

The Formwork Experts.

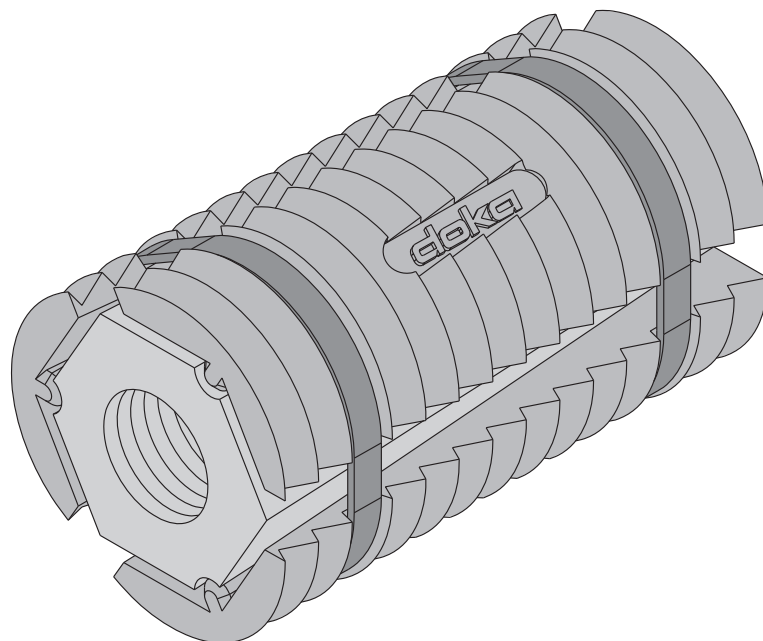
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# Rock anchor spreader unit 15.0

Art. n° 581120000

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## Fitting instructions



## Product description

The Rock-anchor spreader unit 15.0 is used to make single-sided formwork anchoring points in concrete.



- ▶ It is strictly forbidden to use the spreader unit more than once, and to take the load off the anchoring points during use and then re-apply a load! (Except where using a "Suspension cone 15.0 with collar", and during the acceptance test.)
- ▶ When planning the anchoring point, remember that it is only permissible to subject it to tensile forces.
- ▶ The maximum period for which an anchoring point may in use is 6 months.



If using the Rock anchor spreader unit 15.0 in concrete in Germany, **Approval n° Z-21.6-1850** must also be observed.

## Items needed

### Note:

Only use approved tie-rods!

After work is completed, the tie-rod can be re-used, while the "Rock anchor spreader unit" remains in the drilled hole.

**To make an anchoring point, the following items are needed:**

Item	Item name	Art. n°
(A)	<b>Rock drill-bit 37x250mm</b> Suitable for HILTI hammer drills with TE-Y, TE-F and SDS-MAX connection-ends.	581124000
(B)	<b>Tie rod 15.0</b> (length as required)	
(C)	<b>Rock-anchor spreader unit 15.0</b>	581120000
(D)	<b>Rock anchor installation tube</b>	581123000
(E)	<b>Spanner for tie-rod 15.0/20.0</b>	580594000
(F)	<b>Tensioning instrument 300kN</b>	581815000
(G)	<b>Super-plate 15.0</b>	581966000

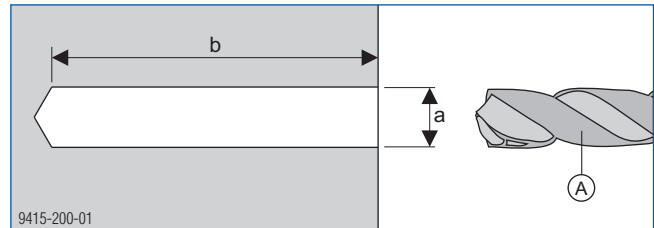
## Drilling the hole



- ▶ **It is not permitted to use diamond tipped hollow core-drills (trepanning cutter).**

These cut through reinforcement steel in the concrete, leaving behind a smooth steel surface which causes slippage and deformation of the spreader segments.

This prevents the rock-anchor from functioning as it should.



a ... Nominal diameter 37 mm

b ... Depth of drilled hole min. 210 mm

**A** Rock drill-bit diam. 37 mm

(if only a diam. 38 mm rock drill-bit is available, this is also possible)



- ▶ Check the diameter **a** of the drilled hole.
- ▶ Be sure to leave at least the minimum gap between the drilled hole and the edge of the structure, and between one drilled hole and the next (rupture cone).
- ▶ The depth of the hole **b** will depend upon the characteristics of the rock or concrete ( $b_{\min.} = 210$  mm). To determine the actual load-bearing capacity of the join (depth of hole), loading tests are necessary.
- ▶ Carefully clean the drilled hole, and blow out all the drill cuttings.

