

**MONTAGE- UND BETRIEBSANLEITUNG
INSTALLATION AND OPERATING INSTRUCTIONS
INSTRUCTIONS DE MONTAGE ET D'UTILISATION**

30.03.2022

**ZWANGSLENKUNG ZWL 30 UND ZWL 50
ZWANGSLENKUNGSBAUTEILE - NACHRÜSTSATZ**

**FORCED STEERING DEVICE ZWL 30 AND ZWL 50
FORCED STEERING COMPONENTS - RETROFIT KIT**

**DIRECTION FORCÉE ZWL 30 ET ZWL 50
COMPOSANTS DE DIRECTION FORCÉE - KIT DE MISE À NIVEAU**

WICHTIGE HINWEISE:

siehe separates Dokument BA_TASC_400002, www.walterscheid.com/downloads/

IMPORTATANT NOTES:

see separate document BA_TASC_400002, www.walterscheid.com/downloads/

NOTES IMPORTANTES:

voir annexe ou document séparé BA_TASC_400002, www.walterscheid.com/downloads/

FORCED STEERING DEVICE ZWL 30 AND ZWL 50

1. TECHNICAL DATA AND DESIGNATIONS:

DESCRIPTION AND APPLICATION:

Forced steering components are used to transfer steering forces between the towing vehicle and trailer. The central element for connection to the handlebar of the trailer can be a 50 mm ball or a 30 mm pin. A spherical cap 50 in accordance with ISO 26204 Figure 2 or a spherical plain bearing 30 in accordance with DIN ISO 12240-4 is mounted as a counterpart on the piston rods of the steering cylinders of the forced steering systems.

TYPES AND CHARACTERISTIC VALUES:

Type	Connecting element	Counterpart (Order-No.)	adm. steering force [kN]
ZWL 50	ball 50	Spherical cap 50 (8004721)	20
ZWL 30	pin 30	spherical plain bearing 30 (8004838)	40

Table 1

CONNECTING DEVICES:

The ball 50 and spherical cap 50 must ensure the same swivel angles as the ball coupling 80 according to ISO 24347:2005. These are +/- 60 degrees in the horizontal direction and +/- 20 degrees in the vertical and axial directions.



WARNING:

The ball 50 of the ZWL50 is not suitable for connection with ball couplings of class B50 according to ECE-R 55. The steering forces that are introduced into the connection device via the ZWL components must not exceed the values in table 1.



IMPORTANT:

To avoid injury, protective gloves, safety glasses and safety shoes must be worn during all dismantling/ assembly actions described in this chapter.

Environment:

Lubricants can enter the environment. Environmental pollution: Collect, store and correctly dispose of lubricants in suitable containers.

2. INSTALLATION:

INSTALLATION OF FORCED STEERING COMPONENTS



NOTE:

The pertinent regulations (e.g. Accident Prevention Regulations for Vehicles) and the attachment guidelines of the vehicle manufacturers must be observed when installing the forced steering components!

**IMPORTANT:**

If the vehicle owner does not have the appropriate skilled workers and the necessary technical equipment, the installation of forced steering components may only be performed by a specialist workshop.

The ball 50 or the bolt 30 has to be mounted in the distance given by the trailer manufacturer according to the ball 80. Usually this is corresponding to the measurements of ISO 26402 (see Figure 1). In case of application of Walterscheid-towing frames this is generally given. To reach these or other dimensions Walterscheid offers different distance plates.

**IMPORTANT:**

Due to the variety of options for the correct operation of the ZWL, it is necessary to seek advice from our technical sales department. For the relevant contacts, see www.walterscheid.com.

2.1 FORCED STEERING DEVICE (ZWL-KU) FOR TOWING FRAMES WITH FIX BALL 80:

(see Figure 2-10,12)

- > Due to the installation of forced steering device to a towing frame, 2 threaded holes (M20) must be available at the towing frame in a horizontal distance of 50 mm or 55 mm (see figure 2).
- > The ZWL with a horizontal distance of 55 mm are particularly suitable for towing frames of the KK design with a longer coupling point (see Fig. 8).
- > Fix the forced steering device with 2 hexagon head screws (M20) to the coupling frame. Tightening torque: 660 Nm.
- > For a better force transmission into the steering rod, forced steering devices with 3 fixing holes to allow an adjustment of $\pm 15^\circ$ are available (see fig. 4 and 6).

