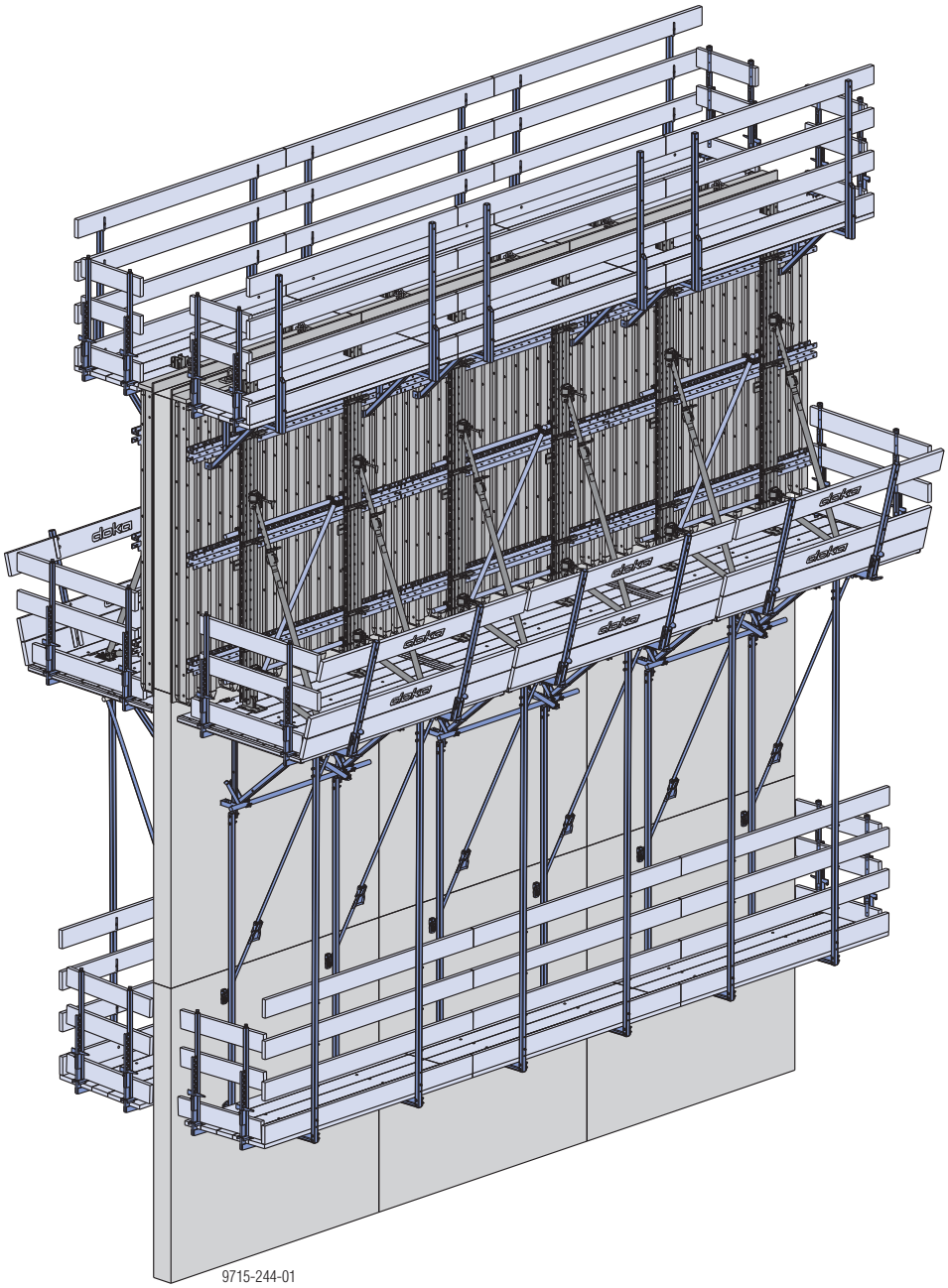
Climbing formwork K



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The Formwork Experts

مقالات تحلیلی آموزشی موسسه ۸۰۸

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Elementary safety warnings

User target groups

- This User Information booklet (Method Statement) is aimed at everyone who will be working with the Doka product or system it describes. It contains information on the standard design for setting up this system, and on correct, compliant utilisation of the system.
- All persons working with the product described herein must be familiar with the contents of this manual and with all the safety instructions it contains.
- Persons who are incapable of reading and understanding this booklet, or who can do so only with difficulty, must be instructed and trained by the customer.
- The customer is to ensure that the information materials provided by Doka (e.g. User Information booklets, Instructions for Assembly and Use, Operating Instruction manuals, plans etc.) are available to all users, and that they have been made aware of them and have easy access to them at the usage location.
- In the relevant technical documentation and formwork utilisation plans, Doka shows the workplace safety precautions that are necessary in order to use the Doka products safely in the usage situations shown.
  In all cases, users are obliged to ensure compliance with national OH&S (occupational health and safety) rules throughout the entire project and to take appropriate additional or alternative workplace safety precautions where necessary.

Hazard assessment

- The customer is responsible for drawing up, documenting, implementing and continually updating a hazard assessment at every job-site.
  This document serves as the basis for the site-specific hazard assessment, and for the instructions given to users on how to prepare and utilise the system. It does not substitute for these, however.