## Installation



### NOTICE

Make sure that you fit the Rock anchor spreader in the correct mounting position, as shown here.

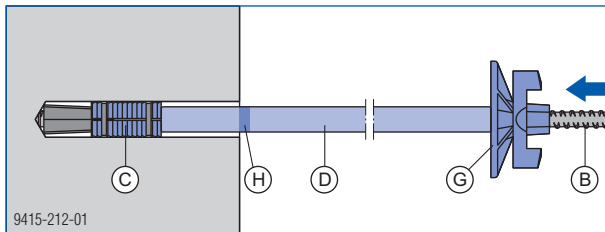
### Variant 1

- 1) Screw the tie rod (length e.g. 750 mm) flush into the spreader cone of the Rock anchor spreader unit.
- 2) Push the Rock anchor installation tube over the tie rod and fix it with a Super plate.



Make a chalk mark on the Rock anchor installation tube to give you an easy-to-see check of the placement depth.

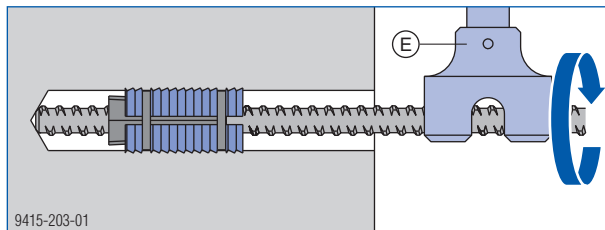
- 3) Push the assembled anchoring point all the way into the cleaned drilled hole, i.e. until it reaches the bottom of the hole.



- B** Tie rod 15.0
- C** Rock anchor spreader unit 15.0
- D** Rock anchor installation tube
- G** Super plate 15.0
- H** Depth mark made with e.g. chalk

- 4) Firmly tighten the Super plate. This forces the segments to spread so that they bite into the walls of the drilled hole.
- 5) Remove the Super plate and the Rock anchor installation tube.
- 6) Turn the tie rod with the tie-rod wrench - the spreader segments now press hard into the walls of the drilled hole.

Required tightening torque:  
approx. 400 Nm (40 kgm)



- E** Tie-rod wrench 15.0/20.0



This job can be made easier by attaching a tube-extension to the tie-rod wrench, e.g. 40 kg for a 1.00 m long extension.

- 7) Alternatively, instead of using the tie-rod wrench you can also pre-tension the anchoring point with the tensioning instrument (see the section headed "Carrying out the acceptance test").

Required load on tie rod: min. 60 kN

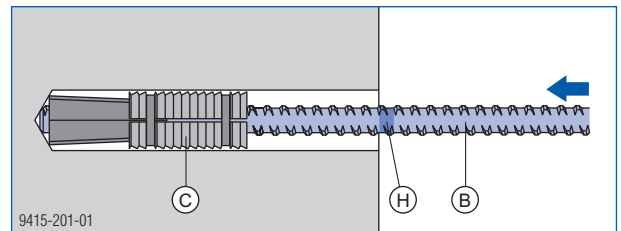
### Variant 2

- 1) Screw the tie-rod (length e.g. 750 mm) flush into the spreader cone of the Rock anchor spreader unit.



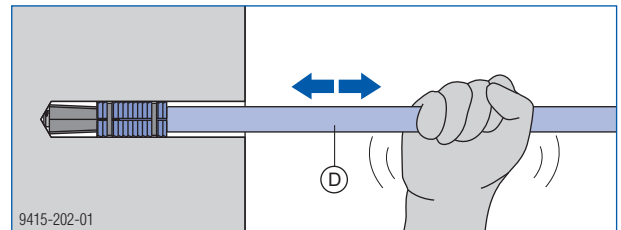
Make a chalk mark on the tie-rod to give you an easy-to-see check of the placement depth.

- 2) Push the assembled anchoring point all the way into the cleaned drilled hole, i.e. until it reaches the bottom of the hole.



