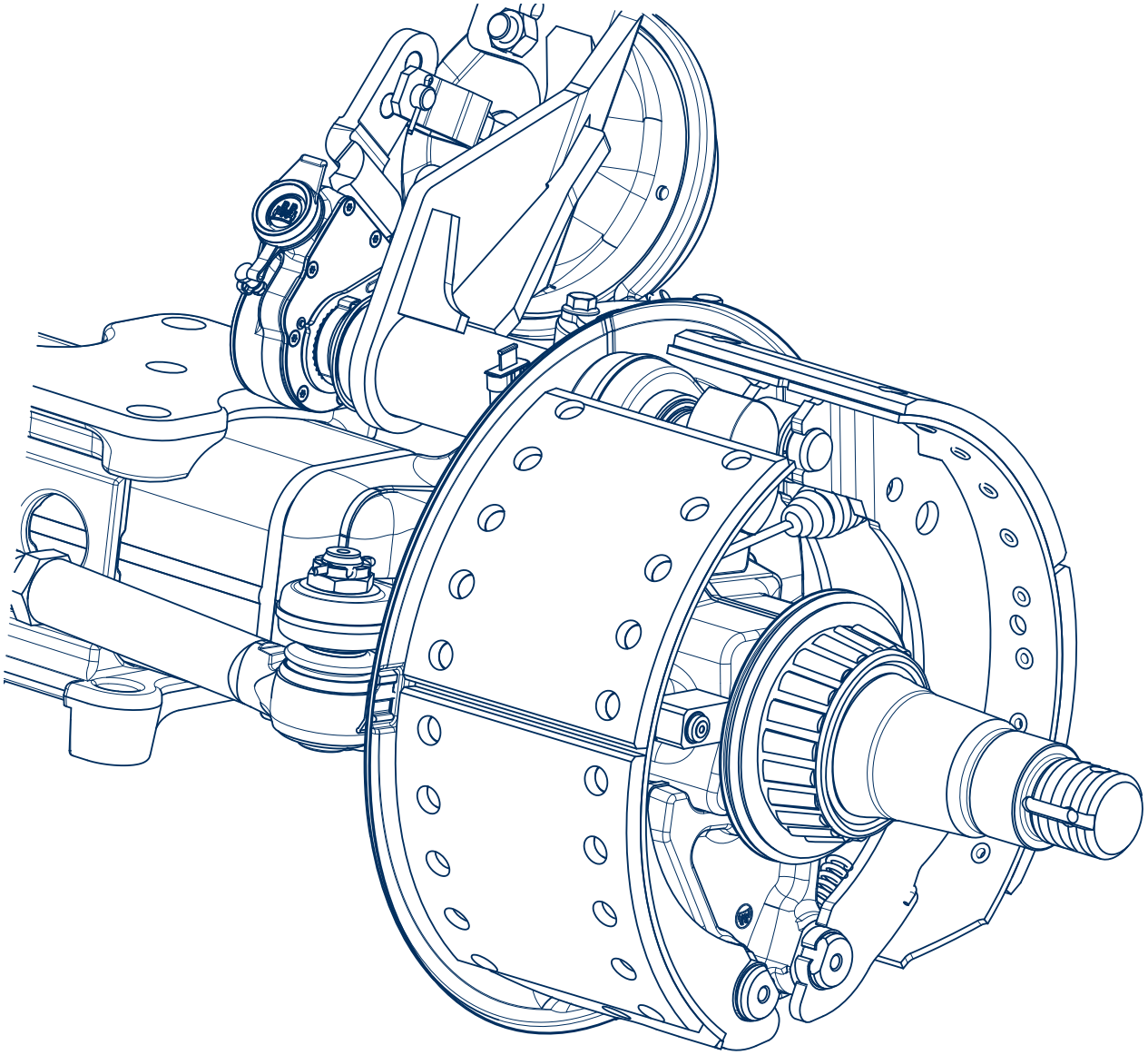


Workshop Manual

Agricultural - Bearings

BPW-WH-Agrar 55021702e

we think transport

Basic rules

Never overload axles, brakes and chassis!

In light of this

- **No irregular overloading of vehicles by exceeding the permissible gross vehicle weight.**
- **The permissible brake load must not be exceeded.**
- **No unilateral overloading by improper loading or driving on curbs etc.**
- **Use only approved wheels and tyres. Maximum difference between the track and the spring centre must be observed.**
- **Do not overload by using wheels with a lateral impact or inadmissible wheel offset.**
- **The permissible maximum speed must not be exceeded.**
- **Before each use, check the proper adjustment of brakes and brake pads and ensure their proper operation.**
- **Warranty does not cover wear and unauthorised changes.**

In order to maintain operational and road safety of the vehicle, maintenance must be carried out at predetermined intervals. All relevant operation, service and safety regulations of the vehicle manufacturer or other vehicle parts manufacturers must be observed.

The elimination of reported deficiencies or the replacement of worn parts should be entrusted to a BPW Service Centre if the vehicle owner does not have access to appropriate professionals and necessary technical equipment on site.

The exclusive use of original BPW replacement parts is strongly advised. BPW-approved parts for trailer axles and axle units are regularly subject to special inspections. BPW accepts product liability for these. BPW cannot assess whether each individual third-party product can be used in the BPW trailer axles, axle assemblies and overrun devices without safety risks. This applies even if an authorised testing organization has accepted the product.

Using spare parts other than original BPW parts voids our warranty.

As of : 02 January 2017

2nd edition

Subject to change without notice.

Current versions and additional information can be found online at www.bpw.de

Table of Contents

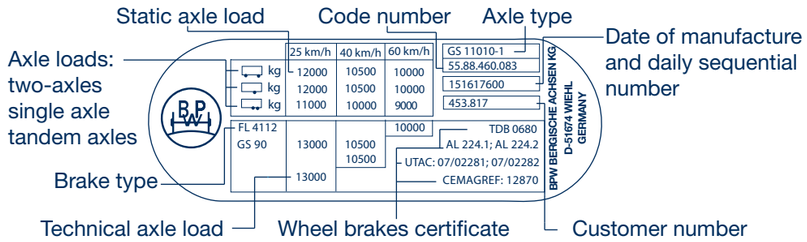
1 Product identification

1.1 BPW identification plate agricultural axle

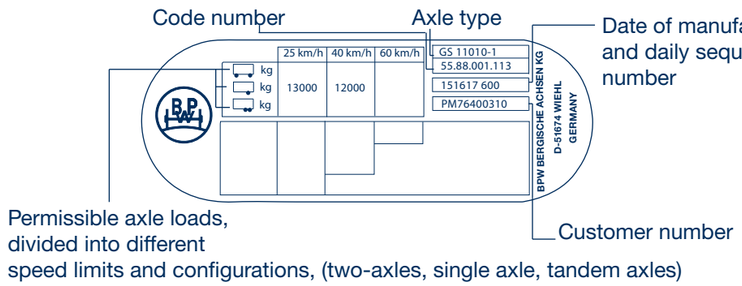
Every BPW axle has a type plate. It is affixed to the centre of the axle beam - opposite to the travel direction.

Data on the type plate can be used to define the required spare parts or - after an accident, for instance - the complete axle.

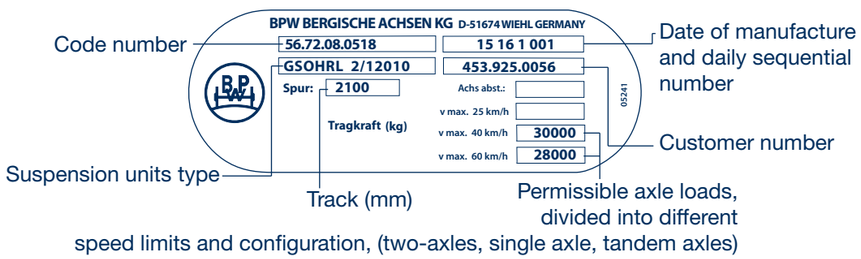
Type plate Braked axle



Type plate unbraked axle



Type plate Suspension unit



Type designation and number key 1.2

Type designation axles: Example

G	S		LA	11010	-1	
G						BPW trailer axle for agricultural vehicles
	S					Single wheels, wheels without offset
		N				Braked axle max. speed: 80 km/h
		ST				Axle stub
			LA			Unit steering axle, type LA
			LL			Unit steering axle type LL
			HLL			Unit steering axle type LL for underneath brake cylinders
			L			Steering axle type L (positive steering)
				11010		Axle capacity and number of wheel studs per wheel (last two digits)
					-1	Bearing type number

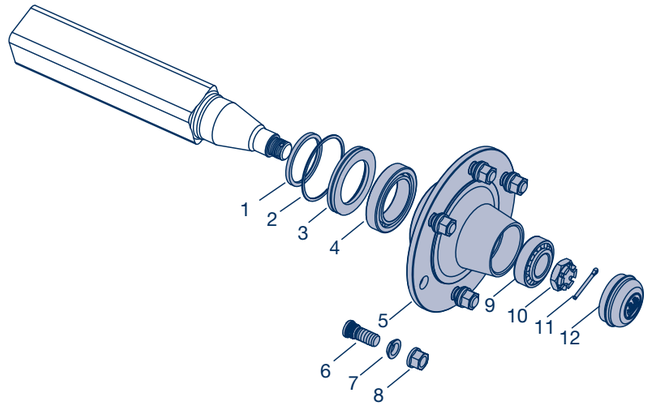
Code number key, axles: Example

55.	88.	460.	600	
26. or 36.				Agricultural trailer axle, steered
55.				Agricultural trailer axle, braked and unbraked
58.				Agricultural axle stub, braked and unbraked
	53.			GS 3606; Bearings: 30206-30209
	56.			GS 4006; Bearings: 32207-30210
	62.			GS 5006; Bearings: 32207-32211
	63.			GS 5506; Bearings: 32207-32013x
	66.			GS 8010-2; Bearings: 32310A-32215
	67.			GS 7006; GS 7008; Bearings: 30210-32014x
	70.			GS 8008-3; GS 8010-3; Bearings: 32213-33118
	72.			GS 12010; GSN 12010; Bearings: 33213-33118
	76.			GS 9010; Bearings: 32213-32215
	77.			GS 12010; GSN 12010; Bearings: 33213-33118
	74.			GS 14010; Bearings: 33215-32219
	88.			GS 11008-1; GS 11010-1; Bearings: 32310A-33116
		001.		Without brake
		356.		Wedge - type brake S 3008 RA (3081)
		375.		Wedge - type brake S 3006-7 RASK
		376.		Wedge - type brake S 3006-7 SK
		381.		Wedge - type brake S 3006-7 RAZG
		384.		Wedge - type brake S 3006-7 ZG
		443.		Cam brake N 3006-3
		447.		Cam brake N 4408-3
		448.		Cam brake N 4012-3
		454.		Cam brake N 6108-3
		449.		Wing cam brake FL 4118
		460.		Wing cam brake FL 4112
		461.		Cam brake N 4008-4
		462.		Cam brake N 4012-4
		744.		S-Cam brake SN 4220
			001 999	Serial number

