

SH
SK
S..LL

BPW Original-Spare parts

BPW Trailer axles / Steering axles
with ECO Disc Trailer disc brakes



BPW-EL-TSB 31231601e

we think transport





BPW-EL-TSB 31231601e

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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Contents

| | | Page |
|-----|--|---------|
| | Explanation of BPW axle type codes | 4 |
| | Explanation of BPW axle code numbers | 4 |
| | BPW type plate | 5 |
| ◎ 1 | Axle beams, steering axle beams | 6 - 9 |
| 1.1 | Axle beams, steering pivot bearing | 8 - 9 |
| ◎ 2 | Steering axle, steering lock | 10 - 15 |
| 2.1 | Steering rods, spare parts | 12 - 13 |
| 2.2 | Steering rod attachments, steering lock | 14 - 15 |
| ◎ 3 | Brake parts BPW ECO Disc | 16 - 31 |
| 3.1 | Brake parts BPW ECO Disc TSB 3709 / 4309 / 4312 | 20 - 21 |
| 3.2 | Brake discs | 22 - 23 |
| 3.3 | Disc protectors, brake pad slot protector | 24 - 25 |
| 3.4 | Brake cylinders | 26 - 29 |
| 3.5 | BPW Brake Monitor | 30 - 31 |
| ◎ 4 | Hubs, hub bearings | 32 - 45 |
| 4.1 | Hub bearing, ECO Plus 2 | 38 |
| 4.2 | Hub bearing, ECO Plus 3 | 39 |
| 4.3 | Hub bearing, ECO ^{Plus} | 40 |
| 4.4 | Hubs, ECO Plus 2, ECO ^{Plus} | 41 |
| 4.5 | Grease sprays for greasing taper roller bearings | 42 |
| 4.6 | Grease filling, bearing adjustment, ECO Plus 2 | 43 |
| 4.7 | Grease filling, bearing adjustment, ECO Plus 3 | 44 |
| 4.8 | Grease filling, bearing adjustment, ECO ^{Plus} | 45 |
| ◎ 5 | ABS | 46 - 51 |
| 5.1 | ABS parts TSB 3709 / 4309 / 4312 - Rigid axles | 48 - 49 |
| 5.2 | ABS parts TSB 3709 / 4309 - Steering axles, ABS retrofit part sets for rigid and steering axles | 50 - 51 |
| ◎ 6 | Wheel studs | 52 - 55 |
| 6.1 | Wheel studs, single wheels / twin wheels | 54 - 55 |
| ◎ 7 | Accessory | 56 - 63 |
| 7.1 | Steering dampers | 56 - 57 |
| 7.2 | Hub caps with integrated Hubodometer | 58 |
| 7.3 | Hub caps with digital odometer (ECOMETER) | 59 |
| 7.4 | Special tools for BPW ECO Disc Trailer disc brakes | 60 - 63 |

Valid: **1.3.2016**

This spare parts list shows fast moving parts for BPW trailer axles and steering axles series **SH.. / SK.. 8 - 12 tonnes** from 2010 onwards.

Additional spare parts as per spare parts catalogue.

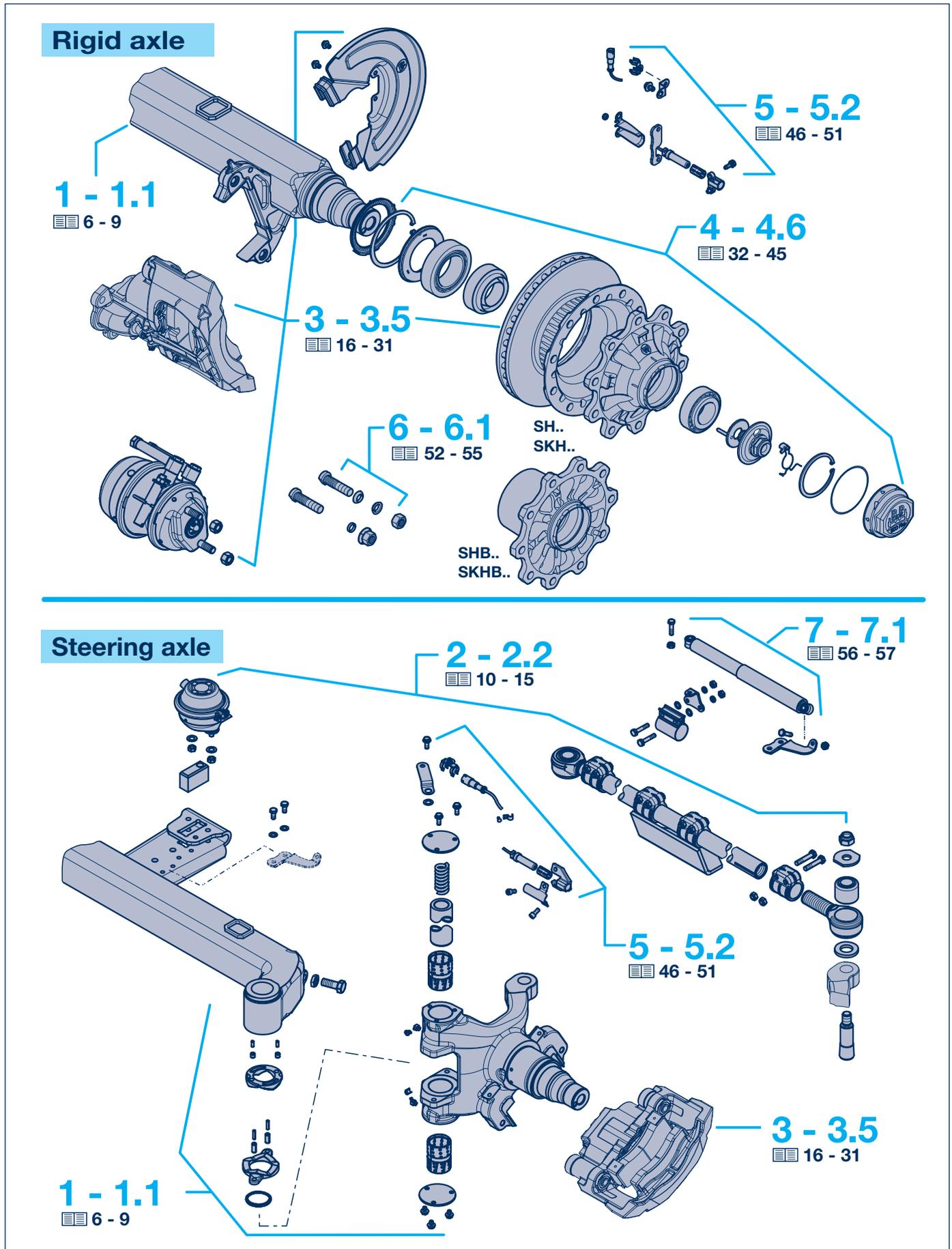
Current versions and additional informations can be found online at www.bpw.de.

Subject to change (without notice).

 -parts are embossed with BPW Code no.



Contents (Exploded View)



Explanation of BPW axle type codes and code numbers

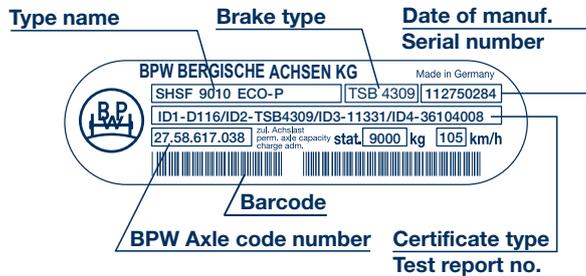
Example

| Explanation of BPW axle type codes (extract) | | | | | | |
|--|---|----------------|--|---|----------------------|---------------|
| Example: | | | | | | |
| SH | S | F | LL | 9010 | -15 | ECO Plus 2 |
| | | | | Axle series | Brake | Tyre |
| SH | | | | SH.. | TSB 4309 TSB 4312 | 22.5" / 24" |
| SKH | | | | SKH.. | TSB 3709 | 19.5" (22.5") |
| SM | | | | SM.. | TSB 4309 TSB 4312 | 22.5" / 24" |
| SKM | | | | SKM.. | TSB 3709 | 19.5" (22.5") |
| B | | | | For single wheels, wheels with offset | | |
| S | | | | For single wheels, wheels without offset | | |
| Z | | | | For twin wheels | | |
| F | | | | Wheel studs M 22 x 1.5 without wheel nuts, order wheel nuts for stud or spigot alignment separately | | |
| M | | | | For spigot alignment | | |
| | | LL | Self steering axle, series LL | | | |
| | | 8008 - 12010 | Axle load (kg) + quantity of wheel studs per hub | | | |
| | | -15 | Axle beam - wall thickness, e.g. 15 mm | | | |
| | | 8° - 27° | Steering angle of steering axle | | | |
| | | | ECO ^{Plus} | Weight optimised trailer axle with ECO ^{Plus} hub system | | |
| | | | ECO Plus 2 | Weight optimised trailer axle with ECO Plus 2 hub system | | |
| | | | ECO Plus 3 | Weight optimised trailer axle with ECO Plus 3 hub system | | |

| Explanation of BPW axle code numbers (extract) | | | | |
|---|---|--|------------------------|---------------------------|
| Example: | | | | |
| 27. | 58. | 616. | 000 | |
| Axle type | | | | |
| 20. | Trailer axle without suspension parts (ECO Plus 3) | | | |
| 26. | Steering axle without suspension parts | | | |
| 27. | Trailer axle without suspension parts | | | |
| 29. | Steering axle without suspension parts (ECO Plus 3) | | | |
| | | Axle load | Roller bearings | Bearing generation |
| 50. | 10000 - 12000 kg | | 33118 / 33213 | ECO ^{Plus} Unit |
| 58. 59. | 8000 - 9000 kg | | 33118 / 33213 | ECO Plus 2 Unit |
| 68. | 8000 - 9000 kg | | 33118 / 33213 | ECO Plus 3 Unit |
| | | Wheel brake type | Dimensions | |
| 5. + 6. digit (ECO Plus 3) | | | | |
| 40. | TSB 3709 (ECO Disc) | | Ø 370 x 45 | |
| 41. | TSB 4309 (ECO Disc) | | Ø 430 x 45 | |
| 5. - 7. digit (Ref. number 2... / 3... / 6...) | | | | |
| 616. | TSB 3709 (ECO Disc) | | Ø 370 x 45 | |
| 617. | TSB 4309 (ECO Disc) | | Ø 430 x 45 | |
| 618. | TSB 4312 (ECO Disc) | | Ø 430 x 45 | |
| 0000 | | 7. - 10. digit consecutive number 0000 - 9999 (ECO Plus 3) | | |
| 000 | | 8. - 10. digit consecutive number 000 - 999 | | |

BPW Type plate

BPW Type plate (Adhesive type plate)



BPW Type plate ECO Plus 3



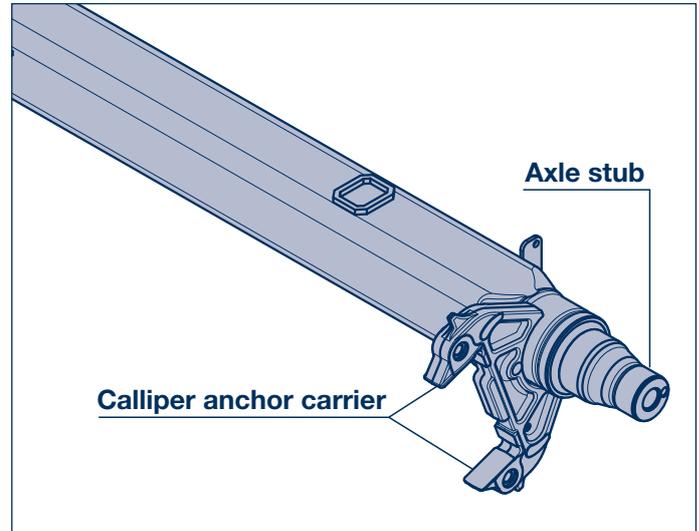
| | Example: |
|---|---|
| The BPW type name is composed of a letter group and a number group. | SHSF 9010 ECO-P |
| The letter group identifies the type of axle and suspension version as well as defining the hub version. | SHSF - BPW axle series SH for single wheels (without offset), wheel studs M 22 x 1.5, without wheel nuts |
| The number group specifies the axle load on the ground in kilogrammes and the number of wheel studs per wheel hub (for disc wheel connection). | 9010 - 9000 kg axle load - 10 wheel studs per wheel |
| The group of letters at the end of the model name defines the type of hub bearing. | ECO-P - ECO^{Plus} bearing generation |
| You can view the brake certificate referenced by certificate type/test report number on the type plate by logging onto the BPW website at www.bpw.de (Download Centre in the German version of the website - „Bremsgutachten“). | e.g. D116/.../36104008 - D116 Certificate type - 36104008 Test report no. |

1 Axle beam, steering axle beam

General

BPW Axle beams

Square, reliable, light – the BPW axle beam. It's the stable foundation for a long vehicle life. In combination with our brakes and suspension systems, the square axle produces axle systems which offer convincing all round performance with long service life and maintenance intervals.



The BPW square axle beam consists of two high-quality, specially rolled "U" sections which are welded together inside and out.

The special feature of the BPW standard axle tube with a 120 mm axle cross-section is its Q.U.A.D. profile (Quality Upgraded Advanced Design). This profile features more material at the corner radii and less material in the top and bottom areas. As a result, the axle cross-sections are reinforced at the points where the force is applied and are optimally shaped to cope with the load.

The Q.U.A.D. profile ensures that the maximum service life can be achieved. BPW axle tubes are available with various cross-sections and wall thickness values depending on the axle load and the application conditions.

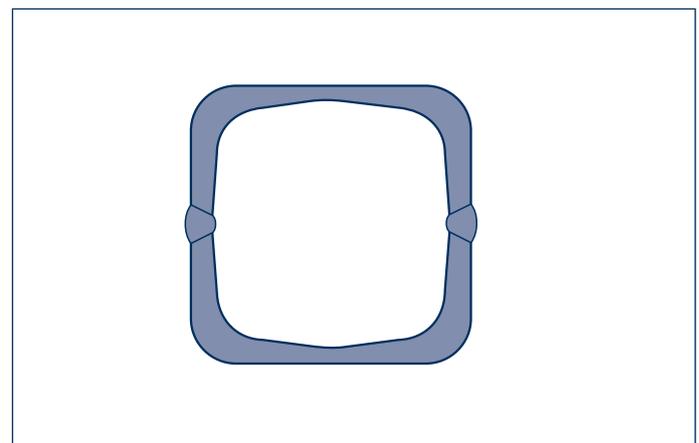
BPW axle stubs are forged, quenched and tempered. They have two stepped bearing seats.

The axle stubs and axle tube are flash butt welded together to produce the one piece BPW axle beam.

In this welding process, the axle tube and the ends of the axle stubs are heated up to welding temperature by an electric current applied at their joining faces, whilst at the same time being forced together.

This produces an absolutely homogeneous connection without any inclusions. In contrast to conventional welding processes, no filler metals are needed.

At the same time, the axle beam is given its camber and toe-in.



Axle beam, steering axle beam 1

General

Determining replacement axle beams

The BPW axle code number is shown on the type plate. If this is missing or no longer legible, the BPW axle number can be read off the front end of the axle stub in most cases.

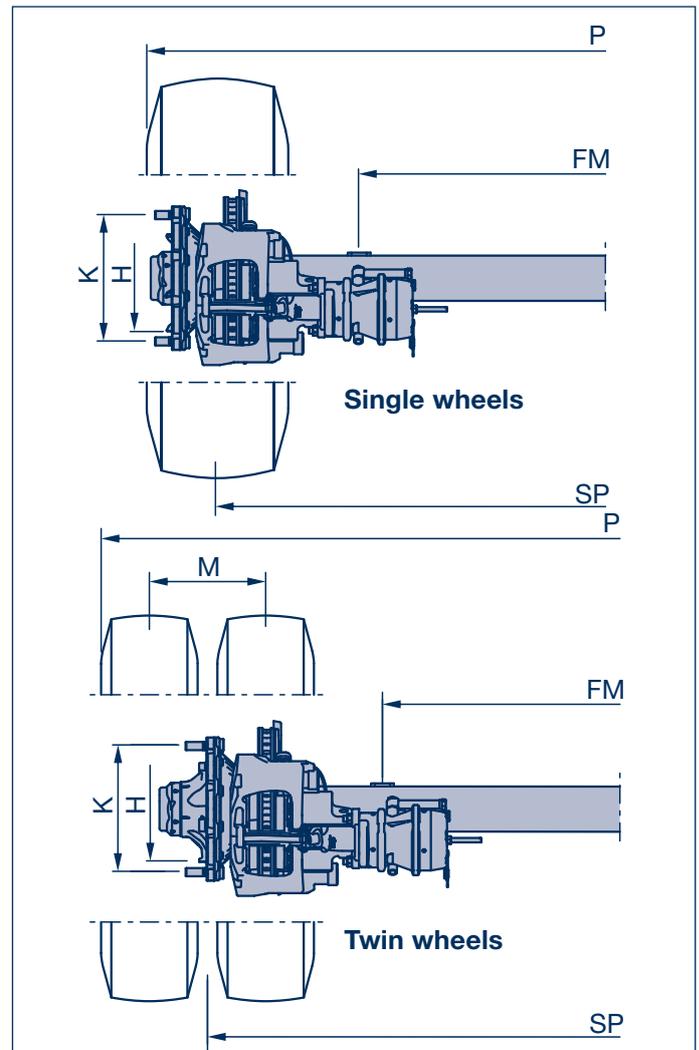
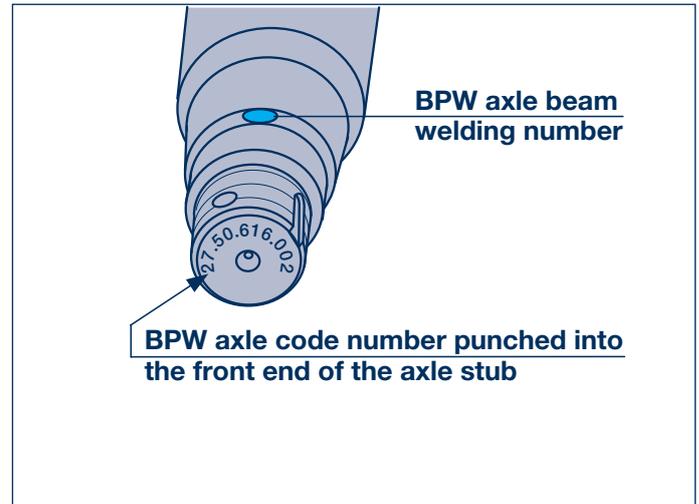
When ordering the axle beam, quote this BPW axle number with the reference to a replacement axle beam. In steering axles and ECO Plus 2 bearings, there is no code number embossed on the front end of the stub.

From June 2012, the axle beam welding number will now be stamped onto the axle stub on the front.

If there is no BPW axle number or none is known, BPW can identify the axle on the basis of the axle beam welding number (see also BPW Internet application for spare part lists for commercial vehicles) or the dimensions.

1. **Axle beam cross section** (□ 120 / 150, Ø 127)
2. **Axle beam wall thickness** (if known)
3. **Spring centre** (FM)
4. **Track** (SP)
5. **Overall width** (P)
6. **Leaf spring width**
7. **Spring pad hole pattern** (if present)
8. **Wheel seat** (H)
9. **Pitch circle and number of wheel studs** (K)
10. **With steering axles steering pivot centre**

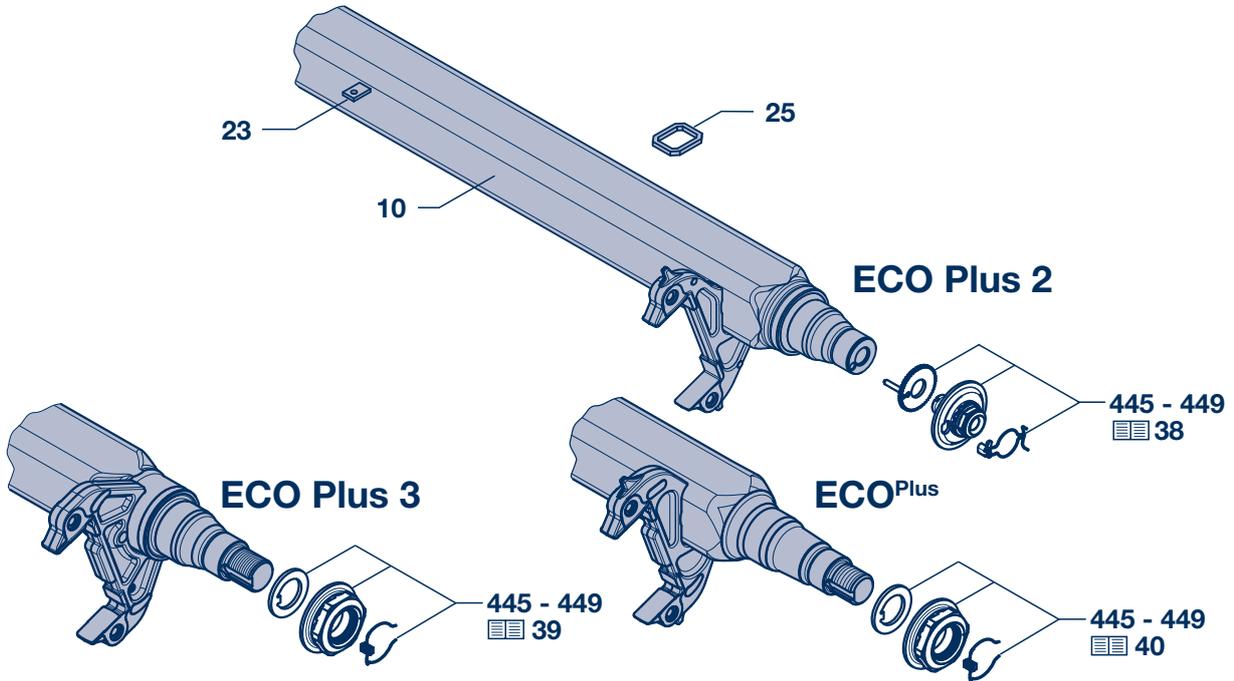
In addition to which the **type of tyres**, the **wheel size** and the **brake size** should also be specified, as well as the approximate **year of manufacture** (initial registration).



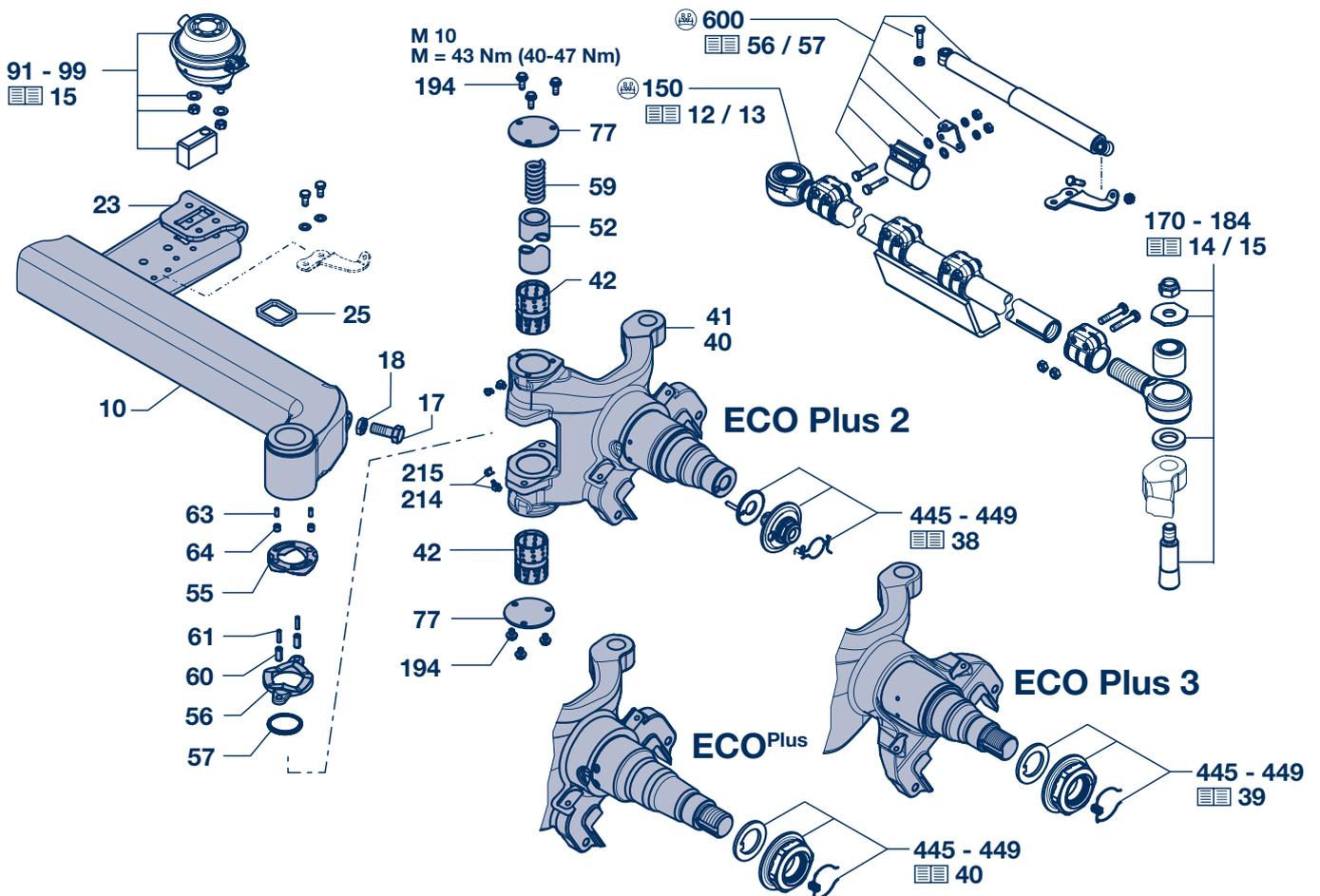
1 Axle beam, steering axle beam

1.1 Axle beams, steering pivot bearing

Rigid axles



Steering axles (Series LL)



Axle beam, steering axle beam 1

Axle beams, steering pivot bearing 1.1

| Item | Designation | BPW Code no. | Dimension | |
|-----------------------------------|--|---|-------------------------|---|
| Rigid axles | | | | |
| 10 | Axle beam assembly | When ordering axle beam assembly, please state axle type and BPW code-no. (axle type plate). | | |
| 23 | Plate (attachment air suspension valve) | 03.281.42.03.0 | | |
| 25 | Centering frame (for clamped axle spring seat assembly) | 03.295.46.21.0 | 72.5 x 60 x 8 | For other spring plate designs, see the spares catalogues for the corresponding suspension units. |
| Steering axles (Series LL) | | | | |
| 10 | Steering axle beam assembly | When ordering steering axle beam assembly, please state axle type and BPW code-no. (axle type plate). | | |
| 17 | Hexagon bolt | 02.5026.64.80 | M 20 x 50 - 8.8 | |
| | | 02.5037.61.80 | M 20 x 60 - 8.8 | |
| | | 02.5026.69.80 | M 20 x 70 - 8.8 | |
| | | 03.340.13.19.0 | M 20 x 70 - 8.8 | |
| 18 | Hexagon nut | 02.5205.09.04 | M 20 | |
| 23 | Shaped plate | upon request | | |
| 25 | Centering frame (for clamped axle spring seat assembly) | 03.295.46.21.0 | 72.5 x 60 x 8 | For other spring plate designs, see the spares catalogues for the corresponding suspension units. |
| 40 | Steering pivot assembly, right | When ordering steering pivot assembly, please state axle type, BPW code-no. (axle type plate) and side (right or left). | | |
| 41 | Steering pivot assembly, left | | | |
| | | Steering angle < 24° | | Steering angle > 25° |
| 42 | Bush | 03.112.76.08.0 | Ø 60 / 65 x 90 | 03.112.76.08.0 Ø 60 / 65 x 90 |
| 45 | Repair kit steering bolt, (item 42 , 52 - 64, 214) | 09.801.02.35.0 | | 09.801.07.90.0 |
| 52 | Steering bolt | 03.240.08.04.0 | Ø 39 / 60 x 331 | 03.240.08.04.0 Ø 39 / 60 x 331 |
| 55 | Thrust washer, upper | 03.128.05.07.0 | Ø 64 / 99 x 18.5 | 03.128.05.10.0 Ø 64 / 99 x 18 |
| 56 | Thrust washer, lower | 03.128.05.06.0 | Ø 64 / 99 x 18.5 | 03.128.05.09.0 Ø 64 / 99 x 18 |
| 57 | Seal | 02.5681.03.00 | Ø 70 / 62 / 59 x 5 | 02.5681.03.00 Ø 70 / 62 / 59 x 5 |
| 59 | Pressure spring | 03.125.07.10.1 | Ø 30 / 38 x 86 / Ø 8 | 03.125.07.10.1 Ø 30 / 38 x 86 / Ø 8 |
| 60 | Roll pin | 02.6006.95.90 | Ø 12 x 28 | 02.6006.95.90 Ø 12 x 28 |
| 61 | Roll pin | 02.6016.01.90 | Ø 7 x 28 | 02.6016.01.90 Ø 7 x 28 |
| 63 | Roll pin | 02.6016.00.90 | Ø 7 x 18 | 02.6016.00.90 Ø 7 x 18 |
| 64 | Roll pin | 02.6016.11.90 | Ø 12 x 12 | 02.6016.11.90 Ø 12 x 12 |
| 77 | Washer | 03.320.66.04.0 | Ø 100 x 4.75 / 3 x Ø 11 | 03.320.66.04.0 Ø 100 x 4.75 / 3 x Ø 11 |
| 194 | Locking bolt | 02.5070.60.02 | M 10 x 12 | 02.5070.60.02 M 10 x 12 |
| | | 02.5070.63.02 | M 10 x 25 | 02.5070.63.02 M 10 x 25 |
| 214 | Grease nipple | 02.6802.06.50 | BM 10 x 1 / 45° | |
| 215 | Cap | 02.3505.20.00 | | |

2 Steering axle, steering lock

General

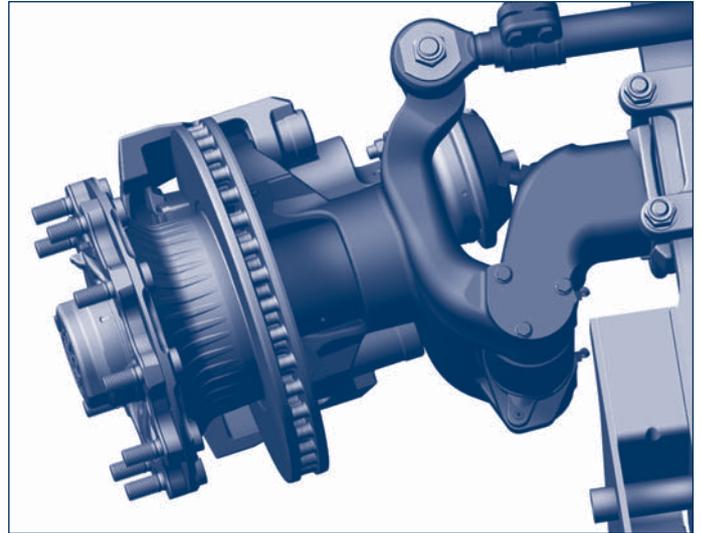
BPW Steering axles series LL

No one wants to lose rubber from their tyres every time they turn a corner. So we've developed an axle which allows your tyres to roll instead of slide.

The **BPW LL self-steering axle**.

The enormous advantages of the steering axle come to the fore when manoeuvring: Better manoeuvrability, reduced wear on all tyres and less fuel consumption.

As a result, the BPW self-steering axle is the right economical solution for delivery and distribution traffic chiefly consisting of journeys in congested conurbations and cities.



Function

LL stands for “**load-dependent steering stabilisation**” and it describes the unique functional principle of the BPW self-steering axle.