2.2 FORCED STEERING DEVICE (ZWL-KB) FOR TOWING FRAMES WITH BALL-TYPE SLIDER (KB, KBK, KBX):

(see Figure 11 and 13)

- > In combination with ball-type slider KB, KBK or KBX, remove the locking pin on the corresponding side.
- > Mount the M20 (3) screw into the forced steering device. If necessary, use distance plates in between to reach the distance of 250 mm or other distances.
- > Mount the anti-twist protection (5) in order to the above shown figures. A sufficient area of support should be given as well at the coupling frame as at the ball support. Maybe use distance rings.
- > Fix the forced steering device to the coupling frame by using the hexagon screw (5) and screw nut (4). Tightening torque: 660 Nm.
- > Turn the stud screw (2) against the guide rail on the towing frame and minimize the play from the connection. Secure the stud screw (2) of the nut (3).

2.3.1 FORCED STEERING DEVICE FOR BALL-TYPE DRAWBAR (KBa-MODEL) WITH ADAPTER 525:

(see Figure 14)

The adapter 525 (2) is mountable on both sides. Check clearance before installation.

- > Drill two $\varnothing 16$ H11 holes (6) into the ball-type drawbar (1) according to the assembly drawing (see Figure 15) on that side, where the forced steering device should be fixed. In some ball-type drawbars you can find a countersink at the position where the $\varnothing 16$ hole should be placed.
- > Install the 2 dowel pins 16x100 – ISO 8752 (4) flush with the surface of the adapter and the ball-type drawbar (1).
- > Additionally, fix the device with a hexagonal screw M20x50-DIN EN ISO 4017-10.9 (5) from bottom side into the ball-type drawbar (1). Tightening torque: 660 Nm.

- > Mount ZWL50KUN (3) using hexagon head screws M20x80 (4) as described under 2.1.

If adapters are mounted on both sides of the ball-type drawbar, it is necessary to replace the lower retainer pin with the separately available collar bolt. This allows the retainer to be removed for adjustment when the adapters are fitted. To assemble and disassemble the collar bolt, the retainer housing must be dismantled.

2.3.2 FORCED STEERING DEVICE FOR BALL-TYPE DRAWBAR (KBa-MODEL) WITH RETAINER NH8300ZWL: (see Figure 16)

On ball-type drawbars with retainer NH8300ZWL (2), on both sides ZWL can be mounted. Check clearance before installation.

- > Mount ZWL50KUN (7) using hexagon head screws M20x80 (4) as described under 2.1.

2.4 SPHERICAL CAP RESP. SPHERICAL PLAIN BEARING: (see Figure 17-20)

The spherical cap 50 (Figure 17) or the spherical plain bearing 30 (Figure 20) is mounted to the piston rods of steering cylinders with an M30x2 thread. When using the spherical cap 50 on freely rotatable piston rods of steering cylinders, the anti-rotation device (see Figure 18) must also be used.

3. OPERATION:



WARNING:

The pertinent safety regulations must be observed when connecting the connecting element and counterpart.

No one may stand between the vehicles. The forced steering components may only be operated in locked state, i. H. with closed retainer or secured bolt.

3.1 COUPLING

3.1.1 ZWL50: (see Figure 9)

- > Remove the spring pin (3) of the retainer pin (5) and pull out the pin.
- > Swing the retainer (2) through 90° into the lateral position.
- > Move the ball-type trailer shank at the steering rod over the ball 50 (1).
- > Swing the retainer (2) back so that it is above the ball-type trailer shank.
- > Secure with the retainer pin (5) and the spring pin (3).

3.1.2 ZWL50N: (see Figure 10)

- > Unlock the retainer (2) by pulling the ring (3) on the locking pin and swivel it through 90 ° into the lateral position.
- > Move the ball-type trailer shank at the steering rod over the ball 50 (1).
- > Swing the retainer (2) back so that it is above the ball-type trailer shank.
- > Secure the ZWL by loosening the locking pin on the ring (3)

3.1.3 ZWL30: (see Figure 6 and 7)

- > Remove the linch pin of the locking pin and pull it out.

- > Put the hinge bearing at the steering rod into the opening of ZWL30.
- > Push the bolt into the hole of the support and the hinge bearing.
- > Secure with the linch pin.

3.2 UNCOUPLING:

- > The execution works vice versa according to point 3.1.