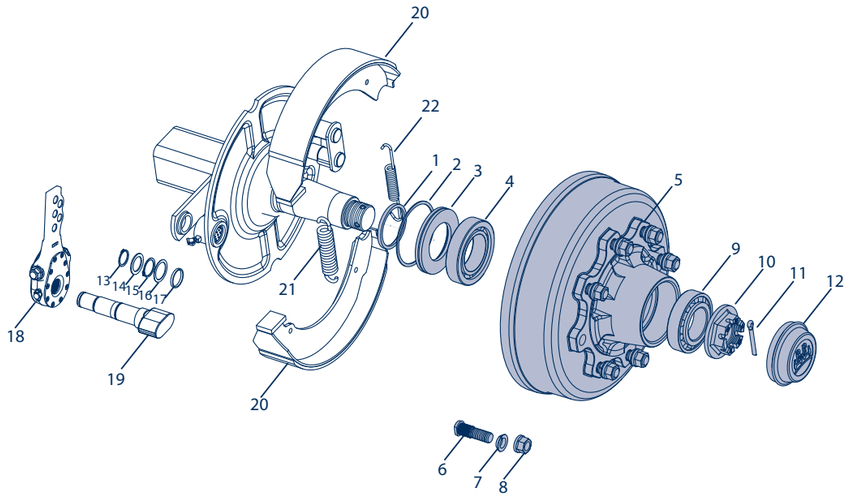
2 Exploded view

2.1 Solid axle beam

Solid axle beam without brake



Solid axle beam with Cam brake N



Solid axle beam without brake

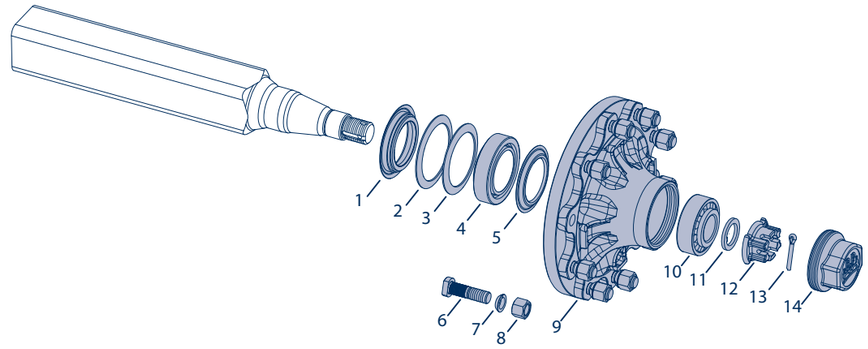
Item	Name
1	Thrust washer
2	Ring
3	Gasket
4	Roller bearing
5	Hub
6	Wheel studs
7	Spring washer
8	Flat collar nuts
9	Tapered roller bearing
10	Castle nut
11	Splint
12	Hub cap

Solid axle beam with Cam brake N

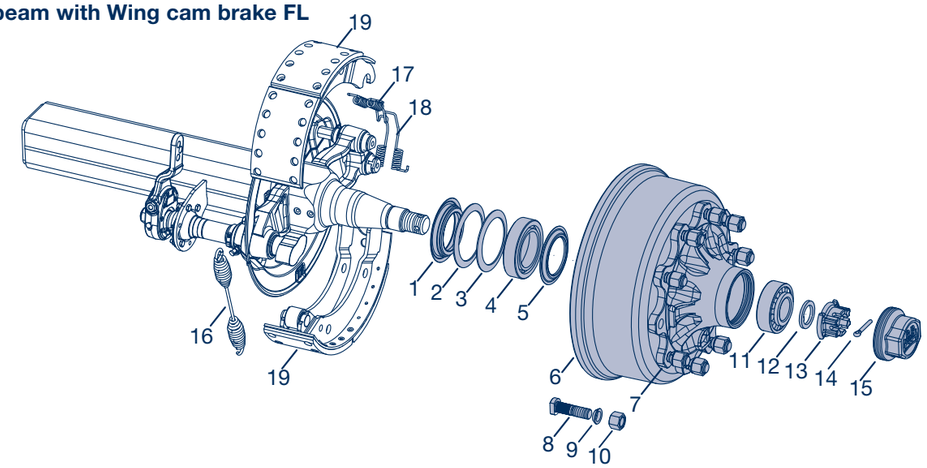
Item	Name	Item	Name
1	Thrust washer	13	Lock ring
2	Ring	14	Shim washer
3	Seal ring	15	Lock ring
4	Tapered roller bearing	16	Ring
5	Hub	17	O-Ring
6	Wheel studs	18	Slack adjuster
7	Spring washer	19	Brake camshaft
8	Flat collar nut	20	Brake shoes
9	Tapered roller bearing	21	Tension spring
10	Castle nut	22	Tension spring
11	Splint		
12	Hub cap		

Hollow axle beam 2.2

Hollow axle beam without brake



Hollow axle beam with Wing cam brake FL



Hollow axle beam without brake

Item	Name
1	Thrust washer
2	Ring (Nylon)
3	Ring (Nylon)
4	Roller bearing
5	Cover plate
6	Wheel studs
7	Spring washer
8	Wheel nuts
9	Hub
10	Tapered roller bearing
11	Washer
12	Castle nut
13	Splint
14	Hub cap

Hollow axle beam with Wing cam brake FL

Item	Name	Item	Name
1	Thrust washer	15	Hub cap
2	Ring (Nylon)	16	Tension spring
3	Ring (Nylon)	17	Tension spring (Hook)
4	Roller bearing	18	Tension spring (Eye)
5	Cover plate	19	Brake shoe
6	Brake drum		
7	Hub		
8	Wheel studs		
9	Spring washer		
10	Wheel nuts		
11	Roller bearing		
12	Washer		
13	Castle nut		
14	Cotter		

3 Safety regulations, safety information

3.1 Safety regulations

- All work must be performed by trained mechanics at competent repair facilities or authorised specialised workshops who have access to all relevant tools and have acquired the know-how required for this work. Anyone who performs maintenance and repair work must have been trained as an automotive mechanic and already have experience in repairing trailers. Anyone who performs brake work must be trained in brake systems.
- Comply with local safety regulations.
- The relevant operations and service regulations as well as safety regulations of the vehicle manufacturer and of the manufacturers of the vehicle parts must be adhered to.
- The dust created from grinding brake linings comprises particles that can cause lung damage.
  A safety mask must therefore be worn to prevent brake dust from being inhaled.
- Use prescribed dust washing devices or vacuum cleaners for cleaning, never use compressed air or other high-pressure devices.
- Ensure adequate ventilation at the workplace.
- The vehicle must be prevented from moving during repair work. Please observe the relevant safety regulations for repair work on commercial vehicles, in particular the safety regulations for jacking up and securing the vehicle.
- During repair work, make sure that the brake is not operated inadvertently.
- Do not perform repair work unless wearing protective clothing (gloves, safety boots, safety googles, etc.) and using the recommended tools.
- Work on brake components removed from the vehicle must be carried out with the components fixed in place such as in a vise.
- Only use recommended tools.
- A second mechanic must provide assistance when working with heavy components (brake drums or brake removal/installation).
- All air lines and components must be depressurised before being removed.
- Following each repair, perform a function check or a test drive in order to make sure that the brakes are functioning correctly. New drums and linings only have maximum effect after a few braking actions.
  Avoid hard braking.
- All exchanged components must be reused or disposed of in accordance with the applicable environmental regulations, laws and directives.
- Tighten bolts and nuts with the prescribed tightening torque.

Safety information 3.2

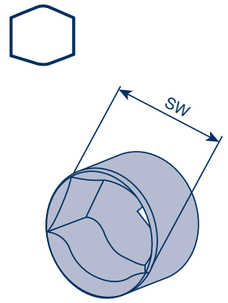
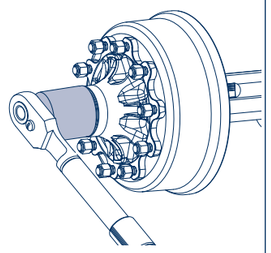
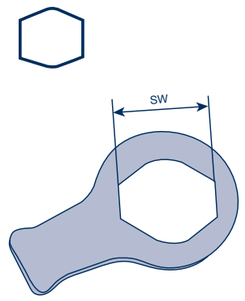
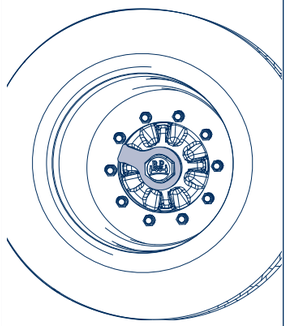
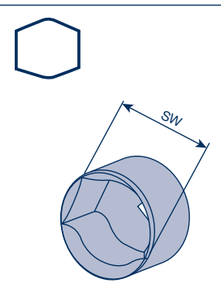
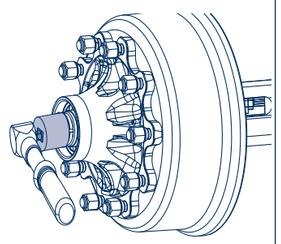
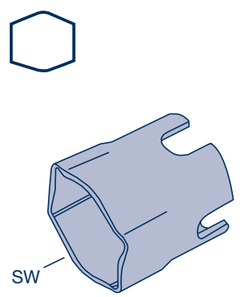
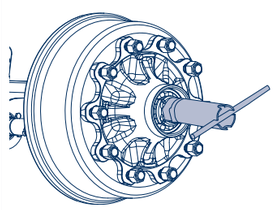
This workshop manual contains different types of safety instructions, each of which is designated by an icon and a signal word. The signal word describes the severity of the potential danger.

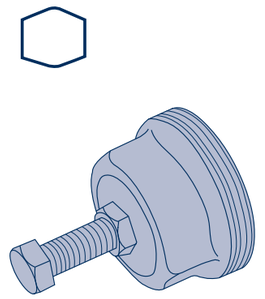
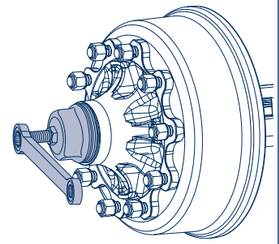
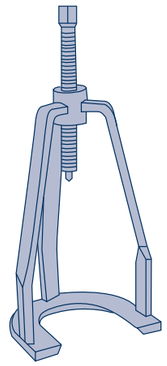
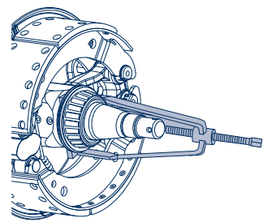
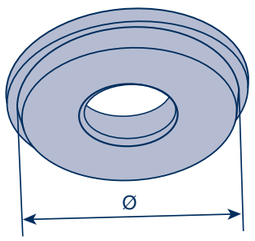
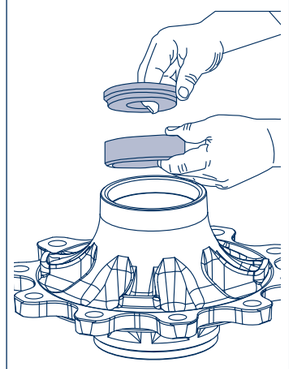
Danger !	**Immediate** potential danger of serious or fatal injury (severe injury or death).
Warning !	**Possible** potential danger of serious or fatal injury (severe injury or death).
Caution !	**Possible** dangerous situation (slight injury or damage to property).

