

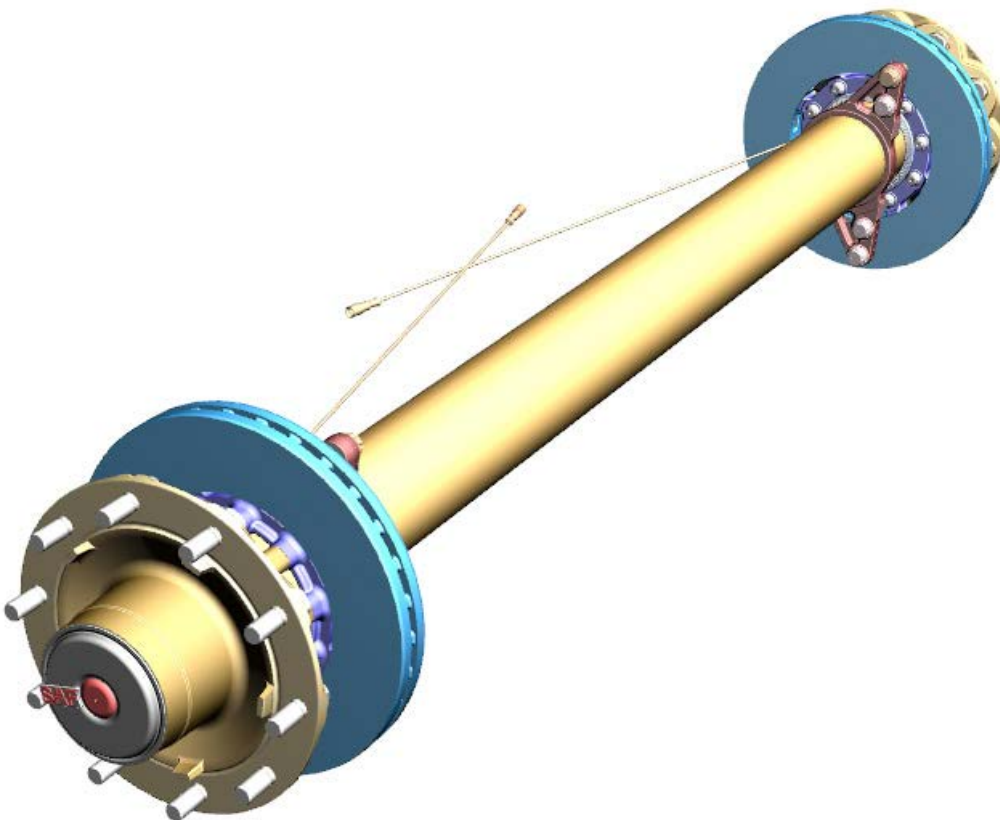
Repair Instructions

SAF SI12-22K10

SAF ZI12-22K10

SAF SI11-22K11

SAF ZI11-22K11



Please note

These repair instructions are intended for the exclusive use by trained persons within the commercial vehicle industry and related workshops.

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No liability is assumed as a result of incorrect or inappropriate parts being fitted to the product or the omission of appropriate tests after the servicing of the product. Use appropriate spare parts' documentation when obtaining spare parts. Use only genuine SAF-HOLLAND GmbH spare parts in repairs.

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1 Product data

1.1 Information on the axle

The SAF axles S(Z)11(12)-22K11/K10 are an axle module that is specially designed for high loads under extremely difficult conditions.

Technical details of the axle

- permissible axle load 11 or 12 tons.
- permissible maximum speed 105 km/h.
- proven SAF brake SN7 / SK7 (11t)
- Use of standard brake chambers
- Integral brake disc

1.2 Identifying the axle

Please have the exact type designation of the product ready when ordering spare parts.

The 11-digit serial number (Serial No.) and the identification number (Ident. No.) is on the type plate

► Fig. 1.




SAF-HOLLAND GMBH D-63856 BESSENBACH · GERMANY			
Version	BI9-22K01	ID1 – SBK2243 – 115	
Serial No.	11 12 117 0009	ID2 – SBK2243 – 115 01	
Ident No.	147 96 62 7 48 20	ID3 – 10791	
Stat. 9000 kg Vmax. 105 km/h		ID4 – 36110303	
Made in Germany	E		
		SN 11121170009	

Fig. 1 - Type plate

1.3 Location of type plate

The type plate -arrow-, ► Fig. 2 is located in the centre on the back of the axle tube.

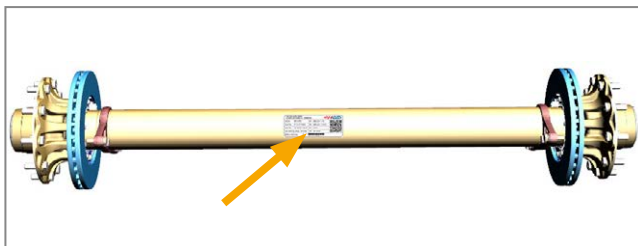


Fig. 2 - Type plate position

1.4 Identification in case of a missing type plate

In case of a missing type plate, the serial number (S/N) is embossed on the axle stub end, ► Fig. 3 on the right in the direction of travel.



