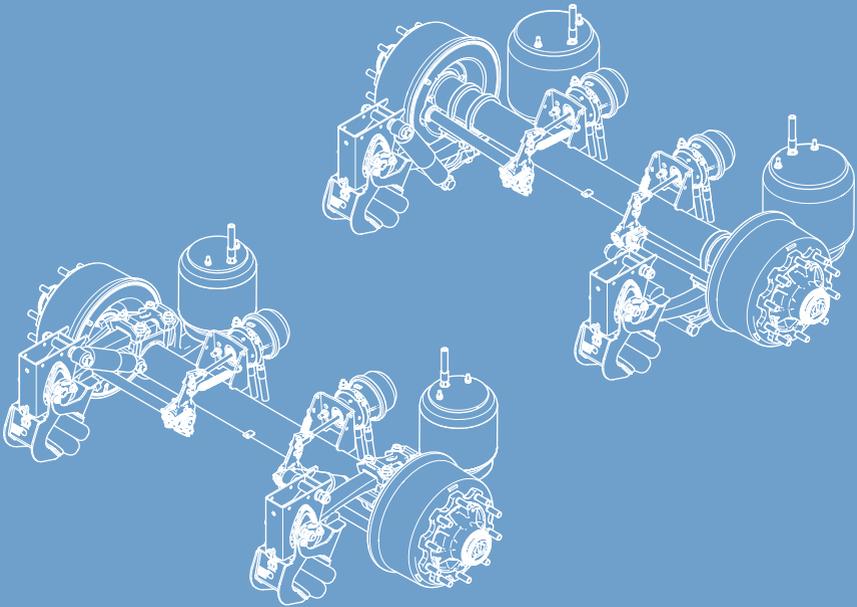




MAINTENANCE INSTRUCTIONS

KRONE TRAILER AXLES

Drum brake



515098440-04 EN

Dear customer,

These are the maintenance instructions for the KRONE Trailer Axles.

These maintenance instructions contain important information for the proper use and safe operation of the axles.

If these maintenance instructions should become completely or partially useless for any reason, you can order a replacement using one of the numbers listed below for your axle.

Customer Service

Telephone: +49 (0) 59 51 / 209-320

Fax: +49 (0) 59 51 / 209-367

email: kd.nfz@krone.de

Spare Parts

Telephone: +49 (0) 59 51 / 209-302

Fax: +49 (0) 59 51 / 209-238

Email: Ersatzteile.nfz@krone.de



www.krone-trailer.com



www.krone-trailerparts.com

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1 Information about this document

1.1 Introduction

These maintenance instructions apply to the KRONE Trailer Axles with drum brake GAKTX1 brakes with the "top air suspension link" and "bottom air suspension link" air suspension unit types. The relevant differences between the versions have been indicated in the corresponding text passages and illustrations. Otherwise, the illustrations are to be considered as examples.

These maintenance instructions are intended for the operator of the KRONE Trailer Axles with drum brakes GAKTX1 and its personnel as well as the driver. For better readability, the axles will be referred to as the "KRONE Trailer Axle" in the following. The maintenance instructions are designed to help you to familiarise yourself with the Krone Trailer Axle and to use it within its intended scope of application.

Maintenance and repairs serve to maintain the operational readiness and to prevent premature wear.

Maintenance is divided into:

- Maintenance and
- Repair

The maintenance instructions contain important information on how to operate the KRONE Trailer Axle in a safe, proper, and economical manner. Compliance with the instructions assists in the prevention of accidents and in the reduction of repair cost and downtimes, as well as in enhancing the reliability and service life of the KRONE Trailer Axle. Read the maintenance instructions carefully and attentively. Fahrzeugwerk Bernard KRONE GmbH & Co. KG does not accept any liability for damage or malfunctions that result from failure to observe these maintenance instructions. The warranty conditions can be found in our general terms and conditions of business.

- ▶ These maintenance instructions should be supplemented by applicable national rules and regulations concerning accident prevention and environmental protection.
- ▶ Ensure that the maintenance instructions are always available where the KRONE Trailer Axle is being used.

The maintenance instructions must be read, understood and applied by every person who is tasked with the following work:

- Servicing the KRONE Trailer Axle (maintenance and repair),
- Disposing of working materials and auxiliary materials.
- ▶ In addition to the maintenance instructions, the following must be observed:
 - The binding regulations concerning accident prevention which exist in the country of use and the place of use,
 - The accepted technical rules for safe and proper working.
- ▶ Pay special attention to the following:
 - The "safety" section (*see "2 Safety", pg. 8*).
 - The warnings found in the individual chapters/sub-chapters,
 - The supplier documentation that is included with the delivery.

1.2 Other applicable documents

The main part of the maintenance instructions for the KRONE Trailer Axle consists of the repair and maintenance instructions for the components used. Safe and fault-free maintenance and repair of the KRONE Trailer Axle is not possible without detailed knowledge of the individual components.

- ▶ Become fully familiar with all the applicable documents.
- ▶ If a reference document is missing, please contact customer service (*see "7.2 Customer service and support", pg. 72*).

1.3 Product identification and type plate

The item number and serial number are engraved on the axle body next to the type plate. This is to identify the axle if the type plate is lost or is not sufficiently legible.

The type plate and the engraving for product identification of the KRONE Trailer Axle are attached at the following location:

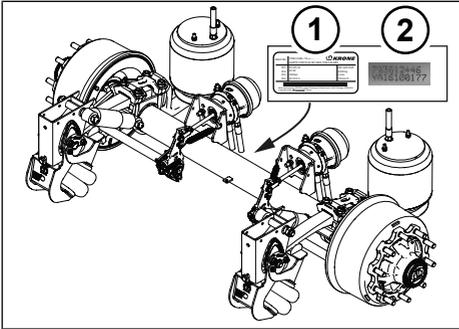


Fig. 1-1: Type plate position

- 1 Type plate
- 2 Engraving

The following information is presented on the type plate:

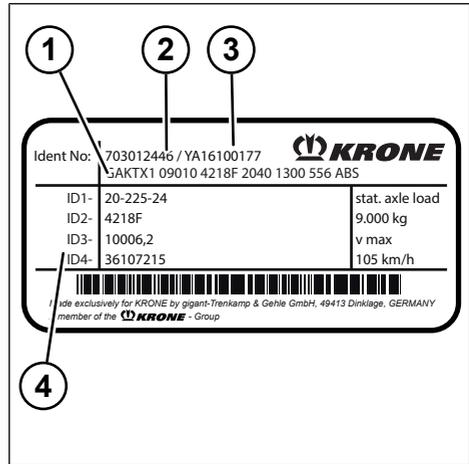


Fig. 1-2: Type plate example

- 1 Axle designation
- 2 Item number
- 3 Serial number
- 4 ID test log

1.4 Retention of documents

- ▶ Store these instructions and all other applicable documents in a safe place.
- ▶ Pass the complete documentation on to the next driver or owner.

1.5 Symbols used in these instructions

Various markings and symbols are used in the text in these instructions. These are explained below.

- Bullet list
 - Sub-list
- 1. Numbered list
- ☑ Prerequisite for action
- ▶ Action step
 - ⇒ Intermediate action result
- ✓ Result of the action

Name of the software buttons



Visual inspection



Work step



Visual inspection and work steps

INFO

Additional information and tips.

 : Also observe the enclosed supplier documentation.

1.6 Copyright

These instructions represent an official document within the meaning of laws against unfair competition. They incorporate texts and drawings which, in their entirety or partly, without written consent of the manufacturer, are not to be

- copied (except attached copy originals),
- published, or
- made public by other means.

The copyright to these instructions remains with

Fahrzeugwerk Bernard KRONE
GmbH & Co. KG, D-49757 Werlte

Violations oblige compensation for damages.

2 Safety

This manual contains instructions for your safety and for safe operation.

The basic safety instructions include instructions that fundamentally apply to the safe use or the maintenance of the safe condition of the axles.

The action-related warnings warn you about residual hazards and are found before a dangerous action.

- ▶ Follow all the instructions to prevent personal injury, environmental or property damage.

2.1 Warnings

Design and structure

The action-related warnings are structured as follows:

⚠ WARNING
Type and source of the danger!
Explanation of the type and source of the danger.
▶ Measures to avert the danger.

Hazard level

The warnings are classified according to the severity of the danger. The following explains the danger levels with their associated signal words and warning symbols.

⚠ DANGER
Direct danger to life or serious injuries

⚠ WARNING
Possible danger to life or serious injuries

⚠ CAUTION
Possible slight injuries, environmental damage or property damage

NOTE
Possible environmental damage or property damage

2.2 Intended use

The KRONE Trailer Axle has been manufactured according to state-of-the-art technology and in compliance with all applicable safety-related laws, rules and regulations. Nevertheless, its use may result in danger to life and limb of the user or third parties or damage to the KRONE Trailer Axle and other property.

- ▶ Only use the KRONE Trailer Axle when it is in technically perfect condition.
- ▶ Only operate the KRONE Trailer Axle for its intended purpose, while aware of safety and risks and in accordance with the operating instructions.

The KRONE Trailer Axle is only to be used as intended within the manufacturer's specifications as prescribed by Fahrzeugwerk Bernard KRONE GmbH & Co. KG. and in compliance with mandatory statutory regulations.

The owner is responsible for complying with the intended use.

Intended use includes the observance of all operating and maintenance instructions supplied with the KRONE Trailer Axle as well as the observance of the maintenance intervals and conditions prescribed therein.

Any use going beyond proper usage is considered improper.

Improper use also includes exceeding the technically permitted weights, axle and drawbar loads as well as exceeding the permitted maximum speed.

Fahrzeugwerk Bernard KRONE GmbH & Co. KG is not liable for damage resulting from improper or unauthorised use. Risks deriving from such infractions are exclusively borne by the user.

Authorised/proper usage also includes compliance with the maintenance and repair instructions.

Operational reliability of the KRONE Trailer Axle is guaranteed only if all applicable instructions, settings and performance limitations are fully complied with.

2.3 Personnel qualification and requirements

KRONE Trailer Axles may only be maintained and repaired by persons who are appropriately qualified and who have read and understood the maintenance instructions. These maintenance instructions differ between the operator and the skilled craftsman.

2.3.1 Operator

The operator is responsible for proper use of the KRONE Trailer Axle.

The operator must:

- Have reached a statutory minimum age of 21,
- Ensure that the KRONE Trailer Axle is checked and serviced once a year at an authorised specialist workshop.

2.3.2 Skilled craftsmen

The skilled craftsmen of a specialist workshop are authorised to perform the maintenance work (maintenance and repair). Authorised skilled craftsmen must have a recognised qualification or have the relevant knowledge of their specialised area required to meet the relevant regulations, rules and guidelines.

2.4 Personal protective equipment

PPE is used to prevent injuries. During maintenance and repair work, poisonous and corrosive materials can be used which can irritate or injure the eyes, respiratory organs and skin.

- ▶ Wear suitable protective gloves and safety shoes when operating and servicing the KRONE Trailer Axle.

2.5 Additional hazards

- ▶ Only used tested operating materials, special consumables and accessories.

- ▶ When combined with other products (e.g. tyres), note that this results in an enhanced axle system. This increases the potential risk.

2.6 Notes about legal regulations

The KRONE Trailer Axle is built according to the applicable regulations at the time of the delivery.

- ▶ Observe compliance with the nationally prescribed monitoring inspections and time intervals.
- ▶ Ensure compliance with the nationally prescribed permitted weights, axle and drawbar loads, which may be lower than those technically possible.

Changes to the KRONE Trailer Axle compared to the data provided in the registration documents result in the operating permit becoming invalid.

- ▶ Do not make any unauthorised changes or manipulations.
- ▶ Only use proper and approved tyres.
- ▶ Only used approved and suitable spare parts (see "7.1 Spare parts", pg. 72).

2.7 Warranty and liability

The "General terms and conditions of sale and delivery" from Fahrzeugwerk Bernard KRONE GmbH & Co. KG fundamentally apply.

Warranty and liability claims for personal and property damage are excluded if they are due to one of more of the following causes:

- Improper use (see "2.2 Intended use", pg. 8),
- Failure to follow the instructions, requirements and prohibitions of the maintenance instructions,
- Unauthorised structural changes to the KRONE Trailer Axle.
- Inadequate monitoring of wear parts,

- Improper maintenance or repairs not being carried out in good time,
- Use of non-approved and unsuitable spare parts (see "7.1 Spare parts", pg. 72).

You can find the warranty conditions at www.krone-trailer.com.

2.8 Original spare parts

Only use spare parts that are suitable for the KRONE Trailer Axle .

The use of unsuitable or non-approved spare parts can interfere with safety and lead to a loss of the operating licence and warranty. You can find KRONE spare parts at www.krone-trailer.com.

2.9 Environmental hazards

- ▶ During maintenance and repair work, always observe environmental protection.
- ▶ Avoid the release of operating materials into nature and the environment.
- ▶ Dispose of operating materials and other chemicals in accordance with the applicable national regulations.

3 KRONE Trailer Axle overview

3.1 Components

3.1.1 Axle body

The KRONE Trailer Axle is fitted with an axle body. The axle body is used to transfer force and connects all other components of the KRONE Trailer Axle.

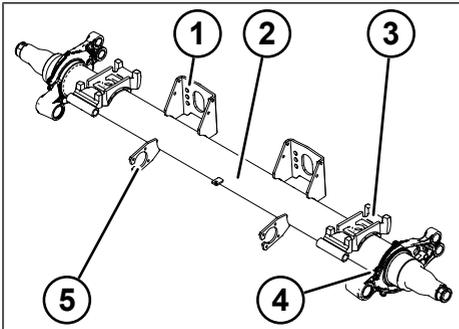


Fig. 3-1: Axle body components (top air spring link)

- 1 Brake cylinder carrier
- 2 Axle body
- 3 Axle plate
- 4 Brake bracket
- 5 Spherical cam bearing bracket

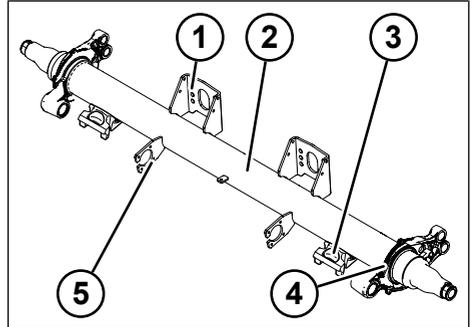


Fig. 3-2: Axle body components (bottom air spring link)

- 1 Brake cylinder carrier
- 2 Axle body
- 3 Axle plate
- 4 Brake bracket
- 5 Spherical cam bearing bracket

3.1.2 Integration

The KRONE Trailer Axle is fitted with an integration. The integration connects the axle body and the air suspension.

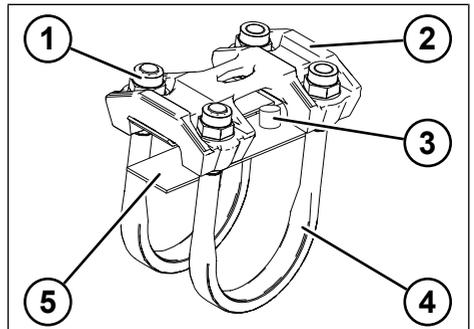


Fig. 3-3: Integration components (top air spring link)

- 1 Retainer nut/flat washer
- 2 Clamp plate
- 3 Heart stud
- 4 Spring clip
- 5 Shim

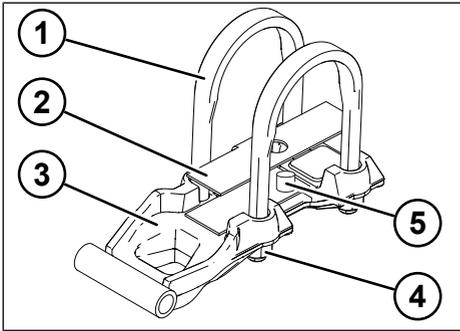


Fig. 3-4: Integration components (bottom air spring link)

- 1 Spring clip
- 2 Shim
- 3 Clamp plate
- 4 Retainer nut/flat washer
- 5 Heart stud

3.1.3 Air suspension

The KRONE Trailer Axle is fitted with air suspension.

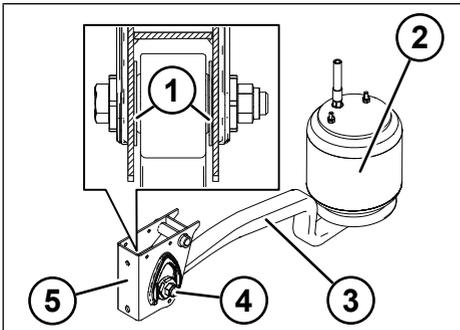


Fig. 3-5: Air suspension components

- 1 Thrust washers
- 2 Air spring bellow
- 3 Air spring link
- 4 Link fitting
- 5 Air spring bracket

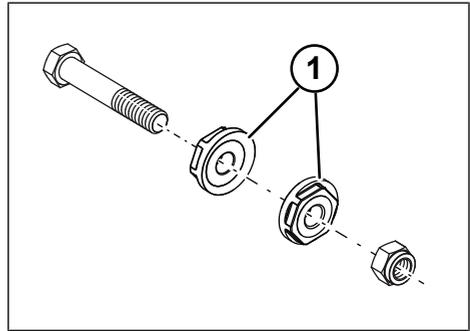


Fig. 3-6: Link fitting with eccentric nuts Generation 1

- 1 Eccentric nuts

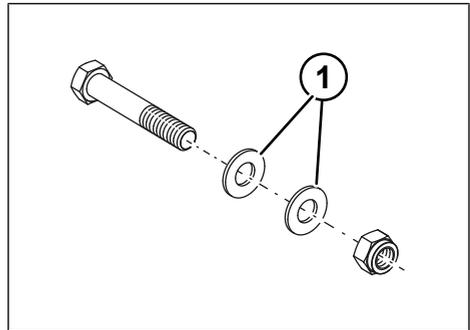


Fig. 3-7: Link fitting with washers Generation 2

- 1 Washers

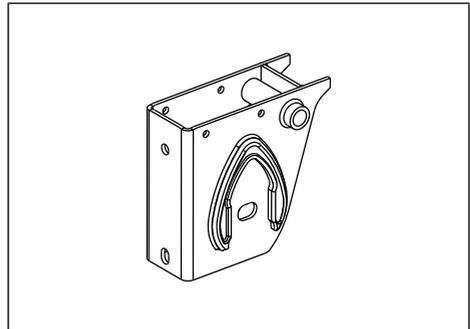


Fig. 3-8: Air spring bracket Generation 1

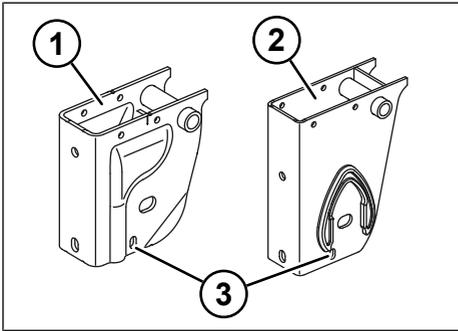


Fig. 3-9: Air spring bracket Generation 2

- 1 T-bracket
- 2 M-bracket/O-bracket
- 3 Slot for track setting

3.1.4 Shock absorber

The KRONE Trailer Axle is fitted with two shock absorbers.

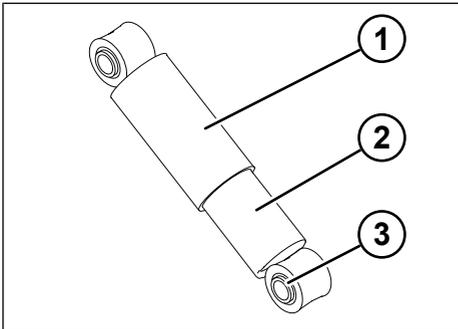


Fig. 3-10: Shock absorber components

- 1 Protective tube
- 2 Container
- 3 Silent block

3.1.5 Air spring bellow

The KRONE Trailer Axle is fitted with two air spring bellows. The air spring bellows are used to adjust the air suspension. The air spring bellow is split in two parts for rail loading.

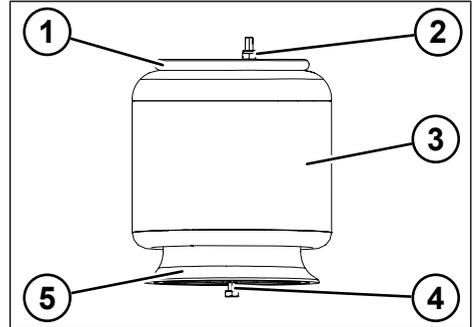


Fig. 3-11: Air spring bellow components

- 1 Crimped plate
- 2 Crimped plate retainer nut
- 3 Air spring bellow
- 4 Screwed fitting on the piston
- 5 Piston

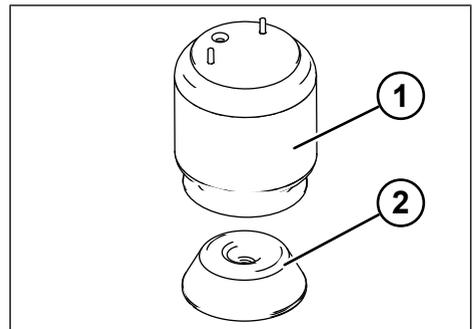


Fig. 3-12: Air spring bellow rail loading components

- 1 Air spring bellow
- 2 Cone

3.1.6 Brake

The KRONE Trailer Axle is fitted with a drum brake.