Repair Guide !	Risk of damage to property or consequential damage if this information is not observed.

Note !	Application hints and especially useful information

4 Special tools

No.	Description	Illustration of tool	Tool in operation
1	Sockets for hub caps (BPW shape) BPW code number: **03.364.29.02.0** SW 95 **03.364.29.03.0** SW 110		
2	Ring spanner for hub caps (flat shape / BPW shape) BPW code number: **03.339.04.03.0** SW 95 **03.339.05.04.0** SW 110 **03.339.05.02.0** SW 120		
3	Sockets for axle nuts (BPW shape) BPW code number: **03.364.20.03.0** SW 65 **03.364.24.03.0** SW 80		
4	Box spanner for axle nuts BPW code number: **03.364.20.02.0** SW 65 **03.364.24.02.0** SW 80 **03.364.26.03.0** SW 85		

No.	Description	Illustration of tool	Tool in operation
5	Hub puller BPW code number: **05.012.26.03.0** SW 95 M 115 x 2 **05.012.27.05.0** SW 110 M 125 x 2 **05.012.28.03.0** SW 120 M 150 x 2 Order bolt separately BPW code number: **02.5026.70.80** M 22 x 100		
6	Puller for taper roller bearings for axles 6,5 -14 t BPW code number: **02.0125.10.00**		
7	Press tools for inserting the outer rings of roller bearings **Roller bearing** / **Ø** / **BPW code number** 32310 / 100 / 15.005.20052 32219 / 160 / 15.008.20052 33118 / 142 / 15.011.20052 33116 / 123 / 15.012.20052 33213 / 113 / 15.013.20052 33215 / 123 / 15.014.20052		

4 Special tools

<table>
<tr><th>No.</th><th>Description</th><th>Illustration of tool</th><th>Tool in operation</th></tr>
<tr><td>9</td><td>Impact tool for hub cap (without thread)
<table>
<tr><th>Hub cap code number</th><th>D1 Ø</th><th>D2 Ø</th><th>D3 Ø</th><th>L</th></tr>
<tr><td>03.211.03.05.0</td><td>62</td><td>70</td><td>64</td><td>17</td></tr>
<tr><td>03.211.08.03.0</td><td>120</td><td>122</td><td>116</td><td>19</td></tr>
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<tr><td>03.211.20.08.0</td><td>120</td><td>120</td><td>114</td><td>27</td></tr>
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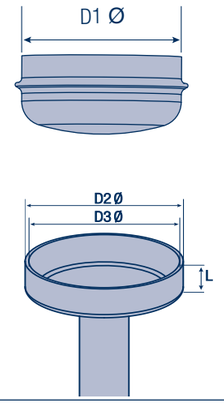
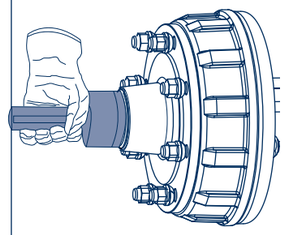
</table></td><td> 
</td><td>  </td></tr>
<tr><td>10</td><td>Impact tool for bearing
<table>
<tr><th rowspan="2">Type of bearing</th><th colspan="3">Tool</th></tr>
<tr><th>D1Ø (mm)</th><th>D2Ø (mm)</th><th>L (mm)</th></tr>
<tr><td>30206</td><td>37</td><td>31</td><td>130</td></tr>
<tr><td>30209</td><td>52</td><td>46</td><td>130</td></tr>
<tr><td>32207</td><td>46</td><td>36</td><td>130</td></tr>
<tr><td>30210</td><td>58</td><td>51</td><td>130</td></tr>
<tr><td>32211</td><td>62</td><td>56</td><td>130</td></tr>
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<tr><td>32213</td><td>76</td><td>66</td><td>130</td></tr>
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<tr><td>33118</td><td>97</td><td>91</td><td>190</td></tr>
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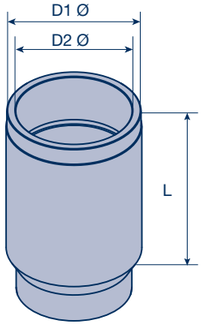
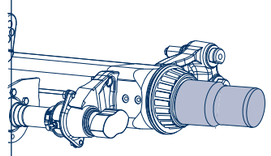
</table></td><td> 
</td><td>  </td></tr>
</table>

Fastener torque values 5

Description	Thread /Wrench size/ Bearing	Fastener torque values
Hub cap for axle		M = 500 Nm
Hub cap for axle 14 t		M = 800 Nm
Locknut for wheel studs /drumside	M 20 x 1,5 / SW 30	M = 300 Nm
	M 22 x 2 / SW 32	M = 400 Nm
	M 22 x 1,5 / SW 32	M = 400 Nm
Castle nut	M 27 x 1,5 / SW 41 / 30206	M = 20 Nm
	M 36 x 1,5 / SW 55 / 30210	M = 90 Nm
	M 27 x 1,5 / SW 41 / 32207	M = 45 Nm
	M 52 x 2 / SW 80 / 32213	M = 150 Nm
	M 42 x 2 / SW 65 / 32310	M = 150 Nm
	M 52 x 2 / SW 80 / 33213	M = 150 Nm
	M 60 x 2 / SW 85 / 33215	M = 150 Nm
Wheel nut / bolt centering	M 18 x 1,5 / SW 24	M = 270 Nm
	M 20 x 1,5 / SW 27	M = 380 Nm
	M 22 x 1,5 / SW 32	M = 510 Nm
	M 22 x 2 / SW 32	M = 460 Nm /Schwarz/
Wheel nut / central centering	M 22 x 1,5 / SW 32	M = 630 Nm
Locking screw for dust cover	M 10 / SW 13	M = 38 Nm
Self-tapping screw for dust cover	M 10 / SW 13	M = 43 Nm
Self-tapping screw for sensor bracket	M 8 / SW 13	M = 25 Nm
Locking screw for sensor bracket	M 6 / SW 10	M = 8 Nm

6 Checking the tightness of hub cap

Wheel hub cap without thread

- after every 500 working hours, at every brake lining replacement, latest annually

[1] Drive the hub cap firmly in correct position using a special tool, see page 12.

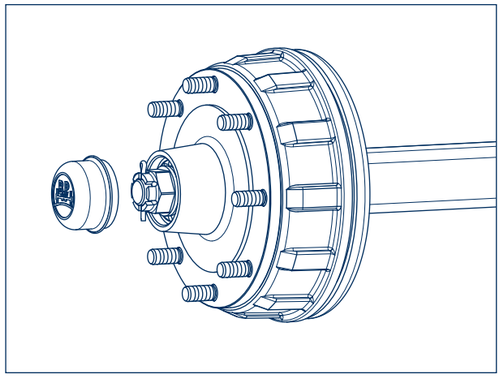


Figure 1

Wheel hub cap with thread

[1] Check the tightness of hub cap with a torque wrench, if necessary re-tighten it.

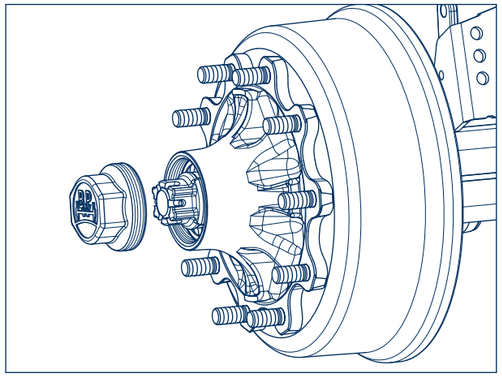


Figure 2

Tightening torque:

8 -12 t	M = 500 Nm
14t	M = 800 Nm

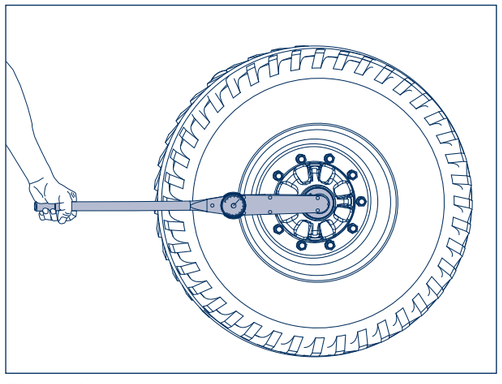


Figure 3

Checking the tightness of wheel nuts 7

- after the first run under loaded conditions, after each wheel change and every 500 hours of operation or annually.

Tighten wheel nuts crosswise to the torque value specified in the table using a torque wrench.

Wheel contact with no additional application of paint (risk of loosening disc wheels)!

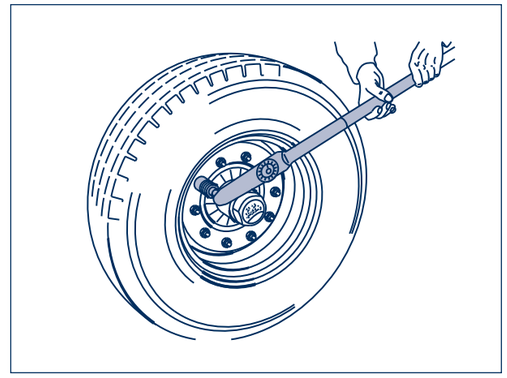
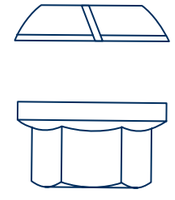
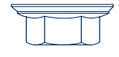


Figure 4

Tightening torque for wheel nuts

It is imperative that the prescribed tightening torques are adhered to in order to ensure that the wheels are securely fastened!

Thread	Wrench size mm	Max tightening torque			Picture
		Dacromet Geomet Geopett	Galvanised	Black	
Stud alignment					
M 14 x 1,5	22	--	**125 Nm** (120 - 130 Nm)	**125Nm** (120 - 130 Nm)	
M 18 x 1,5	24	**270 Nm** (250 - 290 Nm)	**320 Nm** (300 - 340 Nm)	**290 Nm** (275 - 305 Nm)	
M 20 x 1,5	27	**380 Nm** (360 - 400 Nm)	**420 Nm** (400 - 440 Nm)	**380 Nm** (360 - 400 Nm)	
M 22 x 1,5	32	**510 Nm** (485 - 535 Nm)	**560 Nm** (535 - 585 Nm)	**510 Nm** (485 - 535 Nm)	
M 22 x 2	32	--	**505 Nm** (480 - 530 Nm)	**460 Nm** (435 - 485 Nm)	
Spigot alignment					
M 22 x 1,5	32	**630 Nm** (600 - 660 Nm)	--	--	

7 Checking the tightness of wheel nuts

The values indicated by a torque wrench can be reached almost exactly by using an ordinary wheel nut spanner (vehicle tool kit).

