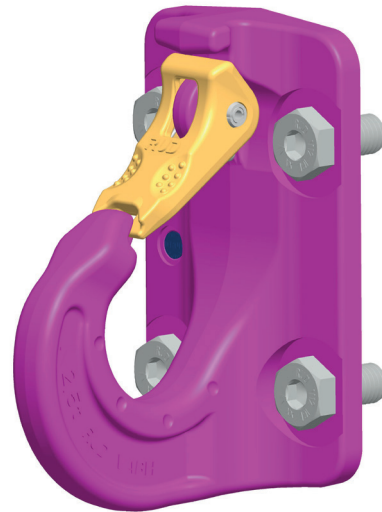


> VABH-B <

Excavator hook for bolting



Safety instructions

This safety instruction/declaration of the manufacturer has to be kept on file for the whole lifetime of the product.
Translation of the Original instructions



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RUD-Art.-Nr.: 8502224-EN / 10.020

Excavator hook for bolting **VABH-B**



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EG-Konformitätserklärung

entsprechend der EG-Maschinenrichtlinie 2006/42/EG, Anhang II A und ihren Änderungen

Hersteller: **RUD Ketten**
Rieger & Dietz GmbH u. Co. KG
 Friedensinsel
 73432 Aalen

Hiermit erklären wir, dass die nachfolgend bezeichnete Maschine aufgrund ihrer Konzipierung und Bauart, sowie in der von uns in Verkehr gebrachten Ausführung, den grundlegenden Sicherheits- und Gesundheitsanforderungen der EG-Maschinenrichtlinie 2006/42/EG sowie den unten aufgeführten harmonisierten und nationalen Normen sowie technischen Spezifikationen entspricht.
 Bei einer nicht mit uns abgestimmten Änderung der Maschine verliert diese Erklärung ihre Gültigkeit.

Produktbezeichnung: Anbauhaken
VABH-B / VABH-W / VCGH-G / VCGH-S

Folgende harmonisierten Normen wurden angewandt:

| | |
|--------------------------------|-----------------------------------|
| <u>DIN EN 1677-1 : 2009-03</u> | <u>DIN EN ISO 12100 : 2011-03</u> |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

Folgende nationalen Normen und technische Spezifikationen wurden außerdem angewandt:

| | |
|----------------------------------|----------------------------|
| <u>BGR 500, KAP2.8 : 2008-04</u> | <u>DIN 15428 : 1978-08</u> |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

Für die Zusammenstellung der Konformitätsdokumentation bevollmächtigte Person:
 Michael Betzler, RUD Ketten, 73432 Aalen

Aalen, den 26.09.2016 Dr.-Ing. Arne Kriegsmann, (Prokurist/QMB)
 Name, Funktion und Unterschrift Verantwortlicher *Arne Kriegsmann*

EC-Declaration of conformity

According to the EC-Machinery Directive 2006/42/EC, annex II A and amendments

Manufacturer: **RUD Ketten**
Rieger & Dietz GmbH u. Co. KG
 Friedensinsel
 73432 Aalen

We hereby declare that the equipment sold by us because of its design and construction, as mentioned below, corresponds to the appropriate, basic requirements of safety and health of the corresponding EC-Machinery Directive 2006/42/EC as well as to the below mentioned harmonized and national norms as well as technical specifications.
 In case of any modification of the equipment, not being agreed upon with us, this declaration becomes invalid.

Product name: Bolt on / Weld on hook
VABH-B / VABH-W / VCGH-G / VCGH-S

The following harmonized norms were applied:

| | |
|--------------------------------|-----------------------------------|
| <u>DIN EN 1677-1 : 2009-03</u> | <u>DIN EN ISO 12100 : 2011-03</u> |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

The following national norms and technical specifications were applied:

| | |
|----------------------------------|----------------------------|
| <u>BGR 500, KAP2.8 : 2008-04</u> | <u>DIN 15428 : 1978-08</u> |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

Authorized person for the configuration of the declaration documents:
 Michael Betzler, RUD Ketten, 73432 Aalen

Aalen, den 26.09.2016 Dr.-Ing. Arne Kriegsmann, (Prokurist/QMB)
 Name, function and signature of the responsible person *Arne Kriegsmann*

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Carefully read the operating instructions before using the lifting point VABH-B. Ensure that you have understood all the contents.

