



MAINTENANCE MANUAL

Keep performance.





RUNNING GEAR IDENTIFICATION

transporter

vehicle manufacturer

vehicle identification no.

vehicle commissioning date

AXLE REFERENCES

identification no.

axle type

axle no. 1

axle no. 2

axle no. 3

axle no. 4

axle no. 5

SUSPENSION TYPE

TERMS OF THE WARRANTY



The SAE-SMB company provides a warranty to users of SAE-SMB axles and suspension 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, the warranty does not cover labour or workshop costs for dismantling, mounting and inspecting parts.

The warranty applies only to damage to SAE-SMB 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 axle systems
- lack of vehicle brake adjustment
- mechanical damage due to an 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 maintenance manual
- alteration of parts or modifications to the SAE-SMB axle systems
- the use of foreign parts instead of original SAE-SMB 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 axle systems.



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 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 may grant ON-ROAD warranty terms. Use in zone 3 countries as shown in the table (page 6) 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 (see attached form or the use 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, no later than two weeks after the defect is found.

Non-compliant dismantled parts shall be retained and shall not be removed without the express agreement of SAE-SMB. SAE-SMB may send an 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 axle systems are an 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 spare parts or parts authorised by SAE-SMB 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.

IDENTIFICATION



SAE-SMB Industries
03090 CHARLEVILLE - France

Ident.N°/ Prod.N° 10127247 - S31-2014

DSOH7 09010 4345H4 2040 1200 SO/SAO

ID1 - D222 / ID2 - 4345H4 / ID3 - 10791

Charge statique adm. perm.
Static axle capacity
(Kg)

9000

Vitesse max.
Max. speed
(Km/h)

105

ID4 -
Homologation
Test report

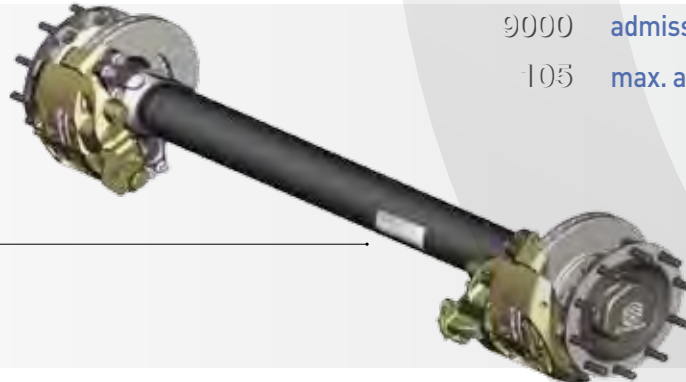
361-037-12

Made in France

N° de série: 140701000

DSOH7 09010 4345H4 2040 1200 SO/SAO

ID1-S222/ID2-4345H4/ID3-10791/ID4-361-037-12



10124247

item no.

S31 2014

manufacturing date

DSOH7 09010 4345H4 2040 1200 SO/SAO

item reference

ID1-S222/ID2-4345H4/ID3-10791/ID4-361-037-12

identifiers following ECE R13

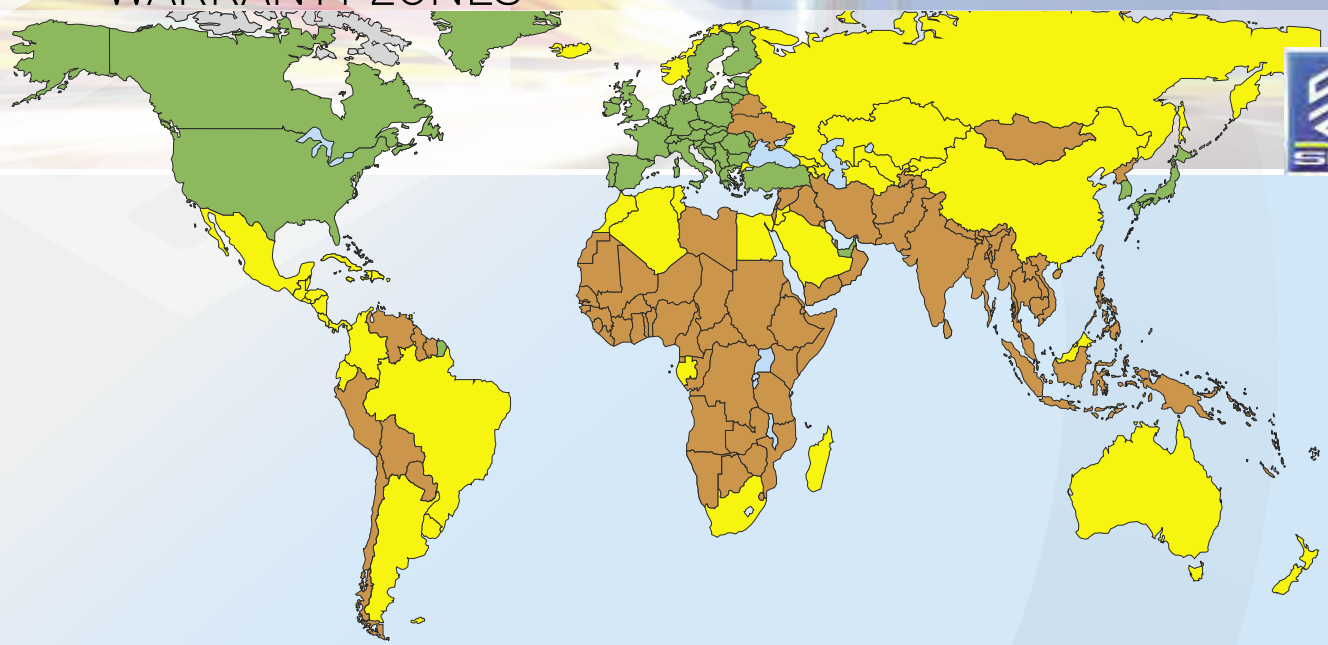
9000

admissible static load (Kg)

105

max. admissible speed (Km/h)