Repair Guide!

However always check with a torque wrench as soon as possible afterwards!

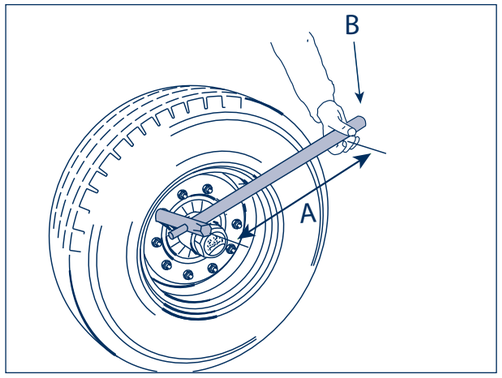


Figure 5

Reaching the tightening torque with hand tools

Tightening torque	Pipe length „A“	Body weight „B“
270 - 310 Nm	300 mm	90 - 105 kg
	350 mm	78 - 89 kg
	400 mm	68 - 78 kg
320 - 350 Nm	350 mm	91 - 99 kg
	400 mm	80 - 88 kg
	450 mm	71 - 78 kg
	500 mm	64 - 70 kg
360 - 400 Nm	400 mm	90 - 99 kg
	450 mm	80 - 89 kg
	500 mm	72 - 80 kg
	600 mm	60 - 67 kg
440 - 480 Nm	500 mm	88 - 96 kg
	600 mm	73 - 80 kg
	700 mm	63 - 69 kg
480 - 540 Nm	600 mm	80 - 90 kg
	700 mm	67 - 77 kg
	800 mm	60 - 67 kg
600 - 660 Nm	700 mm	85 - 95 kg
	800 mm	75 - 83 kg
	900 mm	67 - 73 kg
	1000 mm	60 - 66 kg
820 - 900 Nm	1000 mm	82 - 90 kg

Check wheel hub bearing play 8

Check wheel hub bearing play, adjust if necessary
(conventional)

◎ after every 500 working hours, at every brake lining replacement, latest annually

Check wheel hub bearing play by lifting axle until the tyres are free. Release brake. Apply a lever between the tyre and the ground and check the play.

Warning!

Prevent the vehicle from rolling away! Release the park and service brake only after lifting!

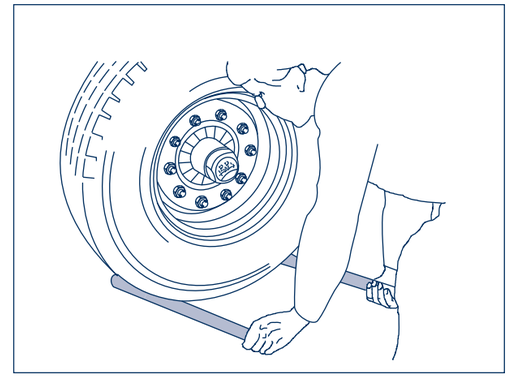


Figure 6

If there is a significant bearing play:
(the bearing hangs down)

[1] Remove wheels and hub caps.

[2] Remove split pin and axle nut.

[3] Tighten the axle nut with a torque wrench whilst simultaneously turning the wheel hub to the torque shown in the table:

Type of external tapered roller bearings)	Tightening torques (Nm)
30206	20 Nm
32207	45 Nm
30210	90 Nm
32213	150 Nm
32310	150 Nm
33213	150 Nm
Tolerance: +5% -15%	

Tighten castellated nut with a normal axle nuts key (hand tools) until the running of the wheel bearing drags slightly.

[4] If the cotter pin holes do not coincide after tightening turn back the axle nut until next hole. Hole deviation should be max. 30°

[5] Insert the split pin and bend it slightly.

[6] Refill hub cap with special BPW special longlife grease (ECO-Li 91).
Observe the grease quantity (Table B), page 25.

[7] Grease the threads of the hub cap all around with BPW special longlife grease (ECO-Li 91) and tighten to the specified torque 500 Nm.

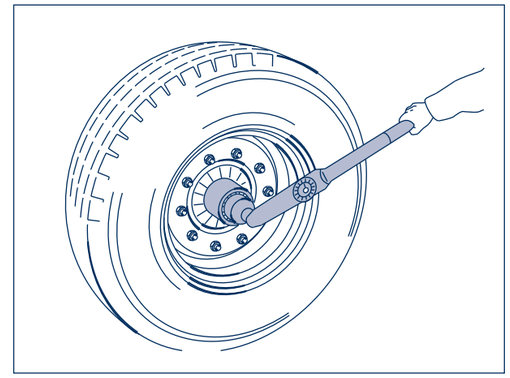


Figure 7

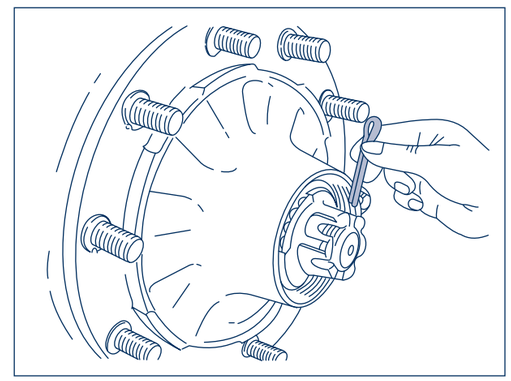


Figure 8

8 Check wheel hub bearing play

Check wheel hub bearing play, adjust if necessary
(for Central Tire Inflation System with KM axle nut)

[1] Remove wheels. Screw the air pressure connection out of the wheel hub cap or the axle stub.

Note!

Refer to the operating instructions of the control system manufacturer.

[2] Unscrew the hub cap.

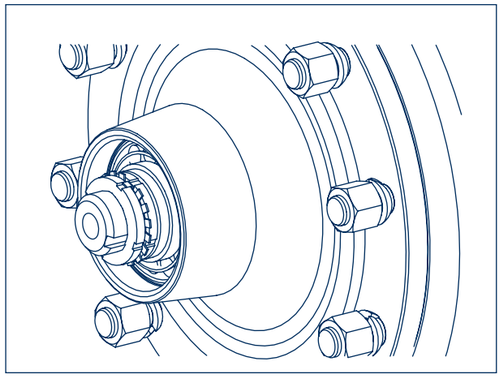


Figure 9

[3] Screw down the outer KM axle nut and remove the retaining plate.

Repair Guide!

Reuse of the disassembled locking plate is prohibited!
It must be replaced!

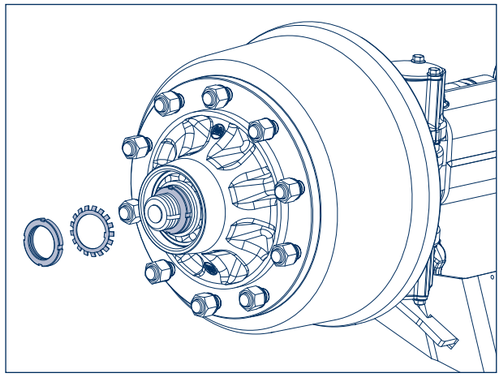


Figure 10

[4] Tighten the inner KM axle nut while turning the wheel hub at the same time with a tightening torque of 150 Nm using a torque wrench. (Several turns have to be made until the tightening torque is reached).

When using a normal axle nut wrench (on-board tool), tighten the axle nut until the running of the wheel bearing drags slightly.

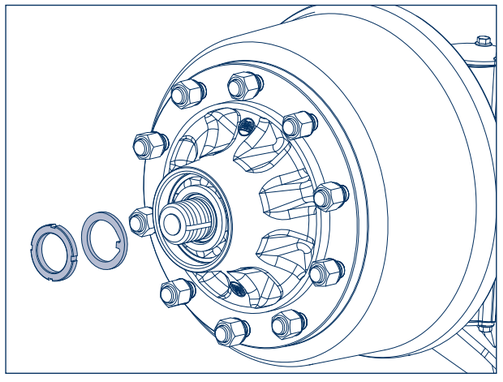


Figure 11

[5] Put the new retaining plate in place. Screw up the KM axle nut by hand until it tightens slightly.

Note!

Install the retaining plate with the convex side facing the axle center. Pay attention to the correct installation of the axle nut.

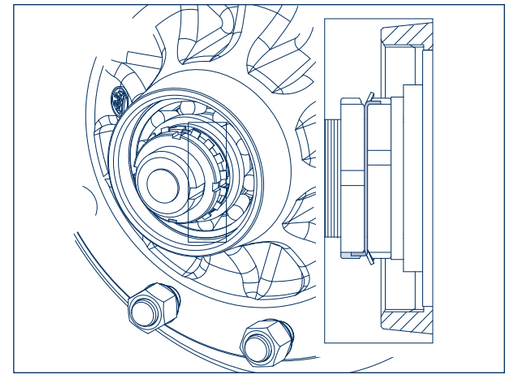


Figure 12

[6] Turn the inner KM axle nut back to the next possible groove for the locking collar and bend the nose into the groove of the axle nut, when the locking collar is opposite the next groove (max. 30°).

[7] Tighten outer KM axle nut with 150 Nm tightening torque. Bend the locking collar into the groove of the KM axle nut.

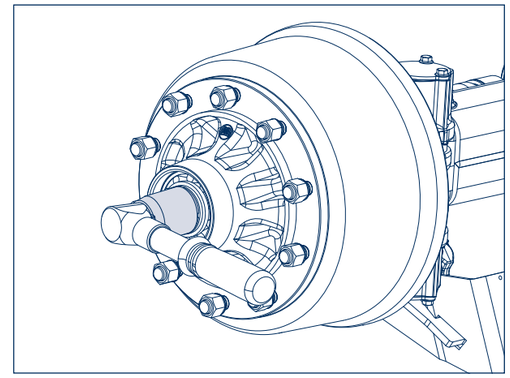


Figure 13

[8] Grease the thread of the hub cap all round with the BPW special longlife grease (ECO-Li 91) and tighten it to the prescribed 500 Nm tightening torque.

Note!

The air connection should be free from grease.

[9] Install the Central Tire Inflation System.

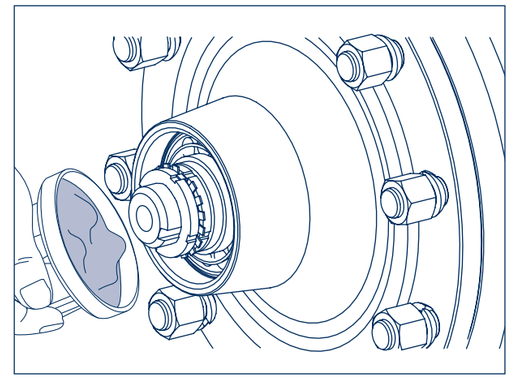


Figure 14

9 Lubrication

Change the grease from hub bearing
(conventional)

◎ after every 1000 working hours, at every brake lining replacement, latest annually

Warning!