4. MAINTENANCE

(see Figure 9 and 10)

As part of the vehicle maintenance, the contact surfaces between the connecting element and the counterpart must be lubricated and the attachment of the spherical cap or spherical bearing checked for tightness.

The retainer (2) should be pulled out completely at regular intervals, depending on the schedule density, and any dirt in the bearing has to be eliminated. The retainer pin (5) or the pin screw (5) must be removed beforehand for this purpose. Subsequently re-grease the bearing.

REPLACING THE BALL 50:

If the dimension falls below the wear limit according to Table 2, the ball must be replaced. If the vertical play of the hitched coupling exceeds 1,5 mm, and the retainer is not adjustable any longer, the appropriate parts must be replaced, e.g. retainer, ball or ball-type trailer shank.

- > Remove the nut M30 (7) as well as the washer $\varnothing 31$ (6) below the ball 50
- > Press out the ball (1) from below, using a suitable press.
- > Centre the new ball and press it in up to the stop, likewise using a press.
- > Mount with washer (6) and nut M30 (7). Tightening torque 1000 Nm. Retain the nut with Loctite.

REPLACING THE PIN 30:

If the dimension falls below the wear limit according to Table 2, the pin must be replaced.

4.1 CARE

The forced steering components unit must always be cleared of dirt and corrosion in order to ensure perfect functioning.

4.2 CLEANING AND LUBRICATION

- > All moving parts must be lubricated regularly (depending on the period of use) and checked for ease of movement.
- > If there is a grease nipple on the cap, the ball can be supplied with grease via the central lubrication.
- > Avoid cleaning with high pressure cleaners if possible. If this does happen, the parts must be re-lubricated.
- > For relubrication, remove the old grease and lubricate the coupling head with fresh grease. For lubrication use a water-resistant, multi-purpose grease (Grease type: lithium saponified, consistency class: NL-GI2).



IMPORTANT:

Use only original Walterscheid spares when replacing parts. If the vehicle owner does not have the appropriate skilled workers and the necessary technical equipment, the replacement may only be performed by a specialist workshop.

WEAR LIMITS:

Designations	Nominal dimension	Wear limit dimension	Gauge
	[mm]	[mm]	
Ball SØ 50	50	49	X
Spherical cap SØ50 inner	50,1	51	X
Spherical cap SØ50 outer	70	69	-
Pin Ø 30	30	28,5	-
Spherical plain bearing Ø 30	30	31	-

Table 2

For convenient checking of some wear limits, a separately available Walterscheid test gauge can be used.

If the wear limits are reached, the ball coupling and/or the ball must be replaced.



WARNING:

SAFETY NOTES:

- > The user is obliged to always operate the forced steering components in perfect condition and to forbid its use by unauthorised persons.
- > Unauthorised conversion or modification of the forced steering components is not permitted.

BILD 1
FIGURE 1

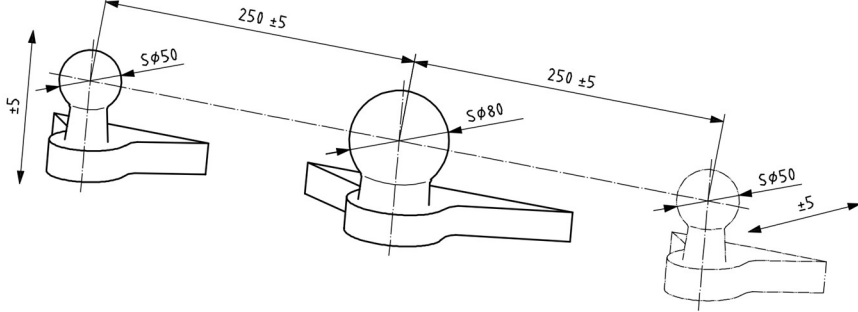


Figure 3 ISO 26402— Location of connecting point(s) of tractor (50 mm ball) in relation to 80 mm ball-type coupling device

BILD 2
FIGURE 2



Gerade Anordnung mit Kugel 50 / Straight arrangement with ball 50 / Arrangement droit avec la boule 50

Typ/type: ZWL50KU

BILD 3
FIGURE 3



Winkelige (15°) Anordnung mit Kugel 50 / Angular arrangement with ball 50 / Arrangement angulaire avec la boule 50

Typ/type: ZWL50KUW15

BILD 4
FIGURE 4



Gerade Anordnung mit Kugel 50 / Straight arrangement with ball 50 / Arrangement droit avec la boule 50