WARRANTY ZONES



- ZONE 1
- ZONE 2
- ZONE 3

standard warranty terms

warranty terms to be defined with SAE-SMB depending on cases of application

OFF-ROAD warranty terms, regardless of application

SH7 3010 / 3020 / 3316 / 3620 / 4220 TYPE AXLES

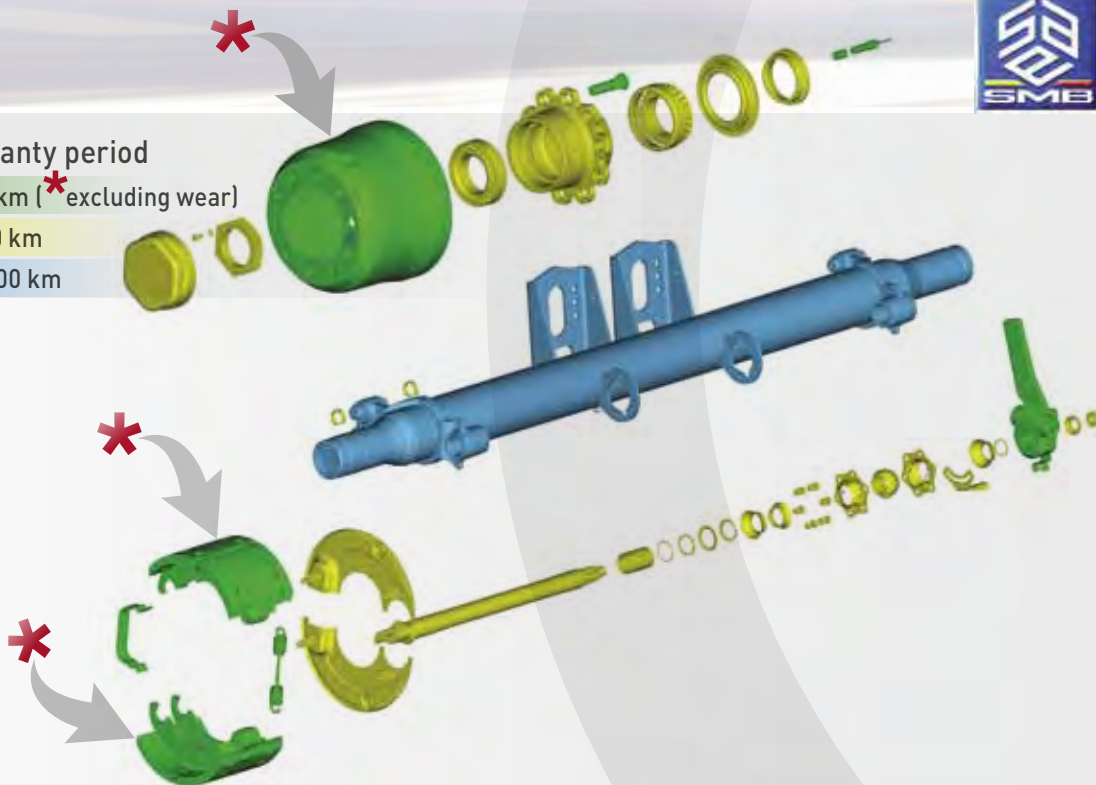


ON-ROAD warranty period

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

3 years or 500,000 km

6 years or 1,000,000 km



SH7 C113-SMB TYPE AXLES

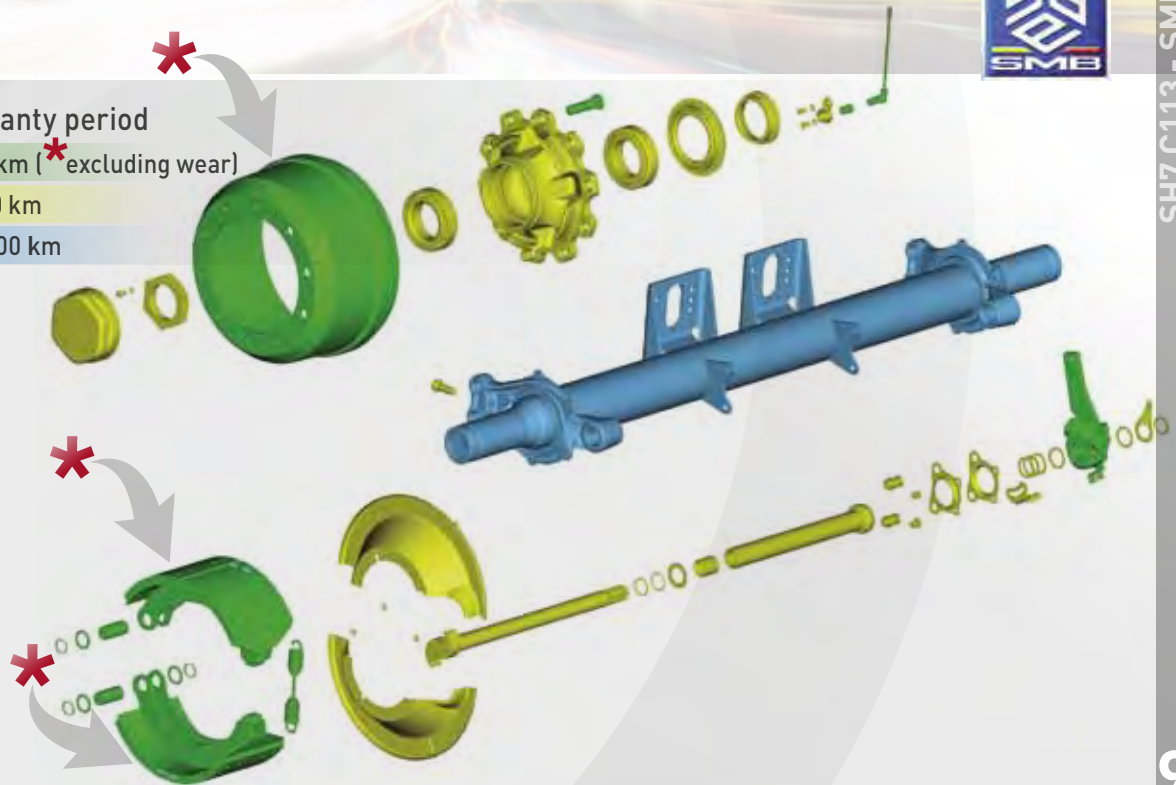


ON-ROAD warranty period

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

3 years or 500,000 km

6 years or 1,000,000 km



DSH7 3745 / 4345 TYPE AXLES



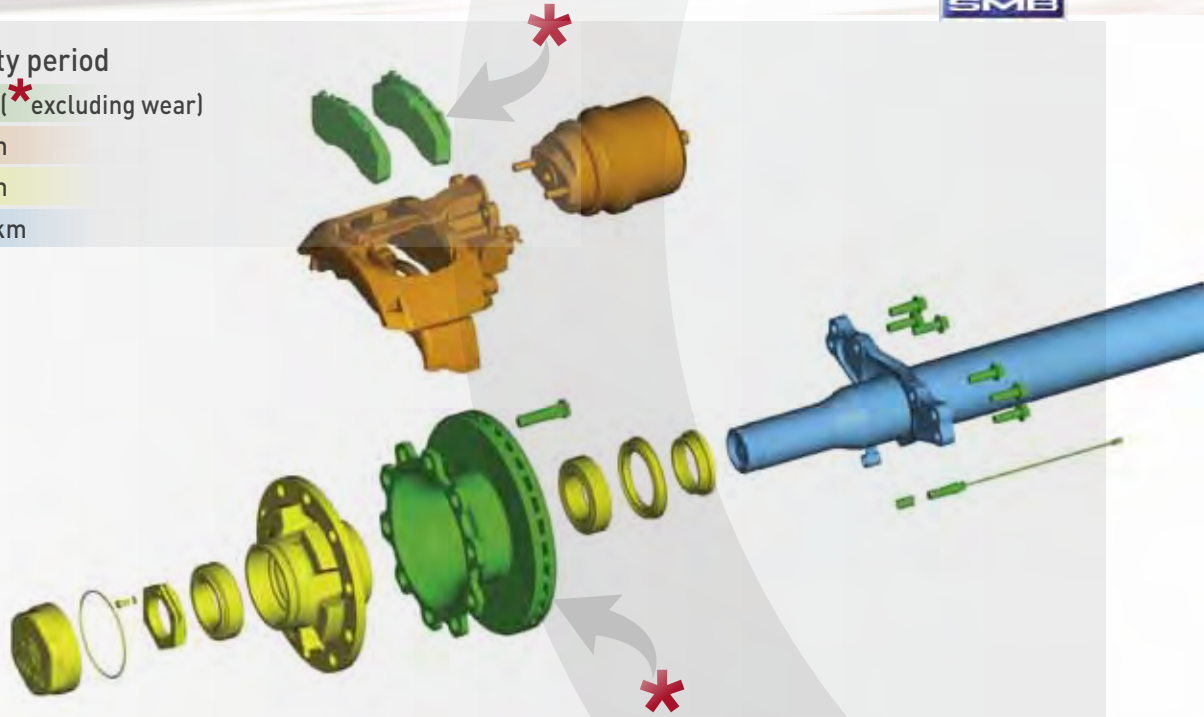
ON-ROAD warranty period

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



DSOKH2 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



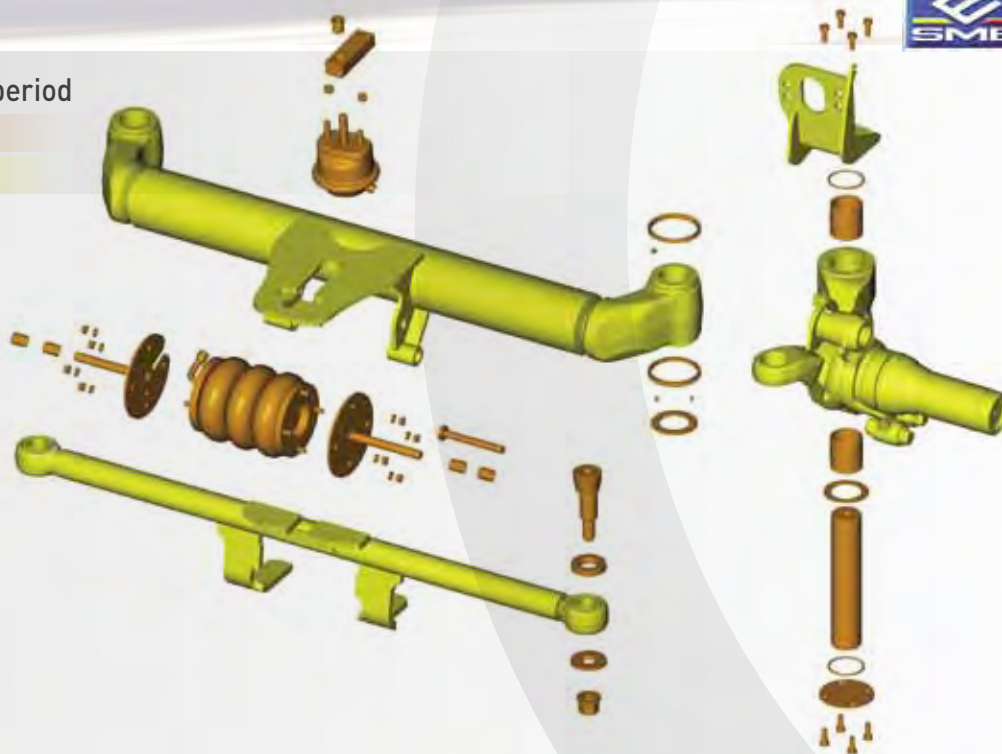
SELF-STEERING AXLE BEAM



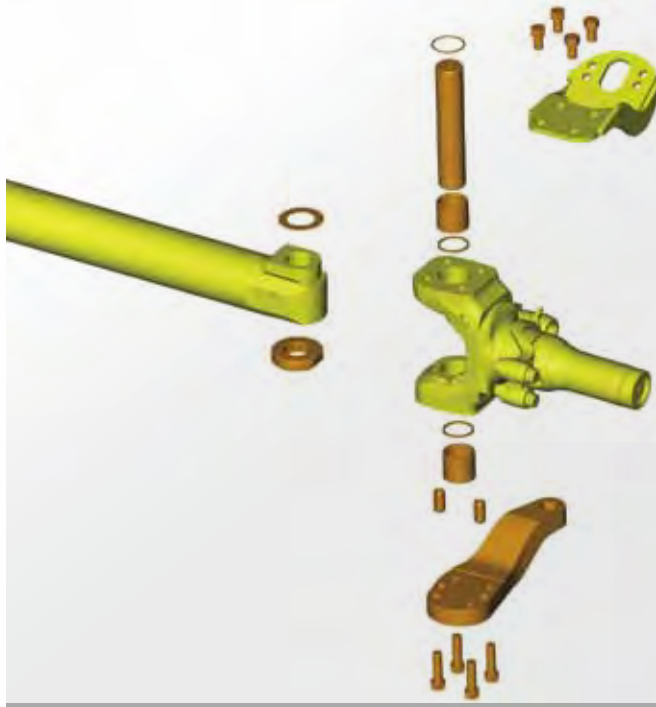
ON-ROAD warranty period

2 years or 200,000 km

3 years or 500,000 km



SELF-STEERING AXLE BEAM



ON-ROAD warranty period

2 years or 200,000 km

3 years or 500,000 km

SERVICE SCHEDULE

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

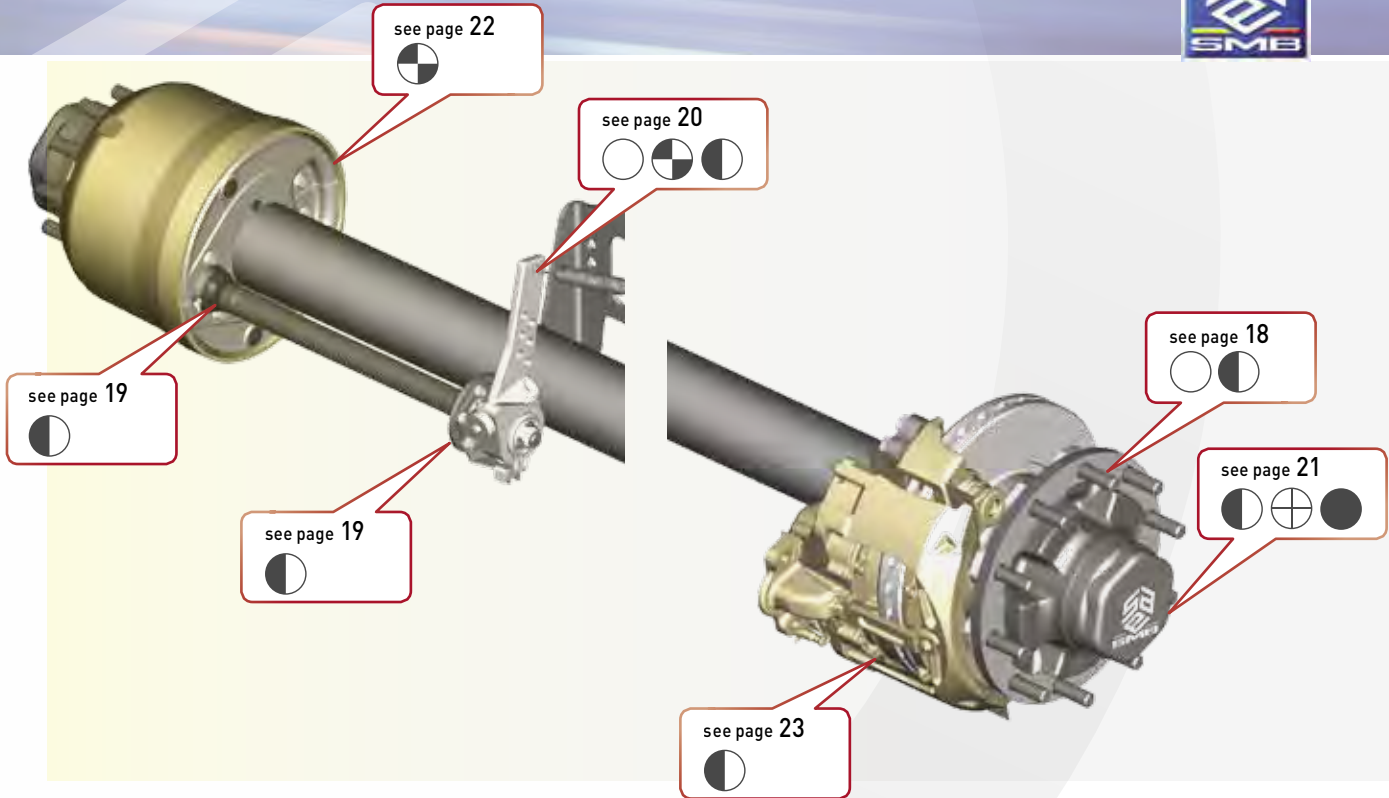


after 1 year
or every 200,000 km

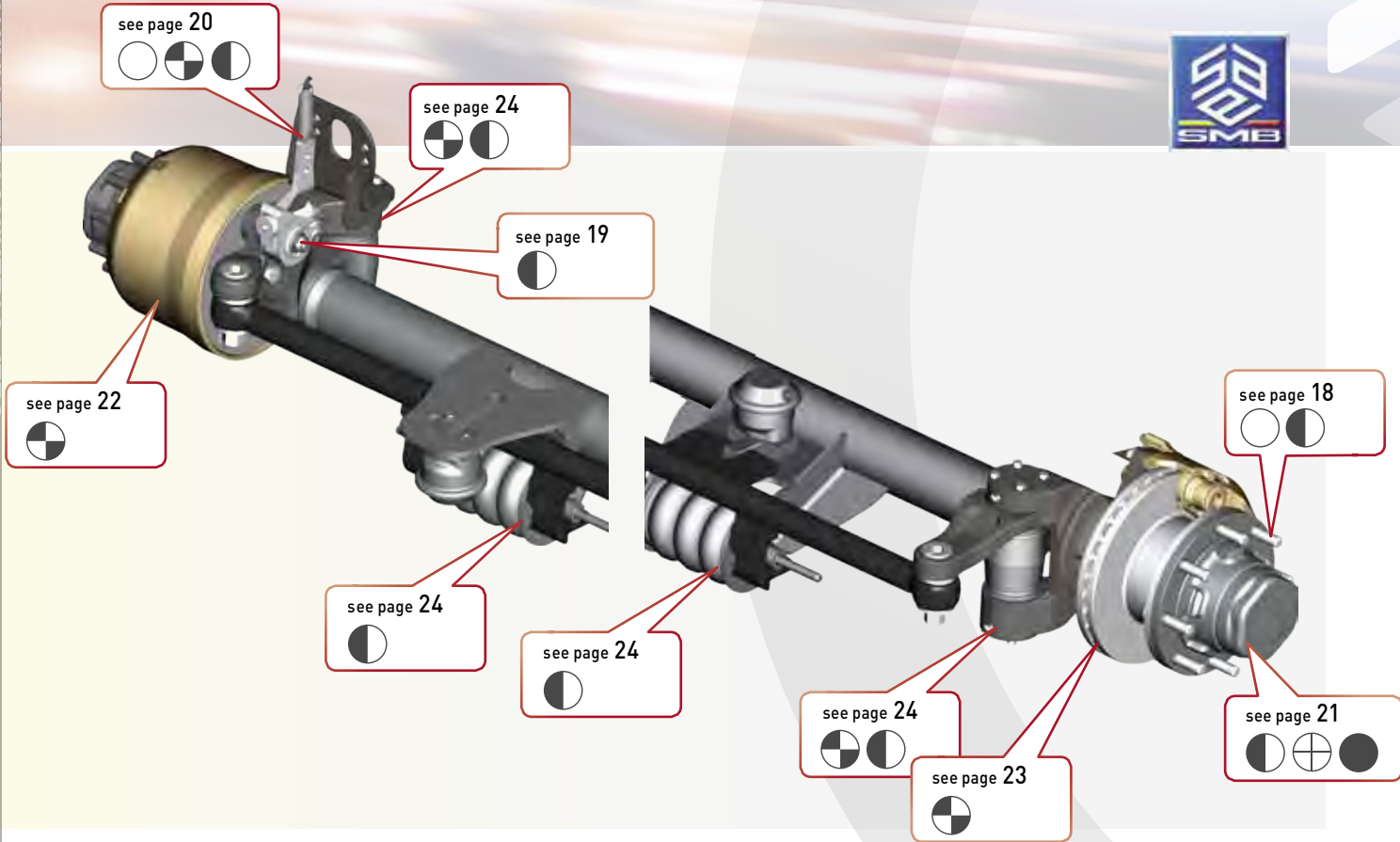


after 3 years
or after 500,000 km
or after intensive use
(for example, work on a construction site)