Lift the vehicle in an accident-free manner and release the brake.

[1] Remove wheels and dust caps.

[2] Remove the split pin from the hole and unscrew the axle nut.

[3] Pull off the wheel hub with brake drum, tapered roller bearing and sealing elements using a suitable puller from the axle stub.

Repair Guide!

Mark hubs and bearings together so that they are not interchanged during assembly.
It is imperative that the bearing inner rings with rollers be reused on the same hubs.

[4] Clean the brake, check the components for wear, damage, function and replace worn parts. The inside of the brake must be free of lubricants and contamination.

[5] Clean wheel hub inside and outside thoroughly. Remove old grease completely, clean tapered roller bearing (diesel oil), dry and check them for re-usability. Replace seals.

[6] Clean the bearing seats of the axle stub (it must be metallic bright, dry and free from grease) and grease all over with BPW special longlife grease (ECO-Li 91).

Note!

Do not over-grease!
Make sure that the sealing elements can be pushed up easily on the axle stub.

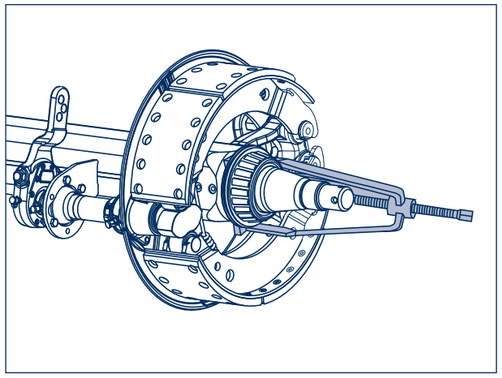


Figure 15

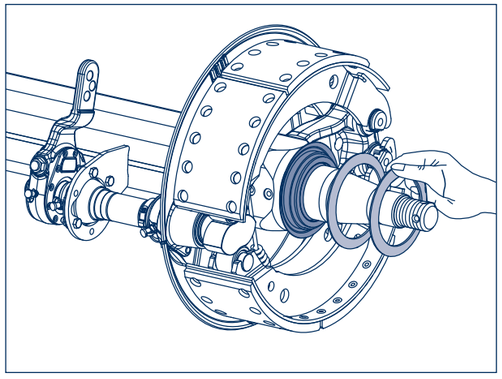


Figure 16

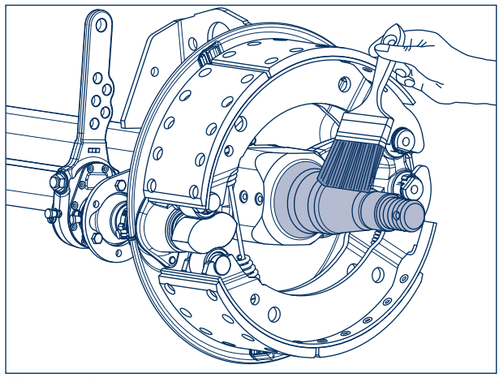


Figure 17

[7] Push the thrust ring and new sealing rings onto the axle stub. If necessary, push them carefully with pipe bushings without tilting and damaging.

Note!

Check the seals and bearings for wear and damage. Contact surfaces of the bearings must be free of damage. Replace if necessary

[8] Fill up the free spaces between tapered roller bearings with BPW special longlife grease (ECO-Li 91) and work them together.
Observe the final grease quantity (table A) see page 23.

[9] Smear the remaining quantity of grease into the bearing outer ring of the hub.

[10] Push up the pre-assembled wheel hub and brake drum unit centrically. Push sensor if available, back into the correct position by the wheel hub and brake drum unit carefully. Therefore wheel hub unit is not misaligned.

Note!

Check the displacement of the sensor if available, before installing the wheel hub, see page 32.

[11] Insert outer taper roller bearing

[12] Insert the washer and screw on the axle nut using a torque wrench to tighten the wheel hub to the prescribed tightening torque according to the table, see page 17. (several turns until the tightening torque is reached).

[13] Turn the axle nut back to the next possible hole. If the cover is the same, screw the axle nut back to the next hole (max 30°).

[14] Insert the split pin and bend it slightly.

[15] Refill the hub cap with BPW special longlife grease (ECO-Li 91) the grease quantity (table B), see page 25.

[16] Grease the threads of the hub cap all around with special BPW longlife grease (ECO-Li 91) and tighten to the specified torque 500 Nm.

[17] Adjust the brake.

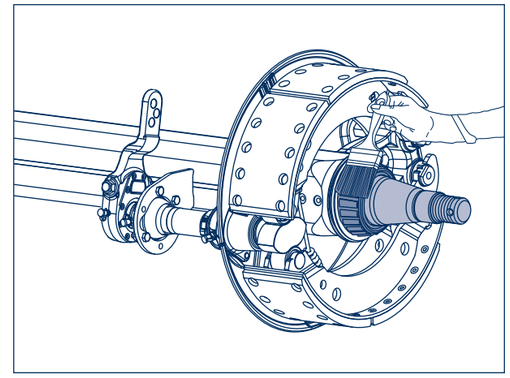


Figure 18

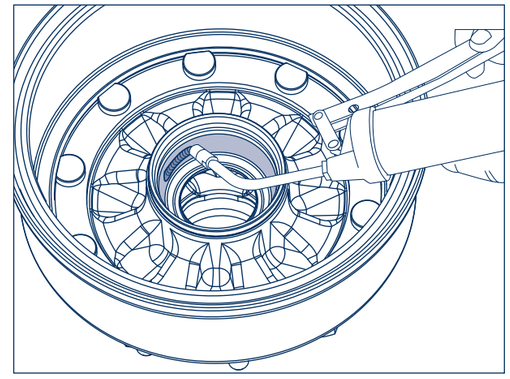


Figure 19

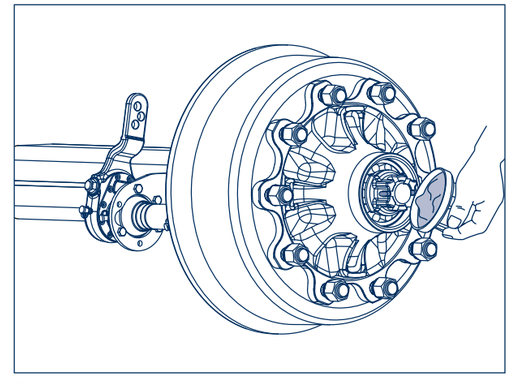


Figure 20

9 Lubrication

Change the grease from hub bearing
(for Central Tire Inflation System with KM axle nut)

◎ after every 500 working hours, at every brake lining replacement, latest annually

[1] Raise the axle and remove wheels.

Warning!

Prevent the vehicle from rolling away! Release the park and service brake only after lifting!

[2] Screw the air pressure connection out of the wheel hub cap or the axle stub.

Note!

Refer to the operating instructions of the control system manufacturer.

[3] Unscrew the wheel hub cap.

[4] Screw down the outer KM axle nut and remove the retaining plate.

Repair Guide!

**Reuse of the disassembled locking plate is prohibited!
It must be replaced!**

[5] Unscrew KM axle nut and take out the washer.

[6] Pull off the wheel hub with brake drum, tapered roller bearing and sealing elements using a suitable puller from the axle stub.

Note!

The wheel hub unit must be secured against falling down.

Repair Guide!

**Mark hubs and bearings together so that they are not interchanged during assembly.
It is imperative that the bearing inner rings with rollers be reused on the same hubs.**

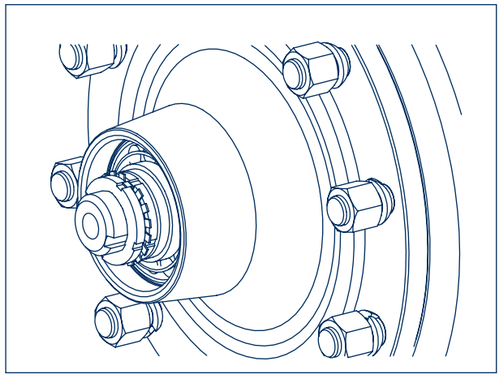


Figure 21

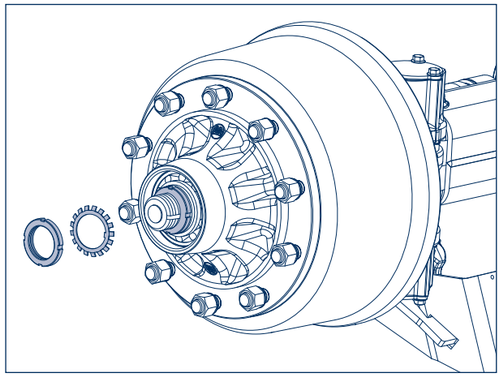


Figure 22

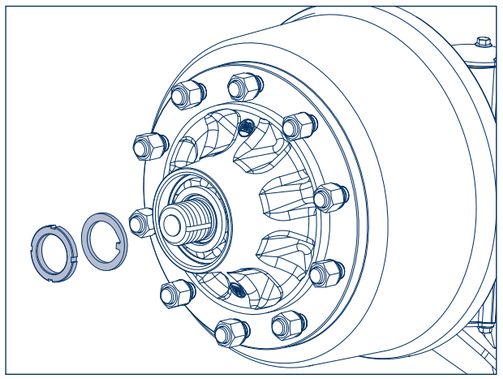


Figure 23

[7] Clean the brake, check the components for wear, damage, function and replace worn parts. The inside of the brake must be free of lubricants and contamination.

[8] Clean wheel hub inside and outside thoroughly. Remove old grease completely, clean tapered roller bearing (diesel oil), dry and check them for re-usability. Replace seals.

[9] Clean the bearing seats of the axle stub (it must be metallic bright, dry and free from grease) and grease all over with BPW special longlife grease (ECO-Li 91).

Note!

**Do not over-grease!
Make sure that the sealing elements can be pushed up easily on the axle stub.**

[10] Push the thrust ring and new sealing rings onto the axle stub. If necessary, push them carefully with pipe bushings without tilting and damaging.

Note!

Check the seals and bearings for wear and damage. Contact surfaces of the bearings must be free of damage. Replace if necessary

[11] Fill up the free spaces between tapered roller bearings with BPW special longlife grease (ECO-Li 91) and work them together.
Observe the final grease quantity (table A) see page 25.

[12] Smear the remaining quantity of grease into the bearing outer ring of the hub.

[13] Push up the pre-assembled wheel hub and brake drum unit centrically. Push the sensor if available, back into the correct position by the wheel hub and brake drum unit carefully. Therefore wheel hub unit is not misaligned.

