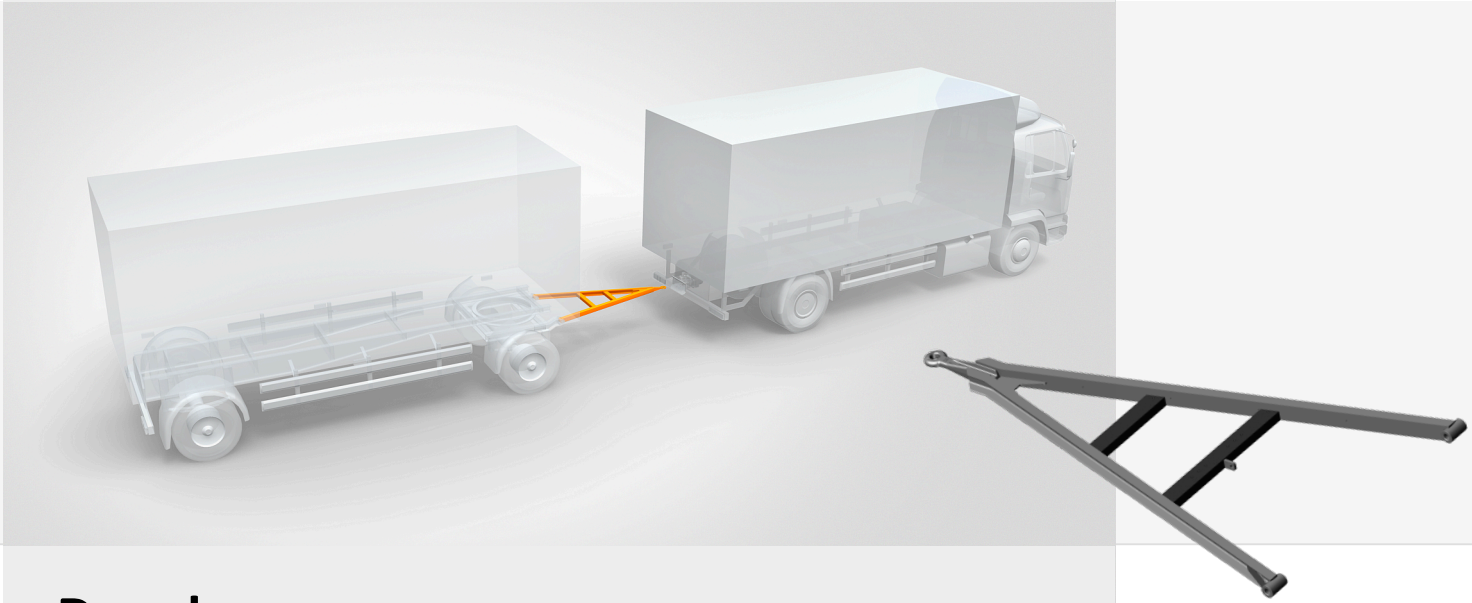
ROCKINGER



Drawbars

EN **Installation and operating instructions**

Table of contents

1 Explanation of symbols

WARNING!

Means that death, serious physical injury or significant material damage can occur if the relevant safety instructions are not followed.

ATTENTION!

Means that minor physical injury or material damage can occur if the relevant safety instructions are not followed.

IMPORTANT!

Contains additional important information.

ADVICE!

This note is a reminder of the obligation to read the documentation!
Failure to comply with these instructions can result in mishandling by personnel.

These installation and operating instructions contain relevant information for the installation, operation, inspection, maintenance and disposal of drawbars. They enable people to work safely on and with the product.

The installation and operating instructions contain safety information and warnings to prevent danger and damage to drawbars.

Drawbars form the connection between the tractor unit and the steerable drawbar trailer. They are designed for mounting on a bogie.

Improper handling of drawbars during installation, repair or operation can give rise to dangerous situations. The safety information in Chapter 3, "Safety information" and the instructions in Chapter 4, "Proper usage" must be adhered to. Please also heed all warnings in the installation and operating instructions. The hazard symbols are explained in Chapter 1, "Explanation of symbols".

Modifications of any kind may have an impact on safety and are not permitted. Furthermore, modifications will rule out all warranty claims and invalidate the vehicle operating licence. The product must not be used until it has been established that the installed drawbar complies with the national regulations for road traffic.

WARNING!

Risk of injury to persons

All safety information can be found in Chapter 3, "Safety information".

Warnings are included in the individual sections at the point where danger can occur, and can be identified by the hazard symbol shown adjacent.

IMPORTANT!

Technical modifications reserved. Up-to-date information can be found on our homepage at: www.jost-world.com

When handling towing hitches, towing vehicles, steerable drawbar trailers and drawbars, the relevant safety regulations for the country of use (for example „Berufsgenossenschaft Verkehr“ in Germany) apply.

The relevant safety information in the owner's handbook for the towing vehicle and steerable drawbar trailer continue to apply and must be followed.

3.1 Liability

No liability will be accepted for damage attributable to the following:
- Improper use of drawbars
- Failure to comply with the documentation
- Unapproved modifications to drawbar components
- Inexpert work on and with drawbars
- Operation of incorrectly fitted drawbars
- Operating drawbars when safety and protective equipment is not functioning correctly
- Insufficient monitoring of drawbar components that are subject to wear
- Incorrectly performed repairs
- Unapproved, inexpert modification of operating parameters
- Disasters, the impact of foreign bodies, force majeure

ADVICE!

Read these installation and operating instructions carefully before installation.

3.2 Welding work

WARNING!

Risk of injury to persons

Incorrectly performed welding can lead to injuries.
- Have welding carried out in suitable workshops by trained personnel with proven, suitable qualifications according to EN 287-1 and EN ISO 9606-1.
- Have welding performed exclusively by authorised specialist companies.

ATTENTION!

Risk of material damage

A lack of surface protection can lead to damage.
- It is imperative to apply surface protection paint to the drawbar when all welding is complete.
- Paint the drawbar before any further installation work.

ATTENTION!

Risk of material damage

Mishandling can lead to damage.
- Always take great care not to damage electrical wiring during welding work on the vehicle.
- Connect the negative lead of the welder as close as possible to the weld point on the vehicle.

ATTENTION!

Risk of material damage

Unsuitable welding materials can lead to damage.

- The quality of the weld must satisfy the requirements of assessment group B according to EN ISO 5817.
- The welding materials must be selected to suit the rigidity of the base metal.

3.3 Installation

Attach drawbars to the steerable drawbar trailer as described in Chapter 6, "Installation and operation".

WARNING!

Risk of injury to persons

Incorrect installation can lead to injuries.

- Have the ROCKINGER drawbar installed by trained personnel in suitable workshops.
- Have installation performed only by authorised specialist companies.
- Install ROCKINGER drawbars as per the manufacturer's instructions.
- During installation, pay attention to the instructions on the type of fastening, overall vehicle length, axle load, clearance, etc.

WARNING!

Risk of injury to persons

Defective individual parts can lead to injuries.

- Do not use damaged or repaired individual parts, e.g. repairs using deposition welding.
- Use only genuine ROCKINGER parts that are in perfect condition.

IMPORTANT!

The drawbar manufacturer will not accept any warranty claims if installation is carried out incorrectly.

3.4 Maintenance

WARNING!

Risk of injury to persons

Incorrect maintenance can lead to injuries.
- Have the ROCKINGER drawbar serviced by trained personnel in suitable workshops.
- Have maintenance work performed exclusively by authorised specialist companies.

WARNING!

Risk of injury to persons

Defective spare parts can lead to injuries. We cannot provide any information about the properties of spare parts from other manufacturers.
- Use only genuine ROCKINGER spare parts for maintenance and repairs.

ATTENTION!

Risk of material damage

Unsuitable lubricants can lead to damage. The use of lubricants other than those specified here may damage individual parts of the drawbar.
- Use only the specified lubricants.

4.1 General information

Drawbars form the connection between the towing vehicle and the steerable drawbar trailer. They are designed for mounting on a bogie.

Drawbars are parts that connect vehicles and require type approval, and are therefore subject to the highest safety requirements. They may only be used with correct tow hitches approved for use with the towing eye.

For towing eyes that can be used with the preferred, approved towing hitch, please refer to the following table:

Towing eye	Possible approved towing hitches
40 DIN 74054 A + B	DIN 74051; Type RO 400; Type RO 40E
50 DIN 74053 A + B	DIN 74052; Type RO 500; UN - R 55 Class C50
50 heavy duty	DIN 74052; Type RO 500; UN - R 55 Class C50; RO 56E
40 Swiss towing eye	Type RO 40CH
57 Scandinavian towing eye	Type RO 57; Type RO 57 flex.
76 VG 74059 A + B	UN-R 55 Class K
40 DIN 11026	DIN 11029; Type RO 850; Type RO 860
KS 80 coupling head	Type RO 825; Type RO KS80
68 BNA	Type RO 50 BNA

Table 1: Possible towing eyes for use with the preferred, approved towing hitch

IMPORTANT!

Changes of any kind (except those permitted in Chapter 6.2, "Installing fasteners") exclude warranty claims and invalidate the type approval and therefore the vehicle operating licence.

4.2 Principle

ROCKINGER drawbars are state-of-the-art products that conform to the applicable safety regulations. ROCKINGER drawbars have type approval as per UN Regulation 55 and custom models with individual certificates are available.

4.3 Custom models with certificate

Custom models with certificate granting individual approval in accordance with Para. 13 of the German Vehicle Parts Order (FzTV) in conjunction with Para. 22a of the German Road Traffic Licensing Regulation (StVZO) receive an individual test mark (TP no.). The associated certificate is sent separately and must be kept with the vehicle documents.

ROCKINGER has appropriate UN type-approved drawbars for almost all vehicle combinations. In order to meet the requirements of the market, further type approvals are planned, and existing ones are being extended and added to. For this reason, all drawbars are subject to changes in the interest of technical progress.

Drawbars have a type plate bearing the official approval number and load data for the complete drawbar. The towing eyes

used are covered by the overall drawbar type approval and do not require separate type approval.

