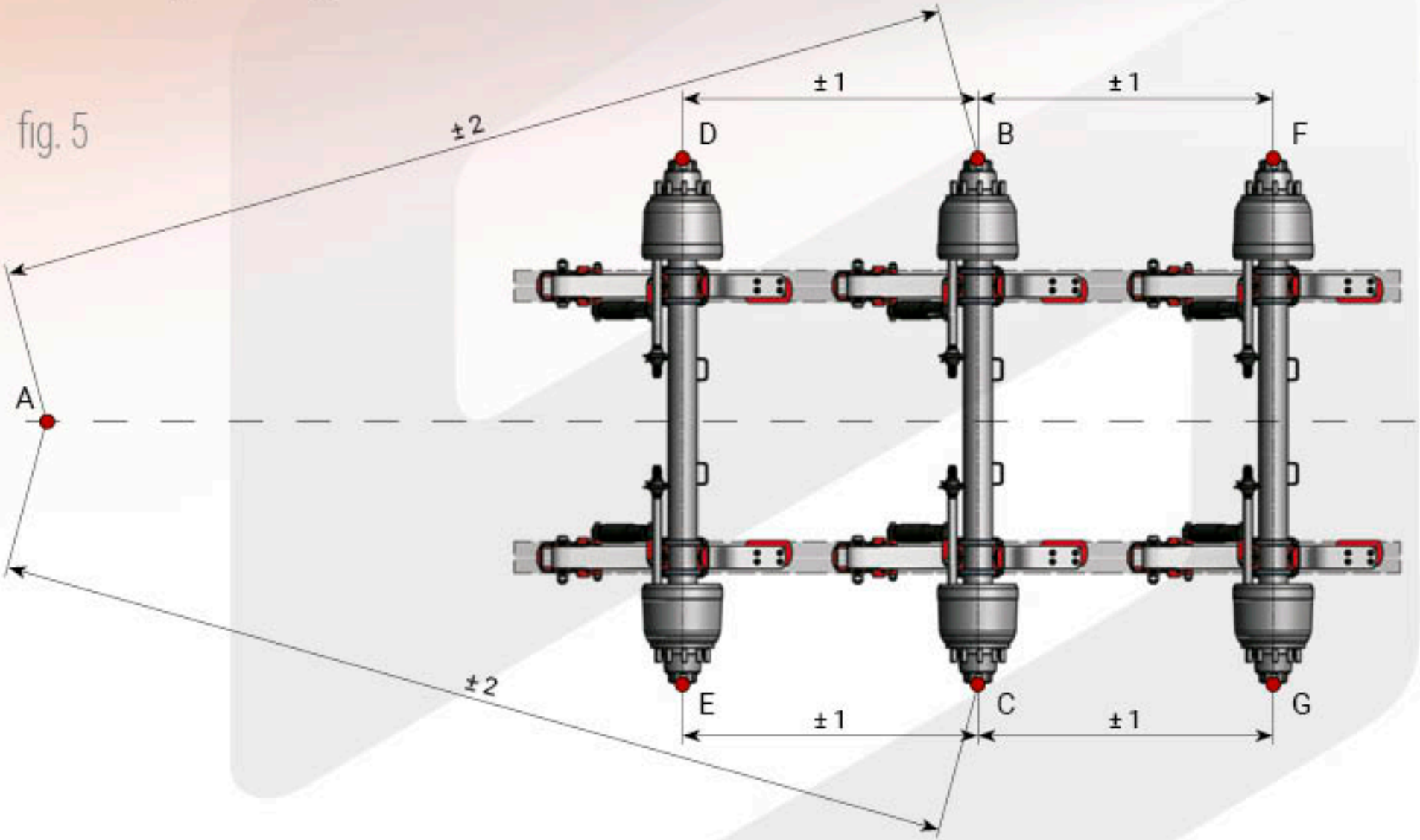


INSTRUCTION SHEETS

- ST364-1: SP / OKQ Air suspensions, Track alignment with eccentric

Determine the diagonal distance A-B and A-C by comparable measures (tolerance ±2mm Verify, and if necessary correct the wheel base B-D and C-E for the front axle as well as for -F and C-G for the rear axle (tolerance ±1). See schema 5

fig. 5



INSTRUCTION SHEETS

- ST364-1: SP / OKQ Air suspensions, Track alignment with eccentric

1 Before the track alignment starts, for all 4 eccentric bushes of each axle line must be paid attention for that the zero point (marque) on the eccentric bushes points to the ground when the vehicle is upright. Tightening locking nut so far, that eccentric bush let move stiff (approx. 200 Nm).

2 Alignment tooling mounting according the manufacture advise and orientate.

3 Doing track alignment and diagnostic actual requirements!
For example: axle line must be in driving direction to left justified backwards!

4 With mounting tool or 2 fork spanner Sw60 turning both eccentric bushes of air suspension according to schema 7:

5 Checking track alignment:

☹, then back to step 4 and point precisely ↻ or ↺

☺, then step 6.

fig. 6

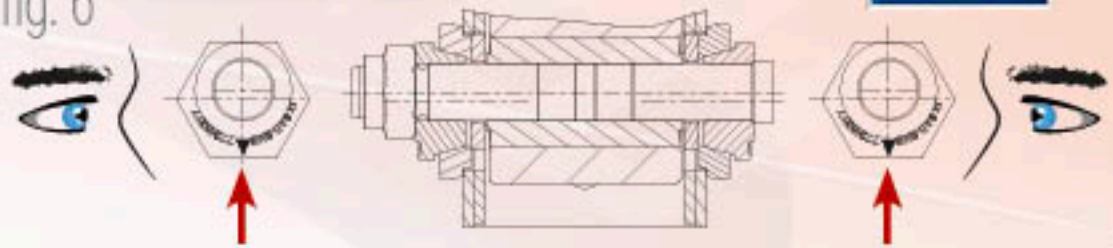


fig. 7 (example)

fig. 8 (example)