- B** Tie-rod 15.0
- C** Rock-anchor spreader unit 15.0
- H** Depth mark made with e.g. chalk

- 3) Push the Rock anchor installation tube over the tie-rod and bang it against the Rock anchor spreader unit several times. This forces the segments to spread so that they bite into the walls of the drilled hole.



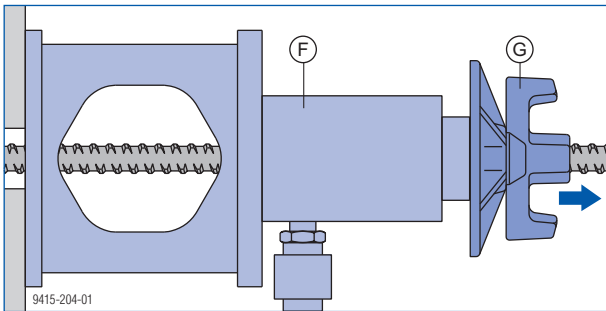
- D** Rock anchor installation tube

- 4) All other steps are the same as from Point 6 of Variant 1 onwards.

## Carrying out the acceptance test

### **WARNING**

- ▶ The load-bearing capacity of the anchoring point will depend upon how well the rock-anchor was fitted.
  - ▶ The test-loading tests the load-bearing capacity of the anchoring point.
  - ▶ If the material into which the rock-anchor has been fitted does not have sufficient bearing capacity, the tensioning instrument may suddenly loosen during the suitability test and/or acceptance test.
  - ▶ For this reason, it is forbidden to stand beneath or behind the testing equipment.
  - ▶ Secure the tensioning instrument so that it cannot drop.
- ▶ For the acceptance test, push the "Hollow-piston cylinder with pressure support" (F) onto the tie-rod and mount the Super-plate 15.0 (G) .
- ▶ Apply the test force by operating the hand pump.



## Trial test to determine the permissible load, based on DIN 4125

### Suitability test

- ▶ On every building site, test at least 3 anchors at a location where unfavourable results may be expected.
- ▶ Load these test anchor-points until they fail, but not to more than **max. 135 kN**.
- ▶ The permitted anchor force is determined from the load at failure with a **safety factor of 1.5**.

#### **Permitted capacity of the tie-rod to DIN 18216:**

90 kN

Specimen calculation:

- Load at failure: 80 kN
- Permitted anchor force:  $80 \text{ kN} / 1.5 = 53.3 \text{ kN}$

- ▶ With reference to the permitted anchor force, space out the anchors and determine the anchor force actually encountered (e.g. 50 kN).

### Acceptance test

- ▶ Every anchoring point must undergo acceptance testing.
- ▶ The test load is 1.25 times the anchor force actually encountered.

Specimen calculation:

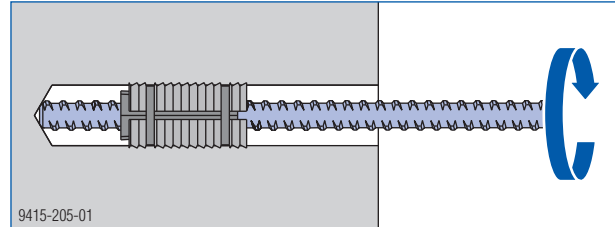
- **Test load:**  $50 \text{ kN} \times 1.25 = 62.5 \text{ kN}$

## Re-tightening the tie-rod



▶ In this situation, the rock anchor is very sensitive to knocks.

- ▶ Detach the tensioning instrument.
- ▶ Re-tighten the tie-rod all the way in to the bottom of the drilled hole.



The anchoring point is now ready for use.

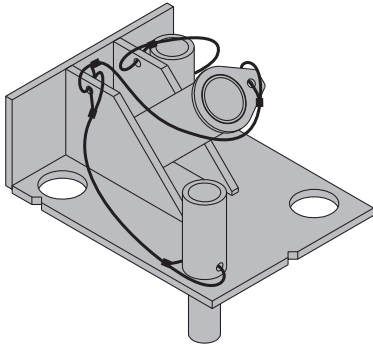
## After use

- ▶ Unscrew the tie-rod and close off the anchoring point so that it cannot be re-used.

