

Kingpin

EN Installation and operating instructions



Installation and operating instructions

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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.

2 General information

When handling fifth wheel couplings, tractor units, semi-trailers and the kingpin, the relevant safety regulations in your country (for example Health and Safety at Work) apply.

The safety instructions in the tractor unit and semi-trailer operating instructions continue to apply and must be followed.

The safety information set out below must be observed for installation and maintenance. Warnings directly linked to each activity are also included in the relevant section.



ADVICE!

Technical modifications reserved. The latest information can be found at www.jost-world.com

3 Safety information

3.1 Installation

- Only use genuine JOST spare parts.
- Do not use damaged or repaired individual parts (e.g. repaired using deposition welding).
- If the kingpin is not installed correctly, all warranty claims against the manufacturer and the supplier of the kingpin will be rendered void.
- The kingpin must only be installed by authorised specialist workshops.
- Refer to the instructions issued by the vehicle manufacturer, for example regarding the type of fastening, fifth wheel position, fifth wheel height, axle load, clearance, etc.

3.2 Maintenance

- Only use the specified lubricants for maintenance work.
- Maintenance work must be performed by qualified personnel only.
- The licensing regulations of the country of use must also be complied with.

4.1 Use

Kingpins provide the link between the tractor unit and the semi-trailer. They are designed for mounting on the semi-trailer.

Kingpins are vehicle-connecting parts that must comply with very high safety requirements and must also undergo design approval tests.

Modifications of any kind will render both the warranty and the design approval void and therefore also invalidate the vehicle's operating licence.

4.2 Design

The D value is a criterion for the load capacity of kingpins. It is calculated using the following formula:

$$D = g \times \frac{0.6 \times T \times R}{T + R - U} \text{ [kN]}$$

D = Drawing bar value [kN]

g = 9.81 m/s²

R = Permissible total weight of the semi-trailer [t]

T = Permissible total weight of the towing vehicle, including U [t]

U = Permissible fifth wheel load [t]

Specimen calculation:

$$D = 9.81 \times \frac{0.6 \times 17 \times 33}{17 + 33 - 10.5} = 83.6 \text{ kN}$$

R = 33 t

T = 17 t

U = 10.5 t

4 Intended use

The permitted D values and relevant type (type series, e.g. KZ 10) can be found in the following table. This information can also be found on the relevant pages of the JOST catalogue and is embossed on the front of the kingpin.

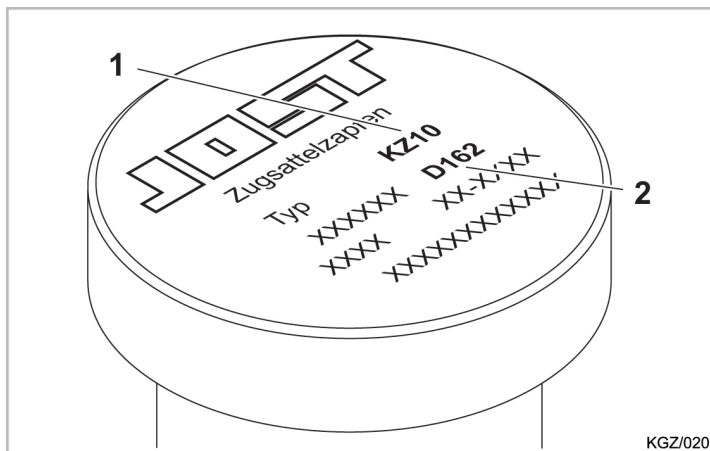


Figure 1: Type and D value

1 Type

2 D value in KN

If they are subject to additional dynamic forces, for example if they are used on uneven road surfaces or on construction sites, do not use the complete fifth wheel load and D value, or alternatively, consult JOST.

Type	Test mark	Kingpin	D value [KN]
KZ 10	E1 55R - 01 0145	KZ 1006-1012	162
KZ 10 U	E1 55R - 01 0145	KZ 1008-1012	162
KZ 1016	E1 55R - 01 0150	KZ 1016	320
KZ 11	E1 55R - 01 0146	KZ 1108-1112	152
KZ 1116	E1 55R - 01 0151	KZ 1116	260
KZ 1312	E1 55R - 02 3465	KZ 1312	105
KZ 14	E1 55R - 01 0147	KZ 1408-1412	162
KZ 1416	E1 55R - 01 1572	KZ 1416	170
KZ 15	E1 55R - 01 0148	KZ 1516	170
KGZ 5216	E1 55R - 01 2936	KZ 5216	400

Table 1: Maximum load data



IMPORTANT!