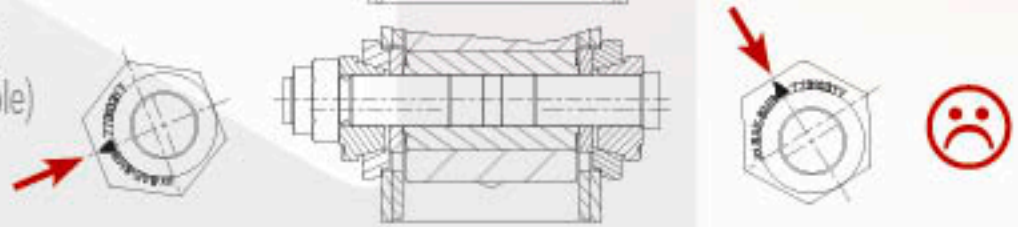
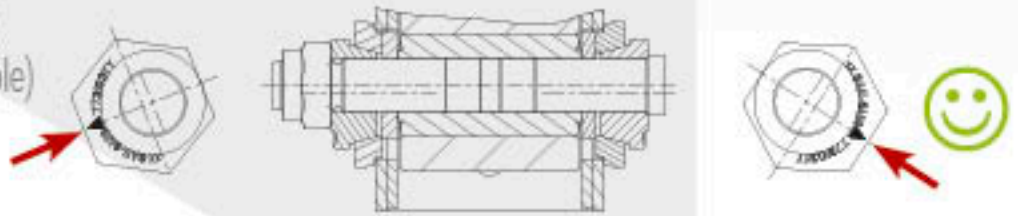


fig. 9 (example)



6 Tightening the nut **M27x1.5 au couple 550-600 Nm**. Make sure that the zero point of the eccentric bushes does not turn and the marking point are exactly opposite each other.

Assembly tools:

Ref.: 00311047
or 990801

Ref.: 092511002
or 990808

INSTRUCTION SHEETS

- ST375-4: P14 - P16 - P18 axles, Bearings adjustment procedure

Mounting and hub greasing: Check ST296

This instruction is applicable both to outboard and inboard mounting.

1 Mounting of the lock washer in contact with the bearing.

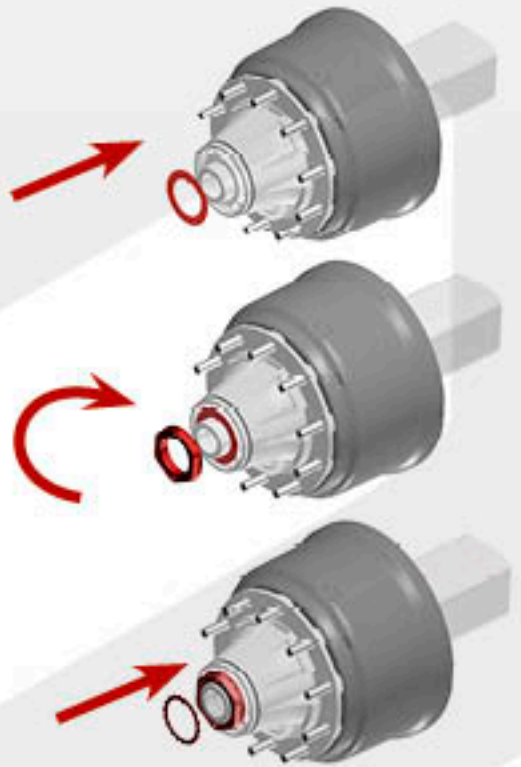
2 Tightening of spindle nuts (SW120)

2.1 Tighten progressively the nut from 300 until to 400N.m during the rotation of the hub

2.2 Unscrew completely the nut hub

2.3 Tighten the spindle nut during the rotation of the hub:
TT = 110-130 Nm (P14)
TT = 130-150 Nm (P16 / P18)

3 Mounting of the safety ring in contact with the spindle nut.



INSTRUCTION SHEETS

- ST375-4: P14 - P16 - P18 axles, Bearings adjustment procedure

4 Tighten slightly the spindle nut to have the threaded hole M8 in front of the closest form of the safety ring

5 Set up and tighten the 2 security screw M8

TT = 20-25 Nm

6 Fill the hub cap with grease type SAE-SMB: Thickness 35 - 40 mm, 550 to 600 g.

7 Check that the O-ring is in position

8 Screw the hub cap and tighten it with a torque wrench:

TT = 700-800 Nm

9 Check if O-ring is not pinch

INSTRUCTION SHEETS

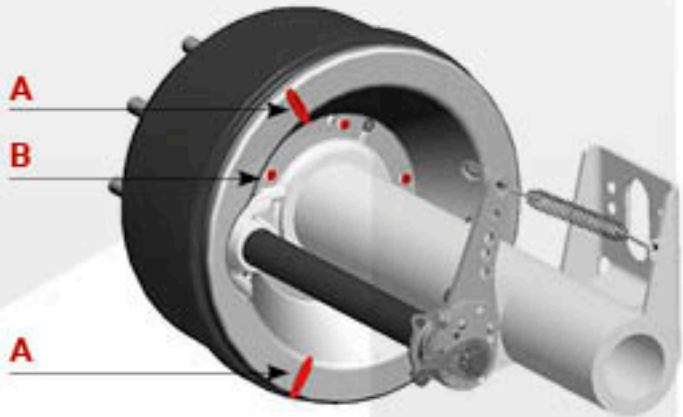
- ST406-1: SH7 axles with brake 4220C1 / C113 SMB, Drum brake inspection and maintenance

Checking brake drums and linings:

Every 3 months or 50,000 km:

1 Checking the thickness of the linings

- Remove a rubber plug (**A**) on each mudguard plate.
- Check the residual thickness of the linings using a ruler: If this thickness is less than 6 mm, the linings must be changed.
- After inspection, replace the plugs on the mudguard plates.



2 Checking the attachment of the mudguards

- Checking the tightening torques of the fixing screws (**B**) of the mudguards plate
  M8: 20-25 Nm

3 Checking the drum diameter

- After removing the mudguards and using a caliper, check the diameter of the drum: If this diameter is equal to or greater than Dmax, the drum must be changed.

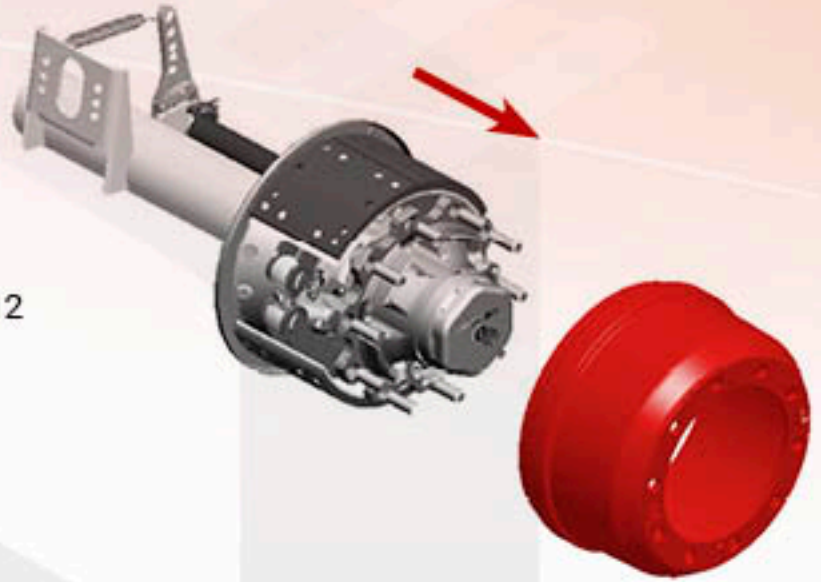
Brake	Type	Dmax.
419x203	4220C1 / C113 SMB	424