Typ/type: ZWL50KUN

BILD 5
FIGURE 5



Winkelige (15°) Anordnung mit Kugel 50 / Angular arrangement with ball 50 / Arrangement angulaire avec la boule 50

Typ/type: ZWL50KUNW15

BILD 6
FIGURE 6



Gerade Anordnung mit Bolzen 30 / Straight arrangement with pin 30 / Arrangement droit avec le boulon 30

Typ/type: ZWL30KU

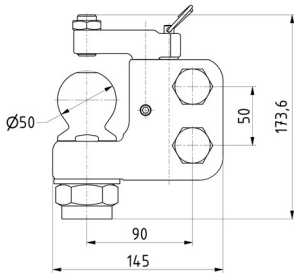
BILD 7
FIGURE 7



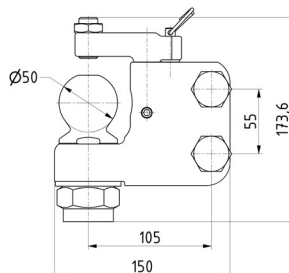
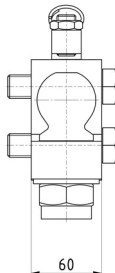
Winkelige (15°) Anordnung mit Bolzen 30 / Angular arrangement with pin 30 / Arrangement angulaire avec le boulon 30

Typ/type: ZWL30KUW15

BILD 8
FIGURE 8



ZWL50KUN



ZWL50KUN2

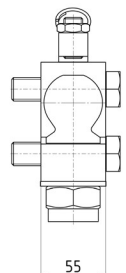
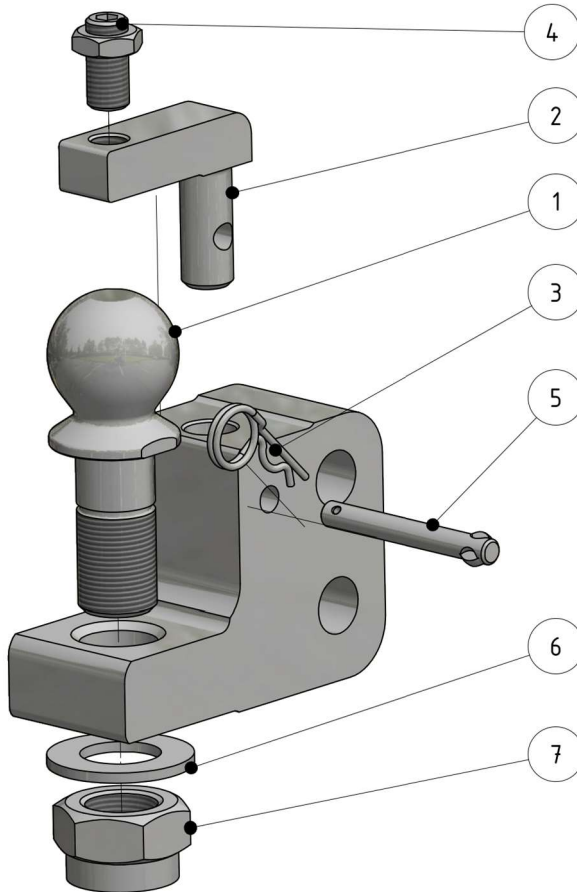


BILD 9
FIGURE 9



Legende:

- 1..... Kugel 50
- 2..... Niederhalter 50
- 3..... Federstecker
- 4..... Stellschraube
- 5..... NH-Bolzen
- 6..... Scheibe
- 7..... Mutter M30