Remarks on this document

- This User Information booklet can also be used as a generic method statement or incorporated with a site-specific method statement.
- **Many of the illustrations in this booklet show the situation during formwork assembly and are therefore not always complete from the safety point of view.**
  Any safety accessories not shown in these illustrations must still be used by the customer, in accordance with the applicable rules and regulations.
- **Further safety instructions, especially warnings, will be found in the individual sections of this document!**

Planning

- Provide safe workplaces for those using the formwork (e.g. for when it is being erected/dismantled, modified or repositioned etc). It must be possible to get to and from these workplaces via safe access routes!
- **If you are considering any deviation from the details and instructions given in this booklet, or any application which goes beyond those described in the booklet, then revised static calculations must be produced for checking, as well as supplementary assembly instructions.**

Rules applying during all phases of the assignment:

- The customer must ensure that this product is erected and dismantled, reset and generally used for its intended purpose under the direction and supervision of suitably skilled persons with the authority to issue instructions.
  These persons' mental and physical capacity must not in any way be impaired by alcohol, medicines or drugs.
- Doka products are technical working appliances which are intended for industrial/commercial use only, always in accordance with the respective Doka User Information booklets or other technical documentation authored by Doka.
- The stability of all components and units must be ensured during all phases of the construction work!
- The functional/technical instructions, safety warnings and loading data must all be strictly observed and complied with. Failure to do so can cause accidents and severe (even life-threatening) damage to health, as well as very great material damage.
- Fire-sources are not permitted anywhere near the formwork. Heating appliances are only allowed if properly and expertly used, and set up a safe distance away from the formwork.
- The work must take account of the weather conditions (e.g. risk of slippage). In extreme weather, steps must be taken in good time to safeguard the equipment, and the immediate vicinity of the equipment, and to protect employees.
- All connections must be checked regularly to ensure that they still fit properly and are functioning correctly.
  It is very important to check all screw-type connections and wedge-clamped joins whenever the construction operations require (particularly after exceptional events such as storms), and to tighten them if necessary.

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Assembly

- The equipment/system must be inspected by the customer before use, to ensure that it is in suitable condition. Steps must be taken to rule out the use of any components that are damaged, deformed, or weakened due to wear, corrosion or rot.
- Combining our formwork systems with those of other manufacturers could be dangerous, risking damage to both health and property. If you intend to combine different systems, please contact Doka for advice first.
- The assembly work must be carried out by suitably qualified employees of the client's.
- It is not permitted to modify Doka products; any such modifications constitute a safety risk.

Erecting the formwork

- Doka products and systems must be set up in such a way that all loads acting upon them are safely transferred!

Pouring

- Do not exceed the permitted fresh-concrete pressures. Excessively high pouring rates lead to formwork overload, cause greater deflection and risk causing breakage.

Striking the formwork

- Do not strike the formwork until the concrete has reached sufficient strength and the person in charge has given the order for the formwork to be struck!
- When striking the formwork, never use the crane to break concrete cohesion. Use suitable tools such as timber wedges, special pry-bars or system features such as Framax stripping corners.
- When striking the formwork, do not endanger the stability of any part of the structure, or of any scaffolding, platforms or formwork that is still in place!

Transporting, stacking and storing

- Observe all regulations applying to the handling of formwork and scaffolding. In addition, the Doka slinging means must be used - this is a mandatory requirement.
- Remove any loose parts or fix them in place so that they cannot be dislodged or fall free!
- All components must be stored safely, following all the special Doka instructions given in the relevant sections of this User Information booklet!

Regulations; industrial safety

- Always observe all industrial safety regulations and other safety rules applying to the application and utilisation of our products in the country and/or region in which you are operating.

Instruction as required by EN 13374:

- If a person or object falls against, or into, the edge protection system and/or any of its accessories, the edge protection component affected may only continue in use after it has been inspected and passed by an expert.

Maintenance

- Only original Doka components may be used as spare parts. Repairs may only be carried out by the manufacturer or authorised facilities.

Symbols used

The following symbols are used in this booklet:

Important note
Failure to observe this may lead to malfunction or damage.

CAUTION / WARNING / DANGER
Failure to observe this may lead to material damage, and to injury to health which may range up to the severe or even life-threatening.

Instruction
This symbol indicates that actions need to be taken by the user.

Sight-check
Indicates that you need to do a sight-check to make sure that necessary actions have been carried out.

Tip
Points out useful practical tips.

Reference
Refers to other documents and materials.

Miscellaneous

We reserve the right to make alterations in the interests of technical progress.

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Eurocodes at Doka

In Europe, a uniform series of Standards known as **Eurocodes** (EC) was developed for the construction field by the end of 2007. These are intended to provide a uniform basis, valid throughout Europe, for product specifications, tenders and mathematical verification.

The EC are the world's most highly developed Standards in the construction field.

In the Doka Group, the EC are to be used as standard from the end of 2008. They will thus supersede the DIN norms as the "Doka standard" for product design.

The widely used "Permissible stress design" (comparing the actual stresses with the permissible stresses) has been superseded by a new safety concept in the EC.