INSTRUCTION SHEETS

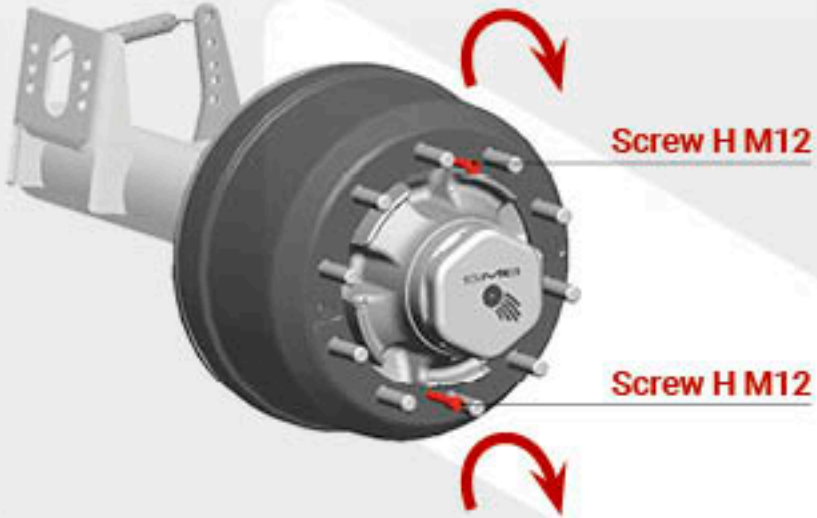
- ST406-1: SH7 axles with brake 4220C1 / C113 SMB, Drum brake inspection and maintenance

Replacing the brake drums:

- Remove the wheels.
- Put the brake in the initial position (brake not applied).
- Remove the brake drum by sliding it axially.



- If the brake drum does not disengage from the axle, screw two H-M12 screws into the holes provided and tighten them alternately until the drum disengages from the axle.

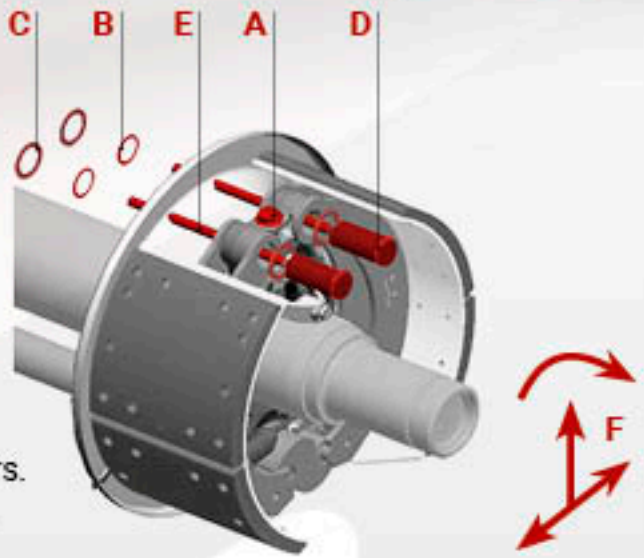


- Thoroughly clean the centering and the bearing surface of the drum on the hub and fit the new drum on the hub.
- Refit the wheels and check the brake adjustment. (See **ST306** or **ST310**)
- Check the braking efficiency (preferably by tests on a brake bench)

INSTRUCTION SHEETS

- ST406-1: SH7 axles with brake 4220C1 / C113 SMB, Drum brake inspection and maintenance

Replacing the brake linings:



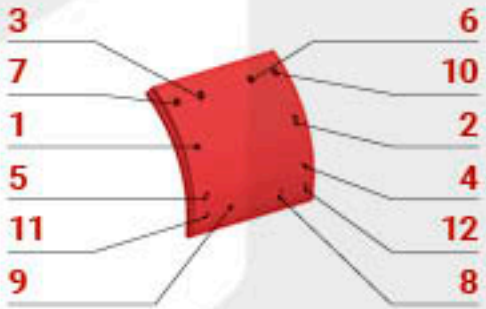
- Remove the wheels and make sure the brakes are fully released (free).
- Remove the hub caps (Using the wrench M009813 or 990810).
- Remove the spindle nuts with the wrench M009813 or 990810.

Attention: Right screw's thread on the right side, left screw's thread on the left side!

- Remove the hub-drum assemblies.

Attention: Do not damage bearings and stub axles!

- Loosen the security screw (A) on the "Spider" brake brackets which hold the axes of the fixed points of the brake shoes.
- Remove Circlips (B) and washers (C) on these axes of fixed points.
- Remove fixed point axis (D) by pushing them with a cylindrical tool (E) (pin pusher for example).
- Push (F) the shoes lined down to disengage them from the brake support.
- Remove the entire brake shoes with lining as well as the return spring and the cam rollers.
- Examine the brake shoes: If damaged (wear of the rollers, corrosion, deformation, etc.), systematically replace them with an original SAE-SMB "shoes with lining " assembly.
  - > Or change the brake linings:
    - Derived the old brake linings and carefully clean the brake shoes.
    (The support surface of the linings must be perfectly free of rust and any other irregularity)
    - Rivet the new linings (Original SAE-SMB) respecting the riveting order as shown in the figure opposite. (**Riveting force from 1800 to 2300 DaN**).



- Visually check the riveting, you must:
  - > An absence of play between the lining and the shoe.
  - > An absence of cracking of the linings.
- Examine the camshaft. In the event of wear or play, replace the cam and its housing (bronze bushings and seals).
- Check the state of corrosion and elongation of the brake shoe return spring. (No play between unloaded spring turns allowed). Systematically replace it if damaged.
- Install the brake shoes in the reverse order to removal.