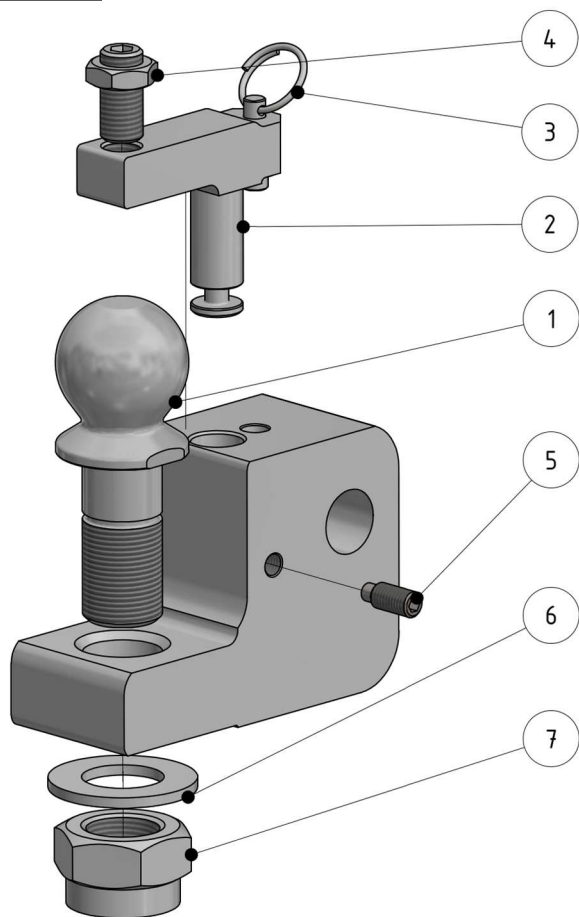
Legend:

- 1..... ball 50
- 2..... retainer 50
- 3..... spring pin
- 4..... adjusting bolt
- 5..... pin screw
- 6..... washer
- 7..... nut M30

Légende :

- 1boule 50
- 2dispositif de retenue 50
- 3goupille fendue
- 4vis de réglage
- 5boulon de maintien
- 6rondelle
- 7écrou de vis M30

BILD 10
FIGURE 10



Legende:

- 1..... Kugel 50
- 2..... Niederhalter 50N
- 3..... Ring
- 4..... Stellschraube
- 5..... Stiftschraube
- 6..... Scheibe
- 7..... Mutter M30

Legend:

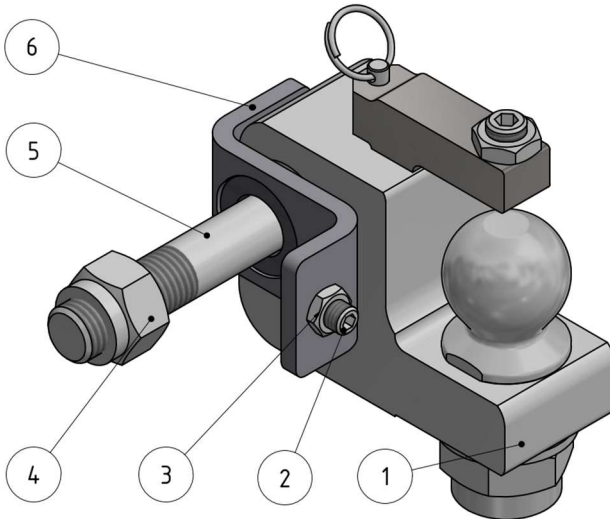
- 1..... ball 50
- 2..... retainer 50N
- 3..... ring
- 4..... adjusting bolt
- 5..... pin screw
- 6..... washer
- 7..... nut M30

Légende :

- 1boule 50
- 2dispositif de retenue 50N
- 3bague
- 4vis de réglage
- 5boulon de maintien
- 6rondelle
- 7écrou de vis M30



BILD 11
FIGURE 11



Legende:

- 1..... Kugelträger
- 2..... Stiftschraube
- 3..... Mutter M16
- 4..... Mutter M20 oder M24
- 5..... Sechskantschraube M20x200
oder M24x200
- 6..... Verdrehsicherung

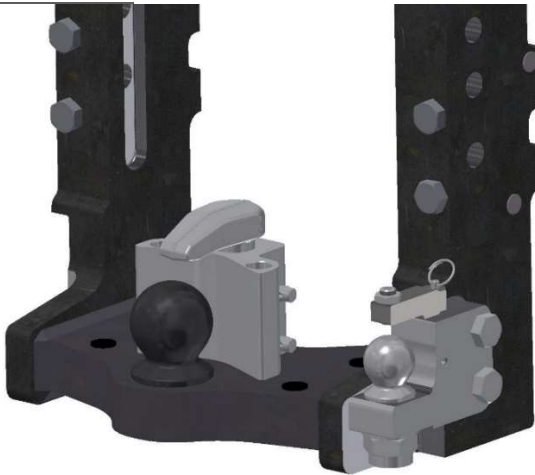
Legend:

- 1..... ball carrier
- 2..... stud screw
- 3..... nut M16
- 4..... nut M20 or M24
- 5..... hexagon screw M20x200
or M24x200
- 6..... anti-twist protection