Fig. 3 - Serial number on the right of the axle stub end

2 Ordering spare parts / component overview

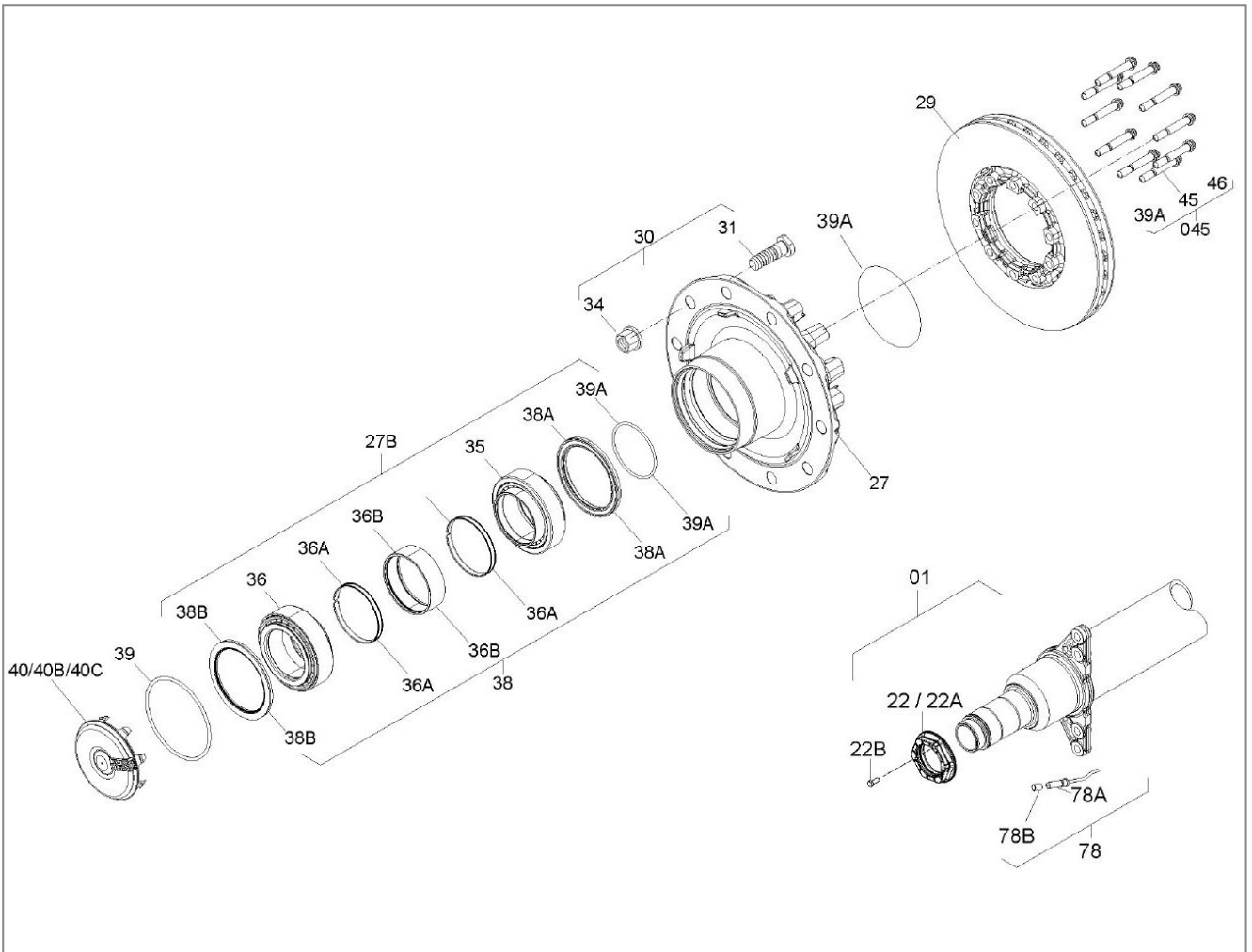
2.1 Ordering spare parts

When ordering original spare parts from SAF-HOLLAND, make sure you accurately identify the respective product. Copied parts have a negative effect on the function of the product, have a shorter lifetime and cause risks and hazards that SAF-HOLLAND cannot estimate. It also increases the maintenance requirement.

SAF-HOLLAND operates a tight service network of partner companies for technical support of SAF-HOLLAND products and supply of parts (see www.safholland.com).

For further instructions on identifying spare parts, refer to the Aftermarket section of our home page www.safholland.com. Updates are published as necessary on the Internet at www.safholland.com.

2.2 Component overview S(Z)I11(12)-22K10/K11



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Item	Designation	Dimensions / note	Quantity
22	Axle nut - left	M75x1.5/SW95	1
22A	Axle nut - right	M75x1.5/SW95	1
22B	Screw	M8x20	2
27	Wheel hub unit	TK335/10	2
27B	Wheel bearing repair kit	88mm	2
29	Brake disc - INTEGRAL - including magnet wheel	Ø430x50	2
30	Wheel bolts - group	Item 31, 34	20
31	Wheel bolts	M22x1.5x68	20
34	Wheel bolt nuts	M22x1.5x27H/SW32	20
35	tapered roller bearings	B/S/Z series	2
36	tapered roller bearings	B/S/Z series	2
36A	Retaining ring		4
36B	Spacer ring		2
38	Grease change repair kit		2
38A	Sealing ring - inner	D112/138.5x11	2
38B	Sealing ring - outer	D112/138.5x6	2
39	Sealing ring	Ø152x139.5x5.15	2
39A	O-ring	Ø92x4	2
40	Hub caps - group	S/Z/ZI/BI	2
40B	Hub caps - group / hubodometer	S/Z/ZI/BI	2
40C	Hub caps - group	TIRE PILOT	2
45	Double hexagon screw	M14x1.5x90	20
045	Brake disc accessories	Item 39.1, 45, 46	2
46	grease	SAF LiLube Expert	2
056	Brake calliper - mounting bolts	Item 56, 56.1	2
56	Double hexagon screw	M18x1.5x55	6
56A	Tolerance bolt	M18x1.5x55	2
78	ABV - WABCO set	Item 78.1, 78.2	2
78A	Rod sensor		2
78B	Rod sensor clamping sleeve		2