Note!

Check the displacement of the sensor if available, before installing the wheel hub, see page 32.

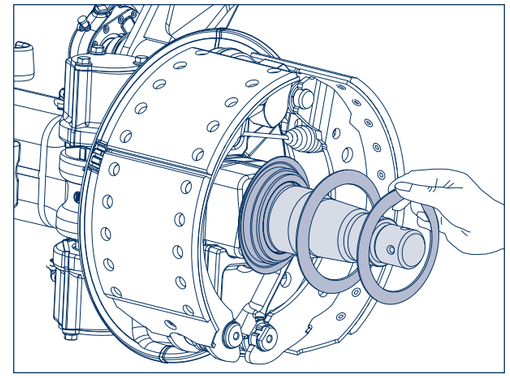


Figure 24

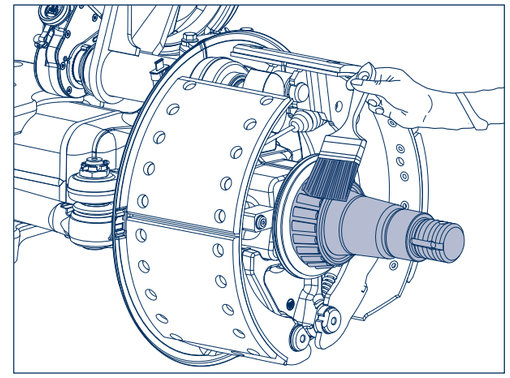


Figure 25

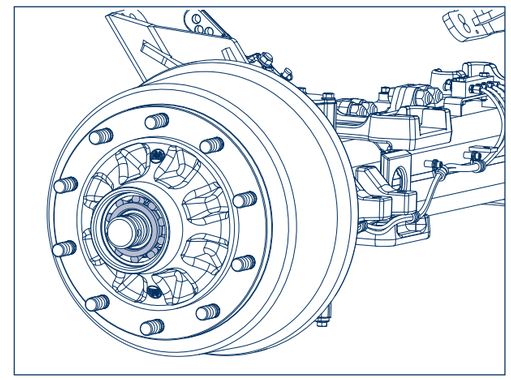


Figure 26

9 Lubrication

[14] Insert outer taper roller bearing

[15] Insert the washer and screw on the axle nut using a torque wrench to tighten the wheel hub with the prescribed tightening torque according to the table (several turns until the tightening torque is reached).

[16] Put the new retaining plate in place. Screw up the KM axle nut by hand until it tightens slightly.

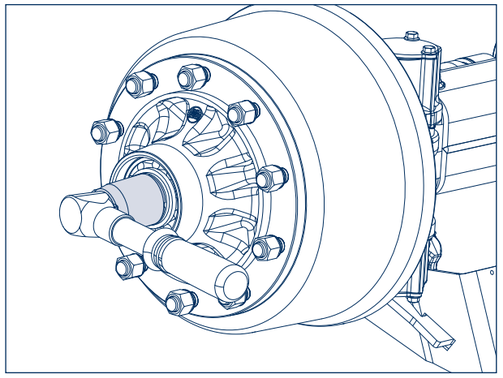


Figure 27

Note!

Install the retaining plate with the convex side facing the axle center. Pay attention to the correct installation of the axle nut.

[17] Turn the inner KM axle nut back to the next possible groove for the locking collar and bend the nose into the groove of the axle nut, when the locking collar is opposite the next groove (max. 30°).

[18] Tighten outer KM axle nut with 150 Nm tightening torque. Bend the locking collar into the groove of the KM axle nut.

[19] Refill the hub cap with BPW special longlife grease (ECO-Li 91) the grease quantity (table B), see page 25.

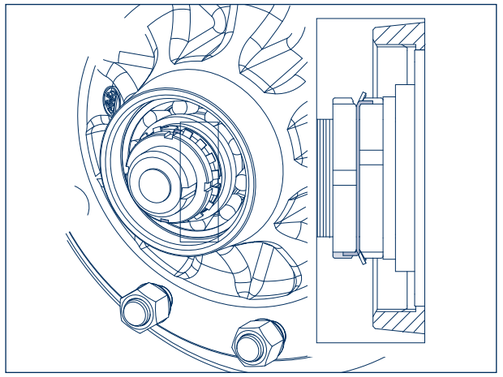


Figure 28

Note!

The air connection should be free from grease.

[20] Grease the thread of the hub cap all round with the BPW special longlife grease (ECO-Li 91) and tighten it to the prescribed 500 Nm tightening torque.

[21] Install the Central Tire Inflation System.

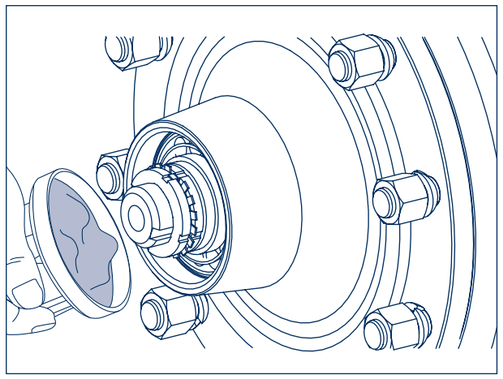
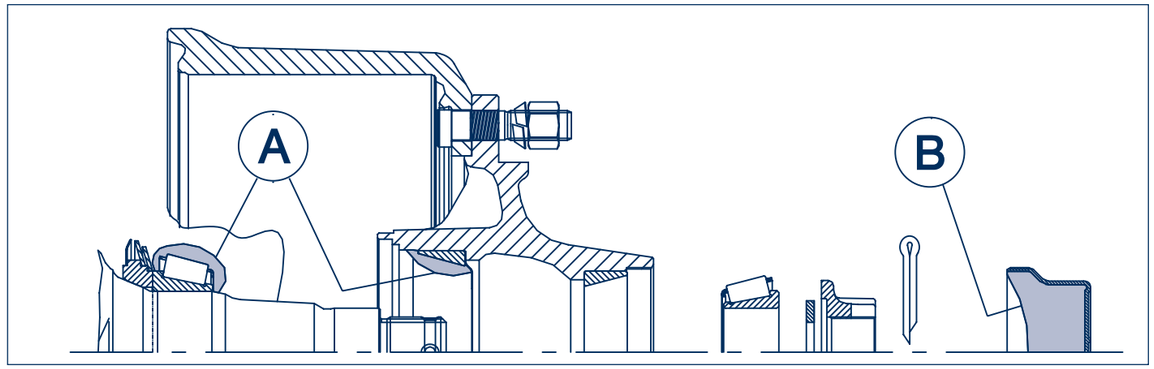


Figure 29



Type of bearing	Wheel hub	BPW Special-Longlife (ECO-LI 91) Grease quantity per tapered roller bearing	
		Inner A	Outer B
30206-30209	GS 3006	30 g	60 g
32207-30210	GS 4006	30 g	60 g
32207-32211	GS 5506	40 g	60 g
32207-32013	GS 5506 GS 5508	40 g	60 g
32310-32215	GS 8010	90 g	290 g
30210-32014	GS 7006 GS 7008	50 g	180 g
32213-32215	GS 8008-1 GS 8010-1	90 g	200 g
32310-33116	GS 11008-1 GS 11010-1	100 g	290 g
32310-33116 with KM axle nut	GS 11008-1 GS 11010-1	100 g	350 g
33213-33118	GS 12008 GS 12010	130 g	320 g
33213-33118 with KM axle nut	GS 12008 GS 12010	130 g	370 g
33215-32219	GS 14010	190 g	500 g
		Smear any residual grease into the bearing outer ring of the hub. Fill up the free spaces between tapered roller bearings with grease and work them together.	The grease for the outside tapered roller bearing is injected when the hub cap filled with grease is screwed into the bearing.

10 Disassembling and assembling the hub unit

10.1 Helical studs

Disassembly:

[1] Drive out wheel studs from the dismantled hub brake drum unit.
(Do not damage the threaded studs, for this reason use a bronze hammer)

Installation:

[1] Place hub brake drum unit onto the wheel hub.

☞ The thread of the cap in the hub must not be damaged.

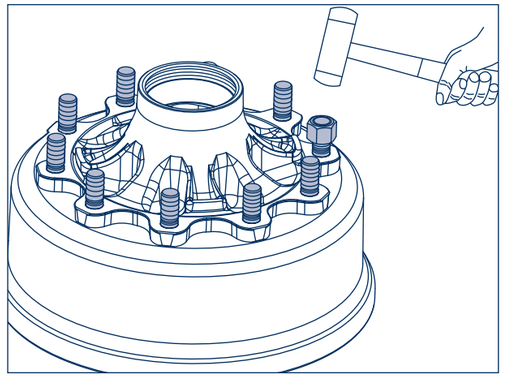


Figure 30

[2] Insert the wheel bolts as far as possible into the wheel hub by hand.

Repair Guide!

Ensure correct seating of the wheel stud head on the brake drum (arrow). The flattened side of the head of the wheel bolt must rest on the brake drum collar (anti-rotation solution).

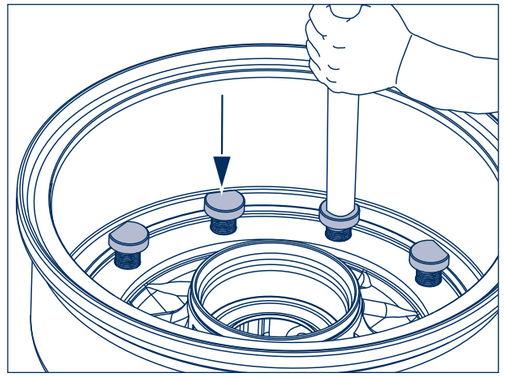


Figure 31

[3] Turn wheel studs until contact with the flange.

Repair Guide!

The hub, which is equipped with flange, has to be installed again!

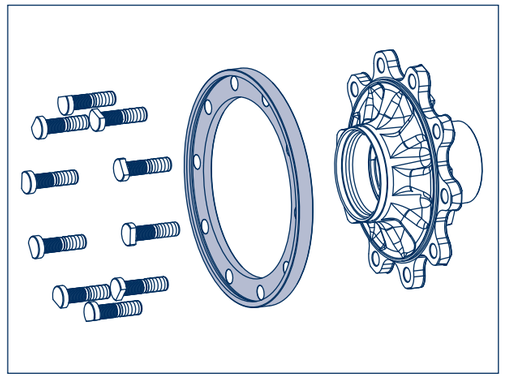


Figure 32

Threaded studs 10.2

Disassembly:

[1] Turn over the dismantled hub brake drum unit and lay it down with the hub side down.

☞ The thread of the cap in the hub must not be damaged!

[2] Remove the back nuts from the wheel studs on the drum side.

[3] Drive out wheel studs from the dismantled hub brake drum unit and pull down the drum.
(Do not damage the thread of the wheel studs; it is recommended to use a bronze hammer.)