Légende :

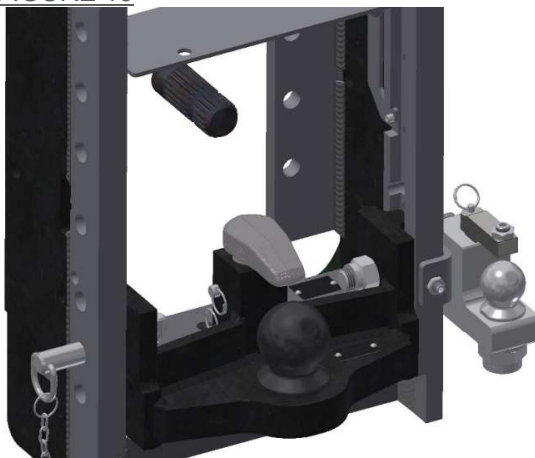
- 1..... porte-boule
- 2..... boulon de maintien
- 3..... écrou de vis M16
- 4..... écrou de vis M20 ou M24
- 5..... vis à tête hexagonale
M20x200 ou M24x200
- 6..... dispositif anti-torsion

BILD 12
FIGURE 12



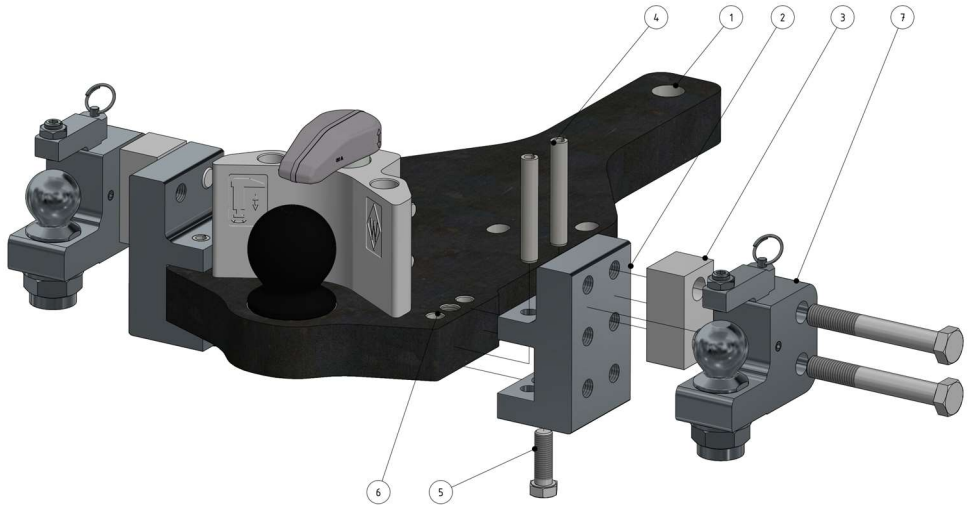
Anhängebock mit fester Kugel 80 und ZWL50KUN
Towing frame with fixed ball 80 and forced steering device ZWL50KUN
Support d'attelage avec boule fixe 80 et ZWL50KUN

BILD 13
FIGURE 13



Anhängebock mit Kugelbock KB und ZWL50KBN
Towing frame with ball coupling 80 and forced steering device ZWL50KBN
Support d'attelage avec boule d'attelage KB et ZWL50KBN

BILD 14
FIGURE 14



Legende:

- 1..... Kugelbalken KBa
- 2..... Adapter 525
- 3..... Distanzstück
- 4..... Spannstift 16x100
- 5..... Sechskantschraube M20x50
- 6..... Bohrung Ø16 H11
- 7..... ZWL50KUN

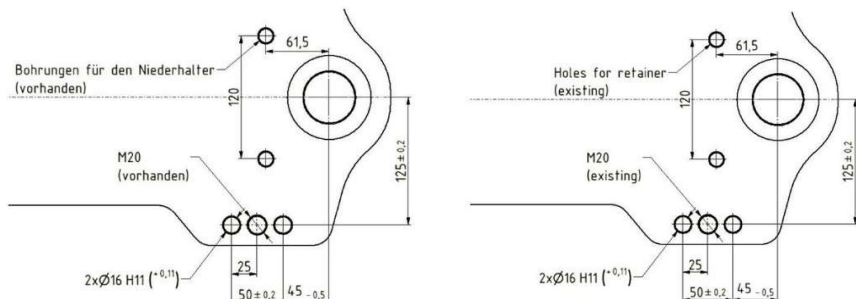
Legend:

- 1..... ball drawbar KBa
- 2..... adapter 525
- 3..... distance plate
- 4..... dowel pin 16x100
- 5..... hexagon screw M20x50
- 6..... hole Ø16 H11
- 7..... ZWL50KUN

Légende :

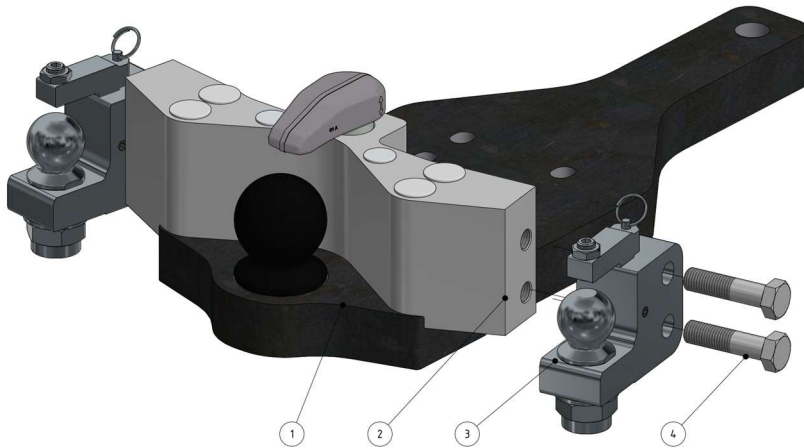
- 1 barre à boules KBa
- 2..... adaptateur 525
- 3 espaceur
- 4 goupille 16x100
- 5..... vis à tête hexagonale M20x50
- 6..... trou Ø16 H11
- 7 ZWL50KUN

BILD 15
FIGURE 15



Montagezeichnung / assembly drawing / dessin d'assemblage

BILD 16
FIGURE 16



Legende:

- 1..... Kugelbalken KBa
- 2..... Gehäuse 8300 ZWL
- 3..... ZWL50KUN
- 4..... Sechskantschraube M20x80

Legend:

- 1..... ball drawbar KBa
- 2..... housing 8300 ZWL
- 3..... ZWL50KUN
- 4..... hexagon screw M20x80

Légende :

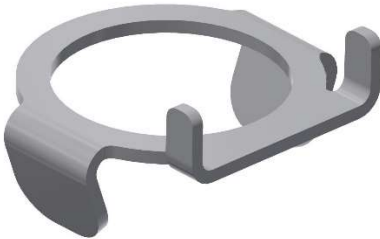
- 1 barre à boules KBa
- 2 logement 8300 ZWL
- 3 ZWL50KUN
- 4 vis à tête hexagonale M20x80

BILD 17
FIGURE 17



Kugelkalotte 50 / spherical cap 50 / calotte sphérique 50

BILD 18
FIGURE 18



Verdrehsicherung / anti-rotation device / dispositif anti-rotation

BILD 19
FIGURE 19

A-A (1 : 1)

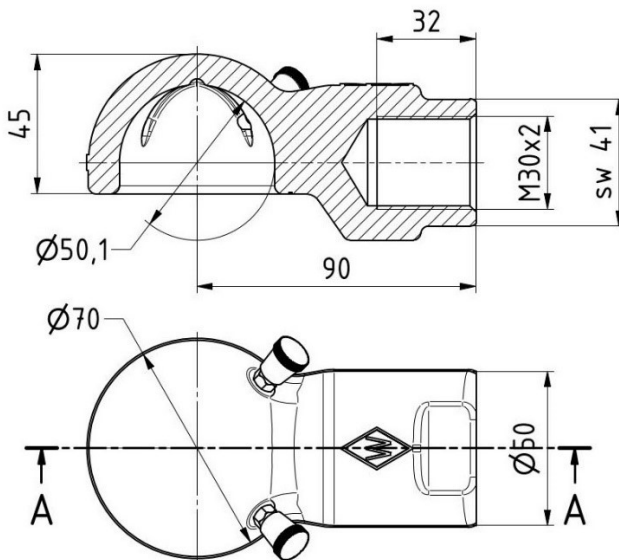


BILD 20
FIGURE 20



Gelenklager 30/ spherical plain bearing 30 / rotules lisses 30