The EC contrast the actions (loads) with the resistance (capacity). The previous safety factor in the permissible stresses is now divided into several partial factors. The safety level remains the same!

$$E_d \leq R_d$$

E_d **Design value of effect of actions**
(E ... effect; d ... design)
Internal forces from action F_d
(V_{Ed}, N_{Ed}, M_{Ed})

F_d **Design value of an action**
$F_d = \gamma_F \cdot F_k$
(F ... force)

F_k **Characteristic value of an action**
"actual load", service load
(k ... characteristic)
e.g. dead weight, live load, concrete pressure, wind

γ_F **Partial factor for actions**
(in terms of load; F ... force)
e.g. for dead weight, live load, concrete pressure, wind
Values from EN 12812

R_d **Design value of the resistance**
(R ... resistance; d ... design)
Design capacity of cross-section
(V_{Rd}, N_{Rd}, M_{Rd})

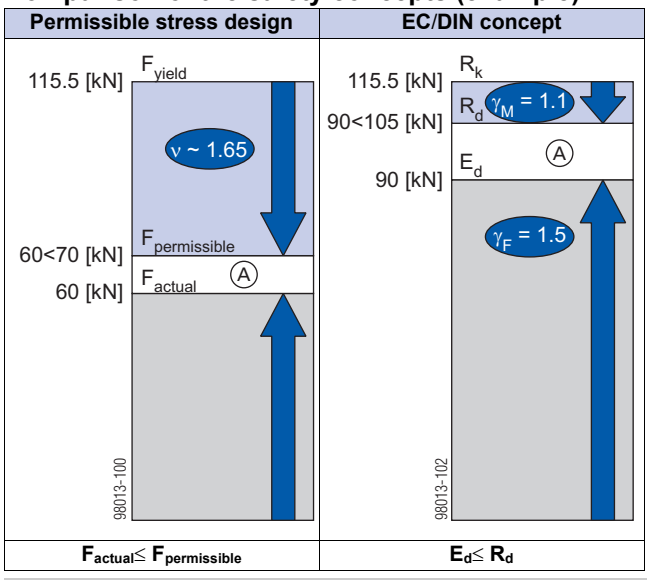
Steel: $R_d = \frac{R_k}{\gamma_M}$ Timber: $R_d = k_{mod} \cdot \frac{R_k}{\gamma_M}$

R_k **Characteristic value of the resistance**
e.g. moment resistance to yield stress

γ_M **Partial factor for a material property**
(in terms of material; M...material)
e.g. for steel or timber
Values from EN 12812

k_{mod} **Modification factor** (only for timber – to take account of the moisture and the duration of load action)
e.g. for Doka beam H20
Values as given in EN 1995-1-1 and EN 13377

Comparison of the safety concepts (example)



A Utilisation factor

The "permissible values" communicated in Doka documents (e.g.: $Q_{permissible}$ = 70 kN) do not correspond to the design values (e.g.: V_{Rd} = 105 kN)!

- Avoid any confusion between the two!
- Our documents will continue to state the permissible values.

Allowance has been made for the following partial factors:
γ_F = 1.5
$\gamma_{M,\ timber}$ = 1.3
$\gamma_{M,\ steel}$ = 1.1
k_{mod} = 0.9

In this way, all the design values needed in an EC design calculation can be ascertained from the permissible values.

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Doka services

Support in every phase of the project

Doka offers a broad spectrum of services, all with a single aim: to help you succeed on the site.

Every project is unique. Nevertheless, there is one thing that all construction projects have in common – and that is a basic structure with five phases. We at Doka know our clients' varying requirements. With our consulting, planning and other services, we help you achieve effective implementation of your formwork assignment using our formwork products – in every one of these phases.

Project development phase

Taking well-founded decisions thanks to professional advice and consulting

Find precisely the right formwork solutions, with the aid of

- help with the bid invitation
- in-depth analysis of the initial situation
- objective evaluation of the planning, execution, and time-risks

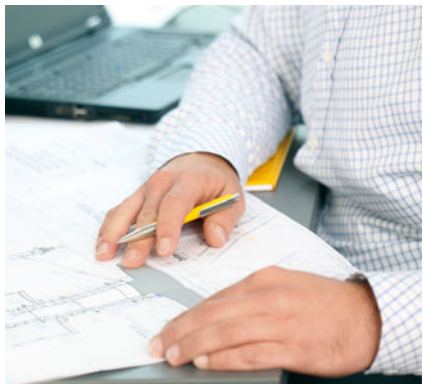
Tendering phase

Optimising the preliminary work with Doka as an experienced partner

Draw up potentially winning bids, by

- basing them on realistically calculated guideline prices
- making the right formwork choices
- having an optimum time-calculation basis

Operations scheduling phase



Controlled, regular forming operations, for greater efficiency resulting from realistically calculated formwork concepts

Plan cost-effectively right from the outset, thanks to

- detailed offers
- determination of the commissioning quantities
- co-ordination of lead-times and handover deadlines

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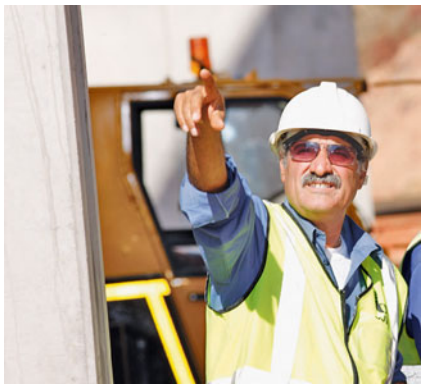
(Shell) construction phase



Optimum resource utilisation
with assistance from the Doka Formwork Experts

Workflow optimisation, thanks to

- thorough utilisation planning
- internationally experienced project technicians
- appropriate transport logistics
- on-site support

(Shell) completion phase

Seeing things through to a positive conclusion
with professional support

Doka Services are a byword for transparency and efficiency here, offering

- jointly handled return of rented formwork
- professional dismantling
- efficient cleaning and reconditioning using special equipment

The advantages for you
thanks to professional advice and consulting

- **Cost savings and time gains**
  When we advise and support you right from the word "go", we can make sure that the right formwork systems are chosen and then used as planned. This lets you achieve optimum utilisation of the formwork equipment, and effective forming operations because your workflows will be correct.
- **Maximised workplace safety**
  The advice and support we can give you in how to use the equipment correctly, and as planned, leads to greater safety on the job.
- **Transparency**
  Because our services and costs are completely transparent, there is no need for improvisation during the project – and no unpleasant surprises at the end of it.
- **Reduced close-out costs**
  Our professional advice on the selection, quality and correct use of the equipment helps you avoid damage, and minimise wear-and-tear.