4.4 Drawbar layout

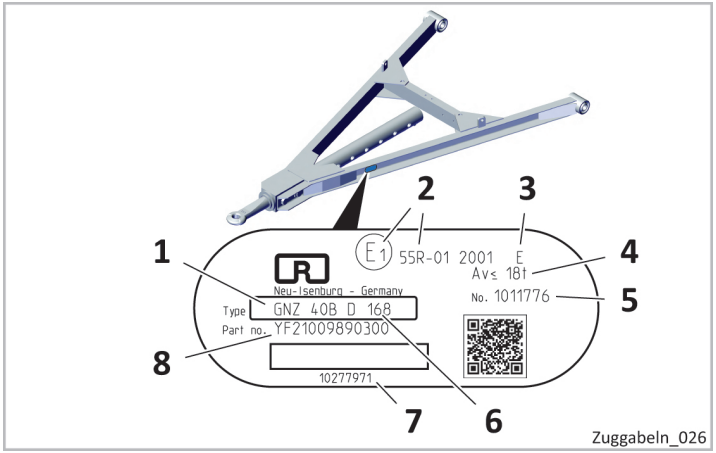


Figure 1: Contents of type plate

1	Type	**5**	Item number
2	Type approval number	**6**	Permitted D value in kN
3	Type class	**7**	Serial number
4	Maximum front axle load Av in t	**8**	Article no.

For the maximum load data for drawbars, please refer to the information on the type plate or the respective, currently valid data sheets. They apply to intended use pursuant to Regulation UN R55.

IMPORTANT!

Drawbars are components that are subject to mandatory identification.

IMPORTANT!

Scan the QR code on the type plate to view the installation and operating instructions.

ADVICE!

The maximum load data for drawbars can be found in the online catalogue:

JOST e-Catalogue

IMPORTANT!

If you have any questions on the layout of the drawbar, please contact the technical customer support team by email at: tkd-technik@jost-world.com

In the case of additional dynamic stress, e.g. operation on uneven road surfaces, on construction sites and in forestry, please do one of the following:

- do not go up to the maximum D value, or
- use a stronger drawbar, or
- contact the technical customer support team with any questions.

The main criteria for selecting a drawbar are the D value and the maximum front axle load of the bogie on which it is to be mounted. Specifications on the admissible maximum weight of the trailer are purely recommendations to provide guidance.

The suitability of a drawbar for producing a tractor-trailer unit can be checked using the specified D value, see Chapter 4.5, "Calculating the D value".

4.5 Calculating the D value

The D value is the theoretical drawbar force between the towing vehicle and the trailer, a calculated value comparing the forces between moving masses.

The D value can only be calculated from the maximum total weight of both values (towing vehicle and steerable drawbar trailer).

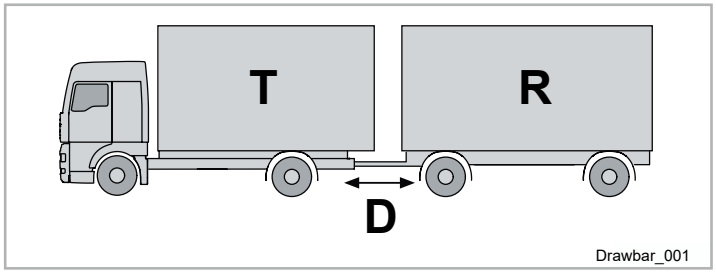


Figure 2: Towing vehicle, steerable drawbar trailer

Calculating the D value (kN):

$$D = g \times \frac{T \times R}{T + R} \text{ [kN]}$$

D = drawbar value [kN]
T = total weight of towing vehicle in t
R = total weight of steerable drawbar trailer in t
g = acceleration due to gravity 9.81 m/s²

ATTENTION!

Risk of material damage

An incorrect layout can lead to damage. The calculated D value may be equal to or lower than the D value of the drawbar.

- Choose a suitable drawbar to ensure this.

ATTENTION!

Risk of material damage

If the towing eye is at the wrong angle, there is a risk of damage and premature wear.

- When forming a tractor-trailer unit, take care to ensure that the angle of the towing eye (upwards or downwards) relative to the horizontal does not exceed 3°.
- Choose a suitable drawbar to ensure this.

UN test marks, type approval numbers and maximum load data of the various types of drawbar can be found in the following table Tab. 2.

UN type approval	Type	Front axle load Av [kN]	D value [kN]
E1 55R-01 1964	GNZ 9.4	5	70
E1 55R-01 1911	GNZ 18	8-10*	98
E1 55R-01 1911	GNZ 18 N	10	98
E1 55R-01 1909	GNZ 27	12	125
E1 55R-01 1909	GNZ 27 N	12	125
E1 55R-01 2001	GNZ 40 A	12-18*	125
E1 55R-01 2021	GNZ 40 B	12-18*	168
E1 55R-01 2022	GNZ 50	18-24*	190
E1 55R-01 2676	GNZ 50 HD	24	206
E1 55R-02 3362	GSG 48	12-24*	125/160
E1 55R-01 2840	GSZ 50 A	12-20*	125
E1 55R-01 2865	GSZ 50 B	12-24*	125/190
E1 55R-01 2516	GZA 40 A	12-24*	125
E1 55R-01 2528	GZA 40 B	12-24*	160
E1 55R-02 2634	GZHL 27	10	112
E1 55R-02 2471	GZL 27	10-12*	125
E1 55R-02 2604	GZL 50 A	10-12*	125
E1 55R-01 2892	GZL 50 B	12-24*	190
E1 55R-01 2685	GZLG A	10-12*	125

Table 2: Technical data

UN type approval	Type	Front axle load Av [kN]	D value [kN]
„Einzelabnahme“ (individual approval)	GZLG B	12-24*	168
E1 55R-02 2937	GZLV A	12-24*	125
E1 55R-02 2924	GZLV B	12-24*	190
E1 55R-01 2446	GZU 27	9-10*	125
E1 55R-02 3311	GZU 40 A	9-10*	125
E1 55R-02 3321	GZU 40 B	9-12*	190
E1 55R-02 2488	GZV B	18-24*	190
E1 55R-01 2464	GZY 27	10	125
E1 55R-01 2314	GZY 36 A	12	125
E1 55R-01 2831	GZY 44	18	190

Table 2: Technical data

* For Av load, see technical data sheet in the online catalogue.

4.6 Application limits

ROCKINGER drawbars may be used solely in compliance with the maximum permitted load data. Certain types of drawbar are not suitable for use on forestry or construction site vehicles.

WARNING!

Risk of injury to persons and material damage

Failure to comply with the specified limits of use can lead to injury and damage.

- Use ROCKINGER drawbars solely in compliance with the maximum permitted load data.

IMPORTANT!

In case of doubt, please email queries about the suitability of drawbar types separately to the technical customer support team: tkd-technik@jost-world.com

5.1 Drawbar

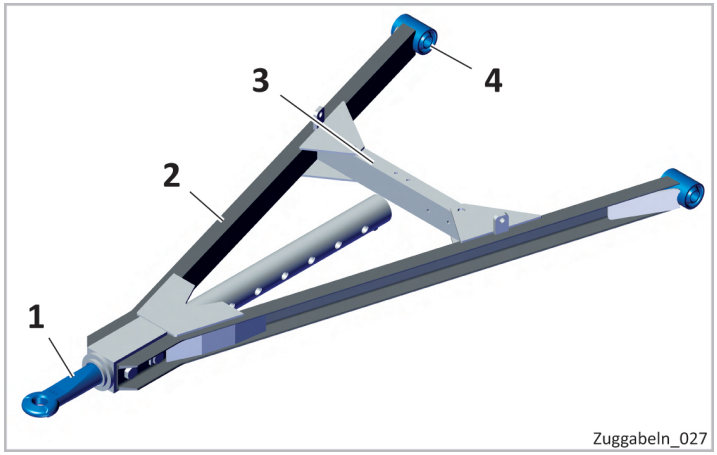


Figure 3: Drawbar layout

1 Towing eye
2 Longitudinal strut
3 Cross strut
4 Bearing eye

ROCKINGER drawbars generally consist of two longitudinal struts (2), which culminate in a towing eye (1) at the front end in the direction of travel. At the rear end of each longitudinal strut is a bearing eye (4) for mounting on the bogie. The longitudinal struts are reinforced by one or more cross struts (3), depending on their design.

5.2 Drawbar shoe

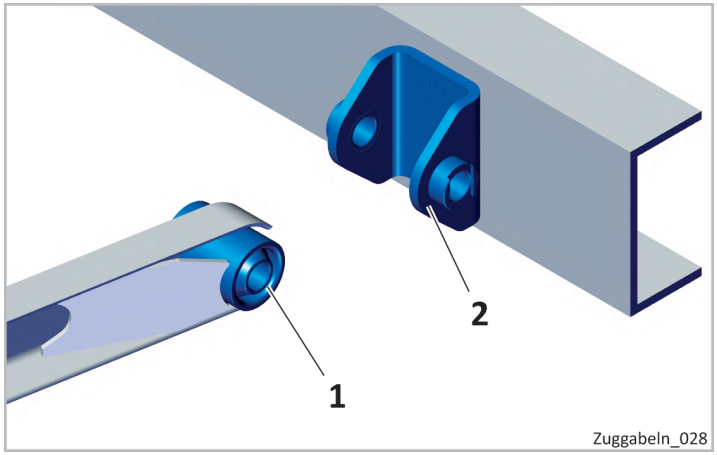


Figure 4: Bearing eye and drawbar shoe

1 Bearing eye
2 Drawbar shoe

Drawbar shoes (2) are needed for attaching the drawbar to the bogie. These are welded onto the bogie before the drawbar is fitted. The bearing eyes (1) of the drawbar produce the connection to the drawbar.

5.3 Height adjusters

Height adjusters enable the drawbar to be positioned horizontally. You can find further details on height adjustment systems in Chapter 6.5, "Assembling a height adjustment system".

- Before installation, check that you have all the parts and that they are undamaged.
- Do not use damaged parts.

WARNING!

Risk of injury to persons and material damage

Modification or repair welding can lead to injury and damage. Welding work on the drawbar is strictly prohibited, as it can weaken the material.

- The only welding permitted is that described in this manual.

WARNING!

Risk of injury to persons and material damage

There is a risk of injury and damage.

- Have the necessary welding work performed by qualified personnel in specialist workshops.
- Have installation performed solely by trained personnel.

WARNING!

Risk of injury to persons

Inadequate PPE can lead to injury.

- Ensure personal safety during installation.
- Always wear the required PPE.