JOST kingpins comply with the applicable standards. When installed, the kingpins must extend by a tolerated longitudinal distance from the semi-trailer plate.

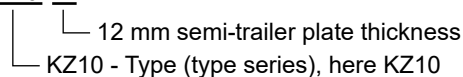


WARNING!

Sharp edges and protruding welding seams can cause serious injuries.

Before installation, the semi-trailer plate must be checked to ensure it is even, and the semi-trailer plate thickness must also be checked. The unevenness of the semi-trailer plate must be no more than 2 mm in the load-bearing section of the fifth wheel coupling. The semi-trailer plate must cover the fifth wheel coupling's set-down surface in every position. The design designation of the kingpins is made up as follows:

F. e.: KZ10 12



+ 0.6	+ 0.6	+ 0.4	+ 0.4	+ 0.2	+ 0.3
6 mm	7 mm	8 mm	10 mm	12 mm	16 mm
- 0.1	- 0.1	- 0.3	- 0.3	- 0.5	- 0.5

Table 2: Maximum tolerances for the skid plate in mm, except KZ 1106 to KZ 1112 and KZ 1116

+ 0.0
6 to 16 mm
- 0.3

Table 3: Maximum tolerances for the skid plate in mm for types KZ 1106 to KZ 1112 and KZ 1116

For welding mounting flanges or mounting cones in place, the following welding methods are permitted along with the specified welding materials and consumables:

Welding method according to ISO 4063	111	135	135
Welding material (with approval of one of the following organisations: BV, DB, DNV, GL, LR, TÜV)	Rod electrode	Welding wire	Inert gas
Standard designation 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

Table 4: Permitted welding methods for welding mounting flanges or mounting cones in place



ATTENTION!

The quality of the welding must satisfy the requirements of evaluation group B in accordance with EN ISO 5817. The choice of welding material must be made in accordance with the stability of the substrate material used.

5 Installation

Weld seam preparation is the responsibility of the user, in accordance with generally accepted engineering standards. The skid plate must be adequately reinforced for the load. The vehicle manufacturer must decide on the type and dimensions of the reinforcement. For reasons of stability, we recommend a skid plate thickness of 12 mm for 2" kingpins and a skid plate thickness of 16 mm for 3.5" kingpins (recommended material: EN 10025 S355J2G3). Kingpins must be installed centred and at right angles. Conical kingpins must be securely fixed (knocked) into position after the joint surface has been cleaned. The castle nut must be tightened to the specified torque and secured with a split pin. Installation suggestions and tightening torques can be found in the following table:

Type designation	Screw/nut		Tightening torque in Nm
	Art. No.	Size	
KZ1006 – KZ1012 KZ1408 – KZ1412 KGZ5006 – KGZ5012	KZE 1012-03	M14 x 35	190 ± 10
KZ0906 – KZ0912	KZE0912-06	M14 x 1.5	130 ± 10
KZ1416	KZE1416-03	M16 x 45	280 ± 15
KZ1016, KZ1516	KZE1016-06	M20 x 50	500 ± 30
KZ1312	KZE1312-05	M14	120 ⁺⁵ ₋₁₀
KZ1108 – KZ1112	KZE 1112-04	M56	1200
KZ1116 – KZ1120	KZE 1116-04	M72	1500
KGZ 5216	KZE1016-06	M20 x 50	500 ± 30

Table 5: Installation suggestions and tightening torques



IMPORTANT!

For safety reasons, we recommend using bolts only once.



ATTENTION!

The installed kingpins must be protected from weld spatter. After welding, check the fastening nuts and bolts to ensure they are at the correct tightening torque, and tighten as necessary. After installation, check the tolerated length dimension by which the kingpin projects out of the skid plate. Mask mating surfaces and functional surfaces before painting.

5 Installation

5.1 Suggested installations

There are different options for fitting the kingpin, depending on the type of skid plate, see Fig. 2 to Fig. 8.

The various options are shown graphically below. (The flange hole pattern must be installed as shown in Fig. 2.)