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Product description

Doka climbing formwork K: The versatile climbing formwork assembled from a folding platform and a formwork element or panel

The climbing formwork for structures where the formwork has to be repositioned upwards in several casting sections, and there is no need for a retractable (roll-back) formwork. The formwork can be tilted back for easy cleaning.

The Climbing formwork K is based on the field-proven Folding platforms K, and is ideal for use with either framed or timber-beam formwork.

The Folding platform K is tested and approved as a "working and protection platform" in accordance with DIN 4420 and the "UVV" accident prevention rules of the German "BBG" employee safety organisation.

Climbing scaffold and formwork are lifted and repositioned together

- means that repositioning can be carried out with no need for time-consuming interim storage of the formwork
- saves time by combining several operations into one

Cost-effective and geared to on-site requirements

- using standard components to combine the folding platform with a formwork element or panel results in a fully-fledged climbing formwork system
- quick and easy to assemble when using the standard Folding platform K
- low-cost, as only standard components are used
- complete safety in all phases of the work
- wide (1.80 m) work-platforms

Easy to operate

- formwork can be set up and struck with no need for a crane
- swift, precise formwork adjustment in all directions
- entire unit is lifted in one piece, quickly and easily (i.e. minimal crane time)

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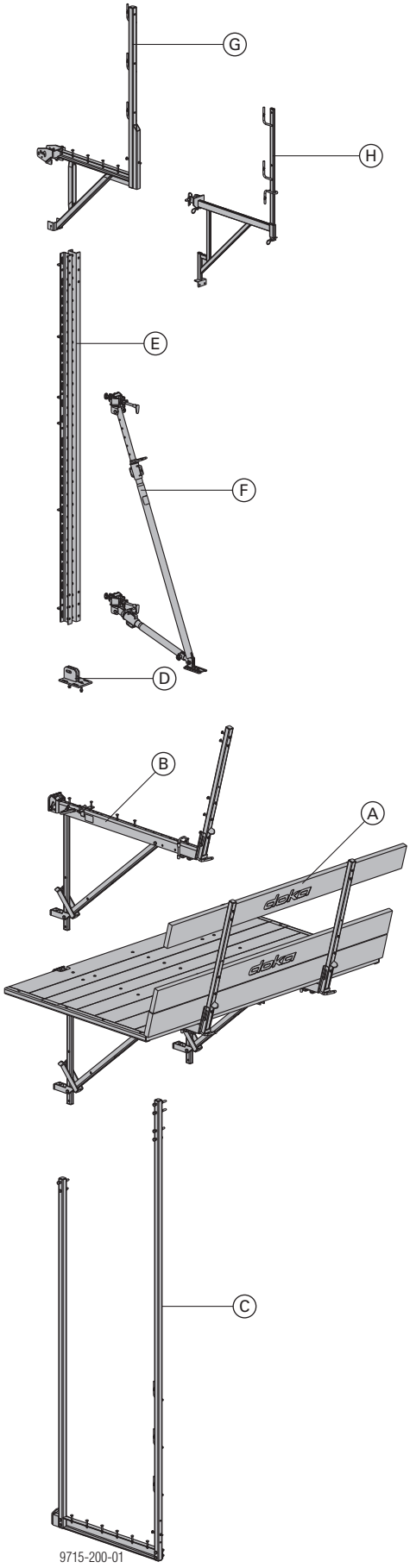
System overview



Adding a few standard components converts your working platform into a fully-fledged, tiltable climbing formwork unit which can be repositioned as a complete form and access-platform in one single operation.

- **Climbing scaffold**

  Either single Folding brackets K, or ready-assembled Folding platforms K, can be used to assemble the climbing scaffold.

  - **Folding platform K** (3.00m or 4.50m) **(A)**
    Pre-assembled, collapsible scaffold platforms with nominal lengths of 3.00 m and 4.50 m, assembled from Folding brackets K, the decking and the railings. The centre-to-centre spacing of the brackets is fixed (at 1.50 m).
  - **Folding bracket K (B)**
    Collapsible bracket for assembling the climbing scaffold.
    When single Folding brackets K are used, the centre-to-centre spacing of the brackets and the platform length can both be individually selected.

- **Suspended platform 120 4.30 m (C)**

  Finishing-work platform that can be screwed onto the folding brackets

- **Connection shoe K (D)**

  for connecting the Folding bracket to the Multi-purpose waling WS10 Top50. This makes it possible for the entire climbing unit to be lifted and repositioned in one piece, together with the formwork.

- **Multi-purpose waling WS10 Top50 (E)**

  For holding the timber-beam or framed formwork. The length of this waling will depend on the height of the formwork elements or panels.

- **Panel strut 340 (F)**

  For exact plumbing and aligning of the formwork element or panel.