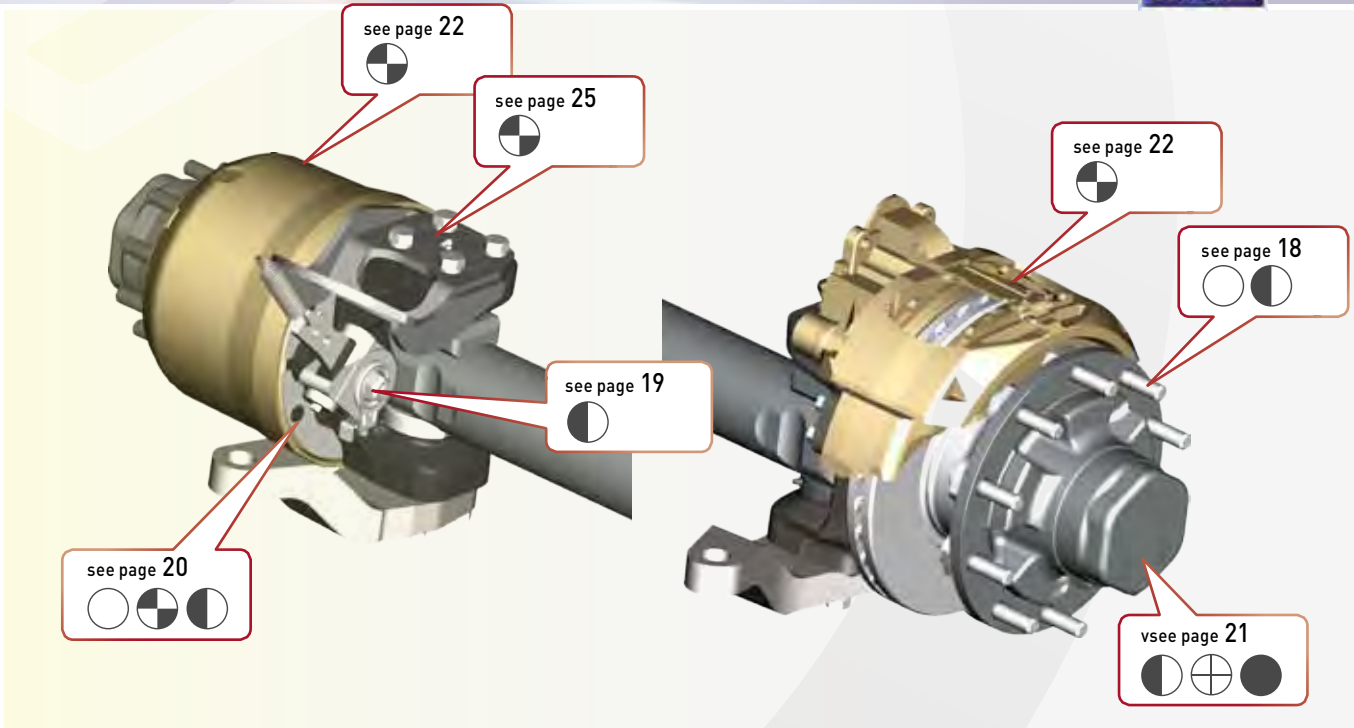
RIGID AXLE MAINTENANCE



SELF-STEERING AXLE MAINTENANCE



STEERING AXLE MAINTENANCE



MOUNTING THE WHEELS



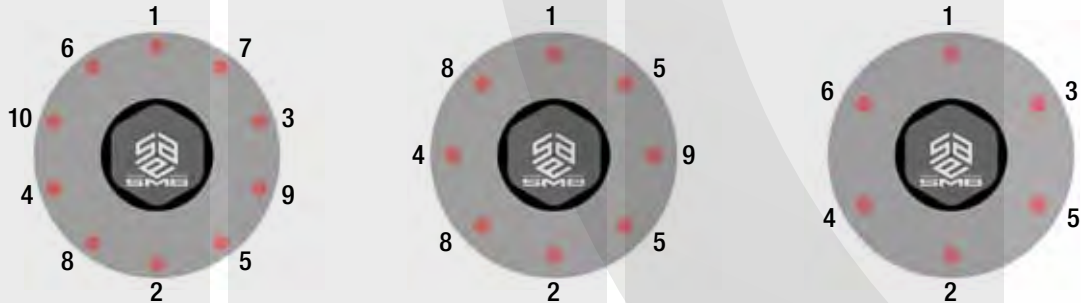
- Before mounting, the surfaces in contact (on the wheel, hub or drum) and the wheel studs must be clean and free of corrosion.
- Lightly oil the wheel stud threads (no lubricant).
- Put the wheel in place, centring the stud holes with the studs. The wheel is centred on the hub (M assembly). DIN assembly (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
M24 x 1.5	700 - 800 Nm

NB: For specific applications (OFF-ROAD) some studs may be fitted with a pre-centring bush:
See ST 251 SAE.



CAMSHAFT BEARING

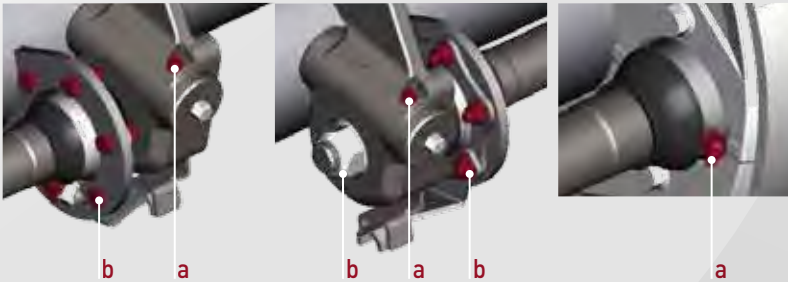


Every 6 months or 100,000 km, each time the lining is changed, before activation after a long period of immobilisation:

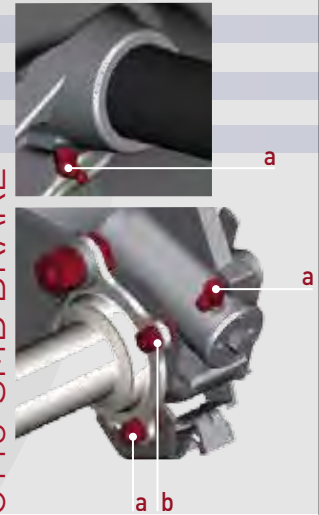
- a) lubricate the camshafts and automatic brake levers:
 - using the grease nipples, fill with grease until the fresh grease comes out of the bearings
- b) screws and nuts fastening the bearings and brake levers:
 - check the tightening torques.

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

SAE BRAKE



C113-SMB BRAKE



BRAKE SLACK ADJUSTERS



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: see ST306 SAE

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 SAE

replacing the automatic slack adjuster:

see ST310 SAE



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 diagram opposite), check the clearance. If there is a high degree of clearance, check the roller bearing settings and rectify them if possible (see ST SAE 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 - type axles

adjusting the roller bearings: **see ST297 SAE**

lubricating and replacing the roller bearings: **see ST296 and ST297 SAE**

SH7/DSH7 RANGE - replacing the roller bearing lubricant:

- every 3 years or 500,000 km min. in ON-ROAD condition.
- every year or 100,000 km min. in OFF-ROAD condition.

DSOKH2 - type axles (compact roller bearings)

adjusting and lubricating compact roller bearings: impossible! (the roller bearings are lubricated "for life")

replacing the roller bearings: **see ST311 SAE**

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 after-sales department.

BRAKE DRUMS AND LININGS



Every 3 months or 50,000 km:

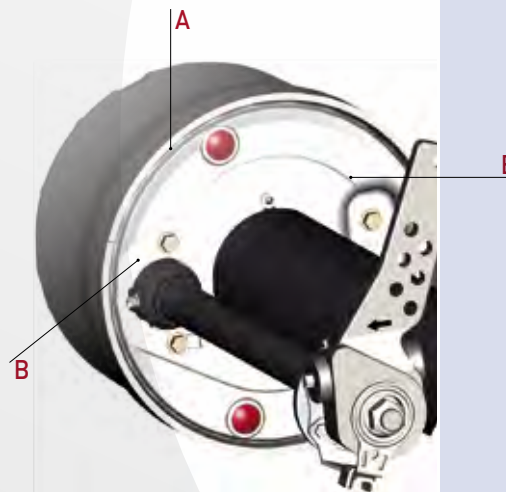
1 Checking the brake lining thickness

- Remove one rubber plug (A) from each dustcovers.
- Check the residual thickness of the linings: if the linings are less than 5 mm thick, they must be changed.
- After inspection, put the plugs back on the dustcovers.

2 Checking the drum diameter

- After dismantling the dustcovers 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	3010S2	305
300x200	3020S2	305
360x200	3620S2	365
420x200	4220S2	425
419x203	4220C1	424



3 Checking that the dustcovers 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 ST 266 SAEST306 SAE**

BRAKE DISKS AND LININGS

Every 3 months or 50,000 km:

1 Checking the lining thickness

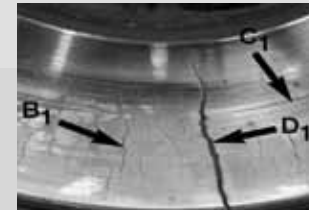
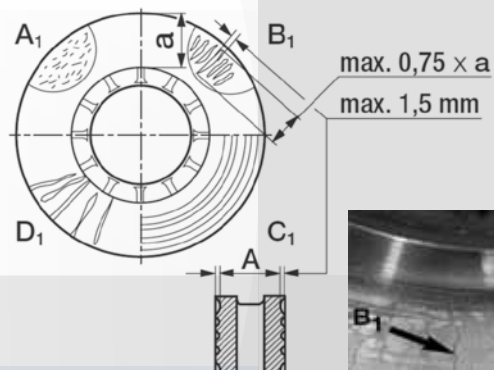
- Check the residual lining thickness: if the linings are less than 2 mm thick, they must be changed.



2 Checking the disc thickness

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

brake	T (mm)	MinT
3334	34	28
3745	45	37
4345	45	37

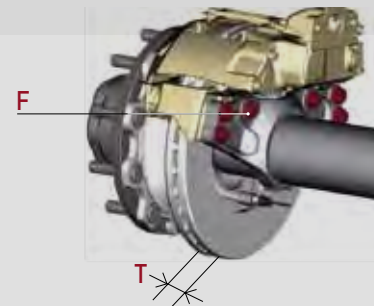


3 Checking the disc surfaces

defects	decision
A1 reticulated cracking	admissible
B1 cracks in the central part	admissible
C1 concentric streaks (Depth \leftarrow 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

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

Every 6 months or 100,000 km:

1 Checking the drum diameter

- Checking the 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 the drum diameter

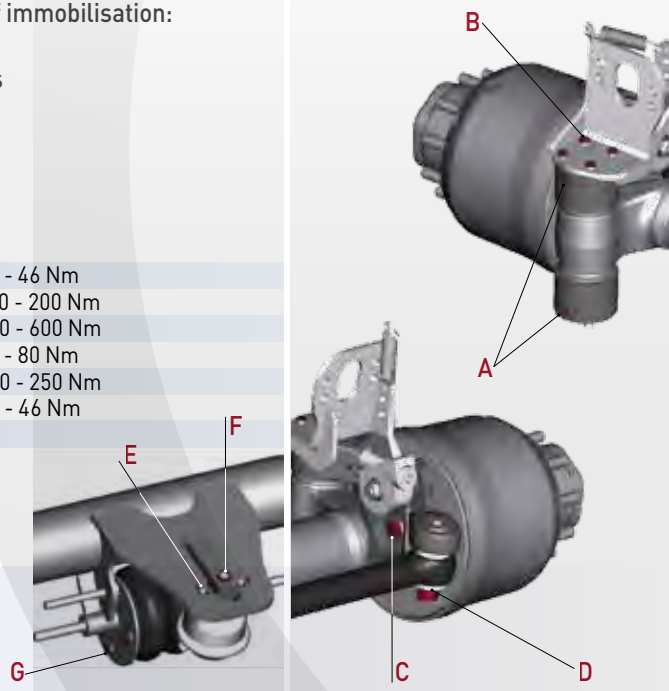
- Change it if signs of damage are apparent.