ATTENTION!

Risk of material damage

Mishandling can lead to damage.

- Always take great care not to damage electrical wiring during welding work on the vehicle.
- Connect the negative lead of the welder as close as possible to the weld point on the vehicle.

IMPORTANT!

Hand all documents containing information and instructions to the customer. They can then be kept in the vehicle for future maintenance and care.

6.1 Welding work

6.1.1 Preparing the weld seam

The surfaces around the weld seam must be prepared to ensure perfect welds. Moisture and impurities such as dirt, rust, scale, slag, paint, oil and grease will adversely affect the result. To prevent weld defects due to the surface impurities mentioned above, components in the vicinity of the weld must be prepared accordingly (cleaning, drying, etc.).

6.1.2 Welding process

The earth connection must ensure perfect electrical contact.

6.1.3 Heat treatment

Heat treatment can be performed using any method that is suitable for the base metal. However, care must be taken to ensure that the specified temperatures are achieved and the defined time is adhered to.

Preheating
Please note the following points as per EN 1011-2, SEW 088 Supplement 1, SEW 088 Supplement 2:

- The area around the weld must be sufficiently preheated if required, in line with the type of material, weld cross-section and thickness of the components to be welded.
- Make sure that a sufficiently large area is preheated before welding, including tack welding, if the material requires this.
- In the case of multi-layer welds, the weld temperature of the existing layer must not fall below the stated preheating temperature while the intermediate and top layers are being welded.

Post weld heat treatment
The type and extent of post weld heat treatment depend on the material used, the wall thickness, the structure itself and the intended purpose.

- Carry out post weld heat treatment in accordance with current engineering standards or the specifications of the party that placed the order or of the material supplier.

Temperature monitoring

- Check the temperature of the workpiece during preheating and post weld heat treatment using suitable and monitored measuring equipment, e.g. a thermocouple or thermochromic marker.

6.1.4 Welding process

The following welding methods, with the specified welding materials and consumables, are permitted:

Welding method according to ISO 4063	111	135	135
Welding material Approved by one of the following organisations: BV, DB, DNV, GL, LR, TÜV	Electrode rod	Welding wire	Inert gas
Name of standard Welding material/welding consumable	ISO 2560-A-E 35 3 B ISO 2560-A-E 38 3 B ISO 2560-A-E 42 3 B	ISO 14341-A-G 38 3 C1 2Si ISO 14341-A – G 42 3 M21 2Si ISO 14341-A-G 42 3 C1 3Si1 ISO 14341-A-G 42 4 M21 3Si1 ISO 14341-A-G 46 3 C1 4Si1 ISO 14341-A-G 46 4 M21 4Si1	ISO 14175 - C1 ISO 14175 - M21

6.2 Installing fasteners

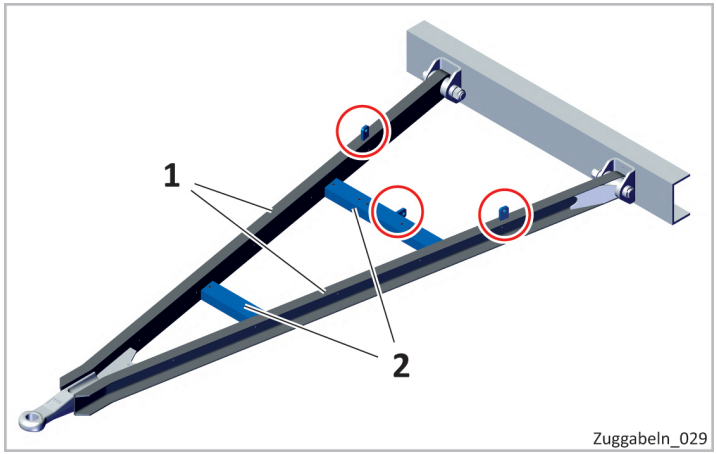


Figure 5: Drawbar fastening points

1 Longitudinal struts (for additional hooks or eyes)

2 Cross struts (with holes and eye)

The cross struts (2) feature holes and an eye, which vary according to the type, for attaching fasteners and for mounting height adjusters, dummy couplings and similar.

Furthermore, additional mounting points can be fitted to the longitudinal struts (1) using suitable clamping devices, e.g. a spring shackle for a GHE height adjustment system.

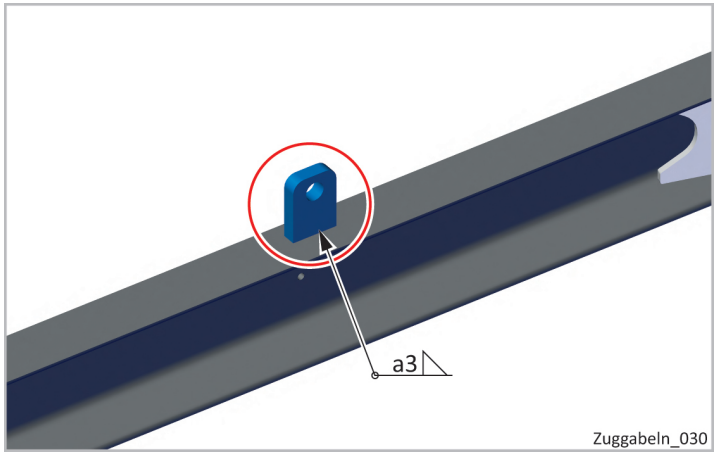


Figure 6: Welding specification for fastening points

If the above options are not sufficient, hooks or eyes can be welded onto the longitudinal strut. When doing this, make absolutely sure that they are attached with great care to the centre of the section using a circumferential fillet weld (a = 3 mm).

6.3 Installing the drawbar shoes

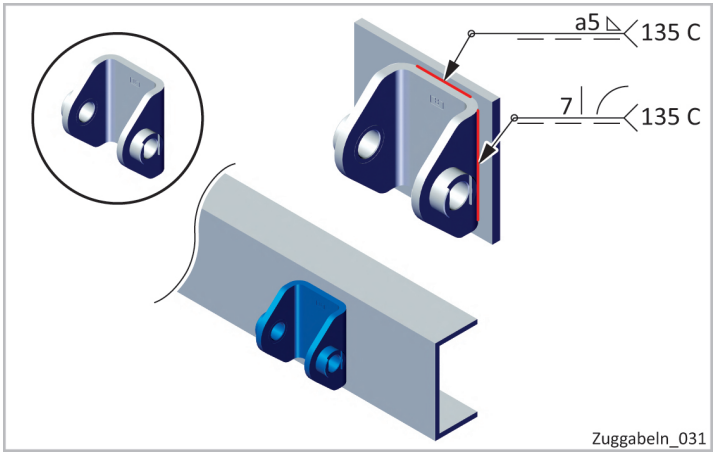


Figure 7: Minimum weld seam figure for drawbar shoes

The drawbar shoes shown in Fig. 7 form the fastening points between the bogie and the drawbar.

The weld points on the bogie must be prepared for welding beforehand. There must not be any paint or similar on the surface.

The weld seam figure applies to ROCKINGER drawbar shoes and is a minimum figure.

Burn marks must be carefully sanded down.

The drawbars must be attached in a suitable fashion for the particular bogie and is the responsibility of the vehicle manufacturer.

6.4 Installing the drawbar bearing assembly

6.4.1 Installation with a silent bush

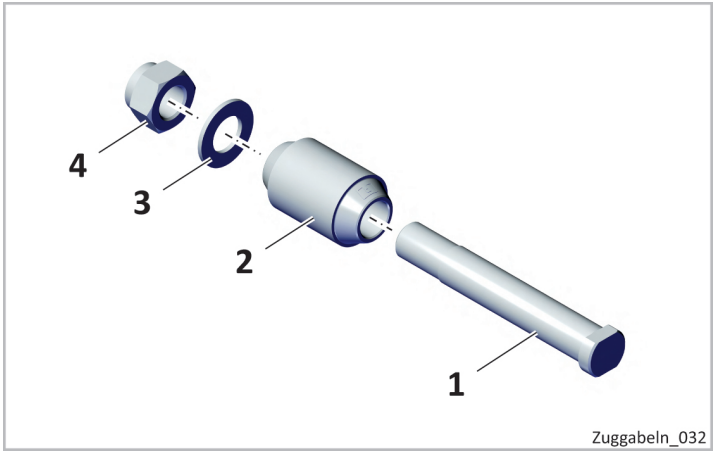


Figure 8: Fastening materials with silent bush

1	Bearing pin	**3**	Washer
2	Silent bush	**4**	Self-locking nut

The mounting parts shown in Fig. 8 are used to secure the drawbar to the bogie. When the self-locking nut (4) is tightened, the silent bush (2) achieves its clamping action, which ensures radial motion by means of the rubber element, see "Tightening torque of self-locking nut".

ATTENTION!

Risk of material damage

Using drawbar lowering systems and exceeding the vertical pivot angle may cause damage to the silent bushes (2).

- Do not exceed the maximum vertical pivot angle of the drawbar, which is ±20°.
- If the bearing in the drawbar eye includes a silent bush (2), do not use a drawbar lowering system.

IMPORTANT!

ROCKINGER recommends the use of genuine ROCKINGER bearing pins (M 30-8.8).

IMPORTANT!

ROCKINGER chiefly recommends the use of silent bushes (2). for the drawbar bearing. Silent bushes (2) reduce wear and maintenance work and increase comfort.

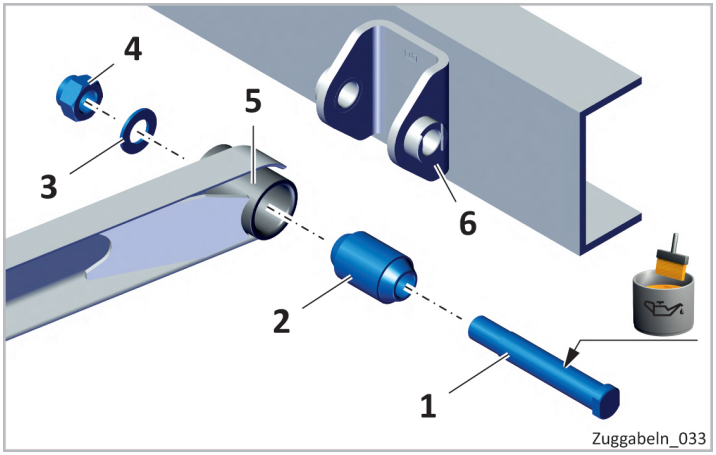


Figure 9: Sequence for installing the drawbar in the drawbar shoe

1	Bearing pin	**4**	Self-locking nut
2	Silent bush	**5**	Bearing eye
3	Washer	**6**	Drawbar shoe

IMPORTANT!