- **Universal bracket 90 (G)** or
  Framax bracket 90 (H)

  For assembling pouring platforms. Choose the relevant type of bracket, depending on the formwork system being used (timber-beam or framed formwork).

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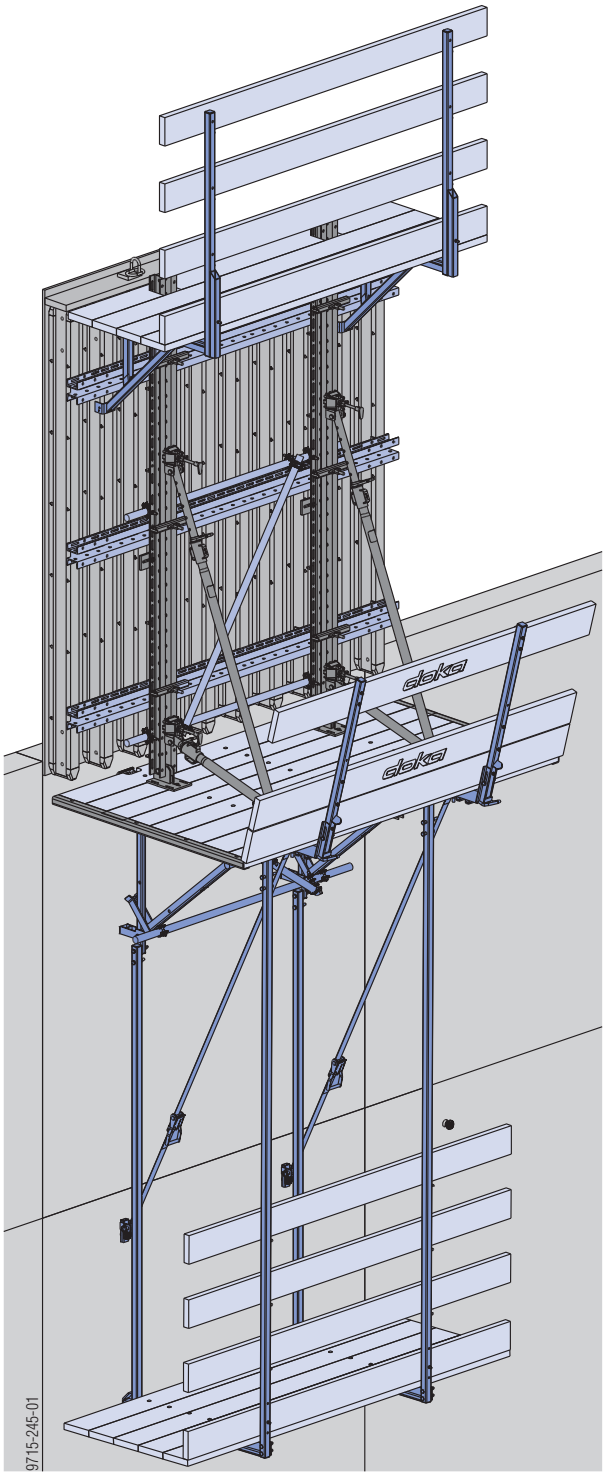
Possible formwork systems

Timber-beam formwork

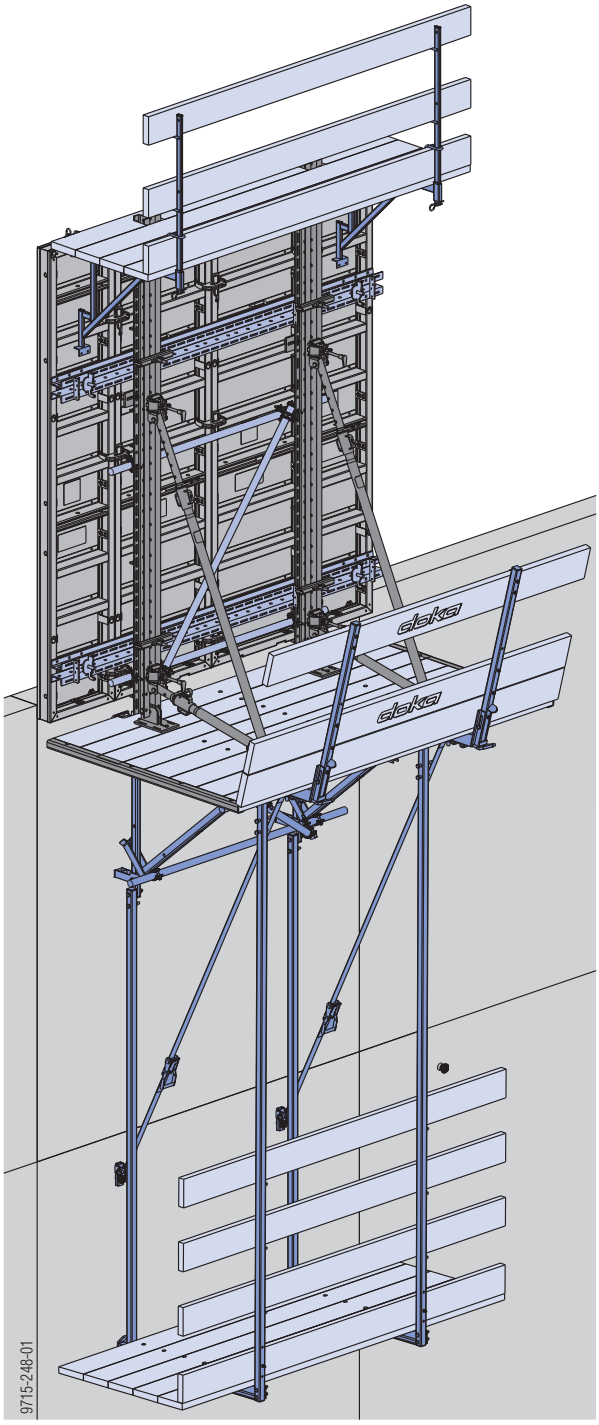
- FF20 and Top 50 timber-beam formwork



Follow the directions in the relevant User Information booklet!