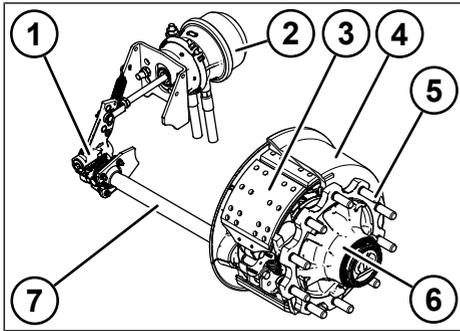


Fig. 3-13: Brake components

- 1 Automatic slack adjuster
- 2 Brake cylinder
- 3 Brake pad assembly
- 4 Brake drum
- 5 Bolt
- 6 Hub unit
- 7 Brake camshaft

3.1.7 Brake cylinder

The KRONE Trailer Axle is fitted with brake cylinders. The brake is operated using the brake cylinder.

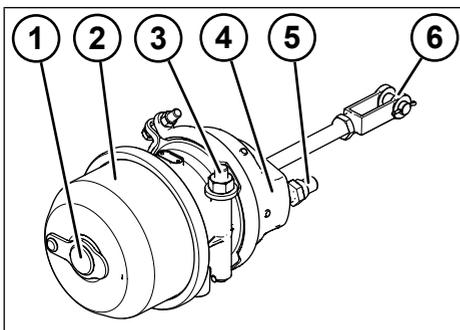


Fig. 3-14: Brake cylinder components

- 1 Protective cap
- 2 Spring storage
- 3 Bracket with emergency release screw

- 4 Brake cylinder
- 5 Retainer nuts
- 6 Fork head with bolt and safety split pin

3.1.8 Brake pad assembly

The KRONE Trailer Axle is fitted with a brake pad assembly.

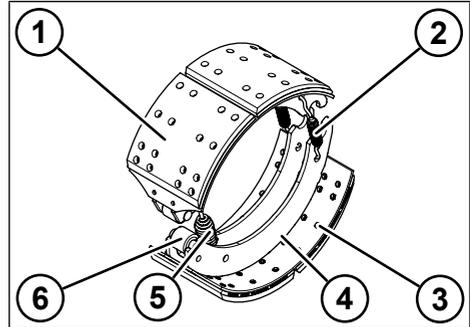


Fig. 3-15: Components of the brake pad assembly

- 1 Brake pad
- 2 Fixed-point springs
- 3 Rivet
- 4 Brake pad carrier
- 5 Release spring
- 6 Cam roller

3.1.9 Automatic slack adjuster

The KRONE Trailer Axle is equipped with an ASA (automatic slack adjuster). The ASA transfers the brake power of the brake cylinder to the brakes.

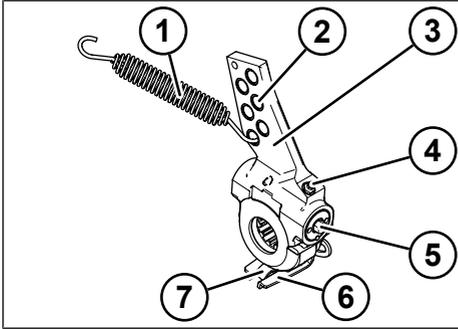


Fig. 3-16: Components of the ASA system

- 1 Tension spring (is not required when using brake cylinders with reinforced inner return spring).
- 2 Fork head bolt hole
- 3 ASA
- 4 ASA grease nipple
- 5 ASA setting nut
- 6 ASA fixed-point tab
- 7 Control lever

3.1.10 Twinlift

As an option, the KRONE Trailer Axle is fitted with a Twinlift. The Twinlift helps with low loading of the axle.

Krone makes a distinction between two generations here. Generation 1 has a two-part mount on the steering pin with an anchor plate. Generation 2 has closed mounts on the steering pin.

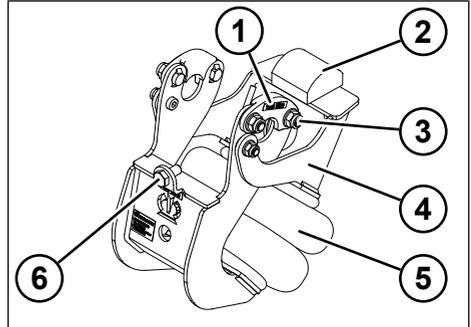


Fig. 3-17: Generation 1 Twinlift components

- 1 Anchor plate
- 2 Wear block
- 3 Anchor plate fitting
- 4 Lift lever
- 5 Two-fold bellow
- 6 Screw

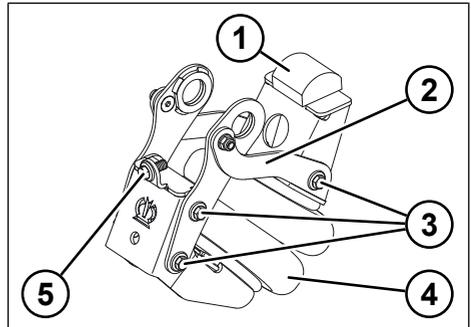


Fig. 3-18: Generation 2 Twinlift components

- 1 Wear block
- 2 Lift lever
- 3 Clamping screws
- 4 Two-fold bellow
- 5 Screw

3.1.11 Control device

The control device for the air suspension and the brake system is normally found behind the axle assembly on the left-hand side of the vehicle in the direction of travel on a common bracket.

4 Maintenance

⚠ WARNING

Risk of accident and property damage caused by improperly performed or lack of maintenance!

Improperly performed or lack of maintenance work and incorrect replacement parts affect safety.

- ▶ Observe the national accident prevention regulations.
- ▶ Only have maintenance work performed by an authorised specialist workshop in compliance with the KRONE maintenance and repair instructions.
- ▶ Only use original spare parts.
- ▶ Observe the maintenance instructions for the installed supplied components (e.g. brake cylinder).

⚠ WARNING

Risk of accident due to instability and rolling away!

Unintentional trailer movements can cause serious injury and property damage.

- ▶ Secure the trailer against rolling away by applying the parking brake.
- ▶ Use the wheel chocks to prevent the trailer from rolling away.
- ▶ Park the trailer on a solid surface to avoid sinking in or tipping.

⚠ WARNING

Risk of accident due to defective components!

A failure or defect can lead directly to an accident.

- ▶ Only use the KRONE Trailer Axle with components which are in perfect condition.
- ▶ Do not operate the KRONE Trailer Axle if there is a defect or any wear beyond the wear limits.
- ▶ Take the trailer out of operation if there are defective components.

NOTE

Environmental damage due to chemicals and improper disposal!

During maintenance, lubricants and operating substances may end up in the waste water and damage the environment.

- ▶ Do not allow lubricants or other chemicals to escape into drains, sewers or to seep into the ground.
- ▶ Ensure that lubricants, operating materials and components are disposed of properly and in an environmentally-friendly way.
- ▶ Observe the nationally applicable environmental protection regulations.
- ▶ Observe the applicable environmental protection measures.

The aim of maintenance is:

- that the commissioned KRONE Trailer Axle is kept operating safely and performing properly during use,
- to prevent downtimes,
- to keep the costs of operational readiness reasonable and financially justifiable,
- and to limit unavoidable repair expenditures.

4.1 Preparatory work

WARNING

Risk of accident caused by pressurised lines!

Loosening lines that are pressurised can cause serious injuries.

- ▶ Disconnect the compressed air supply and ensure that it does not inadvertently power on.

Depending on the scope of the repairs, preparatory work is required to allow safe repair work and to prevent accidents.

Carry out the following preparatory work:

- ▶ Use wheel chocks to prevent the trailer from rolling away.
- ▶ Use supports on the vehicle frame.
- ▶ Secure the axle or components that you are working on using a height-adjustable jack or similar.
- ▶ Depressurise the brake system or the air suspension system.
- ▶ Remove the wheels on the axle that you are working on.

4.2 Maintenance intervals

In addition to the general safety inspections in accordance with statutory regulations, for KRONE axle assemblies there is the visual inspection of the components and threaded unions. This maintenance work may only be performed by an authorised specialist workshop. For the check, the threaded unions should be checked visually as specified and if necessary, checked for firm seat with the torque spanner. With regards to the maintenance, replace the screw fittings, if necessary, and tighten them to the prescribed torque

(among other things, rust and settling signs can be an indication of loose fittings). Also observe the maintenance instructions of the installed supplied components.

In the maintenance intervals, you will find the maximum maintenance work for the vehicle when used on the road. The maintenance intervals are shortened accordingly when using the vehicle off-road or depending on the driving style, and must be adjusted individually. To ensure proper operating condition of the KRONE Trailer Axle, the following maintenance work must be carried out:

- ▶ Perform regular visual inspections.
- ▶ Observe the maintenance intervals.
- ▶ Observe the applicable current national and international regulations.
- ▶ Report any safety faults determined to the operator.
- ▶ Take the KRONE Trailer Axle out of service in the event of poor operational safety.
- ▶ If there is a fault, have the KRONE Trailer Axle repaired by an authorised specialist workshop.
- ▶ Properly performed maintenance work must be documented in the maintenance master data sheet in the operation instructions.

All maintenance intervals and work are listed on the following page and shown in an overview.



Visual inspection



Work step



Visual inspection and work steps

Maintenance intervals for the authorised specialist workshop

Air suspension	Maintenance work	Monthly	Every 3 months	Every 6 months	Yearly
Air spring bracket Pos. 1					X
Shock absorber Pos. 2					X
Integration Pos. 3					X
Air spring bellow Pos. 8					X
Thrust washers Pos. 7					X
Silent block Pos. 12					X
Link fitting Pos. 13					X

Brake	Maintenance work	Monthly	Every 3 months	Every 6 months	Yearly
Brake camshaft Pos. 4				X	
ASA Pos. 5				X	
Brake cylinder* Pos. 6				X	
Wheel nuts Pos. 10		During initial commissioning and after every wheel change, tighten up after 100 km.			
Brake drum Pos. 11				X	
Brake pad Pos. 16			X		

* Observe the maintenance instructions from the manufacturer.

Wheel hub unit	Maintenance work	Monthly	Every 3 months	Every 6 months	Yearly
Wheel hub unit Pos. 9				X	
Outer/inner bearing Pos. 9					X
Bearing grease Pos. 9		The bearing grease must be replaced every 5 years (check the bearing).			
Seal Pos. 9		The seal must be replaced every 5 years.			

Twinlift	Maintenance work	Monthly	Every 3 months	Every 6 months	Yearly
All components Pos. 14				X	

Axle body	Maintenance work	Monthly	Every 3 months	Every 6 months	Yearly
All components Pos. 15				X	

Maintenance intervals for the driver

Brake	Maintenance work	Monthly	Every 3 months	Every 6 months	Yearly
Wheel nuts Pos. 10		Visual inspection for wear and damage before each trip. After each wheel change, tighten up after 100 km. Tightening torque: 630 Nm +/- 30 Nm Test torque: 600 Nm			

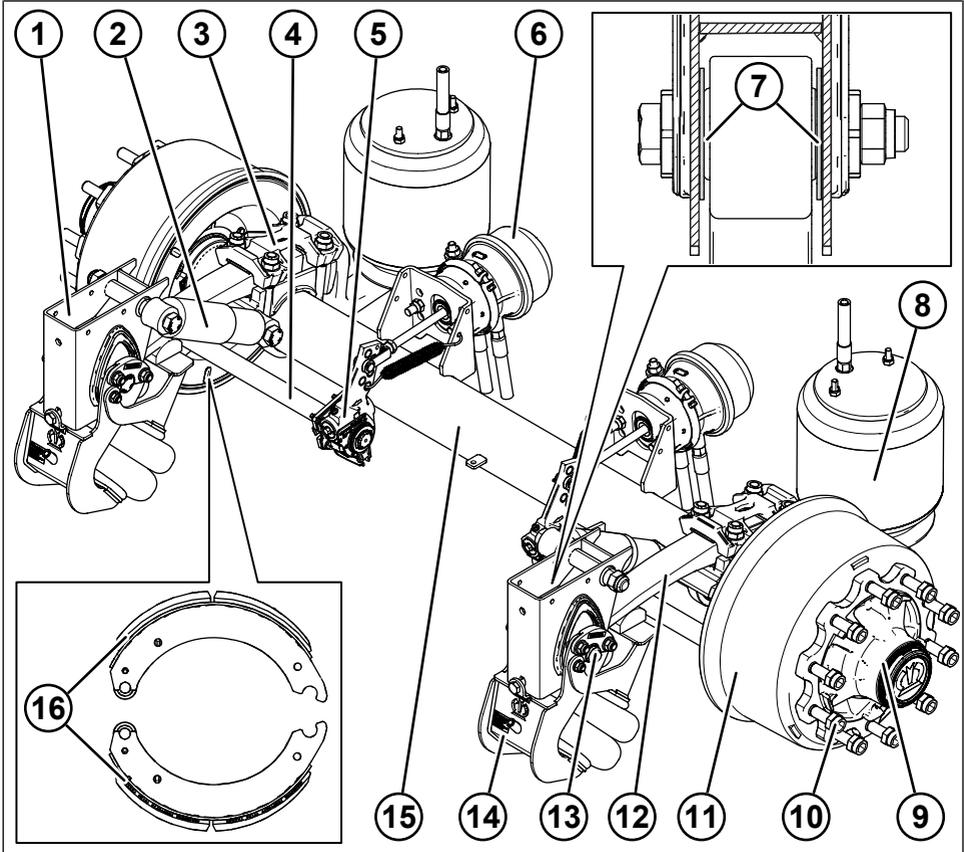


Fig. 4-1: Drum brake maintenance overview

INFO

Wear must be assessed by an authorised specialist workshop. Only specialists with expert knowledge can evaluate the wear and implement the corresponding measures.

4.3 Maintenance work

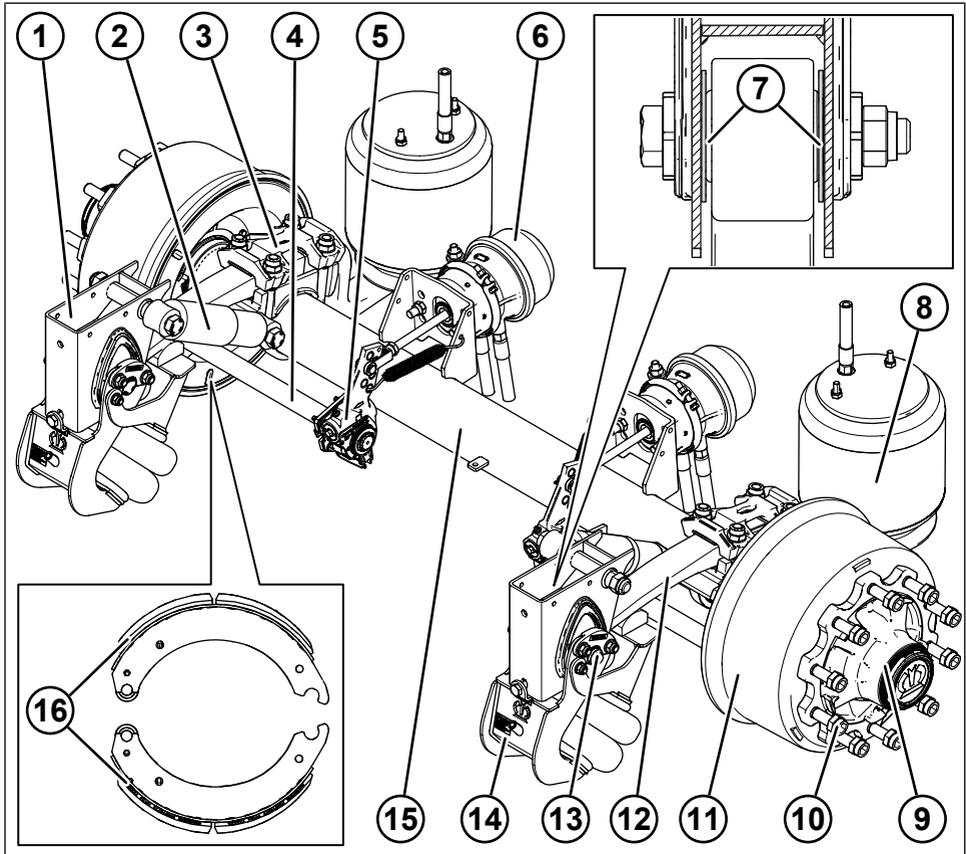


Fig. 4-2: Maintenance overview

Perform the following maintenance work:

- ▶ Carry out preparatory work (see "4.1 Preparatory work", pg. 17).
- ▶ Perform a visual inspection of all individual parts for wear and damage.
- ▶ Replace damaged components.

Component	Item number	Maintenance work
Air spring bracket	1	Check for damage.
Shock absorber	2	Check for damage, wear and excessive oil loss. A "slight sweat" is allowed. Perform a twist test of the rubber bushings.
Integration	3	Check for tight fitting.
Brake camshaft	4	Grease the brake camshaft (4 grease nipples per axle).
ASA	5	Check the function and grease (2 grease nipples per axle).
Brake cylinder	6	Check for damage and functionality.

MAINTENANCE

Component	Item number	Maintenance work
Thrust washers	7	Check for wear (if the thrust washer thickness is < 2 mm, the thrust washers must be replaced).
Air spring bellow	8	Check the screw fittings on the crimped plate and the link for tightness. Check for correct fitting, cracks and any trapped foreign bodies.
Wheel hub unit	9	Check for damage and functionality.
Outer/inner bearing	9	Check play.
Bearing/bearing grease	9	Check bearing/replace bearing grease.
Seal	9	Replace seal.
Wheel nuts	10	Check tightening torque.
Brake drum	11	Check for cracks, damage or wear (check the internal diameter of the brake drum when changing the brake shoes).
Silent block in the link eye	12	Check the wear of the silent bearing.
Link fitting	13	Check the screw fitting for tightness.
Twinlift	14	Check the screw fitting for tightness. Check the two-fold bellow for cracks and any trapped foreign bodies.
Axle body	15	Check for damage, corrosion and wear.
Brake pads	16	Check for wear (minimum thickness 5 mm).

4.4 Testing and tightening torques

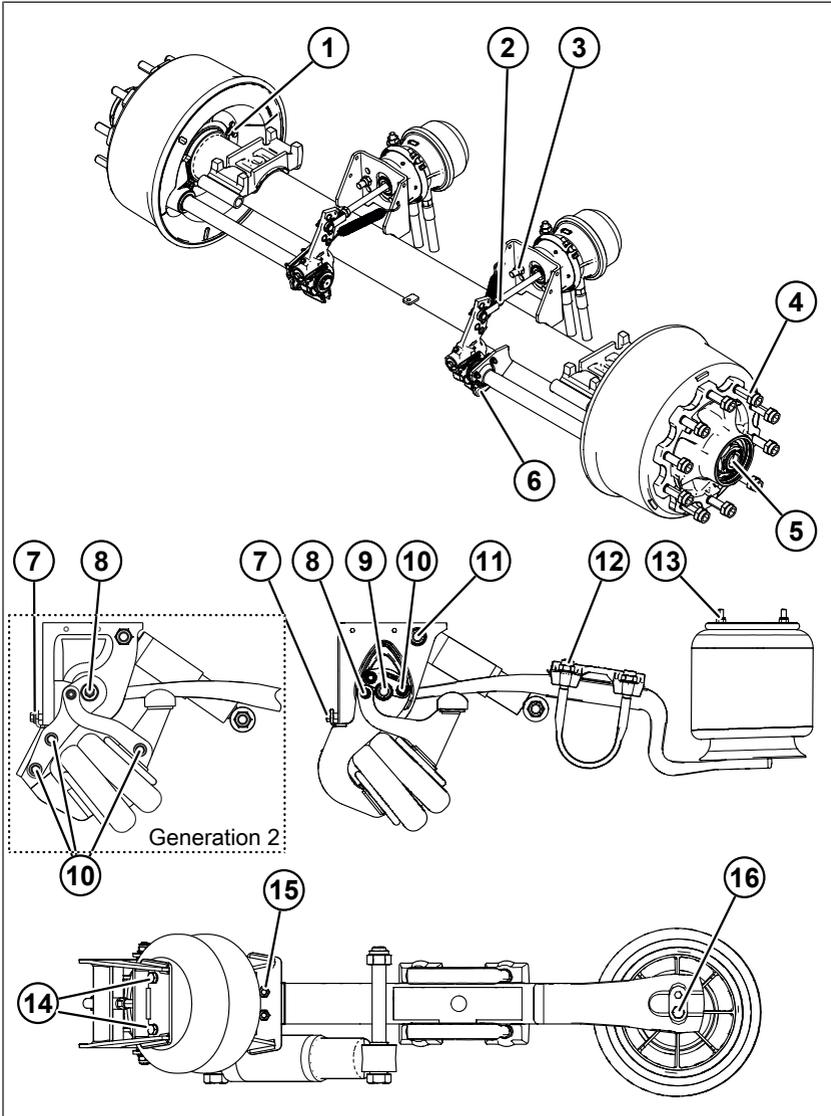


Fig. 4-3: Overview of testing and tightening torques (top air spring link)

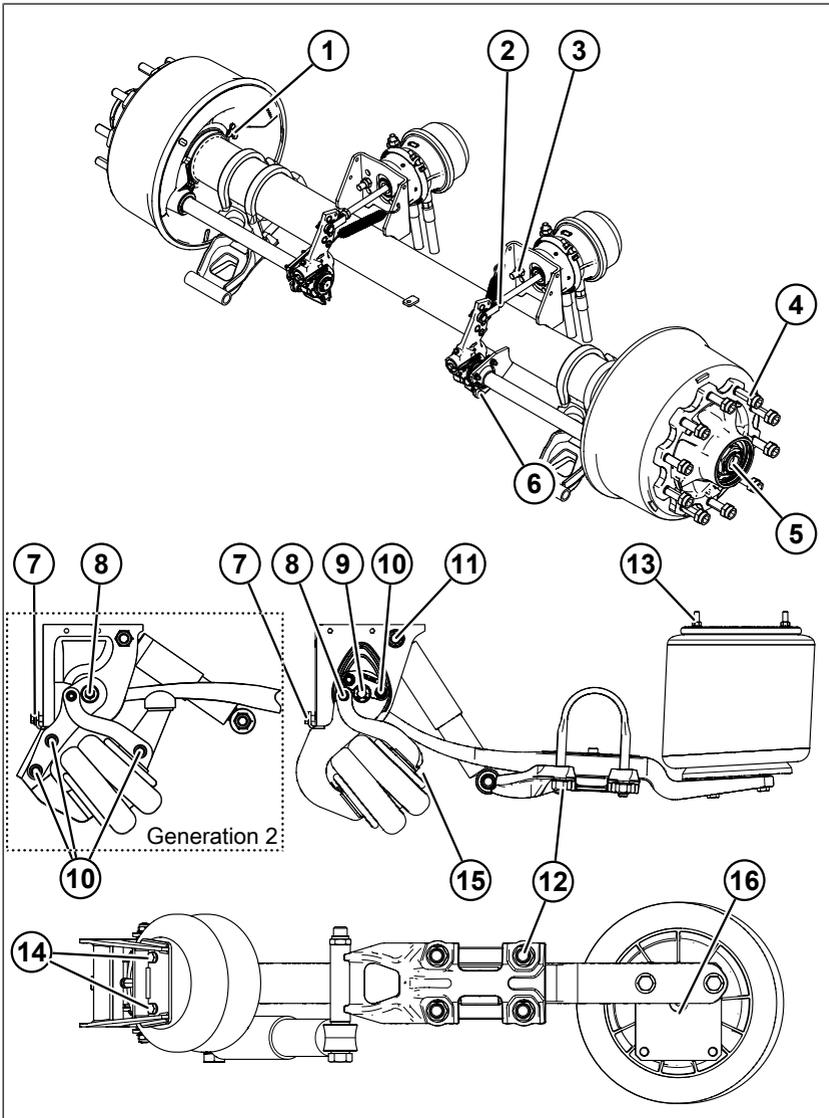


Fig. 4-4: Overview of testing and tightening torques (bottom air spring link)

Perform the following maintenance work:

- ▶ Carry out preparatory work.
- ▶ Check the prescribed testing torques according to the table.