In ROCKINGER drawbars with a silent bearing, the silent bush (2) is already installed in the bearing eye (5).

IMPORTANT!

Silent bearings do not need lubrication.

- Position the bearing eyes (5) in the drawbar shoes (6) so that the bearing eyes are not wedged in the shoes.
- Before installing for the first time, apply standard lubricating grease or assembly paste to the bearing pin (1), to facilitate its removal later on.
- Insert the bearing pin (1) in the hole in the drawbar shoe (6) from the outside of the drawbar, so that it goes through the silent bush (2) and is fully in contact with the drawbar shoe (6).
- Fit the washer (3) on the end of the bearing pin (1) that is protruding from the inside of the drawbar.
- Next, screw the self-locking nut (4) onto the bearing pin (1) until the nut is in contact with the drawbar shoe (6).
- Tighten the self-locking nut (4) to the specified torque.

IMPORTANT!

Tightening torque of self-locking nut (4): 400 Nm

6.4.2 Installation with a brass bush

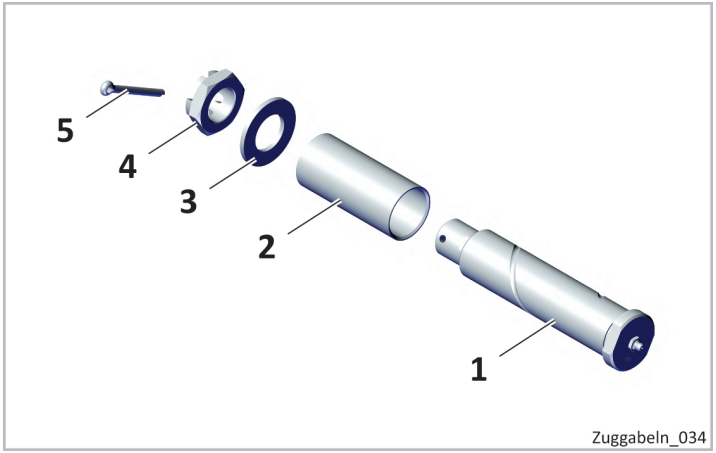


Figure 10: Fastening materials with brass bush

1	Spring bolt	**4**	Castle nut or self-locking nut
2	Bush	**5**	Split pin
3	Washer		

The mounting parts shown in Fig. 10 are used to secure the drawbar to the steerable drawbar trailer.

ATTENTION!

Risk of material damage

Incorrect installation can lead to damage.

- During installation, make sure that the drawbar can still move vertically but is secured in the bearing without any play.
- Install the drawbar bearing without play and ensure it can move vertically.

ATTENTION!

Risk of material damage

Inadequate lubrication can lead to damage and increased wear.

- Regularly reapply grease to the spring bolt (1) during operation.
- Comply with the lubrication intervals or connect the spring bolt (1) to the centralised lubrication system.

IMPORTANT!

There are two options for securing a spring bolt:

– A washer (3), a castle nut (4) and a split pin (5) (recommended)
– A washer (3) and a self-locking nut (4)

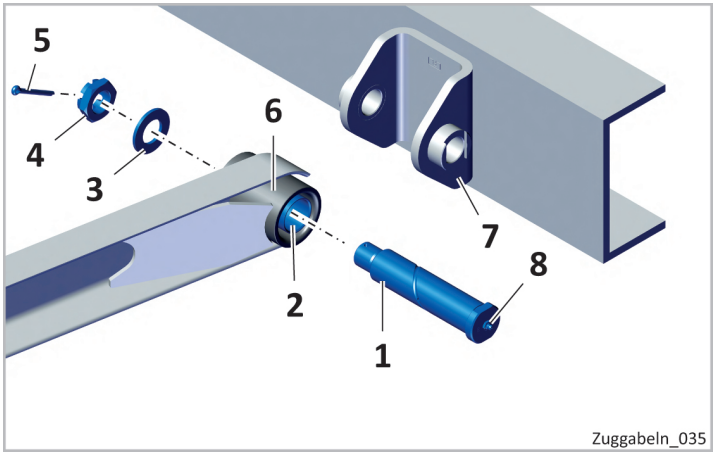


Figure 11: Fastening materials with silent bush

1	Spring bolt	**5**	Split pin
2	Bush	**6**	Bearing eye
3	Washer	**7**	Drawbar shoe
4	Castle nut or self-locking nut	**8**	Grease nipple

IMPORTANT!

If the split pin (5) cannot be inserted when a castle nut (4) is used for installation, continue tightening the nut until the next split pin hole is covered.

- It must be tightened at least to the minimum tightening torque.

IMPORTANT!

Tightening torque of castle nut or self-locking nut (4): 180 Nm

- Position the bearing eyes (6) in the drawbar shoes (7) so that the bearing eyes are not wedged in the shoes.
- Before installing for the first time, apply standard lubricating grease or assembly paste to the spring bolt (1), to facilitate its removal later on.
- Insert the spring bolt (1) in the hole in the drawbar shoe (7) from the outside of the drawbar, so that it goes through the brass bush (2) and is fully in contact with the drawbar shoe (7).
- Fit the washer (3) on the end of the spring bolt that is protruding from the inside of the drawbar.
- Next, screw the castle nut or self-locking nut (4) onto the spring bolt (1) until the nut is in contact with the drawbar shoe (7).
- Tighten the castle nut or self-locking nut (4) to the specified torque.

IMPORTANT!

When using a castle nut (4) for installation, secure it with the split pin (5).

- After installation, apply multi-purpose grease NLGI 2 to the spring bolt (1) via the grease nipple (8).

6.5 Assembling a height adjustment system

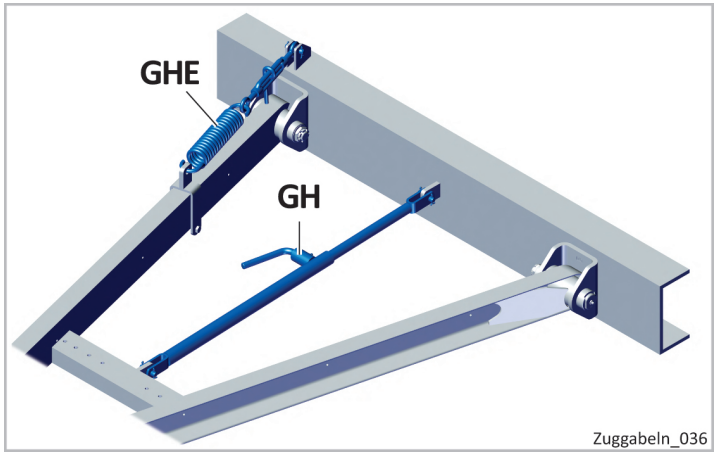


Figure 12: Drawbar with type GH and GHE height adjustment system

A height adjustment system prevents the drawbar from dropping onto the ground and ensures that the towing eye is at the same height as the funnel of the towing hitch.

Height adjustment systems are required by law for trailers with a gross weight of over 3.5 tons.

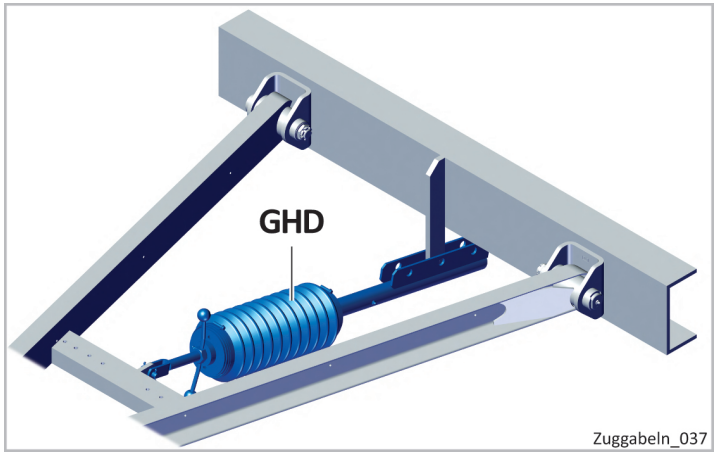


Figure 13: Drawbar with type GHD height adjustment system

ATTENTION!

Risk of injury to persons and material damage

If the drawbar drops to the ground, this can lead to injury and damage. Do not allow drawbars to fall all the way to the ground. If they are detached when horizontal, they must not fall from a height of less than 200 mm.

- Install the drawbar so it is clear of the ground.

IMPORTANT!

When using ROCKINGER height adjustment systems on drawbars from other manufacturers, please pay attention to the relevant operating and installation instructions from the vehicle manufacturer or for other vehicle parts.

IMPORTANT!

A spring shackle is needed to secure the height adjustment system.

This is not included with delivery, but is available separately as an accessory, with different profiles.

Requirements

After installing a height adjustment system, make sure the following requirements are met:

- The drawbar must have the required ground clearance.
- The towing eye must be adjusted to the required height.
- Have one person adjust the drawbar to the height of the funnel, without the use of tools.
- Move the towing eye up and down 300 mm from its horizontal position above the road surface.
- Within this 300-mm range, the drawbar must be adjustable either infinitely or in increments of no more than 50 mm, measured from the towing eye.
- The drawbar must still be able to move freely after the coupling process.