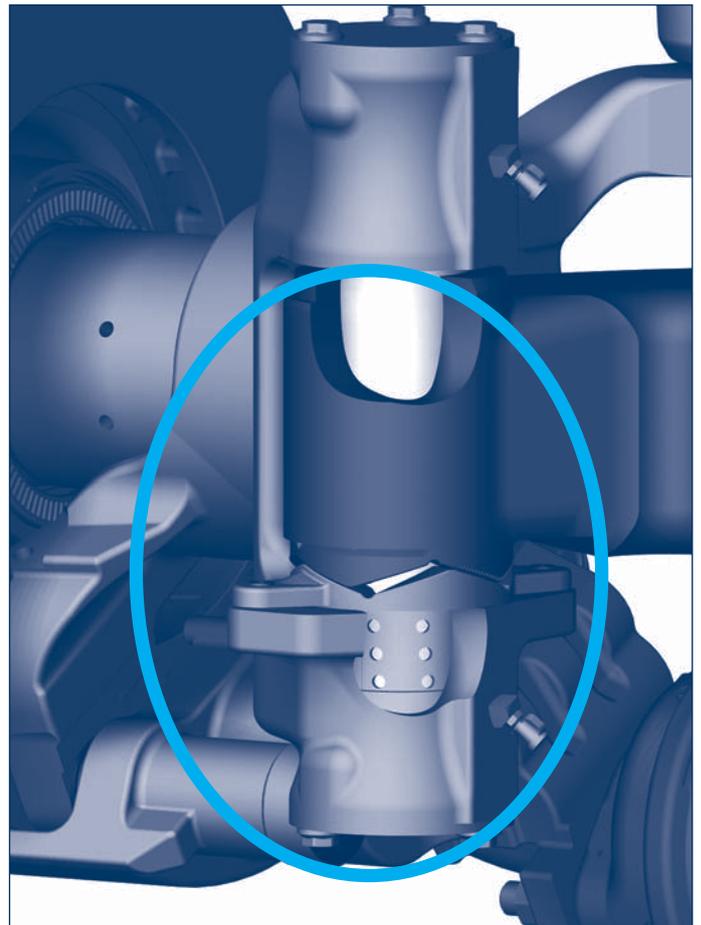
Conventional steering axle designs require steering stabilisers powered from an external source – this is not the case with the BPW self-steering axle. The axle beam and axle stub are connected to undulating thrust bearings via steering pivots.

When driving straight ahead (zero position), the undulations in the thrust washers keep the wheels on track. The weight of the vehicle presses the undulating contours of the upper and lower thrust washers together. The wheels remain stable in the correct straight-ahead position.

When the semi-trailer follows the tractor unit into a curve, the wheel castor action ensures the wheels turn in accordance with the curve radius (the thrust washers slide over one another).

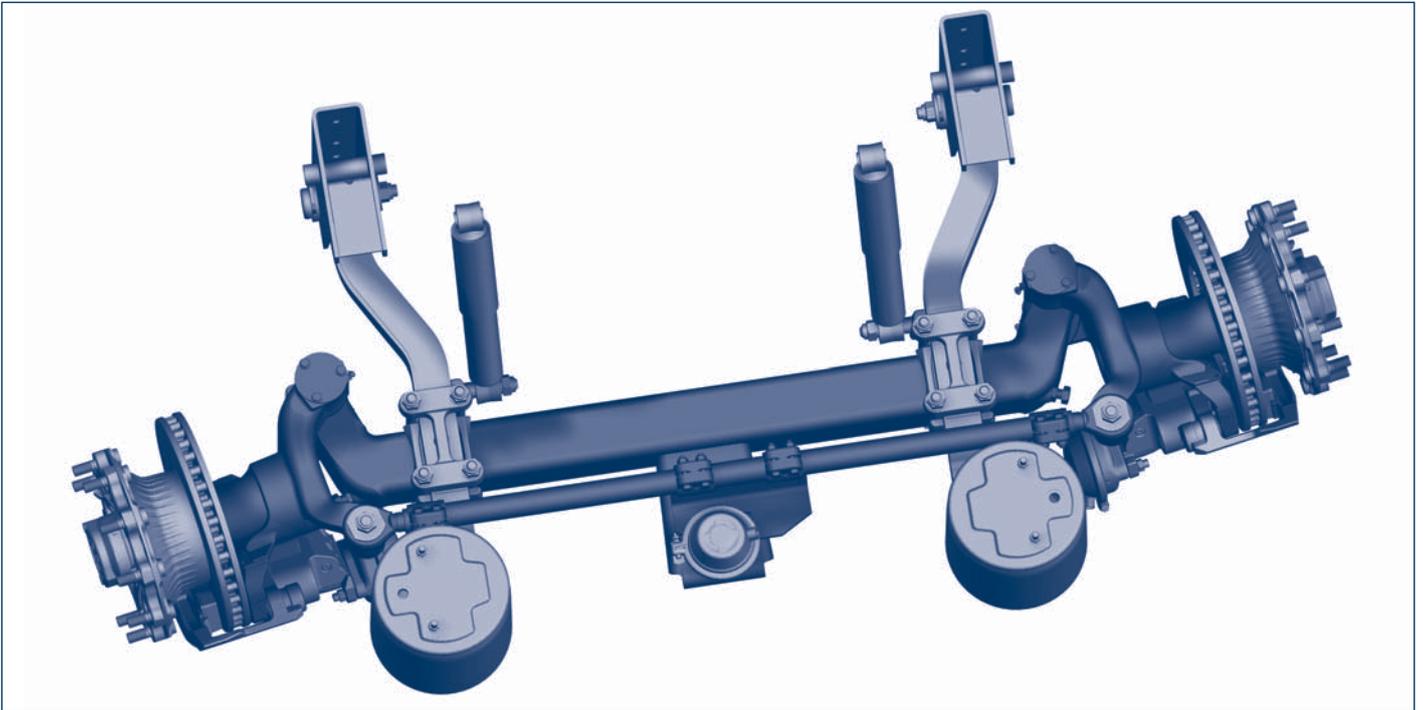
The frictional resistance changes according to the load on the axle. As a result, a steering angle (of 8 to 27°, depending on the axle type) is achieved according to the load, and is entirely controlled by mechanical means.

The link connecting the wheels uses a steering lock to prevent the wheels from steering when the vehicle is reversing.



Steering axle, steering lock 2

General



The effect of the steering axle is that the suspension unit steers into corner better and virtually follows in the tracks of the tractor unit.

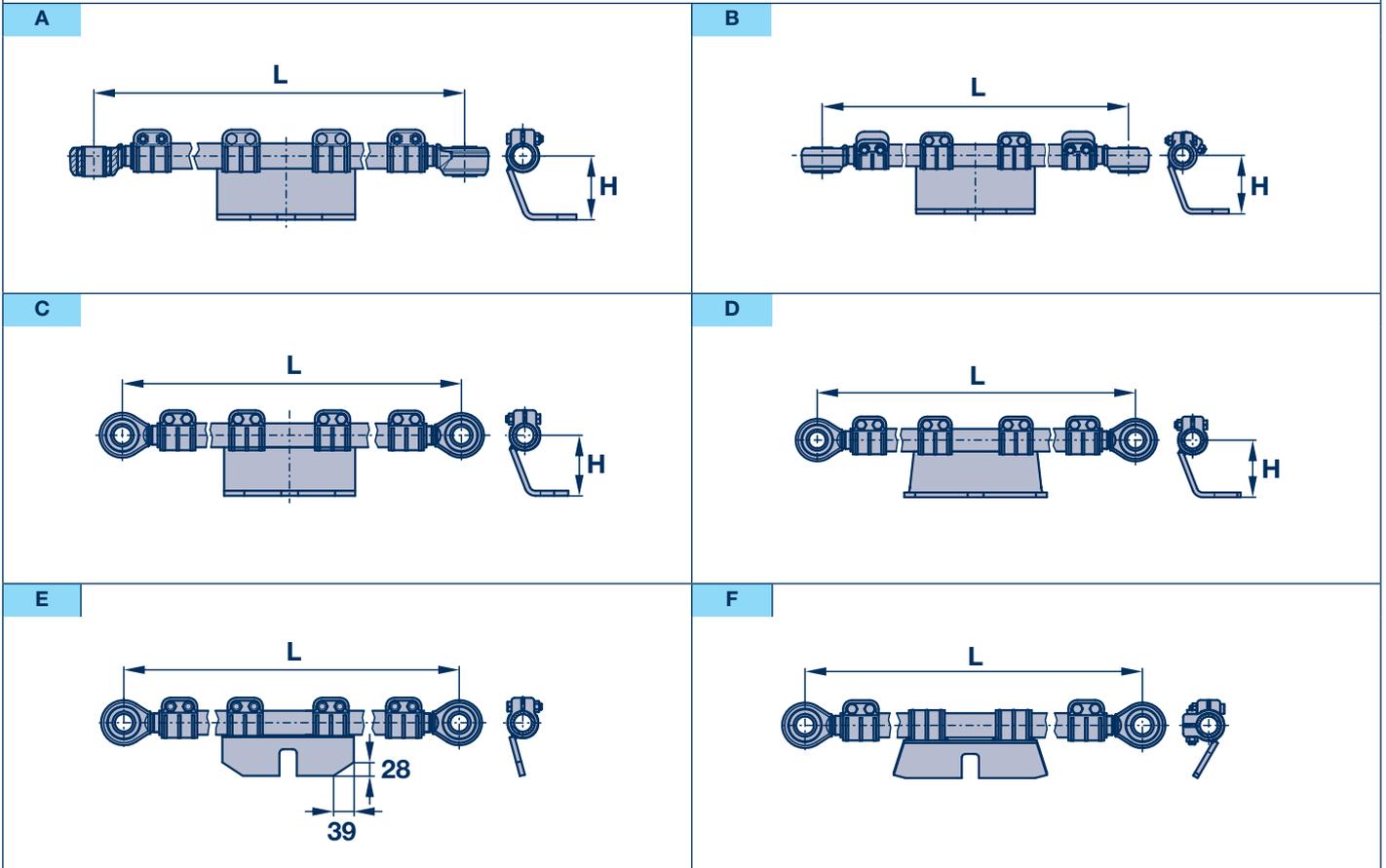
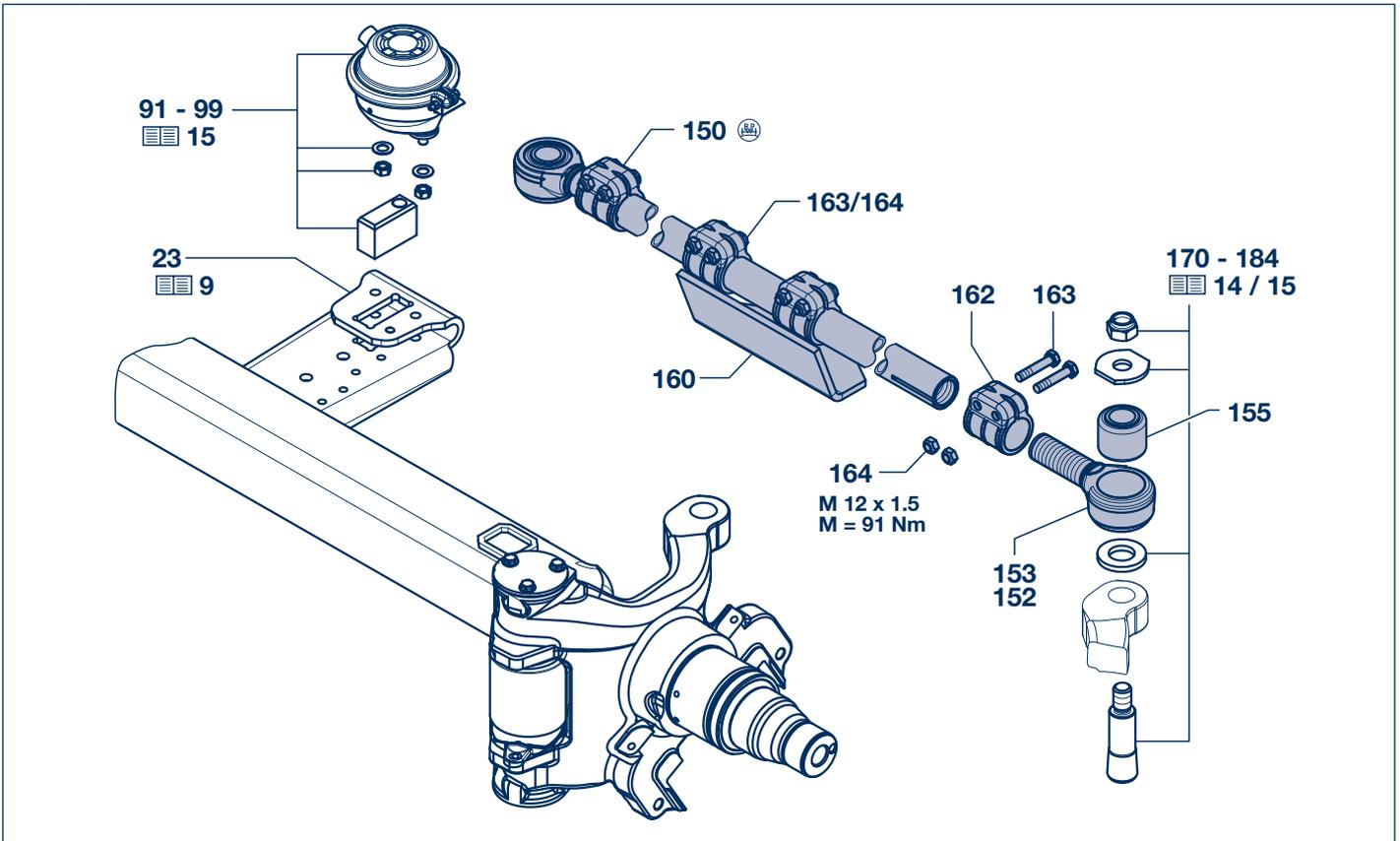
The lateral forces on the tyres, occurring for example in the case of a three-axle trailer, are thus ideally distributed between all the axles.

As a result of the fact that each axle experiences considerably lower lateral forces, the mileage covered by the tyres is demonstrably increased by up to 50 % on the front axle and actually up to 70 % on the rear axle.

The use of the BPW steering axle delivers absolutely even wear.

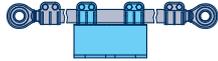
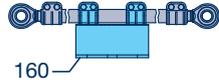
2 Steering axle, steering lock

2.1 Steering rods, spare parts



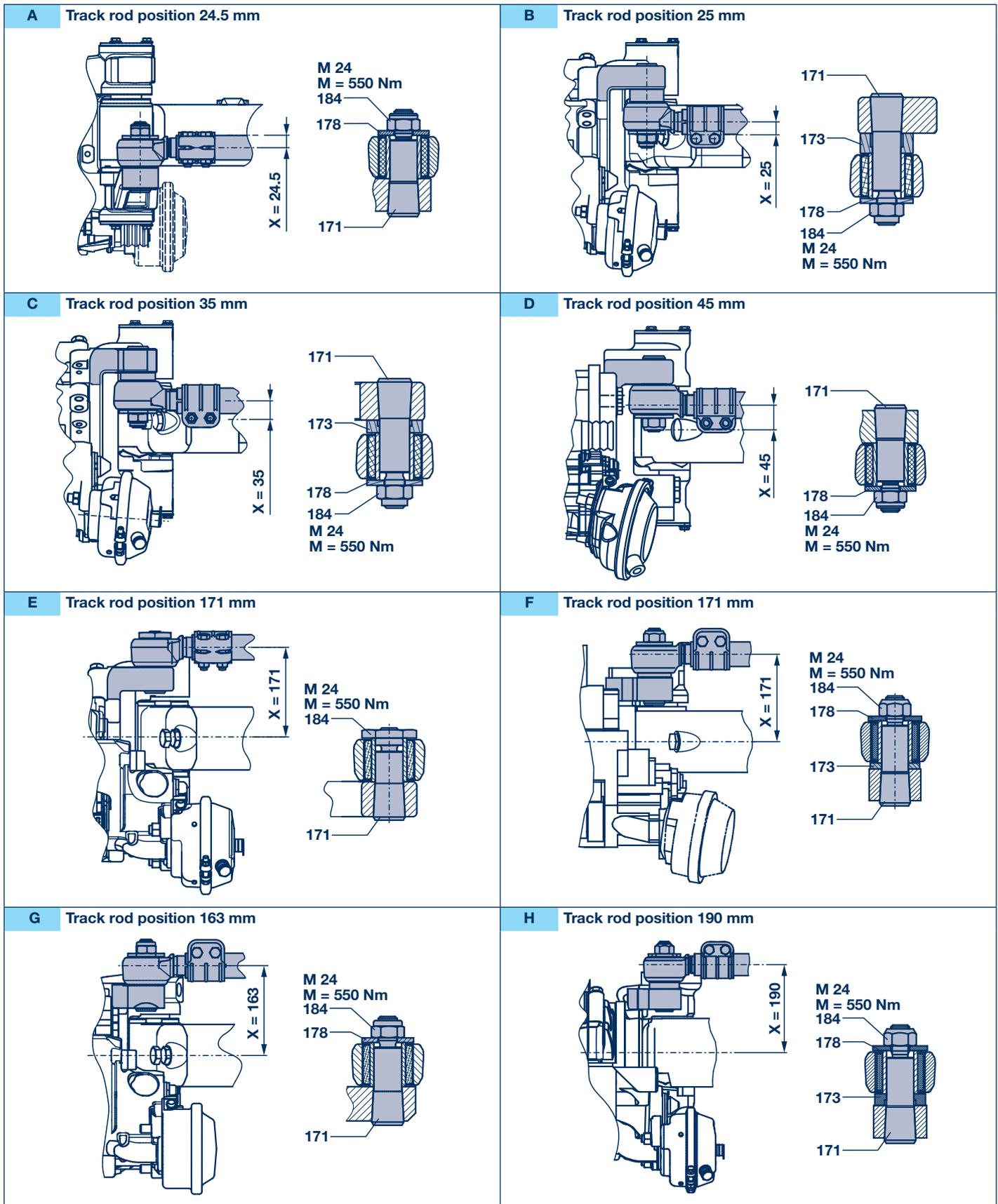
Steering axle, steering lock 2

Steering rods, spare parts 2.1

| Item | Designation | Dimension | BPW Code no. | Fig. | BPW Code no. | |
|----------------------|--|-----------------------------|----------------------|--|---|----------------|
| | | | |  |  | |
| | | L (Adjustment range) | H | 2 clamps | Support (Locking plate) only (item 160), incl. item 163 - 164 | |
| 150 | Steering rod complete, incl. item 152, 153, 160, 162 - 164 | 1180 (1160 - 1199) | 121 | 05.246.46.55.0 | A | 05.189.14.39.1 |
| | | | 129 | 05.246.46.30.0 | A | 05.189.14.99.1 |
| | | 1220 (1200 - 1239) | 129 | 05.246.46.34.0 | A | 05.189.14.99.1 |
| | | | 1260 (1240 - 1279) | 121 | 05.246.46.64.0 | A |
| | | 129 | | 05.246.46.39.0 | A | 05.189.14.99.1 |
| | | 1300 (1280 - 1319) | 121 | 05.246.46.54.0 | A | 05.189.14.39.1 |
| | | | 129 | 05.246.46.29.0 | A | 05.189.14.99.1 |
| | | 1340 (1320 - 1359) | - | 05.246.41.06.0 | E | 05.189.07.07.1 |
| | | | 121 | 05.246.46.56.0 | A | 05.189.14.39.1 |
| | | | 129 | 05.246.46.31.0 | A | 05.189.14.99.1 |
| | | 1380 (1360 - 1399) | - | 05.246.41.02.0 | E | 05.189.07.07.1 |
| | | | 121 | 05.246.46.52.0 | A | 05.189.14.39.1 |
| | | | 129 | 05.246.46.27.0 | A | 05.189.14.99.1 |
| | | 1420 (1400 - 1439) | - | 05.246.41.01.0 | E | 05.189.07.07.1 |
| | | | - | 05.246.49.26.0 | F | 05.189.15.51.1 |
| | | | 121 | 05.246.46.51.0 | A | 05.189.14.39.1 |
| | | | 121 | 05.246.49.51.0 | D | 05.189.14.42.1 |
| | | | 129 | 05.246.46.26.0 | A | 05.189.14.99.1 |
| | | | 129 | 05.246.49.77.0 | D | 05.189.15.07.1 |
| | | | 150 | 05.246.46.77.0 | C | 05.189.14.53.1 |
| | | 1460 (1440 - 1479) | - | 05.246.41.05.0 | E | 05.189.07.07.1 |
| | | | 121 | 05.246.46.61.0 | A | 05.189.14.39.1 |
| | | | 129 | 05.246.46.36.0 | A | 05.189.14.99.1 |
| | | | 129 | 05.246.49.81.0 | D | 05.189.15.07.1 |
| | | 1500 (1480 - 1519) | - | 05.246.41.03.0 | E | 05.189.07.07.1 |
| | | | - | 05.246.49.28.0 | F | 05.189.15.51.1 |
| | | | 121 | 05.246.46.53.0 | A | 05.189.14.39.1 |
| | | | 129 | 05.246.46.28.0 | A | 05.189.14.99.1 |
| 129 | 05.246.49.79.0 | | D | 05.189.15.07.1 | | |
| 1520 (1520 - 1559) | - | 05.246.49.38.0 | F | 05.189.15.51.1 | | |
| 1540 (1520 - 1559) | - | 05.246.41.13.0 | E | 05.189.07.07.1 | | |
| | 121 | 05.246.46.63.0 | A | 05.189.14.39.1 | | |
| | 121 | 05.246.49.63.0 | D | 05.189.14.42.1 | | |
| | 129 | 05.246.46.38.0 | A | 05.189.14.99.1 | | |
| | 129 | 05.246.49.89.0 | D | 05.189.15.07.1 | | |
| 152 | Track rod end assy., incl. item 155 | left threaded | 05.353.68.27.0 | | | |
| 153 | Track rod end assy., incl. item 155 | right threaded | 05.353.68.26.0 | | | |
| 155 | Bush | Ø 35 / 64 x 56 | 05.113.92.04.0 | | | |
| 162 | Clamp | | 02.3507.25.00 | | | |
| 163 | Hexagon bolt | M 12 x 1.5 x 60 - 8.8 | 02.5029.35.80 | | | |
| 164 | Lock nut | VM 12 x 1.5 - 8 | 02.5220.15.82 | | | |

2 Steering axle, steering lock

2.2 Steering rod attachments, steering lock



Steering axle, steering lock 2

Steering rod attachments, steering lock 2.2

| Item | Designation | BPW Code no. | Dimension | Fig. | |
|------|------------------------------|-----------------------------------|------------------------|----------|--|
| | | Track rod position 24.5 mm | | A | |
| | | Track rod position 45 mm | | D | |
| | | Track rod position 163 mm | | G | |
| 170 | Assembly kit, item 171 - 184 | 05.801.43.18.1 | | | |
| 171 | Threaded bolt | 03.177.04.15.0 | Ø 40 / 35 / M 24 x 133 | | |
| 178 | Washer | 03.320.24.05.0 | Ø 24.5 / 70 x 65 x 6 | | |
| 184 | Lock nut | 02.5220.76.12 | VM 24 / 980 - 10 | | |
| | | Track rod position 25 mm | | B | |
| 170 | Assembly kit, item 171 - 184 | 05.801.43.51.1 | | | |
| 171 | Threaded bolt | 03.177.04.14.0 | Ø 40 / 35 / M 24 x 163 | | |
| 173 | Ring | 03.310.03.22.0 | Ø 35 / 40 / 65 x 25 | | |
| 178 | Washer | 03.320.24.05.0 | Ø 24.5 / 70 x 65 x 6 | | |
| 184 | Lock nut | 02.5220.76.12 | VM 24 / 980 - 10 | | |
| | | Track rod position 35 mm | | C | |
| | | Track rod position 190 mm | | H | |
| 170 | Assembly kit, item 171 - 184 | 05.801.43.19.1 | | | |
| 171 | Threaded bolt | 03.177.04.06.0 | Ø 40 / 35 / M 24 x 153 | | |
| 173 | Ring | 03.310.03.06.0 | Ø 35 / 40 / 65 x 15 | | |
| 178 | Washer | 03.320.24.05.0 | Ø 24.5 / 70 x 65 x 6 | | |
| 184 | Lock nut | 02.5220.76.12 | VM 24 / 980 - 10 | | |
| | | Track rod position 171 mm | | E | |
| 170 | Assembly kit, item 171 - 184 | 05.801.43.50.1 | | | |
| 171 | Threaded bolt | 03.177.14.40.0 | Ø 40 / 35 / M 24 x 118 | | |
| 184 | Lock nut | 03.260.56.03.0 | M 24 - 10 | | |
| | | Track rod position 171 mm | | F | |
| 170 | Assembly kit, item 171 - 184 | 05.801.43.47.1 | | | |
| 171 | Threaded bolt | 03.177.04.13.0 | Ø 40 / 35 / M 24 x 146 | | |
| 173 | Washer | 03.320.33.24.0 | Ø 35 / 64 x 8 | | |
| 178 | Washer | 03.320.24.05.0 | Ø 24.5 / 70 x 65 x 6 | | |
| 184 | Lock nut | 02.5220.76.12 | VM 24 / 980 - 10 | | |

Steering lock

| | | | | |
|----|------------------------------|----------------|----------|--|
| 91 | Cylinder, incl. item 98 + 99 | 02.0327.38.00 | | |
| 96 | Lock | 03.060.00.13.0 | | |
| 98 | Spring washer | 02.5601.12.90 | A 12 | |
| 99 | Hexagon nut | 02.5202.16.80 | M 12 - 8 | |

3 Brake parts BPW ECO Disc

TSB 3709 / 4309 / 4312

General

Brakes that are under utilised glaze up and their braking effort is reduced. Over utilisation causes disproportionate wear.

Correct selection and dimensioning of the brake is therefore of crucial significance.

BPW offers you the correct brake for every application.

BPW ECO Disc Trailer disc brake (TSB) 3709 (Ø 370)

For versatile deployment in the haulage business under normal conditions (e.g. long-distance road haulage in Western Europe).

| | |
|--------------|-----------------------------------|
| Axle load: | 9 – 10t |
| Tyre size: | 19.5" (9 + 10t) 22.5" (9t) |
| Wheel exec.: | E, Z, ET 0 ET 120 (only 9t) |

BPW ECO Disc Trailer disc brake (TSB) 4309 (Ø 430)

For conditions that demand greater disc and pad volume, such as mountainous routes, frequently changing tractor-trailer combinations, when deployed in Eastern Europe or in regional distribution.

| | |
|--------------|-----------------------------------|
| Axle load: | 9 – 10t |
| Tyre size: | 22.5" |
| Wheel exec.: | E, Z, ET 0; ET 120 (only 9t) |

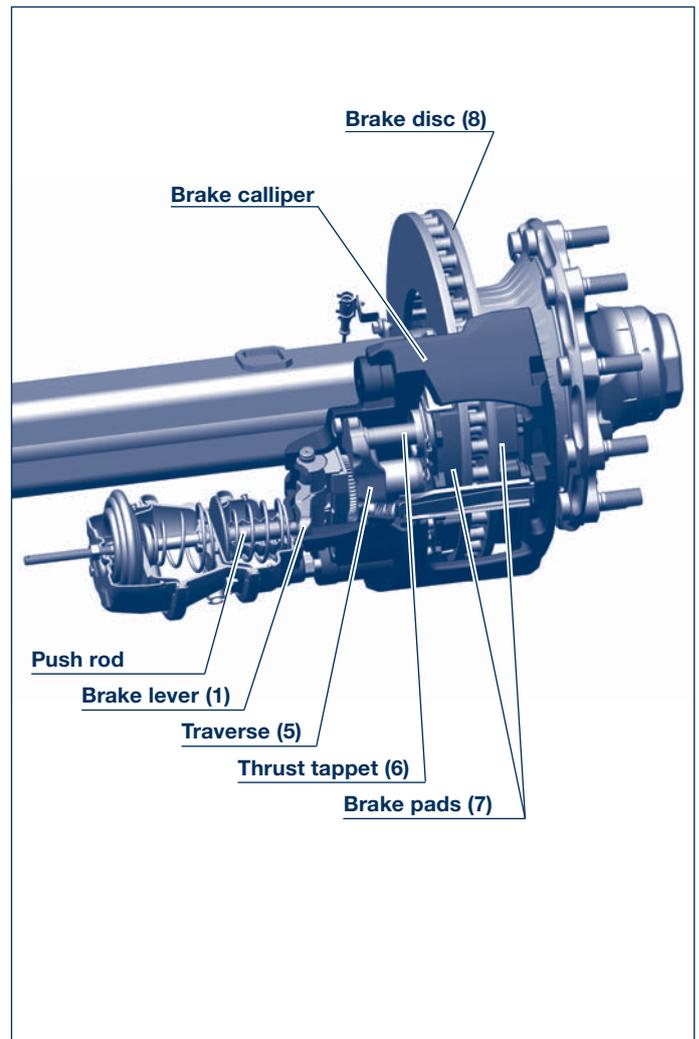
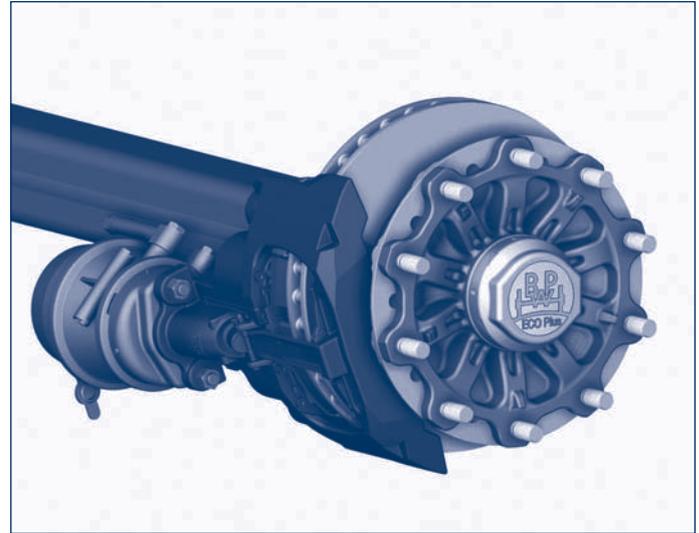
Advantage: Large diameter brake discs and calliper matching the axle load.

BPW ECO Disc Trailer disc brake (TSB) 4312 (Ø 430)

For axle loads above 10 tonnes.

| | |
|--------------|------------|
| Axle load: | 11 – 12t |
| Tyre size: | 22.5" |
| Wheel exec.: | E, Z, ET 0 |

E = Single wheels
Z = Twin wheels
ET = Offset



Brake parts BPW ECO Disc 3

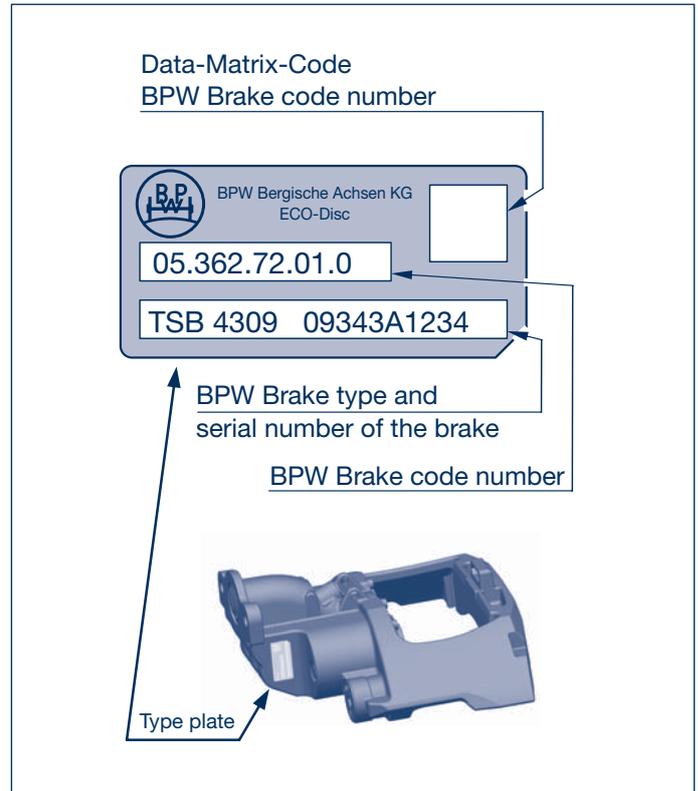
TSB 3709 / 4309 / 4312

General

Type plate

There is a manufacturer's nameplate fixed onto each brake calliper, on which are stamped the data necessary for the identification of the brake in question.