Non-observation of the instructions can lead to injuries or damage and will invalidate the guarantee.

1 Safety instructions



WARNING

Incorrectly mounted or damaged lifting points and improper use can lead to injuries and damage to objects after a fall.

Check the lifting points carefully every time before use.

- Withdraw all body parts (fingers, hands, arms etc.) from the danger zone during the lifting process (risk of crushing).
- The RUD lifting points VABH-B may only be used by authorised and instructed persons in compliance with the DGUV Regulations 100-500 (BGR 500), Chapter 2.8, and in compliance with any valid national regulations if used outside Germany.
- Do not exceed the working load limit (WLL) indicated on the lifting point.
- No technical modifications must be made at the VABH-B.
- No persons are allowed in the danger zone.
- Standing below suspended loads is prohibited.
- Jerky lifting (strong impacts) should be prevented.
- Always ensure a stable position of the load when lifting. Swinging must be prevented.
- Damaged or worn VABH-B must not be used.

2 Intended use

- VABH-B lifting points must only be attached at a load or used at load accepting means.
- Their usage is intended to be used as lifting means.
- VABH-B lifting points can also be used as lashing points for fixing lashing means.
- VABH-B lifting points must only be used in the here described operation purpose.

3 Assembly- and instruction manual

3.1 General information

- Effects of temperature:
Due to the DIN/EN bolts that are used in the VVABH-B lifting points, the working load limit must be reduced accordingly:
 - -40°C up to 100°C no reduction (-40°F to 212°F)
 - 100°C up to 200°C minus 15 % (212°F to 392°F)
 - 200°C up to 250°C minus 20 % (392°F to 482°F)
 - 250°C up to 350°C minus 25 % (482°F to 662°F)

Temperatures above 350°C (662°F) are not permitted!

- VABH-B lifting points must not come into contact with aggressive chemicals, acids and their vapours.
- The place where the VABH-B lifting points are fixed should be clearly marked with colour.
- VABH-B lifting points are supplied with a crack test inspected ICE-bolts.
- Original ICE-bolts are available as a spare part from RUD (standard and vario-length, see table 6).
- **When using your own bolts, the bolts have to be 100 % crack tested** (a written confirmation of the absence of cracks must be added to the documentation). The min. quality of the hexagon bolt had to be 10.9 accord. EN 24014 (DIN 931) with the nominal diameter.



WARNING

A combination of bolts made of different strength classes is not allowed to be used for a fixation of the excavator hooks.

3.2 Hints for the assembly

Basically essential:

- The material construction to which the lifting point will be attached, should be of adequate strength to withstand forces during lifting without deformation. The German testing authority BG/DGUV, recommends the following minimum for bolt lengths:
 - 1 x M in steel (minimum quality S235JR [1.0037])
 - 1.25 x M in cast iron (for example GG 25)
 - 2 x M in aluminium alloys
 - 2.5 x M in light metals of low strength(M = diameter of RUD lifting point bolt, for ex. M 20)



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When lifting light metals, nonferrous heavy metals and gray cast iron the thread has to be chosen in such a way that the working load limit of the thread corresponds to the requirements of the respective base material.

- VABH-B lifting points must be positioned at the load in such a way that improper loading like turning or twisting of the load will be avoided:
 - **For single leg lifts:** Load ring should be positioned vertically above the centre of gravity.
 - **For two leg lifts:** Lifting points must be positioned on both sides and above the centre of gravity.
 - **For three and four leg lifts:** Lifting points should be arranged equally in a plain level around centre of gravity
- Symmetry of loading:
Determine the working load limit of each individual RUD lifting point for symmetrical and unsymmetrical loading according to the following physical formula:

$$W_{LL} = \frac{G}{n \times \cos \beta}$$

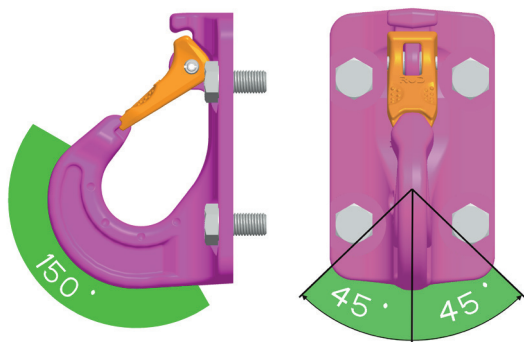
W_{LL} = working load limit (kg)
 G = load weight (kg)
 n = number of load bearing legs
 β = angle of inclination of the chain to the vertical