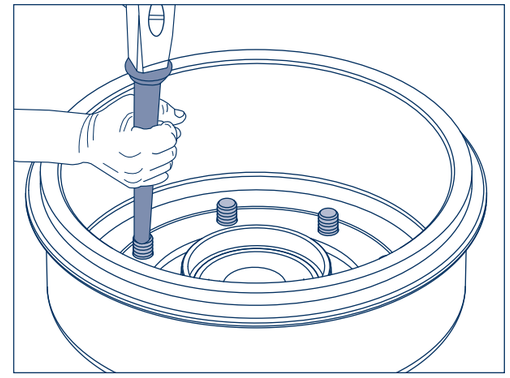


Figure 33

Assembly:

[1] Insert the wheel bolts into the hub in accordance with the notch pin and press each of them until it stops, at the correct position.

[2] Turn over the wheel hub with the wheel bolts and place the brake drum onto them.

☞ Ensure that contact surfaces are clean and parts are properly adjusted and centered.

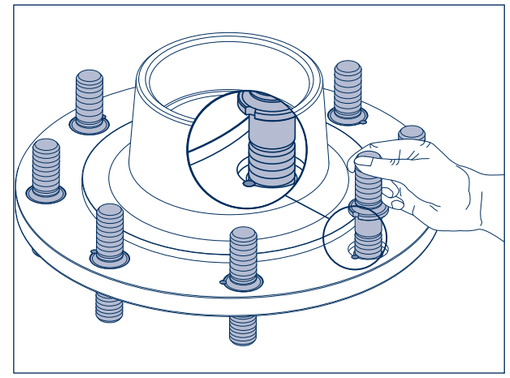


Figure 34

[3] Screw in the back nuts and tighten with the prescribed tightening torque.

◎ Tightening torque: (Strength class 10)

M 20 x 1,5	**300 Nm**	(290 Nm - 310 Nm)
M 22 x 2	**400 Nm**	(390 Nm - 410 Nm)
M 22 x 1,5	**400 Nm**	(390 Nm - 410 Nm)

☞ Mount hub brake drums unit and adjust the hub bearing play. See pages 17 - 19.

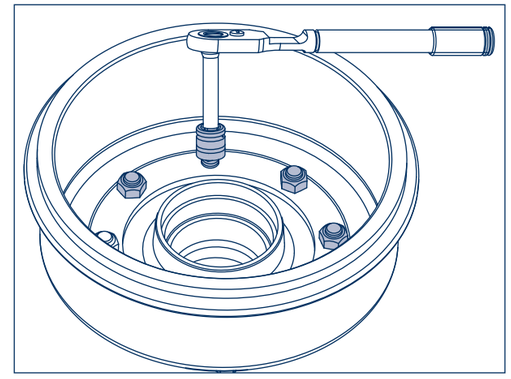


Figure 35

10.3 Disassembly of the bearing cone

Disassembly:

[1] Remove the bearing cups together with the cover plate (grease plate) from the wheel hub.

Note!

Protect the bearing seat from damage.

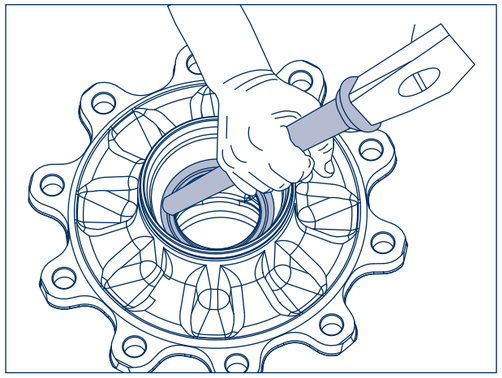


Figure 36

Assembly:

[1] Clean the bearing seats thoroughly.

[2] Insert the new cover plate (grease pot) with the convex side facing down.

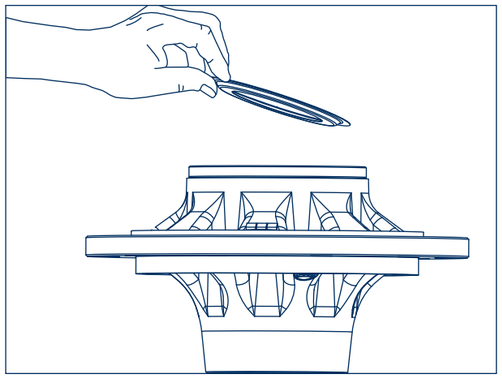


Figure 37

[3] Insert new bearing cups centered in the wheel hub and mount with a press (at least 6 t) and the BPW press tools, see page 11.

Note!

Observe the correct position of the bearing cups in the wheel hub.

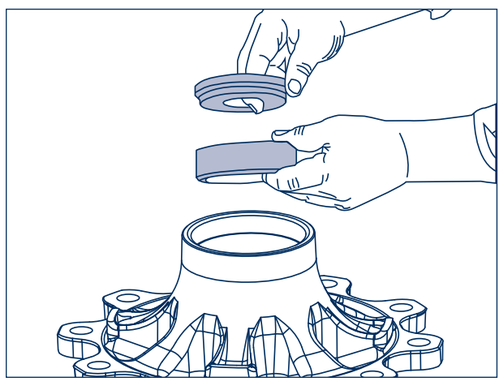


Figure 38

Sealing components 10.4

◎ at every brake lining replacement, latest annually

Disassembly:

[1] FL brake / Fig. 39:
remove thrust washer (1) and sealing rings (2,3),

N brake / Fig. 40:
pull down thrust washer (1) and sealing ring (2) from the axle stub.

N 4012-4 brake / Fig. 41:
remove the shaft seal (1) from the axle stub.

[2] Clean the sealing elements thoroughly (diesel oil) and check for re-usability, replace if necessary.

Assembly:

[1] Clean the bearing seats of the axle stub (it must be metallic bright, dry and free from grease) and grease all over with BPW special longlife grease (ECO-Li 91).

Note!

Do not over-grease!
Make sure that the sealing elements can be pushed up easily on the axle stub.

[2] FL brake / Fig. 39:
push thrust washer (1) and sealing rings (2,3) onto axle stub.

N brake / Fig. 40:
push the thrust ring (1) and the sealing ring (2) onto the axle stub.

N 4012-4 brake / Fig. 41:
insert the shaft seal (1) with the closed side pointing towards the center of the axle until it contacts with the axle stub collar.

Note!

There are also customized seals used in the particular conditions of use on the BPW axle. These have special characteristics.

Please contact your business partner or the vehicle manufacturer for maintenance instructions regarding these washers.

FL brakes

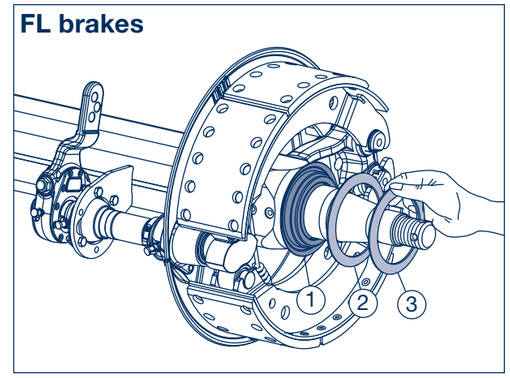


Figure 39

N brakes

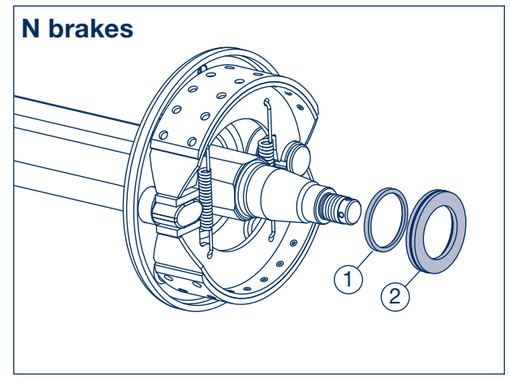


Figure 40

N 4012-4 brakes

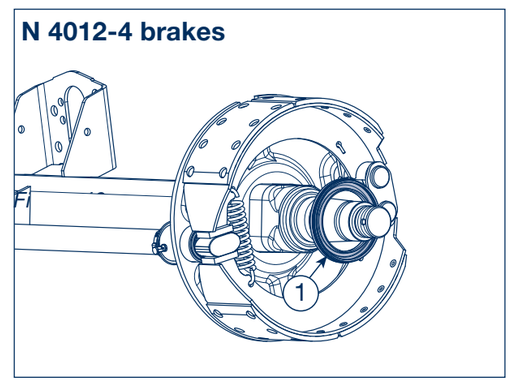


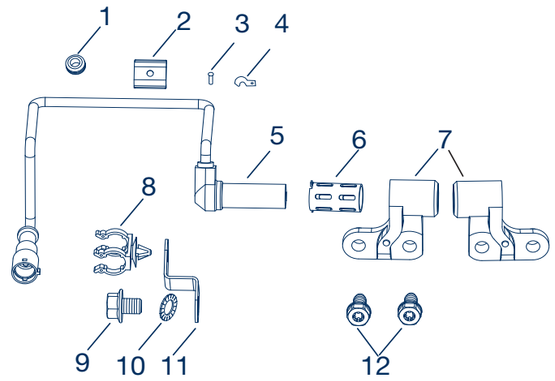
Figure 41

11 ABS

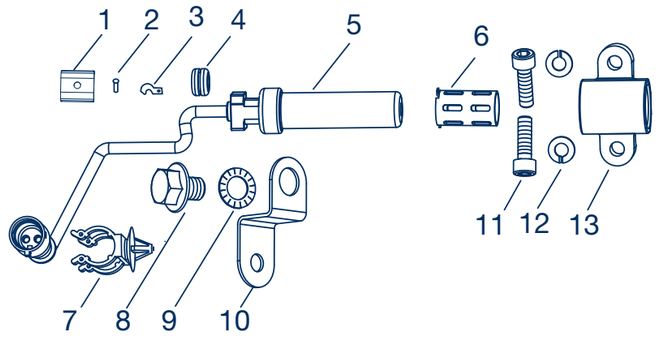
11.1 ABS-components

- In an anti-lock braking system (ABS), the rotational movement is detected without contact by a exciter ring secured to the hub and a pulse generating sensor (speed sensor).