2.3 Tightening Torques

Item No.	Designation	Tightening torque	Width across flats (WAF)
22B	Locking screw of the axle nut, M8 x 20	30 Nm	13 (hexagon)
22, 22A	Axle nut	900 Nm	95 (hexagon)
45	Integral brake disc DSK screw	180 Nm	15 (DSK)
31	Wheel bolts	600 Nm	32 (hexagon)



Note:

An internal hexagon socket (SW95) is available for loosening and tightening the axle nut.

Part number: 04 434 3891 00

3 General information

3.1 Liability

SAF-HOLLAND's „General Terms and Conditions“ apply ► *chapter 3.2*.

SAF-HOLLAND accepts no liability claims for personal injury or material damage with one or more of the following causes:

- Failure to observe the proper use ► *chapter 4.2*.
- Failure to observe the repair manual and the safety instructions contained in it ► *chapter 4.5*.
- Arbitrary changes or modifications to the product.
- Insufficient maintenance of parts that are subject to wear ► *chapter 6.2*.
- The use of any spare parts other than original SAF-HOLLAND parts ► *chapter 2.1*.
- Use of damaged parts.
- Disasters due to external influences or force majeure.

3.2 Warranty and general terms and conditions of business

Refer to the “Sales” section of our home page www.safholland.com for information on current warranties and general terms and conditions.

3.3 Environmental protection

All components and consumables used for maintenance and care must be disposed of in an environmentally friendly manner.

Recyclable components must be cleaned of oil and lubricants and recycled.

When doing so, you must adhere to the disposal instructions for the respective consumables and the valid national and regional regulations.

4 Safety Precautions

4.1 Target group

The repair manual of the product is restricted exclusively to use by trained personnel from authorised specialist workshops.

4.2 Proper use

The product has been constructed using state-of-the-art technology and in accordance with recognized rules of technical safety. However, its use may result in hazards for the operator or third parties or damage to the device or other objects of material value.

Proper use also includes:

- Observance of the operating manual and the repair manual, as well as implementation of the working steps stipulated in the repair manual
- Adherence to the performance limits ► *Fig. 1* of the product
- Adherence to all repair and care instructions, as well as additional inspections ► *chapter 6.2*
- Use of the auxiliary and operating materials listed, as well as their environmentally-friendly disposal ► *chapter 3.3*

Operationally safe functioning can only be guaranteed if all the instructions, setting and performance limits for the product are adhered to.

4.3 Safety instructions and symbols used

The following symbols are used to denote particularly important information and sections of the text. It must be ensured that they are always read and observed before working with the product.



Danger!

This safety instruction with the exclamation mark warns of a possible safety risk or serious and fatal injuries.



Caution!

This safety instruction with the exclamation mark warns of possible damage to the product.



Note:

Marking for special user tips and other particularly useful and important information for efficient work and economical use.

4.4 Marking used for sections of text

- Marking for instructions for actions and information in safety instructions

1., 2., 3., ... Marking used for working steps.

4.5 General safety instructions



Danger!

Risk of serious traffic accidents due to the loss of traffic safety and operational safety, which may lead to serious or fatal injuries!

It is imperative to adhere to the following safety instructions for your SAF-HOLLAND axles and suspensions in order to comply with operational safety and traffic safety:

During operation:

- You must make sure that the brakes do not overheat, e.g. due to continuous use. Overheating can lead to a dangerous reduction of the braking power.
- In case of overheating the parking brake must not be applied until the brake has cooled down. The brakes may otherwise become damaged as a result of different levels of tension arising during the cooling process.
- When loading and unloading the provided support devices must be used in order to prevent damage to the axle.

- Adhere to the trailer manufacturer's recommendations for OFF ROAD use of the installed axles and suspensions. The SAF-HOLLAND definition OFF ROAD refers to driving on non-tarmacked/ concreted stretches, e.g. gravel roads, countryside and forest roads, on construction sites and in gravel pits.
- The operation of SAF-HOLLAND axles and suspensions in OFF ROAD use which are not conceived for this purpose can cause damage and thus compromise traffic safety.

For care work:

- After successful disassembly, the wheel contact surfaces and wheel hub units must be cleaned.
- The contact surfaces must be clean, smooth and free from grease.
- The wheel contact surfaces and the wheel screw supports must NOT be additionally painted.
- Ensure that painted and corrosion-protected surfaces are not damaged during cleaning and upkeep work.

Further safety instructions:

- You must only use the wheel rims and tyre sizes specified by the trailer manufacturer.
- The tyres must always have the stipulated air pressure.

5 Initial and Final Procedures

5.1 General information

The objective of this chapter is to give guidelines on how "Initial" and "Final" procedures shall be performed in a standardised way.

The "Initial" procedure is a recurring procedure that has to be performed prior to the Inspection and/or Repair procedures covered in this Service Manual.