Screw connection	Item number	Size	Torque	
			Testing torque	Tightening torque (pre-tensioning torque)
Fastening bolts	1	M8	20 Nm	22 Nm +/- 4 Nm
Lock nut	2	M16 x 1.5	60 Nm	50 Nm +/- 15 Nm*
Brake cylinder nuts	3	M16 x 1.5	175 Nm	195 Nm +/- 15 Nm*
Wheel nuts	4	M22 x 1.5	600 Nm	630 Nm +/- 30 Nm
Axle nut	5	M55 x 1.5	N/A	630 Nm +/- 30 Nm
Screw connection	6	M8	20 Nm	22 Nm +/- 4 Nm
Fastening bolts	7	M14 x 2.0 L = 30 mm	80 Nm	80 Nm +/- 5 Nm
Retainer nut	8	M12	N/A	100 Nm +/- 10 Nm Loctite 270
Steering pins	9	M24	680 Nm	340 Nm + 90° (pre-tensioning torque: 200 Nm, set the eccentric nut to Neutral)
Retainer nut	10	M14 x 2.0	N/A	120 Nm +/- 10 Nm
Fastening bolt	11	M24 x 3	480 Nm	530 Nm +/- 30 Nm
Retainer nut	12	M22 x 1.5	600 Nm	700 Nm +/- 25 Nm
Retainer nut	13	M12	N/A	55 Nm +/- 5 Nm
Fastening bolts	14	M10	N/A	40 Nm +/- 5 Nm Loctite 243
Retainer nut	15	M10	N/A	40 Nm +/- 5 Nm
Fastening bolt	16	M12	45 Nm	82 Nm +/- 3 Nm

* The tightening torque only applies to KNORR brake cylinders. When using other brake cylinders, observe the manufacturer's specifications.

4.5 Wear dimensions

4.5.1 Air suspension, brakes and ASA

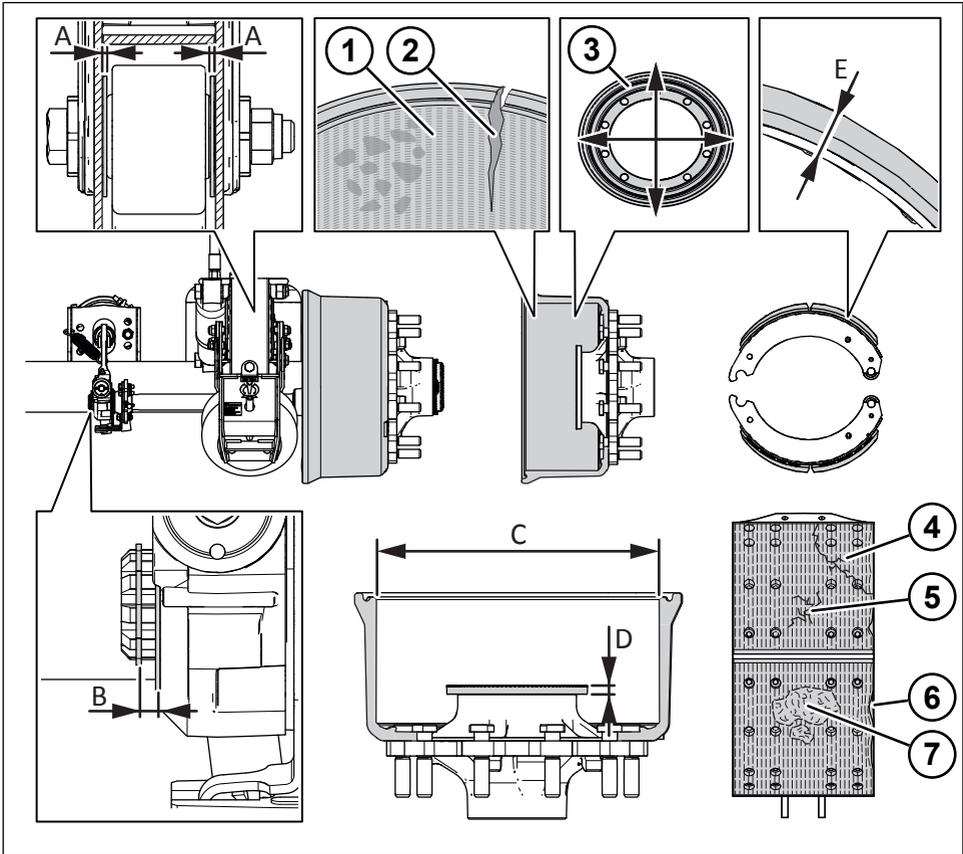


Fig. 4-5: Wear dimensions: Air suspension, brakes and ASA

- ▶ Carry out preparatory work (see "4.1 Preparatory work", pg. 17).
- ▶ Check the prescribed wear dimensions in accordance with the table.

Position	Test parameters	Wear dimension*
A	Thrust washers	Thickness < 2 mm
B	ASA play	0.5 - 2.0 mm
C	Brake drum inner diameter	> 425 mm
D	ABS magnetic wheel parallelism	Parallelism <= 0.2 mm
E	Brake pad thickness	Thickness < 5 mm
1	Brake drum martensite tracks	Not permitted, check brakes and replace the brake pads
2	Continuous cracks on brake drum	Not permitted, check brakes

Position	Test parameters	Wear dimension*
3	Brake drum ovality	Not permitted, check brakes and replace brake drum
4	Cracks to the rivet base area	Not permitted
5	Permitted bifurcations	Individual cracks max. 1 mm wide and max. 90 mm long
6	Brake pad edge breakouts	> 8 mm over the whole brake pad thickness is not permitted
7	Brake pad surface breakouts	>= 15 % of the brake pad surface and a depth of > 1.5 mm is not permitted

*When the wear dimension is reached or if the wear is not permitted, the component must be replaced.

4.5.2 Shock absorber wear

INFO
 When the wear dimension is reached or if the degree of wear is not permitted, the component must be replaced.

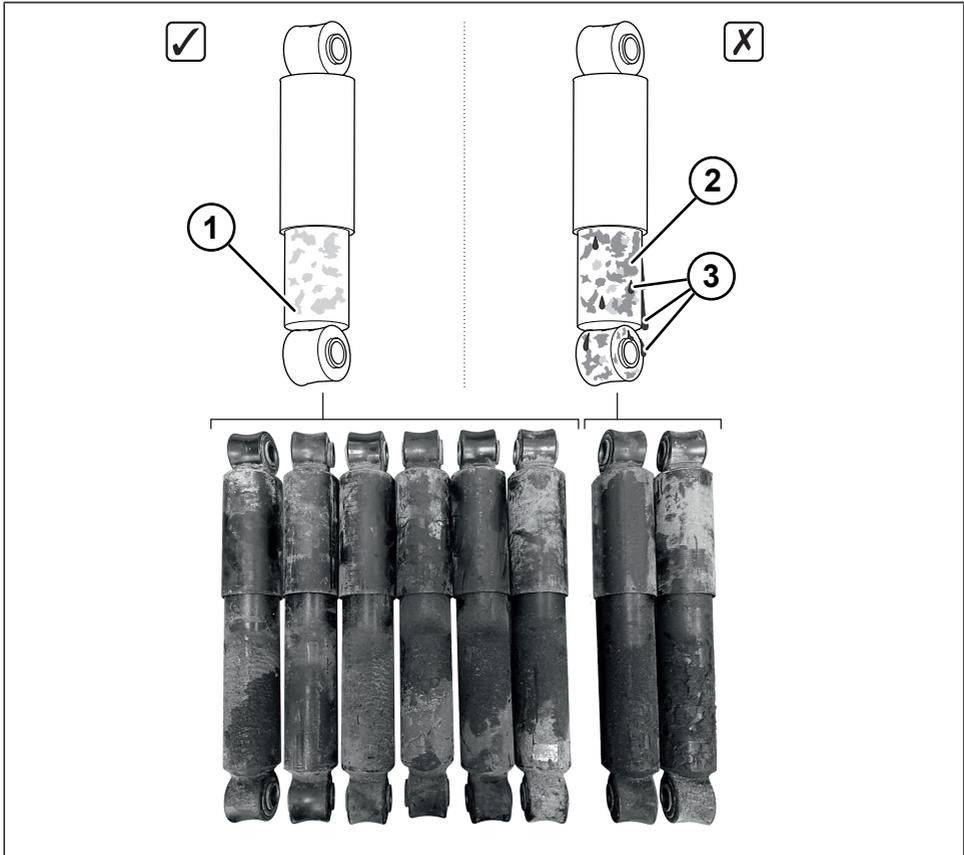


Fig. 4-6: Examples of shock absorber defects

Perform the following maintenance work:

- ▶ Carry out preparatory work (see "4.1 Preparatory work", pg. 17).

- ▶ Check the prescribed degree of wear in accordance with the table.

Position	Degree of wear	Assessment
1	Slight sweating: Visible greasy and dry surface of the container	Permitted
2	Severe sweating: Visible greasy and wet surface of the container including the shock absorber bracket	Not permitted
3	Oil dropping from the shock absorber	Not permitted

5 Repair

DANGER

Risk of accident due to unintended vehicle movements!

Unintended vehicle movements can cause serious injury.

- ▶ Use wheel chocks to prevent the trailer from rolling away.
- ▶ Park the trailer on solid and level ground to avoid sinking in or tipping.
- ▶ During maintenance and repair work, observe the stability of the trailer.
- ▶ Observe the applicable national accident prevention regulations.

CAUTION

Risk of injury due to unexpected component movements!

Pneumatically or electrically driven components may move unexpectedly and injure people.

- ▶ Fully depressurise the pneumatic system and disconnect the electrical connections before beginning maintenance work. Ensure that the system cannot be switched on again.

WARNING

Risk of accident and material damage caused by improperly performed troubleshooting and repair work!

Improperly performed troubleshooting and repair work affect safety and may lead to serious injuries and property damage.

- ▶ Only have necessary repair work performed by an authorised specialist workshop.
- ▶ Only use original spare parts and spare parts authorised by KRONE.
- ▶ Observe the instructions concerning troubleshooting issued by the suppliers of the installed components.
- ▶ Verify functionality after installing/repairing components.

WARNING

Risk of accident due to defective components!

A failure or defect can lead directly to an accident.

- ▶ Only use the KRONE Trailer Axle with components which are in perfect condition.
- ▶ Do not operate the KRONE Trailer Axle if there is a defect or any wear beyond the wear limits.
- ▶ Take the trailer out of operation if there are defective components.

NOTE

Environmental damage due to chemicals and improper disposal!

During maintenance, lubricants and operating substances may end up in the waste water and damage the environment.

- ▶ Do not allow lubricants or other chemicals to escape into drains, sewers or to seep into the ground.
- ▶ Ensure that lubricants, operating materials and components are disposed of properly and in an environmentally friendly way.
- ▶ Observe the nationally applicable environmental protection regulations.
- ▶ Observe the applicable environmental protection measures.

Repair work includes the replacement and the repair of components and is only required when components are damaged by wear or other external circumstances.

The following applies to the specialist workshop:

- The necessary repair work must be performed professionally, according to the rules of engineering and in accordance with the applicable regulations.
- Do not repair worn or damaged components using a makeshift repair.

- Only use original or approved spare parts for repairs (see "7.1 Spare parts", pg. 72).
- Always replace any removed seals with new seals.
- Welding work on the frame, chassis and on bearing parts may only be performed after consultation with KRONE customer service and KRONE construction.

5.1 Preparatory work

⚠ WARNING

Risk of accident caused by pressurised lines!

Loosening lines that are pressurised can cause serious injuries.

- ▶ Disconnect the compressed air supply and ensure that it does not inadvertently power on.

Depending on the scope of the repairs, preparatory work is required to allow safe repair work and to prevent accidents.

Carry out the following preparatory work:

- ▶ Use wheel chocks to prevent the trailer from rolling away.
- ▶ Use supports on the vehicle frame.
- ▶ Secure the axle or components that you are working on using a height-adjustable jack or similar.
- ▶ Depressurise the brake system or the air suspension system.
- ▶ Remove the wheels on the axle that you are working on.

5.2 Brake

5.2.1 Wheel nuts

Removing the wheel nuts

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Loosen the wheel nuts.

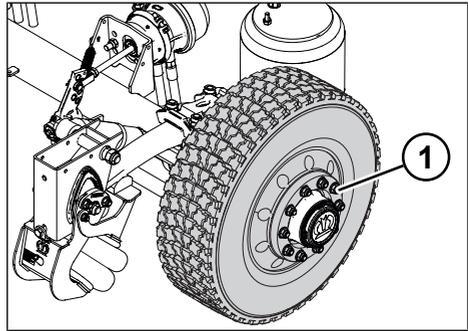


Fig. 5-1: Wheel nuts

- 1 Wheel nuts

- ▶ Remove any rust or dirt from the bolts and wheel nuts.
- ▶ Replace any worn or defective bolts and wheel nuts.
- ✓ The wheel nuts are removed.

Fitting the wheel nuts

⚠ WARNING

Risk of accident caused by loose wheel nuts!

Wheel nuts that are not tightened correctly will come loose during travel, possibly leading to serious accidents.

- ▶ Tighten the wheel nuts with the appropriate tightening torque.
- ▶ Check the tightness of the wheel nuts after each wheel change, and again shortly after the first laden journey.

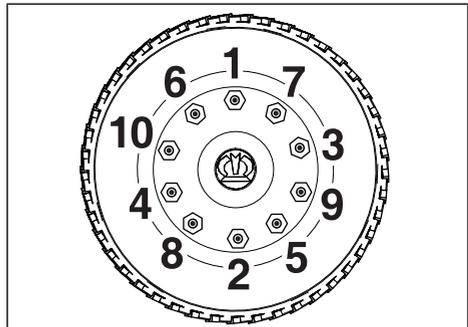


Fig. 5-2: Wheel nut tightening sequence

INFO

On initial commissioning and after every wheel change, tighten up the wheel nuts after 100 km.

- ▶ Tighten up the wheel nuts with a tightening torque of 630 Nm +/- 30 Nm. Ensure that the wheel nuts are tightened in the tightening sequence.
- ✓ The wheel nuts are fitted.

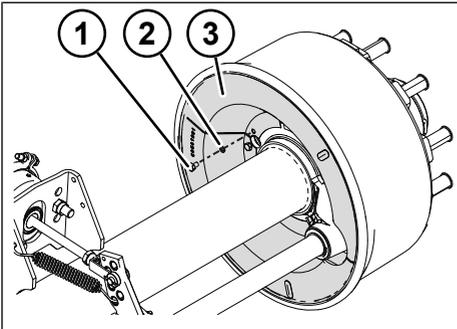
5.2.2 Cover plate

Fig. 5-3: Cover plate

- 1 Screw
- 2 Retainer washer
- 3 Cover plate

Removing the cover plate

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Loosen and remove the bolt and retainer washer.
- ▶ Remove the cover plate.
- ✓ The cover plate is removed.

Installing the cover plate

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Position the cover plate.
- ▶ Insert the bolt and retaining washer and tighten to the appropriate torque (22 Nm +/- 4 Nm).
- ✓ The cover plate is fitted.

5.2.3 Hub cap**Remove the hub cap**

- ▶ Lever out the hub cap in the hub cap groove provided.

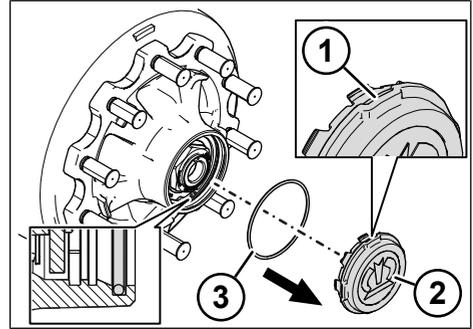


Fig. 5-4: Removing the hub cap

- 1 Hub cap groove
- 2 Hub cap
- 3 Sealing ring

- ▶ Remove the sealing ring.
- ✓ The hub cap is removed.

Installing the hub cap

- ▶ Lightly grease the new sealing ring and insert into the groove.
- ▶ Insert the hub cap by turning it backwards and forwards to ensure that the sealing ring is securely seated.

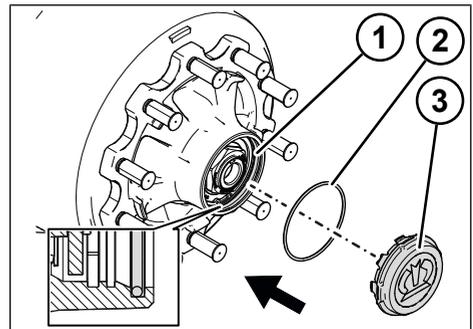


Fig. 5-5: Inserting the hub cap

- 1 Sealing ring groove
- 2 Sealing ring
- 2 Hub cap

- ▶ Carefully tap the hub cap firmly into place using a plastic hammer until the hub cap is seated flush.
- ✓ The hub cap is installed.

5.2.4 Brake cylinder

Removing the brake cylinder

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Mark and remove the compressed air lines.

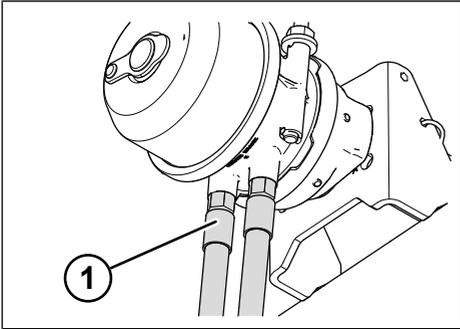


Fig. 5-6: Removing the compressed air lines

- 1 Compressed air line

- ▶ Loosen the retainer nut and flat washer.
- ▶ Remove the emergency release screw from the holder.

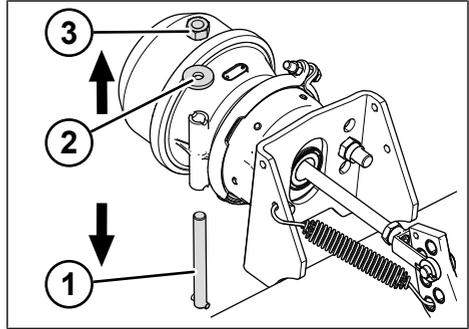


Fig. 5-7: Removing the emergency release screw

- 1 Emergency release screw
- 2 Flat washer
- 3 Retainer nut

- ▶ Open the cap.
- ▶ Insert the emergency release screw.

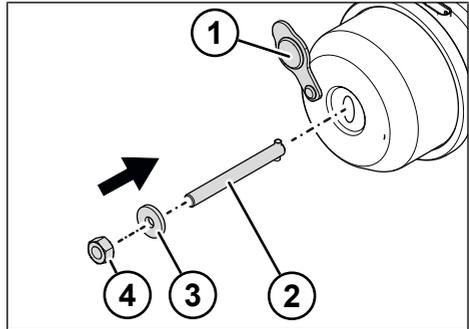


Fig. 5-8: Install the emergency release screw

- 1 Protective cap
- 2 Emergency release screw
- 3 Flat washer
- 4 Retainer nut

- ▶ Turn the emergency release screw clockwise (90°) until it engages.
- ▶ Screw the retainer nut and flat washer onto the emergency release screw.
- ▶ Tighten up the retainer nut until the brake cylinder releases and is mechanically secured.

- ▶ If necessary, mark the tension spring position on the automatic slack adjuster (ASA).
- ▶ If necessary, unhook the tension spring.