- ⊙ BPW Brake code number
- ⊙ Brake type + serial number
- ⊙ For replacement, brake callipers will only be supplied as a complete replacement brake calliper (**09.362**) with complete lining set, see table below



| BPW code number on the brake calliper | Brake | Brake pad | BPW replacement brake calliper cpl. with brake pads - 7 / 2011 | BPW replacement brake calliper cpl. with brake pads 8 / 2011 - |
|---------------------------------------|----------|-----------|---|--|
| 05.362.72.03.0 | TSB 3709 | BPW 8200 | 09.362.72.03.0 * | 09.362.72.13.0 |
| 05.362.72.04.0 | | | 09.362.72.04.0 * | 09.362.72.14.0 |
| 05.362.72.03.0 | | BPW 8101 | 09.362.72.03.1 * | 09.362.72.13.1 * |
| 05.362.72.04.0 | | | 09.362.72.04.1 * | 09.362.72.14.1 * |
| 05.362.72.01.0 | TSB 4309 | BPW 8200 | 09.362.72.01.0 * | 09.362.72.11.0 |
| 05.362.72.02.0 | | | 09.362.72.02.0 * | 09.362.72.12.0 |
| 05.362.72.01.0 | | BPW 8101 | 09.362.72.01.1 * | 09.362.72.11.1 * |
| 05.362.72.02.0 | | | 09.362.72.02.1 * | 09.362.72.12.1 * |
| 05.362.72.05.0 | TSB 4312 | BPW 8301 | 09.362.72.05.0 * | 09.392.72.15.0 |
| 05.362.72.06.0 | | | 09.362.72.06.0 * | 09.362.72.16.0 |
| | | | * = No longer available, replaced by the new version (8 / 2011 -) | |

3 Brake parts BPW ECO Disc

TSB 3709 / 4309 / 4312

General

BPW ECO Disc Trailer disc brakes TSB 3709 / 4309 / 4312

OPERATING PRINCIPLE: SLIDING CALLIPER BRAKE

APPLYING THE BRAKE

During braking, the cylinder pushrod of the spring brake or diaphragm cylinder presses onto the brake lever (1).

The offset position of the brake lever amplifies the force created by the brake cylinder and allows it to be transferred to the intermediate plate (2) with minimal loss via a needle bearing.

Mounted in the pressure plate (4), the intermediate plate counteracts the vertical movement of the lever and ensures optimal transfer to the cross support.

The clamping force acts on the inner brake pad (7a) via the cross support (5) and the pressure plates (6).

Once the play between the inner brake pad and the brake disc (8) has been overcome, the reaction force is transferred to the outer brake pad (7b) via the brake calliper.

The brake torque for the wheel is generated when the brake pads contact the brake disc.

The radial stabilizer force created by the responding brake pad at this time is transferred directly to the axle via the brake calliper.

RELEASING THE BRAKE

When brake pressure rises, the pressure spring (9) moves the actuating unit back to its initial position.

ADJUSTMENT

The brake is fitted with an automatic non-wearing adjusting device (10) to maintain constant clearance between the brake pad and the brake disc.

Each time the brake is operated the axial movement of the lever block (2) and pressure plate (4) causes the adjuster pin (11) to be rotated via a trapezoidal thread.

The adjuster pin is connected to the threaded tube (14) by the movement thread (11a) which in turn can rotate the threaded tube (14) via the spring loaded indented ball coupling sleeve (12). When play increases the threaded tube (14) is turned correspondingly via the indented ball coupling (12).

Axial play in the trapezoidal thread between the pressure plate (4) and the adjuster pin determines the free play value of the disc brake.

When the free play is set correctly the spring loaded indented ball coupling sleeve (12) can disengage without turning the threaded tube (14).

The overall play (total play on both sides of the disc brake) measures 0.7 - 1.3 mm.

RESET MECHANISM

The disc brake features a reset mechanism at the front for replacing the brake pads and brake disc.

The return spring gear wheel (13) is mechanically connected to the external gearing of the threaded tube (14) so that the pressure plates (6) can return to their initial position. Only minimal torque is required to move the pressure plates (6) back to this position or preset the play.

BRAKE CYLINDER

Air pressure builds up behind the diaphragm due to the action of compressed air on the brake cylinder.

Air pressure forces the thrust rod out of the cylinder via the diaphragm plate.

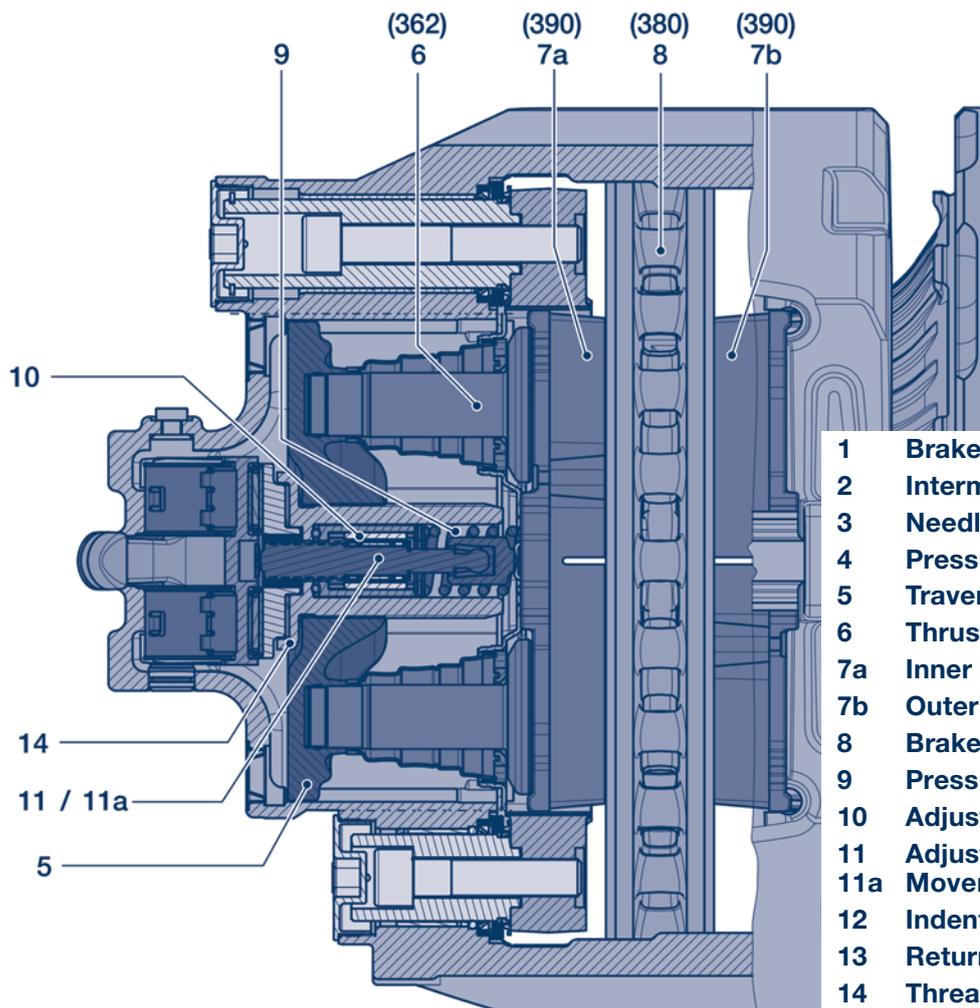
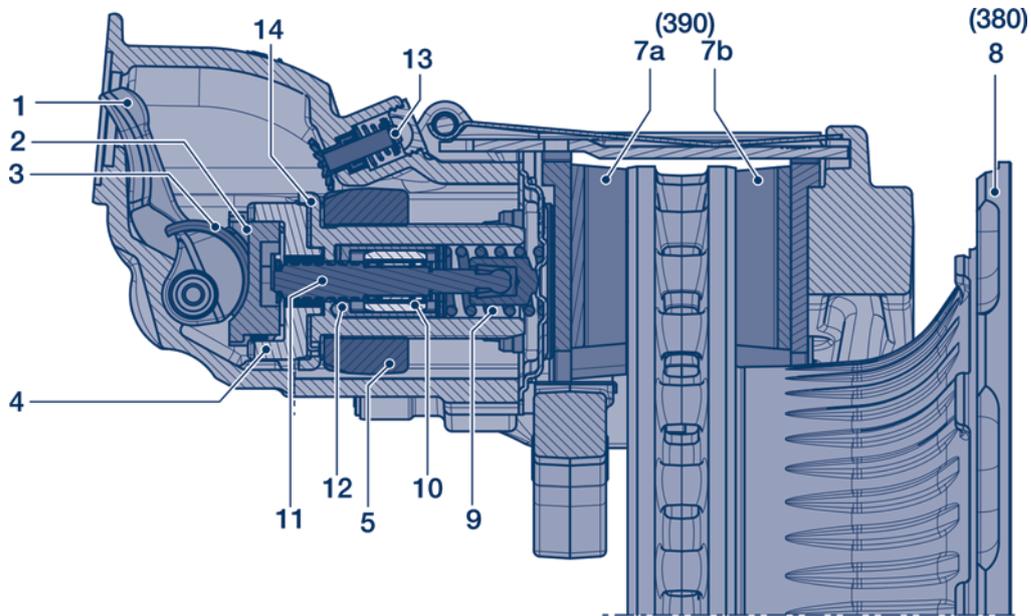
The brakes may only be fitted with brake cylinders which, apart from the sealing of the flange surface, are fitted with a so called „inner sealing“.

This means that the pushrod acting on the lever (1) must be hermetically sealed from the secondary chamber of the brake cylinder as otherwise the internal mechanism is completely open to its surroundings.

Brake parts BPW ECO Disc 3

TSB 3709 / 4309 / 4312

General



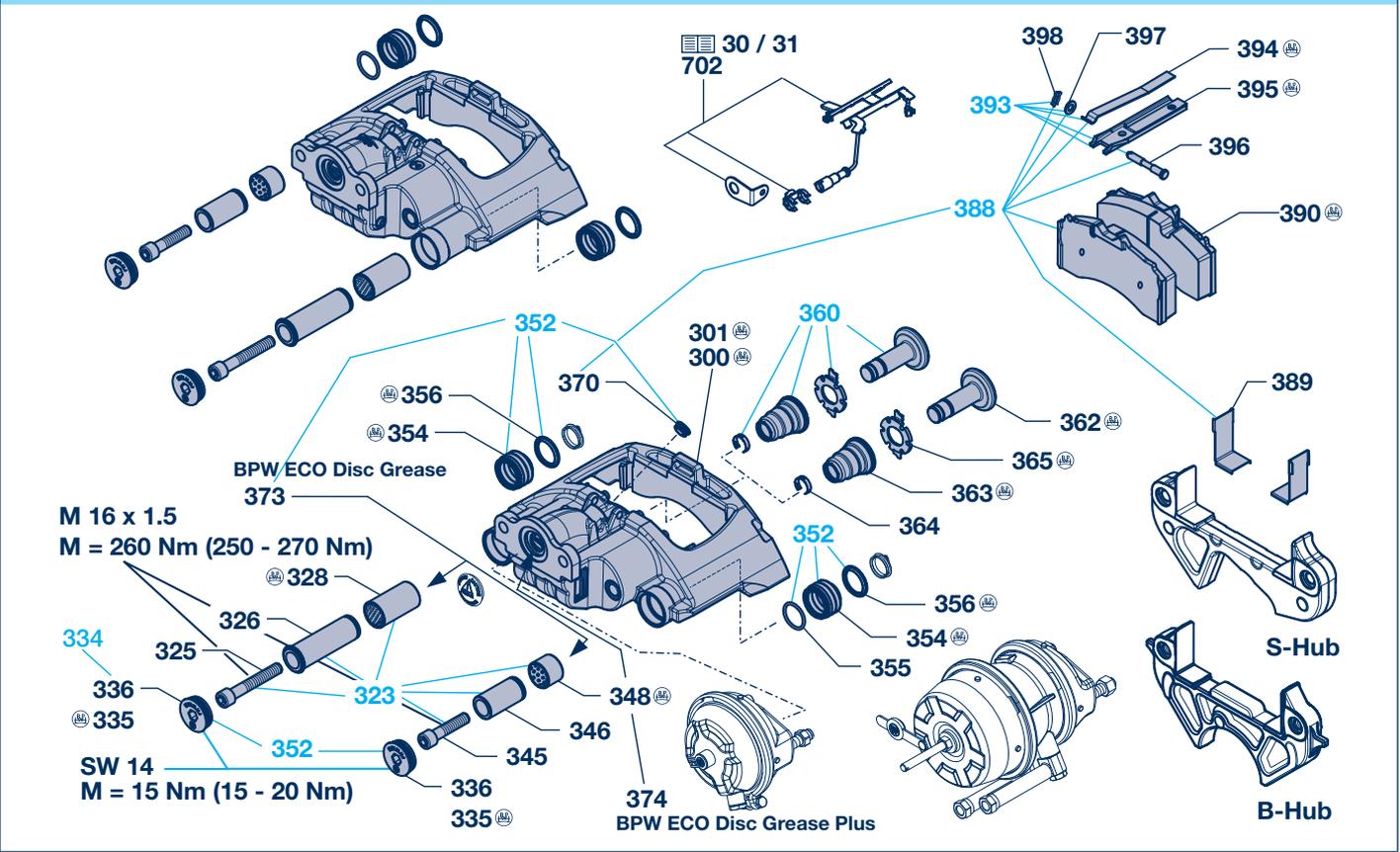
- 1 Brake lever
- 2 Intermediate plate
- 3 Needle bearing
- 4 Pressure plate
- 5 Traverse
- 6 Thrust tappets
- 7a Inner brake pad
- 7b Outer brake pad
- 8 Brake disc
- 9 Pressure spring
- 10 Adjustment device
- 11 Adjuster pin with
- 11a Movement thread
- 12 Indented ball coupling
- 13 Return spring gear wheel
- 14 Threaded tube

3 Brake parts BPW ECO Disc

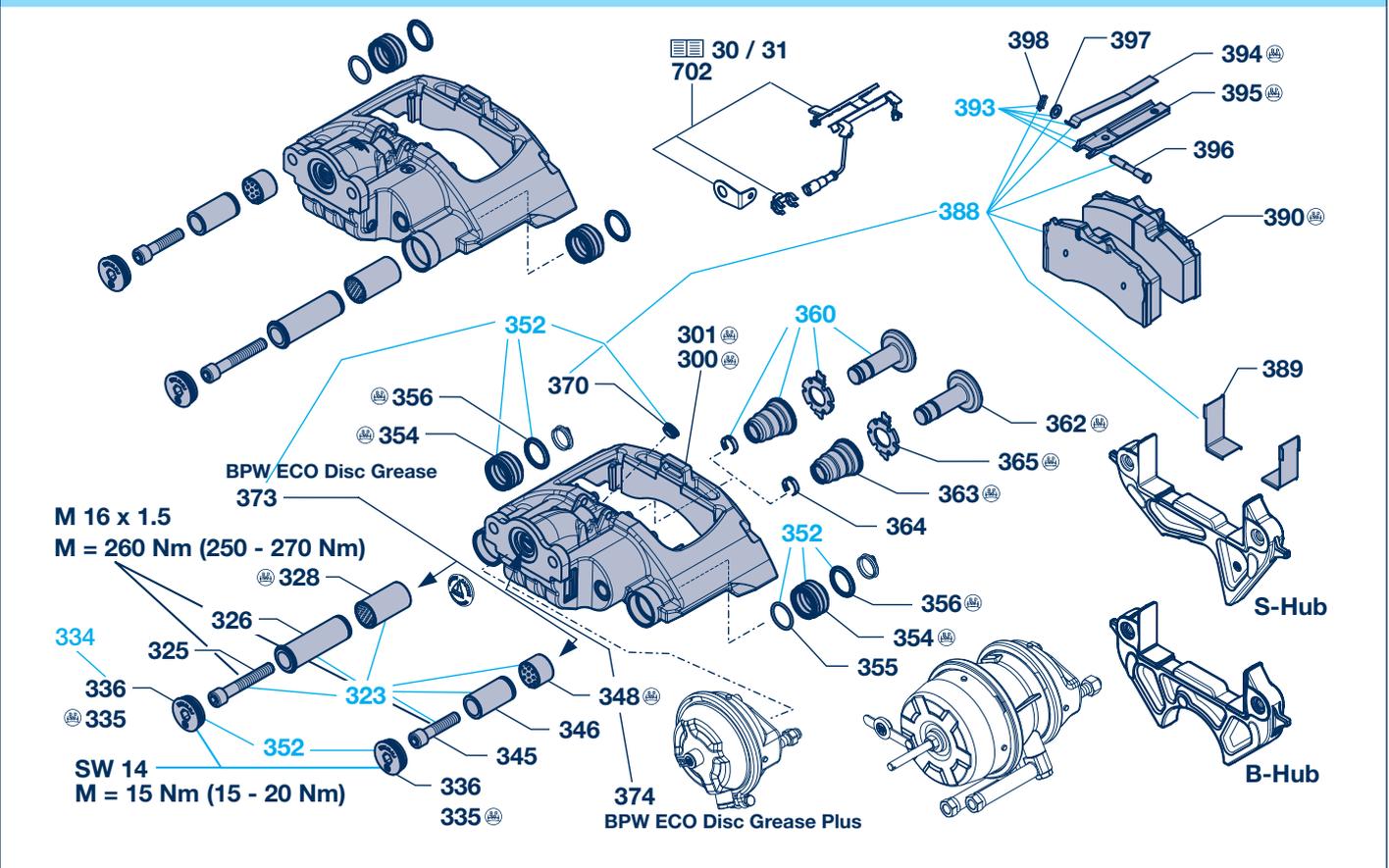
3.1 TSB 3709 / 4309 / 4312

Spare parts

BPW ECO Disc TSB 3709



BPW ECO Disc TSB 4309 / 4312



Brake parts BPW ECO Disc 3

TSB 3709 / 4309 / 4312 3.1

Spare parts

| Item | Designation | Dimension | BPW Code no. | | |
|-------------------|---|-------------------------|---------------------------------------|---------------------------------------|-------------------------------------|
| | | | TSB 3709 ---.616.--- ---.40.--- | TSB 4309 ---.617.--- ---.41.--- | TSB 4312 ---.618.--- |
| 300 | BPW replacement brake calliper cpl. (pre-greased), incl. guide pins, brake pads and attachment parts. See page 17. | BPW 8200 | 09.362.72.13.0 ¹⁾ | 09.362.72.11.0 ¹⁾ | - |
| 301 | | BPW 8301 | 09.362.72.14.0 ¹⁾ | 09.362.72.12.0 ¹⁾ | - |
| | | | - | - | 09.362.72.15.0 ¹⁾ |
| | | | - | - | 09.362.72.16.0 ¹⁾ |
| 323 | Repair kit guide pins, item 325, 326, 328, 345, 346, 348, 373 | for one axle side | 09.801.07.61.0 | | |
| 325 ²⁾ | Cylinder head screw | M 16 x 1.5 x 100 - 10.9 | 02.5016.70.16 | | |
| 326 ²⁾ | Guide pin, long (fixed bearing) | Ø 17 / 26 / 37 x 123 | 05.001.00.41.0 | | |
| 328 ²⁾ | Guide bush (fixed bearing) | Ø 37 / 41 x 73 | 03.112.33.13.0 | | |
| 334 | Repair kit sealing cap, item 335 + 356 | for one axle side | 09.801.07.87.0 | | |
| 335 ²⁾ | Sealing cap, incl. item 336 | M 49 x 1.5 | 05.001.00.45.0 | | |
| 336 ²⁾ | 'O'-Ring | Ø 45 x 2 | 02.5679.97.40 | | |
| 345 ²⁾ | Cylinder head screw | M 16 x 1.5 x 70 - 10.9 | 02.5015.78.16 | | |
| 346 ²⁾ | Guide pin, short (floating bearing) | Ø 17 / 26 / 36 x 70 | 03.001.00.35.0 | | |
| 348 ²⁾ | Guide bush (floating bearing) | Ø 37 / 41 x 30 | 03.112.33.14.0 | | |
| 352 | Repair kit seal for guide pins, item 335, 354, 355, 356, 370, 373 | for one axle side | 09.801.07.62.0 | | |
| 354 ²⁾ | Bellow | Ø 52 x 34 | 05.130.08.27.0 | | |
| 355 ²⁾ | 'O'-Ring | Ø 36 x 3.5 | 02.5679.98.40 | | |
| 356 ²⁾ | Ring | Ø 38 / 48 x 5 | 03.310.11.19.0 | | |
| 360 | Repair kit tappet, item 362 - 365 | for one axle side | 09.801.07.63.1 | | |
| 362 ²⁾ | Tappet | Ø 24 / 27 / 84.5 x 94.5 | 03.127.18.03.0 | | |
| 363 ²⁾ | Bellow | Ø 26 / 55 x 17 | 05.130.07.07.0 | | |
| 364 ²⁾ | Holding clamp | Ø 25 x 7 | 03.001.57.01.0 | | |
| 365 ²⁾ | Dirt seal | Ø 55 x 1.5 | 03.121.30.15.0 | | |
| 370 | Plug | Ø 24 x 9 | 02.3704.69.00 | | |
| 373 | BPW ECO Disc Grease | 25 g | 02.1040.60.00 | | |
| 374 | BPW ECO Disc Grease Plus * | 5 g | 02.1040.61.00 | | |
| 388 | Repair kit brake lining, item 370, 389, 390, 394, 396 - 398 | for one axle | | | |
| | | (BPW 8200) | 09.801.07.94.0 | 09.801.07.96.0 | - |
| | | (BPW 8301) | - | - | 09.801.07.98.0 |
| 389 | Wearing plate | | 03.163.04.02.1 | 03.163.04.03.1 | 03.163.04.04.1 |
| 390 | Brake pad ³⁾ | BPW 8200 | 05.092.90.12.1 ³⁾ | 05.092.90.13.1 ³⁾ | - |
| | | BPW 8301 | - | - | 05.092.90.20.1 ³⁾ |
| 393 | Repair kit brake retaining clip, item 394 - 398 | for one axle | 09.801.07.68.1 | | |
| 394 ²⁾ | Clamping spring | | 03.352.00.08.1 | | |
| 395 ²⁾ | Pad holding bar | | 03.001.00.54.0 | | |
| 396 ²⁾ | Bolt | Ø 8 / 10 / 14 x 75 (73) | 03.084.32.33.0 | | |
| 397 ²⁾ | Washer | Ø 10.5 galv. | 02.5404.10.04 | | |
| 398 ²⁾ | Lock | | 02.3301.31.00 | | |

* Grease the spherical cap in the lever with BPW ECO Disc Grease Plus.

¹⁾ For replacement, brake callipers will only be supplied as a complete replacement brake calliper (09 362) with complete lining set.

²⁾ Only deliverable per kit

³⁾ Only deliverable per kit (item 388)!

3 Brake parts BPW ECO Disc

3.2 TSB 3709 / 4309 / 4312

Brake discs, general

BPW Brake discs

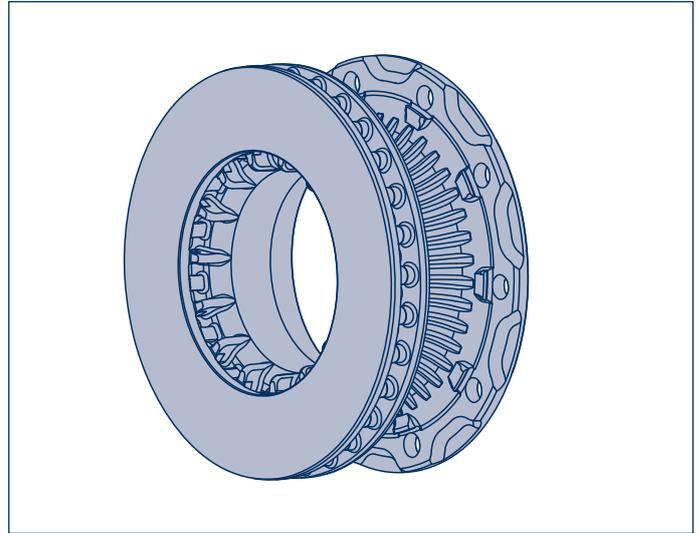
With the introduction of IBD brake discs (IBD = Internal ventilation / permanent brake), the proven BPW design of the collar disc has been further improved.

Further development has focused on the regulation of thermal efficiency in order to optimise wear characteristics and to improve reliability.

The quality of brake discs is the result of a combination of the shape of the design, the materials used and the quality of the mechanical machining.

The chemical composition of the material alloy is in particular responsible for a large number of properties, and hence determines some essential product features.

BPW has taken these technological influences into account for many years in the development of brake discs, matching them to the requirements on the trailer.



BPW Brake disc - IBD version

The latest generation of BPW brake discs offers the following advantages:

- ⊙ Increased surface area for effective heat dissipation
- ⊙ Optimisation of material for improved heat distribution over the surface of the disc
- ⊙ Venuri contour for improved internal air flow
- ⊙ Optimally matched friction pairing (Pads / Brake disc)
- ⊙ High resistance to wear
- ⊙ Simplified spare parts provision thanks to uniform brake discs for 0 and 120 offsets

Brake parts BPW ECO Disc 3

TSB 3709 / 4309 / 4312 3.2

Brake discs

Brake discs

| Brake | BPW Code no. | Pitch circle / hole pattern | Wheel hub | Offset | Series | Remark |
|----------|-----------------------|-----------------------------|-----------|---------|--------|---|
| TSB 3709 | 03.088.34.15.7 | 275 / 8 holes | S, Z | 0 | | |
| | 03.088.34.16.7 | 275 / 8 holes | S, Z | 0 | | with mounting for exciter ring |
| | 03.088.34.14.7 | 335 / 10 holes | S, Z, B | 0 / 120 | IBD | repl. by 03.088.34.21.7 |
| | 03.088.34.17.7 | 335 / 10 holes | S | 0 | IBD | with mounting for exciter ring repl. by 03.088.34.22.7 |
| | 03.088.34.21.7 | 335 / 10 Loch | S, Z, B | 0 / 120 | IBD | |
| | 03.084.34.22.7 | 335 / 10 Loch | S | 0 | IBD | 10t, with mounting for exciter ring |
| TSB 4309 | 03.088.35.05.7 * | 335 / 10 holes | S, Z, B | 0 / 120 | IBD | repl. by 03.088.35.12.7 |
| | 03.088.35.12.7 | 335 / 10 Loch | S, Z, B | 0 / 120 | IBD | |
| TSB 4312 | 03.088.35.05.7 * | 335 / 10 holes | S, Z | 0 | IBD | repl. by 03.088.35.12.7 |
| | 03.088.35.12.7 | 335 / 10 Loch | S, Z | 0 | IBD | |

S = Single wheels, offset 0
B = Single wheels, offset 120
Z = Twin wheels

Wear status of the brake disc

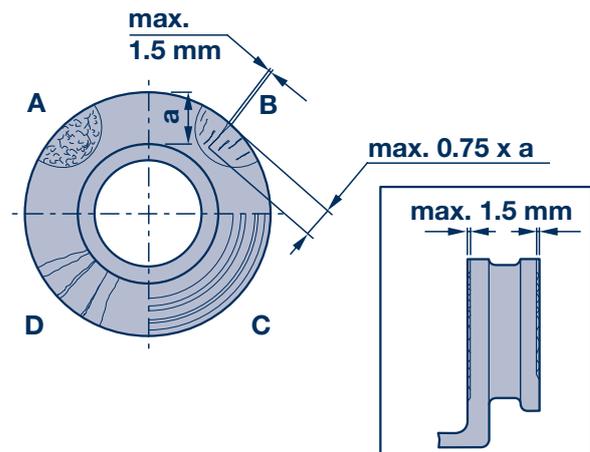
The brake disc is to be regularly checked for its residual thickness and any damage to the braking surface.

The residual thickness of the brake disc must not be less than the permissible minimum in any area of the disc.

Network-like heat cracking (**A**), radial cracks up to 1.5 mm in width and depth (**B**) and pitting of the braking surface less than 1.5 mm (**C**) are permissible.

Continuous cracks (**D**) are not permissible.

If the brake disc has reached its wear limit or its braking surface shows inadmissible damage, it must be replaced.



Technical details:

- ⊙ Disc thickness, new = 45 mm
- ⊙ Minimum permissible disc thickness = 37 mm (check with slide gauge)

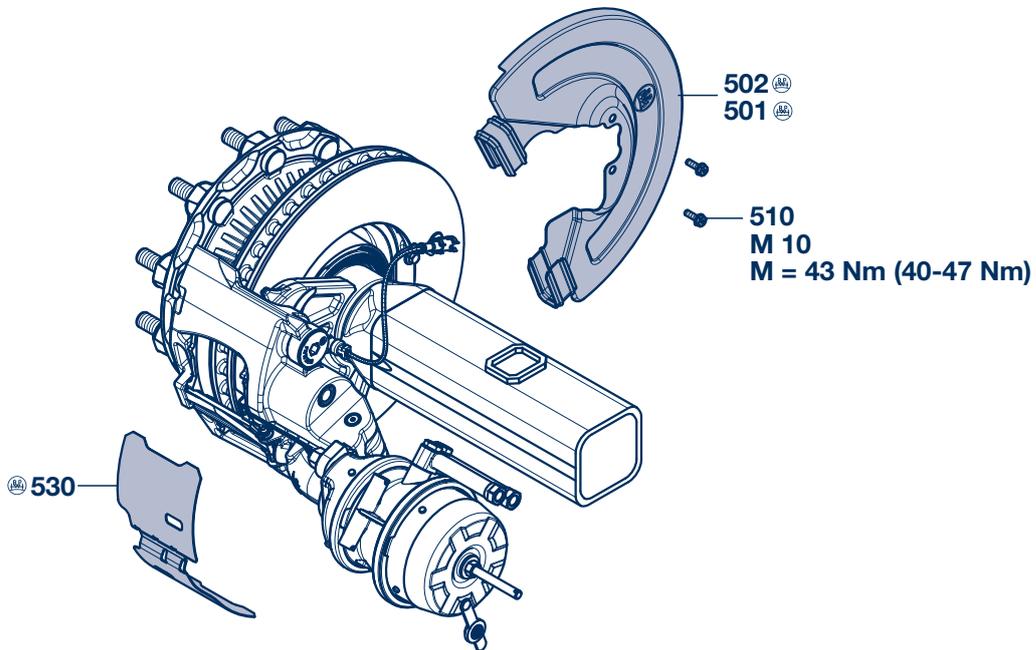
In the case of surface conditions **A - C**, the brake disc can be used until the minimum permissible disc thickness has been reached.