Useful Technical Specifications

ST 206: replacing the pivot kits

ST 232: installing and adjusting the self-steering axles

ST 309: mounting the central bolt kit





STEERING AXLES

Every 3 months or 50,000 km:

- Lubricating the steering pins:
Using the 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).

M20 x 1.5 400 - 430 Nm

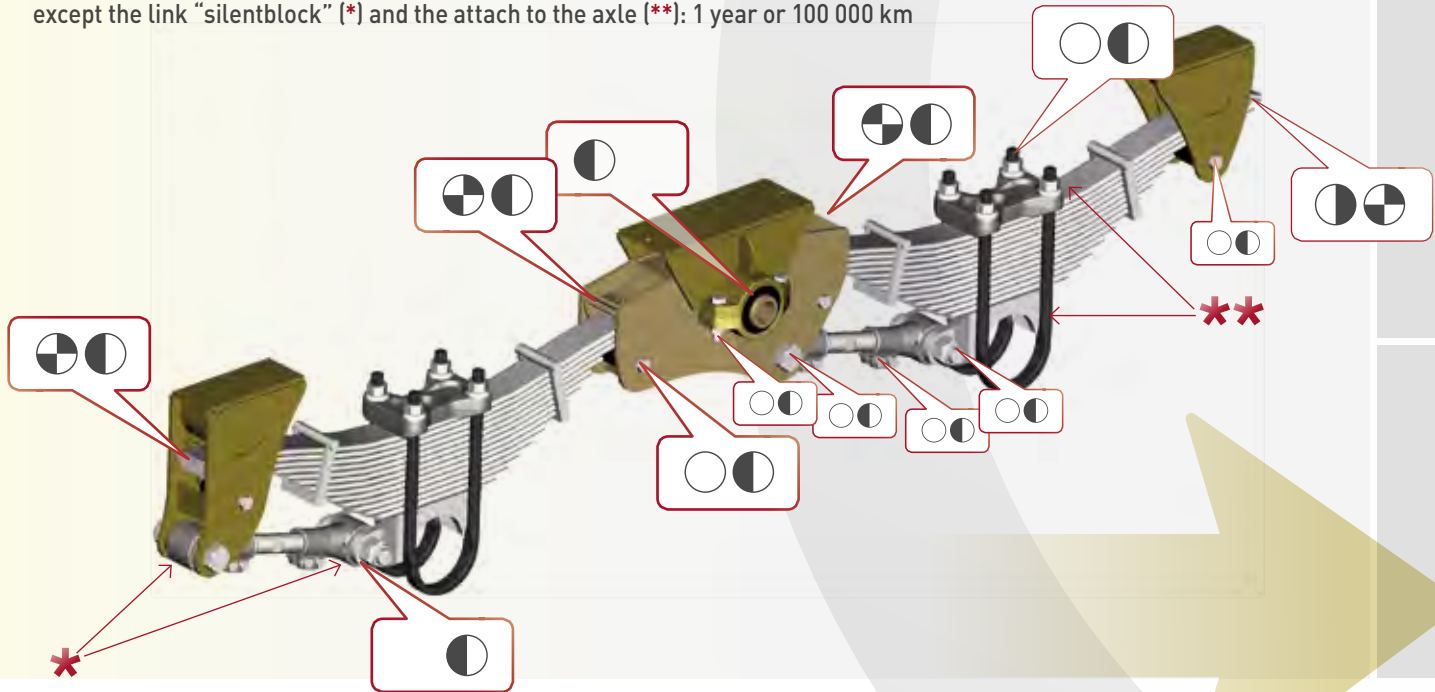


SM75 & SM100 SUSPENSION MAINTENANCE

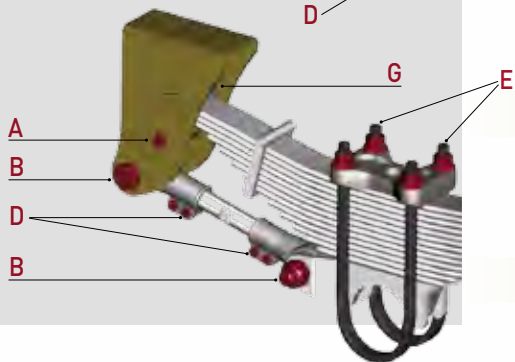
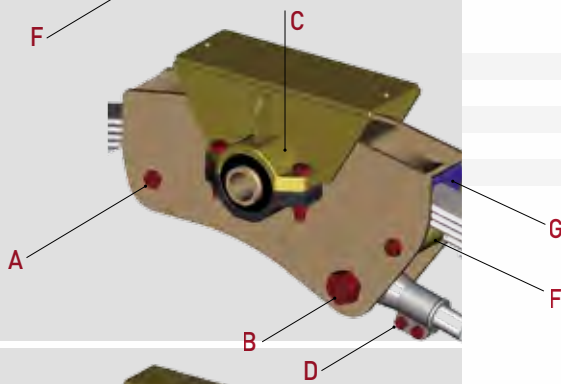
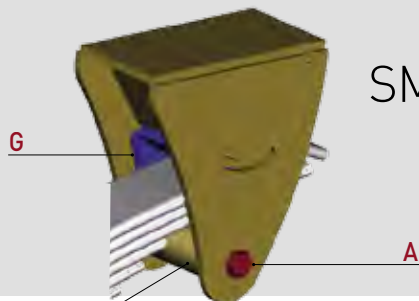


Guarantee Conditions suspension parts SM (Condition ON ROAD):

All parts of mechanical suspensions type SM are guaranteed 2 years or 200 000 km except the link "silentblock" (*) and the attach to the axle (**): 1 year or 100 000 km



SM75 & SM100 SUSPENSION 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	750 - 800 Nm
ref. C	M16 x 2	170 - 190 Nm
ref. D	M12	75 - 80 Nm
ref. E	M22 x 2	650 - 700 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 SAE**

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

Replacing the rubber joints:

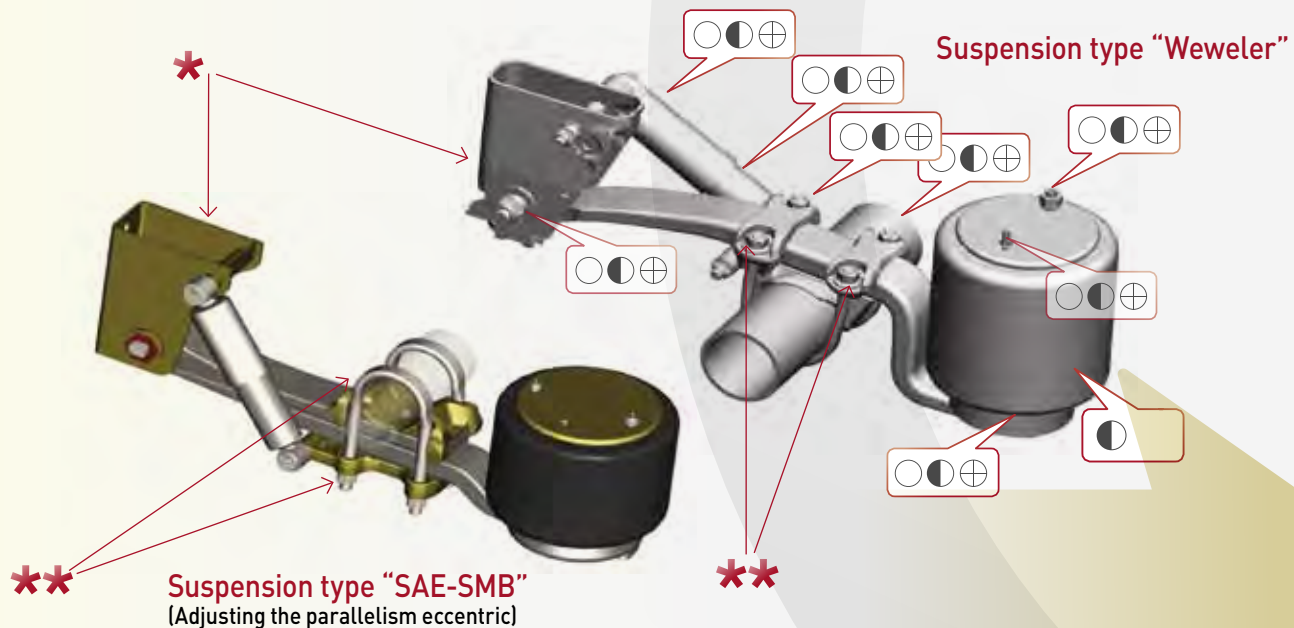
see **ST 313 SAE**

SP PNEUMATIC SUSPENSION MAINTENANCE



Guarantee Conditions suspension parts SP (Condition ON ROAD):

All parts of pneumatics suspensions type SP are guaranteed 2 years or 200.000 km except the "silentblock" of spring (*) and the attach to the axle (**): 1 year ou 100 000 km



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



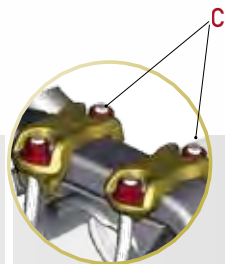
Under ON-ROAD use conditions: Every year or 200,000 km
 Under OFF-ROAD use conditions: After the first 1,000 km and every 6 months or 100,000 km:

CHECK THE TIGHTENING TORQUES BELOW

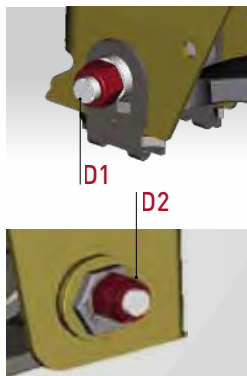
Schock absorber fastening:
 screw (B)
 M20 500 - 550 Nm



Fastening by U-bolts:
 nuts (C)
 M22 600 - 625 Nm
 M24 800 - 850 Nm



Central articulation:
 Screw (D1) weweler (D2)
 SAE with eccentrici
 M27x1,5 550 - 600 Nm



Fastening to the bellow chassis:
 (E1) 30 - 40 Nm
 (E2) M22x1,5 50 - 66 Nm



Fastening to the bellow spring: (F)
 M12 50 - 66 Nm



reference	document	page
	Warranty Request Form	31
ST251	Mounting the Drum Centring Sleeves	32
ST306	SAE-SMB Brake Lever Adjustment Procedure	33
ST310	Self-adjusting Brake Lever Adjustment procedure	34 à 37
ST296	SAE-SMB DH7/DSH7 Axle Lubrication Procedure	38 et 39
ST297	DH7/DSH7 Axle Roller Bearing Adjustment Procedure	40 et 41
ST311	DSOKH2 Hub Group Mounting Procedure	42 à 44
ST266	SAE Drum Brake Checking and Maintenance	46 à 49
ST206	Pin Maintenance Procedure - Self-steering Axles	50 à 54
ST232	SAE-SMB Self-steering Axle Installation Procedure	56 à 59
ST309	Installation Procedure for Self-steering Axle Bolts	61
ST312	Replacement Procedure for SM Suspension Friction Blocks	62 et 63
ST313	Replacing SM Rubber Suspension Joint	65

Warranty claim



Société Ardennaise d'Essieux
Ham-les-Moines


FRANCE - 08090 Charleville-Mézières

N° de tél./fax: +33 (0) 324-595454 / -548158

Only a completely filled out warranty claim paper including all costs can be treated.

date _____
Customer Claim-No. _____

Applicant _____
Street _____
Zipcode/Location _____ Phone/Fax-No. _____
Contact _____
Vehicle owner _____ Vehicle manufacturer _____
Street _____ Street _____
Zipcode/Location _____ Zipcode/Location _____

Vehicle type _____ own drawing _____

 Tipper body
 Tank body
 Chill body
other Types: _____

Registration-No. _____ Application On-road Off-road
Chassis-No. _____ Mileage _____
Registration (date) _____

Axle type _____ **Suspension type** _____
EDP-No. _____ EDP-No. _____
Date of manufacture _____ Date of manufacture _____
Serial-No. _____ Serial-No. _____

short detail description

Suggestion for repair

_____ working time (hours)

Labour costs per hour in €		Total	0,00	0,00 €
spare parts				
Spare parts necessary				
SAE - No.	Description	Quantity	yes <input type="checkbox"/> no <input type="checkbox"/>	Price per piece in €
				Total price in €
				0,00 €
				0,00 €
				0,00 €
				0,00 €
				0,00 €
				0,00 €
				0,00 €
				0,00 €
Other costs				Total
				0,00 €

Comment _____
Total price without VAT _____

YOU CAN DOWN LOAD
THIS FORM
ON OUR WEBSITE
www.sae-smb.com

Important!
- Missing informations lead to extended processing times or refusal of the claim.
- Only customers which have a SAE customer no. can submit this claim.
- Complaint costs are refunded only if they are invoiced separately and proven with appropriate vouchers.
- If there is no other information refused parts will be kept for four weeks beginning with the date of customer information and will be scrapped thereafter.
- Claimed goods must have been purchased from authorised SAE dealers.