The "Final" procedure is a recurring procedure that has to be performed after the Inspection and/or Repair procedures covered in this Service Manual.

5.2 Initial Procedure

5.2.1 Lift up and support the vehicle axle



Danger!

- One or more of the vehicle's axles shall be chocked to prevent involuntary movement of the vehicle!
- If the axle is equipped with a parking brake function, ensure that the brake system is depressurised, that the spring brake chamber is fully disengaged and mechanically secured in this position!



Caution!

- The vehicle manufacturer's safety precautions shall be followed when working on the vehicle!
- Local safety precautions must be observed!
- The vehicle axle must be lifted using a hydraulic jack!

1. Secure the wheels on a flat and even surface.
2. Use stands and lift the axles using a hydraulic jack.
3. Release the parking brake.

5.2.2 Removing the wheel



Danger!

- Take all necessary safety precautions before wheel removal.
- Follow all of the vehicle manufacturer's safety precautions!

1. Check the free rolling resistance, if the resistance is higher than expected, the tyres can be tapped to remove any normal rest tension.
2. Remove the wheel nuts and wheel.

5.3 Final Procedure

5.3.1 Brake

The function test of the brakes is carried out as per the legal regulations.

5.4 Procedimiento final

5.4.1 Mounting of the wheel



Caution!

The axle must not be obstructed in any way.

1. Check the free rolling resistance.
2. Fit the wheel and tighten the wheel nuts to the tightening torque ► *chapter 2.3*



Note:

Do not use impact screwdrivers to fit the wheel.

5.4.2 Lowering of the vehicle axle



Caution!

- If the axle is equipped with a spring brake chamber, it must be ensured that the brake system is pressurised and the spring brake chamber is fully engaged.
- Actuate the parking brake to check that there is sufficient pressure in the system (min. 6 bar).
- Observe the vehicle manufacturer's instructions!

1. Release the parking brake and the mechanical lock.
2. Lift the axle to remove the stands.
3. Carefully lower the vehicle to the ground.
4. Remove the wheel blocks.

6 Repair and maintenance work

6.1 General instructions

The objective of this chapter is to give instruction and guidance on how the axle and its components shall be replaced.



Caution!

- Regularly carry out general visual inspections of the brakes, tyres and all parts of the chassis to make sure they are firmly fastened and to check for wear, leaks, corrosion and damage.
- Following each wheel change, after 50 km and then after 150 km, tighten the wheel nuts to the stipulated tightening torque ► *chapter 2.3*
- Do not use Helicoil inserts and do not re-cut the thread.
- All contact surfaces and treated surfaces must remain paint-free.
- During each brake pad change, the brake disc must be checked for wear and cracking.
- Only use the special tool from SAF-HOLLAND.
- We recommend that only original spare parts from SAF-HOLLAND are used ► *chapter 2.1*.

6.2 Service schedule



Danger!

Failure to observe the service instructions may result in serious road accidents due to loss of road safety and operational safety, which could lead to serious or fatal injuries.



Caution!

- Check all tightening torques!
- Maintenance work must only be carried out by authorised specialist workshops and by personnel with the appropriate training!
- In the case of vehicles with extreme operating conditions, e.g. OFF ROAD or multiple-shift operation, the maintenance intervals have to be shortened from 12 months/120,000 km to 6 months/90,000 km.

Maintenance work on the axle

	Initially after 1 month or 5000 km	Every 6 months or 90,000 km	Every 12 months or 120,000 km	Every 24 months or 180,000 km
General check				
Check that all wheel nuts and mounting bolts of the brake have the correct tightening torque, ► <i>chapter 2.3</i>	x	-	-	-
Check the hub bearing for axial backlash	-	x	-	-
During each brake pad change - at the latest as per the maintenance interval information - check the brake disc for damage	-	-	-	x
Visual inspection				
Check the brake pad thickness and wear limits as per the wear indicator	-	x	-	-
Check all components of the axle for wear, cracks and damage	-	x	-	-
Check the brake system for loss of pressure	-	x	-	-
Check the brakes for correct adjustment and efficient braking effect	x	x	-	-
Check the tractor and semi-trailer for consistent brake pressure. Check the recommended adjustments for service brake pressure (e.g. observe demand control for valve control)	x	-	-	-
Carry out the general safety inspection as per legal regulations.				

6.3 Replacing the ABS sensor

6.3.1 Removal of the ABS sensor



Note:

- The ABS sensor can be pressed when the brake is fitted!
- The ABS sensor can be replaced when the brake is fitted!

1. Pull the ABS sensor ► *Fig. 4* out of the sensor bracket with clamping sleeve.
2. Dispose of the full ABS sensor with connecting cable.

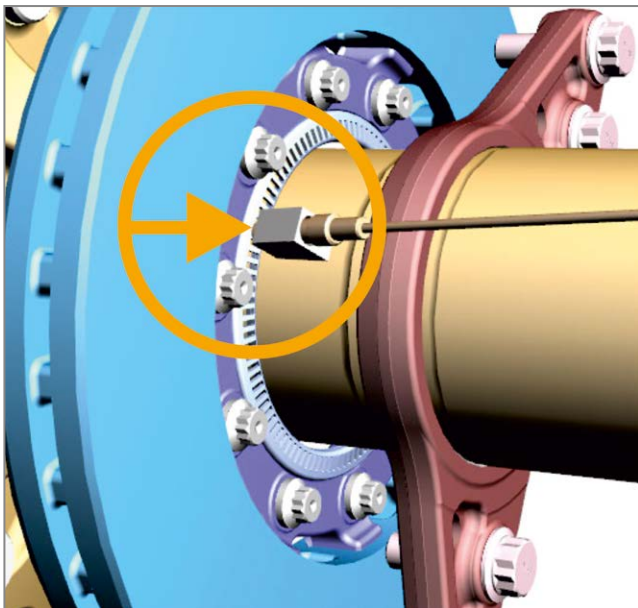


Fig. 4 - Installation and removal of the ABS sensor

6.3.2 Assembly of the ABS sensor



Danger!