6.5.1 Installation with type GH

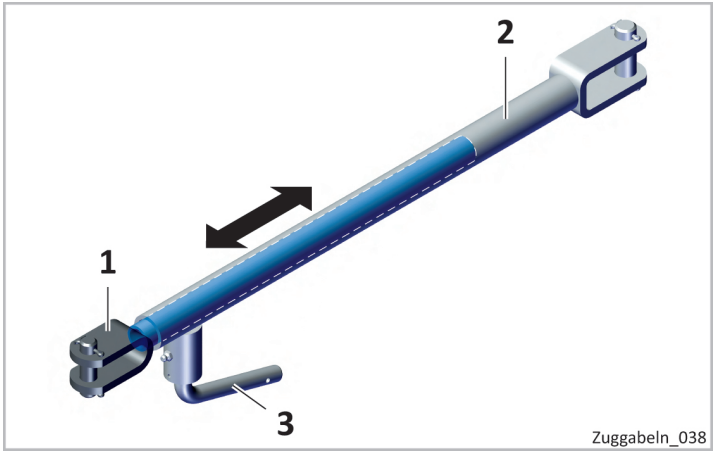


Figure 14: Type GH height adjustment system – Full view

1 Push rod with yoke
2 Drawbar tube with yoke
3 Lever

The type GH height adjustment system basically consists of a moving push rod with yoke (1), a drawbar tube with fixed yoke (2) and a lever (3) that clamps the two moving tubes one inside the other.

This height adjustment system works on the basis of tension and pressure.

For heavier drawbars weighing more than 50 kg, the type GH is used in combination with the type GHE height adjustment system for fast adjustment, see Tab. 3.

Drawbar weight	GH	GHE
≤ 50 kg	X	
Up to 100 kg	X	X

Table 3: Weight-dependent combination of type GH and GHE height adjustment systems

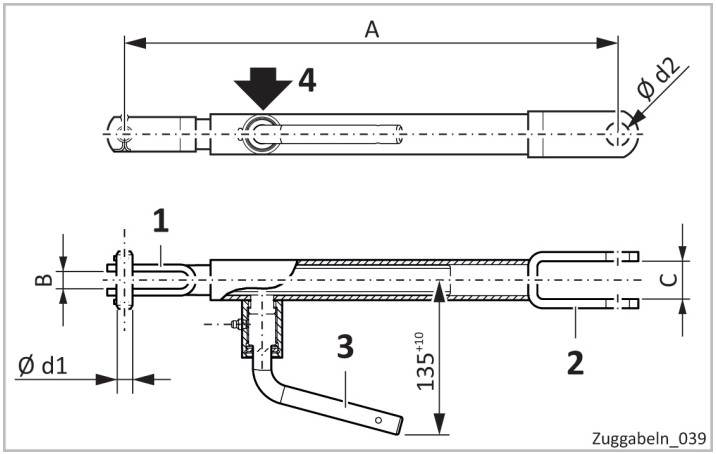


Figure 15: Type GH height adjustment system

1	Push rod with yoke	**3**	Lever
2	Drawbar tube with yoke	**4**	Version with A-L marking

ADVICE!

It is essential to adhere to the requirements Requirements in Chapter 6.5, "Assembling a height adjustment system".

Article no.	Version	A [mm]	B [mm]	C [mm]	Ø d1 [mm]	Ø d2 [mm]
Y258000000	A	422-570	15.5	33	14	20
Y258100000	B	630-880	15.5	33	14	20
Y258200000	C	680-930	15.5	33	14	20
Y258300000	D	840-1090	15.5	33	14	20
Y258330010	E	422-570	15.5	15.5	14	14
Y258330020	F	680-930	15.5	15.5	14	14
Y258400000	G	680-1030	22	33	16	20
Y258600000	H	680-930	15.5	15.5	14	14
Y258500000	I	680-1030	22	33	16	20
Y258030010	J	750-1000	22	33	16	20
Y258630030	K	725-1200	15.5	15.5	14	14
Y258630010	L	680-1030	22	15.5	16	14

Table 4: Versions of type GH height adjustment system

Carry out installation as follows:

- Fasten the push rod with yoke (1) to the cross struts or longitudinal struts of the drawbar, see Chapter 6.1, "Welding work". To secure, use the fastening materials that are generally included with delivery.
- Lift the drawbar.
- Adjust the length of the drawbar tube with yoke (2) and, using a suitable fastening element (not included), secure it to the bogie of the trailer to act as a counter bearing.
- Lock the lever (3) in place.

6.5.1.1 Type GH height adjustment

- Move the drawbar up or down manually and secure in place for coupling using the lever (3), see Fig. 15.

IMPORTANT!

Release the lock before starting to drive.

6.5.2 Installation with type GHE

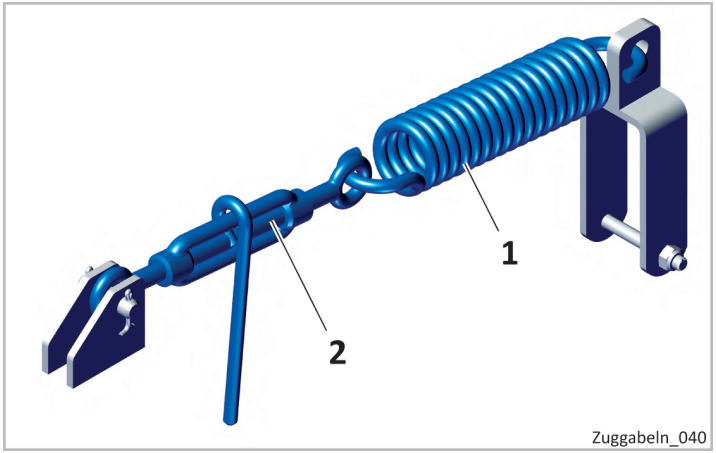


Figure 16: Type GHE height adjustment system – Full view

1 Spring **2** Turnbuckle

The type GHE height adjustment system basically consists of a spring (1) and a turnbuckle (2).

The type GHE is an infinitely adjustable height adjustment system that works on the basis of pressure.

The type GHE is suitable for drawbars up to 100 kg. For drawbars over 100 kg, two type GHE reinforced models are required.

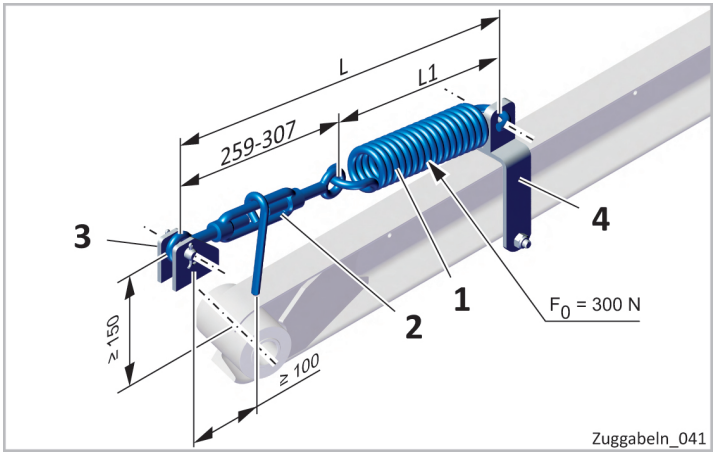


Figure 17: Type GHE height adjustment system

1	Spring	**3**	Bracket
2	Turnbuckle	**4**	Spring shackle (accessory*)

	Spring Ø D10 [mm]	Spring Ø D13 [mm]
L	519 – 647	556 – 676
L1	260 – 340	297 – 369
R [N/mm]	63	135,5

Table 5: Versions of type GHE height adjustment system

ADVICE!

It is essential to adhere to the requirements Requirements in Chapter 6.5, "Assembling a height adjustment system".

Carry out the following preliminary work before installation:

- Check at which point the height adjustment system should be fastened.
- Decide on the fastening point on the bogie. The fastening point should be no more than 100 mm behind and no less than 150 mm above the rotating axle of the drawbar, see Fig. 17.
- Weld the bracket (3) of the height adjustment system onto the bogie using a circumferential fillet weld (a = 3 mm).

Carry out installation as follows:

- First, secure the height adjustment system to both fastening points.
- Next, use the turnbuckle (2) to tension the spring (1).

6.5.2.1 Type GHE height adjustment

Turning the turnbuckle allows the drawbar to be lifted and lowered.

- Turn the turnbuckle to adjust the towing eye to the height of the towing hitch funnel on the vehicle.

* Not included.

6.5.3 Installation with type GHD

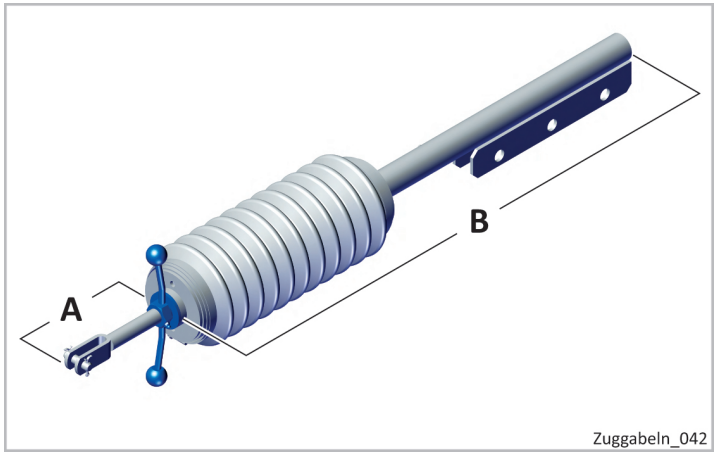


Figure 18: Type GHD height adjustment system – Full view

A Adjustment toggle with cross strut and yoke fastening point

B Fastening unit with bellows

The GHD height adjustment system basically consists of an adjustment toggle with a fastening point for securing the cross strut to the yoke (A) and a fastening unit with bellows (B).

The type GHD is an infinitely adjustable height adjustment system that works on the basis of pressure from below.

The type GHD is suitable for drawbars weighing more than 50 kg.

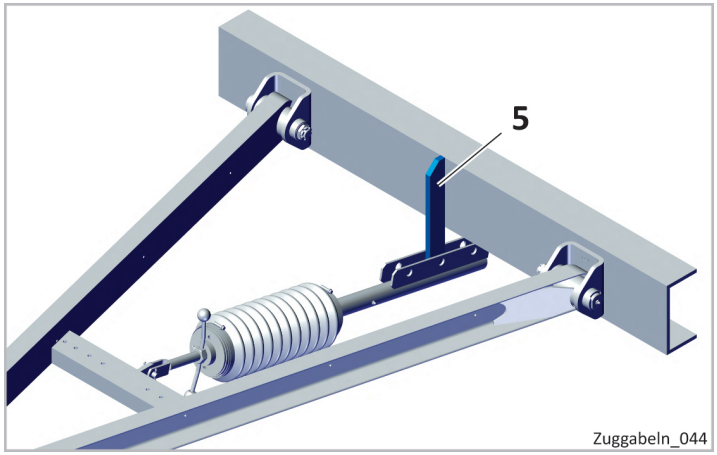


Figure 19: Fastening element for type GHD height adjustment system

5 Fastening element

IMPORTANT!