Number of load bearing strands:

| | Symmetrical | Unsymmetrical |
|----------------|-------------|---------------|
| Double leg | 2 | 1 |
| Three/four leg | 3 | 1 |

Table 1: Load bearing strands (see table 3)

- A plane bolting surface must be guaranteed. The holes must be drilled with a sufficient depth in order to guarantee compatibility with the supporting surface.
- Arrangement/position of the VABH-B:
The installation should be in the direction of pull (siehe Pic. 1).



Pic. 1: Permissible load direction

- The bolts should be tightened with the specified torque (see Table 2 torque).



HINT

* Bolts have to be tightend by using the outside hexagon with a wrench.

| Type | torque bolts [Nm] * | thread d | wrench size SW |
|--------------|---------------------|----------|----------------|
| VABH-B 1.5 t | 55 | M10 | 16 |
| VABH-B 2.5 t | 100 | M12 | 18 |
| VABH-B 4 t | 240 | M16 | 24 |
| VABH-B 6.7 t | 450 | M20 | 30 |

Table 2: torque

- With shock loading or vibrations, especially at through hole fixtures with a nut at the end of the bolt, accidental release can occur.

Securing possibilities: Observe torque moment, use liquid securing glue f.e. Loctite (can be adapted to the usage, observe manufacturer hints) or assemble a form closure bolt locking device f.e. a castle nut with cotter pin, locknut etc.

- Finally check the proper assembly (see 4 Inspection / Repair / Disposal).

3.3 Hints for the usage

- Always regularly observe the appearance of the whole lifting point (e.g. fixed lifting point/slings) before using it (secured bolt seat/torque, strong corrosion, cracks on load-bearing parts, deformations) see 4 Inspection / Repair / Disposal.



ATTENTION

Wrong assembled or damaged VABH-B as well as improper use can lead to injuries of persons and damage of objects when load drops.

Please inspect all VABH-B carefully before each use.

- RUD components are designed according to DIN EN 818 and DIN EN 1677 for a dynamic load of 20,000 load cycles.
 - Keep in mind that several load cycles can occur with a lifting procedure.
 - Keep in mind that, due to the high dynamic stress with high numbers of load cycles, that there is a danger that the product will be damaged.
 - The BG/DGUV recommends: For higher dynamic loading with a high number of load cycles (continuous operation), the working load stress must be reduced according to the driving mechanism group 1Bm (M3 in accordance with DIN EN 818-7). Use a lifting point with a higher working load limit.

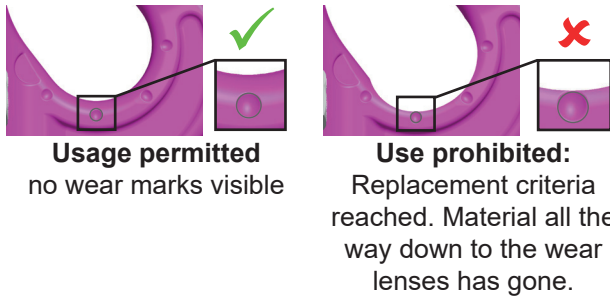


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- Please check carefully the wear indicator markings of the lifting point (see *Pic. 2*):



Pic. 2: Wear indicators

- Keep in mind that the lifting means in the VABH-B must be freely movable. When attaching and removing the lifting means (e.g. lifting chains), crushing, shearing, trapping and impact spots must be prevented.
- Prevent damage being caused to the lifting means by loading at sharp edged.
- If the VABH-B is exclusively used for lashing, the load-bearing capacity value can be doubled: $LC = \text{Permitted lashing force} = 2 \times \text{load-bearing capacity (WLL)}$



HINT

If the VABH-B is/was used as a lashing point, with a force higher than the WLL, it must not be used as a lifting point afterwards.

If the VABH-B is/was used as a lashing point, up to the WLL only, it can still be used afterwards as a lifting point.

- If possible, leave the immediate danger zone.
- Always supervise your suspended loads.