- The connecting cable from the ABS sensor must be laid on the axle so that it is protected from damage and being rubbed.
- Only a new ABS sensor may be installed on the axle!

1. Insert the clamping sleeve into the ABS sensor bracket.
2. Grease the ABS sensor with sensor grease
3. Slide a new ABS sensor with connection cable from outside into the clamping sleeve in the sensor bracket.

4. Slide the ABS sensor further to press it onto the magnet wheel.
5. Check the contacts of the ABS sensor with a voltmeter for voltage output (approx. 100 mV), while turning the wheel hub unit.

6.4 Replace the hub cap

6.4.1 Remove the hub cap

1. Loosen and remove the hub cap -item 1- using a large screwdriver.
2. Remove the sealing ring -item 2.

6.4.2 Fit the hub cap

1. Insert the sealing ring into the hub cap.
2. Insert the wheel cap into the wheel flange and click it into place.

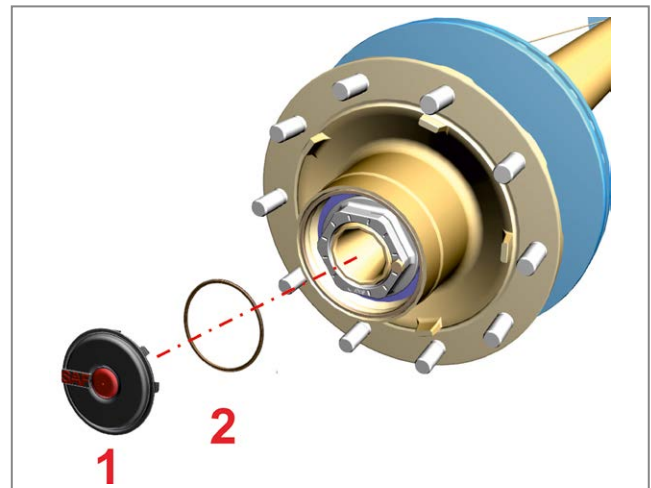


Fig. 5 - Replace the hub cap

6.5 Replace the wheel hub

6.5.1 Removal of the wheel hub



Caution!

For removal, no impact screwdrivers must be used!

1. Remove the hub cap ► *chapter 6.4.1*.
2. Loosen the locking screw ► *Fig. 6* -item 1.
3. Using the SAF axle nut socket (part number 04 434 3891 00) -item 2-, ► *Fig. 7*, remove the axle nut by unscrewing the axle stub end.
4. Place the wheel assembly trolley under the complete wheel hub unit and remove it from the axle stub end.