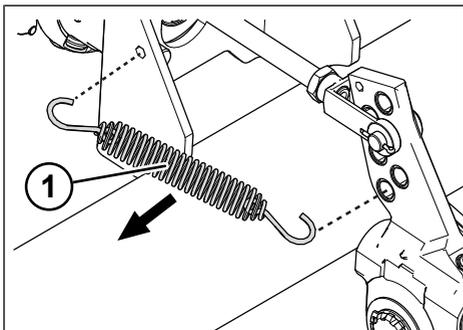


Fig. 5-9: Unhooking the tension spring

- 1 Tension spring (is not required when using brake cylinders with reinforced inner return spring).
- ▶ Turn the setting nut of the ASA (automatic slack adjuster) counter-clockwise until the brake is released. An audible "clicking" noise is normal.

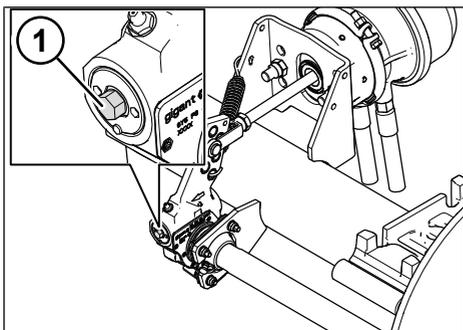


Fig. 5-10: Loosening the setting nut of the ASA

- 1 ASA setting nuts
- ▶ Mark the fork head bolt hole on the ASA.
 - ▶ Remove safety splint.
 - ▶ Remove the fork head bolt.

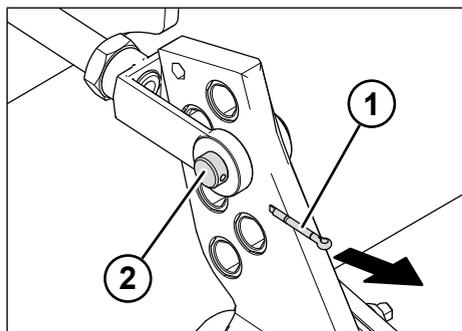


Fig. 5-11: Removing the fork head bolt

- 1 Safety split pin
- 2 Fork head bolt

- ▶ Mark the position of the brake cylinder on the brake cylinder bracket.
- ▶ Loosen the retainer nuts.

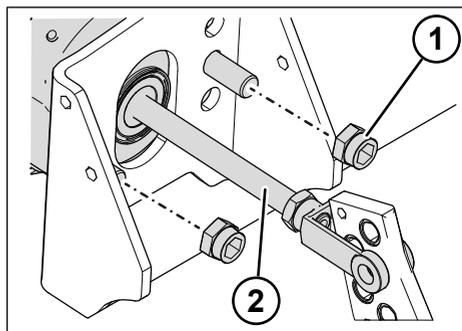


Fig. 5-12: Removing the brake cylinder

- 1 Retainer nuts
- 2 Brake cylinder

- ▶ Remove the brake cylinder.
- ▶ Measure the distance from the fork head to the brake cylinder and record this measurement.

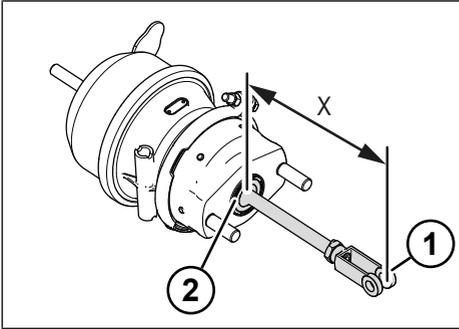


Fig. 5-13: Distance measurement

- 1 Fork head
- 2 Brake cylinder

- ▶ Loosen the lock nut.
- ▶ Remove the lock nut and fork head.

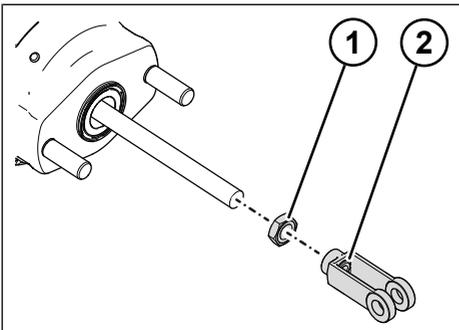


Fig. 5-14: Removing the fork head

- 1 Lock nut
- 2 Fork head

- ✓ The brake cylinder is removed.

Fitting the brake cylinder

INFO

* Compare the tightening torque of the brake cylinder with the corresponding manufacturer specifications.

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Check that the brake cylinder carrier is flat.

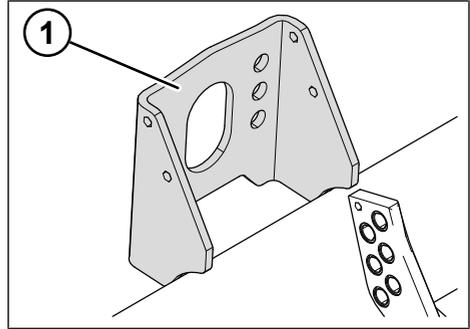


Fig. 5-15: Checking the brake cylinder carrier

- 1 Lock nut

- ▶ Loosen the retainer nut and flat washer.
- ▶ Remove the emergency release screw from the holder.

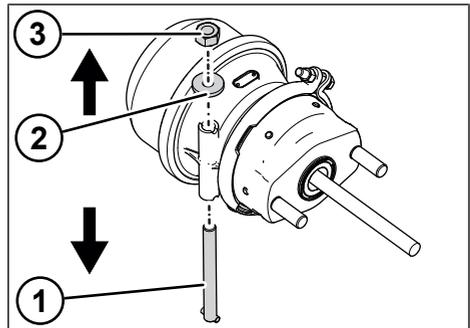


Fig. 5-16: Removing the emergency release screw

- 1 Emergency release screw
- 2 Flat washer
- 3 Retainer nut

- ▶ Open the cap.
- ▶ Insert the emergency release screw.

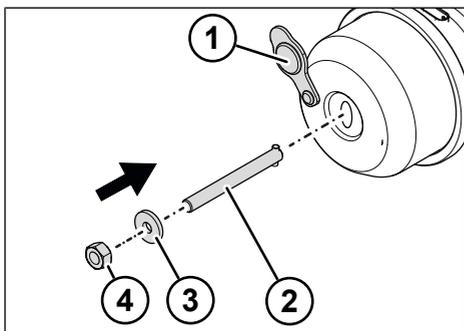


Fig. 5-17: Inserting the emergency release screw

- 1 Protective cap
- 2 Emergency release screw
- 3 Flat washer
- 4 Retainer nut

- ▶ Turn the emergency release screw clockwise (90°) until it engages.
- ▶ Screw the retainer nut and flat washer onto the emergency release screw.
- ▶ Tighten up the retainer nut until the brake cylinder releases and is mechanically secured.
- ▶ Screw the lock nut and fork head onto the brake cylinder.

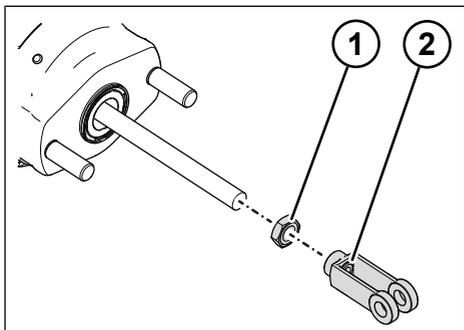


Fig. 5-18: Inserting the fork head

- 1 Lock nut
- 2 Fork head

- ▶ Align the fork head to the distance measured when it was removed.

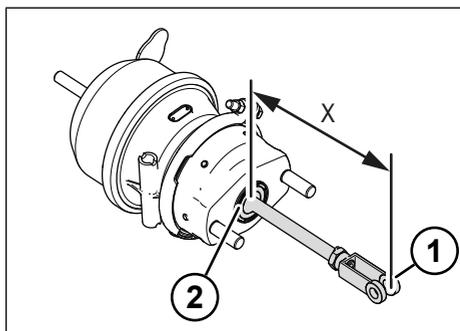


Fig. 5-19: Distance measurement

- 1 Fork head
- 2 Brake cylinder

- ▶ Tighten the lock nut to the corresponding torque ($50 \text{ Nm} \pm 15 \text{ Nm}^*$). The specified torque only applies to KNORR brake cylinders. When using other brake cylinders, observe the manufacturer's specifications.
- ▶ Insert the brake cylinder in the previously marked positions of the brake cylinder carrier and secure it with new retainer nuts. Ensure that the ASA is seated in the fork head. If necessary, adjust the ASA until it is properly seated in the fork head.
- ▶ Tighten the retainer nut to the corresponding torque ($195 \text{ Nm} \pm 15 \text{ Nm}^*$). The specified torque only applies to KNORR brake cylinders. When using other brake cylinders, observe the manufacturer's specifications.

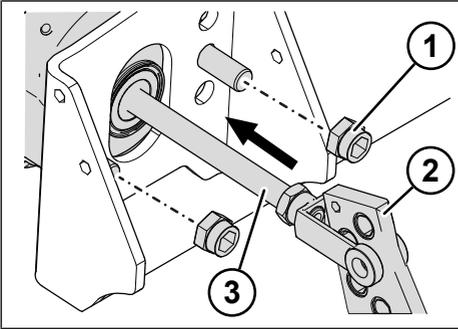


Fig. 5-20: Inserting the brake cylinder

- 1 Retainer nuts
- 2 ASA
- 3 Brake cylinder

- ▶ Adjust the ASA until it can be bolted into the fork head bolt hole which was marked previously.
- ▶ Clean and grease the fork head bolt.
- ▶ Insert the fork head bolt.

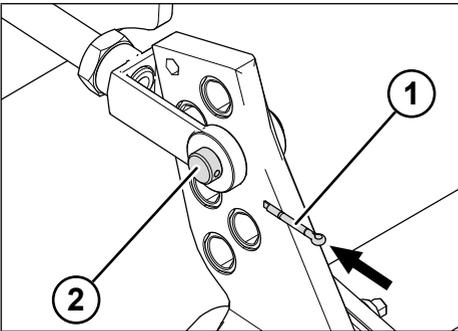


Fig. 5-21: Inserting the fork head bolt

- 1 Safety split pin
- 2 Fork head bolt

- ▶ If necessary, attach the tension spring in the hole marked previously.

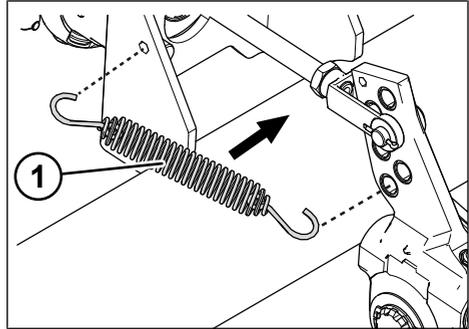


Fig. 5-22: Mount the tension spring

- 1 Tension spring (is not required when using brake cylinders with reinforced inner return spring).

- ▶ Loosen and remove the retainer nut and flat washer.
- ▶ Turn the emergency release screw key counter-clockwise (90°) and disengage it.
- ▶ Remove the emergency release screw.

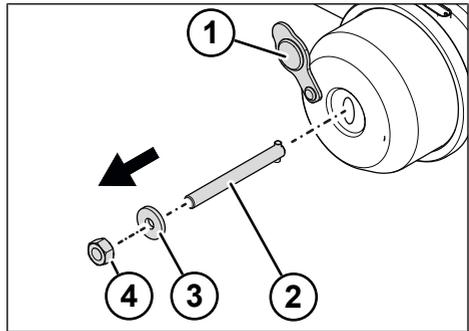


Fig. 5-23: Removing the emergency release screw

- 1 Protective cap
- 2 Emergency release screw
- 3 Flat washer
- 4 Retainer nut

- ▶ Close the cap.
- ▶ Insert the emergency release screw in its holder.

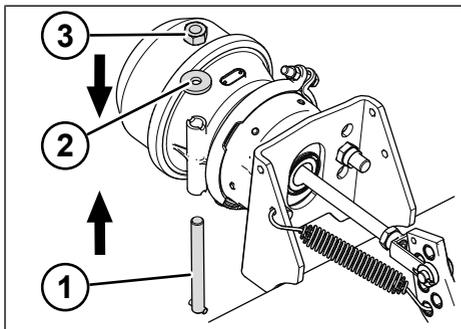


Fig. 5-24: Inserting the emergency release screw

- 1 Emergency release screw
- 2 Flat washer
- 3 Retainer nut

- ▶ Screw the retainer nut and flat washer onto the emergency release screw.
- ▶ Fasten the compressed air lines according to the markings.

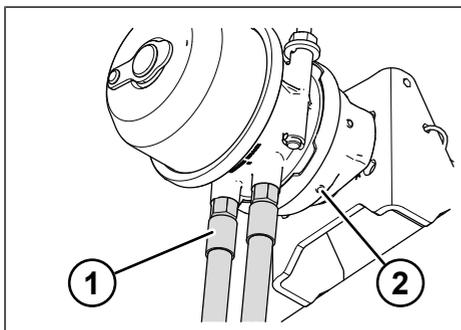


Fig. 5-25: Fastening the compressed air lines

- 1 Compressed air line
- 2 Water drain plug

- ▶ Pull the lower water drain plug.
- ▶ Turn the drum brake slowly.
- ▶ Tighten up the setting nut on the ASA clockwise, until the brake pads start to drag on the drum.
- ▶ Turn the setting nut on the ASA back counter-clockwise (270°). An audible "clicking" noise is normal.

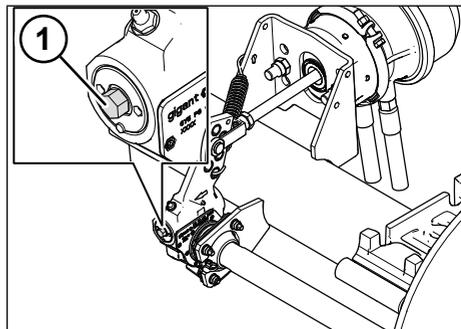


Fig. 5-26: Tightening up the setting nut on the ASA

- 1 ASA setting nut

- ✓ The brake cylinder is fitted and the brake clearance is set.

5.2.5 ASA

Removing the ASA

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ If necessary, mark the tension spring position on the ASA (automatic slack adjuster).
- ▶ If necessary, unhook the tension spring.

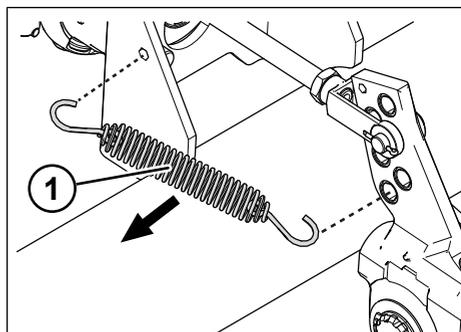


Fig. 5-27: Unhooking the tension spring

- 1 Tension spring (is not required when using brake cylinders with reinforced inner return spring).

- ▶ Turn the setting nut on the ASA counter-clockwise until the brake is released. An audible "clicking" noise is normal.

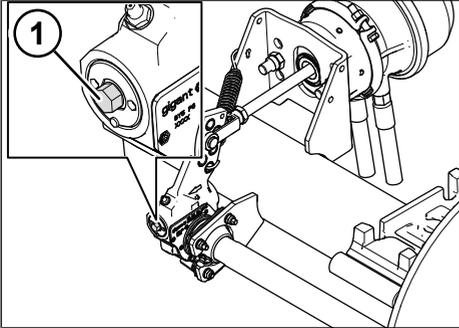


Fig. 5-28: Loosening the setting nut of the ASA

1 ASA setting nut

- ▶ Mark the fork head bolt hole on the ASA.
- ▶ Remove safety splint.
- ▶ Remove the fork head bolt.

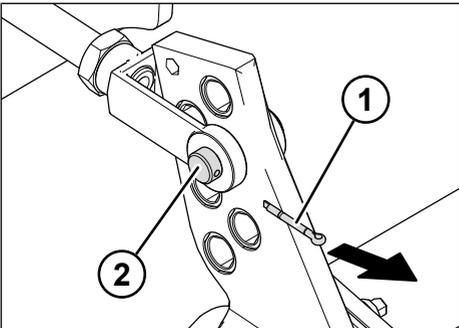


Fig. 5-29: Removing the fork head bolt

1 Safety splint pin
2 Fork head bolt

- ▶ Loosen and remove the circlip.

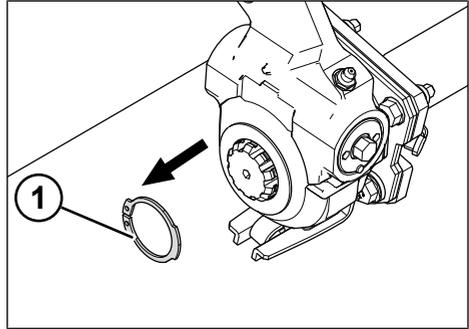


Fig. 5-30: Removing the circlip

1 Circlip

- ▶ Remove the spacer washers and the ASA.

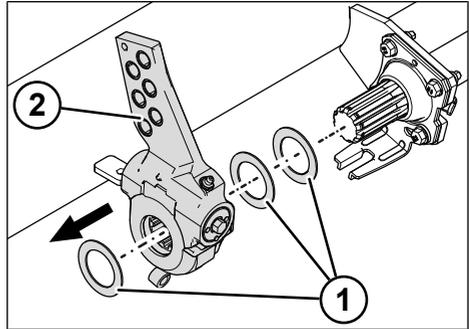


Fig. 5-31: Removing the ASA

1 Spacer washers
2 ASA

- ✓ The ASA is disassembled.

Mounting the ASA

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Clean and grease the splines on the brake camshaft.

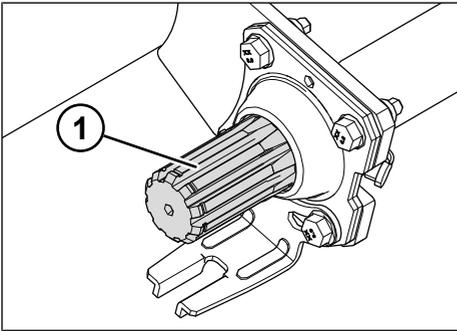


Fig. 5-32: Preparing the brake camshaft

- 1 Brake camshaft splines

- ▶ Push the ASA and spacer washers onto the splines on the brake camshaft.
- ▶ Ensure that the ASA is seated in the fork head.

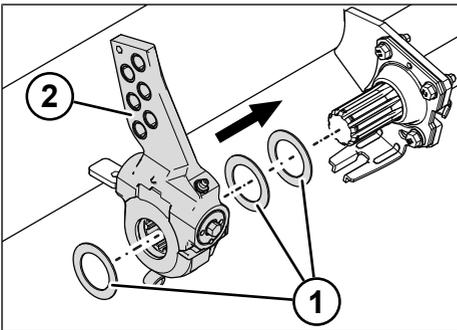


Fig. 5-33: Inserting the ASA and spacer washers

- 1 Spacer washers
2 ASA

- ▶ Check that the ASA is correctly seated in the fixed-point tab for the ASA.
- ▶ Secure the ASA and spacer washers with the circlip.
- ▶ Check the lateral play of the ASA (0.5 - 2.0 mm).

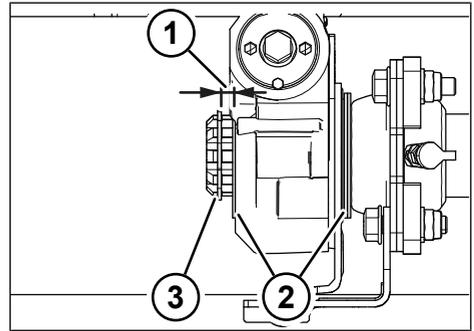


Fig. 5-34: Inserting the circlip

- 1 ASA lateral play
2 Spacer washers
3 Circlip

- ▶ Adjust the ASA until the fork head bolt hole marked during removal can be bolted into.
- ▶ Clean and grease the fork head bolt.
- ▶ Insert the fork head bolt.
- ▶ Insert and spread open the split pin.

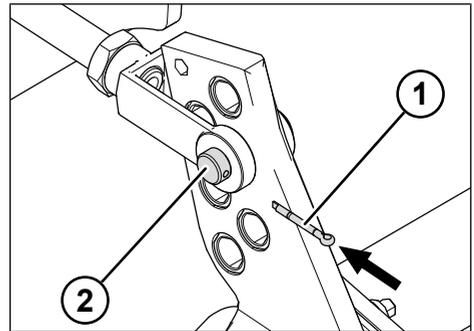


Fig. 5-35: Inserting the split pin

- 1 Safety split pin
2 Fork head bolt

- ▶ If necessary, attach the tension spring in the hole marked when it was removed.

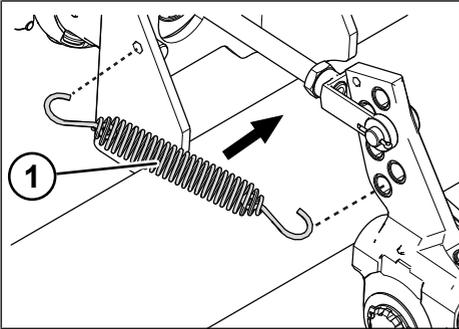


Fig. 5-36: Mount the tension spring

- 1 Tension spring (is not required when using brake cylinders with reinforced inner return spring).

► Grease the ASA using the grease nipple with Mobilith SHC 220.