A suitable fastening element (5) is required for fastening the height adjustment system to the bogie.

This fastening element (5) is not included.

Carry out the following preliminary work before installation:

- Weld the fastening element (5) to the bogie to form a fastening point, see Fig. 19.

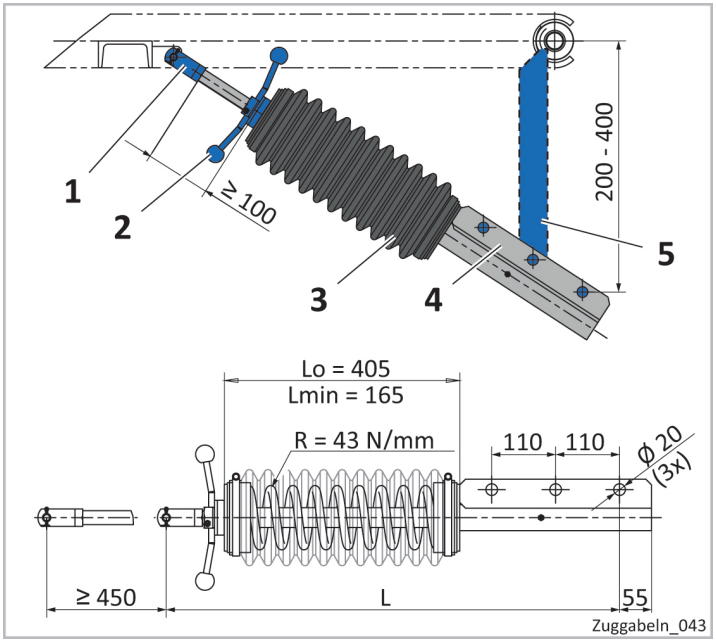


Figure 20: Type GHD height adjustment system

1	Fastening point connecting the cross strut and yoke	**4**	Fastening unit
2	Adjustment toggle	**5**	Fastening element
3	Bellows		

ATTENTION!

Risk of material damage

Incorrect installation can lead to damage. For installation, the threaded rod in the adjustment toggle (2) must be unscrewed by at least 100 mm to allow downward adjustment (as per UN Regulation 55).

- Unscrew the threaded rod before installation.

ATTENTION!

Risk of material damage

Incorrect installation can lead to damage. The connection between the fastening unit (4) and the fastening element (5) on the bogie must still move freely and not get caught on the outer tube.

- Allow sufficient clearance when attaching the fastening unit (4).
- Make sure it does not caught on the outer tube.

ADVICE!

It is essential to adhere to the requirements Requirements in Chapter 6.5, "Assembling a height adjustment system".

Carry out installation as follows (see Fig. 20):

- Secure the height adjustment system to the fastening point that connects the cross strut to the yoke (1).
- Secure the height adjustment system on the fastening unit (4) to the welded on fastening element (5).

6.5.3.1 Type GHD height adjustment

If the drawbar is not horizontal, it can be infinitely readjusted by turning the adjustment toggle.

- Turn the adjustment toggle to bring the drawbar into a horizontal position.

6.6 Note on extending drawbars

ADVICE!

Pay attention to overall vehicle lengths in your country of use and to the vehicle manufacturer's instructions.

6.6.1 Adjusting the length of drawbars GZU, GZL, GZHL 30, GZLG and GZHU

IMPORTANT!

Do not grease the draw tube, as this will impair its clamping action.

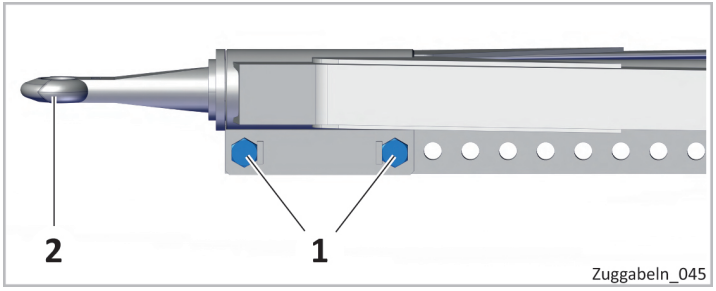


Figure 21: Extendible drawbar (GZL)

1 Clamping bolts **2** Towbar pipe

IMPORTANT!

Tightening torque of clamping bolts (1): 300 Nm

6.6.2 Adjusting the length of drawbar GZHL 27

IMPORTANT!
Do not grease the draw tube, as this will impair its clamping action.

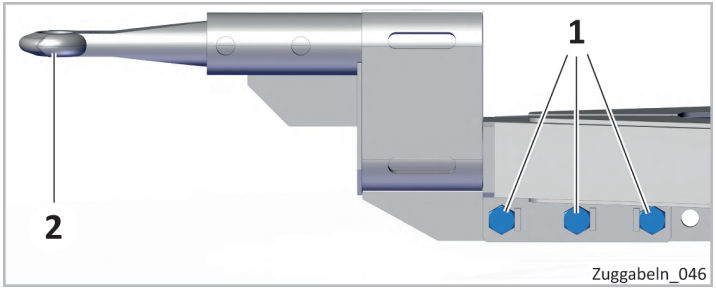


Figure 22: Extendible drawbar (GZHL 27)

1 Clamping bolts **2** Towbar pipe

IMPORTANT!
Tightening torque of clamping bolts (1): 200 Nm

6.6.3 Adjusting the length of drawbar GZV

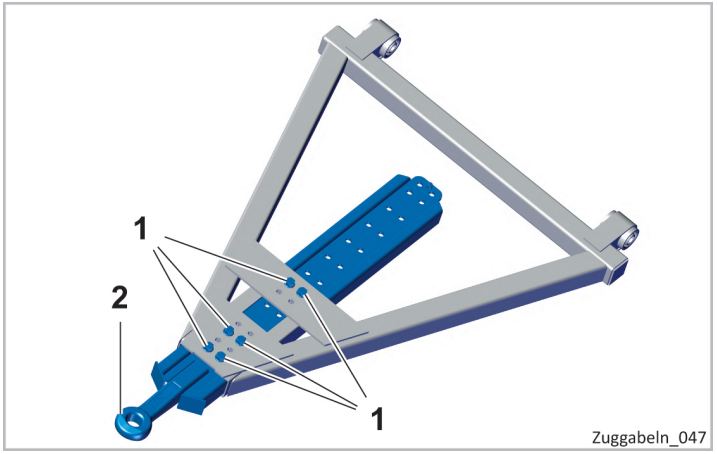


Figure 23: Extendible drawbar (GZV)

1 Fastening bolts **2** Towbar pipe

IMPORTANT!
Tightening torque of fastening bolts (1): 330 Nm

Adjust the length of drawbars from Chapter 6.6.1 to Chapter 6.6.3 as follows:

- Undo and remove the clamping or fastening bolts (1).
- Slide the towbar pipe (2) into the desired position.
- Tighten the clamping or fastening bolts (1) to their specified torque.

6.6.4 Adjusting the length of drawbar GZLV with pneumatic lock

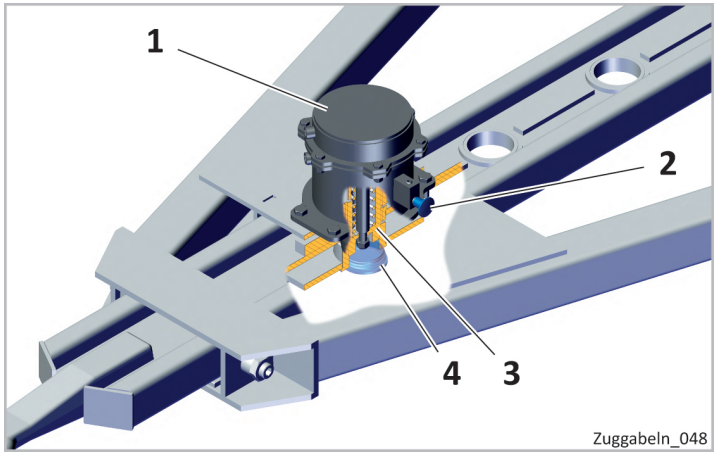


Figure 24: Pneumatic lock

1	Spring-loaded cylinder	**3**	Locking pin
2	Lock	**4**	Cap (optional)

The product may be installed rotated 180°. The use of the ROCKINGER cap (4) (ZGE0009700) to protect the locking pin is optional.

- Connect the spring-loaded cylinder (1) to the compressed air supply of the trailer/truck as per the vehicle manufacturer's instructions.
- If necessary, protect the compressed air connection by means of a separate pressure relief valve to the brake system.

WARNING!

Risk of injury to persons and material damage

Pressure in the pneumatic hoses can lead to injury and damage.

- Make sure there is no pressure in the hoses when working on the vehicle.

WARNING!

Risk of injury to persons

When adjusting the length of the drawbar, there is a danger of getting trapped or run over.

- Move the towing vehicle before adjusting the length of the drawbar.
- When moving the towing vehicle, make sure that there are no persons between the vehicle and the steerable drawbar trailer.
- When moving the towing vehicle, make sure that the parking brake of the steerable drawbar trailer is on to prevent it from rolling.

ATTENTION!

Risk of material damage

Squashed hoses can be damaged. Damaged pneumatic hoses can cause the spring-loaded cylinder to malfunction.

- Install pneumatic hoses in such a way that they cannot be squashed or chafed.

IMPORTANT!

The compressed air valve is not included with delivery.

IMPORTANT!

Connecting thread of spring-loaded cylinder (1):
M12 x 1.5

IMPORTANT!

The spring loaded cylinder (1) can be connected as a single or double-acting version.

- For connection as a single-acting version, protect the second connection of the spring-loaded cylinder (1) from dirt using a filter.
- Do not exceed the maximum system pressure of 8 bar.
- Set the compressed air valve of the spring-loaded cylinder (1) so that it is not under pressure when driving.
- Protect the compressed air valve from dirt and unintended operation.

ATTENTION!

Risk of material damage

Detaching the wrong connection can cause damage to the bogie.

- Take care not to release the lock nut and adjusting screw when adjusting the length of a drawbar with pneumatic lock.
- Make sure to only release the connections described in the instructions below.