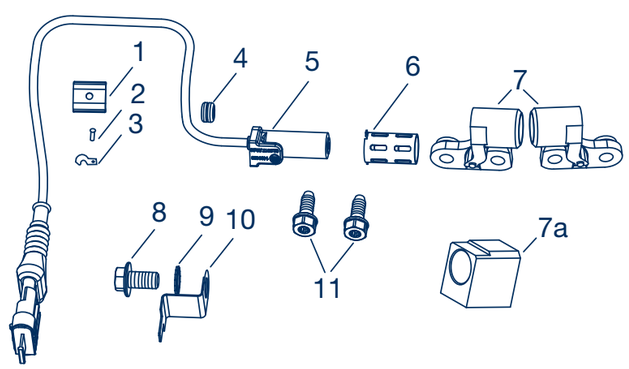
Item	Designation
1	O-Ring
2	Clamp (clip for welding studs)
3	Half rounded grooved pin
4	Fastening (for grooved pin)
5	ABS Sensor (corner-design)
	BPW No.: 02.3317.05.00
6	Clamping bush
7	Sensor bracket (left/right)
8	Bracket
9	Locking screw
10	Serrated lock washer
11	Bracket
12	Locking screw



Item	Designation
1	Clamp (clip for welding studs)
2	Half rounded grooved pin
3	Fastening (for grooved pin)
4	O-Ring
5	ABS Sensor (straight-design)
	BPW No.: 03.3317.07.00
6	Clamping bush
7	Bracket
8	Locking screw
9	Serrated lock washer
10	Bracket
11	Screw
12	Lock washer
13	Sensor bracket



Item	Designation
1	Clamp (clip for welding studs)
2	Half rounded grooved pin
3	Fastening (for grooved pin)
4	O-Ring
5	Speed and direction sensor
	BPW No.: 02.3317.26.00
6	Clamping bush
7	Sensor bracket (welded 7a)
8	Locking screw
9	Serrated lock washer
10	Bracket
11	Locking screw



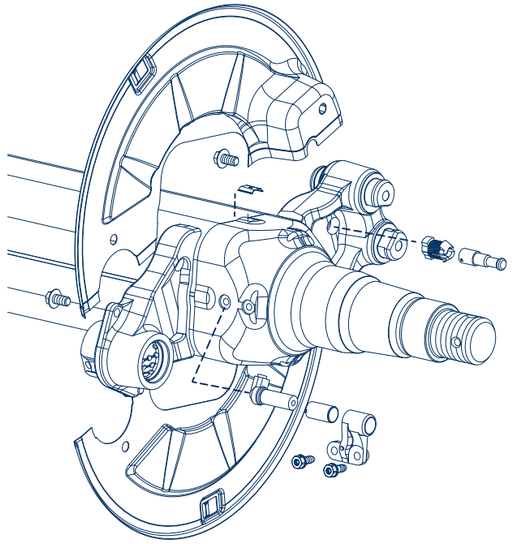
Sensor air gap 11.2

ABS-Sensor

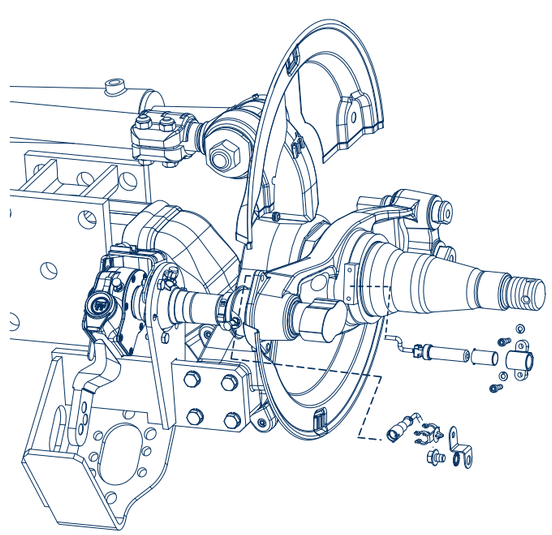
- The ABS sensor air gap is the gap between the exciter ring and the sensor. The larger air gap causes a smaller sensor signal.
- The sensor is installed in conjunction with a special clamping sleeve and pressed to the pole wheel. Later on, during operation, the system automatically adjusts the ABS sensor air gap between the pole wheel and the sensor.

Standard-holder for sensor

Rigid axle



Steering axle



11.3 Installation of ABS sensors

Note!

Check the sensor for damage and displacement. (Displacement force 100-200 N). The damaged sensor must be replaced.

Disassembly:

[1] Unscrew the cover plate and the plug connection screws, remove the sensor cable from the sealing ring, push the sensor and the clamp against incorporation of direction.

☞ See Fig. 42.

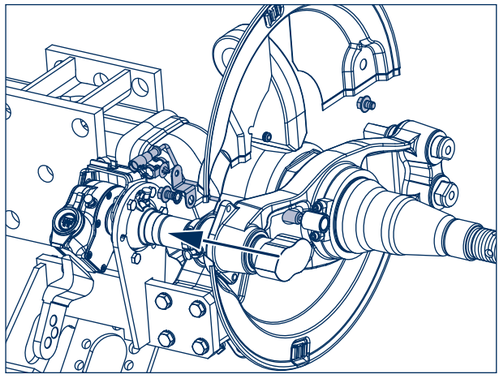


Figure 42

Assembly:

[1] Clean the sensor holder, replace the clamp and push it into its place, smear the socket with special silicone grease and slide the sensor to its place, insert the sensor cable into the sealing ring. Mount the cover plate and the plug connector holder.

☞ See Fig. 43.

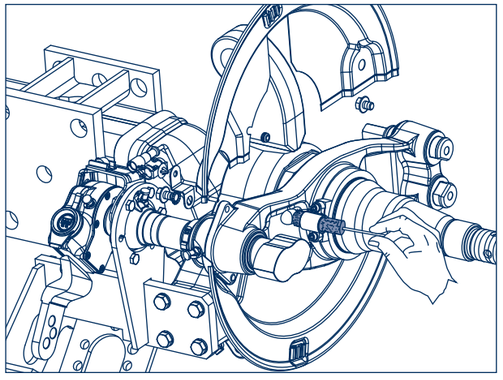


Figure 43

Repair Guide!

Check the covering plate for correct seating on the brake drum. Tighten the screws with a torque according to the table. Do not bend or pinch the connecting cable!

Tightening torques for sensor bracket:

Screw size	Tightening torque
M6	8 Nm
M8	20 Nm
M10	38 Nm
Locking screw M10	43 Nm

Mounting the sensor plug-in

- The connection of the ABS cable (sensor cable - cable for control unit) is the same as in a normal socket by simply plugging the plug into the brake carrier or in dust cover support.

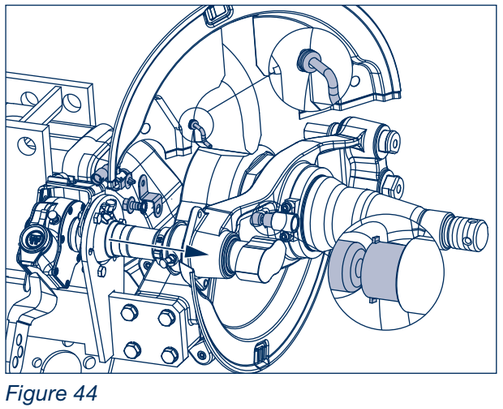


Figure 44

Installation of the exciter ring 11.4

[1] To replace a damaged exciter ring, heat up the exciter ring with burner flame and pull it down.

[2] Clean the contact surfaces of the hub (it must be free of dirt, paint etc.)

[3] Heat the new exciter ring to a temperature of between 120 and 160°C and push the exciter ring onto the undamaged hub surface.

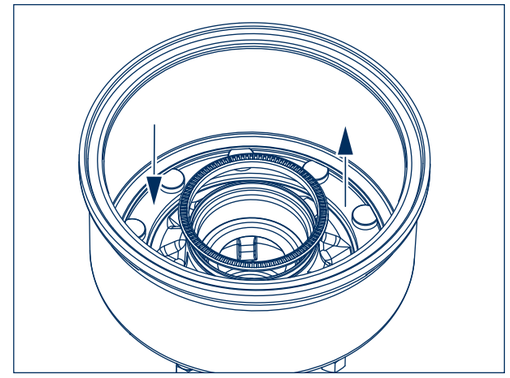


Figure 45

Repair Guide!

The tight fit of the exciter ring is very important for proper operation. Maximum tolerance is 0.2 mm!

Do not apply impact tools onto the gear teeth! The gear teeth must not show any signs of damage.

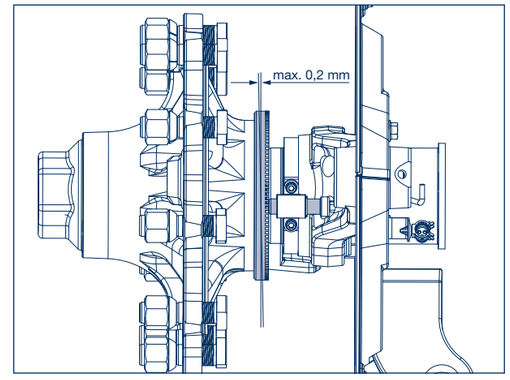


Figure 46

Press-fitted sheet metal pole wheels

- If required, press-fitted sheet metal exciter rings are replaced by solid metal exciter rings.
- If replacement is required. See table below.

  ID number is located on the component side engraved.

Sheet metal exciter ring (default exciter ring)	Solid exciter ring (replacement exciter ring)
03.310.08.42.0 /Ø152/	03.310.08.15.0
03.310.09.35.0 /Ø176/	03.310.08.14.0

Repair Guide!

After the replacement of the sensor or the exciter ring the operation must be tested! During the testing of the ABS unit, it must be ensured that the installed parts provide appropriate information during the operation of the vehicle!

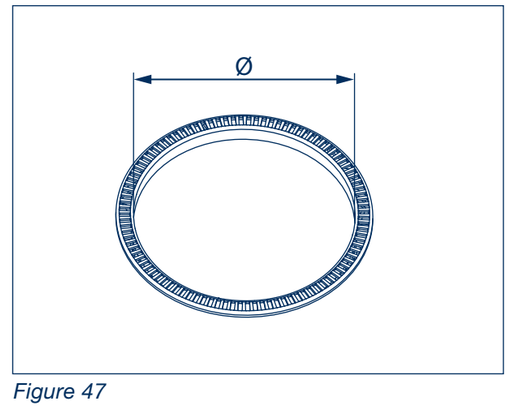


Figure 47

Notice

Notice

BPW-WH-Agrar 550217702e

BPW is a globally leading manufacturer of intelligent running gear systems for trailers and semi-trailers. As an international mobility and system partner, we offer a wide range of solutions for the transport industry from a single source, from axle to suspension and brake to user-friendly telematics applications. We thereby ensure outstanding transparency in loading and transport processes and facilitate efficient fleet management. Today, the well-established brand represents an international corporation with a wide product and service portfolio for the commercial vehicle industry. Offering running gear systems, telematics, lighting systems, composite solutions and trailer superstructures, BPW is the right system partner for automotive manufacturers.

BPW, the owner-operated company, consistently pursues one target: To always give you exactly the solution which will pay off. To this end, we focus our attention on uncompromising quality for high reliability and service life, weight and time-saving concepts for low operating and maintenance costs as well as personal customer service and a close-knit service network for quick and direct support. You can be sure that with your international mobility partner BPW, you always use the most efficient method.

Your partner on the path to economic viability

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