3 Brake parts BPW ECO Disc

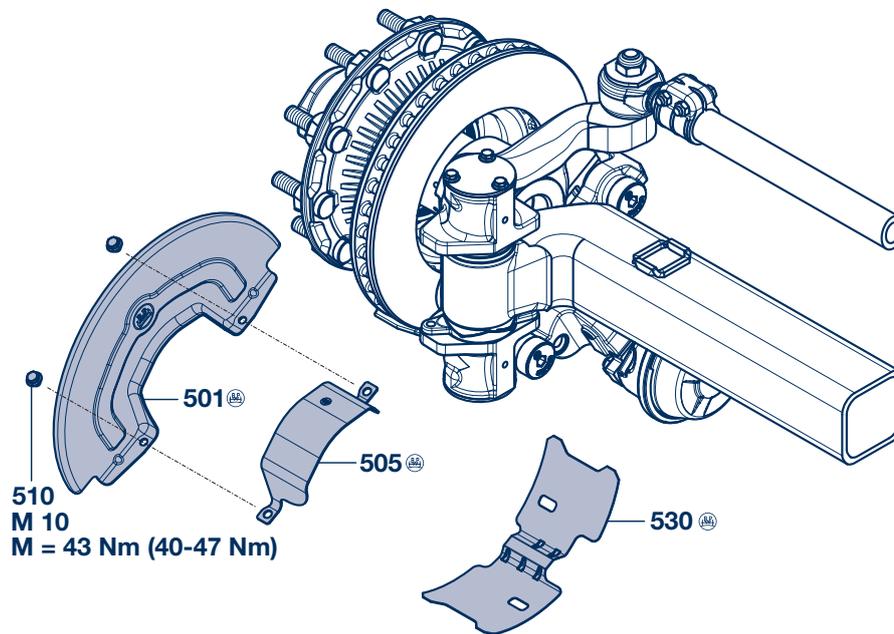
3.3 TSB 3709 / 4309 / 4312

Disc protectors, brake pad slot protector

BPW ECO Disc TSB 3709 / 4309 / 4312 - Rigid axles



BPW ECO Disc TSB 3709 / 4309 - Steering axles



Brake parts BPW ECO Disc 3

TSB 3709 / 4309 / 4312 3.3

Disc protectors, brake pad slot protector

| Disc protectors | | | | | |
|----------------------------------|---|-------------------|--|--|--|
| Item | Designation | Dimension | BPW Code no. | | |
| | | | TSB 3709 ---.616.--- ---.40.--- □ 120 | TSB 4309 ---.617.--- ---.41.--- □ 120 | TSB 4312 ---.618.--- □ 120 / □ 150 |
| Rigid axles | | | | | |
| 500 | Supplementary installation kit cover plates, item 501 - 510 | for one axle | 09.801.07.51.0 | 09.801.07.52.0 | 09.801.07.53.0 |
| 501 | Disc cover | | 03.010.71.59.0 | 03.010.71.61.0 | 03.010.71.57.0 |
| 502 | Disc cover | | 03.010.71.60.0 | 03.010.71.62.0 | 03.010.71.58.0 |
| 510 | Locking bolt | M 10 x 15 | 02.5071.22.00 | 02.5071.22.00 | 02.5071.22.00 |
| 513 | Seal | Ø 7 / 10 / 13 | - | 02.5681.78.00 | - |
| Steering axles | | | | | |
| 500 | Supplementary installation kit cover plates, item 501 - 510 | for one axle | 05.801.50.48.0 | 05.801.50.47.0 | 09.801.07.53.0 |
| 501 | Disc cover | | 03.010.71.64.0 | 03.010.71.63.0 | 03.010.71.57.0 |
| 502 | Disc cover | | - | - | 03.010.71.58.0 |
| 510 | Locking bolt | M 10 x 15 | 02.5071.22.00 | 02.5071.22.00 | 02.5071.22.00 |
| Steering axles ECO Plus 3 | | | | | |
| 500 | Supplementary installation kit cover plates, item 501 - 510 | for one axle | 05.801.49.62.0 | 05.801.49.63.0 | - |
| 501 | Disc cover | | 03.010.71.64.0 | 03.010.71.63.0 | |
| 505 | Disc cover | | | 03.010.95.35.0 | |
| 510 | Locking bolt | M 10 x 15 | | 02.5071.22.00 | |
| Brake pad slot protectors | | | | | |
| 530 | Brake pad protector * | for one axle side | | 03.010.95.32.0 | |

* is mounted under the pad retaining clip without any additional attachment parts

3 Brake parts BPW ECO Disc

3.4 TSB 3709 / 4309 / 4312

Brake cylinders, general

BPW Brake cylinder

BPW Brake cylinders come with a range of special features justifying their high quality level:

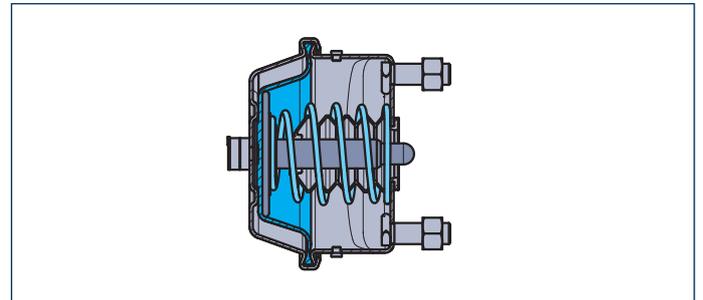
- ⊙ The cylinder size and the part number are embossed on the unit
- ⊙ Parts which are critical to function can be traced back through the QA system by means of their type plate data
- ⊙ The extended compressed air connection makes them easy to install
- ⊙ Double seals on the twin compartment
- ⊙ Effective anti-corrosion protection by powder and Delta Tone coating
- ⊙ Shot-peened, epoxy-coated compression springs
- ⊙ Spring-type accumulator chamber in permanent, positive connection
- ⊙ Long service life thanks to high-performance rubber diaphragms
- ⊙ Closely sealing bellows
- ⊙ Chromated aluminium housing



Types:

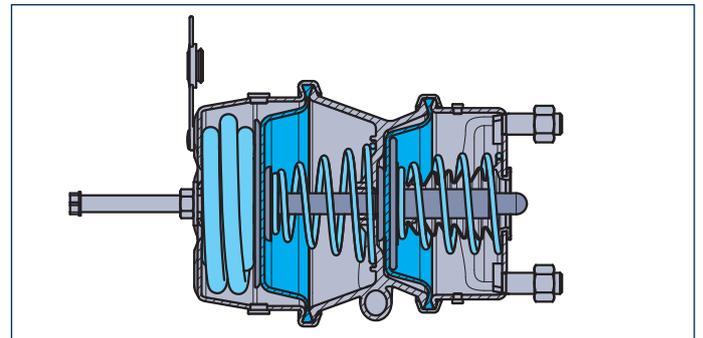
Diaphragm cylinders

These act as a service brake and are characterised by their compact external dimensions and low weight.



Diaphragm-diaphragm cylinders (M - M)

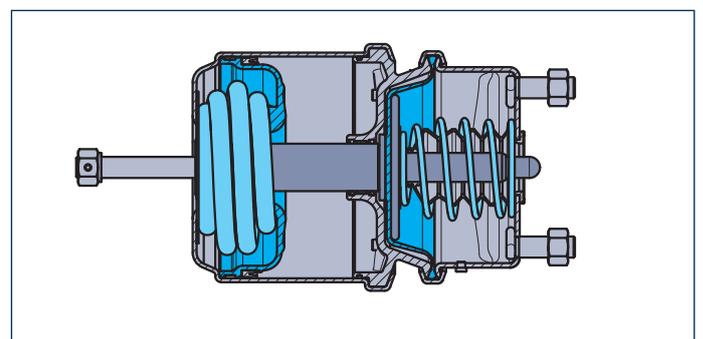
These act both as a service brake and an auxiliary and parking brake. They are lighter than the diaphragm-piston cylinder.



Diaphragm-piston cylinders (M - K)

These have the same function as a diaphragm-diaphragm cylinder.

Their greater spring accumulator force means they are particularly suitable for vehicles with higher axle loads.



Brake parts BPW ECO Disc 3

TSB 3709 / 4309 / 4312 3.4

Brake cylinders, general

Release device

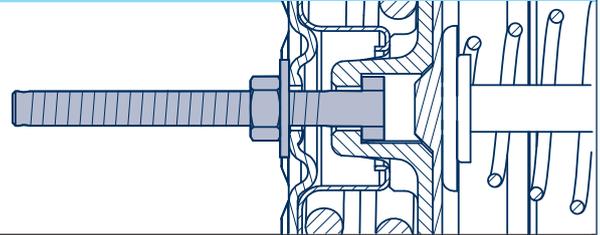
As of March 2004 the release bolt for M/M brake cylinders on axles with disc brakes will have a new parking position. The release bolt will no longer be accommodated in the parking pocket on the outside of the cylinder, but can be left in the cylinder cover plate.

All that is needed to use the parking position is to turn the release bolt through 90° and then lock it in place with a hex. nut.

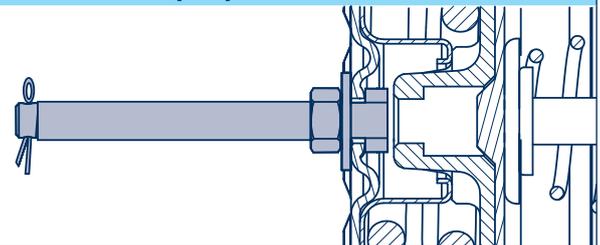
In addition to which it is still also possible to remove the release bolt completely.

Further information can be found under the heading Aktuell / BPW NEWS / News SB 04/01 on the BPW website www.bpw.de.

Release bolt inserted,
spring brake released



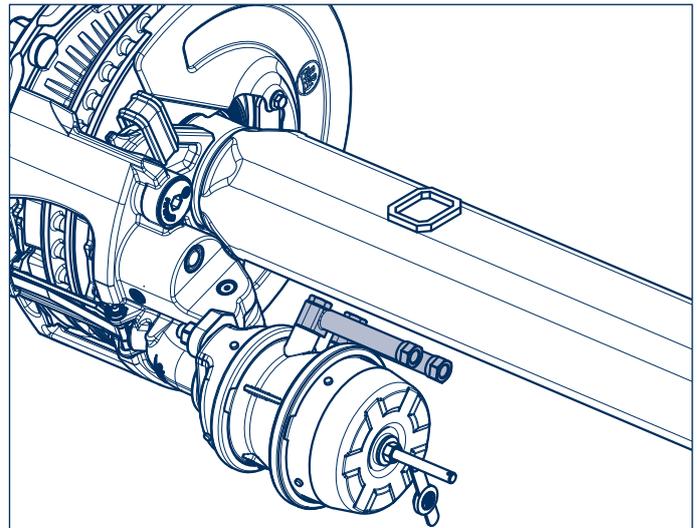
Release bolt in parking position,
plastic sleeve and split pin fitted



Compressed air connection extension (DLAV)

Spring-type cylinders for disc brakes are fitted with a compressed air connection extension (DLAV) as standard.

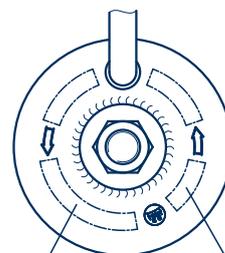
A feature of DLAV is that it enables additional compressed air systems to be mounted on the axle quickly and easily.



Identification

The BPW part number and the cylinder model are stamped on the front of every brake cylinder.

Each brake cylinder also has a manufacturer's nameplate riveted onto it, with the details of the BPW part number, cylinder type and production date.



BPW Code no.

e.g. 05.444.43.01.3

Cylinder size

e.g. 20/24"

BPW Type plate
at brake cylinder

BPW Code no.

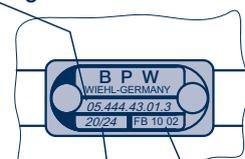
e.g. 05.444.43.01.3

Cylinder size

e.g. 20/24"

manufacture date

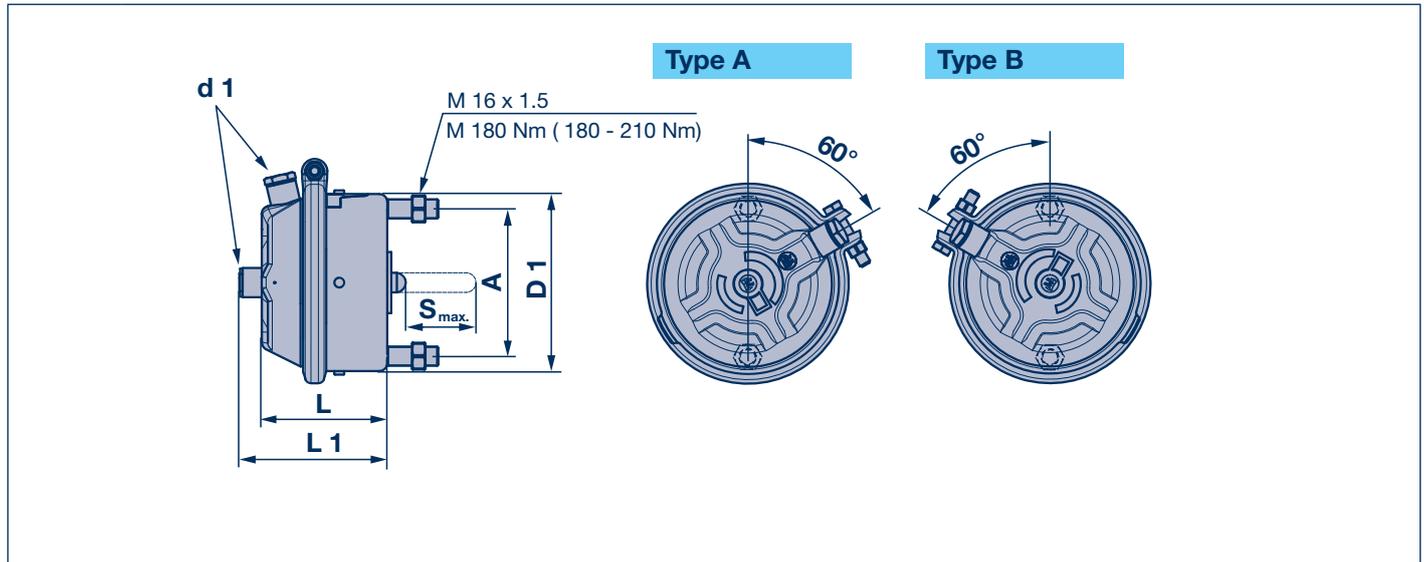
e.g. year 2010 / week 2



3 Brake parts BPW ECO Disc

3.4 TSB 3709 / 4309 / 4312

Brake cylinders, diaphragm cylinder

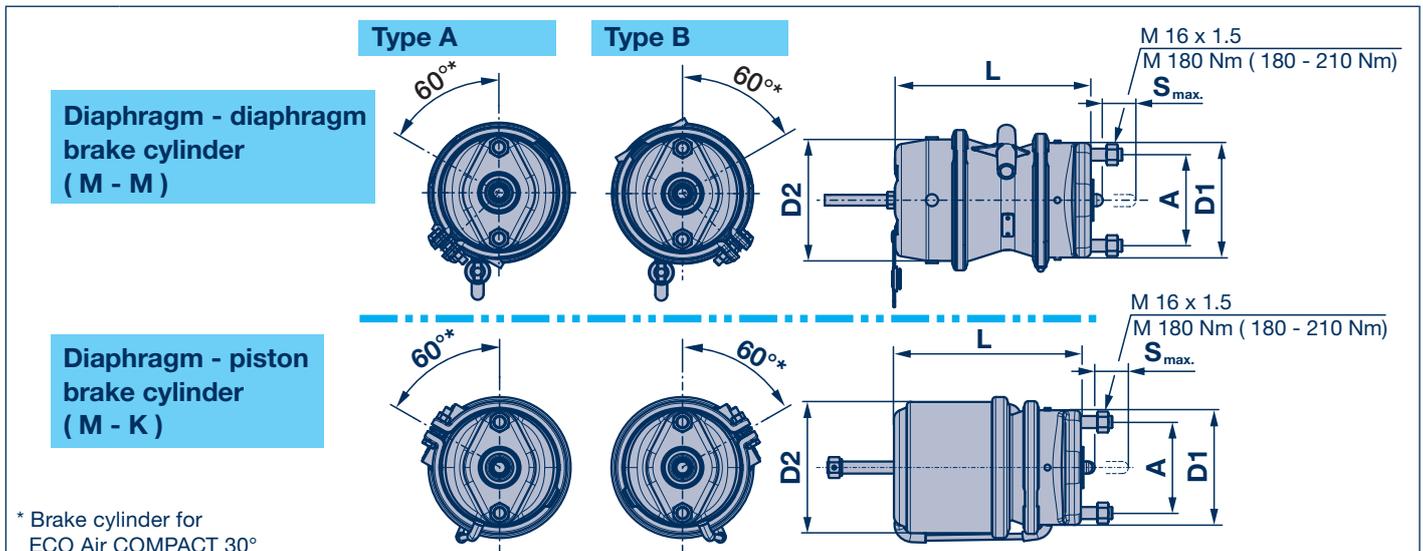


| Brake cylinder size | BPW Code no. | Type | Air connection thread d 1 d 1 | L (mm) | L 1 (mm) | D 1 (mm) | A (mm) Connection dimension | Piston stroke S max. (mm) |
|-------------------------------------|----------------|------|-------------------------------|---------------|---------------------|----------|-----------------------------|---------------------------|
| 14" | 05.444.30.01.0 | B | M 16 x 1.5 | 101 | 116 | 143 | 120.7 | 62 |
| | 05.444.30.02.0 | A | | | | | | |
| 15" | 05.444.31.01.0 | B | | 101 | 116 | 143 | | 60 |
| | 05.444.31.02.0 | A | | | | | | |
| 16" | 05.444.32.01.0 | B | | 101 | 116 | 145 | | 60 |
| | 05.444.32.02.0 | A | | | | | | |
| 18" | 05.444.33.01.0 | B | | 108 | 124 | 150 | | 65 |
| | 05.444.33.02.0 | A | | | | | | |
| 20" | 05.444.34.01.0 | B | | 108 | 124 | 150 | | 65 |
| | 05.444.34.02.0 | A | | | | | | |
| 22" | 05.444.35.01.0 | B | | 110 | 125 | 160 | | 69 |
| | 05.444.35.02.0 | A | | | | | | |
| 24" | 05.444.36.01.0 | B | | 110 | 125 | 160 | | 66 |
| | 05.444.36.02.0 | A | | | | | | |
| Lock nuts for brake cylinder | | | | | | | | |
| | | | | Thread | BPW Code no. | | | |
| | | | | M 16 x 1.5 | 02.5202.21.80 | | | |

Brake parts BPW ECO Disc **3**

TSB 3709 / 4309 / 4312 **3.4**

Brake cylinders, diaphragm - diaphragm / diaphragm - piston



* Brake cylinder for ECO Air COMPACT 30°

| Brake cylinder size | Type | BPW Code no. Brake cylinder without air connection fittings | BPW Code no. Brake cylinder with compressed air connection extension (DLAV) | BPW Code no. Mounting kit * with compressed air connection extension (DLAV) | BPW Code no. Brake cylinder with compressed air connection extension (DLAV) turned on 30° for ECO Air COMPACT | Air connection thread | L (mm) | D 1 (mm) | D 2 (mm) | A (mm) Connection dimension | Piston stroke S max. (mm) |
|---|-----------------|---|---|---|---|--|--------|----------|----------|-----------------------------|---------------------------|
| Diaphragm - diaphragm brake cylinder (M - M) | | | | | | | | | | | |
| 14 / 24" | B | 05.444.38.01.0 | 05.444.38.01.3 | 05.801.21.50.0 | - | M 16 x 1.5 | 235 | 145 | 161 | 120.7 | 57 |
| | A | 05.444.38.02.0 | 05.444.38.02.3 | | | | | | | | |
| 15 / 24" | B | 05.444.39.01.0 | 05.444.39.01.3 | 05.801.21.51.0 | - | | | | | | |
| | A | 05.444.39.02.0 | 05.444.39.02.3 | | | | | | | | |
| 16 / 24" | B | 05.444.40.01.0 | 05.444.40.01.3 | 05.801.21.52.0 | 05.444.40.07.3 | | | | | | |
| | A | 05.444.40.02.0 | 05.444.40.02.3 | | 05.444.40.08.3 | | | | | | |
| 18 / 24" | B | 05.444.42.01.0 | 05.444.42.01.3 | 05.801.21.53.0 | 05.444.42.03.3 | | | | | | |
| | A | 05.444.42.02.0 | 05.444.42.02.3 | | 05.444.42.04.3 | | | | | | |
| 20 / 24" | B | 05.444.44.01.0 | 05.444.44.01.3 | 05.801.21.54.0 | 05.444.44.03.3 | | | | | | |
| | A | 05.444.44.02.0 | 05.444.44.02.3 | | 05.444.44.04.3 | | | | | | |
| Diaphragm - piston brake cylinder (M - K) | | | | | | | | | | | |
| 16 / 16" | B | 05.444.41.01.0 | 05.444.41.01.3 | 05.801.21.55.0 | - | M 16 x 1.5 | 230 | 145 | 162 | 120.7 | 60 |
| | A | 05.444.41.02.0 | 05.444.41.02.3 | | | | | | | | |
| | B ¹⁾ | 05.444.41.03.0 | 05.444.41.03.3 | 05.801.21.59.0 | - | | | | | | |
| | A ¹⁾ | 05.444.41.04.0 | 05.444.41.04.3 | | | | | | | | |
| 20 / 24" | B | 05.444.43.01.0 | 05.444.43.01.3 | 05.801.21.56.0 | - | | | | | | |
| | A | 05.444.43.02.0 | 05.444.43.02.3 | | | | | | | | |
| | B ¹⁾ | 05.444.43.03.0 | 05.444.43.03.3 | 05.801.21.60.0 | 05.444.43.05.3 | | | | | | |
| | A ¹⁾ | 05.444.43.04.0 | 05.444.43.04.3 | | 05.444.43.06.3 | | | | | | |
| 22 / 24" | B | 05.444.45.01.0 | 05.444.45.01.3 | 05.801.21.57.0 | - | | | | | | |
| | A | 05.444.45.02.0 | 05.444.45.02.3 | | | | | | | | |
| | B ¹⁾ | 05.444.45.03.0 | 05.444.45.03.3 | 05.801.21.61.0 | - | | | | | | |
| | A ¹⁾ | 05.444.45.04.0 | 05.444.45.04.3 | | | | | | | | |
| 24 / 24" | B | 05.444.46.01.0 | 05.444.46.01.3 | 05.801.21.58.0 | - | | | | | | |
| | A | 05.444.46.02.0 | 05.444.46.02.3 | | | | | | | | |
| | B ¹⁾ | 05.444.46.03.0 | 05.444.46.03.3 | 05.801.21.62.0 | - | | | | | | |
| | A ¹⁾ | 05.444.46.04.0 | 05.444.46.04.3 | | | | | | | | |
| ¹⁾ for top trailing arm (vent rotated 180°) * BPW complete kit consisting of two brake cylinders (Type A + B) with corresponding fittings (DLAV). | | | | | | Lock nuts for brake cylinder Thread BPW Code no. M 16 x 1.5 02.5202.21.80 | | | | | |

3 Brake parts BPW ECO Disc

3.5 TSB 3709 / 4309 / 4312

BPW Brake Monitor, general

BPW Brake Monitor

With the BPW Brake Monitor retrofit kit for our disc brakes, you can check your vehicle from the outside at any time to see if the wear limit has been reached.

As soon as only one of the brake pads has worn down by approx. 80% the yellow "**WARNING**" LED on the BPW Brake Monitor starts flashing.

Once the minimum pad thickness of 2 mm has been reached, the "**SERVICE**" indicator changes to red, while the green and yellow LEDs flash alternately.

The red **SERVICE** indicator remains visible even if you have parked the vehicle and there is no electrical power supply to the trailer.

This means you can still tell if the wear limit has been reached on at least one brake pad.

If this is the case, you should change the brake pads as soon as possible.



Warning:

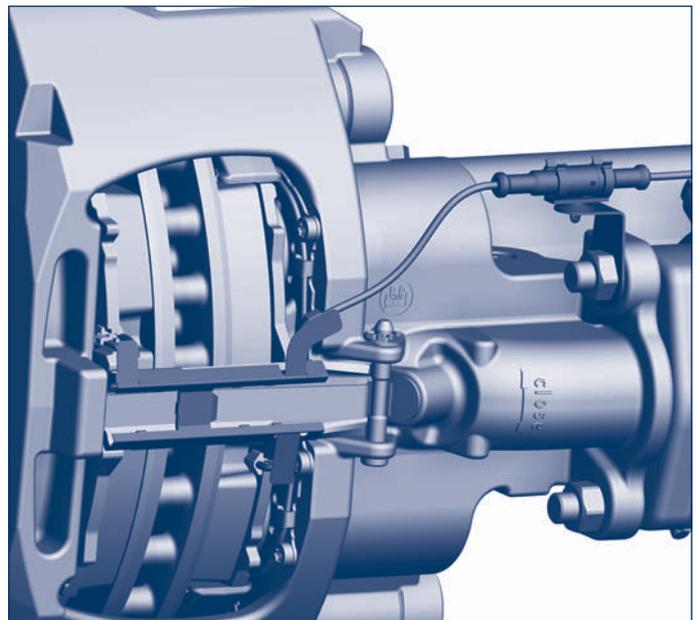
At least one brake pad is approx. 80% worn down!

Service:

At least one brake pad as reached the minimum pad thickness of approx. 2 mm. Have the pads replaced immediately!

BPW Brake Monitor - Features and benefits

- ⊙ Optimum use of the brake pad wear volume
- ⊙ Longer service life for the brake discs and brake
- ⊙ No unscheduled downtime
- ⊙ No expensive follow-on costs (e.g. due to a complete failure)
- ⊙ The service indicator tells you exactly when a brake pad needs changing, even if there is no operating voltage
- ⊙ Operates without a separate ECU and does not need EBS
- ⊙ Individual composition of kits possible because of modules (e.g. for four-axle vehicles)
- ⊙ Quick and easy to install
- ⊙ Can easily be retrofitted
- ⊙ No technical inspection is required, since a general EU certification and hazchem approval have already been obtained
- ⊙ Can be connected to EBS for indication in tractor vehicle

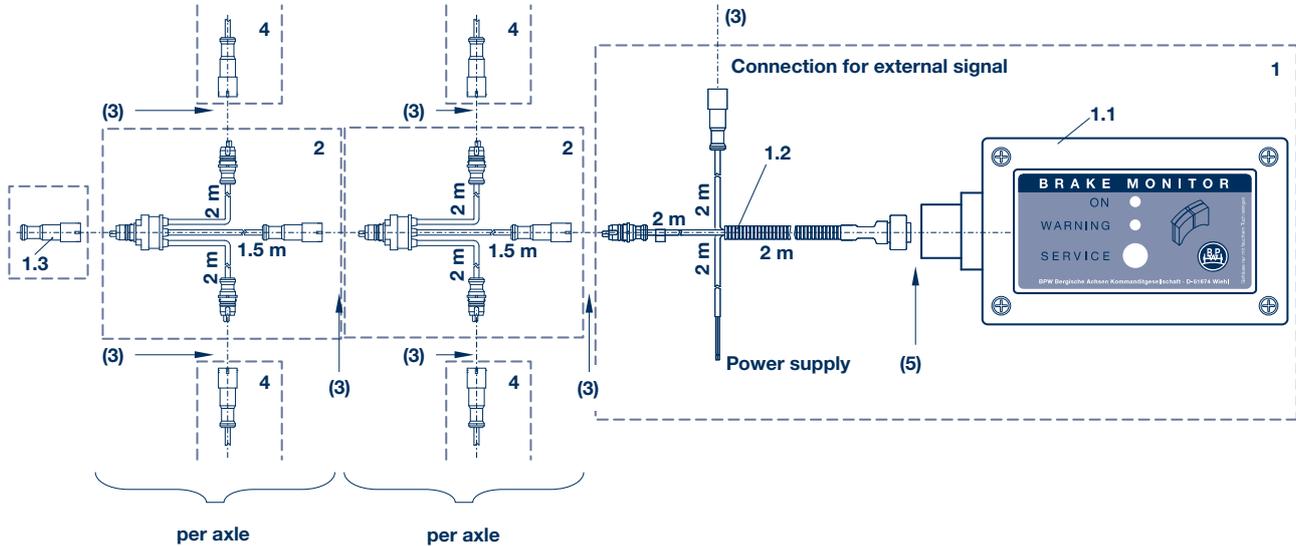


Brake parts BPW ECO Disc **3**

TSB 3709 / 4309 / 4312 **3.5**

Brake Monitor

Component list for BPW brake lining wear indicator (Brake Monitor)



| Item | BPW Code no. | Designation (Remark) | Quantity | | | | | | |
|------|--|--|-------------------------------|-----|-----|-----|-----|-----|-----|
| | | | Vehicle type | | | | | | |
| | | | | | | | | | |
| 1 | 05.801.60.07.0 incl. 1.1 02.0339.01.00 1.2 02.4312.58.00 1.3 02.3713.08.00 | Basic set Brake Monitor with connecting cables Brake Monitor Connecting cable Connecting plug | 1 x | 1 x | 1 x | 1 x | 1 x | 1 x | 1 x |
| 2 | 02.4312.57.00 | Connection modul axle | 1 x | 2 x | 3 x | 4 x | 2 x | 3 x | 4 x |
| 3 | 02.1819.26.00 02.1819.25.00 02.1819.22.00 | Extension 1 m Extension 3 m Extension 5 m 3-pin K/E-connector system | acc. to vehicle configuration | | | | | | |
| 4 | 05.801.49.50.0 | Wear indicator axle set | 1 x | 2 x | 3 x | 4 x | 2 x | 3 x | 4 x |
| 5 | 02.1819.29.00 02.1819.30.00 | Extension 2 m Extension 10 m 7-pin DIN bayonet connector system | acc. to vehicle configuration | | | | | | |

4 Hubs, hub bearings

General

BPW Hub bearings ECO^{Plus} hub bearing

If you require long service life, rapid maintenance and low maintenance costs from your axle, there is only one option for you: ECO^{Plus}.

Working on the basis of the special BPW ECO hub system, the ECO Unit has been further developed to create the trendsetting ECO^{Plus} bearing system.

The maintenance-free hub has an integrated multi-seal system for protecting the tapered roller bearings against dust and dirt.

A central threaded connection with integrated torque limiting function ensures the bearing pre-load is always optimum.

BPW ECO^{Plus} bearing – Features and benefits

- ⊙ Maintenance-free, encapsulated bearing unit (ECO Unit) with integrated multi-seal system to protect the taper roller bearings from dust and dirt.
- ⊙ Integrated torque limiter in the axle nut (ECO^{Plus}) prevents improper use when tightening
- ⊙ Bearings are precisely re-adjusted after every disc replacement
- ⊙ 5+3 years ECO Plus warranty (on-road) without mileage limit
- ⊙ Compact bearing system with DIN-ISO taper roller bearings available worldwide for excellent availability and rapid service
- ⊙ Removal of the complete hub unit - thanks to central threaded connection - with simple tools
- ⊙ Excellent bearing service life with minimal life cycle costs

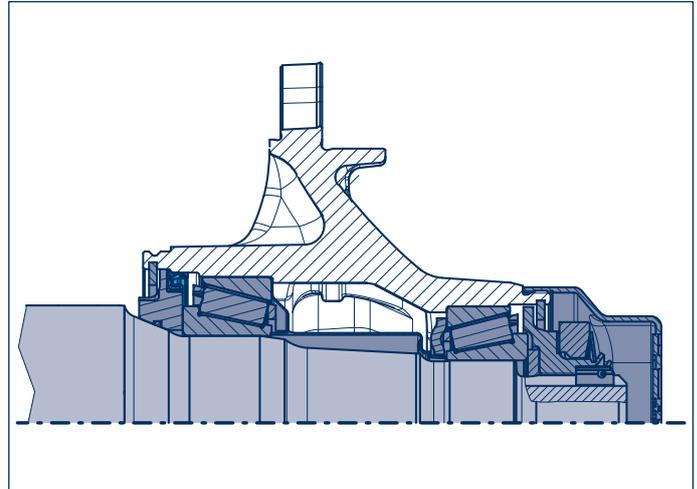


Fig. ECO^{Plus} 10 - 12t

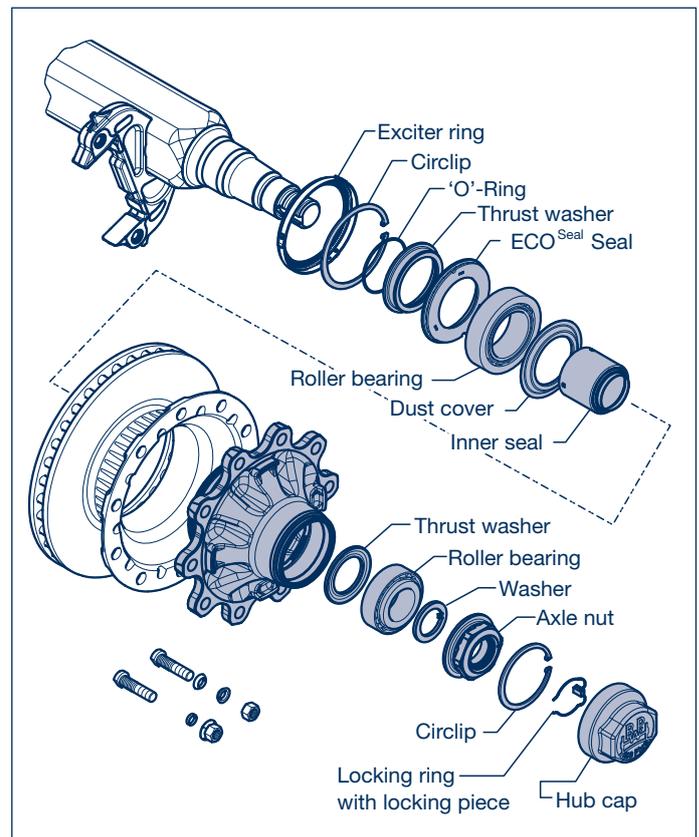


Fig. ECO^{Plus} 10 - 12t

Hubs, hub bearings 4

General

ECO Plus 2 - the new generation of the tried and tested BPW ECO Unit

The BPW ECO Unit, proven a million times over in its ECO^{Plus} version, will be replaced from September 2007 by the still further improved, new ECO Plus 2 design.