MOUNTING THE DRUM CENTRING SLEEVES

ST251-0



2 x 09268001 sleeves
Mounted diametrically opposite



2 x 20°



2 x 20°



IN
CONTACT



MOUNTING THE DRUM CENTRING SLEEVES

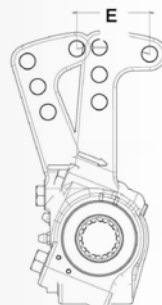
ST306-0

ST 306-0



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 Tt of 70 to 80 Nm).



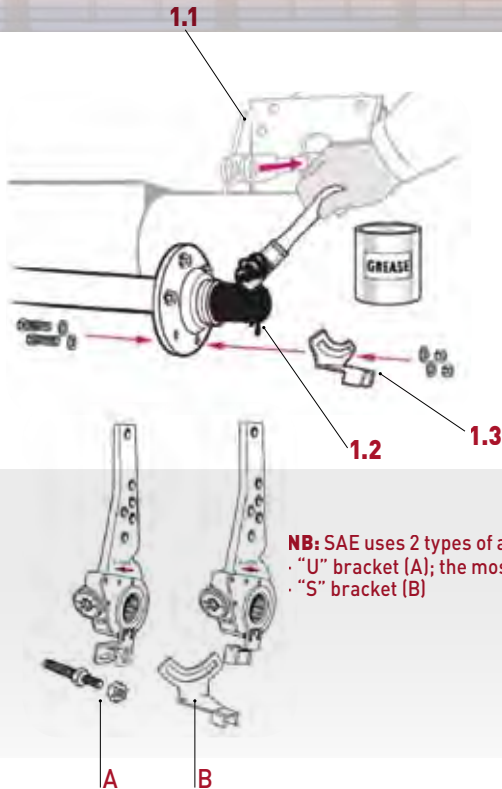
NB: the lever depicted here is model SAE 923. SAE also uses other types of levers and screws in which (A) and (B) can sometimes be the other way round. However, the adjustment procedure remains the same.

A

B

SAE-SMB SELF-ADJUSTING BRAKE LEVERS ADJUSTMENT PROCEDURE

ST310-1



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)

SAE-SMB SELF-ADJUSTING BRAKE LEVERS ADJUSTMENT PROCEDURE

ST310-1



ST 310-1 2/4

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.



2.2

2.1



3 Checking the anchor pin

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

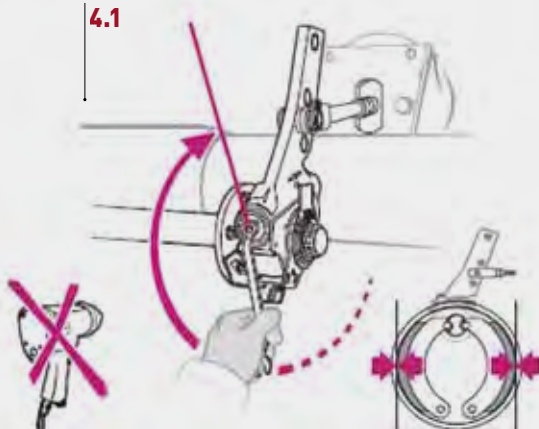
SAE-SMB SELF-ADJUSTING BRAKE LEVERS ADJUSTMENT PROCEDURE

ST310-1



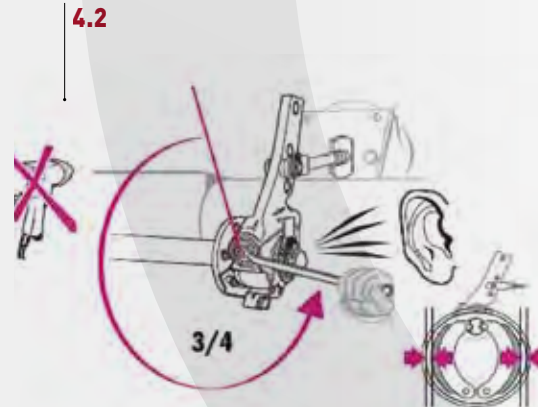
4 Lever adjustment

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).

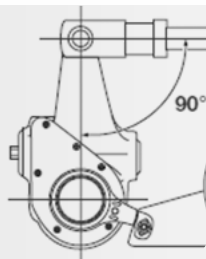


SAE-SMB SELF-ADJUSTING BRAKE LEVERS ADJUSTMENT PROCEDURE

ST310-1



ST 310-1 4/4



4.3 Checking the angle of the cylinder rod when braking

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

SH7/DSH7 AXLES LUBRICATION PROCEDURES

ST296-0

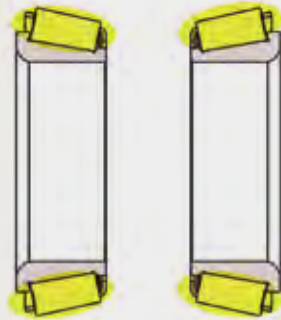


- 1** Press-mount the external cages of the roller bearing into the hub.

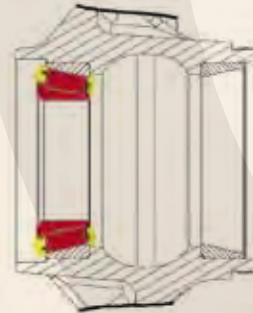


- 2** On the roller bearings without external cages: coat the free spaces between the rollers with lubricant.

Lubricant type: SAE

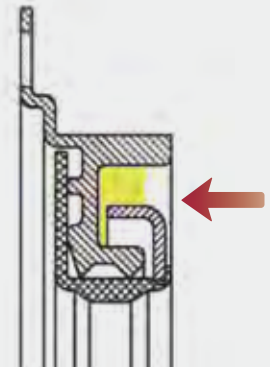


- 3** Mount the internal roller bearing into the hub.



- 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.

Lubricant type: SAE



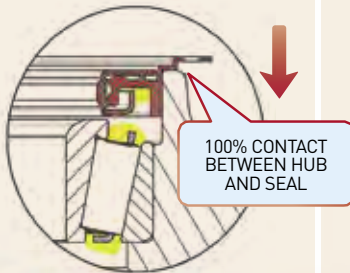
SH7/DSH7 AXLES LUBRICATION PROCEDURES

ST296-0

ST 296-0 2/2

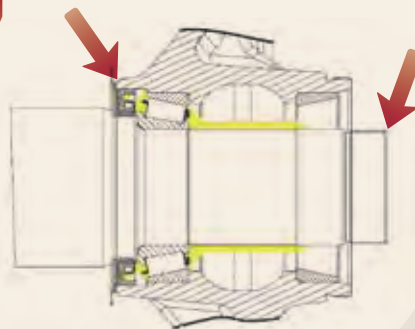


- 4b** Press-mount the seal into the hub. (The perforated ring's base must press against the hub across its entire periphery.)



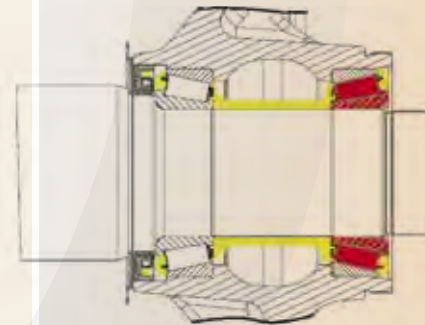
- 5** Mount the hub onto the spindle, taking care not to damage the seal and the thread of the spindle. Evenly fill the free space between the two roller bearings with lubricant (layer 5 to 10 mm thick).

Lubricant type: SAE



- 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.)

Lubricant type: SAE



- 7** Finish mounting and adjusting the roller bearings following: ST 297

SH7/DSH7 AXLES

ROLLER BEARING ADJUSTMENT PROCEDURES

ST297-0



1 Mounting and lubricating the hub following ST296

Surfaces in contact with the roller bearings



A left-hand thread guide is machined into the edges

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

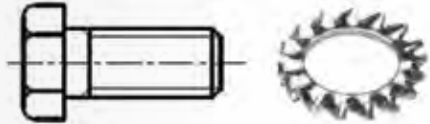
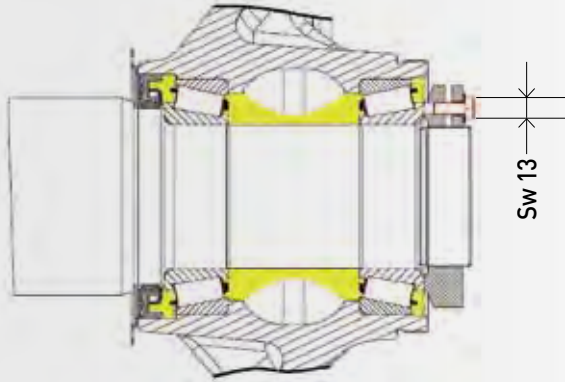
LEFT-HAND THREAD GUIDE ON THE LEFT, NO GUIDE ON THE RIGHT

SW 120

- 2a Gradually **tighten** the SW120 spindle nut from **300 to 400 Nm** while turning the hub (20 turns min.).
- 2b Totally **loosen** the spindle nut.
- 2c **Tighten** the spindle nut gradually from **110 to 130 Nm** while turning the hub (20 turns min. to ensure proper contact with the roller bearing surfaces).

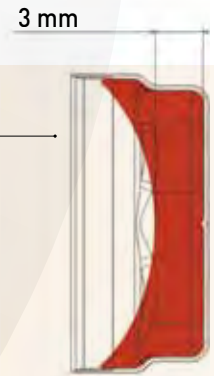
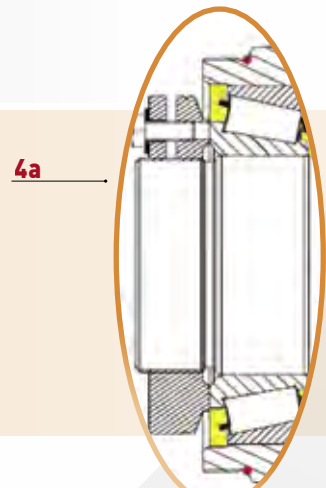
SH7/DSH7 AXLES ROLLER BEARING ADJUSTMENT PROCEDURES

ST297-0



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.

- 4a** Ensure that the O-ring seal is properly in place.
- 4b** Fill the hub cap with lubricant to 50% of its capacity, leaving a gap in the centre for the spindle. (Lubricant type: SAE)
- 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.



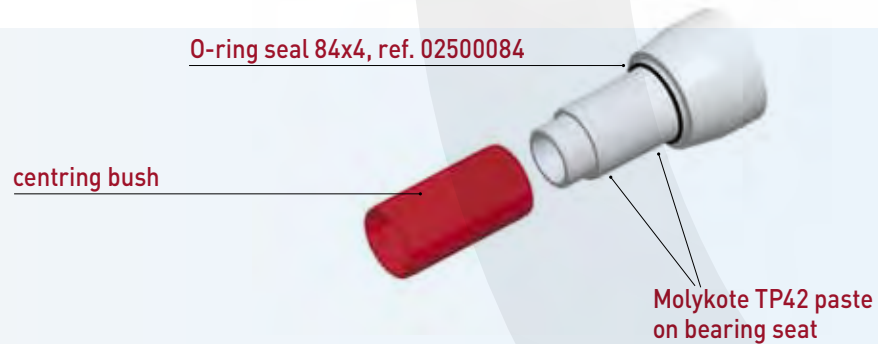
FITTING HUB ASSEMBLY DS0KH2

ST311-0



1 Preparing the axle spindle

- a) Clean the axle spindles with a clean dry rag.
- b) Fit the O-ring seal, ref. 02500084.
- c) Grease the axle spindles using a brush with MOLYKOTE TP42 paste (white paste).
- d) Screw the fitting sleeve by hand onto the end of the axle spindle, ref. 09297005.