4 Inspection / Repair / Disposal

4.1 Hints for periodical inspections

The operator must determine and specify the nature and scope of the required tests as well as the periods of repeating tests by means of a risk assessment (see section 4.2 and 4.3).

The continuing suitability of the lifting point must be checked at least 1x year by an expert.

Depending on the application conditions, e.g. when used frequently or if there is a higher level of wear or corrosion, it may be necessary to carry out inspections at intervals of less than a year. This inspection is also absolutely necessary after damage and special incidents.

The inspection cycles must be specified by the operator.

Only RUD original spare parts must be used and all repairing operations and service work must be documented in the chain card file (of the complete lifting mean) or use the AYE-D.NET.

4.2 Test criteria for the regular visual inspection by the user

- The lifting point should be complete
- Comprehensive, legible load-bearing information as well as the manufacturer's identification mark.
- Correct bolt sizes, bolt quality and screw-in lengths
- Always observe tightness of the bolts → inspect the torque
- The excavator hook has to be mount on plane bolting surfaces with the full back side.
- Deformations on load-bearing parts such as basic body and bolt
- Mechanical damage, such as notches, particularly in high stress areas.

4.3 Additional test criteria for the competent person / repair worker

- Cross-section alterations caused by wear > 10 % (see wear indicator markings)
- opening of the mouth is deformed > 10 %
- Strong corrosion (Lochfraß)
- Other damage
- Additional inspections may be necessary depending on the result of the risk assessment (e.g. incipient cracks at load bearing parts).

4.4 Disposal

Dispose of the discarded components / accessories or packaging in line with local regulations.



| Method of lift | | | | | | | | | | |
|---|---|--------------------|---------------------|---------------------|--------------------|--------------------|--------------------|---------------------|--------------------|--------------------|
| Number of legs | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 / 4 | 3 / 4 | 3 / 4 |
| Angle of inclination β | 0° | 90° | 0° | 90° | 0-45° | >45-60° | Un-symm. | 0-45° | >45-60° | Un-symm. |
| Faktor | 1 | 1 | 2 | 2 | 1.4 | 1 | 1 | 2.1 | 1.5 | 1 |
| Type | For the max. total load weight >G< in metric tons / lbs | | | | | | | | | |
| VABH-B 1.5 t | 1.5 t 3300 lbs | 1.5 t 3300 lbs | 3 t 6600 lbs | 3 t 6600 lbs | 2.12 t 4620 lbs | 1.5 t 3300 lbs | 1.5 t 3300 lbs | 3.15 t 6900 lbs | 2.24 t 4950 lbs | 1.5 t 3300 lbs |
| VABH-B 2.5 t | 2.5 t 5500 lbs | 2.5 t 5500 lbs | 5 t 11000 lbs | 5 t 11000 lbs | 3.5 t 7700 lbs | 2.5 t 5500 lbs | 2.5 t 5500 lbs | 5.25 t 11550 lbs | 3.75 t 8250 lbs | 2.5 t 5500 lbs |
| VABH-B 4 t | 4 t 8800 lbs | 4 t 8800 lbs | 8 t 17600 lbs | 8 t 17600 lbs | 5.6 t 12320 lbs | 4 t 8800 lbs | 4 t 8800 lbs | 8.4 t 18500 lbs | 6 t 13200 lbs | 4 t 8800 lbs |
| VABH-B 6.7 t | 6.7 t 15000 lbs | 6.7 t 15000 lbs | 13.4 t 30000 lbs | 13.4 t 30000 lbs | 9.4 t 21000 lbs | 6.7 t 15000 lbs | 6.7 t 15000 lbs | 14.1 t 31500 lbs | 10 t 22500 lbs | 6.7 t 15000 lbs |