A rigorous upgrade of the components has resulted in a significant weight reduction compared with the current ECO^{Plus} Unit.

In the case of the ECO Plus 2 the hub cap has a bayonet fitting, enabling convenient fitting and removal of the cap.

Grease is supplied to the wheel bearings by means of a grease cartridge located between the bearings.

The axle nut previously used is replaced by an axle bolt with integrated torque limiter.

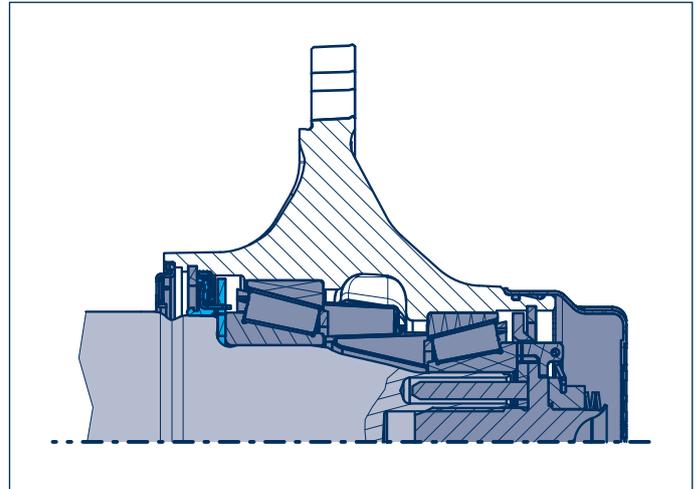


Fig. ECO Plus 2 8 - 9t

ECO Plus 2 bearing - Features and benefits

- ⊙ Maintenance-free, encapsulated bearing unit (ECO Unit) with integrated multi-seal system to protect the taper roller bearings from dust and dirt
- ⊙ Axle bolt with torque limiter prevents improper use when tightening
- ⊙ Bearings are precisely re-adjusted after every disc replacement
- ⊙ 5+3 years ECO Plus warranty (on-road) without mileage limit
- ⊙ Compact bearing system with DIN-ISO taper roller bearings available worldwide for excellent availability and rapid service
- ⊙ Removal of the complete hub unit - thanks to central threaded connection - with simple tools
- ⊙ Simple greasing of the bearing by means of a grease cartridge
- ⊙ Excellent bearing service life with minimal life cycle costs
- ⊙ In conjunction with the revised air suspension system there are weight-savings of up to 25 kg, depending on the axle model
- ⊙ Existing approvals and homologations remain in force

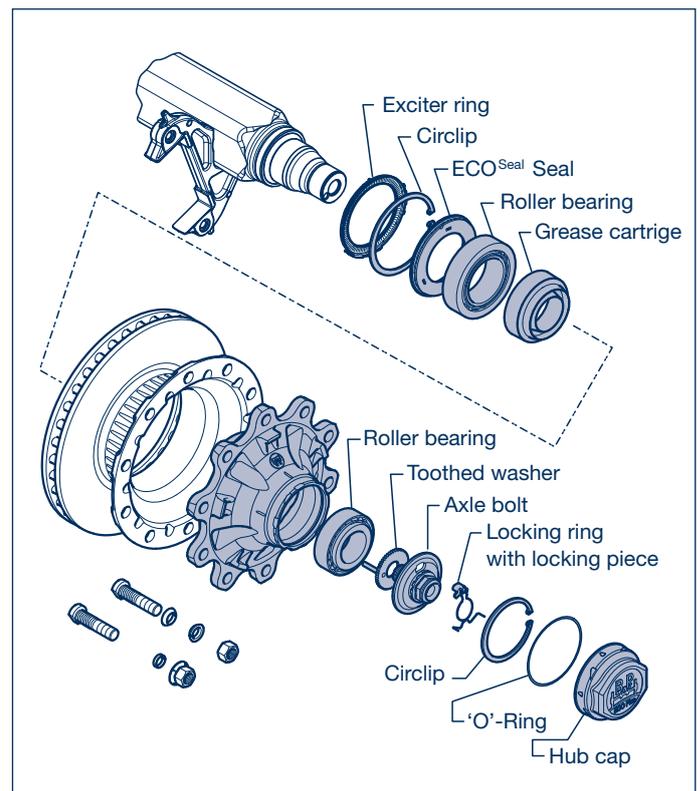


Fig. ECO Plus 2 8 - 9t

4 Hubs, hub bearings

General

ECO Plus 2

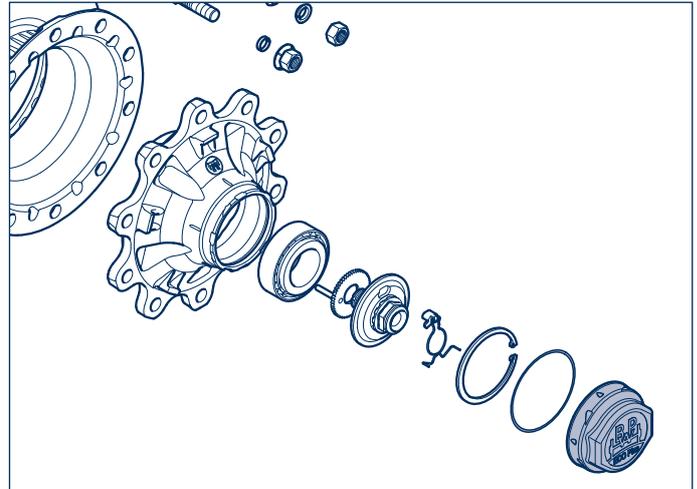
Hub cap / ECOMETER

BPW trailer axles with the ECO Plus 2 Unit have hub caps (and ECOMETERS) with a bayonet fitting.

The bayonet fitting replaces the previously usual threaded connection.

A 120 mm installation spanner (BPW part number 03.339.05.02.0, see also BPW tool catalogue) is needed for fitting or removing the new hub caps with the bayonet fitting.

 **An impact driver must not be used for fitting / removing hub caps or ECOMETERS with a bayonet fitting!**



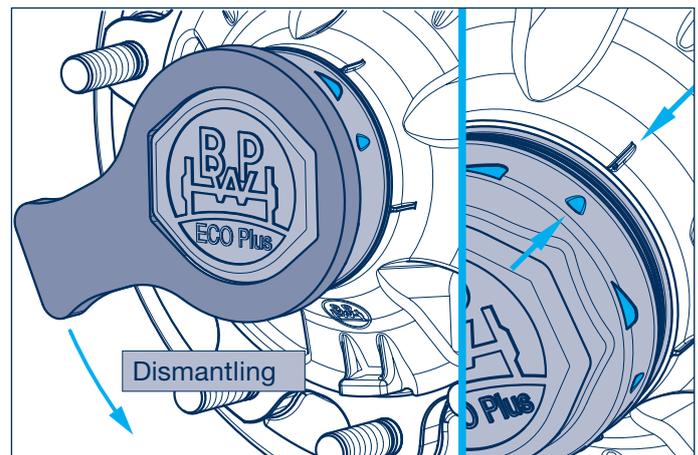
Removal

To remove the hub cap it is turned anticlockwise through approx. 30 degrees with the installation spanner (Fig.).

When turned further, the hub cap lifts clearly away from the hub seat.

The released position is also indicated by markings on the hub cap and on the wheel hub (Fig. / Arrows).

In the released position the hub cap can be removed from the wheel hub by pulling it away.



Assembly

The seal between the hub cap and the wheel hub takes the form of an 'O'-ring in the case of the ECO Plus 2 Unit.

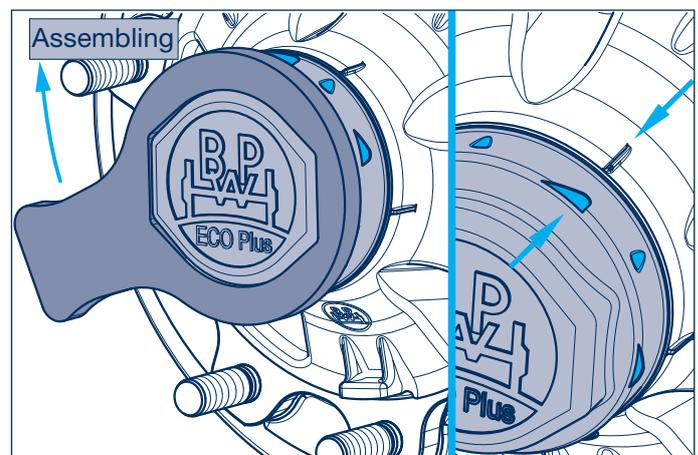
The 'O'-ring is inserted in the groove on the hub collar of the wheel hub, and is to be replaced every time. The hub cap itself is to be given a thin coating of BPW ECO-Li^{Plus} special long-life grease inside in the area of the bayonet fitting, before assembly.

Corresponding markings in the hub cap and on the hub make it easier to fit the hub cap.

The figure shows the hub cap in the correct position for fitting, with the spanner engaged.

After been placed in position, the hub cap is pressed onto the hub and at the same time turned in clockwise direction.

The hub cap is firmly in place when the position shown in Fig. (arrows) has been reached.



Hubs, hub bearings 4

General

Hub seal for ECO^{Plus} bearings

The innovative ECO^{Seal} sealing system is used on all axles with the BPW ECO Disc Trailer disc brake.

With this hub seal, the primary seal lip (ECO^{Seal}) no longer seals directly against the race of the hub but instead against a race which is integrated in the seal itself.

This new design enables the circumferential velocity of the seal to be significantly reduced, and with that, the amount of wear. In addition, the wheel bearing is provided with even better protection against dirt penetration by means of the covering dust and dirt sealing lips.

Benefits:

- ⊙ An introversive pre-stressed main seal lip with a low circumferential speed and a low thermal load, resulting in low wear
- ⊙ An approximately 30% reduction in frictional resistance inside the seal (compared with conventional seals)
- ⊙ The seal is well protected during service due to the cartridge construction
- ⊙ Pre-stressed main seal lip with ventilation function, no opening at low pressures
- ⊙ No coarse dirt seal required

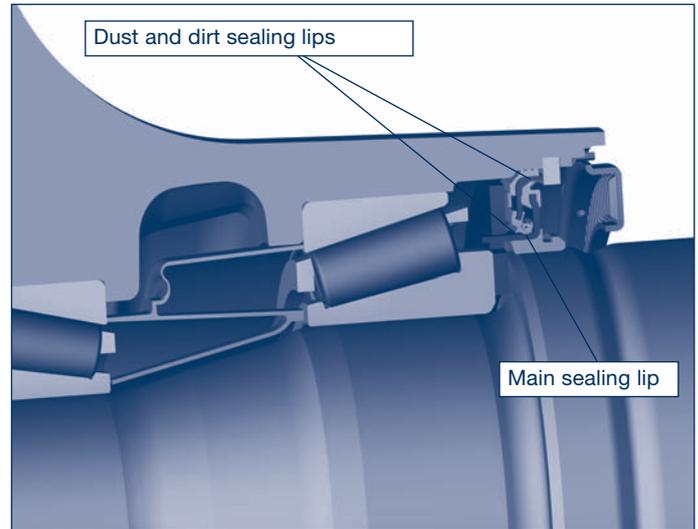


Fig. ECO Plus 2 8 - 9t

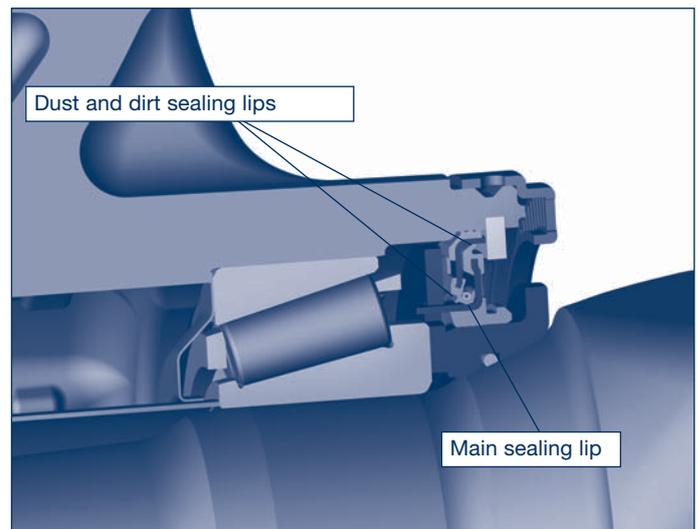


Fig. ECO^{Plus} 10 - 12t

4 Hubs, hub bearings

General

BPW Hub bearings ECO Plus 3 hub bearing

Starting from the special BPW ECO Plus 2 hub system, the ECO Unit was further developed and resulted in the ECO Plus 3 bearing.

The maintenance-free hub has an integrated multi-seal system to protect the tapered roller bearings against dust and dirt.

With the ECO Plus 3, the hub cap has a screw connection (M 135 x 2 / SW 110), which allows comfortable assembly and disassembly of the cap.

The tightening torque of the hub cap is 350 Nm.

An O-ring inserted between wheel hub and hub cap guarantees sealing against moisture and dirt.

Grease is supplied to the wheel bearings by means of a grease cartridge located between the bearings.

A central threaded connection with integrated torque limiting function ensures the bearing pre-load is always optimum.

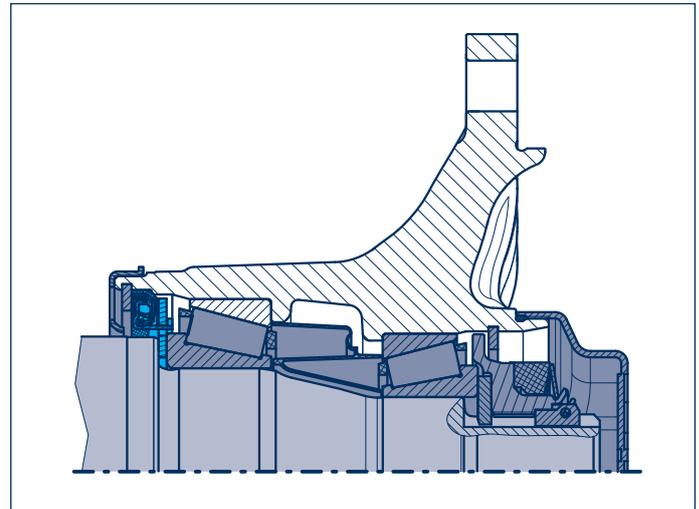
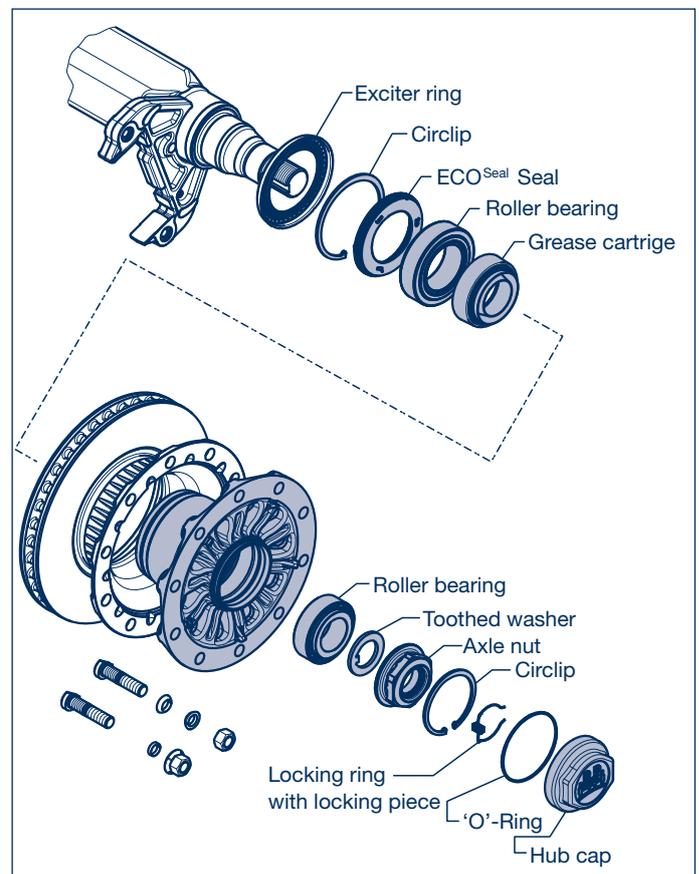


Fig. ECO Plus 3 8 - 9t

ECO Plus 3 bearing - Features and benefits

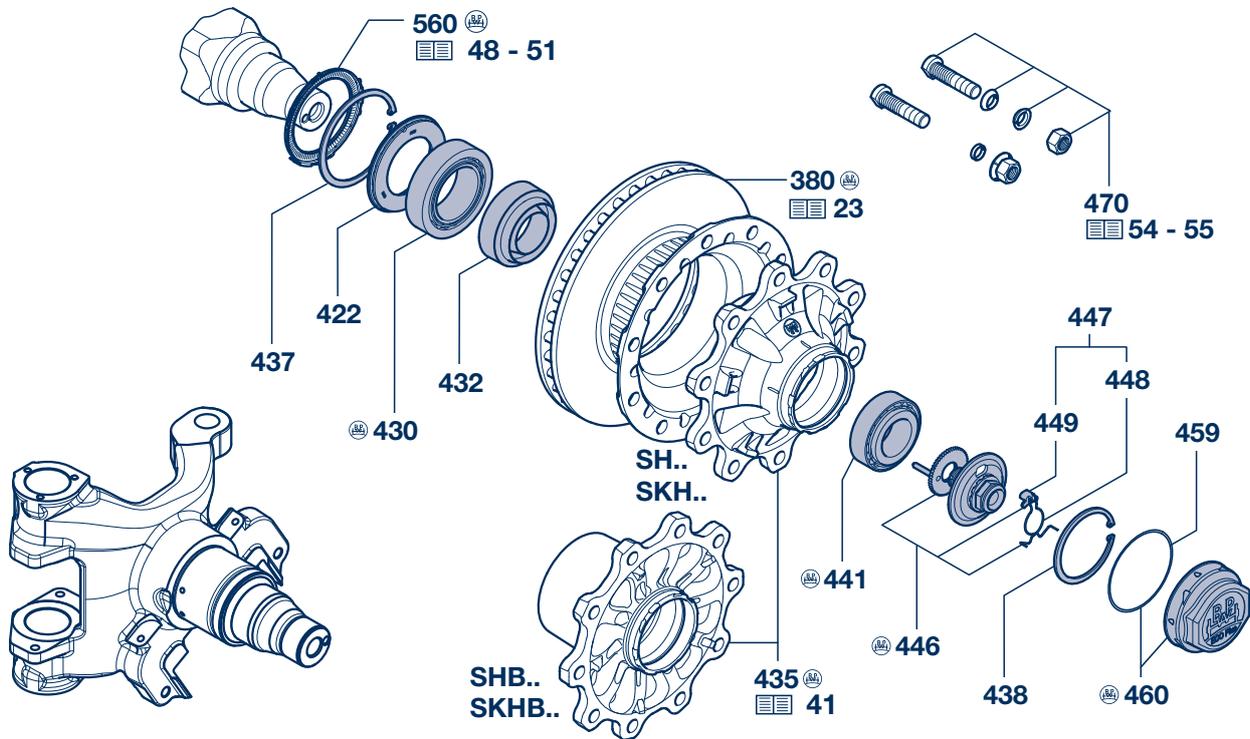
- ⊙ Maintenance-free, encapsulated bearing unit (ECO Unit) with integrated multi-seal system to protect the taper roller bearings from dust and dirt
- ⊙ Axle nut (ECO Plus 3) with torque limiter prevents improper use when tightening
- ⊙ Bearings are precisely re-adjusted after every disc replacement
- ⊙ 5+3 years ECO Plus warranty (on-road) without mileage limit
- ⊙ Compact bearing system with DIN-ISO taper roller bearings available worldwide for excellent availability and rapid service
- ⊙ Removal of the complete hub unit - thanks to central threaded connection - with simple tools
- ⊙ Simple greasing of the bearing by means of a grease cartridge
- ⊙ Excellent bearing service life with minimal life cycle costs
- ⊙ Existing approvals and homologations remain in force



4 Hubs, hub bearings

4.1 Hub bearing

ECO Plus 2 hub system (ECO Plus 2 Unit)



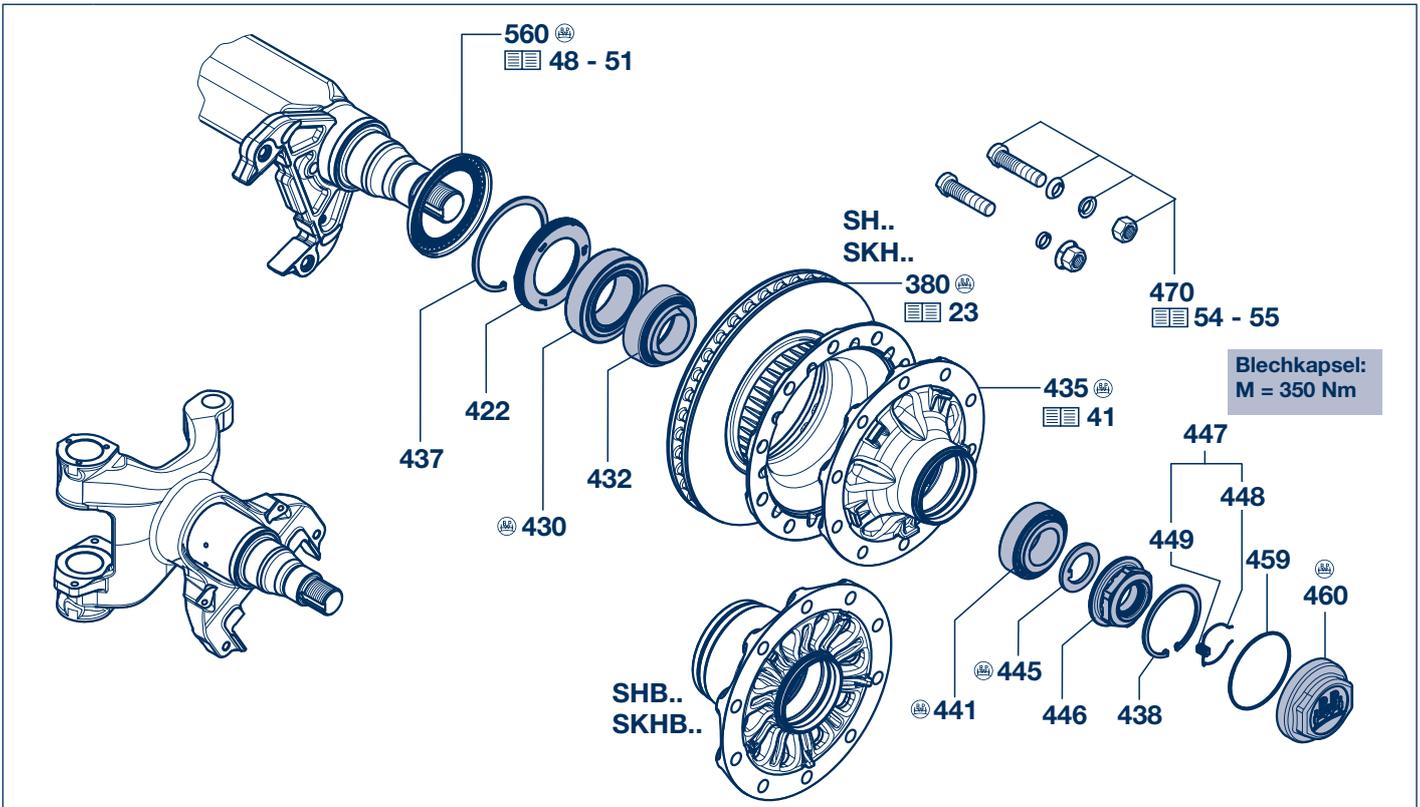
| Item | Designation | BPW Code no. | Dimension |
|------|--|---|--|
| | | SH.. ECO Plus 2 SKH.. ECO Plus 2 8 - 9t | --.58.---- / --.59.---- |
| 380 | Brake disc | see page 23 | |
| 418 | Repair kit roller bearing, with axle bolt and hub cap, item 422 - 432, 437 - 460 | 09.801.07.33.0 | for one axle side |
| 419 | Repair kit roller bearing, without axle bolt and hub cap, item 422, 430, 437 - 441, 459 | 09.801.07.34.0 | for one axle side |
| 422 | ECO ^{Seal} seal | 02.5664.74.00 | Ø 117.5 x 158 x 18.9 |
| 430 | Roller bearing | 02.6410.23.00 | 33118 |
| 432 | Grease cartridge | 03.120.47.08.0 | Ø 101 / 130 x 50 |
| 435 | Hub | see page 41 | |
| 437 | Circlip | 02.5606.58.90 | 158 x 4 / 472 |
| 438 | Circlip | 02.5606.22.90 | 122 x 4 / 472 |
| 441 | Roller bearing | 02.6410.22.00 | 33213 |
| 446 | Axle bolt with toothed washer, incl. item 447 | 09.001.37.03.0 | M 32 x 2 / SW 46 |
| 447 | Locking ring cpl., item 448 + 449 | 05.188.03.10.0 | |
| 448 | Locking ring | 03.188.03.09.0 | |
| 449 | Locking piece | 03.277.10.01.0 | |
| 459 | 'O'-Ring | 02.5678.65.00 | Ø 128 x 3 |
| 460 | Hub cap (Bayonet), incl. item 459 | normal 05.212.25.78.0 chrome ¹⁾ 05.212.25.81.0 | Ø 137 / 142.6 x 56.3 / SW 120 Ø 137 / 142.6 x 56.3 / SW 120 |

¹⁾ Not corrosion-resistant acc. to DIN 50021

Hubs, hub bearings 4

Hub bearing 4.2

ECO Plus 3 hub system (ECO Plus 3 Unit)



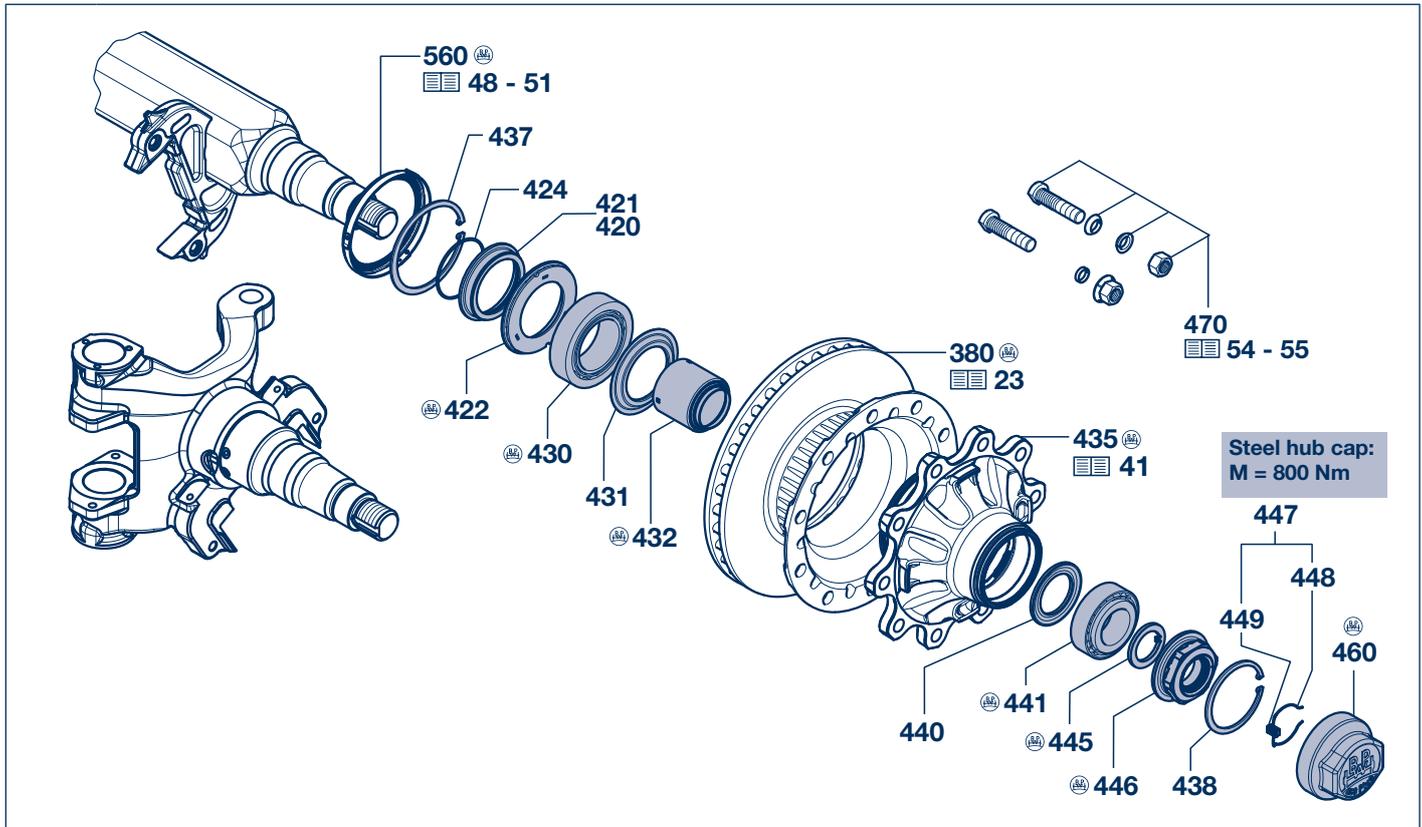
| Item | Designation | BPW Code no. | Dimension |
|------|--|--------------------------------|--|
| | | SH.. ECO Plus 3 | |
| | | SKH.. ECO Plus 3 | |
| | | 8 - 9t | --.68.--.---- |
| 380 | Brake disc | see page 23 | |
| 418 | Repair kit roller bearing, with axle nut and hub cap, item 422 - 432, 437 - 460 | 09.801.08.40.0 | for one axle side |
| 419 | Repair kit roller bearing, without axle nut and hub cap, item 422 - 432, 437 - 445, 459 | 09.801.08.41.0 | for one axle side |
| 422 | ECO ^{Seal} seal | 02.5664.77.00 | Ø 117 / 158 x 15 |
| 430 | Roller bearing | 02.6410.23.00 | 33118 |
| 432 | Grease cartridge | 03.120.47.08.0 | Ø 101 / 130 x 50 |
| 435 | Hub | see page 41 | |
| 437 | Circlip | 02.5606.58.90 | 158 x 4 / 472 |
| 438 | Circlip | 02.5606.22.90 | 122 x 4 / 472 |
| 441 | Roller bearing | 02.6410.22.00 | 33213 |
| 445 | Washer | 03.320.65.05.0 | Ø 53 / 83 x 5.8 |
| 446 | Axle nut | 05.266.47.11.0 | M 52 x 2 / SW 95 |
| 447 | Locking ring cpl., item 448 + 449 | 05.188.04.15.0 | |
| 448 | Locking ring | 03.188.04.10.0 | Ø 62 x 1,8 |
| 449 | Locking piece | 03.277.00.07.0 | |
| 459 | 'O'-Ring | 02.5678.72.00 | Ø 126 x 3 |
| 460 | Hub cap, incl. item 459 | normal chrome ¹⁾ | 05.212.25.98.0 M 135 x 2 / H 48 / SW 110 05.212.25.99.0 M 135 x 2 / H 48 / SW 110 |