## Testing truss for diagonal anchors 15.0/20.0

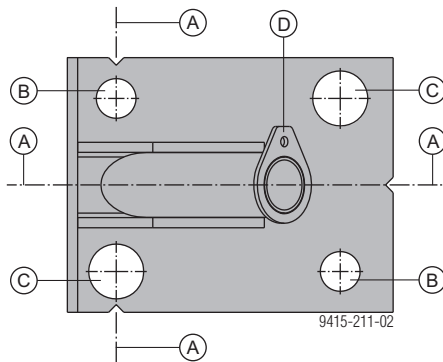
Is used for preparing an anchoring point at a 45° angle.

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### Positioning

- ▶ Align the notches of the testing truss to the guide-lines (A).

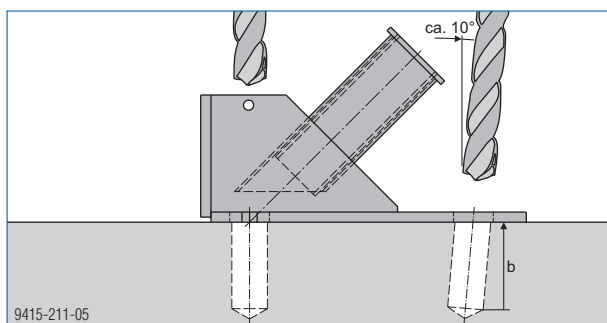


- A** Guide-lines for the desired anchor position
- B** Holes drilled for the pegging-tubes, when a Rock anchor 15.0 is to be used (drill bit diam. 37 mm)
- C** Holes drilled for the pegging-tubes, when a Rock anchor 20.0 is to be used (drill-bit diameter as specified by the manufacturers, DSI or SAH)
- D** Adapter tube for Rock anchor 15.0

### Fixing the testing truss

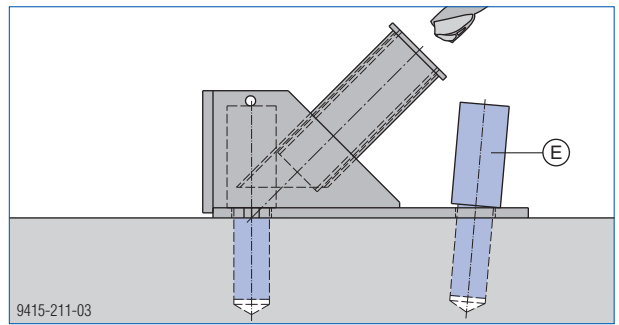
#### Variant 1: using pegging-tubes

- ▶ Drill 2 holes, diagonally opposite one another, for the dimension of rock-anchor that is going to be used.



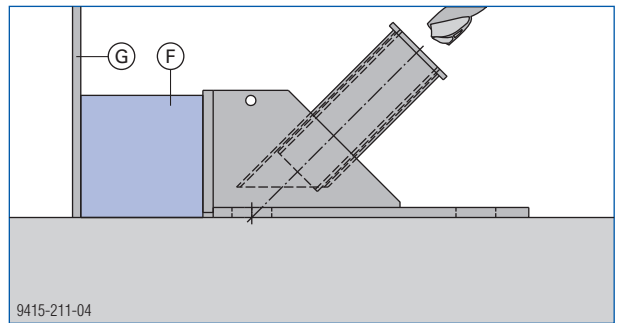
b ... Depth of drilled hole min. 5 cm

- ▶ Push in the pegging-tubes (E) and drill the hole in the diagonal.

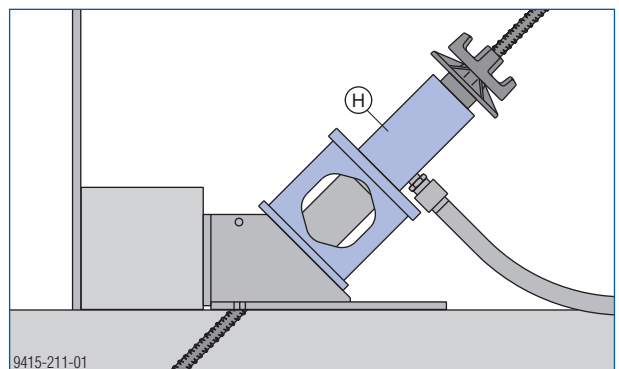


#### Variant 2: using a squared timber spacer

- ▶ Use a site-provided squared timber (F) as a spacer between the reinforcement (G) and the testing truss. Then drill the hole in the diagonal.



- ▶ The testing truss is now finally positioned. The procedure from now on is the same as for installing the Rock anchor spreader unit 15.0.



**H** Hollow-piston cylinder with pressure support