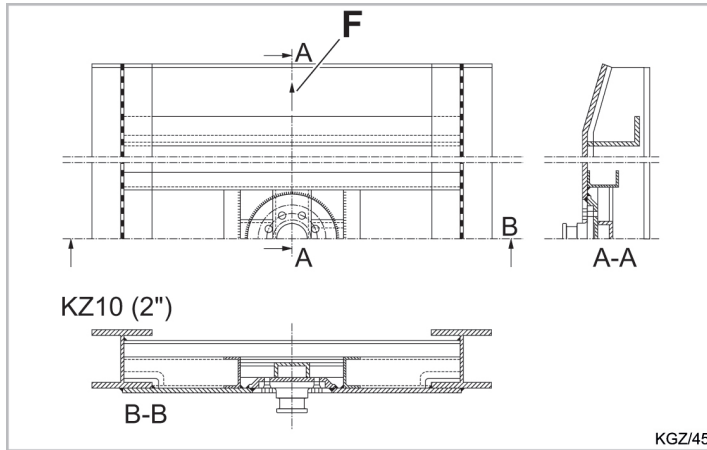


Figure 2: Flange hole pattern in skid plate

F Direction of travel

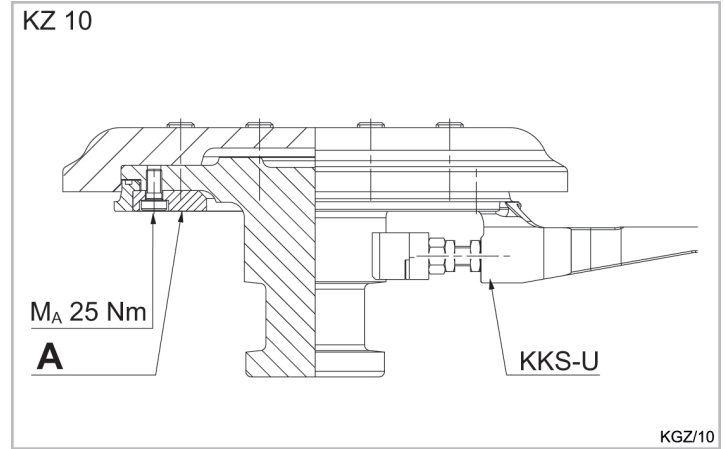


Figure 3: Locking ring (version KZ 10 U)

A Locking ring

Version KZ 10 U of the KZ 10 kingpin is intended for use with the KKS-U system. The KKS-U system is fastened to the kingpin with a locking ring, see Fig. 3.



ADVICE!

See the KKS-U installation and operating instructions for more detailed information.

5 Installation

The type KZ 11 conical kingpin must always be installed with adequate reinforcement, see Fig. 4 and Fig. 5.

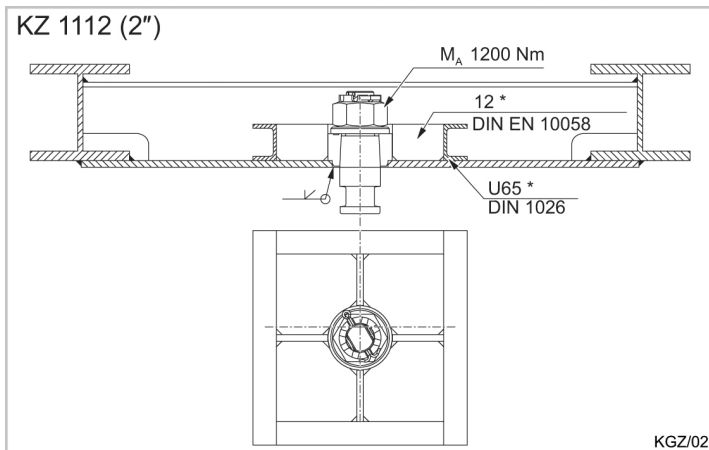


Figure 4: Example of reinforcement for KZ 1112

* Min.

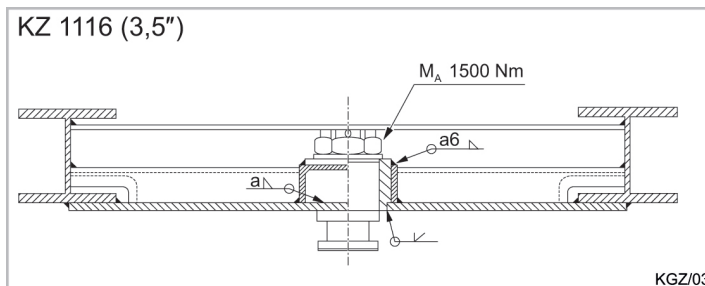


Figure 5: Example of reinforcement for KZ 1116

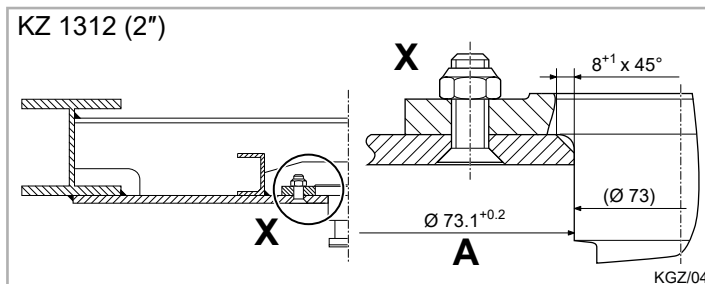


Figure 6: Example of reinforcement for KZ 1312 and attachment to skid plate

A Hole diameter in the skid plate



ADVICE!