¹⁾ Not corrosion-resistant acc. to DIN 50021

4 Hubs, hub bearings

4.1 Hub bearing

ECO^{Plus} hub system (ECO^{Plus} Unit)



| Item | Designation | BPW Code no. | Dimension | |
|------|---|--|--|--------------------------------|
| | | SH.. ECO^{Plus} SKH.. ECO^{Plus} 10 - 12t | --.50.----.---- | |
| 380 | Brake disc | see page 23 | | |
| 419 | Repair kit roller bearing, without axle nut and hub cap, item 420, 422, 430 - 432, 440 - 445 | 09.801.07.04.0 | for one axle side | |
| 420 | Thrust washer cpl., item 421, 424 | 05.370.07.73.0 | | |
| 421 | Thrust washer | 03.370.07.72.0 | Ø 96 / 117.5 / 132 x 22 | |
| 422 | ECO ^{Seal} seal | 02.5664.74.00 | Ø 117.5 x 158 x 18.9 | |
| 424 | 'O'-Ring | 02.5678.00.00 | Ø 100 x 3 | |
| 430 | Roller bearing | 02.6410.23.00 | 33118 | |
| 431 | Dust cover | 03.010.93.34.0 | Ø 94 / 149 x 8.5 | |
| 432 | Seal | 03.120.45.16.0 | Ø 67 / 93 x 90.5 | |
| 435 | Hub | see page 41 | | |
| 437 | Circlip | 02.5606.58.90 | 158 x 4 / 472 | |
| 438 | Circlip | 02.5606.22.90 | 122 x 4 / 472 | |
| 440 | Thrust washer | 03.370.26.24.0 | Ø 71 / 108 x 8 | |
| 441 | Roller bearing | 02.6410.22.00 | 33213 | |
| 445 | Washer | 03.320.64.01.0 | Ø 53 / 76 x 5.8 | |
| 446 | Axle nut | 05.266.47.11.0 | M 52 x 2 / SW 95 | Replacement for 05.266.47.06.0 |
| 447 | Locking ring cpl., item 448 + 449 | 05.188.04.15.0 | | |
| 448 | Locking ring | 03.188.04.10.0 | | |
| 449 | Locking piece | 03.277.00.07.0 | | |
| 460 | Hub cap | normal chrome ¹⁾ | 03.212.25.31.0* M 136 x 2.5 / SW 110 03.212.25.57.0* M 136 x 2.5 / SW 110 | |

¹⁾ Not corrosion-resistant acc. to DIN 50021

Hubs, hub bearings 4

Hubs 4.4

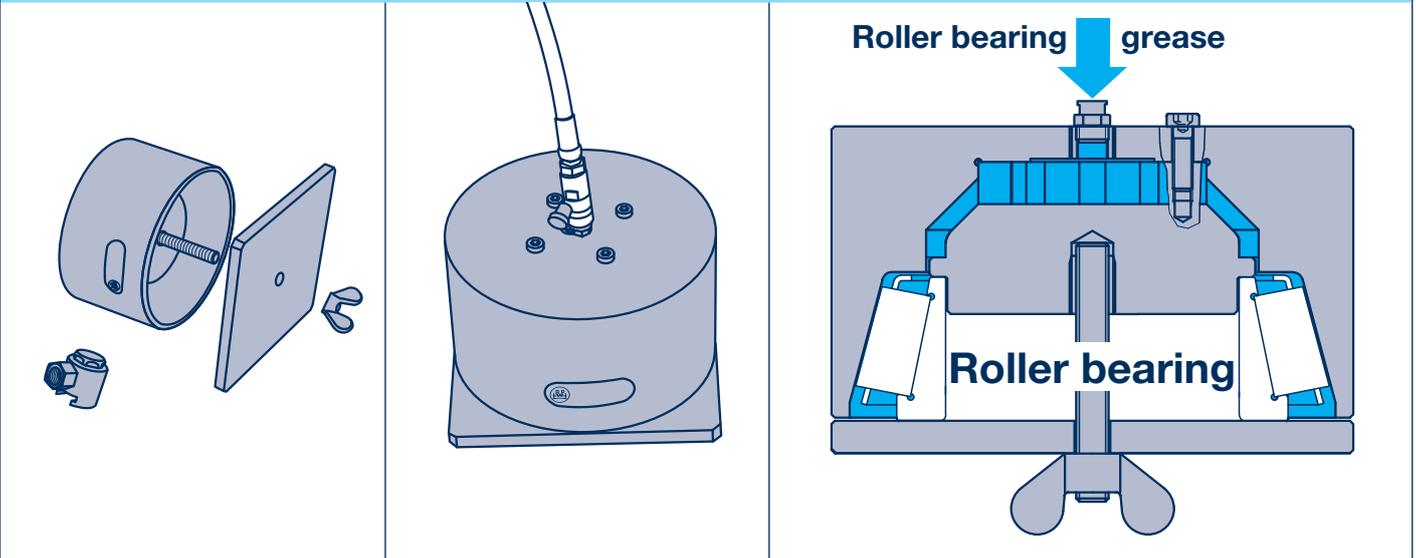
| Item | Designation (Remark) | Hub cap thread | Hub BPW Code no. | Complete hub BPW Code no. | |
|--|--------------------------------|------------------------|---------------------------|---------------------------|----------------|
| SKH..(LL) ECO Plus 2 (TSB 3709) | | | | | |
| 435 | Hub | | 8 - 9t --58,----,--- | | |
| | 220.8 / 275 / 8 x Ø 22 | | | | |
| | SKH.. ECO Plus 2 | Steel and alloy wheels | Bayonet lock | 03.272.46.33.0 | 09.801.07.36.0 |
| | SKMZ..LL ECO Plus 2 | Steel wheels | | | |
| | SKHZMLL ECO Plus 2 | Alloy wheels | | | |
| | 280.8 / 335 / 10 x Ø 22 | | | | |
| SKH.. ECO Plus 2 | Steel and alloy wheels | Bayonet lock | 03.272.43.29.0 | 09.801.07.35.0 | |
| SKMS..LL ECO Plus 2 | Steel wheels | | | | |
| SKHB.. ECO Plus 2 | Steel and alloy wheels | | 03.272.43.28.0 | 09.801.07.32.0 | |
| SH..(LL) ECO Plus 2 (TSB 4309 / 4312) | | | | | |
| 435 | Hub | | 8 - 9t --58,----,--- | | |
| | 280.8 / 335 / 10 x Ø 22 | | | | |
| | SH.. ECO Plus 2 | Steel and alloy wheels | Bayonet lock | 03.272.46.29.0 | 09.801.07.35.0 |
| | SHSLL.. ECO Plus 2 | Steel and alloy wheels | | | |
| | SMS..LL ECO Plus 2 | Steel wheels | | | |
| | SMS..LL ECO Plus 2 | Steel wheels | | | |
| SHB.. ECO Plus 2 | Steel and alloy wheels | Bayonet lock | 03.272.43.28.0 | 09.801.07.32.0 | |
| SHB..LL ECO Plus 2 | Steel and alloy wheels | | | | |
| SMB..LL ECO Plus 2 | Steel wheels | | | | |
| SKH..(LL) ECO Plus 3 (TSB 3709) | | | | | |
| 435 | Hub | | 8 - 9t --68,--,----- | | |
| | 220.8 / 275 / 8 x Ø 22 | | | | |
| | SKH.. ECO Plus 3 | Steel and alloy wheels | M 135 x 2 | 03.272.46.37.0 | - |
| | SKMZ..LL ECO Plus 3 | Steel wheels | | | |
| | SKHZMLL ECO Plus 3 | Alloy wheels | | | |
| | 280.8 / 335 / 10 x Ø 22 | | | | |
| SKHB.. ECO Plus 3 | Steel and alloy wheels | M 135 x 2 | 03.272.43.41.0 | 09.801.08.36.0 | |
| SKH.. ECO Plus 3 | Steel and alloy wheels | | 03.272.43.42.0 | 09.801.08.39.0 | |
| SH..(LL) ECO Plus 3 (TSB 4309) | | | | | |
| 435 | Hub | | 8 - 9t --68,--,----- | | |
| | 280.8 / 335 / 10 x Ø 22 | | | | |
| | SHB.. ECO Plus 3 | Steel and alloy wheels | M 135 x 2 | 03.272.43.41.0 | 09.801.08.36.0 |
| SHB.. ECO Plus 3 | Steel and alloy wheels | | 03.272.43.42.0 | 09.801.08.39.0 | |
| SKH..(LL) ECO^{Plus} (TSB 3709) | | | | | |
| 435 | Hub | | 10 - 12t --50,----,--- | | |
| | 220.8 / 275 / 8 x Ø 22 | | | | |
| | SKH.. ECO ^{Plus} | Steel and alloy wheels | M 136 x 2.5 | 03.272.46.30.2 | 09.801.06.59.2 |
| | 280.8 / 335 / 10 x Ø 22 | | | | |
| | SKH.. ECO ^{Plus} | Steel and alloy wheels | M 136 x 2.5 | 03.272.43.24.2 | 09.801.06.22.0 |
| SKHZM.. ECO ^{Plus} | Alloy wheels | | 03.272.43.18.0 | 09.801.06.83.0 | |
| SH..(LL) ECO^{Plus} (TSB 4309 / 4312) | | | | | |
| 435 | Hub | | 10 - 12t --50,----,--- | | |
| | 280.8 / 335 / 10 x Ø 22 | | | | |
| | SH.. ECO ^{Plus} | Steel and alloy wheels | M 136 x 2.5 | 03.272.43.22.2 | 09.801.06.62.2 |
| SHZM.. ECO ^{Plus} | Alloy wheels | | 03.272.43.26.2 | 09.801.06.23.2 | |

4 Hubs, hub bearings

4.5 Grease filling, bearing adjustment

Grease sprays

Grease sprays for greasing taper roller bearings



| Grease spray | for taper roller bearing | BPW Code no. grease spray loose | BPW Code no. complete set |
|---|--------------------------|---------------------------------|---------------------------|
| | 33118 | 16.062.22935 | 99.00.000.9.55 |
| | 33213 | 16.068.22935 | |
| Complete set including adapter for flat grease nipple | | | |
| Adapter for flat grease nipple | | BPW Code no. | |
| | | 15.069.22935 | |

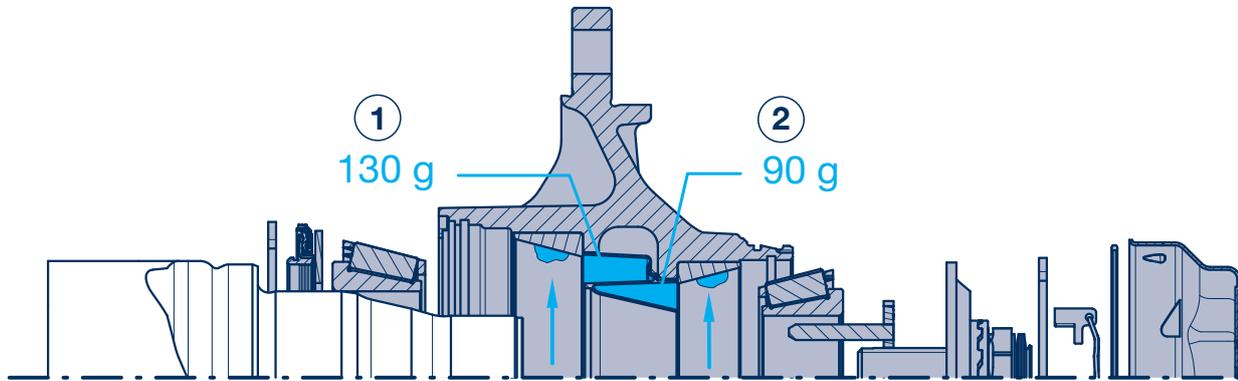
Hubs, hub bearings 4

Grease filling, bearing adjustment 4.6

ECO Plus 2 Hub system (ECO Plus 2 Unit)

Grease filling per wheel hub

ECO Plus 2 hub system (ECO Plus 2 Unit)



The ECO Plus 2 hub system is designed for the use of longlife grease. On expiry of the guarantee, the roller bearings, the inside of the hub and the seals are to be thoroughly cleaned (with diesel oil), dried, checked to see if they can be re-used; and re-greased every three years when used off-road, or every 5 years when used on the road, within Europe (or every year when off-road and every two years when on the road outside of Europe) (observe the current BPW maintenance instructions). Apply **BPW ECO-Assembly and Protection Spray** as thin as possible and around the entire area of bearing seats of the axle stub.

| | | BPW longlife roller bearing grease ECO-Li ^{Plus} , Quantity per tapered roller bearing | | | |
|---------------|--|--|----------|-----------------|----------|
| | | ① inner | | ② outer | |
| Axle load | Axle type | Roller bearings | Quantity | Roller bearings | Quantity |
| 8000 - 9000kg | SH.. 8 - 9t ECO Plus 2 SK.. 8 - 9t ECO Plus 2 | 33118 | 130 g | 33213 | 90 g |

- ① Clean the grease cartridge and fill it on both sides up to the edge with **BPW longlife roller bearing grease ECO-Li^{Plus}**.
+ Apply a ring-shaped bead of grease to the running surfaces of the outer bearing races.
② Apply a coat of **BPW longlife roller bearing grease ECO-Li^{Plus}** all around the lip of the seal.

For other procedures see the current maintenance instructions.

When BPW grease applicators are used there is no need to fill the grease cartridge or to apply the bead of grease.
Greasing with grease spray see page 42.

Bearing adjustment

ECO Plus 2 hub system (ECO Plus 2 Unit)

- Undo the hub cap by turning it through approx. 30 degrees in an anticlockwise direction (see page 34).
When turned further the hub cap lifts clearly away from the ECO unit and can be removed by pulling it away.
- Remove the hooked spring ring and retaining key from the axle bolt.
- Tighten the axle bolt while at the same time turning the ECO unit with a 46 mm hexagon spanner until the crown of the axle bolt clicks round.
NB! Do not use an impact driver.
- Insert the retaining key into the recess in the axle bolt and into the crown of the toothed lock washer (do not turn the axle bolt back).
- Insert the hooked spring ring into the groove at the end of the hexagon profile of the axle bolt.
- Insert a new 'O'-ring into the groove in the wheel hub.
- Apply a thin layer of **BPW longlife roller bearing grease ECO-Li^{Plus}** to the hub cap in the area of the O-ring contact surface and the bayonet fitting.
- Put the hub cap on (position 1, page 34). Use the 120 mm hub cap spanner to lock the hub cap in place by turning it through approx. 30 degrees in a clockwise direction, while at the same time pressing on the hub cap. It is firmly in place when it reaches position 2 (page 34).

NB! Do not use an impact driver - bayonet fitting.

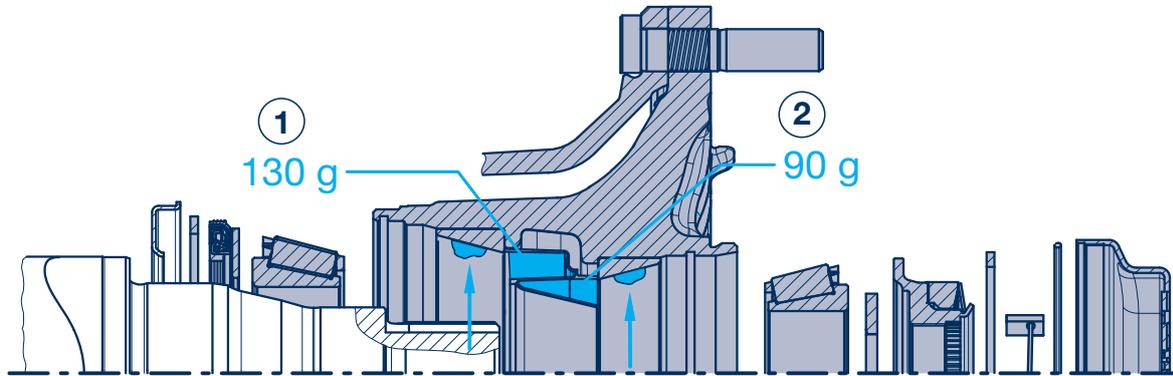
4 Hubs, hub bearings

4.5 Grease filling, bearing adjustment

ECO Plus 3 hub system (ECO Plus 3 Unit)

Grease filling per wheel hub

ECO Plus 3 hub system (ECO Plus 3 Unit)



The ECO Plus 3 hub system is designed for the use of longlife grease. On expiry of the guarantee, the roller bearings, the inside of the hub and the seals are to be thoroughly cleaned (with diesel oil), dried, checked to see if they can be re-used; and re-greased every three years when used off-road, or every 5 years when used on the road, within Europe (or every year when off-road and every two years when on the road outside of Europe) (observe the current BPW maintenance instructions).

Apply **BPW ECO-Assembly and Protection Spray** as thin as possible and around the entire area of bearing seats of the axle stub.

| | | BPW longlife roller bearing grease ECO-Li ^{Plus} , Quantity per tapered roller bearing | | | |
|---------------|--|--|----------|-----------------|----------|
| | | ① inner | | ② outer | |
| Axle load | Axle type | Roller bearings | Quantity | Roller bearings | Quantity |
| 8000 - 9000kg | SH.. 8 - 9t ECO Plus 3 SK.. 9 - 9t ECO Plus 3 | 33118 | 130 g | 33213 | 90 g |

- ① Clean the grease cartridge and fill it on both sides up to the edge with **BPW longlife roller bearing grease ECO-Li^{Plus}**.
 + Apply a ring-shaped bead of grease to the running surfaces of the outer bearing races.
 ② Apply a coat of **BPW longlife roller bearing grease ECO-Li^{Plus}** all around the lip of the seal.

For other procedures see the current maintenance instructions.

When BPW grease applicators are used there is no need to fill the grease cartridge or to apply the bead of grease.
 Greasing with grease spray see page 42.

Bearing adjustment

ECO Plus 3 hub system (ECO Plus 3 Unit)

- Unscrew the hub cap.
- Remove the hooked spring ring and retaining key from the axle nut.
- Use a spanner to tighten the axle nut whilst at the same time turning the wheel hub, until the axle nut torque limiter operates (do not use an impact driver).
- Fit the retaining key in the groove between the axle stub and the nut (do not reset the axle nut).
- Insert the hooked spring ring, depending on the version, behind the flange on the axle nut or in the thread on the axle stub.
- Insert a new 'O'-ring into the groove in the wheel hub.
- Screw on hub cap and tighten to 350 Nm.

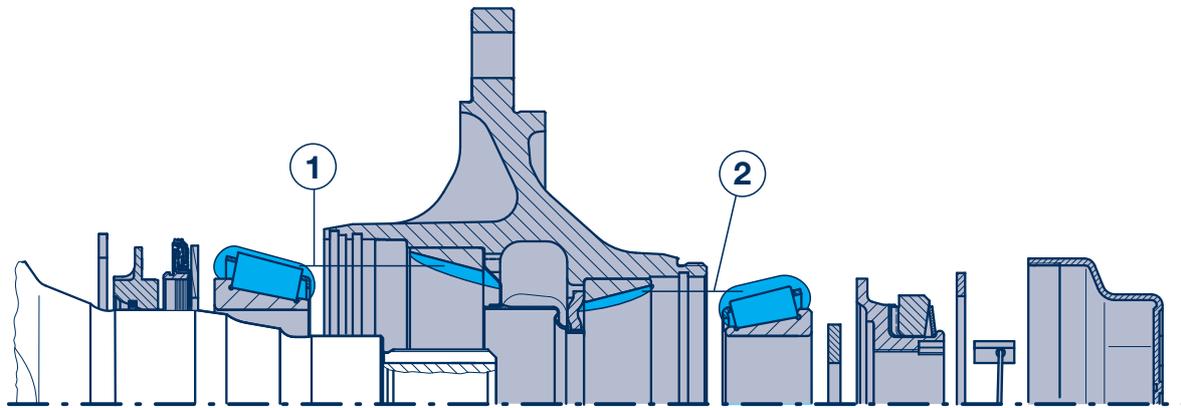
Hubs, hub bearings 4

Grease filling, bearing adjustment 4.6

ECO^{Plus} hub system (ECO^{Plus} Unit)

Grease filling per wheel hub

ECO^{Plus} hub system (ECO^{Plus} Unit)



The ECO^{Plus} hub system is designed for the use of longlife grease. On expiry of the guarantee, the roller bearings, the inside of the hub and the seals are to be thoroughly cleaned (with diesel oil), dried, checked to see if they can be re-used; and re-greased every three years when used off-road, or every 5 years when used on the road, within Europe (or every year when off-road and every two years when on the road outside of Europe) (observe the current BPW maintenance instructions).

Apply **BPW ECO-Assembly and Protection Spray** as thin as possible and around the entire area of bearing seats of the axle stub.

| | | BPW longlife roller bearing grease ECO-Li ^{Plus} , Quantity per tapered roller bearing | | | |
|-----------------|-----------------------------------|--|----------|-----------------|----------|
| | | ① inner | | ② outer | |
| Axle load | Axle type | Roller bearings | Quantity | Roller bearings | Quantity |
| 10000 - 12000kg | SH.. 10 - 12t ECO ^{Plus} | 33118 | 170 g | 33213 | 120 g |
| | SK.. 10 - 12t ECO ^{Plus} | | 130 g * | | 90 g * |

- ① Work **BPW longlife roller bearing grease ECO-Li^{Plus}** thoroughly into the spaces between the tapered rollers and the races. Apply remainder to outer races in the hub.
 +
 ② Apply a coat of **BPW longlife roller bearing grease ECO-Li^{Plus}** all around the lip of the seal.

For other procedures see the current maintenance instructions.

* Greasing with grease spray (see page 42).

Bearing adjustment

ECO^{Plus} hub system (ECO^{Plus} Unit)

- Unscrew the hub cap.
- Remove the hooked spring ring and retaining key from the axle nut.
- Use a spanner to tighten the axle nut whilst at the same time turning the wheel hub, until the axle nut torque limiter operates (do not use an impact driver).
- Fit the retaining key in the groove between the axle stub and the nut (do not reset the axle nut).
- Insert the hooked spring ring, depending on the version, behind the flange on the axle nut or in the thread on the axle stub.
- Screw on hub cap and tighten to 800 Nm.

| BPW longlife roller bearing grease ECO-Li ^{Plus} | Container | BPW Code no. |
|---|------------------|---------------|
| | 0.4 kg Cartridge | 02.1040.45.00 |
| | 5 kg Bucket | 02.1040.47.00 |
| | 25 kg Bucket | 02.1040.49.00 |
| | 50 kg Drum | 02.1040.50.00 |
| BPW ECO-Assembly and Protection Spray | 400 ml Can | 02.3521.12.00 |

ABS 5

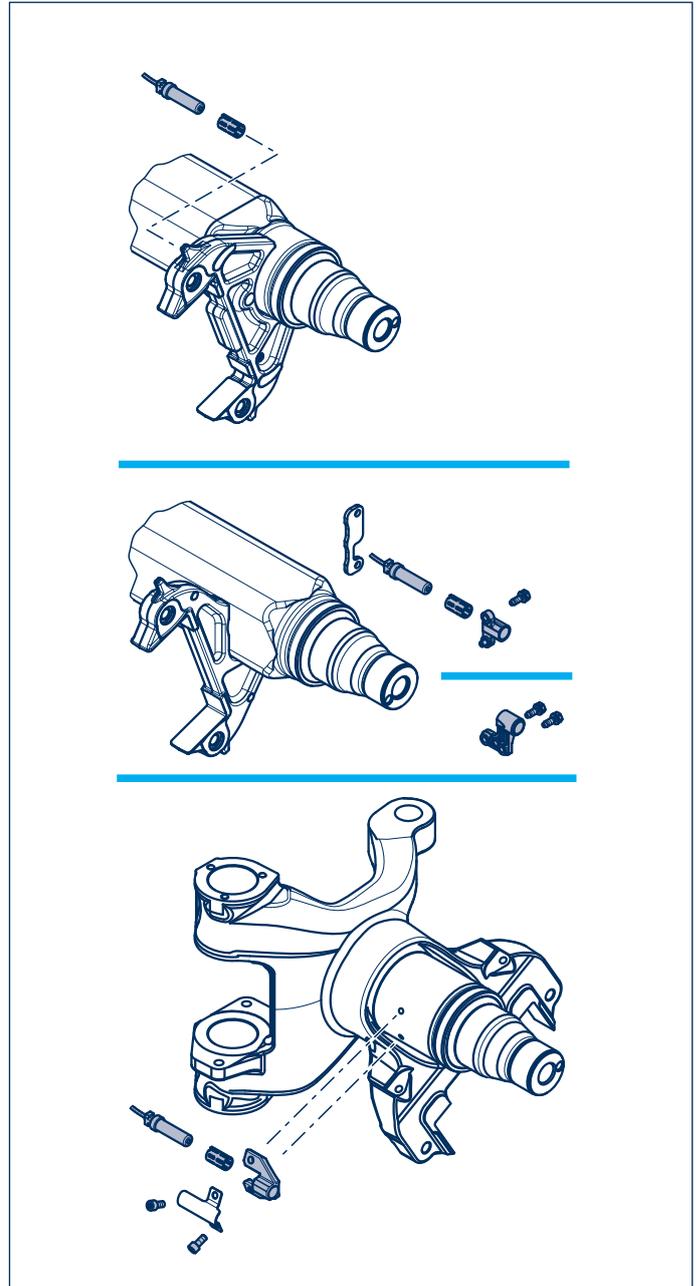
General

Attachments of the sensor brackets

Various sensor attachments are used, depending on the axle design.

- ⦿ Sensor attachment on the brake body or the axle beam (lug), without any additional components

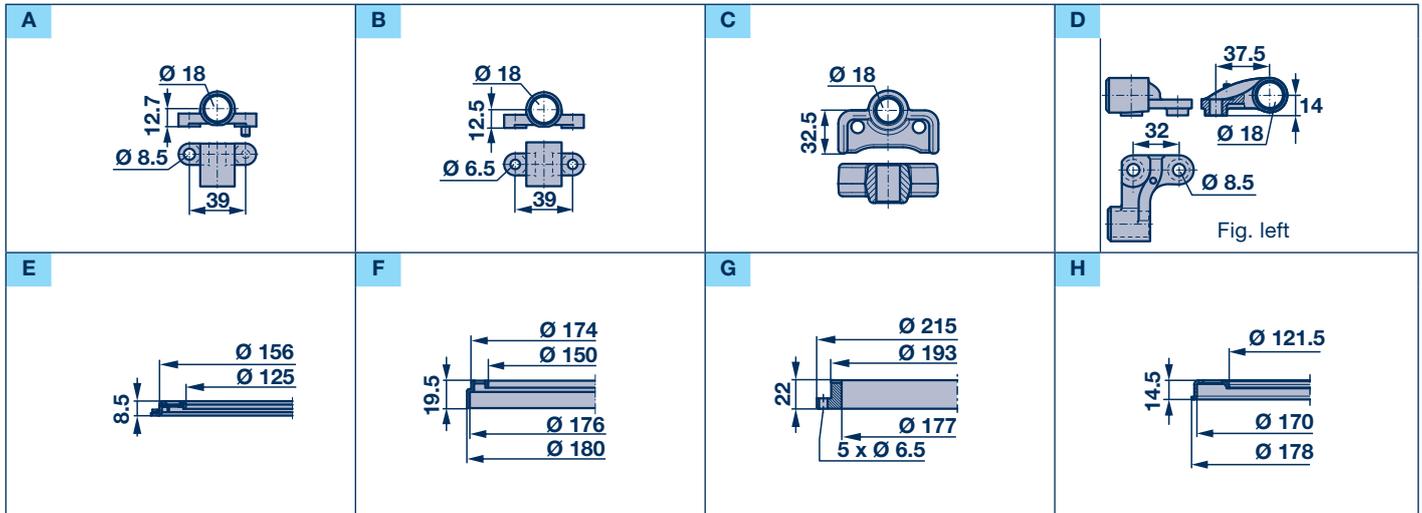
- ⦿ Bolted sensor attachment on the axle beam / steering axle stub



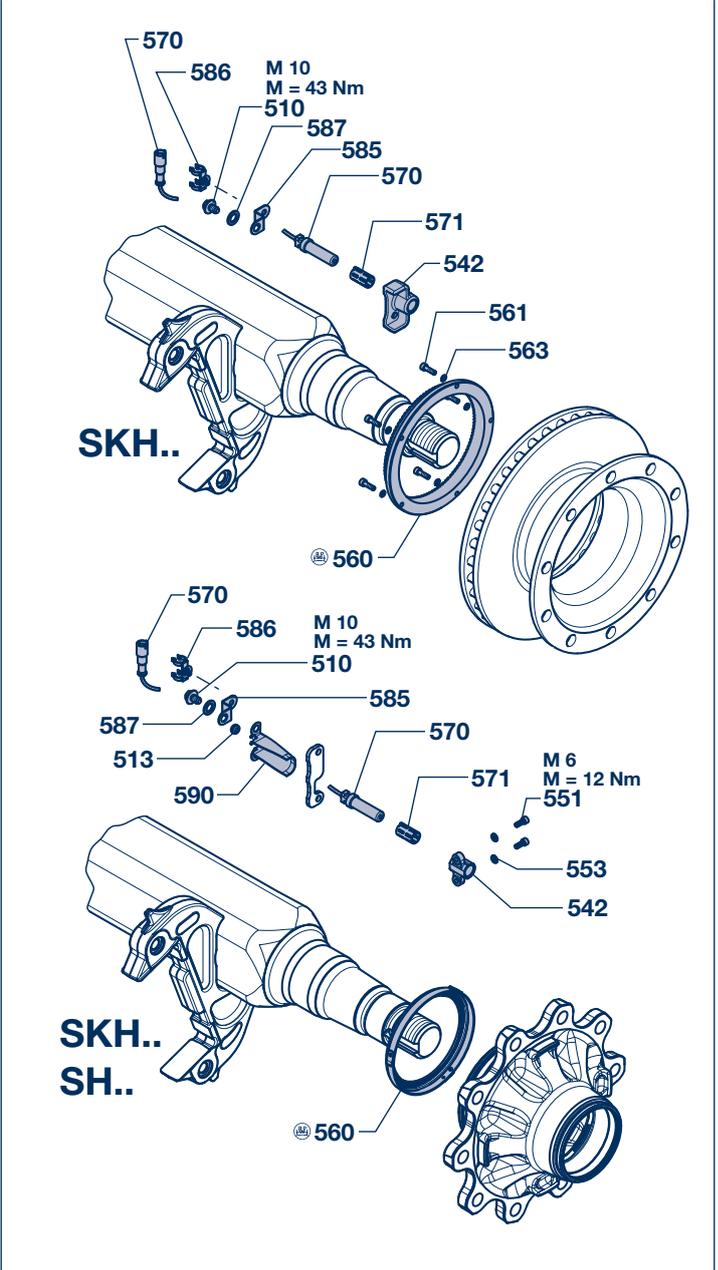
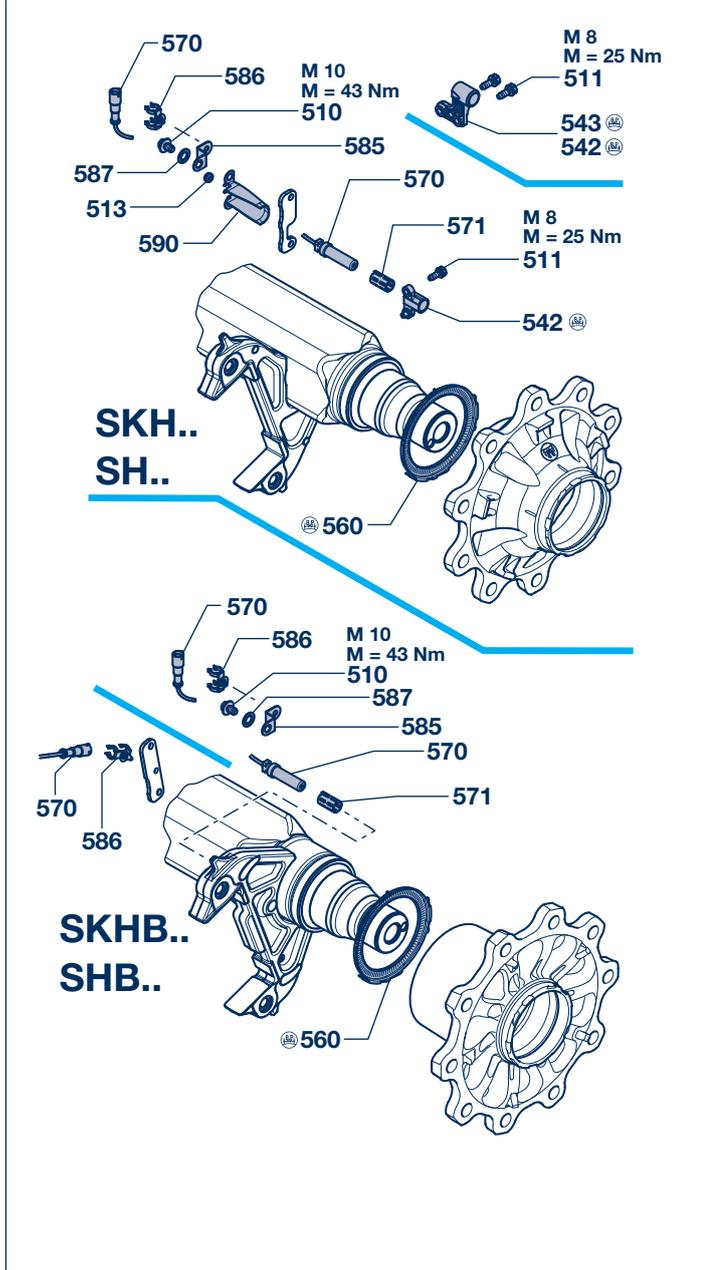
5 ABS