Table 3: WLL overview

| Type | WLL [t] | weight [kg/pc.] | A [mm] | B [mm] | C [mm] | D [mm] | E [mm] | F [mm] | G [mm] | H [mm] | I [mm] | L [mm] | M | T [mm] | torque [Nm] | ref-no. |
|--------------|---------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|--------|-------------|---------|
| VABH-B 1.5 t | 1.5 | 0.78 | 7.5 | 76 | 115 | 111 | 70 | 26 | 48 | 60 | 38 | 13.5 | 4xM10 | 26 | 55 | 7991205 |
| VABH-B 2.5 t | 2.5 | 1.73 | 8.5 | 98 | 148 | 143 | 85 | 31.5 | 60 | 75 | 49 | 17.5 | 4xM12 | 33 | 100 | 7991206 |
| VABH-B 4 t | 4.0 | 3.0 | 11 | 119 | 168 | 164 | 104 | 35 | 70 | 90 | 59 | 24.5 | 4xM16 | 40 | 240 | 7991207 |
| VABH-B 6.7 t | 6.7 | 5.58 | 13 | 147 | 205 | 200 | 120 | 40 | 85 | 110 | 70 | 28 | 4xM20 | 51 | 450 | 8502238 |

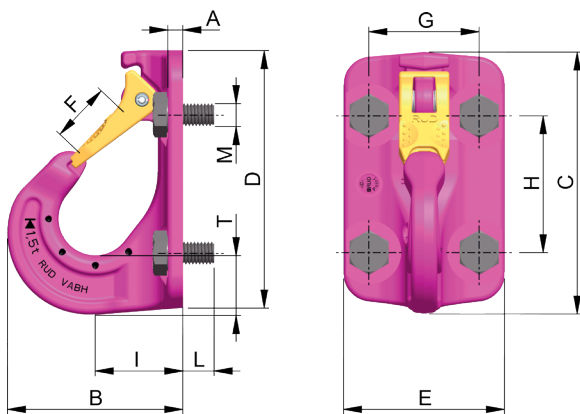
Table 4: Dimensioning

Subject to technical modifications

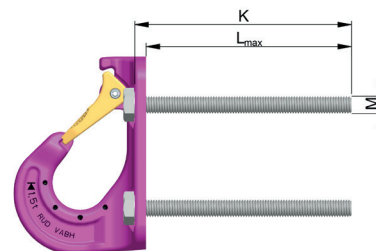
| Type | WLL [lbs] | weight [lbs/pc.] | A | B | C | D | E | F | G | H | I | L | M | T | Anzugs- torque [Nm] | Art.-Nr. ref-no. |
|--------------|-----------|------------------|--------|----------|----------|----------|----------|---------|----------|----------|----------|--------|-------|---------|------------------------|---------------------|
| VABH-B 1.5 t | 3300 | 1.8 lbs | 5/16" | 3" | 4 1/2" | 4 13/32" | 2 3/4" | 1" | 1 7/8" | 2 3/8" | 1 1/2" | 17/32" | 4xM10 | 1" | 55 | 7991205 |
| VABH-B 2.5 t | 5500 | 3.9 lbs | 11/32" | 3 27/32" | 5 13/16" | 5 5/8" | 3 11/32" | 1 3/16" | 2 3/8" | 2 15/16" | 1 15/16" | 23/32" | 4xM12 | 1 5/16" | 100 | 7991206 |
| VABH-B 4 t | 8800 | 7 lbs | 7/16" | 4 11/16" | 6 5/8" | 6 15/32" | 4 3/32" | 1 3/8" | 2 3/4" | 3 17/32" | 2 15/16" | 63/64" | 4xM16 | 1 9/16" | 240 | 7991207 |
| VABH-B 6.7 t | 15000 | 13 lbs | 1/2" | 5 25/32" | 8 1/16" | 7 7/8" | 4 3/4" | 1 9/16" | 3 11/32" | 4 11/32" | 2 3/4" | 1 1/8" | 4xM20 | 2" | 450 | 8502238 |

Table 5: Dimensioning

Subject to technical modifications



Pic. 3: Dimensioning



Pic. 4: bolts long

| Typ | K [mm] | L _{max} [mm] | M | used bolt | Ref.-No. ICE-bolt |
|--------------|--------|-----------------------|---------|-----------|----------------------|
| VABH-B 1.5 t | 125 | 118.5 | 4 x M10 | M10 x 125 | 7905920 |
| VABH-B 2.5 t | 145 | 137.5 | 4 x M12 | M12 x 145 | 7905921 |
| VABH-B 4 t | 185 | 174 | 4 x M16 | M16 x 185 | 7908216 |
| VABH-B 6.7 t | 230 | 217 | 4 x M20 | M20 x 230 | 7908217 |

Table 6: Overview bolts



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