IMPORTANT: Lubricate the cam roller axles and the fixed point axles with copper paste and tighten the safety screw (A) with a torque wrench: Tightening torque: 140 to 200 Nm

- Fit the hub-drum assembly (Lubrication / adjustment of the bearings according to **ST296** & **ST375**) and the wheels.
- Check the brake adjustment.
- If possible, check the braking efficiency (Preferably by tests on a braking bench)

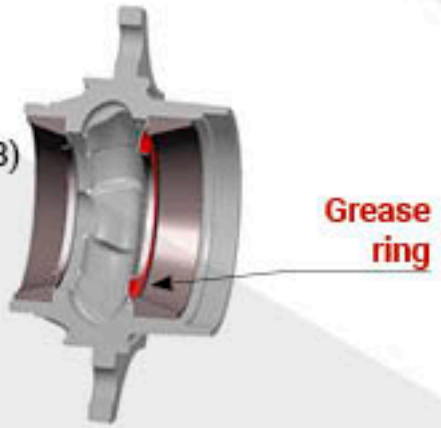
INSTRUCTION SHEETS

- ST408-1: SH7/DSH7 05506 axles, Fitting the hub assembly

1
Press-mount the nilos and the external cages of the roller bearing into the hub

2
On the roller bearings without external cages: coat the free spaces between the rollers with lubricant (Grease type SAE-SMB; 40-60 gr of grease by bearing)

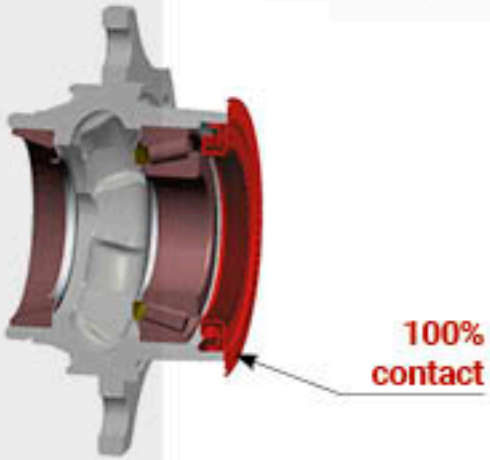
3
Put a grease ring (SAE-SMB) of the nilos 5511201 (50 to 70 gr of grease SAE-SMB)



4
Mount the internal roller bearing into the hub

5
Fill the seal's hollow with lubricant to 75% of its capacity before mounting it into the hub, using the appropriate tool, while visually checking for concentricity between the two parts.

6
Press-mount the seal into the hub. (The perforated ring's base must press against the hub across its entire periphery)



INSTRUCTION SHEETS

- ST411-3: SM / OKE / OKW / OKP Mechanical suspensions, Track alignment

Inevitable tolerance manufacturing oblige an adjustment of the parallelism to minimize tyre wear and rolling resistance.

The adjustable rods allow the adjustment (1)

Adjustment instruction:

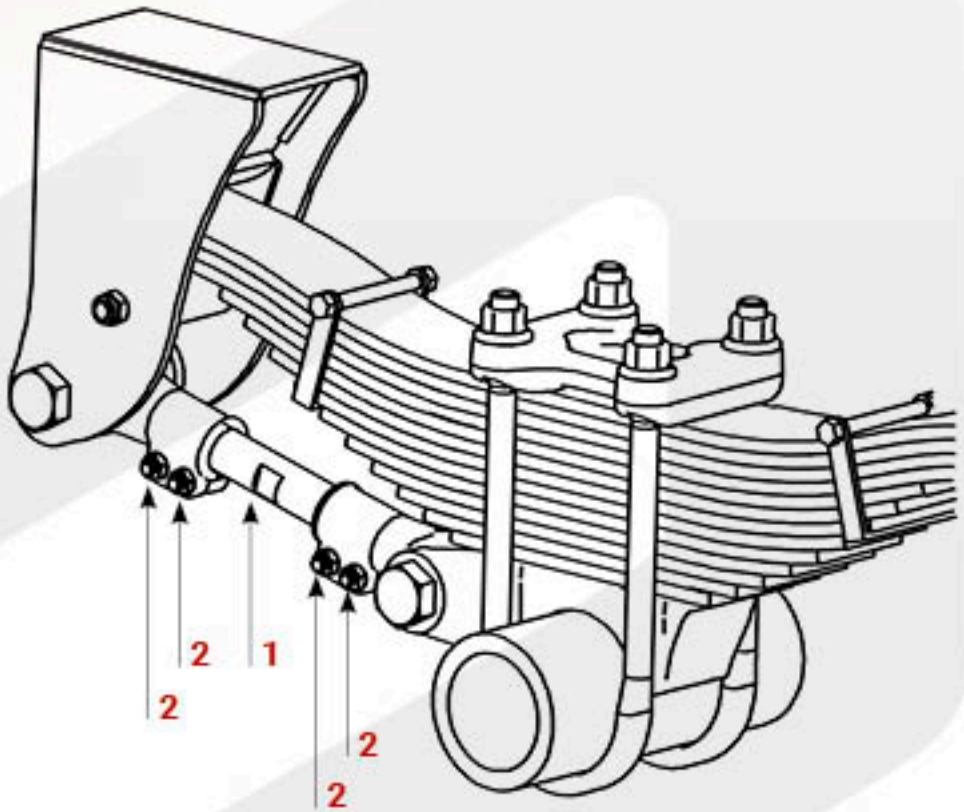
1 Unscrew the connecting nuts of adjustable rod (2)

2 To obtain the desired correction turn the rod (1) using the flat surface **SW=27** and observing the direction of the thread

To correctly align axles see **ST364** Fig.5

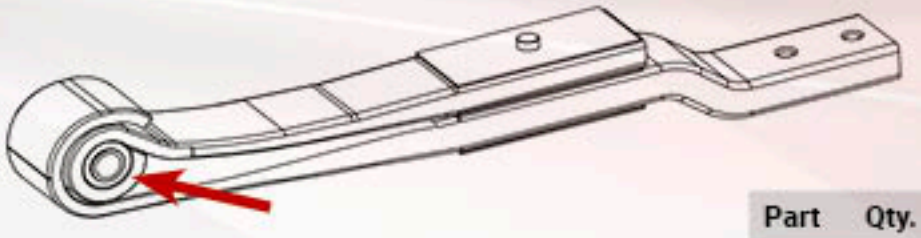
3 Screw the connecting rod nuts (2).
Tightening torque:

Suspension	Type	Tightening torque
SM / OKE / OKW	M12 x 1.75	70 - 80 Nm
OKP	M14 x 2.00	120 - 140 Nm
SM HD / OKZ	M12 x 1.75	70 - 80 Nm