For kingpins that are commissioned with the KKS-I, it is essential to adhere to the welding sequence shown in Fig. 6 and Fig. 7.

See the KKS-I installation and operating instructions for more detailed information.

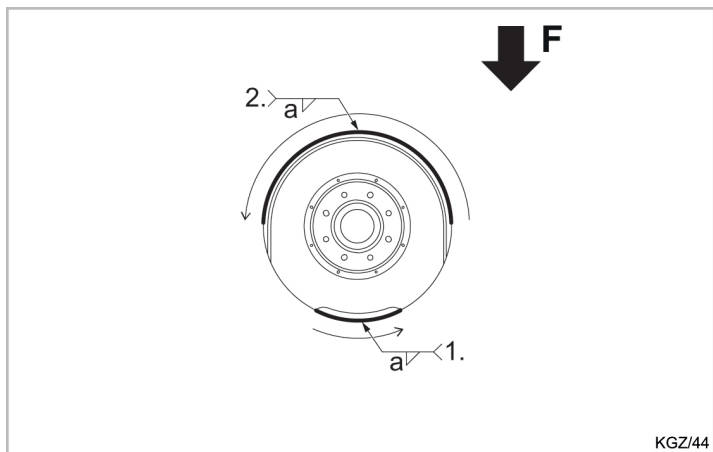


Figure 7: Welding sequence for KKS-I kingpins (view from below)

F Direction of travel

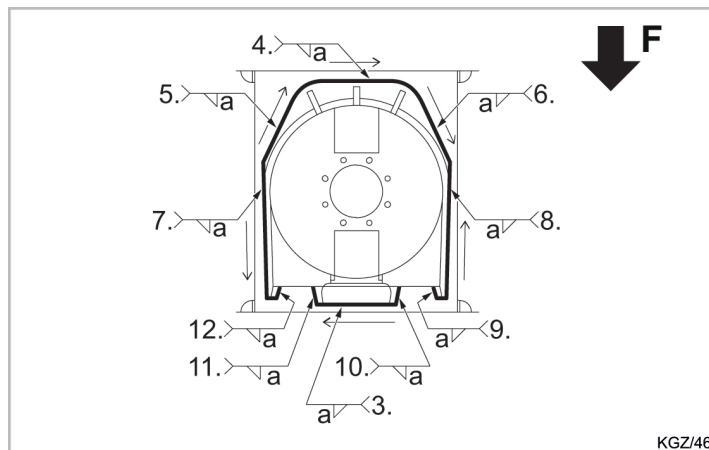


Figure 8: Welding sequence for mounting flange of KKS-I kingpin (view from above)

F Direction of travel

5 Installation

5.2 Weld seam thickness

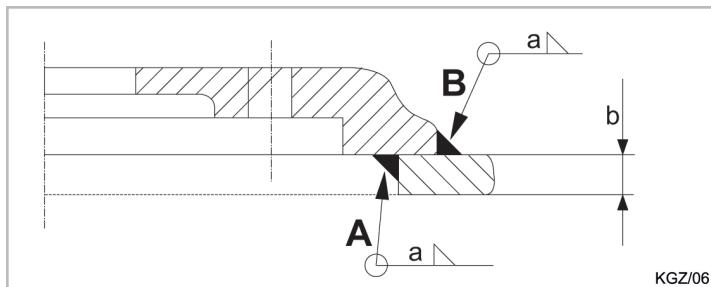


Figure 9: Weld seams for mounting flange

A down

B up



IMPORTANT!

For the kingpin in the KKS-I semi-trailer, please note that the skid plate must have a thickness of 8 mm minimum and 12 mm maximum.

The required weld seam thickness “a” for welding the mounting flange/cone in place depends on the skid plate thickness “b” and whether welding is performed from above or below. For uphill welding from below, the value a_{up} applies, while the value a_{down} applies to downhill welding from above, as shown in the following table.