5.1 ABS parts

Rigid axles



ECO Plus 2 / ECO Plus 3 | **ECOPlus**



ABS 5

ABS parts 5.1

Rigid axles

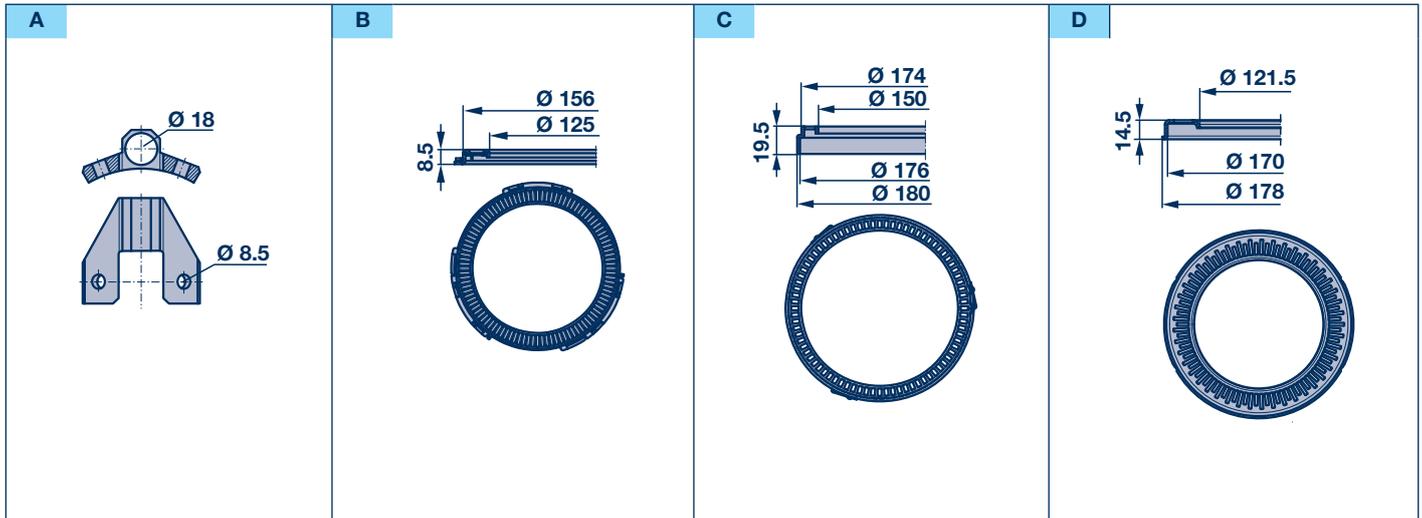
| ABS - Spare parts / TSB 3709 / 4309 / 4312 - Rigid axles | | | | | TSB 3709 | | | | | | TSB 4309 | | | | TSB 4312 | | | | | | | |
|--|-------------------------|-----------------------------|------|----------------|---|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|----------------------|----------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|-----------------------|------------------------------|
| | | | | | SKHB.. 8010 / 9010 ECO Plus 2 | SKHB.. 8010 / 9010 ECO Plus 3 | SKHS.. 8008 / 9008 ECO Plus 2 | SKHZ.. 8008 / 9008 ECO Plus 2 | SKHS.. 8010 / 9010 ECO Plus 2 | SKHZ.. 8010 / 9010 ECO Plus 2 | SKHS.. 8010 / 9010 ECO Plus 3 | SKHZ.. 8010 / 9010 ECO Plus 3 | SKH.. 10008 ECO Plus | SKH.. 10010 ECO Plus | SHB.. 8010 / 9010 ECO Plus 2 | SHB.. 8010 / 9010 ECO Plus 3 | SHS.. 8010 / 9010 ECO Plus 2 | SHZ.. 8010 / 9010 ECO Plus 2 | SHS.. 8010 / 9010 ECO Plus 3 | SHZ.. 8010 / 9010 ECO Plus 3 | SH.. 10110 ECO Plus 2 | SHS.. 10010 - 12010 ECO Plus |
| Item | Designation | Dimension | Fig. | BPW Code no. | | | | | | | | | | | | | | | | | | |
| 510 | Locking bolt | M 10 x 15 | | 02.5071.22.00 | | ● | ● | | | | | | ● | | | | | | | ● | | |
| 511 | Locking bolt | M 8 x 20 | | 02.5071.23.00 | | ● | ● | ● | | | | | ● | ● | ● | | | | | ● | | |
| 513 | Cable protection | | | 02.5681.78.00 | | | ● | ● | | | | | ● | | | | | | | ● | | |
| 542 | Sensor bracket | | A | 03.189.14.61.0 | | ● | ● | ● | | | | | ● | ● | | | | | | | | |
| | | | B | 03.189.07.87.0 | | | | | | | | | | | | | | | | | ● | |
| | | | C | 03.189.15.76.0 | | | | | | ● | ● | | | | | | | | | | | |
| 542 | Sensor bracket, right | | D | 03.189.07.58.0 | | | | | | | | | | | | | | | | ● | | |
| 543 | Sensor bracket, left | | D | 03.189.07.59.0 | | | | | | | | | | | | | | | | ● | | |
| 551 | Cylinder head bolt | M 6 x 16 | | 02.5015.00.80 | | | | | | | | | | | | | | | | ● | | |
| 553 | Spring washer | A 6 | | 02.5601.06.90 | | | | | | | | | | | | | | | | ● | | |
| 560 | Exciter ring | Ø 125 / 156 x 8.5 / Z = 100 | E | 03.310.08.51.0 | ● | | | ● | | | | ● | ● | | | | | | | | | |
| | | | H | 03.310.08.57.0 | | ● | | | ● | | | | ● | | ● | | | | | | | |
| | | | E | 03.310.08.53.0 | | | ● | | | | | | | | | | | | | | | |
| | | | F | 05.310.08.50.1 | | | | | | | | | | | | | | | | | | ● |
| | | | G | 03.310.09.38.0 | | | | | | | ● | | | | | | | | | | | |
| | | | G | 03.310.09.39.0 | | | | | | | | ● | | | | | | | | | | |
| 561 | Cylinder head bolt | M 6 x 30 - 8.8 | | 02.5015.48.82 | | | | | | | | | | | | | | | | ● | | |
| | | | | 02.5015.06.82 | | | | | | | | | | | | | | | | | ● | |
| 563 | Spring washer | Ø 6 | | 02.5611.06.90 | | | | | | | | | | | | | | | | ● | | |
| 570 | Sensor, straight | L = 350 | | 02.3317.07.00 | ● | ● | ● | ● | ● | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | | |
| | Sensor, cranked | L = 350 | | 02.3317.05.00 | | | | | | | | | | | | | | | | | | |
| 571 | Bush | | | 02.0316.59.00 | | | | | | | | | | | | | | | | ● | | |
| | | | | | Sensor support at angled sheet | | | | | | | | | | | | | | | | | |
| 510 | Locking bolt | M 10 x 15 | | 02.5070.22.00 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | |
| 585 | Support (angled sheet) | short - L=35 | | 03.189.07.35.0 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | |
| 586 | Support | | | 02.1421.11.00 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | |
| 587 | Serrated lock washer | | | 02.5414.11.90 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | |
| | | | | | Sensor support at attachment plate | | | | | | | | | | | | | | | | | |
| 586 | Support | | | 02.1421.23.00 | ● | ● | | ● | | | | ● | ● | | | | ● | | | ● | | |
| 590 | Heat protection plate | | | 03.165.14.23.0 | | | ● | ● | ● | | | | | | | | ● | ● | ● | ● | | |
| | Special silicone grease | 3 g | | 02.1040.17.00 | | | | | | | | | | | | | | | | ● | | |

ABS retrofit part sets see page 51.

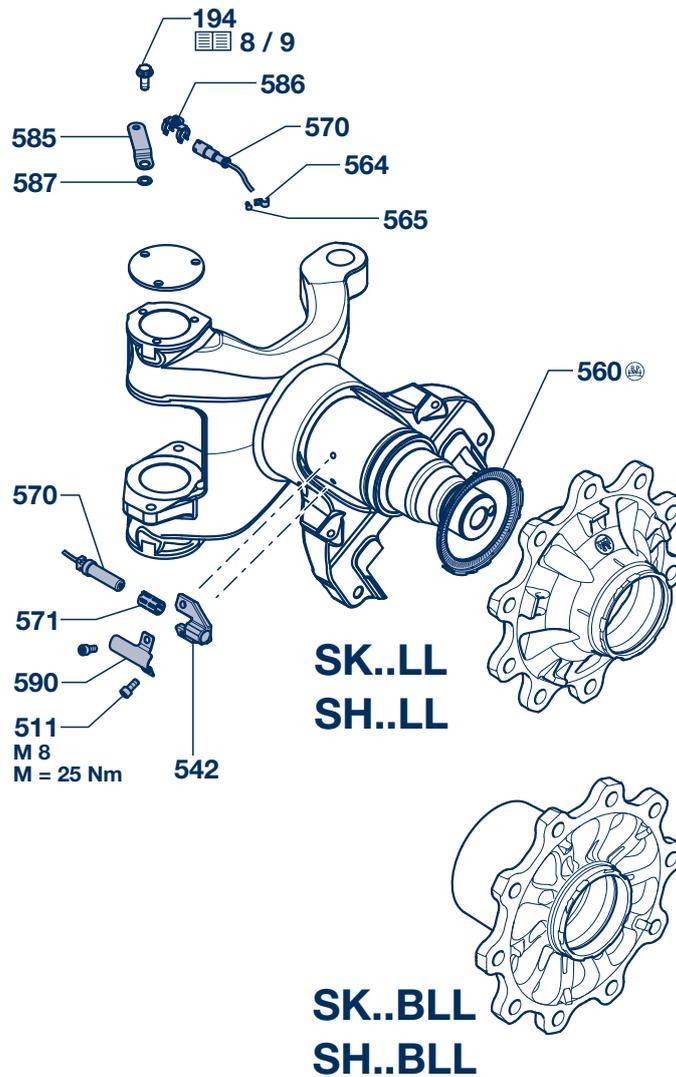
5 ABS

5.2 ABS parts

Steering axles



BPW ECO Disc TSB 3709 / 4309 / 4312 - Steering axles



ABS 5

ABS parts 5.2

Steering axles, ABS retrofit part sets for rigid and steering axles

| ABS - Spare parts / TSB 3709 / 4309 / 4312 - Steering axles | | | | | TSB 3709 | | | | TSB 4309 | | | | TSB 4312 | | |
|---|-------------------------|-------------------------------------|------|----------------|-----------------------|----------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------------------|-----------------|
| | | | | | SK..B..LL 7510 - 9010 | SK..B..LL 7510 - 9010 ECO Plus 3 | SK..S..LL 8008 / 9008 | SK..Z..LL 8008 / 9008 | SK..S..LL 8010 / 9010 | SK..Z..LL 8010 / 9010 | SH..B..LL 8010 / 9010 | SH..S..LL 9010 / 9010 | SH..Z..LL 9010 / 9010 | SH..B..LL 7510 - 9010 ECO Plus 3 | SH..S..LL 10110 |
| Item | Designation | Dimension | Fig. | BPW Code no. | | | | | | | | | | | |
| 511 | Locking bolt | M 8 x 20 | | 02.5071.23.00 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| 542 | Sensor bracket | | A | 03.189.14.86.0 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| 551 | Self-tapping screw | M 8 x 30 / SW 13 | | 02.5047.16.00 | | | | | | | | | ● | ● | ● |
| 552 | Washer | A 8.4 | | 02.5401.08.04 | | | | | | | | | ● | ● | ● |
| 556 | Sleeve | Ø 8.5 / 15 x 10 | | 03.200.71.06.0 | | | | | | | | | ● | ● | ● |
| 560 | Exciter ring | Ø 125 / 156 x 8.5 / Z = 100 | B | 03.310.08.51.0 | ● | | | ● | ● | | | | | | |
| | | Ø 121.5 / 170 / 178 x 14.5 / Z = 90 | D | 03.310.08.57.0 | | ● | | | | ● | | | | | |
| | | Ø 125 / 156 x 8.5 / Z = 80 | B | 03.310.08.53.0 | | | ● | | | | | | | | |
| | | Ø 150 / 174 x 19.5 / Z = 100 | C | 05.310.08.50.1 | | | | | | | | ● | | ● | |
| 564 | Clip | 1 x 6 | | 02.0326.32.00 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| 565 | Drive pin | Ø 4 x 10 | | 02.6005.25.40 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| 570 | Sensor, straight | L = 350 | | 02.3317.07.00 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| 571 | Bush | | | 02.0316.59.00 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| 585 | Support (angled sheet) | long - L=70 | | 03.189.07.72.0 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| 586 | Support | | | 02.1421.11.00 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| 587 | Serrated lock washer | A 10.5 | | 02.5414.11.90 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| 590 | Heat protection plate | | | 03.165.03.01.0 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | Special silicone grease | 3 g | | 02.1040.17.00 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

ABS retrofit part sets see below.

ABS retrofit part sets for rigid and steering axles

ABS retrofit part sets for one axle consisting of exciter rings, sensors, sensor brackets, fastening components and mounting drawings.

Further types upon request.

for **ABS Wabco / Bosch**
also for **Grau-Girling DGX / Grau-Girling MGX 100 / Knorr**

| Axle type | Pitch circle (TK) | Remark | BPW Drawing | Brake | Exciter ring / teeth | BPW Code no. |
|---------------------|-------------------|--------|------------------|----------|----------------------|----------------|
| SKH.. 8008 - 9008 | 275 | □ 120 | C-04.005.33.32.2 | TSB 3709 | 80 | 05.801.74.55.0 |
| SKH.. 8010 - 9010 | 335 | □ 120 | C-04.005.33.32.2 | | 100 | 05.801.74.54.0 |
| SKH..LL 8008 - 9008 | 275 | | C-04.005.10.06.5 | | 80 | 05.801.74.23.0 |
| SKH..LL 8010 - 9010 | 335 | | C-04.005.10.06.5 | | 100 | 05.801.74.22.0 |
| SKH.. 10008 | 275 | □ 150 | C-04.005.33.32.4 | | 80 | 05.801.74.58.0 |
| SKH.. 10010 | 335 | □ 150 | C-04.005.33.32.4 | | 100 | 05.801.74.57.0 |
| SKHB.. 9010 | 335 | □ 120 | C-04.005.33.32.3 | | 100 | 05.801.74.56.0 |
| SH.. 8010 - 9010 | 335 | □ 120 | C-04.005.33.32.2 | TSB 4309 | 100 | 05.801.74.54.0 |
| SH..LL 8010 - 9010 | 335 | | C-04.005.10.06.5 | | 100 | 05.801.74.22.0 |
| SHB.. 9010 | 335 | □ 120 | C-04.005.33.32.3 | | 100 | 05.801.74.56.0 |
| SM..LL 10110 | 335 | □ 120 | C-04.005.10.09.6 | | 100 | 05.801.74.24.0 |
| SM..LL 12110 | 335 | □ 120 | C-04.005.44.23.6 | | TSB 4312 | 100 |

6 Wheel studs

General

BPW wheel studs

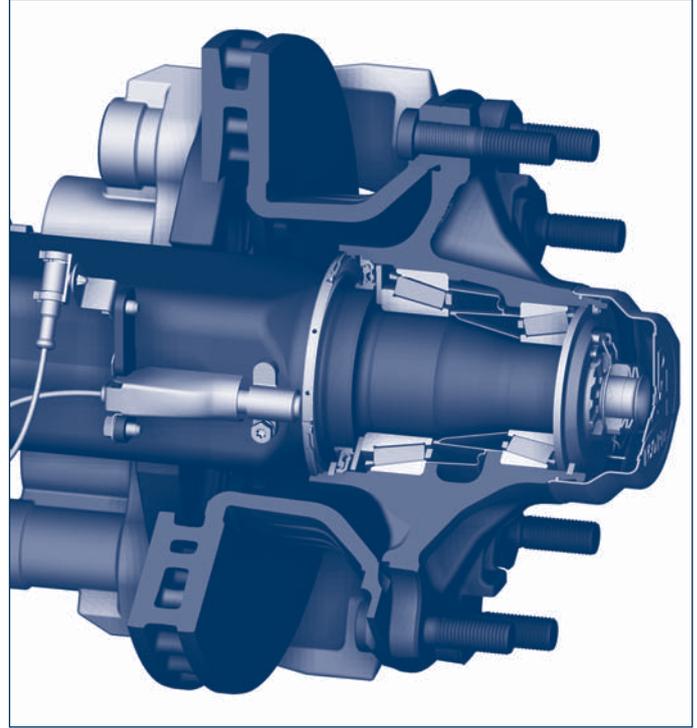
The wheel nave (or wheel disc) connects the rim to the wheel hub. It must absorb the vertical, lateral and longitudinal forces which arise and transmit them to the wheel hub via the wheel studs (wheel bolts).

BPW axles with disc brakes are suitable for wheels with either bolt or hub centring, and with a few exceptions they are all supplied with helical bolts.

Helical studs are easy to maintain and connect the brake drum to the hub using a pressfit. As a result, there is no need for internal nuts.

The hub bore is not damaged even after several removal/installation operations (in contrast to the situation with splined studs) and the clamping forces for the wheel studs remain constant.

The prescribed BPW tightening torques for wheel attachment are listed in the current BPW maintenance instructions and must be observed.

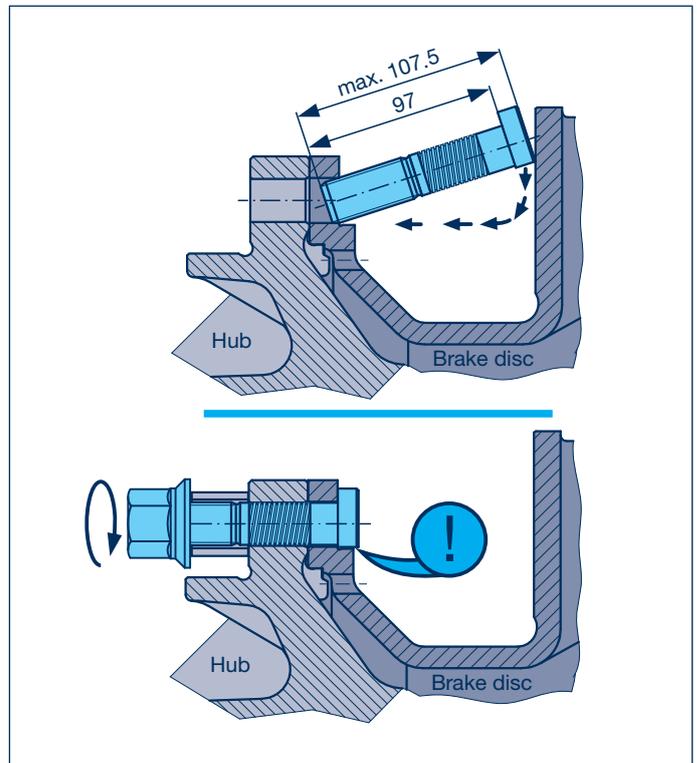


Assembly of the wheel bolts

The helical bolt is inserted from the rear through the hole in the brake disc / hub.

Then a sleeve is pushed over it, a wheel nut is applied and the wheel bolt is drawn into its final position.

 **It is important to ensure that the flattened head of the wheel bolt sits correctly!**

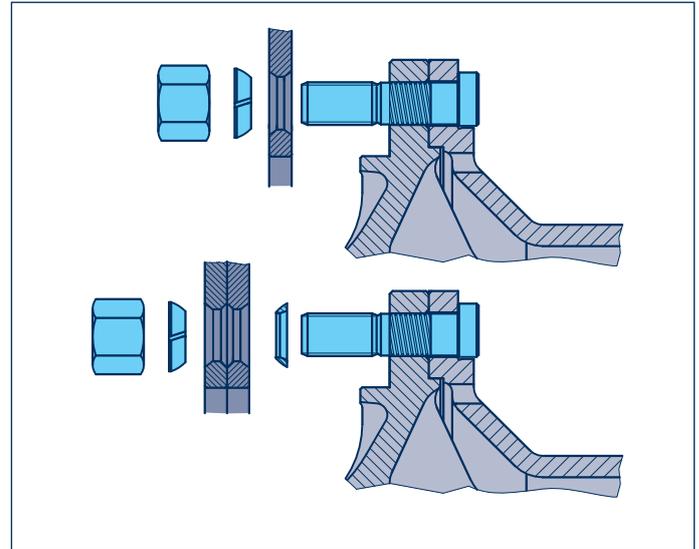


Wheel studs 6

General

Stud alignment

In stud centring, the wheel nave (with countersunk stud holes) is centred using wheel studs with (spring) centring rings.

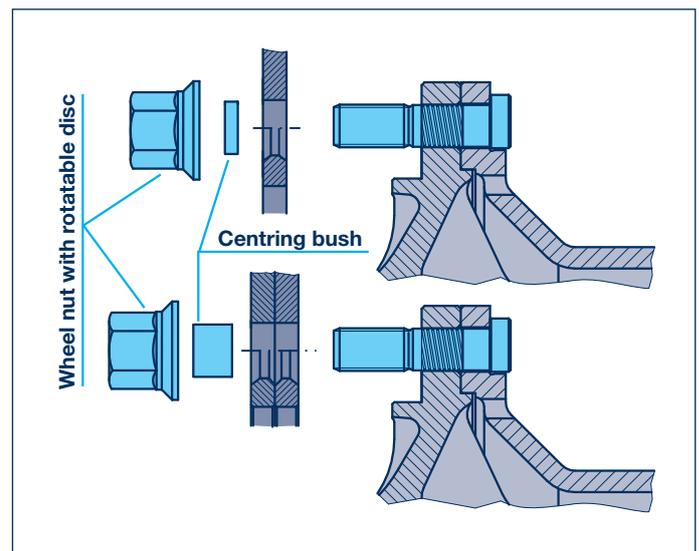


Spigot alignment

In hub centring, the wheel nave is centred using a centring spigot or ring surfaces on the wheel hub.

Centring bushes may be mounted on two opposing wheel bolts of each hub in the case of wheels with hub centring. This is not, however, necessary.

Centring bushes must be mounted on two opposing wheel bolts of each hub in the case of wheels with mixed centring.



Alloy wheels

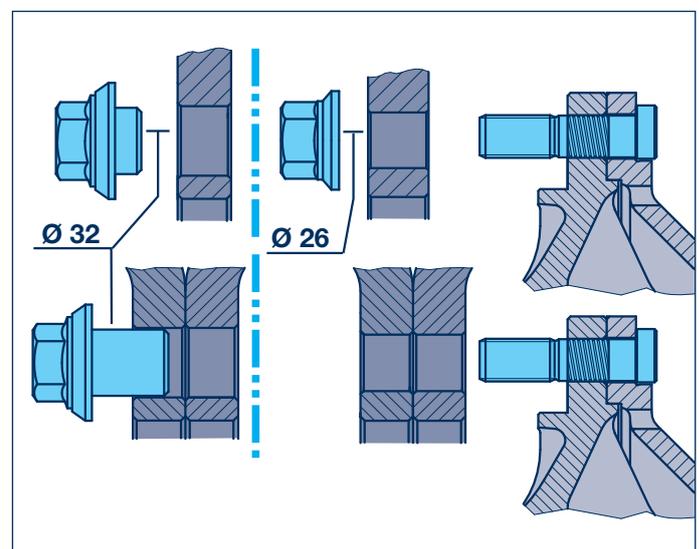
In the case of aluminium wheels, the wheel nave is centred using a centring cam or ring surfaces on the wheel hub.

As the flange thickness is greater with alloy wheels than with steel wheels, it is important to check whether the axles are suitable for fitting alloy wheels (with 26 mm-diameter hole).

In the case of twin tyres the available centring seat and wheel bolts must be of adequate length (i.e. the thread of the wheel nut must be completely engaged with the wheel bolt thread).

If not, aluminium wheels with stud hole $\text{Ø } 32$ can be used in conjunction with shouldered nuts without replacing the hub or the wheel studs.

(The wheel is not centred by the shouldered nuts).



6 Wheel studs

6.1 Single wheels / Twin wheels

| Wheel studs | Hub | Wheel type | | | | | | Wheel nut | | | Fig. | item 470 | | item 472 | item 477 | item 476 | | |
|------------------------|--------------------------|-------------------------------|----------------------------|------------------------------------|---------------------------------|------------------------------------|---------------------------------|----------------|------------------|--------------|---------------|-----------------|---------|--|-----------------------------|---------------------------|--|-----------------------------------|
| | Steel hub | Steel wheel with offset (120) | Steel wheel without offset | Alloy wheel Ø 26 with offset (120) | Alloy wheel Ø 26 without offset | Alloy wheel Ø 32 with offset (120) | Alloy wheel Ø 32 without offset | Stud alignment | Spigot alignment | normal SW 32 | Cap nut SW 33 | Shaft nut SW 32 | | Wheel stud assembly cpl. 09.806. (item 472-474, 477-479) | Dimension wheel stud L / L1 | Wheel stud 03.296. | Centring ring ¹⁾ 03.310. | Bush ²⁾ 03.112. |
| Single wheels | | | | | | | | | | | | | | | | | | |
| Helical fit wheel bolt | Stud alignment | | | | | | | | | | | | | | | | | |
| | ● | ● | ● | | | | | ● | ● | | | | 1 A | 33.75.0 | 80 / 45 | 33.11.1 | - | - |
| | ● | ● | ● | | | | | ● | ● | | | | 1 A | 33.80.0 | 93 / 58 | 33.21.1 | - | - |
| | Spigot alignment | | | | | | | | | | | | | | | | | |
| | ● | | ● | | | | | | ● | ● | | | 1 C | 33.11.0 | 89 / 54 | 33.14.1 | - | 00.43.0 |
| | ● | ● | ● | | | | | | ● | ● | | | 1 C | 33.76.0 | 80 / 45 | 33.11.1 | - | 00.43.0 |
| | ● | ● | ● | | | | | | ● | ● | | | 1 C | 33.81.0 | 93 / 58 | 33.21.1 | - | 00.43.0 |
| | ● | | ● | | | | | | ● | | ● | | 1 C | 33.61.0 | 89 / 54 | 33.14.1 | - | 00.43.0 |
| | ● | | ● | | | | | | ● | | ● | | 1 C | 33.77.0 | 80 / 45 | 33.11.1 | - | 00.43.0 |
| | Alloy wheels Ø 26 | | | | | | | | | | | | | | | | | |
| | ● | | | ● | ● | | | | | ● | | | 1 E | 33.68.0 | 97 / 62 | 33.12.1 | - | - |
| | ● | | | ● | ● | | | | | ● | | | 1 E | 33.81.0 | 93 / 58 | 33.21.1 | - | - |
| | ● | | | | ● | | | | | | ● | | 1 E | 33.69.0 | 97 / 62 | 33.12.1 | - | - |
| | ● | | | | ● | | | | | | ● | | 1 E | 33.82.0 | 93 / 58 | 33.21.1 | - | - |
| | Alloy wheels Ø 32 | | | | | | | | | | | | | | | | | |
| | ● | | | | | ● | | | | | | ● | 1 F | 33.78.0 | 80 / 45 | 33.11.1 | - | - |
| | ● | | | | | ● | | | | | | ● | 1 F | 33.83.0 | 93 / 58 | 33.21.1 | - | - |
| | ● | | | | | | ● | | | | | ● | 1 F | 33.79.0 | 97 / 62 | 33.12.1 | - | - |
| | ● | | | | | | ● | | | | | ● | 1 F | 33.83.0 | 93 / 58 | 33.21.1 | - | - |
| | Twin wheels | | | | | | | | | | | | | | | | | |
| Helical fit wheel bolt | Stud alignment | | | | | | | | | | | | | | | | | |
| | ● | | ● | | | | | ● | ● | | | | 1 B | 33.67.0 | 97 / 62 | 33.12.1 | 10.13.0 | - |
| | ● | | ● | | | | | ● | ● | | | | 1 B | 33.80.0 | 93 / 58 | 33.21.1 | 10.13.0 | - |
| | Spigot alignment | | | | | | | | | | | | | | | | | |
| | ● | ● | | | | | | | ● | ● | | | 1 D | 33.68.0 | 97 / 62 | 33.12.1 | - | 00.42.0 |
| | ● | ● | | | | | | | ● | ● | | | 1 D | 33.81.0 | 93 / 58 | 33.21.1 | - | 00.42.0 |
| | Alloy wheels Ø 32 | | | | | | | | | | | | | | | | | |
| | ● | | | | | | ● | | | | | ● | 1 G | 33.84.0 | 89 / 54 | 33.14.1 | - | - |
| ● | | | | | | ● | | | | | ● | 1 G | 33.85.0 | 97 / 62 | 33.12.1 | - | - | |

¹⁾ Centring ring with helical fit wheel bolts and twin wheels.

²⁾ Bush not included in wheel stud assembly 09.806..... (see page 53).