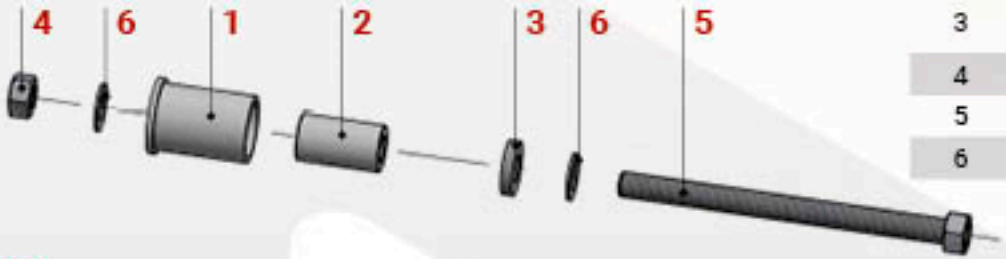
INSTRUCTION SHEETS

- ST428-1: SP / OKQ Air suspensions, Replacing the silentbloc



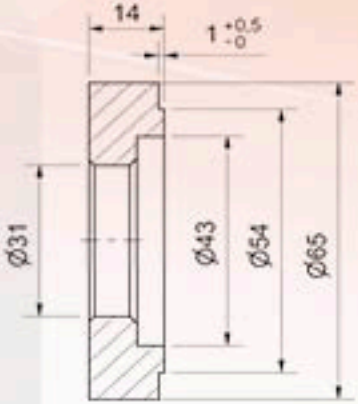
1

Use the tool kit SAE-SMB part N°: **097151245**



Part	Qty.	Description
1	1	Base
2	1	Tube for dismounting
3	1	Washer for silentbloc with external steel ring
4	1	Nut M30 Cl.8 ZN 5/7 ISO4032
5	1	Screw M30 L=400
6	2	Washer M30 HV300 ZN ISO7089

Details part 3:



2

Dismounting silentbloc of trailer arm according picture Fig.2a and Fig.2b. Clean the boring of the trailing arm (a)

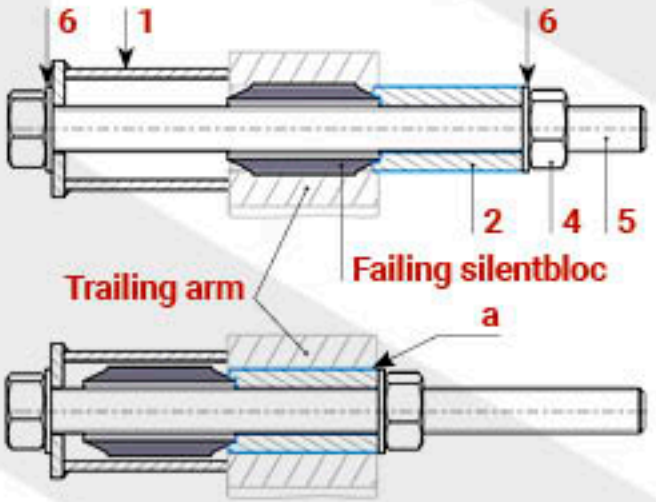


fig. 2a START OF DISMOUNTING

fig. 2b END OF DISMOUNTING

INSTRUCTION SHEETS

- ST428-1: SP / OKQ Air suspensions, Replacing the silentbloc

3 Version 1: Fit the new silentbloc according fig.3a and fig.3b. Use soapy water for easier mounting.

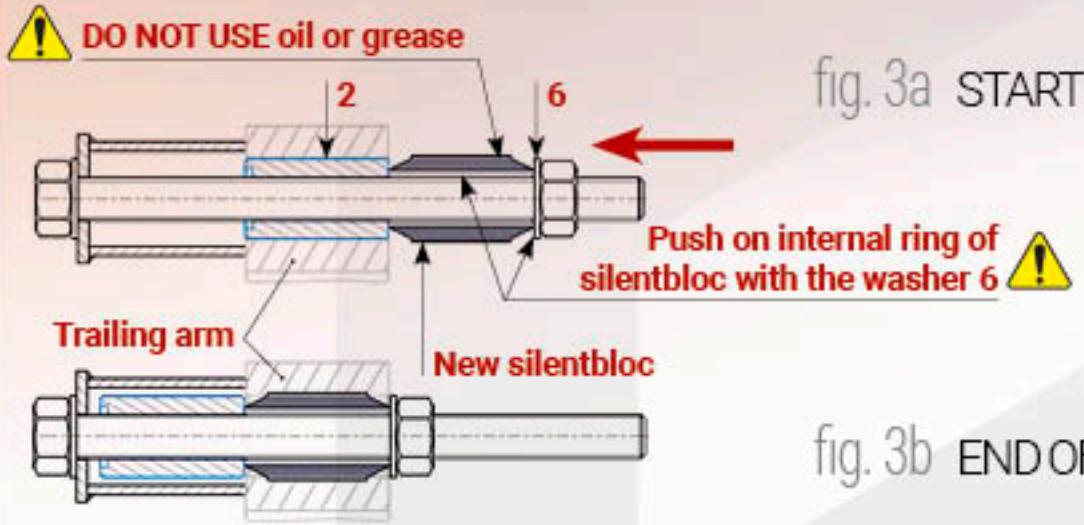


fig. 3a START OF MOUNTING

fig. 3b END OF MOUNTING

Version 1
Without external steel ring

3 Version 2: Fit the new silentbloc according fig.4a and fig.4b. Apply a light coat of grease on external ring of the silentbloc and in the boring of the trailing arm before mounting.