5. Colocar el carro de montaje de la rueda bajo la unidad completa del buje de la rueda y extraerla del mangón del eje.

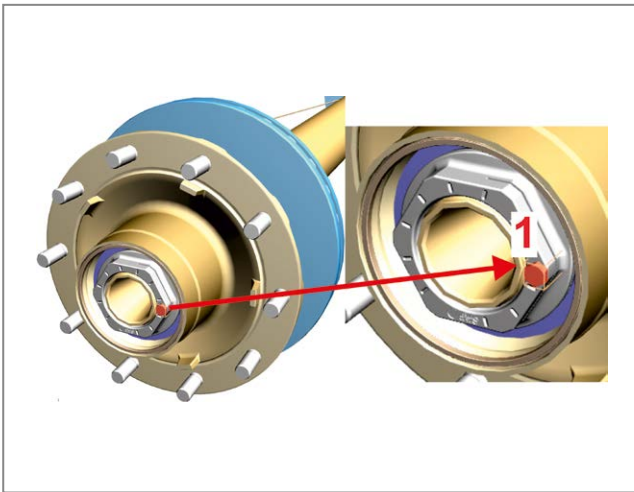


Fig. 6 - Loosen the locking screw

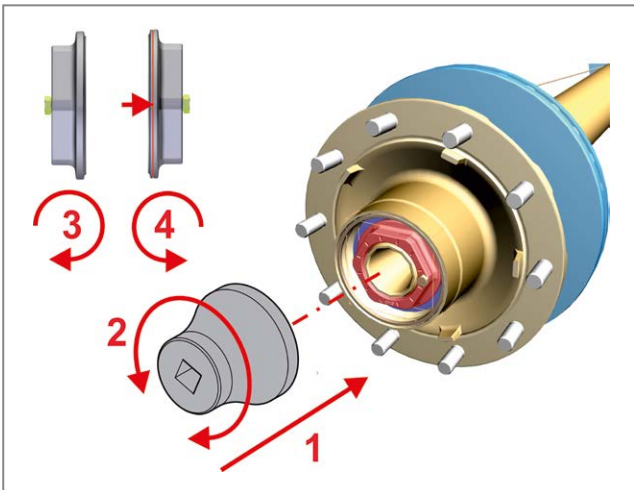


Fig. 7 - Loosen the axle nut

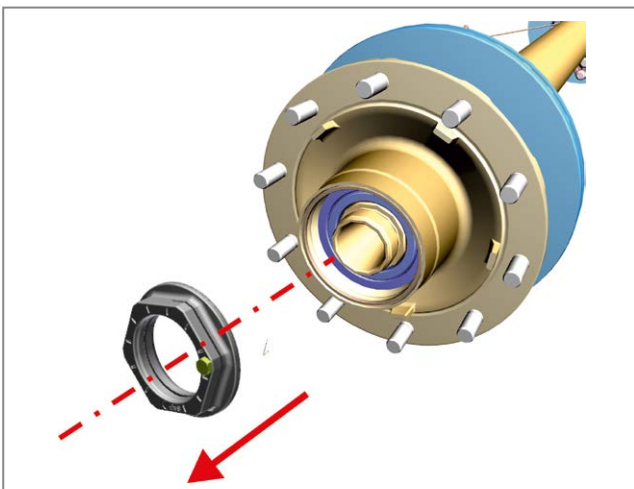


Fig. 8 - Remove the axle nut

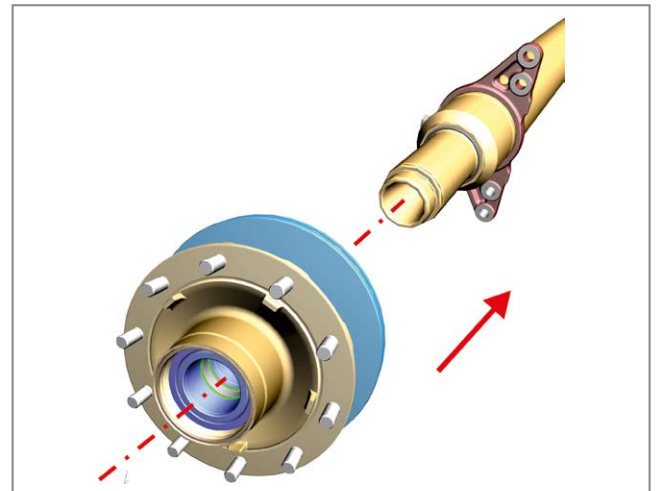


Fig. 9 - Remove the wheel hub

6.5.2 Assembly of the wheel hub

When assembling the wheel hub unit, check the condition of the magnet wheel and replace it if necessary
► *chapter 6.5.3*



Caution!

- For assembly, no impact screwdrivers must be used!
- When assembling the wheel hub unit, the thread must not be damaged!



Note:

When the axle nut is tightened, the wheel hub unit must be turned evenly at least five times during tightening.

1. Grease the axle stub end and place the wheel hub unit ► *Fig. 10* on the axle stub end.
2. Screw on the axle nut ► *Fig. 11, 12* and tighten it to the stipulated tightening torque using the SAF axle nut key (part number 04 434 3891 00).
3. Tighten the locking screw ► *Fig. 13* -item 1- to the stipulated tightening torque ► *chapter 2.3*



Danger!

- A new locking screw ► *Fig. 13* -item 1- must be used.

**Note:**

The wheel must rotate without resistance and there must be no wheel rock on the rim, if necessary check the adjustment.