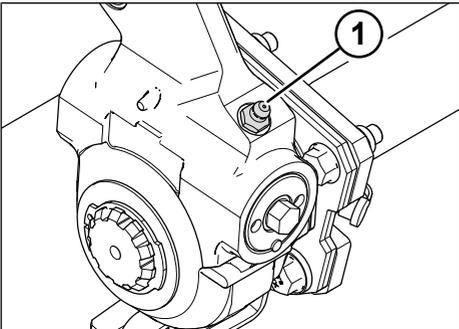


Fig. 5-37: ASA grease nipple

- 1 ASA grease nipple

- Turn the drum brake slowly.
- Carefully turn the setting nut on the ASA until the brake pads start to drag on the drum.
- Turn the setting nut on the ASA back counter-clockwise (270°). An audible "clicking" noise is normal.

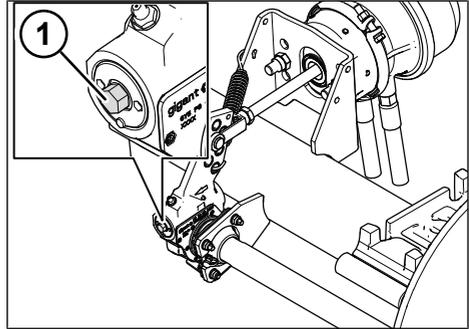


Fig. 5-38: Tightening up the setting nut on the ASA

- 1 ASA setting nut

✓ The ASA is fitted and the brake clearance is set.

5.2.6 Brake drum

Removing the brake drum and hub unit

- Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- Remove the hub cap (see "5.2.3 Hub cap", pg. 31).
- Lever off the safety collar.

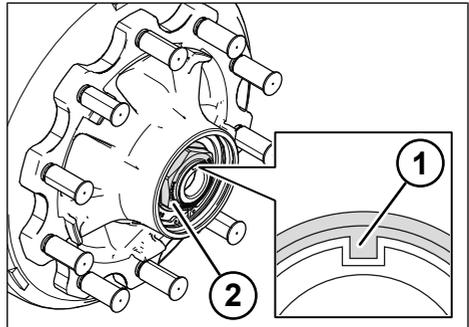


Fig. 5-39: Removing the axle nut

- 1 Safety collar
- 2 Axle nut

- Loosen and dispose of the axle nut.
- Remove the brake drum and hub unit.

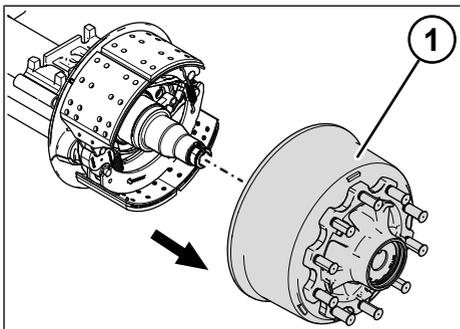


Fig. 5-40: Removing the brake drum and hub unit

1 Brake drum and hub unit

- ✓ The brake drum and hub unit is removed.

Mounting the brake drum and hub unit

INFO

The use of chemical cleaners is permitted. For stubborn residues, the use of an abrasive pad is permitted if the locations can be sanded by hand.

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Clean the surface of the spindle.
- ▶ Check the thread of the spindle and, if necessary, rework with a thread chaser.
- ▶ Paint Optimol White Paste onto the bearing seat positions. Do **not** coat the bearing surfaces and threads.

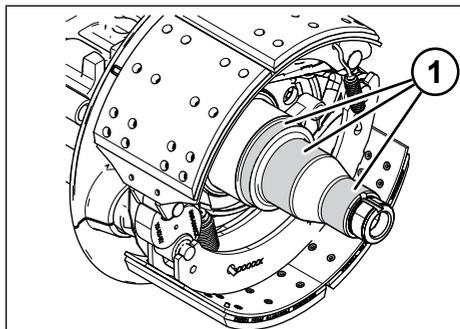


Fig. 5-41: Preparing the spindle

1 Bearing seat positions

- ▶ Check the seating of the ABS sensor and, if necessary, push in against the stop.
- ▶ Insert the brake drum and hub unit. Ensure that the thrust washer sits correctly in the groove of the spindle.

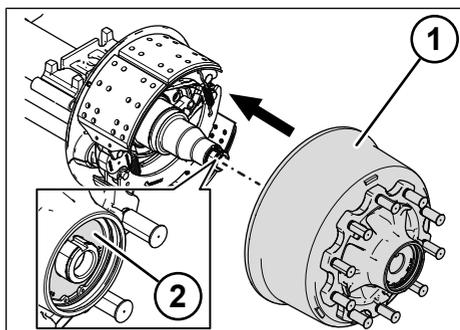


Fig. 5-42: Brake drum and hub unit

1 Brake drum and hub unit
2 Washer

- ▶ Apply a new axle nut and tighten up to the prescribed torque (630 Nm +/- 30 Nm) by turning the hub.
- ▶ Using an awl and hammer, drive the axle nut safety collar into the groove of the spindle.

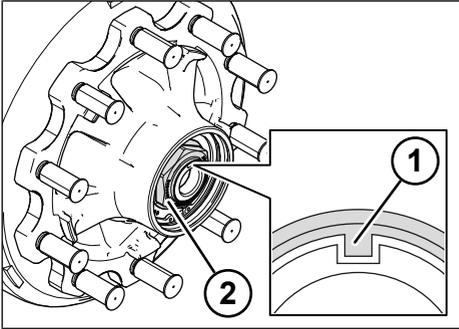


Fig. 5-43: Inserting the axle nut

- 1 Safety collar
- 2 Axle nut

- ▶ Install the hub cap (see "5.2.3 Hub cap", pg. 31).
- ✓ The brake drum with hub unit is fitted.

Removing the brake drum

NOTE

Property damage caused by unprotected brake parts!

Unprotected bearing points which are exposed can be damaged during the maintenance.

- ▶ Cover exposed bearing points.
- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Remove the brake drum and hub unit.
- ▶ Cover exposed bearing points on the hub unit to prevent contamination.
- ▶ Carefully drive out the bolts.

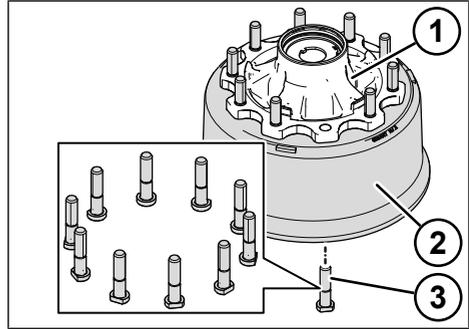


Fig. 5-44: Removing the brake drum

- 1 Hub unit
- 2 Brake drum
- 3 Bolt

- ▶ Remove the brake drum from the hub unit.
- ✓ The brake drum is removed.

Checking the brake drum

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Perform a visual check of the brake drum for wear (see "4.5.1 Air suspension, brakes and ASA", pg. 26).
- ▶ Measure the wear on the brake drum.

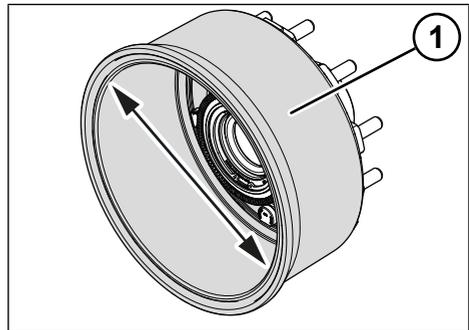


Fig. 5-45: Brake drum wear

- 1 Internal diameter of the brake drum

- ▶ Replace worn brake drums ($\varnothing > 425$ mm).
- ✓ The brake drum is checked.

Fitting the brake drum

- ▶ Perform a visual check of the brake drum for wear (see "4.5.1 Air suspension, brakes and ASA", pg. 26).
- ▶ Check that the ABS magnet wheel is correctly and firmly seated. Ensure that the ABS magnet wheel lies fully on the hub.
- ▶ Clean the contact surface of the hub unit.

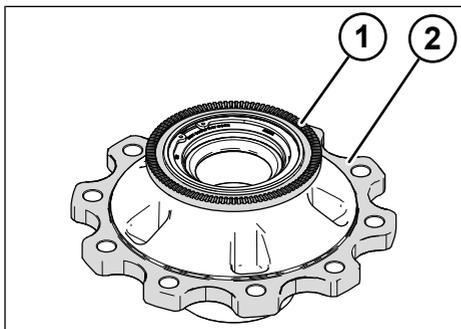


Fig. 5-46: Contact surface of the hub unit

- 1 ABS magnet wheel
- 2 Contact surface of the hub unit

- ▶ Place the brake drum on the hub unit.
- ▶ Carefully drive in the bolts. Ensure that the flattened head side of the bolts lies on the brake drum (anti-rotation protection).
- ▶ Mount the brake drum and hub unit.

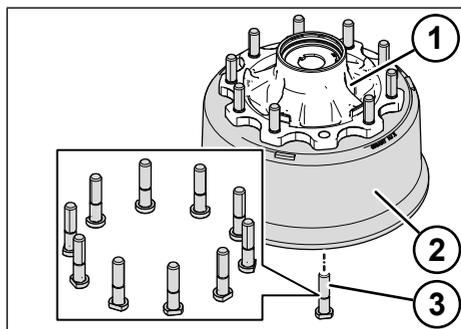


Fig. 5-47: Fitting the brake drum

- 1 Hub unit
- 2 Brake drum
- 3 Bolt

- ✓ The brake drum is mounted.

5.2.7 ABS

Removing the ABS sensor

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Remove the cover plate (see "5.2.2 Cover plate", pg. 31).
- ▶ Remove the ABS sensor from the ABS sensor bushing.
- ▶ Remove the ABS sensor bushing.

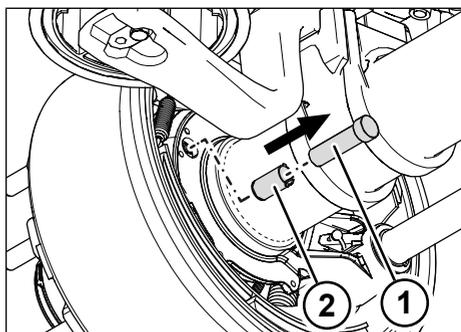


Fig. 5-48: Removing the ABS sensor

- 1 ABS sensor
- 2 ABS sensor bushing

- ✓ The ABS sensor is removed.

Fitting the ABS sensor

⚠ WARNING

Risk of accident and damage to property by functional impairment of the brake!

Lubricants can land on brake parts and surfaces and affect the functionality of the ABS.

- ▶ Keep the front side of the ABS sensor free of grease.
- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Lightly grease the ABS sensor bushing.
- ▶ Insert the ABS sensor bushing.
- ▶ Lightly grease the ABS sensor and insert it. **WARNING! The front side of the ABS sensor must be free from lubricants.**

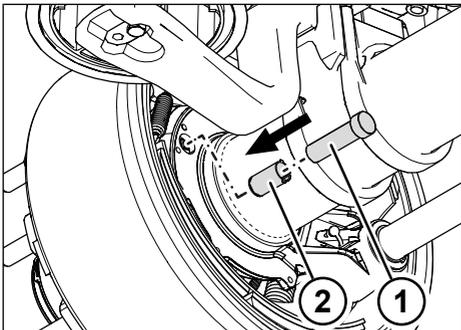


Fig. 5-49: Fastening the ABS sensor

- 1 ABS sensor
- 2 ABS sensor bushing

- ▶ Push the ABS sensor into the stop in the ABS sensor bushing so that it is flush with the ABS magnet wheel.

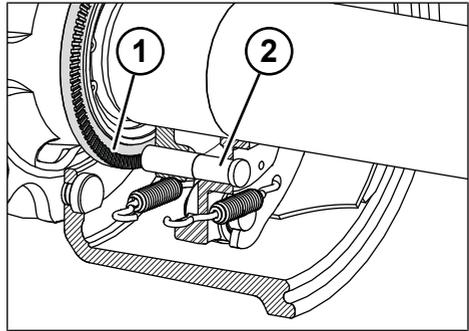


Fig. 5-50: Sectional view of the ABS magnet wheel

- 1 ABS magnet wheel
- 2 ABS sensor with socket

- ▶ Install the cover plate (see "5.2.2 Cover plate", pg. 31).
- ✓ The ABS sensor is fitted.

Removing the ABS magnet wheel

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Remove the brake drum (see "5.2.6 Brake drum", pg. 40).
- ▶ Pull out the ABS magnet wheel.
- ▶ Clean the contact surfaces.
- ✓ The ABS magnet wheel is removed.

Fitting the ABS magnet wheel

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Push in a new ABS magnet wheel.
- ▶ Check that the ABS magnet wheel is correctly and firmly seated. Ensure that the ABS magnet wheel lies fully on the hub.

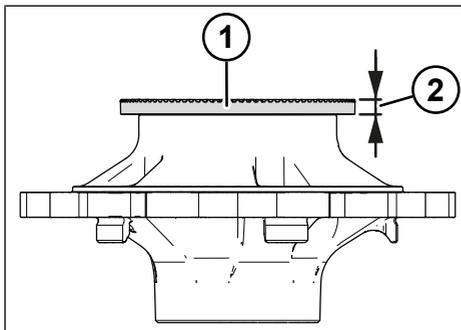


Fig. 5-51: Checking the parallelism of the ABS magnet wheel

- 1 ABS magnet wheel
- 2 Parallelism of the ABS magnet wheel

- ▶ Install the brake drum (see "5.2.6 Brake drum", pg. 40).
- ✓ The ABS magnet wheel is fitted.

5.2.8 Wheel bearing

Removing the wheel bearing

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Remove the brake drum and hub unit (see "5.2.6 Brake drum", pg. 40).
- ▶ Remove the circlip.
- ▶ Remove the thrust washers.
- ▶ Remove the outer bearing.

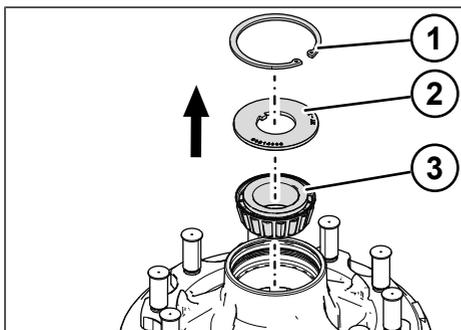


Fig. 5-52: Removing the outer bearing

- 1 Circlip
- 2 Washer
- 3 Outer bearing

- ▶ Remove the circlip.
- ▶ Remove the shaft sealing ring.
- ▶ Remove the wear ring.
- ▶ Remove the inner bearing.

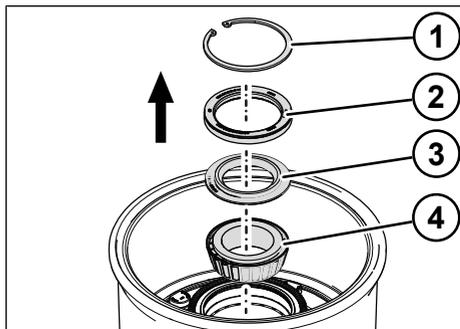


Fig. 5-53: Removing the inner bearing

- 1 Circlip
- 2 Shaft seal ring
- 3 Wear ring
- 4 Inner bearing

- ▶ Remove the outer bearing ring.
- ▶ Remove the inner bearing ring.

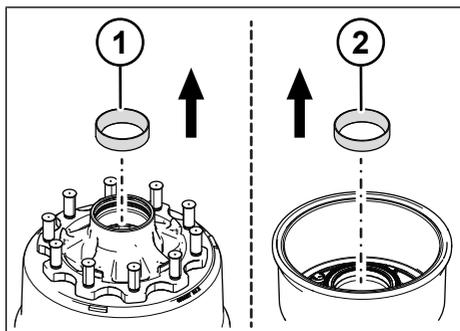


Fig. 5-54: Removing the bearing rings

- 1 Outer bearing ring
- 2 Inner bearing ring

- ✓ The wheel bearing is removed.

Installing the wheel bearing

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Clean the bearing seats.

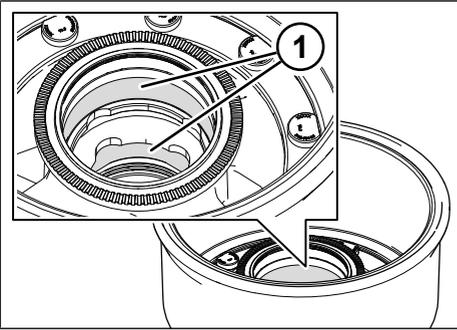


Fig. 5-55: Cleaning the bearing seats

- 1 Bearing seats

- ▶ Drive in the outer bearing ring.
- ▶ Drive in the inner bearing ring.

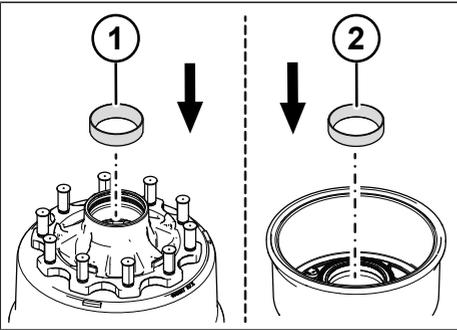


Fig. 5-56: Inserting the bearing rings

- 1 Outer bearing ring
- 2 Inner bearing ring

- ▶ Lightly grease the inner and outer bearing rings and the space between them evenly using Mobilith SHC 220 (200 g).
- ▶ Clean the inner bearing.
- ▶ Grease the inner bearing with Mobilith SHC 220 (120 g). Observe the installation sequence and orientation of the components.
- ▶ Insert the inner bearing.
- ▶ Insert the wear ring.
- ▶ Grease the shaft seal ring on its contact surface with Mobilith SHC 220.

- ▶ Insert the shaft seal ring.
- ▶ Insert the circlip.

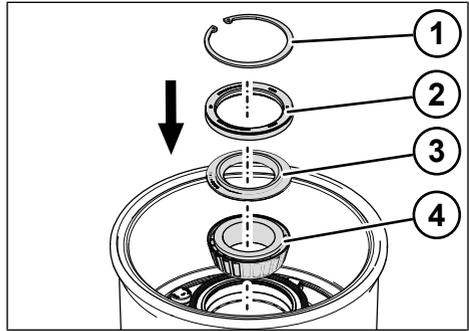


Fig. 5-57: Inserting the inner bearing

- 1 Circlip
- 2 Shaft seal ring
- 3 Wear ring
- 4 Inner bearing

- ▶ Clean the outer bearing.
- ▶ Grease the outer bearing with Mobilith SHC 220 (80 g).
- ▶ Insert the outer bearing.
- ▶ Insert the thrust washer. Ensure that the thrust washer lies on the chamfer on the bearing.
- ▶ Insert the circlip.

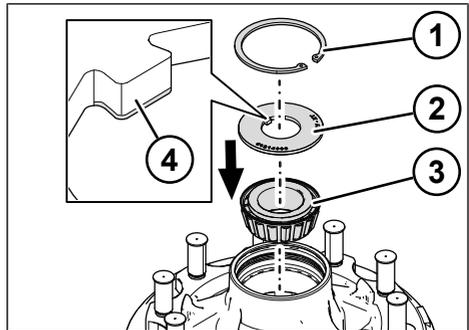


Fig. 5-58: Inserting the outer bearing

- 1 Circlip
- 2 Washer
- 3 Outer bearing
- 4 Chamfer

- ▶ Install the brake drum and hub unit (see "5.2.6 Brake drum", pg. 40).
- ✓ The wheel bearing is fitted.

5.2.9 Brake pad assembly

Removing the brake pad assembly

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Remove the brake drum and hub unit (see "5.2.6 Brake drum", pg. 40).
- ▶ Unhook the fixed-point springs.

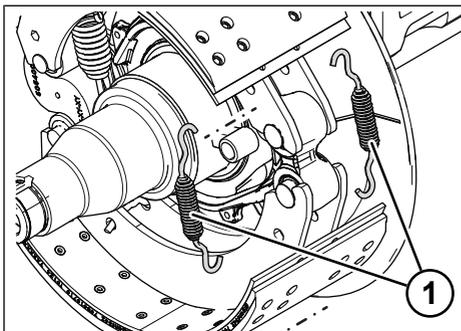


Fig. 5-59: Unhooking the fixed-point springs

1 Fixed-point springs

- ▶ Mark/label the upper and lower brake pad carrier.
- ▶ Pull the brake pad assembly apart upwards and downwards and remove.

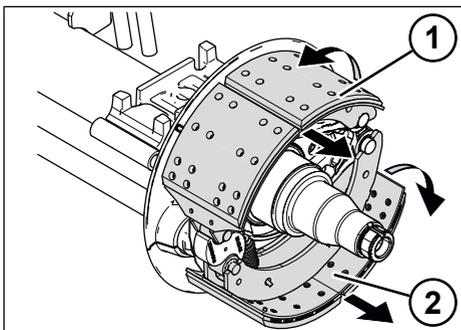


Fig. 5-60: Removing the brake pad assembly

1 Upper brake pad assembly
2 Lower brake pad assembly

- ▶ Unhook the release spring and dispose of it.

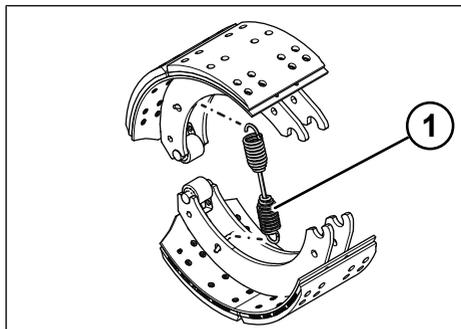


Fig. 5-61: Unhooking the release spring

1 Release spring

- ▶ Check the fixed-point bearing and replace if necessary.
- ▶ Check the cam roller and replace if necessary.
- ▶ Check the brake pads and replace if necessary (see "4.5.1 Air suspension, brakes and ASA", pg. 26).
- ✓ The brake pad assembly is removed.