ATTENTION!

Risk of material damage

Incorrect locking can lead to damage. If the lock on the spring-loaded cylinder (1) is not closed, the drawbar may be damaged. Only begin driving when the lock is properly closed.

- Always check the lock before starting to drive.

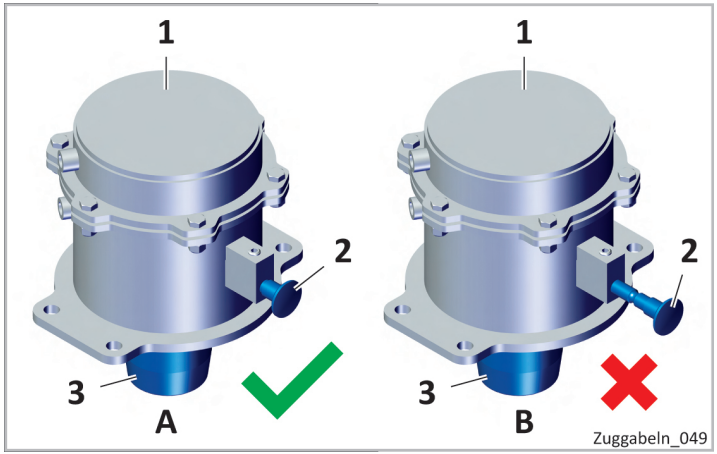


Figure 25: Locking positions of spring-loaded cylinder

A	Lock (2) closed	**B**	Lock (2) open
1	Spring-loaded cylinder	**3**	Locking pin
2	Lock		

Adjust the towbar pipe as follows:

- Pull the lock (2) on the spring-loaded cylinder (1) out as far as it will go.
- Open the lock using the compressed air valve.
- Move the towing vehicle to the desired length, so that you can slide the towbar pipe.
- Lock the new position with the compressed air valve. If necessary, move it forwards or backwards slightly to ensure the lock is secure.
- Push the lock (2) on the spring-loaded cylinder (1) in as far as it will go.
- Check the lock (2) on the spring-loaded cylinder (1) to ensure it is secure.

6.6.5 Adjusting the play of the towbar pipe of drawbar GZLV

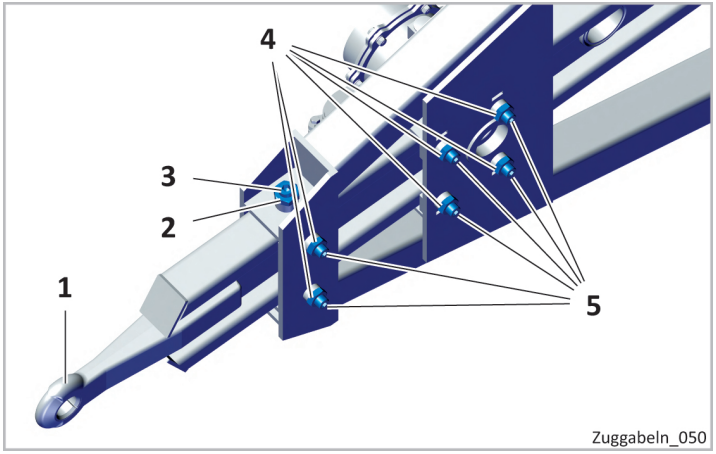


Figure 26: Adjusting the play of the towbar pipe of drawbar GZLV

1	Towbar pipe	**4**	Lock nut
2	Lock nut	**5**	Adjusting screw
3	Adjusting screw		

Adjust lateral play as follows:
- Undo the lock nuts (2).
- Pull the towbar pipe (1) out fully to its final locking position and lock it pneumatically, see Chapter 6.6.4, "Adjusting the length of drawbar GZLV with pneumatic lock".
- Using the adjusting screws (3), align the towbar pipe (1) in the front part of the chassis so that it is symmetrical.
- Readjust the adjusting screws (3).
- Tighten the lock nuts (2) to the specified torque.

Adjust vertical play as follows:
- Undo the lock nuts (4).
- Set the adjusting screws (5) to the desired play.
- Tighten the lock nuts (4) to the specified torque.

IMPORTANT!

Tightening torque of lock nuts (2 and 4): 120 Nm

- After adjusting the lateral and vertical play, check that movement functions well through all locking positions.

6.7 Notes on GSG and GSZ with swivel towing eyes

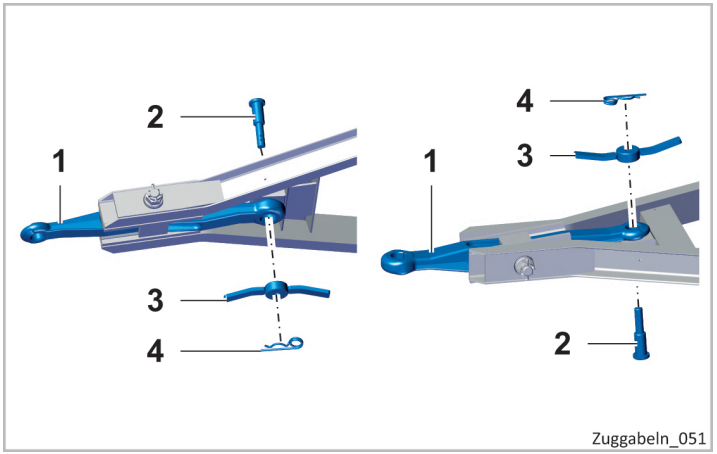


Figure 27: Layout of a swivel towing eye

1	Towing eye	**3**	Toggle nut

2 Positioning pin **4** Spring split pin

Swivel the towing eye as follows:
- Remove the spring split pin (4).
- Unscrew the toggle nut (3) and remove the positioning pin (2).
- Swivel the towing eye (1) 180°.
- Insert the toggle nut (3) and positioning pin (2) in the towing eye so that the toggle nut is on the towing eye side. Fastening is either on the top or bottom, depending on the towing eye used see Fig. 27.
- Tighten the toggle nut (3) by hand.
- Secure the positioning pin (2) with the spring split pin (4) so it cannot come loose.

WARNING!

Risk of injury to persons

Exceeding the maximum load values of the towing eye can lead to injuries.
- It is essential to ensure that, after swivelling, the maximum load data of the specific towing eye being used are complied with. For this, see the information label next to the type plate in Fig. 28.

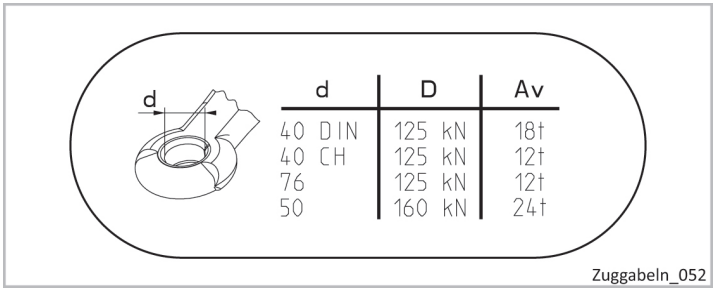


Figure 28: Example information label with load data

6.8 Notes on drawbars GNZ N with replaceable towing eye

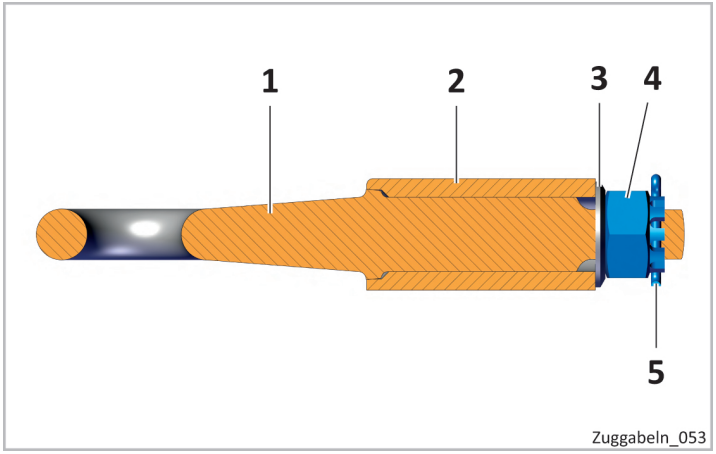


Figure 29: Layout of a replaceable towing eye

1 Towing eye
2 Bearing
3 Washer
4 Castle nut (size 70)
5 Split pin

WARNING!

Risk of injury to persons and material damage

An incorrectly fitted split pin (5) can lead to injuries and damage. If the split pin (5) cannot be inserted, the castle nut (4) must not be loosened.

- Continue tightening the castle nut (4) until the next split pin hole is covered.
- Ensure a minimum tightening torque of 500 Nm and fit the split pin (5) correctly.

Replace the towing eye as follows:

- Remove the split pin (5).
- Remove the castle nut (4) and washer (3).
- Pull the towing eye (1) out of the drawbar.
- Insert a new towing eye (1) through the bearing (2) and into the drawbar.
- Fit the washer (3) and castle nut (4).
- Tighten the castle nut (4) to the specified torque.

IMPORTANT!

Tightening torque of castle nut (size 70) (4):
Minimum 500 Nm, maximum 1000 Nm

- Fit the split pin (5) and bend it to prevent it from falling out, see Fig. 30.

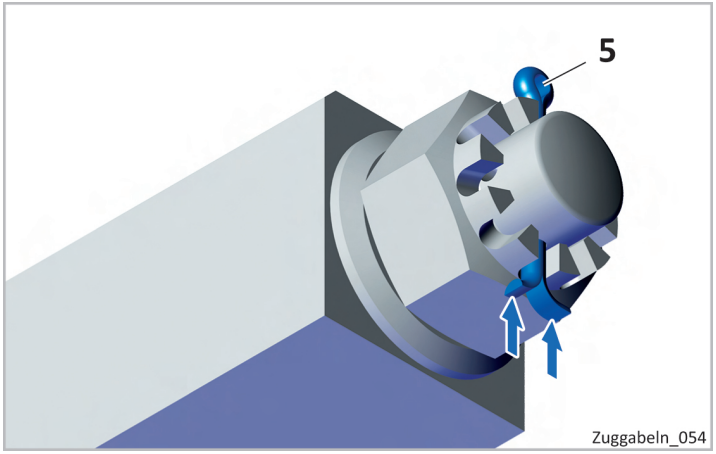


Figure 30: Securing the split pin

5 Split pin

6.9 Painting

ROCKINGER drawbars with a length of up to 3200 mm have cathodic electrophoretic dip coating with zinc phosphate (EDP Zn) to ensure optimum corrosion protection.