4. Check that wheel bearing and wheel rock run properly.
5. Mount the hub cap ► *chapter 6.4.2.*

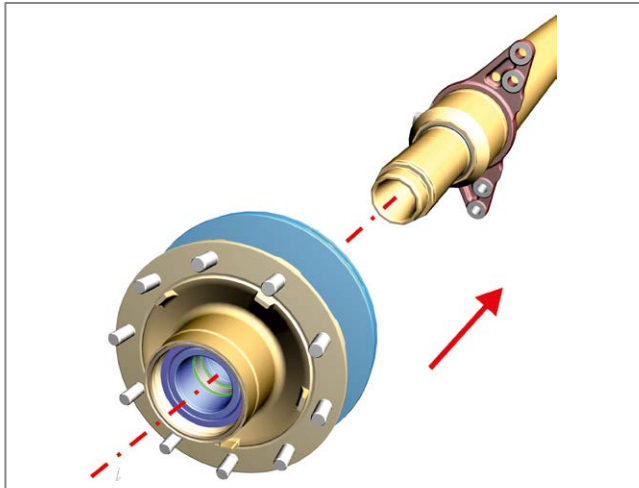


Fig. 10 - Mount the wheel hub

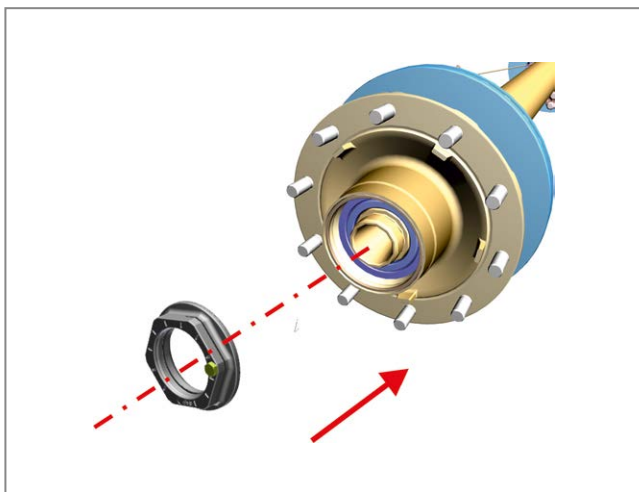


Fig. 11 - Screw on the axle nut

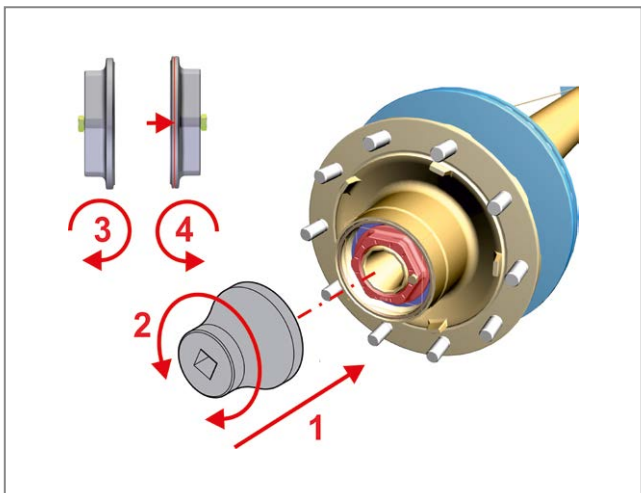


Fig. 12 - Tighten the axle nut

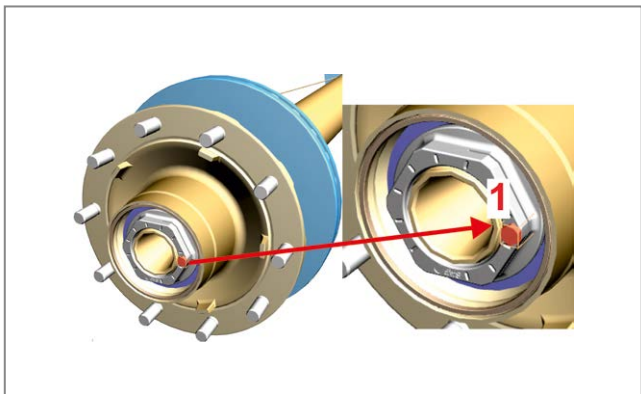


Fig. 13 - Tighten the locking screw

6.5.3 Change the magnet wheel

1. Remove the magnet wheel using a pulling-off device.



Caution!

Do not damage the wheel hub when removing the magnet wheel.

2. Clean the seat of the magnet wheel.



Caution!

Do not damage the wheel hub when removing the magnet wheel.

3. Press in the new magnet wheel from the repair kit using the thrust ring from the wheel hub repair case.
4. Dispose of the old magnet wheel properly.



Note:

Dispose of the old magnet wheel properly.

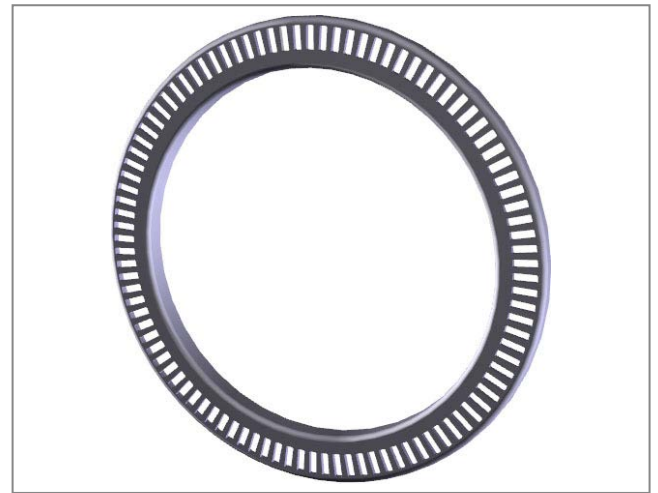


Fig. 15 - Magnet wheel

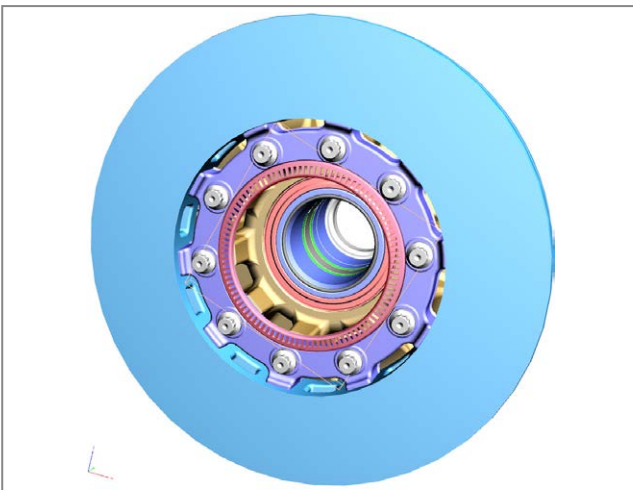


Fig. 14 - Change the magnet wheel

6.5.4 Change the wheel bearing



Note:

- Only replace the wheel bearing together with the complete seal set and the stipulated grease quantities.
- When installing and removing the wheel bearing set, ensure that the bearing seats of the wheel hub unit are not damaged.

Removal of the wheel bearing set



Note:

To install the wheel bearing set, use the SAF tool.