FITTING HUB ASSEMBLY DSOKH2

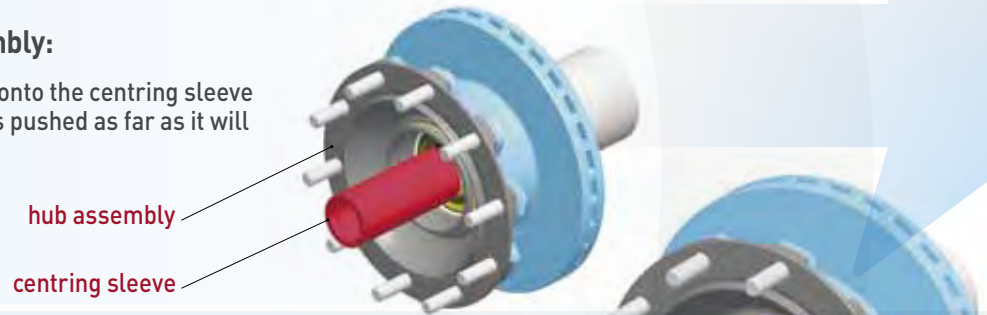
ST311-0

ST 311-0 2/3



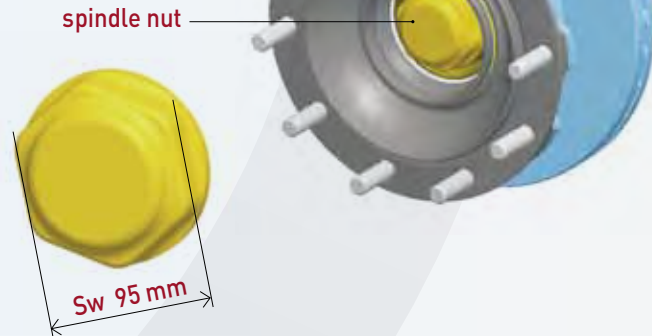
2 Fitting the hub assembly:

- a) 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:

- a) Lightly grease the nut thread and the bearing face of the nut with MOLYKOTE TP42 grease
- b) Screw on the spindle nut: (diameter across flats: SW 95 N.B. RH thread on the right, LH thread on the left!)
 - 1) Screw the nut up to contact with the bearing with a manual wrench (never use a slogging wrench!)
 - 2) Tighten the nut with a torque wrench**TT = 700 Nm +/- 25 Nm**



FITTING HUB ASSEMBLY DSOKH2

ST311-0



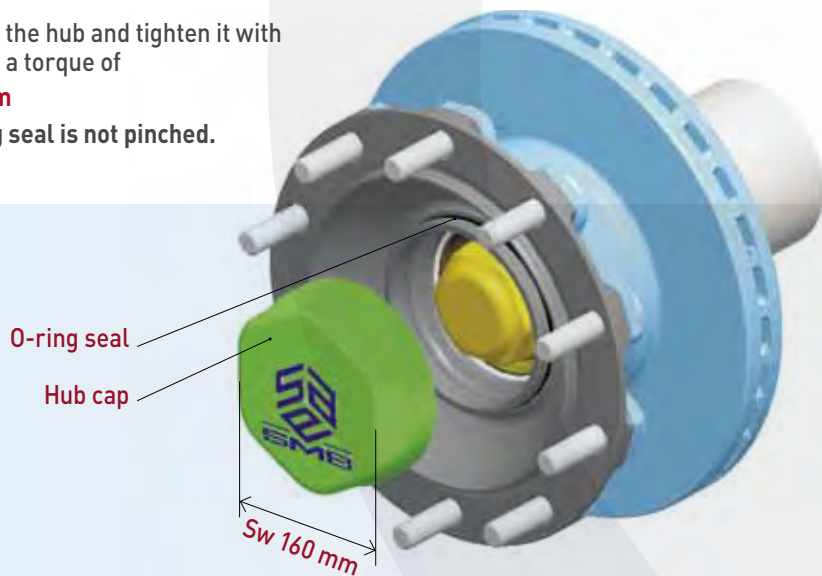
3 Fitting the hub cap

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

b) 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.







AXLES SH7

BRAKE DRUM INSPECTION AND MAINTENANCE

Check the brake drum and linings

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

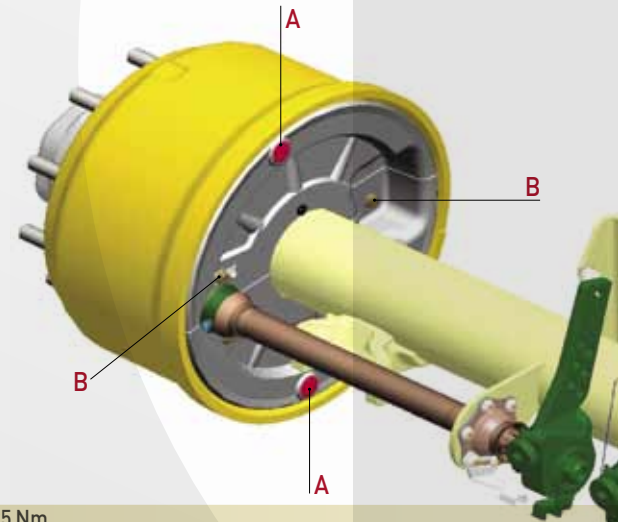
- After removing the dust covers and using a calliper gauge, check the drum diameter: if it is equal to or greater than Dmax, the drum must be changed.

brake	type	Dmax
300x100	3010S2	305
300x200	3020S2	305
360x200	3620S2	365
420x200	4220S2	425
419x203	4220C1	424

3 Check the mudguard fixing

- Check the tightening torques of the mudshield fixing screws (B)

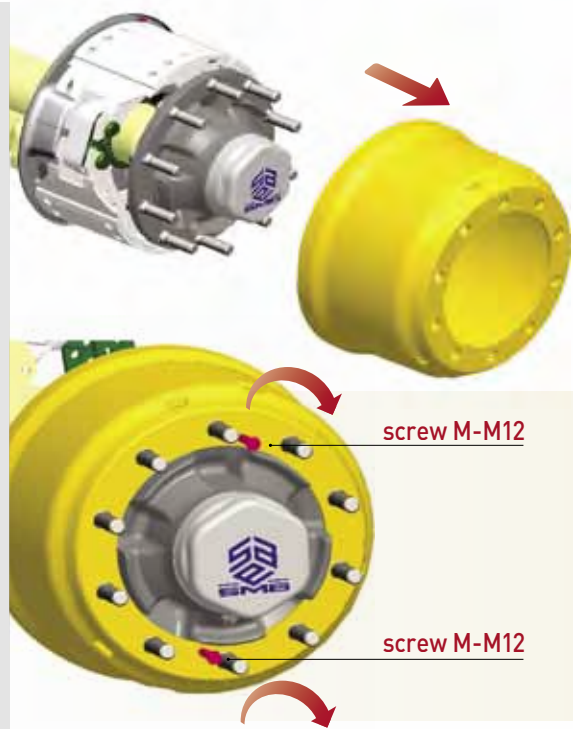
M8 20 - 25 Nm
M10 40 - 46 Nm



AXLES SH7

BRAKE DRUM INSPECTION AND MAINTENANCE

ST266-1



Replacing brake drums

- 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 ST310 SAE-SMB).
- Check braking efficiency (preferably on a brake test bench).

AXLES SH7

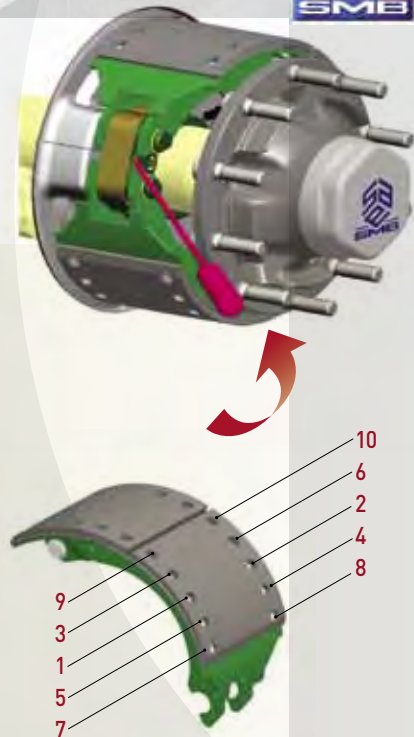
BRAKE DRUM INSPECTION
AND MAINTENANCE

ST266-1



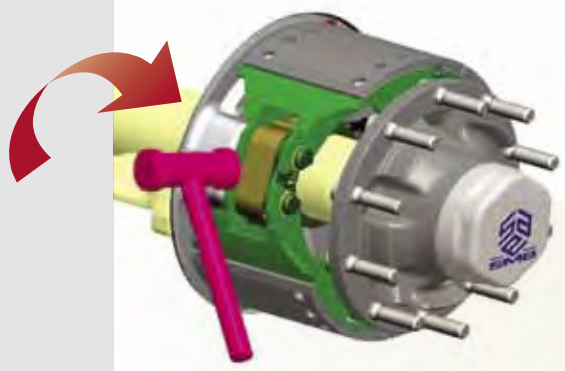
Replacing the brake linings

- a) Remove the wheels and brake drum.
- b) Lift up the brake spring on the “fixed point” side with a thin cylindrical tool (such as a screwdriver) and remove it.
- c) To remove the brake shoes, raise them on the fixed side and pivot them about half a turn (180°) on the cam shaft.
- d) Unhook the return spring.
- e) 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).



ST266-1

AXLES SH7 BRAKE DRUM INSPECTION AND MAINTENANCE



- f) Visually check the riveting; it is essential that there be:
 - No play between the lining and the shoe.
 - No cracks in the linings.
 - g) Examine the camshaft. If there is wear or play, replace the camshaft and its housing (bronze bushes and seals).
 - h) Check the return spring for corrosion and elongation (no play allowed between the coils of the spring). Always replace it if it is damaged.
 - i) Mount the brake shoes in the reverse order to removal.
 - l) Fit the spring on the “fixed point” side using a mallet.
-
- m) Mount the drum and the wheels.
 - n) Check the brake adjustment (see ST310 SAE-SMB).
 - o) Check braking efficiency (preferably on a braking test bench).

SAE-SMB SELF-STEERING AXLE REPLACING THE KINGPIN

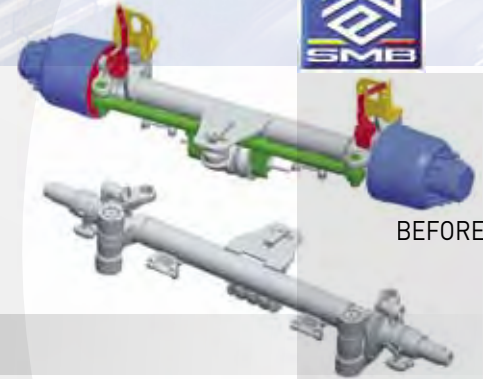
ST206-2



STEP 1: removing the axle

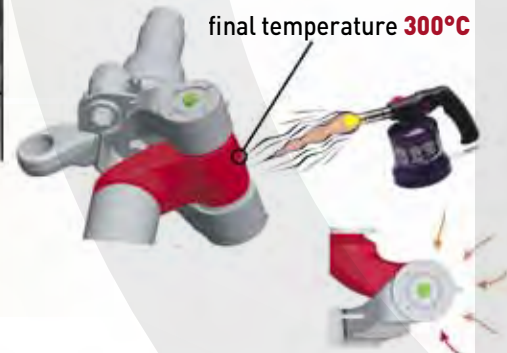
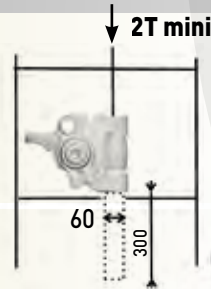
- Remove the hub assembly, the brake and the trackrod **PIVOT** (fig 1)
- Cut the V-ring seals (1).
- Remove the seal covers (2) and remove the O-rings.
- Degrease the pivot.

fig 1



STEP 2: extracting the kingpin

- Position the assembly on a press
Press capacity: 2T min.
 - Support the axle beam.
-
- Heat the Pivot Head around the whole circumference to destroy the adhesive.
Heating time: approx. 5 minutes.
 - Extract the kingpin with the press.



AFTER

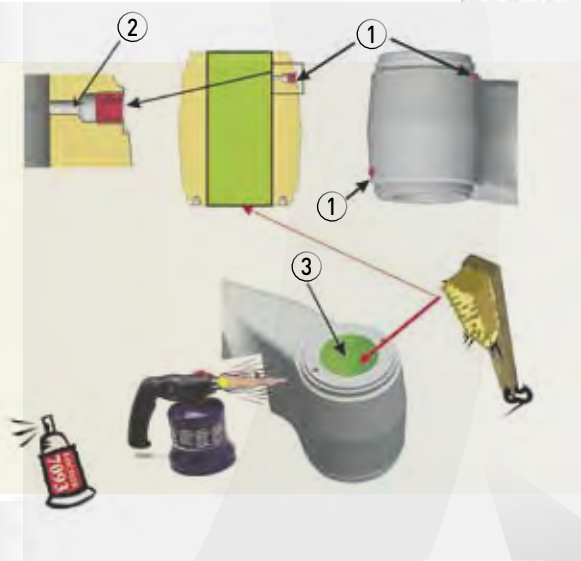
ST206-2

SAE-SMB SELF-STEERING AXLE REPLACING THE KINGPIN



STEP 3: cleaning the kingpin housing

- Unscrew the 2 1/8 gas plugs (1).
- Unblock the 2 orifices (2) using a $\varnothing 3.5$ max tool.
- Thoroughly clean the inside of the bore (3) mechanically.
If there are residues, burn them off at 300°C max.