A top coat of paint may subsequently be applied, but is not essential for normal conditions.

Drawbars over 3200 mm long or over 1400 mm wide are blasted and primed. In this case, customers need to apply a final coat of paint to ensure lasting corrosion protection.

Drawbars are subject to normal wear due to stresses occurring during normal operation. The following criteria must therefore be checked at regular intervals, and repairs performed if necessary.

7.1 Inspection

Inspect the drawbar before every trip to ensure it is safe for road use.

Inspect the drawbar for the following points every 10,000 km or monthly, at the latest, depending on the operating conditions, and carry out repairs if necessary:

- Function
- Wear
- Completeness of fastening elements
- Specified tightening torques
- Damage
- Deformation
- Cracks
- Excessive corrosion

7.1.1 Checking fastening and locking elements

Fastening and locking elements must not be loose or damaged.

- Re-tighten loose fastening elements to the specified tightening torques.
- Replace damaged fastening or locking elements.

7.1.2 Checking the play of the bearing eye

Brass bearing
Axial play: Maximum 2 mm
Lateral play: Maximum 4 mm

Silent bearing
No play is permitted.

IMPORTANT!

Any detachment of bearing material is not permitted (VdTÜV information bulletin 712).

7.1.3 Checking drawbar struts, towing eyes and weld seams

Drawbar struts (longitudinal and cross struts), towing eyes and weld seams must not exhibit any signs of mechanical damage or excessive corrosion.

WARNING!

Risk of injury to persons and material damage

Damaged drawbars can lead to injury and damage. Drawbars with deformations, cracks or breaks are no longer roadworthy. They must not be straightened or repaired in any way.

- Instead, replace damaged drawbars with new ones.

7.1.4 Checking the towing eye

WARNING!

Risk of injury to persons and material damage

Damaged towing eyes can lead to injury and damage. Twisted or deformed towing eyes, towbar pipes and drawbars must not be straightened.

- Replace deformed or twisted towing eyes, towbar pipes and drawbars with new ones.

IMPORTANT!

Towing eyes must not be damaged or worn.

- Knocked out or loose wear bushes must be replaced in good time.
- Replace the towing eye or drawbar if they are outside the wear limits, see Fig. 31 and the tables Towing eye wear limits.

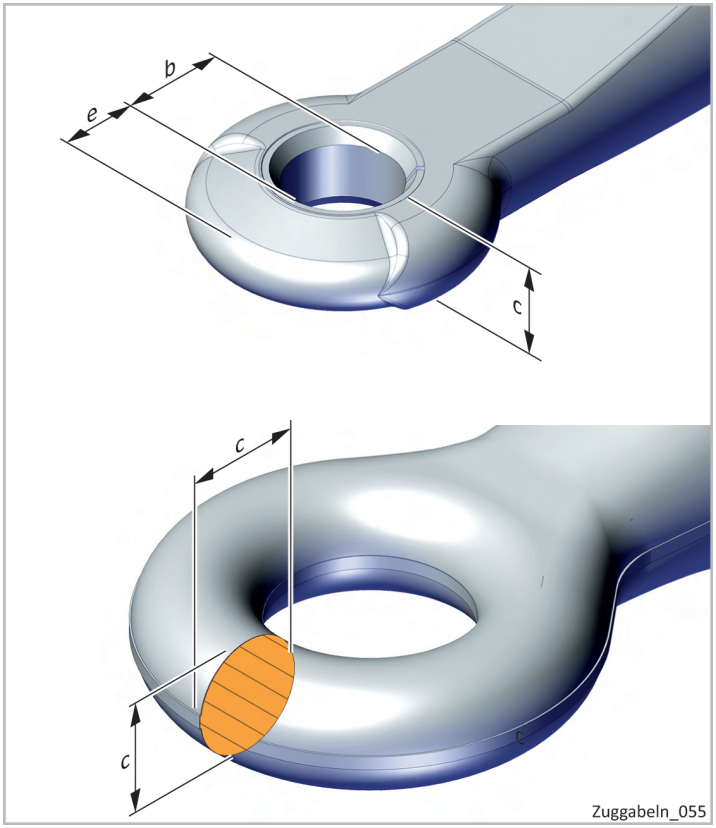


Figure 31: Towing eye wear limits

Towing eye wear limits

Bush diameter	Ø b[1] max. [mm]	c min. [mm]	e[2] min. [mm]	RO test gauge
Ø 40 ISO 8755/DIN 74054	41.5	28.0	22.0	ROE57026
Ø 40 CH	41.5	36.5	29.5	ROE57026
Ø 40 DIN 11026	41.5	38.0	22.0	ROE57026
Ø 50 DIN 74053	52.5	41.5	23.5	ROE57122
Ø 50 HD ROE57005	52.5	41.5	21.0	ROE57122
Ø 57.5 - Scand.	59.5	19.0	-	ROE58243

1 Dimensions with bush

2 Dimensions without bush

Towing eye diameter	c min. [mm]
Ø 68 NF R 41-102 BNA (UN-R55-01 Class L1)	Ø 37.0
Ø 76 NATO VG 74059	Ø 38.0

7.1.5 Checking the BNA (rotating) towing eye

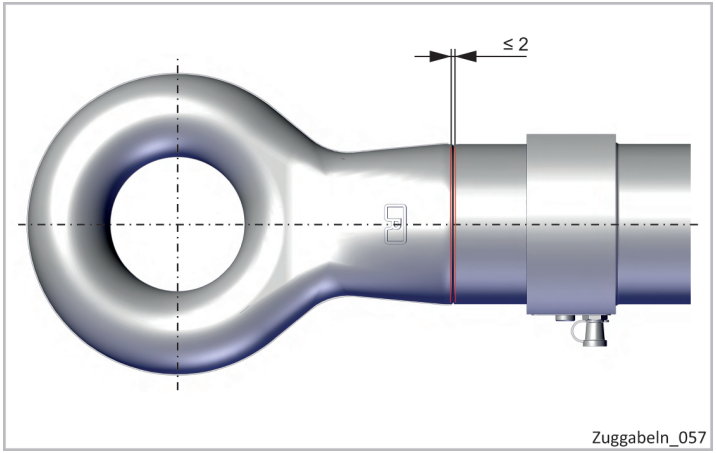


Figure 32: Maximum clearance of BNA towing eye

The BNA towing eye must not be damaged or worn.

- Check the clearance regularly, see Fig. 32.
- If the 2 mm clearance limit is exceeded, replace the towbar pipe.

7.1.6 Checking height adjustment systems

Height adjustment systems must not be loose, damaged or excessively corroded.

- Replace damaged or excessively corroded parts of the height adjustment system.
- The function of the height adjustment system must satisfy the requirements in Chapter 6.5, "Assembling a height adjustment system".

7.2 Maintenance

Drawbars must be serviced regularly to ensure they function for as long as possible.

7.2.1 Towing eye maintenance

- To ensure the towing eye achieves the longest possible service life, apply high-viscosity, ideally water-resistant EP3 grease to the towing eye and bush before commissioning, after long periods of use and after cleaning with pressure washers.

7.2.2 Swivel towing eye maintenance

- If a swivel towing eye is fitted, thoroughly grease the bearing when first commissioning and subsequently every month. In this case, use multi-purpose grease NLGI 2 as a minimum.

7.2.3 BNA towing eye maintenance

IMPORTANT!

For all maintenance tasks described in Chapter 7.2.2, "Swivel towing eye maintenance" to Chapter 7.2.6, "Maintenance of type GZLV drawbar", ROCKINGER recommends biodegradable JOST high-performance lubricant SKE013440000.

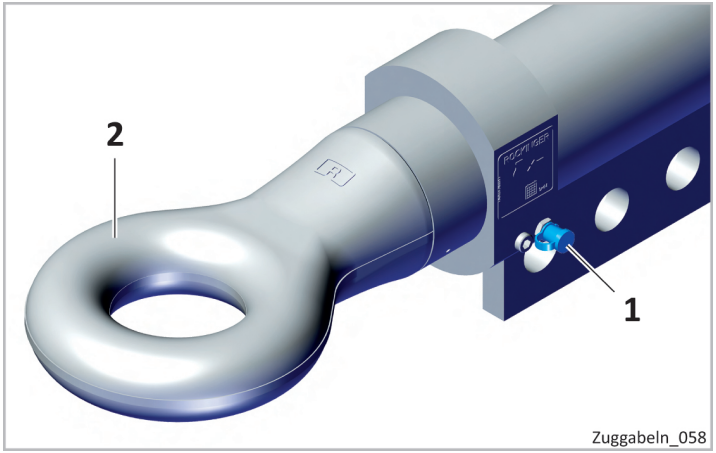


Figure 33: Location of grease nipple on BNA towing eye

1 Grease nipple **2** Towing eye

- Re-grease the bearing points of BNA towing eyes with EP3 grease via the grease nipple (1) at least once a month, see Fig. 33.
- While greasing, rotate the towing eye (2) 360° to improve grease distribution.

7.2.4 Maintenance of height adjustment systems

- Lubricate the adjustment toggle (GHD) via the grease nipple periodically at the service intervals specified for the trailer.
- In addition, apply a little grease to all moving parts.

7.2.5 Maintenance of the spring bolt with brass bushes

- Thoroughly grease the spring bolt during installation and after long periods of use. In this case, use multi-purpose grease NLGI 2 as a minimum.

IMPORTANT!

The silent (rubber/metal) bearing does not require any maintenance.

7.2.6 Maintenance of type GZLV drawbar

- Re-grease the sliding surfaces of the towbar pipe if the length is adjusted frequently or after cleaning with a pressure washer.
- To ensure the locking pins achieve the longest possible service life, apply high-viscosity, ideally water-resistant EP3 grease before commissioning, after long periods of use and after cleaning with pressure washers.

8 Disposal

For disposal, please note the following:
- Dispose of drawbars and all metals as scrap metal.
- Dispose of excess oil and grease in the proper manner.

The packaging can be disposed of as normal domestic waste.

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