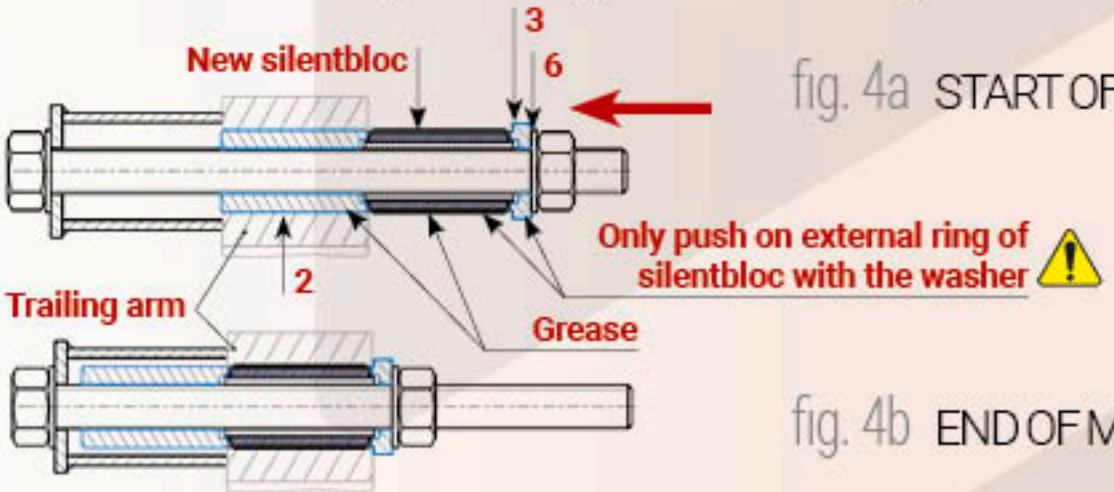


fig. 4a START OF MOUNTING

fig. 4b END OF MOUNTING

Version 2
With external steel ring

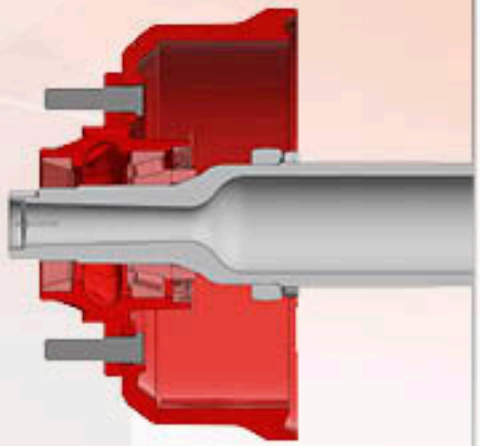
INSTRUCTION SHEETS

- ST435-1: SH7/DSH7 05506 axles, Mounting specification

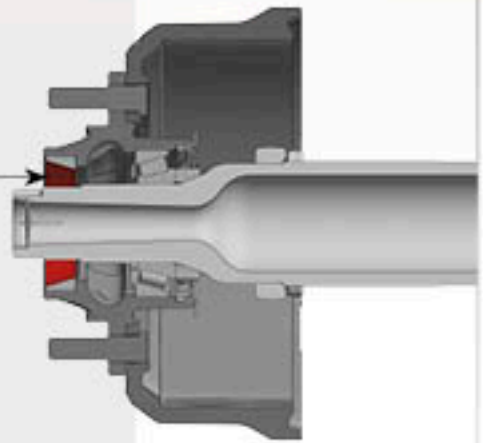
Mounting and hub greasing: See ST408

1

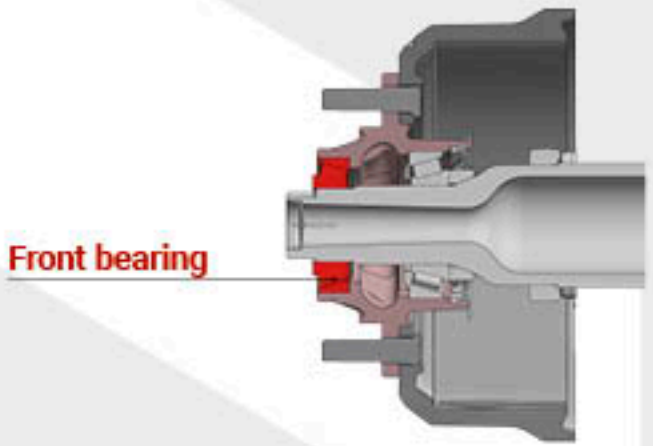
- Clean the spindle with a clean cloth and use a paintbrush to grease the bearing seating lightly with bearing grease
- Mount the hub onto the spindle, taking care not to damage the seal and the thread of the spindle.



2 Put a grease ring (SAE-SMB) of the external cage of external bearing 32212 (40 to 60 gr of grease by bearing)



3 Mount the front roller bearing 32212



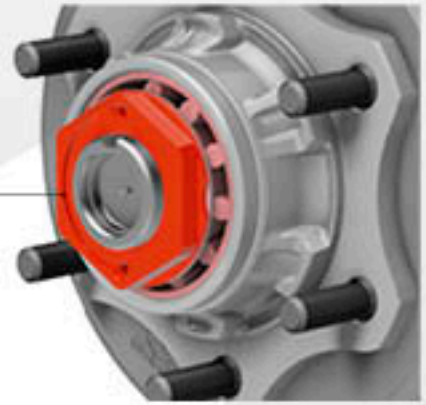
INSTRUCTION SHEETS

- ST435-1: SH7/DSH7 05506 axles, Mounting specification

4 Mounting of the lock washer 57B5502 in contact with the bearing 32212.

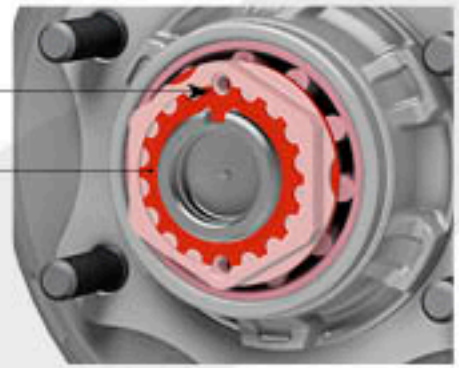
5

- Tighten progressively the spindle nut 57G55B2 (SW85) from **200 until 250 Nm** during the rotation of the hub.
- Unscrew completely the spindle hub.
- Tighten the spindle nut during the rotation of the hub:
  TT = 45 ±5 Nm



6

- Mounting of the safety ring 98805501 in contact with the spindle nut.
- Tighten slightly the spindle nut to have the threaded hole M8 in front of the closest form of the safety ring.

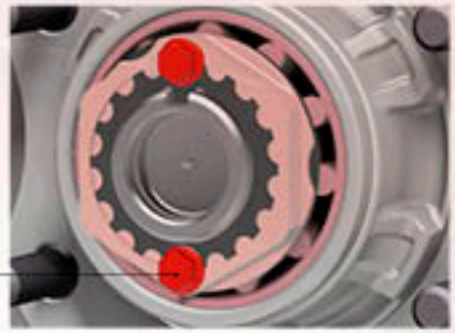


INSTRUCTION SHEETS

- ST435-1: SH7/DSH7 05506 axles, Mounting specification

7 Set up and tighten the 2 security screw M8:

TT = 20-25 Nm



8 Set up the O-Ring 53112001

9 Fill the hub cap 9237-0005
(180-220 g of SAE-SMB grease)

10

- Screw the hub cap and tighten it with a torque wrench: **TT = 700-750 Nm**
- Check if O-ring is not pinch

INSTRUCTION SHEETS

- ST438-1: SH7 07506 3015 axles, Mounting specification

Mounting and hub greasing: See ST296

1

Mounting of the lock washer 57B5502 in contact with the bearing 33212

2

- Tighten progressively the spindle nut 57G55B2 (SW85) from 200 until 250 Nm during the rotation of the hub.
- Unscrew completely the spindle hub.
- Tighten the spindle nut during the rotation of the hub: **TT = 45 ± 5 Nm**

3

- Mounting of the safety ring 98805501 in contact with the spindle nut.
- Tighten slightly the spindle nut to have the threaded hole M8 in front of the closest form of the safety ring.