STEP 4: replacement

See SAE-SMB St227 procedure

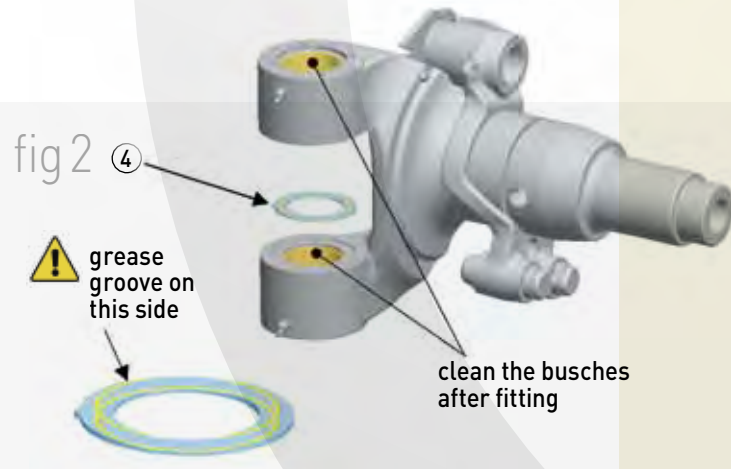
SAE-SMB STEERING AXLE REPLACING KINGPIN

ST206-2



STEP 5: assembling the pivot

- 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 09228053. (3) (fig 1).
- Insert the washers 09228052. (4) (fig 2).



ST206-2



SAE-SMB STEERING AXLE REPLACING KINGPIN



fig 3

- 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 2T
 - 2) using a hammer. In this case, fit a Hm20 screw (7) (fig 4) on the axle to protect it from impacts.

fig 4

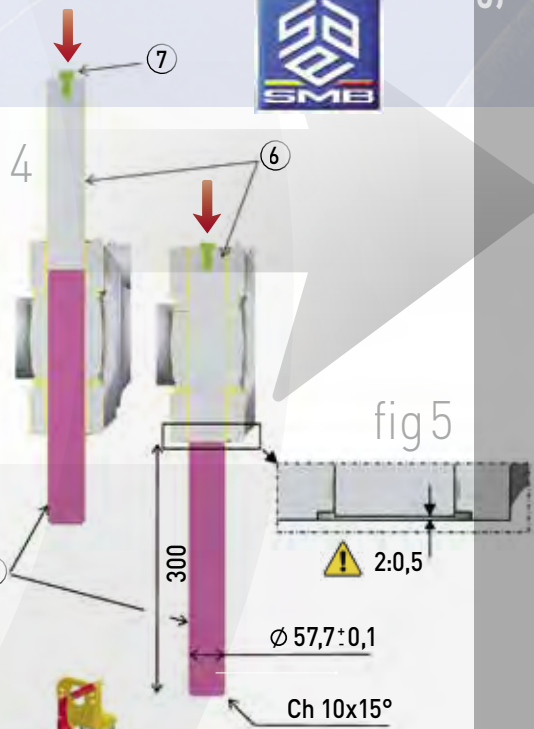


fig 5

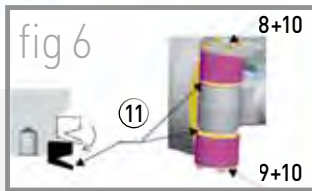
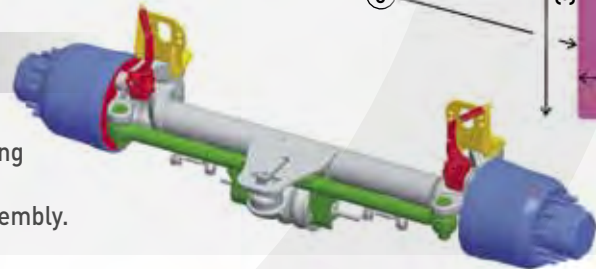


fig 6

- 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).

STEP 3: final assembly

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



SAE-SMB SELF-STEERING AXLE REPLACING THE PIVOT KIT

ST206-2



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

STEP 5: gluing the kingpin

 **40°C** Temperature of parts in contact with the glue:
15°C minimum
Heat if necessary (40°C max).

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).

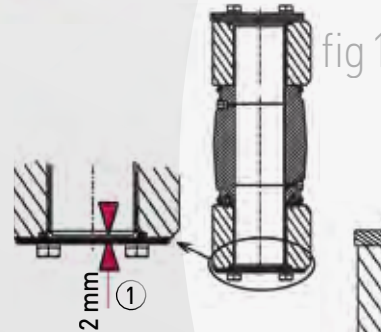
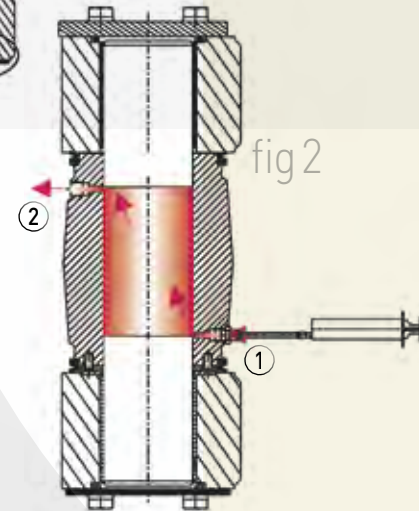


fig 3



Gluing

- Connect the syringe to the bottom orifice (1) (fig 2).
- Empty the bottle of Loctite 648 (10 ml) into the syringe.
- Inject the glue 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).



• Wait 30 minutes before handling.



• Wait 24 h before fitting to the vehicle (glue curing time).



**Grease the kingpins
after mounting the axle
under the vehicle.**



SELF-STEERING AXLES K2

ST232-1



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

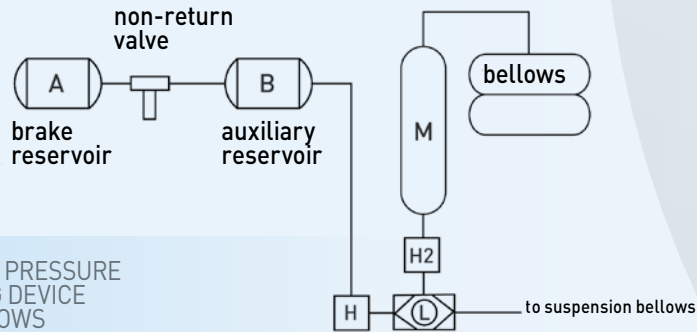


DIAGRAM OF PRESSURE
REGULATING DEVICE
IN THE BELLOW

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 ONU 79 series 01 requires vehicle tests verifying and certifying their stability and road handling.

SELF-STEERING AXLES K2

ST232-1



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

- 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.

N.B.: automatic pressure regulation applies more particularly to vehicles with a “mass on straight axles/mass on steering axles” ratio greater than 1.6. SAE recommends always checking the behaviour of the axle on unladen and laden vehicles.

ESSIEUX AUTO-SUIVEURS K2

ST232-1



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.
(N.B.: 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.

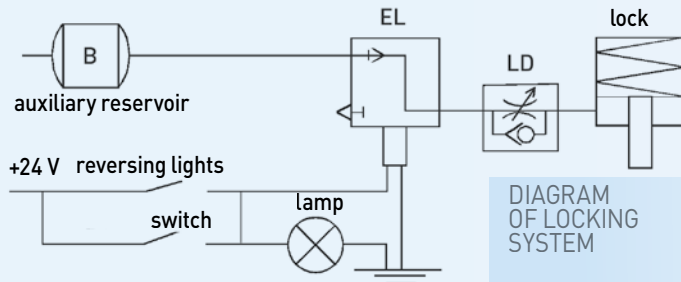


DIAGRAM
OF LOCKING
SYSTEM

N.B.: 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).

ST232-1



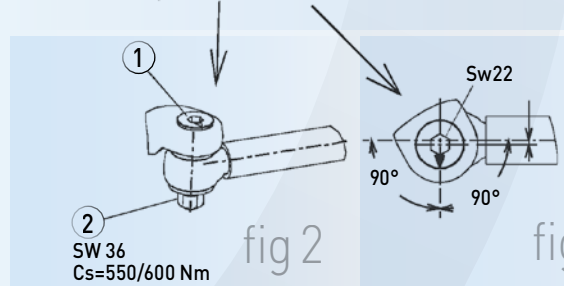
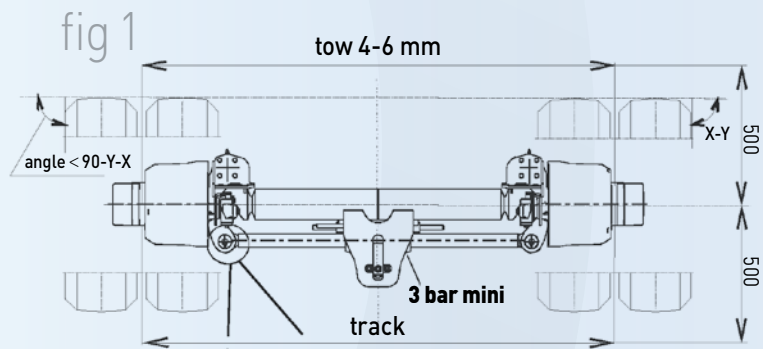
SELF-STEERING AXLES K2

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, Ref 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.

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



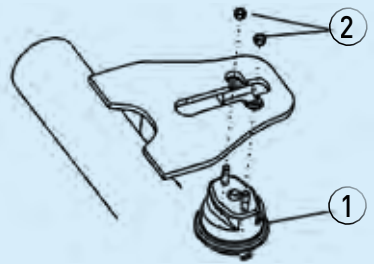


ST309-1

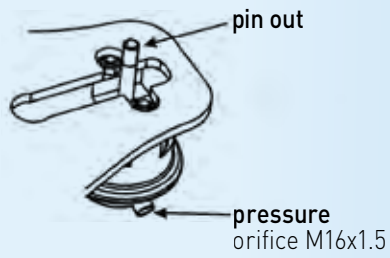
MOUNTING THE LOCKING KIT ON THE SAE-SMB SELF-STEERING AXLE



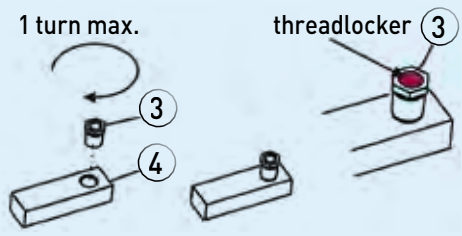
1 Mount the cylinder (1)+(2).
Nut tightening torque
M12x1,5 70Nm +/-16



2 Bring the pin out of the cylinder by putting the cylinder under pressure.



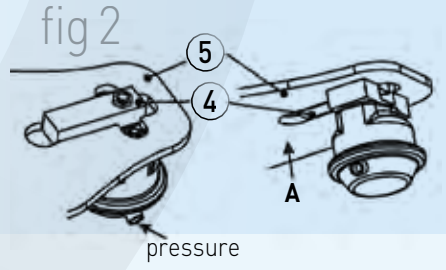
3 Engage the nut (3) in the plate (4) (max.1 turn).
Apply Loctite medium threadlocker only to hole M16.



4 Mount the assembly (3)+(4) on the cylinder pin.
Turn the screw (3) until it mates with the plate (4) (fig 1).
M22x1.5 SW2 4 nut tightening torque: 200-250 Nm



5 Check with the chamber under pressure: the plate (4) should be engaged in the groove in the plate (5) (fig 1).
The plate must not protrude above surface A (5) (fig 2).



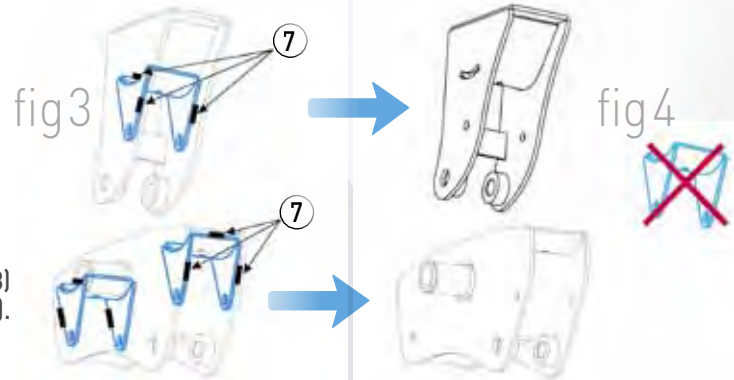
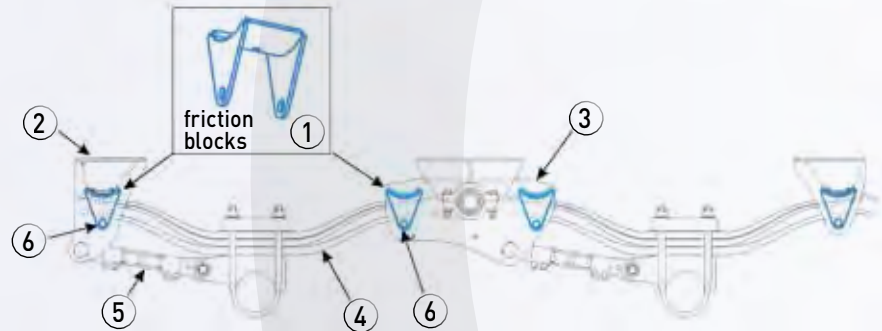
SM75 AND SM100 SUSPENSIONS REPLACING THE SPRING WEAR PADS

ST312-0



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).