SW = spanner width

Wheel studs 6

Single wheels / Twin wheels 6.1

| | |
|---------------------------|----------------|
| item 478 | item 479 |
| Spring washer 02.5615. | Wheel nut |
| 22.90 | 03.260.04.12.0 |
| 22.90 | 03.260.04.12.0 |
| - | 05.260.54.10.0 |
| - | 05.260.54.10.0 |
| - | 05.260.54.10.0 |
| - | 05.260.54.19.0 |
| - | 05.260.54.19.0 |
| - | 05.260.54.10.0 |
| - | 05.260.54.10.0 |
| - | 05.260.54.19.0 |
| - | 05.260.54.19.0 |
| - | 05.260.54.21.1 |
| - | 05.260.54.21.1 |
| - | 05.260.54.21.1 |
| - | 05.260.54.21.1 |
| 22.90 | 03.260.04.12.0 |
| 22.90 | 03.260.04.12.0 |
| - | 05.260.54.10.0 |
| - | 05.260.54.10.0 |
| - | 05.260.54.14.1 |
| - | 05.260.54.14.1 |

Helical fit wheel bolt
Steel hub

Offset 0

Offset 120

| Single wheels | Twin wheels | | | | | | | | | | |
|--|---|--------|------------------|-------------------|-------------------------|------------|-------------------------|-------------------|-------------------------|----------|-------------------------|
| <p>Steel wheels Stud alignment</p> <p style="text-align: right;">A</p> | <p>Tightening torques for wheel nuts item 479</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #e0f0ff;"> <th>Thread</th> <th>Stud alignment</th> </tr> </thead> <tbody> <tr> <td>M 18 x 1.5</td> <td>290 Nm (275-305)</td> </tr> <tr> <td>M 20 x 1.5</td> <td>380 Nm (360-400)</td> </tr> <tr> <td>M 22 x 1.5</td> <td>510 Nm (485-535)</td> </tr> <tr> <td>M 22 x 2</td> <td>460 Nm (435-485)</td> </tr> </tbody> </table> | Thread | Stud alignment | M 18 x 1.5 | 290 Nm (275-305) | M 20 x 1.5 | 380 Nm (360-400) | M 22 x 1.5 | 510 Nm (485-535) | M 22 x 2 | 460 Nm (435-485) |
| Thread | Stud alignment | | | | | | | | | | |
| M 18 x 1.5 | 290 Nm (275-305) | | | | | | | | | | |
| M 20 x 1.5 | 380 Nm (360-400) | | | | | | | | | | |
| M 22 x 1.5 | 510 Nm (485-535) | | | | | | | | | | |
| M 22 x 2 | 460 Nm (435-485) | | | | | | | | | | |
| <p>Steel wheels Spigot alignment</p> <p style="text-align: right;">C</p> | <p>Tightening torques for wheel nuts item 479</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #e0f0ff;"> <th>Thread</th> <th>Spigot alignment</th> </tr> </thead> <tbody> <tr> <td>M 18 x 1.5</td> <td>350 Nm (330-370)</td> </tr> <tr> <td>M 20 x 1.5</td> <td>480 Nm (455-505)</td> </tr> <tr> <td>M 22 x 1.5</td> <td>630 Nm (600-660)</td> </tr> </tbody> </table> | Thread | Spigot alignment | M 18 x 1.5 | 350 Nm (330-370) | M 20 x 1.5 | 480 Nm (455-505) | M 22 x 1.5 | 630 Nm (600-660) | | |
| Thread | Spigot alignment | | | | | | | | | | |
| M 18 x 1.5 | 350 Nm (330-370) | | | | | | | | | | |
| M 20 x 1.5 | 480 Nm (455-505) | | | | | | | | | | |
| M 22 x 1.5 | 630 Nm (600-660) | | | | | | | | | | |
| <p>Alloy wheels Ø 26</p> <p style="text-align: right;">E</p> | <p>Tightening torques for wheel nuts item 479</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #e0f0ff;"> <th>Thread</th> <th>Spigot alignment</th> </tr> </thead> <tbody> <tr> <td>M 22 x 1.5</td> <td>630 Nm (600-660)</td> </tr> </tbody> </table> | Thread | Spigot alignment | M 22 x 1.5 | 630 Nm (600-660) | | | | | | |
| Thread | Spigot alignment | | | | | | | | | | |
| M 22 x 1.5 | 630 Nm (600-660) | | | | | | | | | | |
| <p>Alloy wheels Ø 32</p> <p style="text-align: right;">F</p> | <p>Tightening torques for wheel nuts item 479</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #e0f0ff;"> <th>Thread</th> <th>Spigot alignment</th> </tr> </thead> <tbody> <tr> <td>M 22 x 1.5</td> <td>630 Nm (600-660)</td> </tr> </tbody> </table> | Thread | Spigot alignment | M 22 x 1.5 | 630 Nm (600-660) | | | | | | |
| Thread | Spigot alignment | | | | | | | | | | |
| M 22 x 1.5 | 630 Nm (600-660) | | | | | | | | | | |
| <p>Alloy wheels Ø 32</p> <p style="text-align: right;">G</p> | <p>Tightening torques for wheel nuts item 479</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #e0f0ff;"> <th>Thread</th> <th>Spigot alignment</th> </tr> </thead> <tbody> <tr> <td>M 22 x 1.5</td> <td>630 Nm (600-660)</td> </tr> </tbody> </table> | Thread | Spigot alignment | M 22 x 1.5 | 630 Nm (600-660) | | | | | | |
| Thread | Spigot alignment | | | | | | | | | | |
| M 22 x 1.5 | 630 Nm (600-660) | | | | | | | | | | |

7 Accessory

7.1 Steering dampers, general

BPW Steering dampers

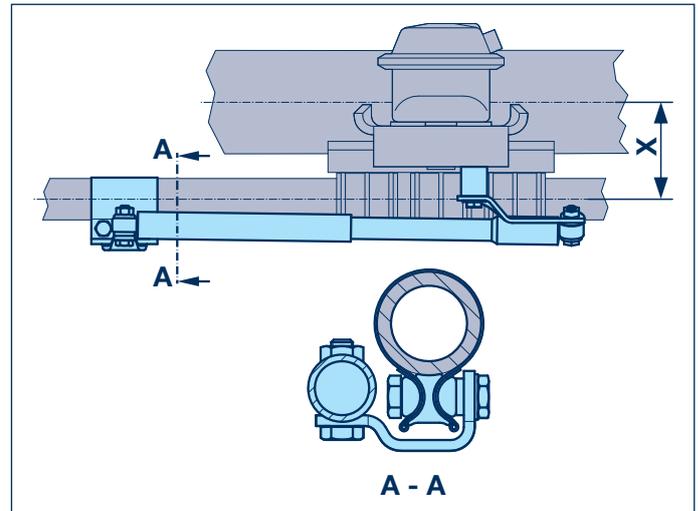
For BPW trailing steering axles, series ..LL, there are various steering damper parts kits.

A steering damper is absolutely essential under the following operating conditions:

- ⦿ Where the ratio of the number of rigid axles to steering axles is 1:1 (2:2)
- ⦿ Where an axle lift is used in the three-axle unit
- ⦿ Where steering axle king pin bearings are connected to a central lubricating system.

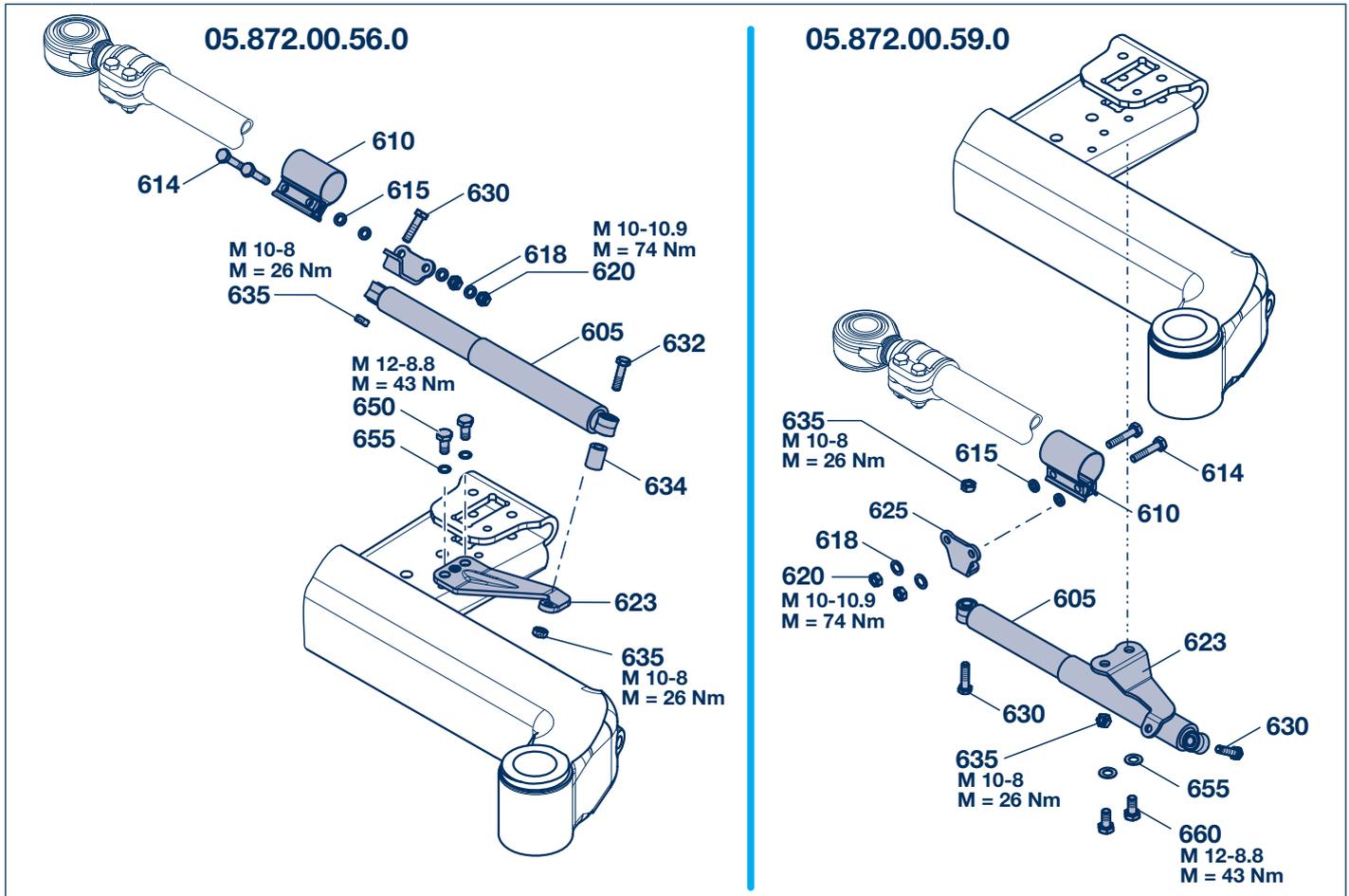
The steering damper is easy to install and also to retrofit. Installation is carried out exclusively by means of bolts (no welding).

The necessary attachment holes are present on the steering axles. Each parts kit also includes an installation drawing.



Accessory 7

Steering dampers 7.1



| Item | Designation | BPW Code no. | Dimension | |
|------|--|-----------------------|--|----------------------------------|
| | | | Trailing arm above X = 163 / 171 | |
| | | | Trailing arm below X = 25 / 35 / 45 | |
| | | | | |
| 600 | Steering damper assembly, item 605 - 660 | 05.872.00.56.0 | | 05.872.00.59.0 |
| 605 | Steering damper | 02.3702.93.00 | | 02.3702.93.00 |
| 610 | Clamp cpl., incl. item 614 | 05.001.00.03.0 | | 05.001.00.03.0 |
| 614 | Hexagon bolt | 02.5025.56.11 | M 10 x 50 - 10.9 | 02.5025.56.11 M 10 x 50 - 10.9 |
| 615 | Ring | 03.310.30.51.0 | Ø 10.5 / 17 x 3.5 | 03.310.30.51.0 Ø 10.5 / 17 x 3.5 |
| 618 | Lock washer | 02.5403.10.92 | B 10 | 02.5403.10.92 B 10 |
| 620 | Hexagon nut | 02.5205.03.24 | M 10 | 02.5205.03.24 M 10 |
| 623 | Shaped plate | 03.165.56.35.0 | | 03.165.35.12.0 |
| 625 | Shaped plate | 03.165.34.10.0 | | 03.165.34.09.0 |
| 630 | Hexagon bolt | 02.5021.43.82 | M 10 x 40 - 8.8 | 02.5021.43.82 M 10 x 40 - 8.8 |
| 632 | Hexagon bolt | 02.5021.50.82 | M 10 x 70 - 8.8 | - |
| 634 | Ring | 03.310.30.68.0 | Ø 10.2 / 13 x 30 | - |
| 635 | Lock nut | 02.5273.10.82 | M 10 | 02.5273.10.82 M 10 |
| 650 | Hexagon bolt | 02.5025.75.82 | M 12 x 16 - 8.8 | 02.5025.75.82 M 12 x 16 - 8.8 |
| 655 | Lock washer | 02.5403.12.92 | B 12 | 02.5403.12.92 B 12 |

7 Accessory

7.2 Hub caps with integrated Hubodometer

| Axle load | Axle series | Axle type | Hub cap thread | Rolling circumference | for tyre e.g. | Hub cap with integrated Hubodometer BPW Code no. |
|-------------|-----------------|---------------------------|----------------|-----------------------|------------------------------------|--|
| 10 - 12t | | SH.. ECO ^{Plus} | M 136 x 2.5 | 2830 - 2860 | 255 / 70 R 22.5 | 05.212.25.41.0 |
| | | | | 2915 | 275 / 70 R 22.5 | 05.212.25.42.0 |
| | | | | 3015 - 3134 | 385 / 55 R 22.5 | 05.212.25.44.0 |
| | | | | | 315 / 70 R 22.5 | |
| | | | | 3175 - 3220 | 10.00 R 20 | 05.212.25.45.0 |
| | | | | | 11.00 R 22.5 | |
| | | | | 3240 - 3260 | 385 / 65 R 22.5 | 05.212.25.46.0 |
| | | | | 3280 - 3310 | 12.00 R 22.5 | 05.212.25.47.0 |
| 3410 - 3470 | 425 / 65 R 22.5 | 05.212.25.48.0 | | | | |
| | 13.00 R 22.5 | | | | | |
| 3505 | 445 / 65 R 22.5 | 05.212.25.49.0 | | | | |
| 8 - 9t | SH.. | SH.. ECO Plus 2 | Bayonet lock | 3015 - 3134 | 385 / 55 R 22.5 315 / 70 R 22.5 | 05.212.25.73.0 |
| | | | | 3175 - 3220 | 11.00 R 22.5 | 05.212.25.74.0 |
| | | | | 3240 - 3260 | 385 / 65 R 22.5 | 05.212.25.75.0 |
| | SH.. ECO Plus 3 | M 135 x 2 | 2830 - 2860 | 255 / 70 R 22.5 | 05.212.75.17.0 | |
| | | | 2915 | 275 / 70 R 22.5 | 05.212.75.18.0 | |
| | | | 3015 - 3134 | 385 / 55 R 22.5 | 05.212.75.20.0 | |
| | | | | 315 / 70 R 22.5 | | |
| | | | 3175 - 3220 | 10.00 R 20 | 05.212.75.21.0 | |
| | | | | 11.00 R 22.5 | | |
| | | | 3240 - 3260 | 385 / 65 R 22.5 | 05.212.75.22.0 | |
| | | | 3280 - 3310 | 12.00 R 22.5 | 05.212.75.23.0 | |
| | | | 3410 - 3470 | 425 / 65 R 22.5 | 05.212.75.24.0 | |
| | | | | 13.00 R 22.5 | | |
| | | | 3505 | 445 / 65 R 22.5 | 05.212.75.25.0 | |
| 10 - 12t | | SKH.. ECO ^{Plus} | M 136 x 2.5 | 2620 - 2650 | 265 / 70 R 19.5 | 05.212.25.38.0 |
| | | | | 2712 - 2750 | 285 / 70 R 19.5 | 05.212.25.39.0 |
| | | | | 2730 - 2790 | 445 / 45 R 19.5 | 05.212.25.40.0 |
| | | | | 2960 | 425 / 55 R 19.5 | 05.212.25.43.0 |
| 8 - 9t | SK.. | SKH.. ECO Plus 2 | Bayonet lock | 2730 - 2790 | 445 / 45 R 19.5 | 05.212.25.72.0 |
| | | SKH.. ECO Plus 3 | M 135 x 2 | 2560 | 245 / 70 R 19.5 | 05.212.75.13.0 |
| | | | | 2620 - 2650 | 265 / 70 R 19.5 | 05.212.75.14.0 |
| | | | | 2712 - 2750 | 285 / 70 R 19.5 | 05.212.75.15.0 |
| | | | | 2730 - 2790 | 445 / 45 R 19.5 | 05.212.75.16.0 |
| | | | | 2830 - 2860 | 435 / 55 R 19.5 | 05.212.25.17.0 |
| | | | | 2960 | 425 / 55 R 19.5 | 05.212.75.19.0 |
| | | | | 3015 - 3134 | 385 / 65 R 19.5 | 05.212.75.20.0 |

Hub caps for BPW ECO axles have internal thread.

Further types upon request.

Accessory 7

Hub caps with digital odometer (ECOMETER) 7.3

The BPW hub cap with its integrated digital odometer is an important instrument for checking the mileage of your trailer or semitrailer. This means you can always track the real trailer mileage, especially when the trailer is used with different tractor units.

The digital ECOMETER can be used universally for all tyre sizes.

The adjustment of the wheel size is carried out by means of the display unit (basic setting 385/65 R 22.5).

A built-in watertight mini-computer counts the wheel revolutions by means of a magnet and a reed contact.

The digital ECOMETER with the special hooked spring ring and integrated magnet is available for all BPW ECO^{Plus} axles with an M 136 x 2.5 hub cap thread, as well as ECO Plus 2 axles with a bayonet fitting.



| | BPW Code no.: |
|---------------------|--|
| Thread M 136 x 2.5 | 05.212.75.06.0 KTL _{Zn} |
| | 05.212.75.03.0 chrome ¹⁾ |
| Bayonet lock | 05.212.75.05.0 KTL _{Zn} incl. 'O'-Ring |
| Circlip loose | |
| | ECO ^{Plus} 05.188.04.13.0 |
| | ECO Plus 2 05.277.10.03.0 |
| Replacement battery | 02.0130.97.00 |

¹⁾ Not corrosion-resistant acc. to DIN 50021

Further information see service and installation instruction 'Digital ECOMETER' - BPW No.: 04.001.21.24.0 (ECO^{Plus}) and 04.001.21.25.0 (ECO Plus 2).



7 Accessory

7.4 Special tools, general

BPW Special tools and calibration equipment

Special tools and measuring devices have a long tradition at BPW Bergische Achsen KG, based on decades of experience.

The existing range of tools has been systematically improved and new products have been added to it with every new generation of axles.

BPW offers a tool case (BPW Code no. 99.00.000.9.68) for service and repair of the BPW ECO Disc Trailer disc brakes, containing all tools that might be required.

In addition to which BPW offers special measuring devices for checking dimensions on axles and suspensions.

Tried and tested design

Tools must prove their worth in hard, everyday use. Only then does it become clear whether tools are up to the demands of the real world.

Use of high-quality materials

High-quality materials are absolutely essential for producing high-quality tools. Continuous quality assurance guarantees consistent quality.

Favourable price/performance ratio

Quality is not always obvious at first glance (e.g. materials).

Buying quality tools is often the most cost effective long term option.

This particularly applies in those cases where tools are regularly needed and where their trouble-free use must be guaranteed at all times.

- ⊙ The special tools ensure that all recommended service work on the BPW ECO Disc (TSB 3709 / TSB 4309 / TSB 4312) can be performed safely and easily.
- ⊙ All work on the vehicle is only allowed to be performed by employees of the commercial vehicle industry and the commercial vehicle trade who have the appropriate technical proficiency. Always follow the safety instructions issued by the vehicle manufacturer.
- ⊙ Observe the BPW workshop manual (www.bpw.de).

Long service life, low wear

BPW tools are designed to be particularly resistant to wear and tear, and guarantee an extremely long service life, even with frequent use.

Simple to handle

Ideal solutions are always simple.

This statement also particularly applies to tools.

For that reason BPW tools are specifically designed to meet the technical requirements.

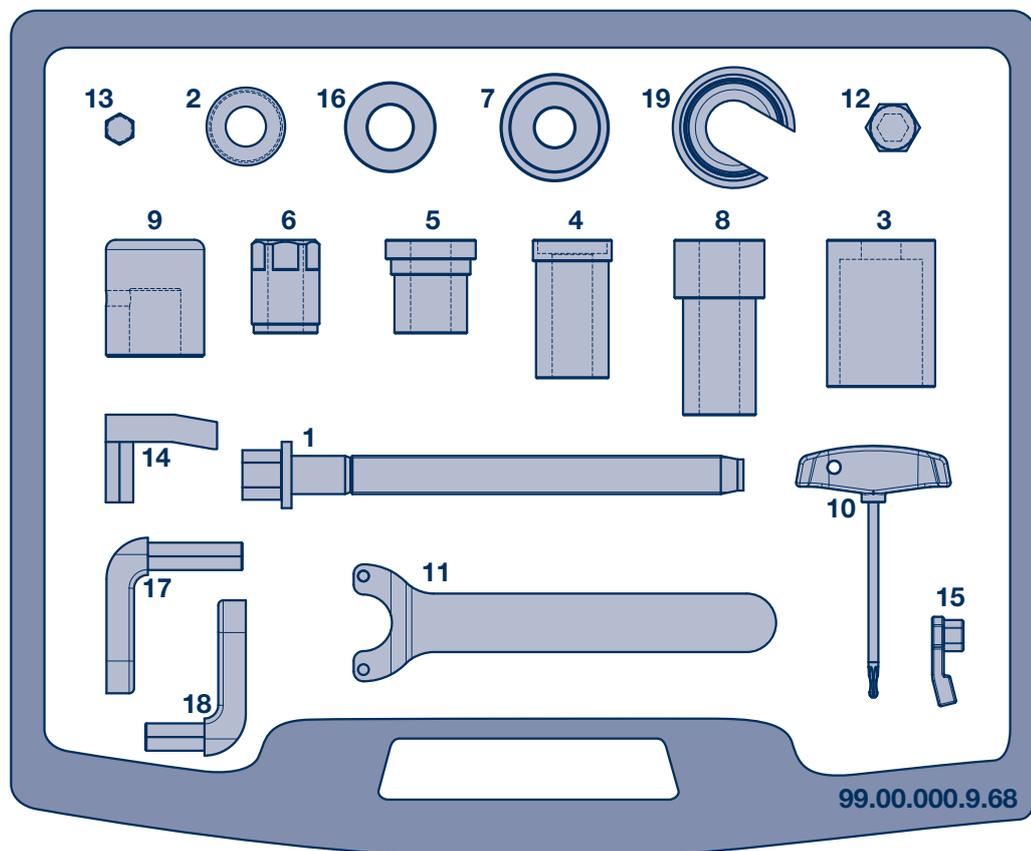
Solutions that do not meet practical requirements are rigorously weeded out at the development stage.

Details on the correct use of the tools can be found in the respective workshop manuals.

For more tools see the BPW tools catalogue.

Accessory 7**Special tools 7.4****Contents of ECO Disc tool case**

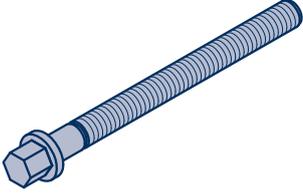
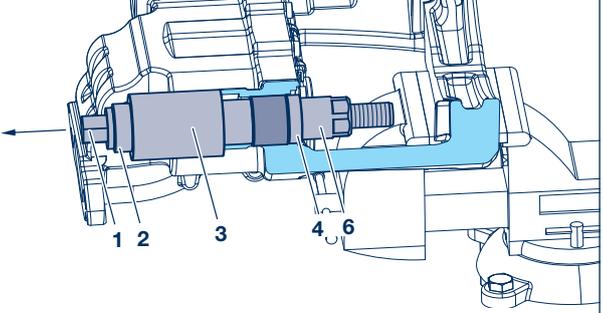
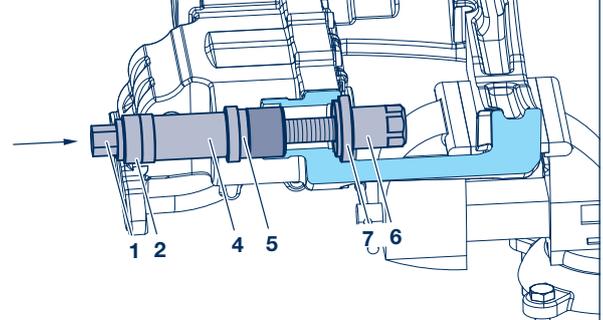
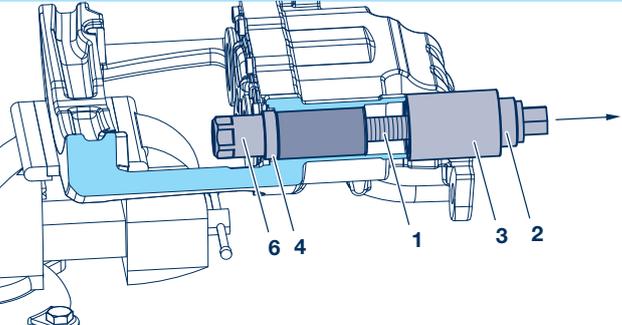
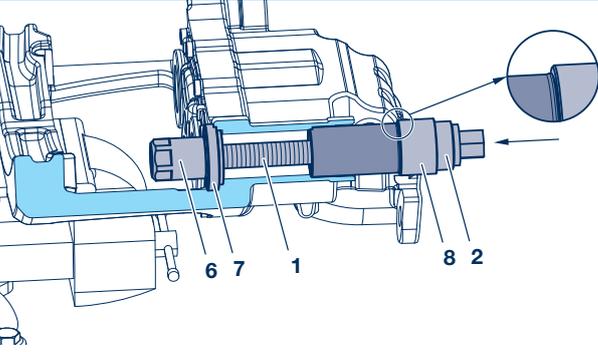
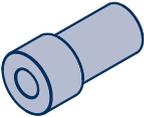
| No. | Designation | BPW Code no. | Dimension | Page |
|-----|---|---------------|-------------------|------|
| 1 | Threaded spindle | 02.0130.39.10 | Tr 20 x 2 / SW 22 | 62 |
| 2 | Ball bearing | 02.0130.40.10 | Ø 20.5/40 x 14.5 | 62 |
| 3 | Sleeve | 02.1410.26.00 | Ø 20.5/42 x 75 | 62 |
| 4 | Press-out tool for movable and fixed bearings | 02.0130.41.10 | Ø 20.5/ 40 x 71 | 62 |
| 5 | Pressing tool (movable bearing) | 02.0130.42.10 | Ø 20.5/46 x 48 | 62 |
| 6 | Nut | 02.5270.37.00 | Tr 20 x 2 / SW 32 | 62 |
| 7 | Counter-hold tool | 02.1421.22.00 | Ø 20.5/55 x 13 | 62 |
| 8 | Pressing tool (fixed bearing) | 02.0130.43.10 | Ø 20.5/46 x 90 | 62 |
| 9 | Press-on tool (plastic bellows) | 02.0130.45.10 | Ø 26/50 x 60 | 62 |
| 10 | Torx spanner return mechanism | 02.0130.44.10 | TX 25 | 63 |
| 11 | Two-hole spanner for coarse dirt seal | 02.3516.20.00 | | 63 |
| 12 | Adapter for movable bearing screw | 02.0130.46.10 | SW 14 / SW 24 | 63 |
| 13 | Adapter for plastic cap | 02.0130.47.10 | SW 14 / SW 13 | 63 |
| 14 | Adapter for torque wrench (movable bearing) | 02.0130.48.10 | SW 14 | 63 |
| 15 | Adapter for torque wrench (plastic cap) | 02.0130.49.10 | SW 14 | 63 |
| 16 | Ring for pulling in wheel studs | 02.5683.92.00 | Ø 23/46 x 15 | 63 |
| 17 | Adapter for fixed bearing bolt | 02.0130.64.10 | SW 14 / SW 14 | 63 |
| 18 | Adapter for movable bearing screw | 02.0130.65.10 | SW 14 / SW 14 | 63 |
| 19 | Mounting tool for the bellows | 02.0130.80.10 | Ø 28/62 x 32 | 63 |



7 Accessory

7.4 Special tools

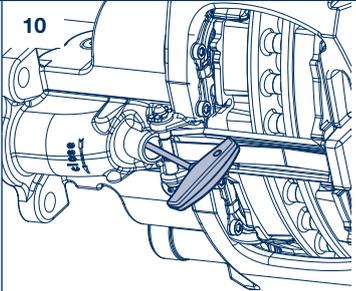
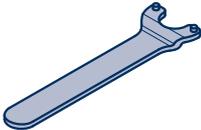
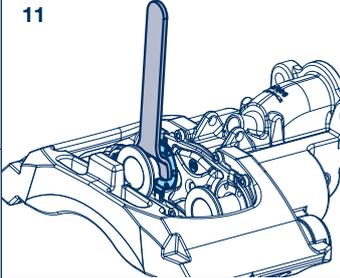
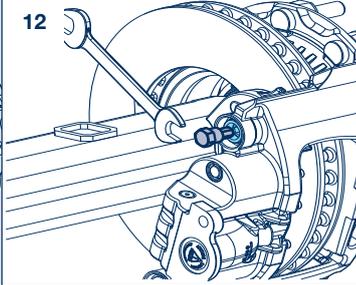
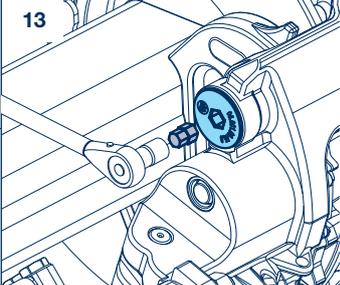
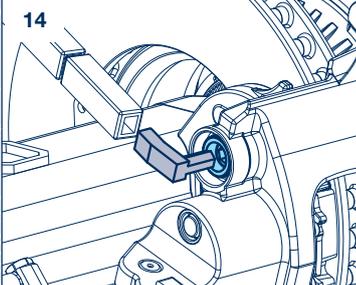
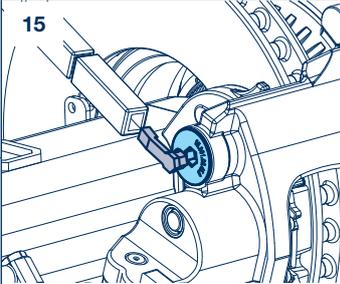
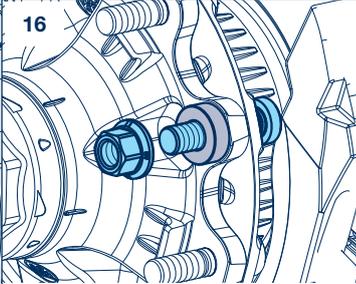
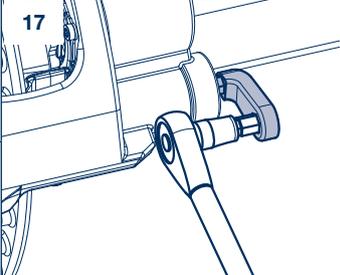
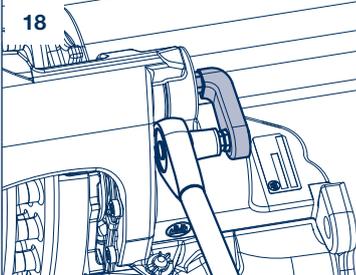
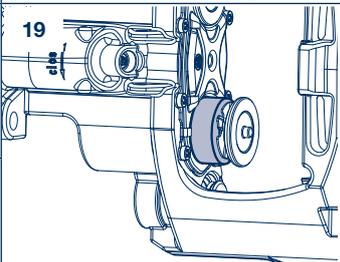
Special tools at work

| BPW special tools at work | | |
|---|---|---|
| Item / BPW Code no. / Designation / Dimension | | |
| 1 02.0130.39.10 Threaded spindle TR 20 x 2 / SW 22 |  | Press-out tool for movable bearing, consisting of item 1, 2, 3, 4, 6  |
| 2 02.0130.40.10 Ball bearing Ø 20.5/40 x 14.5 |  | |
| 3 02.1410.26.00 Sleeve Ø 20.5/42 x 75 |  | Pressing tool for movable bearing, consisting of item 1, 2, 4, 5, 6, 7  |
| 4 02.0130.41.10 Press-out tool for movable and fixed bearings Ø 20.5/40 x 71 |  | |
| 5 02.0130.42.10 Pressing tool (movable bearing) Ø 20.5/46 x 48 |  | Press-out tool for fixed bearing, consisting of item 1, 2, 3, 4, 6  |
| 6 02.5270.37.00 Nut TR 20 x 2 / SW 32 |  | |
| 7 02.1421.22.00 Counter-hold tool Ø 20.5/55 x 13 |  | Pressing tool for fixed bearing, consisting of item 1, 2, 6, 7, 8  |
| 8 02.0130.43.10 Pressing tool (fixed bearing) Ø 20.5/46 x 90 |  | |

Accessory 7

Special tools 7.4

Special tools at work

| BPW special tools at work | | | |
|---|---|---|--|
| Item / BPW Code no. / Designation / Dimension | | | |
| <p>9</p> <p>02.0130.45.10 Press-on tool (plastic bellows) Ø 26/50 x 60</p> |  | <p>9</p>  | <p>10</p>  |
| <p>10</p> <p>02.0130.44.10 Torx spanner return mechanism TX 25</p> |  | | |
| <p>11</p> <p>02.3516.20.00 Two-hole spanner for coarse dirt seal</p> |  | <p>11</p>  | <p>12</p>  |
| <p>12</p> <p>02.0130.46.10 Adapter for movable bearing screw SW 14 / SW 24</p> |  | | |
| <p>13</p> <p>02.0130.47.10 Adapter for plastic cap SW 14 / SW 13</p> |  | <p>13</p>  | <p>14</p>  |
| <p>14</p> <p>02.0130.48.10 Adapter for torque wrench (movable bearing) SW 14</p> |  | | |
| <p>15</p> <p>02.0130.49.10 Adapter for torque wrench (plastic cap) SW 14</p> |  | <p>15</p>  | <p>16</p>  |
| <p>16</p> <p>02.5683.92.00 Ring for pulling in wheel studs Ø 23/46 x 15</p> |  | | |
| <p>17</p> <p>02.0130.64.10 Adapter for fixed bearing bolt SW 14 / SW 14</p> |  | <p>17</p>  | <p>18</p>  |
| <p>18</p> <p>02.0130.65.10 Adapter for movable bearing screw SW 14 / SW 14</p> |  | | |
| <p>19</p> <p>02.0130.80.10 Mounting tool for the bellows Ø 28/62 x 32</p> |  | <p>19</p>  | |

Notes

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