INSTRUCTION SHEETS

- ST438-1: SH7 07506 3015 axles, Mounting specification

4

Set up and tighten the 2 security screw M8:

TT = 20-25 Nm

5

Set up the O-Ring 53112001

6

Fill the hub cap 9237-0005 (Grease type SAE-SMB; 180 to 220 gr)

7

- Screw the hub cap and tighten it with a torque wrench.

TT = 700-750 Nm

- Check if O-ring is not pinch

INSTRUCTION SHEETS

- ST439-1: P20 axles, Fitting the hub assembly

1

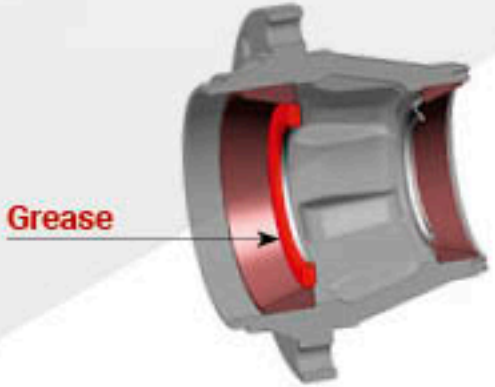
Press-mount the nilos and the external cages of the roller bearing into the hub.

2

On the roller bearings without external cages: coat the free spaces between the rollers with lubricant (Grease type SAE-SMB; 80-100 gr of grease by bearing)

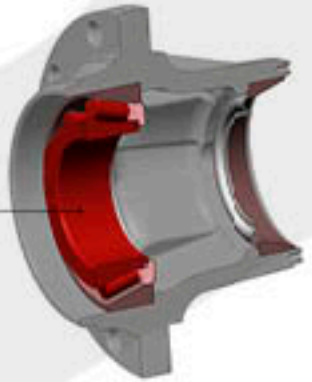
3

Put a grease ring (SAE-SMB) of the nilos 5511201 (150 to 180 gr of grease SAE-SMB)



4

Mount the internal roller bearing into the hub



INSTRUCTION SHEETS

- ST440-1: P20 axles, Mounting specification

Mounting and hub greasing: See ST439

1

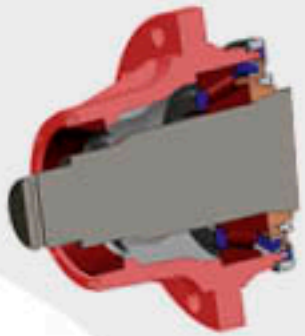
Grease the rings, **Attention: 2 standard parts**

2

- Clean the spindle with a clean cloth and use a paintbrush to grease the bearing seating lightly with bearing grease
- Mount the ring

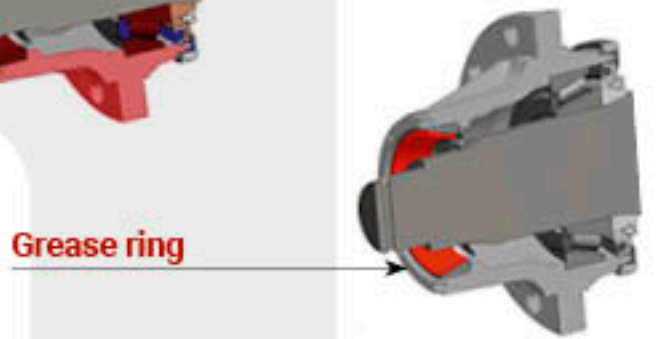
3

Mount the hub onto the spindle, taking care not to damage the seal and the thread of the spindle.



4

Put a grease ring (SAE-SMB) of the external cage of external bearing 33122 (100 to 120 gr of grease by bearing).

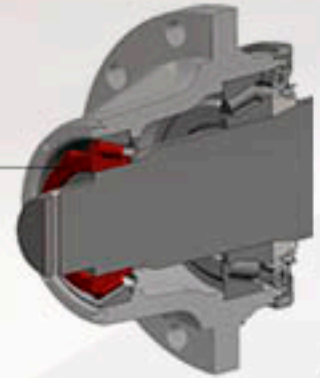


INSTRUCTION SHEETS

- ST440-1: P20 axles, Mounting specification

5

Mount the front roller bearing 33122.



6

Mounting of the lock washer 57B9001 in contact with the bearing 33122.

7

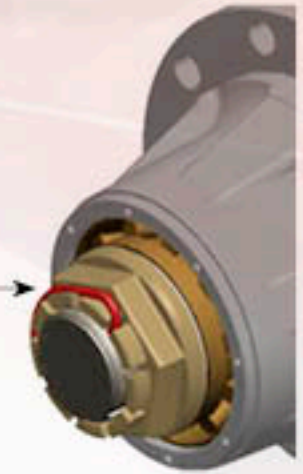
- Tighten progressively the spindle nut 57590D3 (SW120) from **400 until 500 Nm** during the rotation of the hub.
- Unscrew completely the spindle hub.
- Tighten the spindle nut during the rotation of the hub:

TT = 175 ± 15 Nm

8

Unscrew progressively the spindle nut to have the hole Ø9 of the spindle in front of the closest form of the nut.

9
Set up the safety pin.



10
Fill the hub cap 56118007.
(Grease type SAE-SMB; 1000 to 1100 gr)

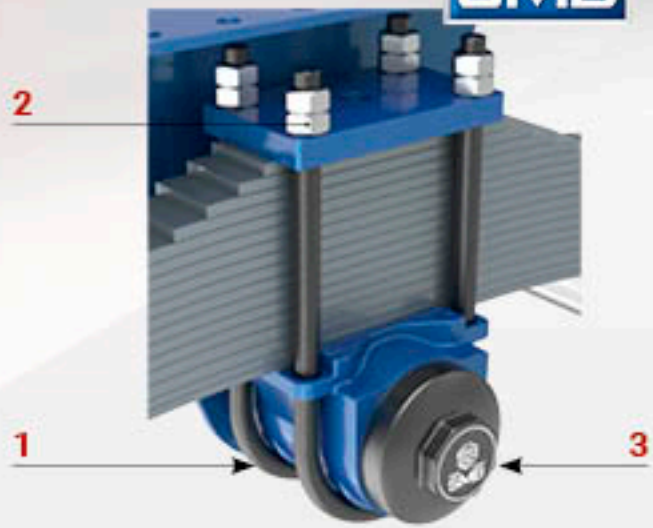
11
Put in place the hub cap and fix it with 8 screw CHC M8x10 Ref.: 96308A0101

TT = 20-25 Nm

INSTRUCTION SHEETS

- ST463-0: SBI / SBZ / OG Bogies, Bushings replacement

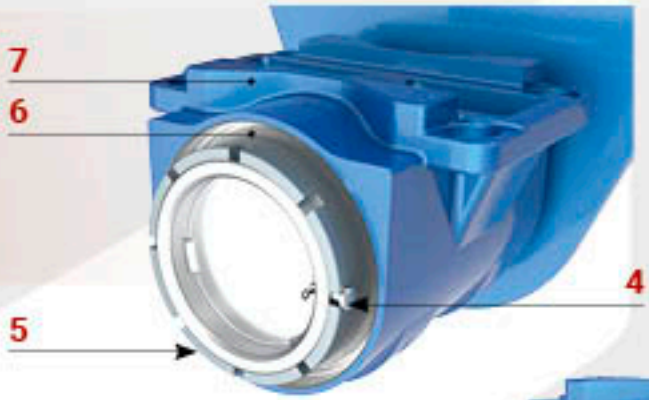
1 After chocking the vehicle, separate the axles + springs assembly from the central part, remove U-bolts (1) and nuts (2).