Framed formwork

- Framed formwork Framax Xlife / Alu-Framax Xlife
- Framed formwork Frameco



Follow the directions in the relevant User Information booklet!

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Structural design

CAUTION

➤ If wind speeds > 72 km/h are likely, and when work finishes for the day or before prolonged work-breaks, always take extra precautions to fix the formwork in place.

Suitable precaution:
- set up the opposing formwork

Climbing scaffold with Folding platforms K

Ready-assembled platforms

The Doka folding platforms K are pre-assembled (and thus immediately work-ready) scaffold platforms designed to be used as

- DIN 4420-1 and ÖNORM B4007 compliant protection platforms
- EN 12811-1 compliant working platforms

See the User Information booklet "Doka folding platform K" for detailed information.

The following points must be observed when using the folding platforms as a climbing formwork:

Max. formwork height 3.75 m on structures of < 100 m in height (wind pressure w_e=1.365 kN/m²)

Permitted service load: 1.5 kN/m² (150 kg/m²) on folding platforms and on pouring platforms of Load Class 2 to EN 12811-1:2003

A suspended platform (of Load Class 2) can be added if wished

Loads on the suspension point:
- Horizontal load: 36 kN
- Vertical load: 20 kN

Climbing scaffold with Folding brackets K

Platform assembled from single brackets

Makes it possible to choose any bracket spacing and any length of platform, for constructing closure platforms (of e.g. less than 3.0 m in length) and special shapes for use in corner zones.

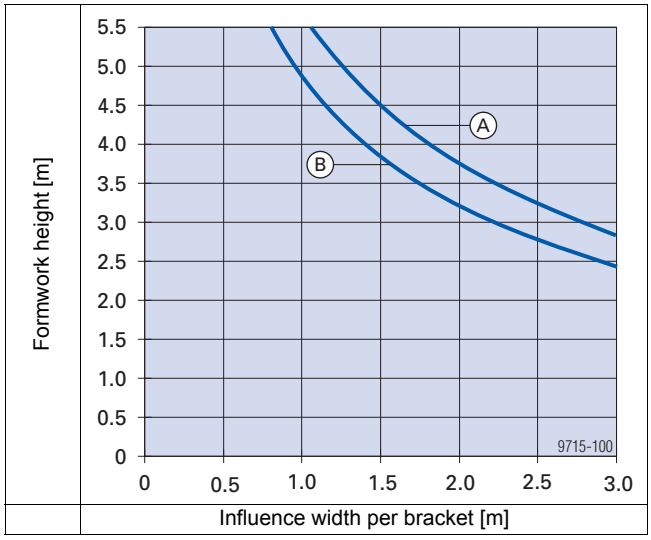
The following points must be observed when using the Folding brackets as a climbing formwork:

Permitted service load: 1.5 kN/m² (150 kg/m²) on folding platforms and on pouring platforms of Load Class 2 to EN 12811-1:2003

A suspended platform (of Load Class 2) can be added if wished

Allow for the wind-load when deciding the formwork height and the influence width of the brackets.

Wind-load on formwork



A... Structure height < 24 m (wind pressure w_e=1.0 kN/m²) (wind speed max. 130 km/h)

B... Structure height < 100 m (wind pressure w_e=1.365 kN/m²) (wind speed max. 150 km/h)

Loads on the suspension point:
- Horizontal load: 36 kN
- Vertical load: 26 kN

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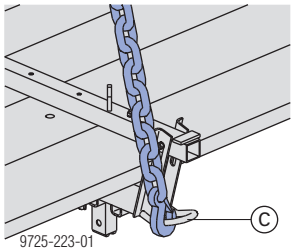
Climbing scaffold – set-up procedure with Folding platforms K

Separating the platforms

➤ Lift the stacked platforms off the truck by crane or forklift truck, and set them down on a flat, paved surface.

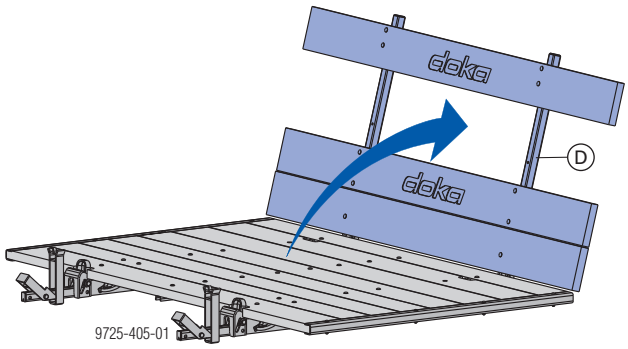
➤ Attach the four-part lifting tackle to the crane hoisting points at the front and to the extra lifting bows at the rear **(C)** .

☞ Only attach and lift 1 platform at a time.