Type designation KZ XXYY	Skid plate thickness b	Weld seam thickness	
		a_{up}	a_{down}
YY = 06	6 mm	4 mm	6 mm
YY = 07	7 mm	5 mm	6 mm
YY = 08	8 mm	5 mm	7 mm
YY = 10	10 mm	7 mm	7 mm
YY = 12	12 mm	8 mm	8 mm
YY = 16	16 mm	8 mm	8 mm

Table 6: Weld seam thicknesses



IMPORTANT!

Weld the seam KGZ 5216 as a geometrically perfect concave fillet weld, to prevent any notch effect.

6 Servicing and testing

Before commissioning the semi-trailer, thoroughly grease the kingpin, skid plate and fifth wheel coupling lock. We recommend JOST biodegradable high-performance lubricant SKE 013 440 000. Generous lubrication of the kingpin and fifth wheel coupling is essential for a long service life.

6.1 Kingpin 50 (2")

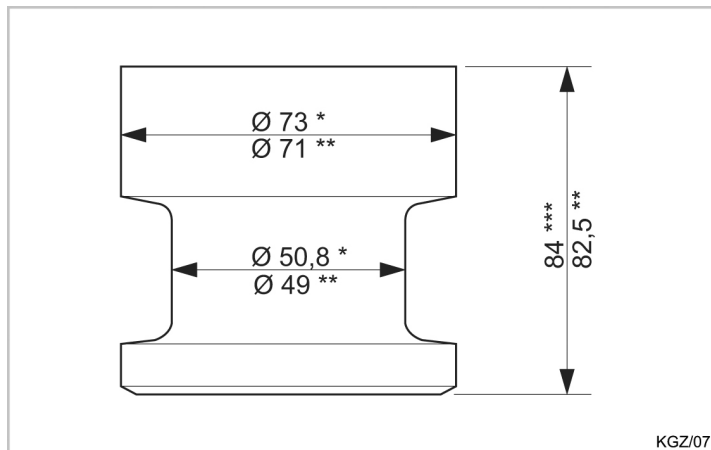


Figure 10: New and wear dimensions for kingpin 50 (2")

* New
** Min.
*** Max.

6.2 Kingpin 90 (3.5")

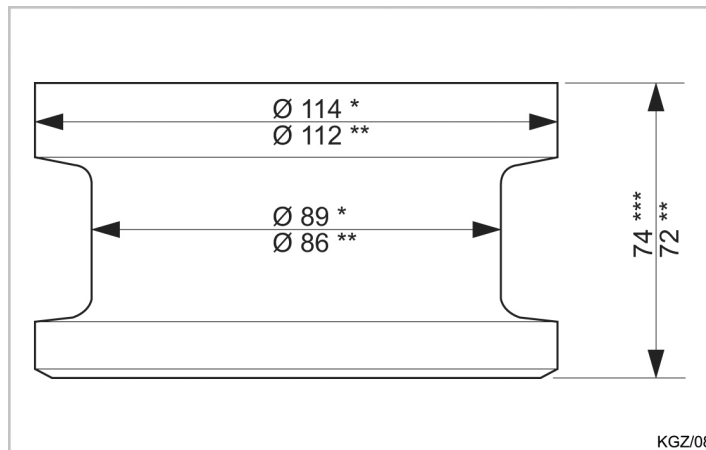


Figure 11: New and wear dimensions for kingpin 90 (3.5")

* New
** Min.
*** Max.

6.3 Inspection instructions

Depending on the conditions of use, but after no more than 50,000 km or every six months, the mounting plate, check the kingpin and fastening elements to ensure they are functioning properly and are free from wear, damage or cracks, and repair as necessary. Check fastening elements to ensure they are tightened to the correct torque.

6 Servicing and testing

6.4 Wear inspection

Fifth wheel couplings and kingpins are subject to more or less wear depending on the conditions in which they are used, and this wear is noticeable by play towards the front of the vehicle. Excessive play causes impacts and may lead to instability on the road and damage to the fifth wheel coupling, mounting plate and vehicle chassis.



ATTENTION!

Kingpin wear must not be compensated by adjusting the fifth wheel coupling.

Replace the kingpin when its wear limit has been reached. To measure wear, we recommend wear gauge J 1027 for 2" kingpins and wear gauge J 1044 for 3 ½" kingpins. After the kingpin has been replaced, you need to reset the locking mechanism on the fifth wheel coupling. Play caused by kingpin wear should either be accepted within the maximum wear limit for the kingpin or rectified by fitting a new kingpin.

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MUB 005 004 M01 (REV-E) 05-2025 • 6.0

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