See Fig. 16:

1. Remove both retaining rings -item 36B- using a screwdriver.
2. Remove the O-ring -item 39A.
3. Remove the inner sealing ring -item 38A- using a screwdriver.
4. Remove the inner tapered roller bearing.
5. Remove the spacer ring.
6. Remove the outer sealing ring -item 38B- using a screwdriver.
7. Remove the outer tapered roller bearing.
8. Press out the outer rings of both tapered roller bearings.
9. Thoroughly clean the wheel hub housing -item 27- and install a completely new wheel bearing set ► *Fig. 13 „Removal of the wheel bearing set“*

Installation of the wheel bearing set



Caution!

When installing the wheel bearing set, all parts must be completely clean as even the slightest contamination can significantly shorten the running time of the wheel bearing!



Note:

- To install the wheel bearing set, use the SAF tool.
- Only new sealing, protection and bearing outer rings must be used for installation.

1. Press in the outer rings of both tapered roller bearings.
2. Insert both tapered roller bearings with spacer ring.
3. Top up the ring surfaces on the front side of the tapered roller bearing with bearing grease.



Note:

- The filling quantity for the tapered roller bearing, outer -item 36-, is 60 g of bearing grease.
- The filling quantity for the tapered roller bearing, inner -item 35-, is 60 g of bearing grease.

4. Press in the outer sealing ring.
5. Press in the inner sealing ring.

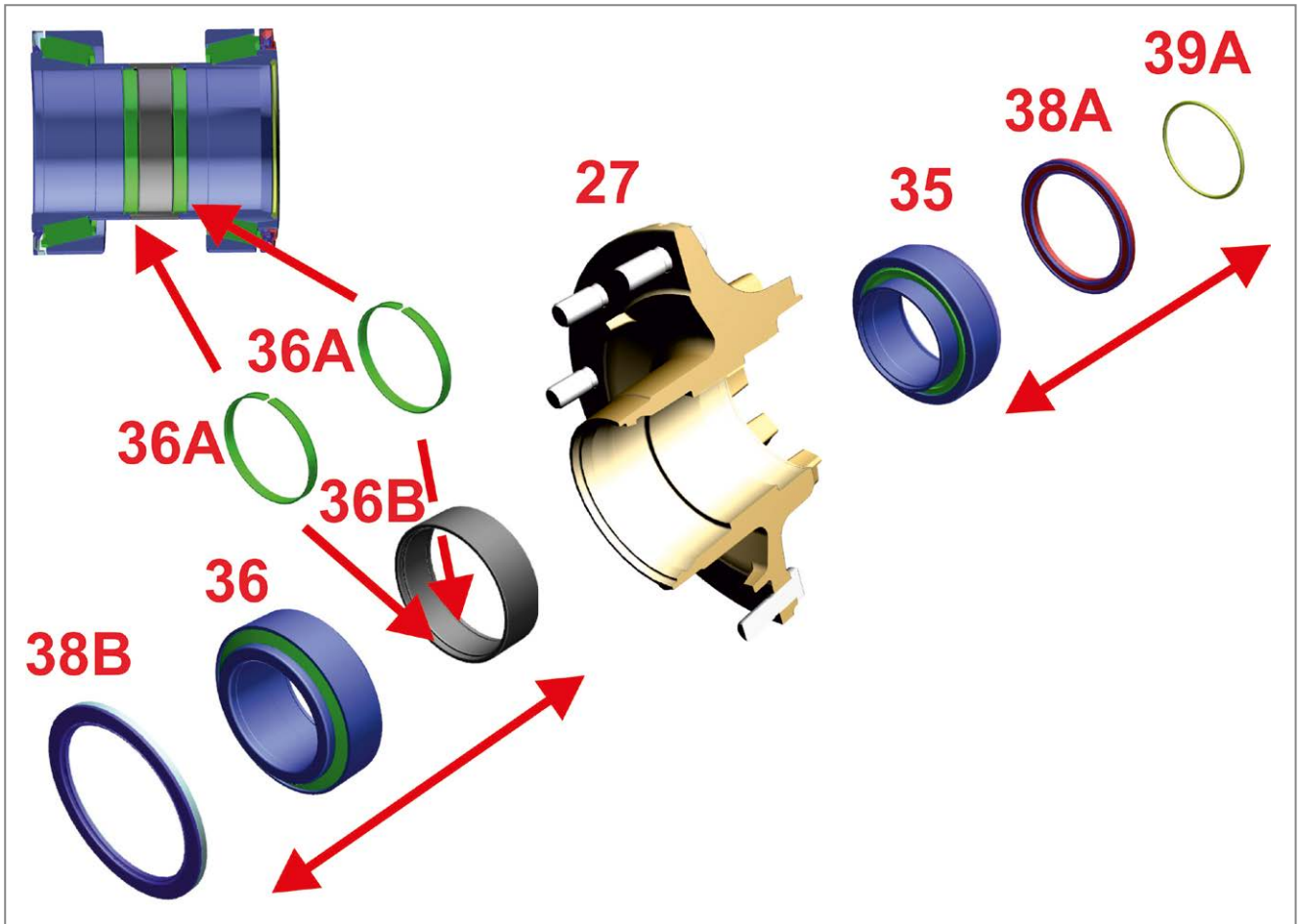


Fig. 16 - Install and remove the wheel bearing

Fig. 31: Item	Designation
38B	Sealing ring (outer)
36	tapered roller bearings
36A	Retaining ring
36B	Spacer ring
36A	Retaining ring
27	wheel hub
35	tapered roller bearings
38A	Sealing ring (inner)
39A	O-ring



“Replacing the bearing set” repair video:

<http://videos.safholland.org/RepKofferRadlager/start.html>



NOTES

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