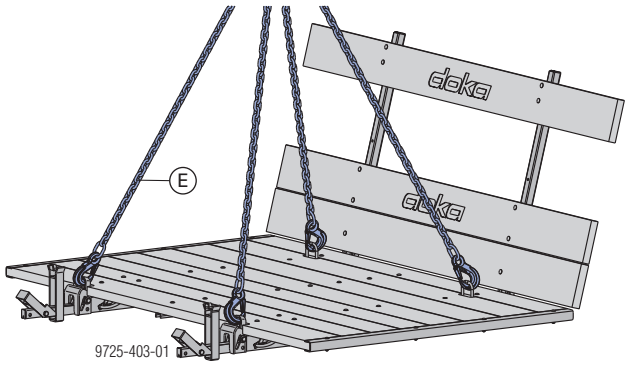
Putting up the railings

➤ Tilt up the railings **(D)** . When you reach the stop, lift the railings and slot them into place.



Attaching the crane

➤ Pull the lifting bows up out of their recesses, attach the four-part lifting tackle **(E)** (e.g. Doka 4-part chain 3.20m) and raise the folding platform.



Pulling out the pressure rod

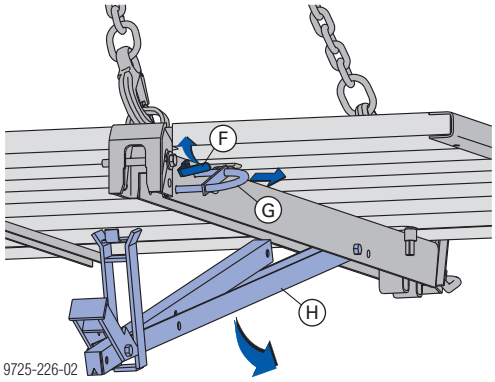
CAUTION

After being released, the pressure rod swings downwards!

➤ Hold the pressure rod **(H)** in one hand.

➤ Then, with the other hand, lift up the red safety clip **(F)** and pull out the U-bolt **(G)** as far as it will go.

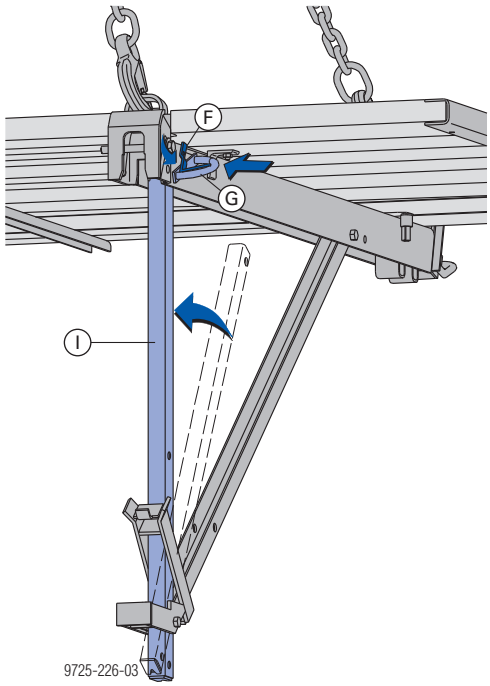
➤ **Gradually** lower the pressure rod by hand.



Bolting the vertical rod in place

➤ Tilt up the vertical rod **(I)** and fix it by inserting the U-bolt **(G)** .

➤ Secure the U-bolt with the red safety clip **(F)** to prevent it being opened accidentally.



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Fitting the bracing

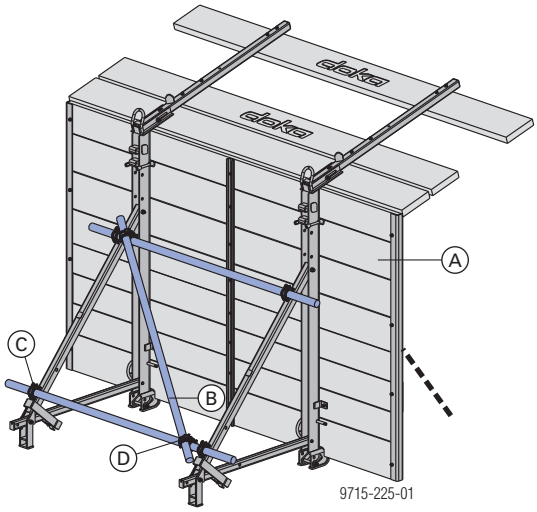
➤ Prepare an assembly bench.

➤ Prepare the bracing.

➤ Tilt up the folding platforms and secure them so that they cannot topple over.

➤ Brace the Folding platforms K in the horizontal, with 4 screw-on couplers and 2 scaffolding tubes.

➤ Mount a scaffolding tube as a diagonal stiffening reinforcement between the brackets, using 2 swivel couplers.



A	Folding platform K
B	Scaffolding tube 48.3mm 2.00m
C	Screw-on coupler 48mm 50
D	Swivel coupler 48mm

Distance between screw-on coupler and swivel coupler: max. 160 mm.

This set-up scheme is for 3.0 m long folding platforms – on 4.5 m long folding platforms, the number of couplers and scaffolding tubes, and the length of the scaffolding tubes, will need to be adjusted accordingly.

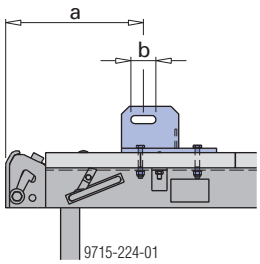
Fitting the Connection shoe K

➤ Bolt the Connection shoe K to the folding platform at the selected distance from the edge, as shown in the drawing.