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

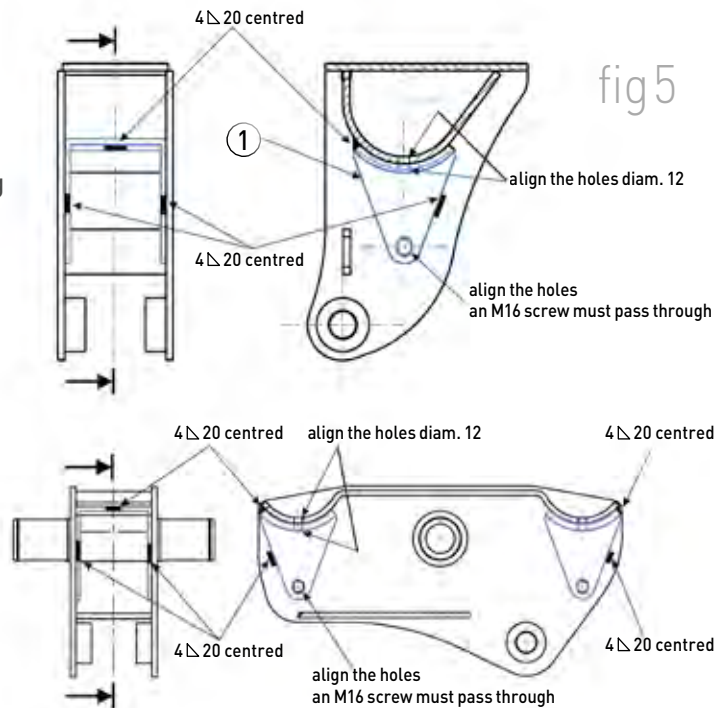
SM75 AND SM100 SUSPENSIONS REPLACING THE SPRING WEAR PADS

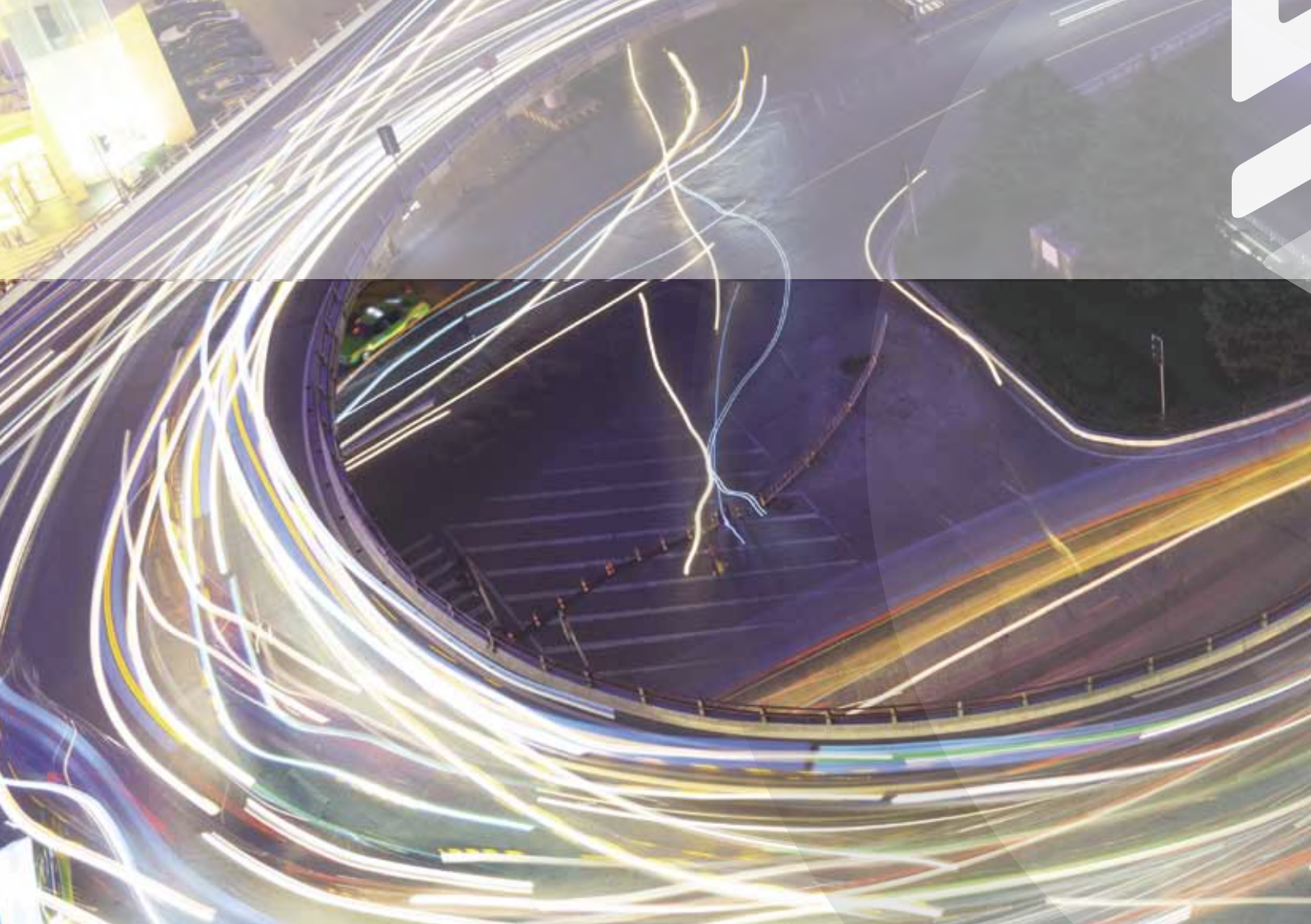
ST312-0



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

Wear pad references:
09714738 for SM100
09714751 for SM75





SM75 AND SM100 SUSPENSIONS REPLACING THE SPRING WEAR PADS

ST313-0

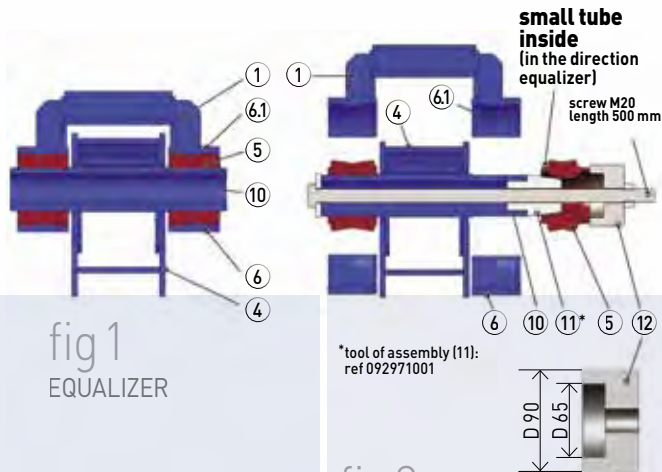


fig 1
EQUALIZER

*tool of assembly (11):
ref 092971001

fig 2
ASSEMBLY OF SILENTBLOCK

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) is 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.

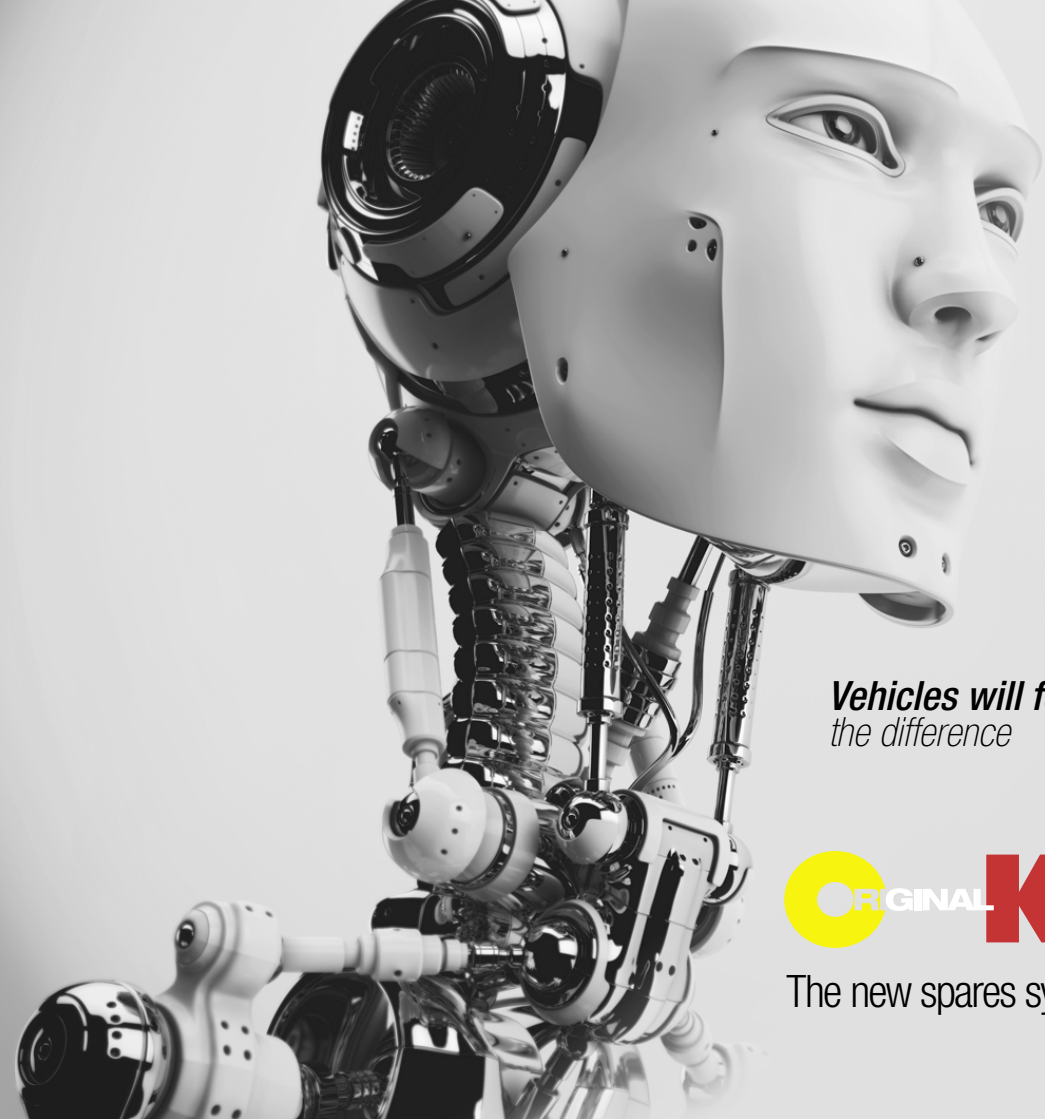
Immerse the rubber bush in lubricant and mount it on the tube (10) using a fitting cone (11) and a forcing-in cup (12) (fig 2).

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 dishwashing liquid. **Do not use oil!**
The equalizer (4) should be held horizontally.

The clamps (M16 screws) must be sufficiently tightened for the junction.

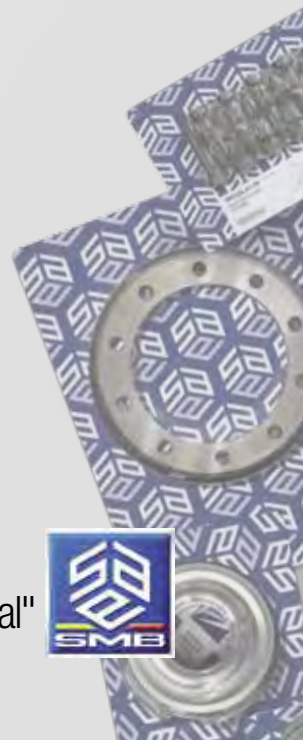
Tightening torque: 170–190 Nm



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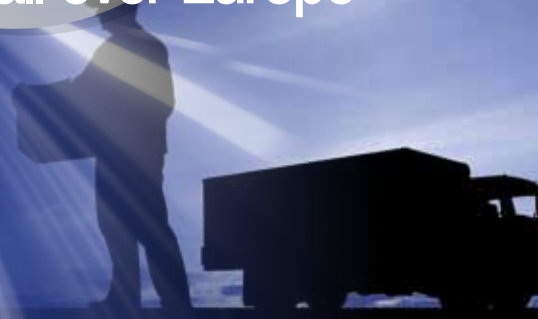
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