Installing the brake pad assembly

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Insert a new release spring.

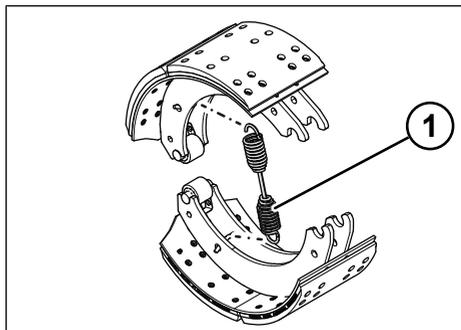


Fig. 5-62: Connecting the release spring

1 Release spring

- ▶ Clean the cam rollers.

- ▶ Coat the fixed-point bearing with copper paste.
- ▶ First place the upper brake pad carrier with the cam roller on the brake camshaft, then place the brake pad carrier on the fixed-point bearing.

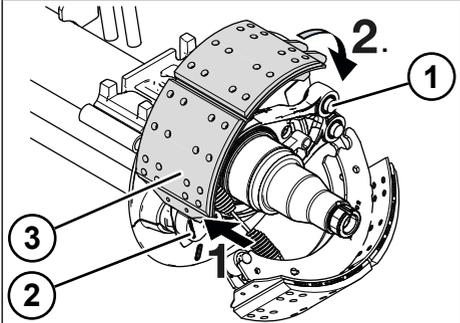


Fig. 5-63: Inserting the upper brake pad carrier

- 1 Fixed-point bearing
- 2 Cam roller
- 3 Upper brake pad carrier

- ▶ First place the lower brake pad carrier with the cam roller on the brake camshaft, then place the brake pad carrier on the fixed-point bearing.

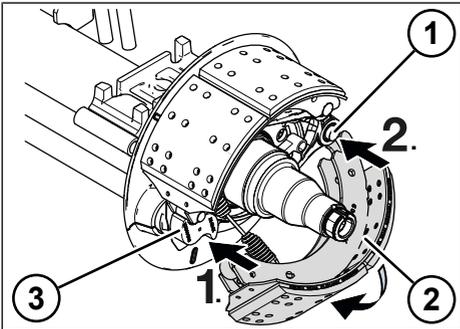


Fig. 5-64: Inserting the lower brake pad carrier

- 1 Fixed-point bearing
- 2 Lower brake pad carrier
- 3 Cam roller mount on the brake camshaft

- ▶ Check the brake pad assembly is seated correctly and tightly.
- ▶ Attach new fixed-point springs.

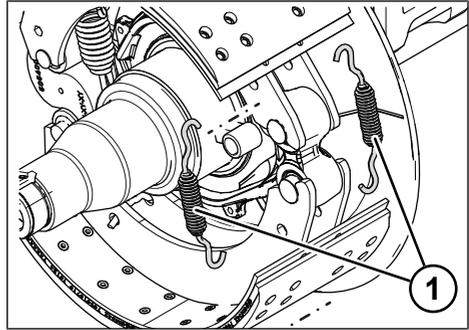


Fig. 5-65: Attaching fixed-point springs

- 1 Fixed-point springs

- ▶ Install the brake drum and hub unit (see "5.2.6 Brake drum", pg. 40).
- ✓ The brake pad assembly is fitted.

Removing the brake pads

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Remove the brake pad assembly.

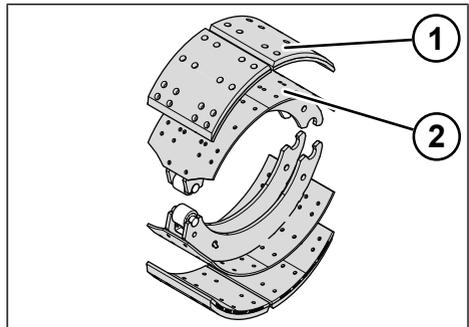


Fig. 5-66: Removing the brake pad

- 1 Brake pad
- 2 Brake pad carrier

- ▶ Remove the rivets on the brake pads.
- ✓ The brake pads are removed.

Fitting the brake pads

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Clean the brake pad carrier.
- ▶ Insert the brake pads.

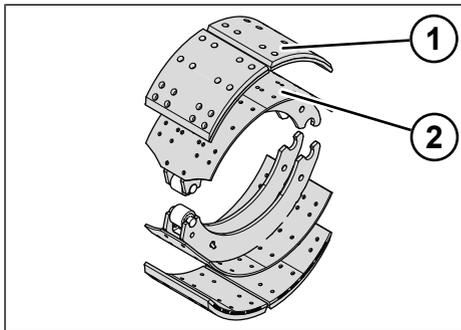


Fig. 5-67: Inserting the brake pad

- 1 Brake pad
- 2 Brake pad carrier

- ▶ Rivet on the brake pads in the correct sequence with the corresponding riveting force (20 kN +/- 2 kN).

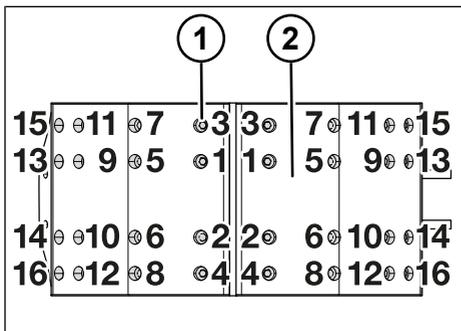


Fig. 5-68: Riveting sequence

- 1 Brake pad rivets
- 2 Brake pad

- ▶ Check the riveting.
Cracks in the riveting area indicate impermissible riveting.
Hole formation and poor closure cap formation are not permitted.
Insufficient closure cap and crack formation are not permitted.

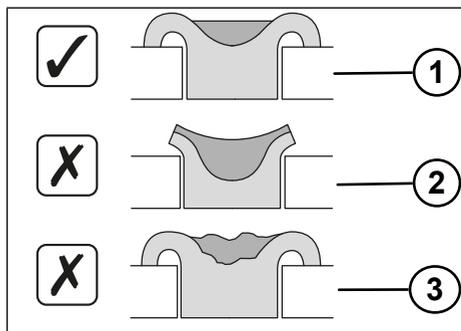


Fig. 5-69: Checking the riveting

- 1 Rivet length correct: No holes formed and firmness is correct
- 2 Rivet length too short: no holes formed and poor closure cap formation
- 3 Rivet length too long: insufficient closure cap, crack formation

- ▶ Fit the brake pad assembly.
- ✓ The brake pads are fitted.

Removing the cam rollers and cam roller bushings

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Clean the cam roller bearing seat.
- ▶ Push the cam roller bushing into the cam roller.
- ▶ Fill the grease pockets of the cam roller bushing with Mobilith SHC 220 and grease it.

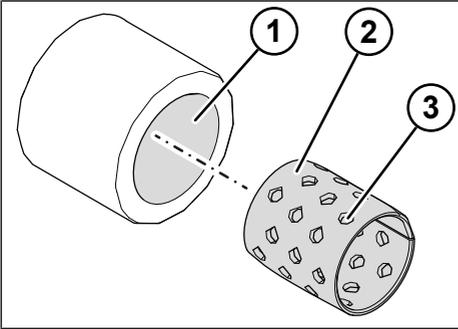


Fig. 5-70: Inserting the cam roller bushing

- 1 Cam roller
- 2 Cam roller bushing
- 3 Cam roller bushing grease pockets

- ▶ Lightly grease the cam roller axle with Mobilith SHC 220.
- ▶ Insert the cam roller axle in the cam roller.
- ▶ Clean off excess grease from the cam roller and cam roller axle.
- ▶ Check the cam roller brackets for cracks and deformation, replace if necessary, and install.

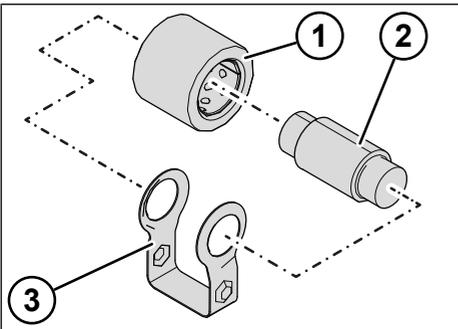


Fig. 5-71: Fitting the cam roller

- 1 Cam roller
- 2 Cam roller axle
- 3 Cam roller bracket

- ▶ Lightly coat the ends of the cam roller axle with copper paste.

- ▶ Insert the cam rollers. While doing this, ensure that they lock into the brake pad carrier correctly.

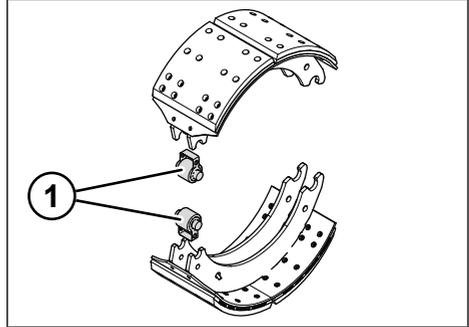


Fig. 5-72: Inserting the cam rollers

- 1 Cam rollers

- ▶ Fit the brake pad assembly.
- ✓ The cam rollers and cam roller bushings are fitted.

Removing the fixed-point bearings

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Remove the brake pad assembly.
- ▶ Remove the fixed-point bolts.
- ▶ Check the fixed-point bushing for wear.
- ▶ Drive out the fixed-point bushing.

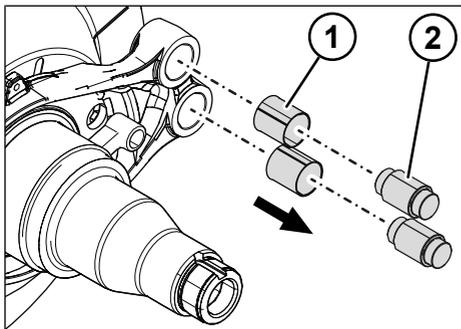


Fig. 5-73: Removing the fixed-point bearing

- 1 Fixed-point bushing
- 2 Fixed-point bolts

✓ The fixed-point bearings are removed.

Fitting the fixed-point bearings

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Clean the fixed-point bearing seat.
- ▶ Drive in the fixed-point bushing. Make sure that the fixed-point bushing is flush with the brake carrier.
- ▶ Lightly grease the fixed-point bolts with Mobilith SHC 220.
- ▶ Insert the fixed-point bolts.

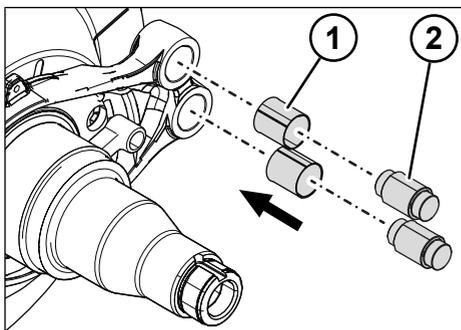


Fig. 5-74: Inserting the fixed-point bearing

- 1 Fixed-point bushing
- 2 Fixed-point bolts

- ▶ Remove excess grease from the fixed-point bolts.

- ▶ Coat the contact surface for the brake pad carrier on the fixed-point bearing with copper paste.

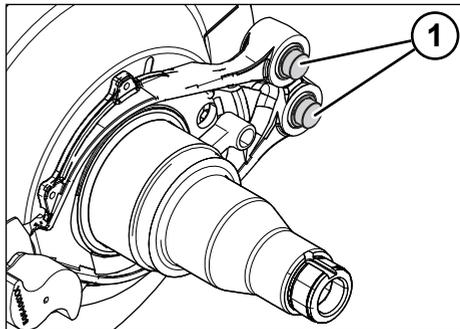


Fig. 5-75: Greasing the brake pad carrier contact surface

- 1 Brake pad carrier contact surface

- ▶ Fit the brake pad assembly.
- ✓ The fixed-point bearings are fitted.

5.2.10 Brake camshaft assembly

Removing the brake camshaft

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Remove the brake pad assembly (see "5.2.9 Brake pad assembly", pg. 47).
- ▶ Remove the ASA (see "5.2.5 ASA", pg. 37).
- ▶ Loosen the circlip.
- ▶ Slide the circlip and spacer washers up to the middle of the brake camshaft.

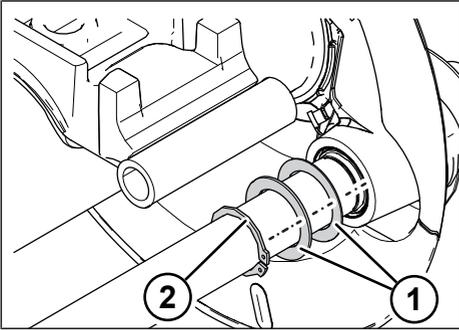


Fig. 5-76: Loosening the circlip

- 1 Spacer washers
- 2 Circlip

- ▶ Remove the brake camshaft from the loosened spherical cam bearing.
- ▶ Remove the circlip.
- ▶ Remove the spacer washers.
- ▶ Remove the brake camshaft from the brake carrier cam bearing bushing.
- ▶ Remove the retainer plate.

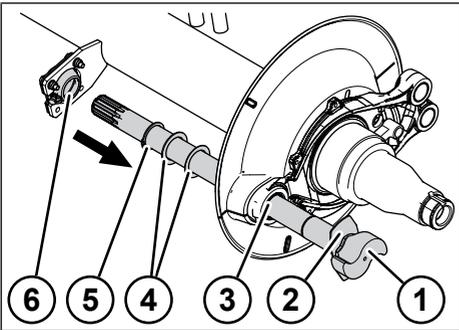


Fig. 5-77: Removing the brake camshaft

- 1 Brake camshaft
- 2 Retainer plate
- 3 Brake carrier cam bearing bushing
- 4 Spacer washers
- 5 Circlip
- 6 Spherical cam bearing

✓ The brake camshaft is removed.

Installing the brake camshaft

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Check the spherical cam bearing, replace if necessary.
- ▶ Check the brake carrier cam bearing bushing, replace if necessary.
- ▶ Clean the brake camshaft.
- ▶ Place the retainer plate on the brake camshaft.
- ▶ Insert the brake camshaft into the brake carrier cam bearing bushing.
- ▶ Slide the circlip and spacer washers onto the brake camshaft.
- ▶ Slide the brake camshaft into the spherical cam bearing up to the stop.

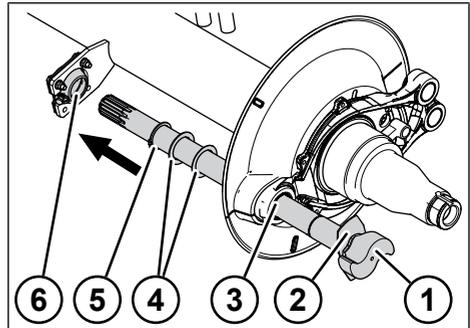


Fig. 5-78: Inserting the brake camshaft

- 1 Brake camshaft
- 2 Retainer plate
- 3 Brake carrier cam bearing bushing
- 4 Spacer washers
- 5 Circlip
- 6 Spherical cam bearing

- ▶ Slide the spacer washers to the end.
- ▶ Slide the circlip to the groove and insert it.

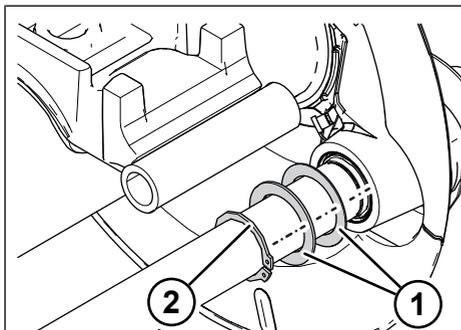


Fig. 5-79: Securing the circlip

- 1 Spacer washers
- 2 Circlip

- ▶ Grease the brake carrier cam bearing bushing using the grease nipple until fresh grease oozes out. Grease may only escape on the axle side. If grease escapes on the brake side, the seals are damaged or are not properly seated.

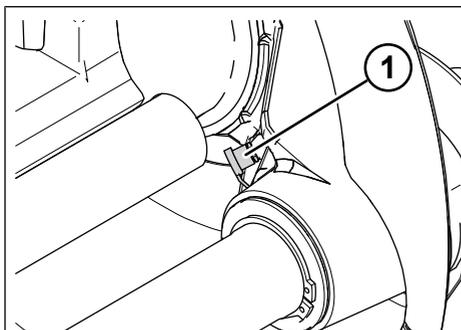


Fig. 5-80: Greasing the brake carrier cam bearing bushing

- 1 Grease nipple

- ▶ Grease the spherical cam bearing using the grease nipple until fresh grease escapes.

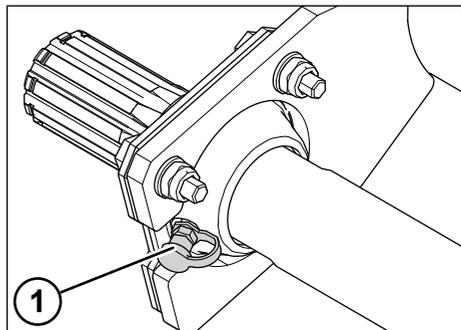


Fig. 5-81: Greasing the spherical cam bearing

- 1 Grease nipple

- ▶ Tighten up the spherical cam bearing (22 Nm +/- 4 Nm) and check that the brake camshaft turns smoothly.
- ▶ Install the ASA (see "5.2.5 ASA", pg. 37).
- ▶ Install the brake pad assembly (see "5.2.9 Brake pad assembly", pg. 47).
- ✓ The brake camshaft is fitted.

Removing the spherical cam bearing

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Remove the ASA (see "5.2.5 ASA", pg. 37).
- ▶ Loosen and remove the retainer nuts and flat washers.
- ▶ Remove the bolts.
- ▶ Remove the ASA fixed-point tab, check and replace if damaged.

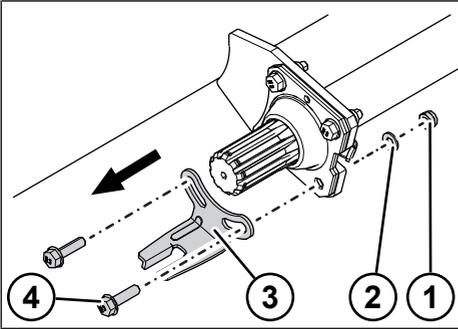


Fig. 5-82: Removing the ASA fixed-point tab

- 1 Retainer nuts
- 2 Flat washers
- 3 ASA fixed-point tab
- 4 Screws

- ▶ Loosen and remove the retainer nuts and flat washers.
- ▶ Remove the rest of the bolts.
- ▶ Remove the spherical cam bearing.

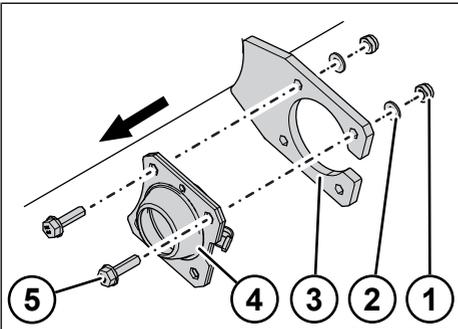


Fig. 5-83: Removing the spherical cam bearing

- 1 Retainer nuts
- 2 Flat washers
- 3 Spherical cam bearing bracket
- 4 Spherical cam bearing
- 5 Screws

- ✓ The spherical cam bearing is removed.

Fitting the spherical cam bearing

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).

- ▶ Clean the cam bearing of the ASA.
- ▶ Clean the contact surface of the spherical cam bearing bracket.
- ▶ Insert the cam bearing of the ASA. Ensure that the grease nipple is correctly seated in the recess.
- ▶ Insert the bolts.
- ▶ Insert the retainer nuts and flat washers.

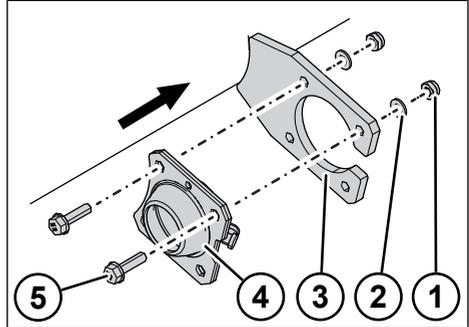


Fig. 5-84: Fitting the spherical cam bearing

- 1 Retainer nuts
- 2 Flat washers
- 3 Spherical cam bearing bracket
- 4 Spherical cam bearing
- 5 Screws

- ▶ Insert the ASA fixed-point tab.
- ▶ Insert the bolts.
- ▶ Insert the retainer nuts and flat washers.

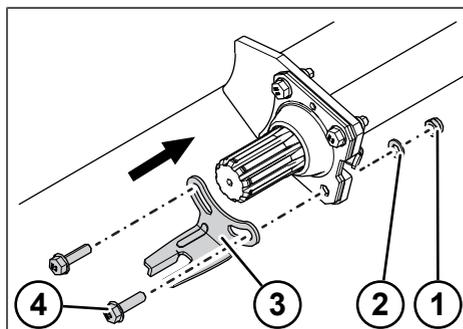


Fig. 5-85: Inserting the ASA fixed-point tab

- 1 Retainer nuts
- 2 Flat washers
- 3 ASA fixed-point tab
- 4 Screws

- ▶ Tighten up the retainer nuts evenly to the corresponding torque (22 Nm +/- 4 Nm) evenly and in a criss-cross pattern.
- ▶ Grease the spherical cam bearing and check that the brake camshaft turns smoothly.
- ▶ Install the ASA (see "5.2.5 ASA", pg. 37).
- ✓ The spherical cam bearing is fitted.