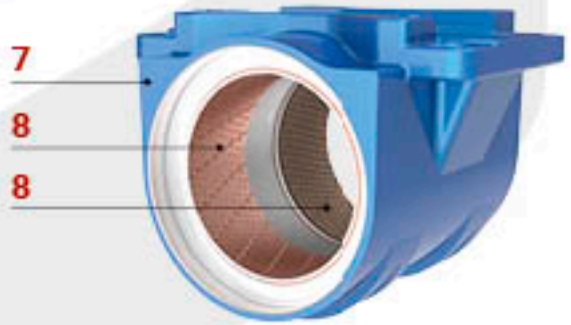
2 Remove the cap (3) using tool SW 120.

3 Remove the safety pin (4), loosen the stopper ring (5) and remove the friction washer (6).

3.1 With the help of a bar, move the plummer block in order to see the clearance. Use a standard gauge to measure the clearance, if it's upper than 1mm, change bushings. If the clearance is not important continue to reassemble the bogie following the step 9.



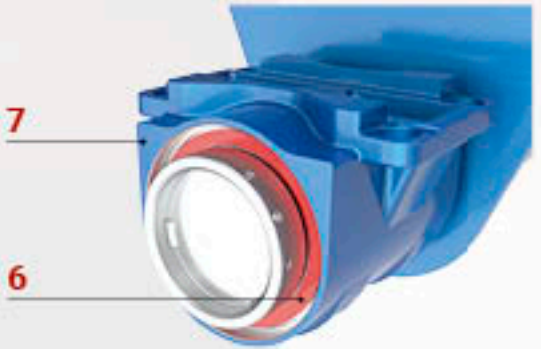
4 Remove the plummer block (7)



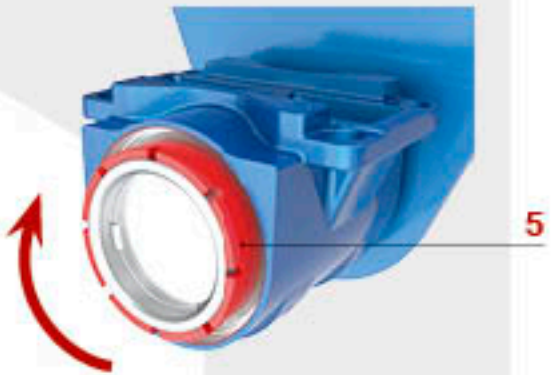
5 Replace the bronze bushings (8) inside the plummer block (7), a press tool can be necessary.

6 Replace the seal (8).

7 Reassemble the plummer block (7) and insert a new friction washer (6).



8 Keeping the plummer block horizontal, screw the stopper ring (5) in contact until the part locks.

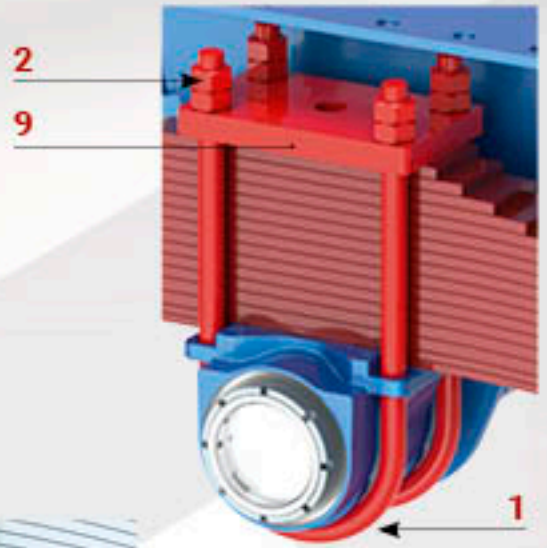


INSTRUCTION SHEETS

- ST463-0: SBI / SBZ / OG Bogies, Bushings replacement

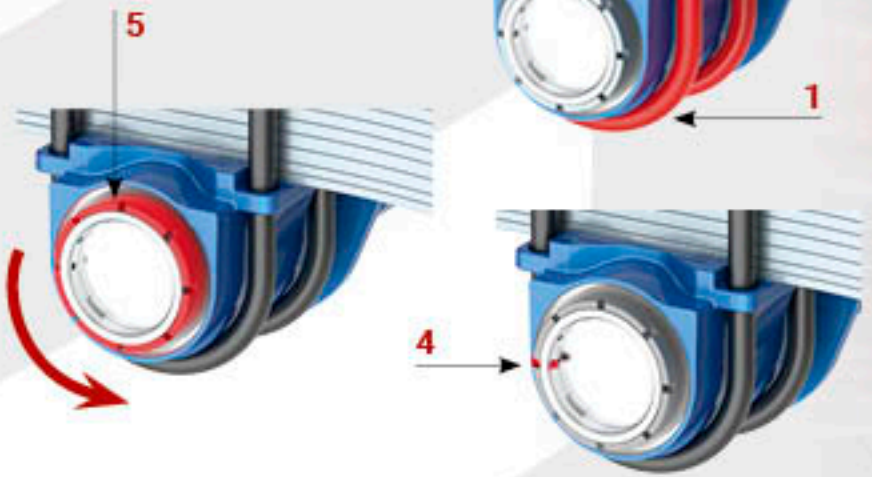
9 Position springs + axles on the plummer block and fix top plate (9) with U-bolts (1) and nuts M36x3 (2)

Tightening torque = 1550-1700 Nm



10 Unscrew the stopper ring (5) to match the first radial hole and insert the safety pin (4).

Check that the bearing rotation is free by hand, otherwise unscrew the lock ring again to match the next hole.



11 Screw the cap (3) using tool SW 120.

Tightening torque = 750-850 Nm

NOTE

NOTE

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