Removing the brake carrier cam bearing bushing

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Remove the brake camshaft.
- ▶ Remove the sealing rings.
- ▶ Drive out the brake carrier cam bearing bushing.

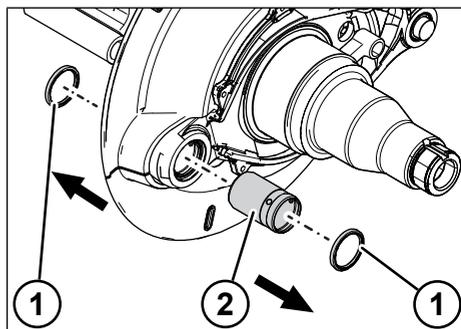


Fig. 5-86: Removing the brake carrier cam bearing bushing

- 1 Sealing rings
- 2 Brake carrier cam bearing bushing

- ✓ The brake carrier cam bearing bushing is removed.

Installing the brake carrier cam bearing bushing (with a groove)

INFO

Depending on the version, the brake carrier cam bearing bushing can have a different design:

- ▶ Version bushing with **one** groove and indent in the brake carrier
- ▶ Version bushing with **two** grooves and stepless fit in the brake carrier
- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Grease the cam bearing bushing with Mobilith SHC 220.
- ▶ Align the cam bearing bushing with the circumferential groove towards the spindle.
- ▶ Press in the cam bearing bushing flush up to the indent.

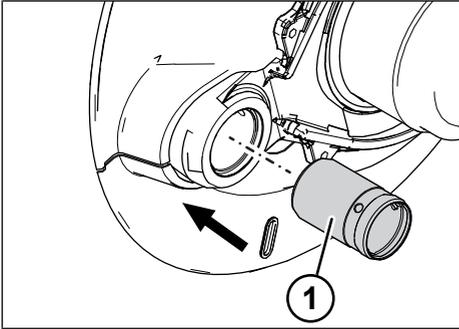


Fig. 5-87: Inserting the brake carrier cam bearing bushing

1 Brake carrier cam bearing bushing

- ▶ Lightly grease the sealing rings on their inner surfaces with Mobilith SHC 220.
- ▶ Insert the sealing rings. While doing this, make sure that the open side of both sealing rings points towards the centre of the axle and the sealing rings are sealed flush on both sides.

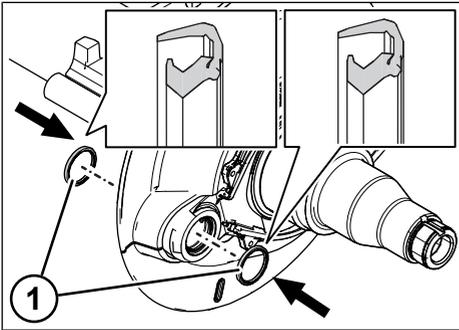


Fig. 5-88: Inserting the sealing rings

1 Sealing rings

- ▶ Fit the brake camshaft.
- ✓ The cam bearing of the axle body is fitted.

Installing the brake carrier cam bearing bushing (with two grooves)

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).

- ▶ Grease the cam bearing bushing with Mobilith SHC 220.
- ▶ Press the cam bearing bushing in 6.3 mm deep.

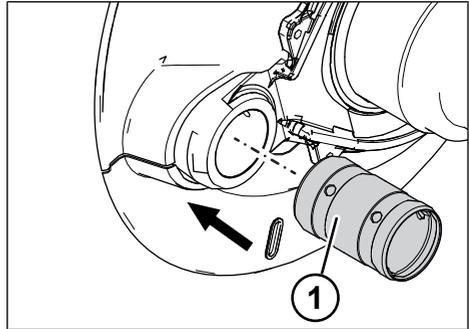


Fig. 5-89: Inserting the brake carrier cam bearing bushing

1 Brake carrier cam bearing bushing with two grooves

- ▶ Lightly grease the sealing rings on their inner surfaces with Mobilith SHC 220.
- ▶ Insert the sealing rings. While doing this, make sure that the open side of both sealing rings points towards the centre of the axle and the sealing rings are sealed flush on both sides.

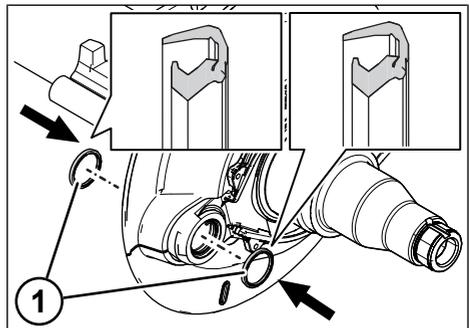


Fig. 5-90: Inserting the sealing rings

1 Sealing rings

- ▶ Fit the brake camshaft.
- ✓ The cam bearing of the axle body is fitted.

5.3 Air suspension

5.3.1 Shock absorber

Removing the shock absorber

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Remove the retainer nuts.

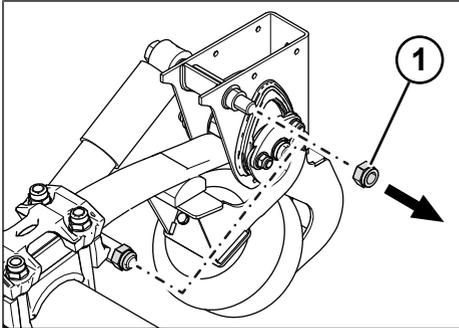


Fig. 5-92: Removing the retainer nut

- 1 Retainer nuts

- ▶ Remove the bolts.
- ▶ Remove the shock absorber.

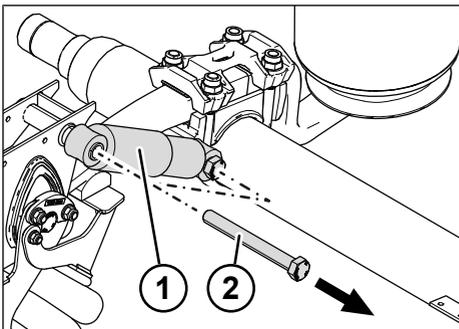


Fig. 5-92: Removing the bolts

- 1 Shock absorber
- 2 Bolt

- ✓ The shock absorber is removed.

Fitting the shock absorber

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).

- ▶ Insert the shock absorber aligned properly.
- ▶ Insert the bolts.

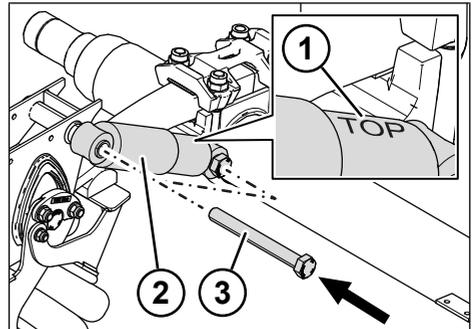


Fig. 5-93: Inserting the shock absorber

- 1 "TOP" marking, if applicable
- 2 Shock absorber
- 3 Bolt

- ▶ Tighten the retainer nut of the shock absorber fastening with a tightening torque of 530 Nm +/- 30 Nm.

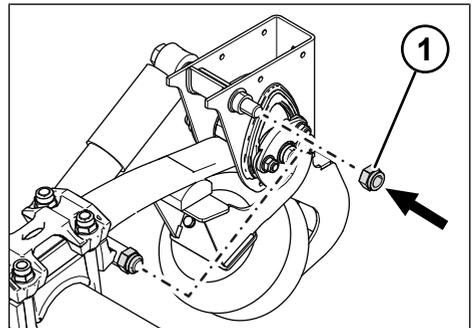


Fig. 5-94: Fastening the retainer nut

- 1 Retainer nuts

- ✓ The shock absorber is fitted.

5.3.2 Twinlift

Removing the Twinlift

Generation 1

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).

- ▶ Remove the compressed air line.

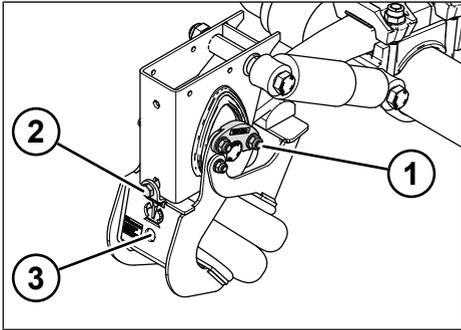


Fig. 5-95: Removing the twinlift

- 1 Anchor plate fitting
- 2 Screw
- 3 Compressed air line

- ▶ Secure the Twinlift to prevent it falling down.
- ▶ Loosen and remove the screws.
- ▶ Loosen and remove the anchor plate fitting.
- ▶ Remove the anchor plate.
- ▶ Remove the Twinlift.
- ✓ The Twinlift is removed.

Generation 2

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Remove the compressed air line.

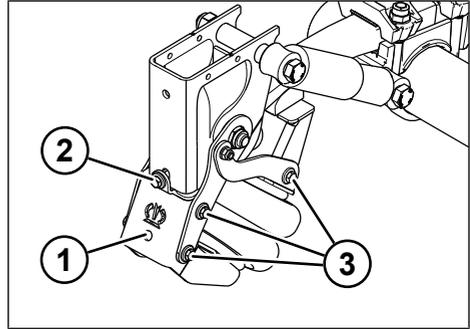


Fig. 5-96: Removing the Twinlift

- 1 Compressed air line
- 2 Screw
- 3 Screws for side parts

- ▶ Secure the Twinlift to prevent it falling down.
- ▶ Loosen and remove the screws.
- ▶ Loosen the screws for the side parts.
- ▶ Spread the side parts apart until the Twinlift can be removed.
- ▶ Remove the Twinlift.
- ✓ The Twinlift is removed.

Installing the Twinlift

Generation1

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Position the Twinlift.

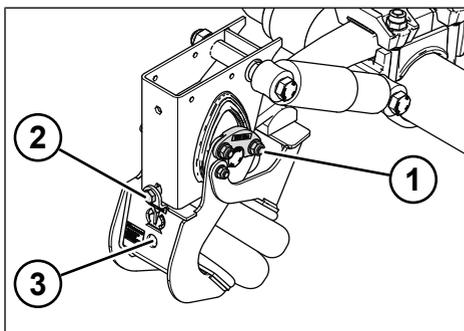


Fig. 5-97: Fastening the Twinlift

- 1 Anchor plate fitting
- 2 Screw
- 3 Compressed air line

- ▶ Replace the anchor plate and secure with new retainer nuts.
- ▶ Fasten the anchor plate with a tightening torque of 120 Nm +/- 10 Nm.
- ▶ Position the screw in the slotted hole of the air spring bracket and fasten with a tightening torque of 80 Nm +/- 5 Nm.
- ▶ Fasten the compressed air line.
- ✓ The Twinlift is installed.

Generation 2

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Loosen the screws for the side parts.
- ▶ Spread the side parts apart.

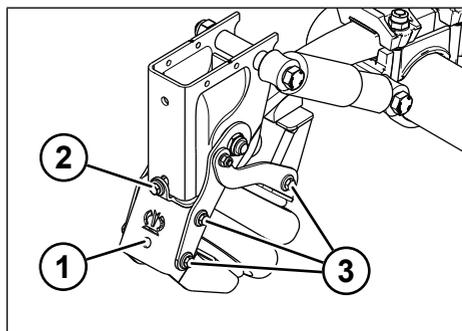


Fig. 5-98: Fastening the Twinlift

- 1 Compressed air line
- 2 Screw
- 3 Screws for side parts

- ▶ Place the Twinlift on the steering pin fitting.
- ▶ Fasten the screws for the side parts with a tightening torque of 120 Nm +/- 10 Nm.
- ▶ Position the screw in the slotted hole of the air spring bracket and fasten with a tightening torque of 80 Nm +/- 5 Nm.
- ▶ Fasten the compressed air line.
- ✓ The Twinlift is installed.

5.3.3 Twinlift two-fold bellows

Removing the two-fold bellows

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Loosen and remove the twinlift's compressed air line.

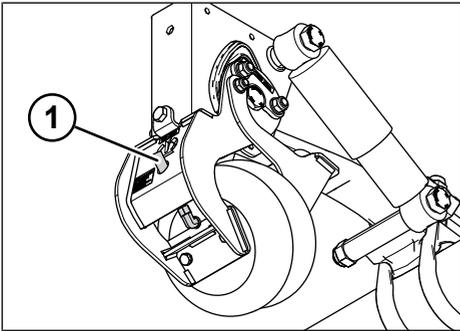


Fig. 5-99: Removing the compressed air line

- 1 Compressed air line

- ▶ Move the twinlift downwards.
- ▶ Loosen and remove the fitting and flat washers of the two-fold bellow.
- ▶ Remove the two-fold bellow.

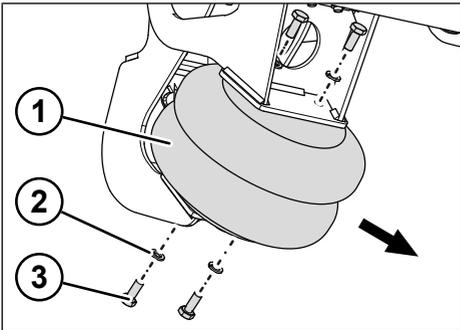


Fig. 5-100: Removing the two-fold bellow

- 1 Two-fold bellow
- 2 Flat washers
- 3 Two-fold bellow fitting

- ✓ The two-fold bellow is removed.

Fitting the two-fold bellow

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Position the two-fold bellow.
- ▶ Moisten the screws with Loctite 243.
- ▶ Fasten the screws and flat washers onto the two-fold bellow with a tightening torque of 40 Nm +/- 5 Nm.

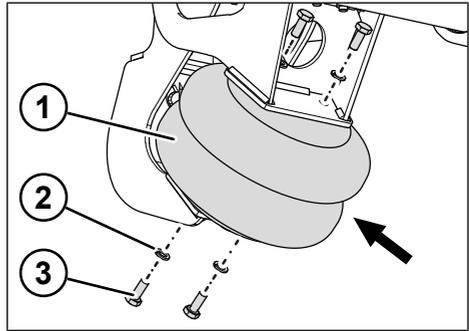


Fig. 5-101: Fitting the two-fold bellow

- 1 Two-fold bellow
- 2 Flat washers
- 3 Two-fold bellow fitting

- ▶ Fasten the compressed air line for the twinlift.

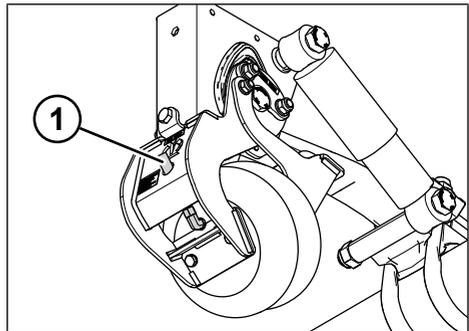


Fig. 5-102: Fastening the compressed air line

- 1 Compressed air line

- ✓ The two-fold bellow is fitted.

Removing the wear block

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Loosen and remove the wear block's fitting.
- ▶ Remove the wear block.

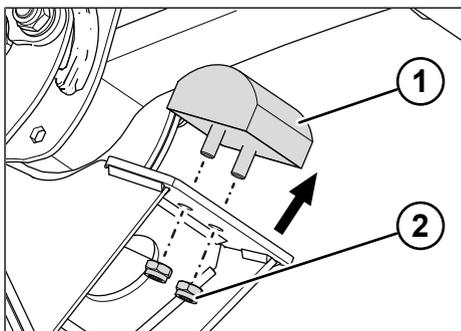


Fig. 5-103: Removing the wear block

- 1 Wear block
- 2 Fitting

✓ The wear block is removed.

Fitting the wear block

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Clean the surfaces of the twinlift.
- ▶ Position the wear block.
- ▶ Fasten the wear block with new retainer nuts with a tightening torque of 40 Nm +/- 5 Nm.

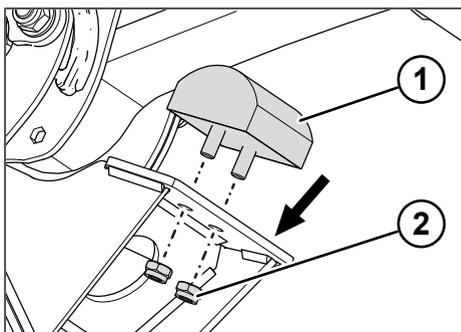


Fig. 5-104: Fitting the wear block

- 1 Wear block
- 2 Fitting

✓ The wear block is fitted.

5.3.4 Air spring bellow

Removing the air spring bellow

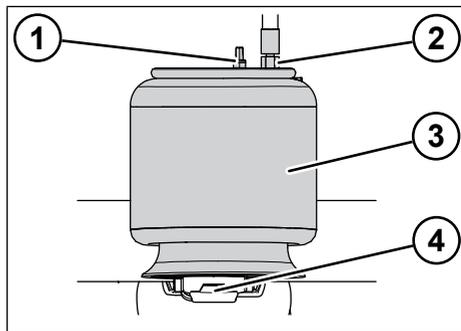


Fig. 5-105: Air spring bellow

- 1 Crimped plate retainer nut
- 2 Compressed air line
- 3 Air spring bellow
- 4 Fitting on the air spring bellow to the link

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Loosen and remove the compressed air line.
- ▶ Loosen and remove the retainer nuts on the crimped plate.
- ▶ Loosen and remove the lower fitting on a one-part air spring bellow.

INFO

With a two-part air spring bellow (rail loading), only remove the cone on the link / adapter plate if it is damaged or the link has been replaced.

- ▶ Remove the air spring bellow.
- ✓ The air spring bellow is removed.

Fitting the air spring bellow

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Position the air spring bellow.
- ▶ With a two-part air spring bellow (rail loading), position the cone on the link.

- ▶ Fasten the lower fitting on the air spring bellow / cone on the link with a micro-encapsulated M12 screw to a tightening torque of 82 Nm +/- 3 Nm. **NOTE! Place the adapter plate at the same position as before removal. M16 screw: 280 Nm +/- 10 Nm, M12 nut: 110 Nm +/- 10 Nm**
- ▶ Fasten the retainer nut of the crimped plate with a tightening torque of 55 Nm +/- 5 Nm.
- ▶ Fasten the compressed air line.
- ✓ The air spring bellow is fitted.

5.3.5 Integration (top air spring link)

Removing the integration

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Secure the axle body to prevent it falling down.
- ▶ Loosen and remove the retainer nuts and flat washers.
- ▶ Remove the clamp clip.
- ▶ Remove the spring clip.

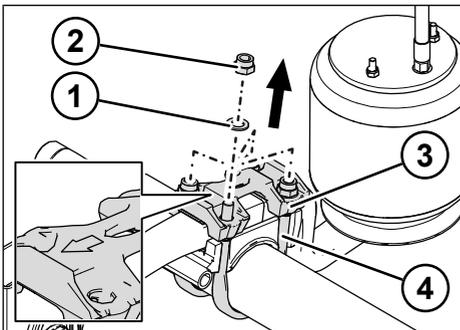


Fig. 5-106: Loosening the retainer nuts

- 1 Retainer nuts
- 2 Flat washers
- 3 Spring clip
- 4 Clamp plate

- ▶ Lower the axle body downwards.
- ▶ Remove the shim and heart stud.

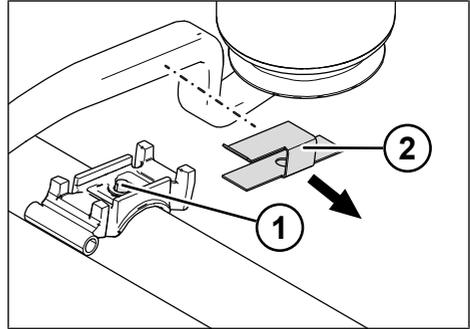


Fig. 5-107: Removing the shim

- 1 Heart stud
- 2 Shim

- ▶ Check the axle plate for damage and deformation. If there is convex deformation of the axle plate, contact KRONE GmbH & Co. KG.

- ✓ The integration is removed.

Fitting the integration

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Replace the shim and heart stud. While doing this, ensure that the hole of the shim and the hole on the link are aligned with each other.

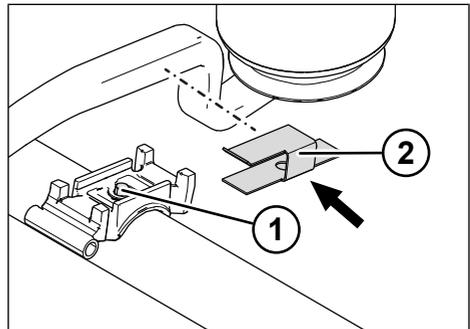


Fig. 5-108: Fastening the shim

- 1 Heart stud
- 2 Shim

- ▶ Lift up the axle body so that the air spring link sits on the axle plate. While doing this, ensure that the heart stud engages in the air spring link.
- ▶ Replace the clamp plate. While doing this, ensure that the arrow points in the direction of travel.

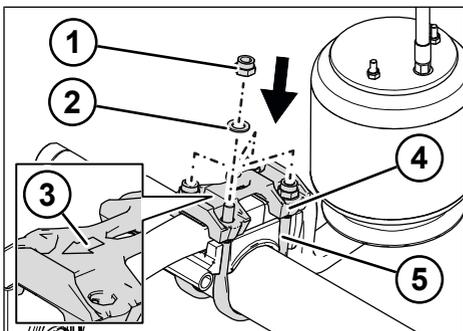


Fig. 5-109: Fastening the retainer nuts

- 1 Retainer nuts
- 2 Flat washers
- 3 Arrow
- 4 Spring clip
- 5 Clamp plate

- ▶ Insert the spring clip evenly.
- ▶ Replace the flat washers and new retainer nuts.
- ▶ Align the air spring link at 90° to the axle.

INFO

The spring clips must not tilt and the threaded ends must protrude evenly over the retainer nuts.

- ▶ Tighten up all the retainer nuts evenly with half the torque in a criss-cross pattern.
- ▶ Tighten up all the retainer nuts evenly with a tightening torque of 700 Nm +/- 25 Nm in a criss-cross pattern.
- ✓ The integration is fitted.

5.3.6 Integration (bottom air spring link)

Removing the integration

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Secure the axle body and air spring link to prevent them from falling down.
- ▶ Loosen and remove the retainer nuts and flat washers.
- ▶ Remove the clamp clip.
- ▶ Remove the spring clip.

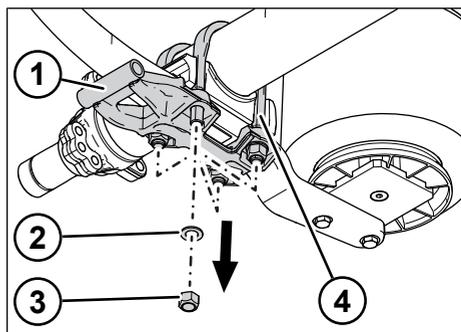


Fig. 5-110: Loosen the retainer nuts [integration, bottom air spring link]

- 1 Clamp plate
- 2 Flat washers
- 3 Retainer nuts
- 4 Spring clip

- ▶ Lower the air spring link downwards.
- ▶ Remove the shim and heart stud.

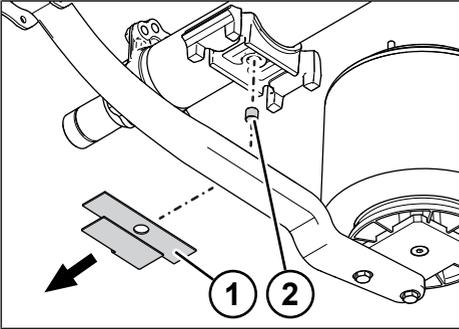


Fig. 5-111: Removing the shim

- 1 Shim
- 3 Heart stud

- ▶ Check the axle plate for damage and deformation. If there is convex deformation of the axle plate, contact KRONE GmbH & Co. KG.
- ✓ The integration is removed.

Fitting the integration

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Replace the shim and heart stud. While doing this, ensure that the hole of the shim and the hole on the air spring link are aligned with each other.

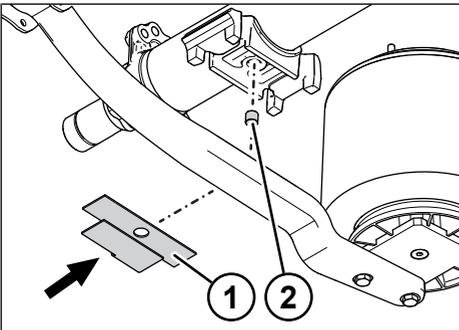


Fig. 5-112: Fastening the shim

- 1 Shim
- 2 Heart stud

- ▶ Lift up the air spring link so that the air spring link sits on the axle plate. While doing this, ensure that the heart stud engages in the air spring link.
- ▶ Put on the spring clip.
- ▶ Place the clamp plate.
- ▶ Replace the flat washers and new retainer nuts. While doing this, ensure that the shock absorber mount points forward in the direction of travel.

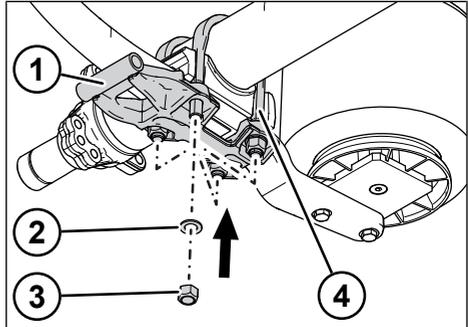


Fig. 5-113: Fastening the retainer nuts

- 1 Clamp plate
- 2 Flat washers
- 3 Retainer nuts
- 4 Spring clip

- ▶ Align the air spring link at 90° to the axle.

INFO
 The spring clips must not tilt and the threaded ends must protrude evenly over the retainer nuts.

- ▶ Tighten up all the retainer nuts evenly with half the torque in a criss-cross pattern.
- ▶ Tighten up all the retainer nuts evenly with a tightening torque of 700 Nm +/- 25 Nm in a criss-cross pattern.
- ✓ The integration is fitted.

5.3.7 Air spring link

Removing the air spring link

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Remove the Twinlift (see "5.3.2 Twinlift", pg. 57).
- ▶ Remove the integration (see "5.3.5 Integration (top air spring link)", pg. 62).
- ▶ Allow the axle to lower down under control until the link is freely accessible.
- ▶ Secure the air spring link to prevent it falling down.
- ▶ Loosen and remove the fitting of the air spring bellow.

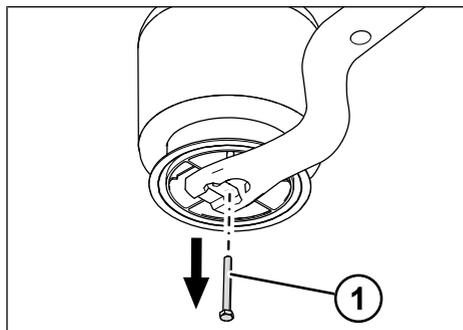


Fig. 5-114: Removing the fitting of the air spring bellow

- 1 Air spring bellow fitting

- ▶ Loosen the retainer nut and remove with the eccentric nuts/washers.

INFO

The link fitting of the Generation 2 air spring bracket has no eccentric nuts. Washers are used instead.

- ▶ Remove the steering pin and eccentric nut/washer.

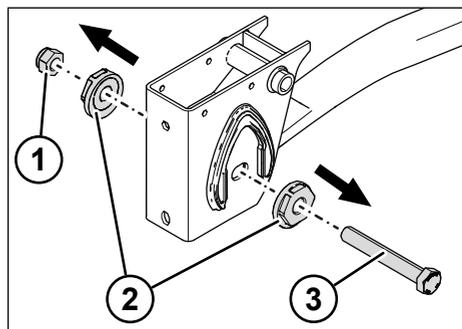


Fig. 5-115: Removing the link fitting

- 1 Retainer nut
- 2 Eccentric nuts/washers
- 3 Steering pins

- ▶ Remove the air spring link.
- ▶ Remove and check the thrust washers (see "4.5.1 Air suspension, brakes and ASA", pg. 26).

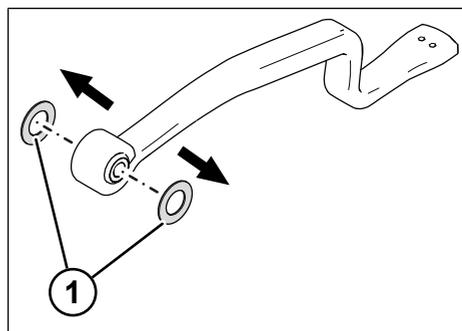


Fig. 5-116: Removing the thrust washers

- 1 Thrust washers

- ✓ The air spring link is removed.

Fitting the air spring link

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Place the thrust washers on the inner ring of the silent block.

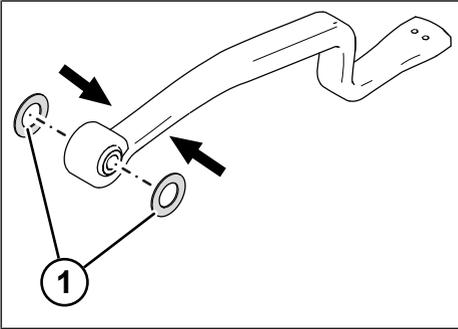


Fig. 5-117: Fastening the thrust washers

- 1 Thrust washers

- ▶ Insert the air spring link in the air spring bracket.
- ▶ Secure the air spring link to prevent it falling down.
- ▶ Insert the steering pin with eccentric nut/washer.

INFO
 The link fitting of the Generation 2 air spring bracket has no eccentric nuts. Washers are used instead.

- ▶ Insert the retainer nut with eccentric nut/washer.

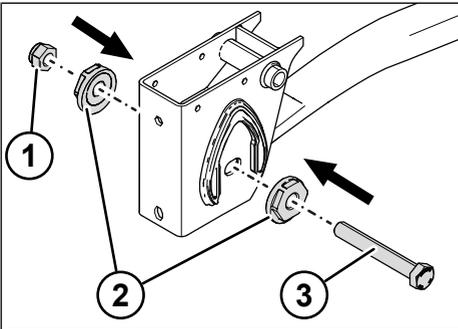


Fig. 5-118: Fastening the link fitting

- 1 Retainer nuts
- 2 Eccentric nuts/washers
- 3 Steering pins

- ▶ Fasten the air spring bellow with a tightening torque of 82 Nm +/- 3 Nm.

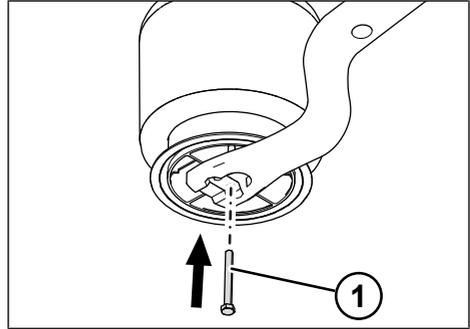


Fig. 5-119: Fastening the air spring bellow fitting

- 1 Air spring bellow fitting

- ▶ Install the integration (see "5.3.5 Integration (top air spring link)", pg. 62).
- ▶ Align the air spring unit at the ride height.
- ▶ Fasten the retainer nut with a pre-tensioning tightening torque of 200 Nm. For Generation 1 air spring brackets, ensure that the marking on the eccentric nuts points downwards (neutral position).

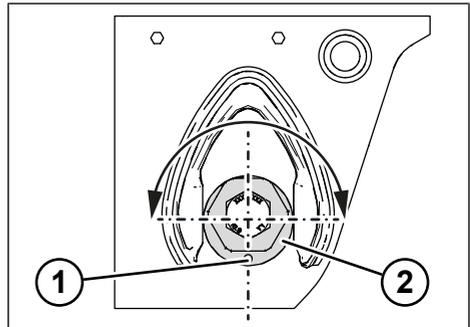


Fig. 5-120: Adjusting the play of the air spring link

- 1 Marking
- 2 Eccentric nuts

- ▶ Set the track (see "5.3.8 Setting the track", pg. 69).
- ✓ The air spring link is fitted.

Removing the silent bearing

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Remove the Twinlift (see "5.3.2 Twinlift", pg. 57).
- ▶ Loosen the retainer nut and remove with the eccentric nut/washer.

INFO

The link fitting of the Generation 2 air spring bracket has no eccentric nuts. Washers are used instead.

- ▶ Remove the steering pin and eccentric nut/washer.

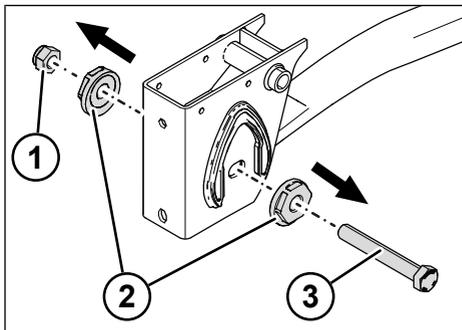


Fig. 5-121: Removing the link fitting

- 1 Retainer nut
- 2 Eccentric nuts/washers
- 3 Steering pins

- ▶ Lower the axle body downwards.
- ▶ Remove and check the thrust washers Air suspension, brake and wheel bearing unit.

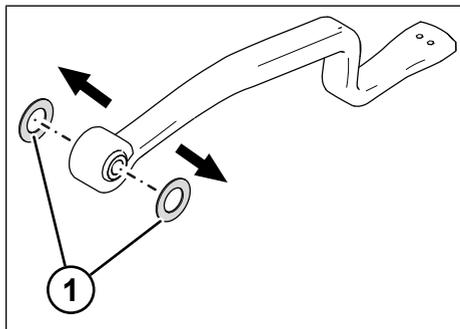


Fig. 5-122: Removing the thrust washers

- 1 Thrust washers

- ▶ Removing the silent bearing

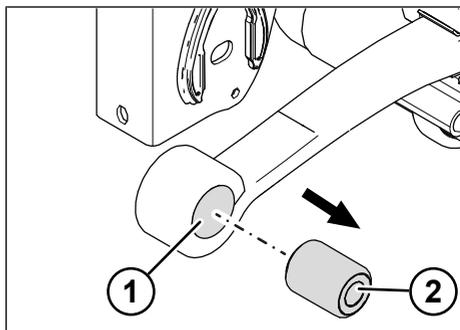


Fig. 5-123: Removing the silent bearing

- 1 Link bearing
- 2 Silent bearing

- ✓ The silent bearing is removed.

Fitting the silent bearing

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Clean the link eye.
- ▶ Insert the silent bearing in the link eye.

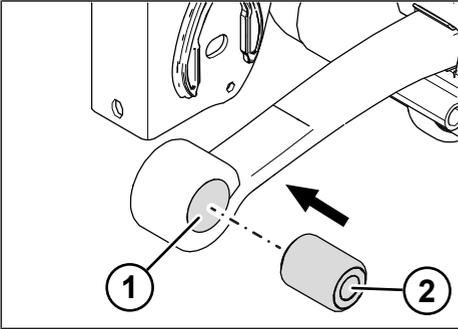


Fig. 5-124: Inserting the silent bearing

- 1 Silent bearing
- 2 Link eye

- ▶ Insert the thrust washer (thickness > 2.0 mm).

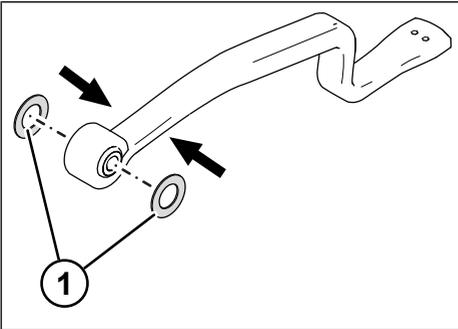


Fig. 5-125: Fastening the thrust washers

- 1 Thrust washers

- ▶ Lift up the axle body so that the air spring link sits on the air spring bracket.
- ▶ Insert the steering pin and eccentric nut/washer.

INFO

The link fitting of the Generation 2 air spring bracket has no eccentric nuts. Washers are used instead.

- ▶ Insert the retainer nut with eccentric nut/washer.

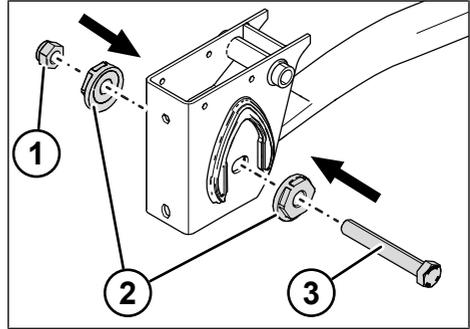


Fig. 5-126: Fastening the link fitting

- 1 Retainer nut
- 2 Eccentric nuts/washers
- 3 Steering pins

- ▶ Align the air spring unit at the ride height.
- ▶ Fasten the retainer nut with a pre-tensioning tightening torque of 200 Nm. For Generation 1 air spring brackets, ensure that the marking on the eccentric nuts points downwards (neutral position).

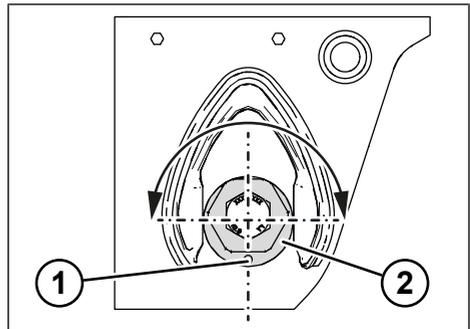


Fig. 5-127: Adjusting the play of the air spring link

- 1 Eccentric nuts/washers
- 2 Marking

- ▶ Fit the track measuring device in accordance with the manufacturer's instructions and align it.
- ▶ Set the track (see "5.3.8 Setting the track", pg. 69).

- ▶ Install the Twinlift (see "5.3.2 Twinlift", pg. 57).
- ✓ The silent bearing is installed.

5.3.8 Setting the track

Generation 1 air spring bracket

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Align the air spring unit at the ride height.
- ▶ Fasten the retainer nut with a pre-tightening torque of 200 Nm. While doing this, ensure that the marking on the eccentric nuts points downwards (neutral position).

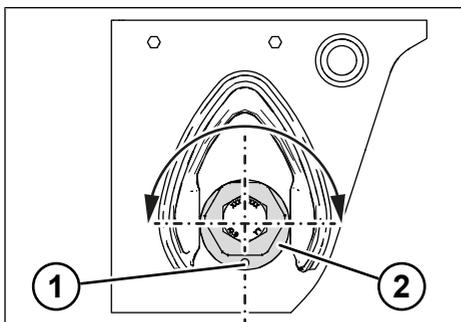


Fig. 5-128: Adjusting the play of the air spring link

- 1 Markings
- 2 Eccentric nut

- ▶ Fit the track measuring device in accordance with the manufacturer's instructions and align it.
- ▶ Set the track.

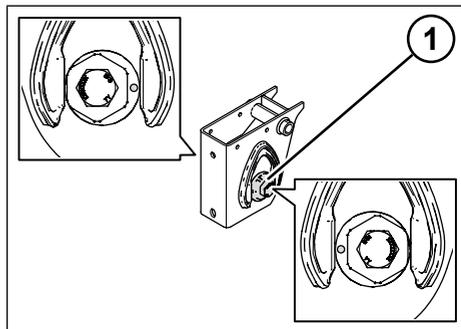


Fig. 5-129: Adjusting the eccentric nuts identically

- 1 Eccentric nut

- ▶ By evenly turning the eccentric nuts on each air spring bracket, the axle can be moved forwards or backwards ± 5 mm. While doing this, ensure that both eccentric nuts are adjusted identically.
- ▶ Fasten the retainer nut with a tightening torque of 340 Nm \pm 20 Nm \pm 90° \pm 3°. While doing this, ensure that both eccentric nuts remain adjusted identically.
- ▶ Remove the track measuring device according to the manufacturer specifications.
- ✓ The track is adjusted.

Generation 2 air spring bracket

- ▶ Carry out preparatory work (see "5.1 Preparatory work", pg. 30).
- ▶ Loosen the retainer nut until the steering pin fitting can be moved by hand.
- ▶ Fit the track measuring device in accordance with the manufacturer's instructions and align it.
- ▶ Put on the lever tool.

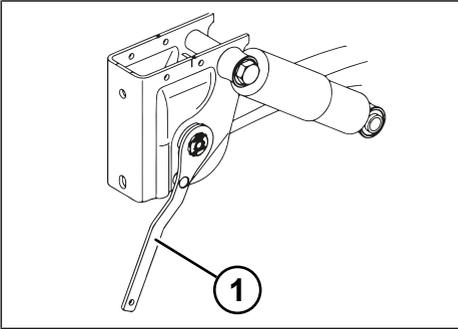


Fig. 5-130: Lever tool

1 Lever tool

- ▶ Set the track. The axle can be moved by +/- 5 mm forwards or back by pulling or pressing on the lever tool.
- ▶ Fasten the retainer nut with a tightening torque of 340 Nm +/- 20 Nm +90° +/- -3°. Make sure that the steering pin fitting is not shifted.
- ▶ Remove the track measuring device according to the manufacturer specifications.
- ✓ The track is adjusted.

6 Repair time schedule

General aspects

No.	Component	Work step	Repair time [min]	Upstream tasks	Working time, complete [min.]
1	Vehicle	Set-up time, complete	30		
2	Wheel	Fitting and removing	10		
3	Brake air gap	Testing and setting	6	2	16
4	EBS/ABS brake system	Reading the error memory	30		

Drum brake

No.	Component	Work step	Repair time [min]	Upstream tasks	Working time, complete [min.]
5	Brake cylinder	Removing and installing	15		
6	Hub unit with brake drum	Removing and installing	10	2	20
7	Brake shoe	Removing and installing	4	2, 6	24
8	Brake drum	Removing and installing	20	2, 6	36
9	Outer, inner wheel bearing, seal	Removing and installing	20	6	30
10	Bar adjuster	Removing and installing	10		
11	S-camshaft, camshaft bearing, camshaft bushing	Removing and installing	20	6, 7, 10	44
12	Cover plate	Removing and installing	8		

7 Spare parts and customer service

Bernard-Krone-Straße 1
D-49757 Werlte

7.1 Spare parts

NOTE

Property damage caused by incorrect spare parts!

The use of non-approved or incorrect spare parts affects safety and can result in voiding of the operating permit.

- ▶ Only use original spare parts.

The original spare parts are regularly checked for safety and functionality. The use of original spare parts guarantees road and operating safety and the operating permit is retained.

- ▶ When ordering spare parts, provide the item number and the axle name.

You can order spare parts by phone under +49 (0) 59 51 / 209-302 or from the KRONE website. An electronic spare parts catalogue is available on the website: www.krone-trailer.com



www.krone-trailer.com



www.krone-trailerparts.com

7.2 Customer service and support

The customer service department at Fahrzeugwerk Bernard KRONE GmbH & Co. KG can be reached using the following contact data:

Customer Service

Telephone: +49 (0) 59 51 / 209-320

email: kd.nfz@krone.de

Internet: www.krone-trailer.com/service/kundendienst

Spare Parts

Telephone: +49 (0) 59 51 / 209-302

Email: Ersatzteile.nfz@krone.de

Internet: www.krone-trailer.com

Fahrzeugwerk Bernard KRONE
GmbH & Co. KG

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