Required nuts & bolts etc.

- two M 12x80 hexagon screws
- two A 13 washers
- two M 12 hexagon nuts (self-locking)

included with product

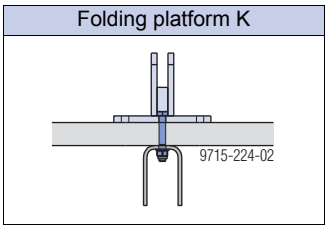


a ... 363 mm with Top50 and FF20
a ... 264 mm with Framax Xlife and Alu-Framax Xlife
b ... 45 mm

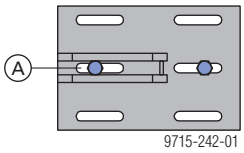
CAUTION

➤ It is not sufficient to fix the Connection shoe K only through the deck-boards.

How to fix the Connection shoe K



Plan view without platform decking



A	Holes drilled for Folding platform K

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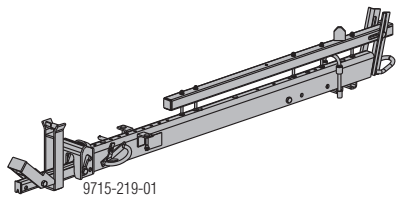
Climbing scaffold – set-up procedure with Folding brackets K

The professionals from the Doka "Ready-to-Use Service" plan and assemble **site-ready and custom formworks** exactly to your specifications.

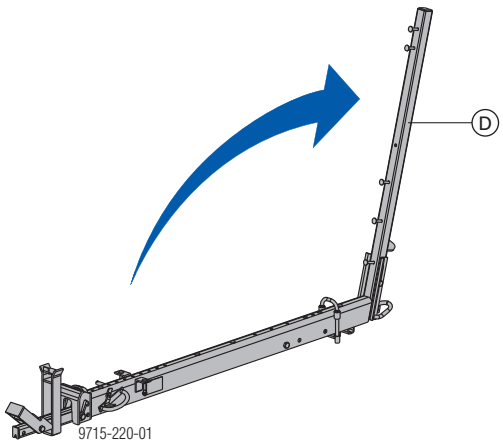
Separating the brackets

➤ Lift the Folding brackets K off the truck and set them down on a flat surface.



Putting up the railings

➤ Tilt up the railings **(D)** . When you reach the stop, lift the railings and slot them into place.

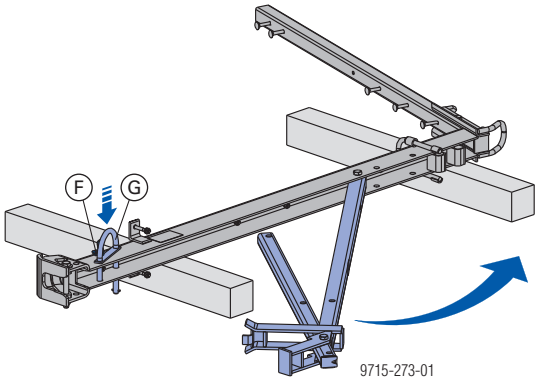


➤ Place the Folding bracket K on its side, on timber supports on the ground.

Pulling out the pressure rod

➤ Raise the red locking lever **(F)** and pull out the U-bolt **(G)** as far as it will go.

➤ Pull out the pressure rod.



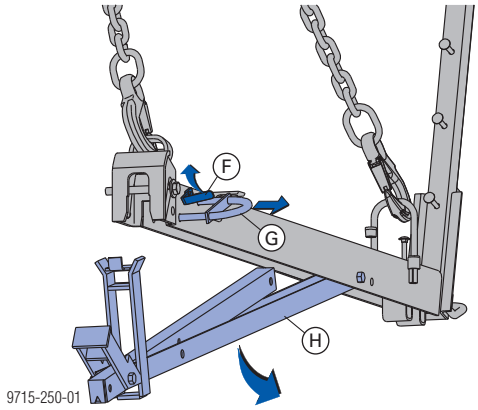
Note:
In cases where the bracket is unfolded while suspended from the crane:

CAUTION
After being released, the pressure rod swings downwards!

➤ Hold the pressure rod **(H)** in one hand.

➤ Then, with the other hand, lift up the red safety clip **(F)** and pull out the U-bolt **(G)** as far as it will go.

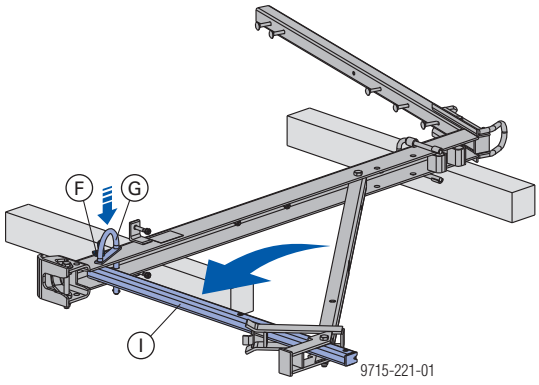
➤ **Gradually** lower the pressure rod by hand.



Bolting the vertical rod in place

➤ Tilt up the vertical rod **(I)** and fix it by inserting the U-bolt **(G)** .

➤ Secure the U-bolt with the red safety clip **(F)** to prevent it being opened accidentally.



Fitting the bracing

➤ Prepare an assembly bench.

➤ Prepare the bracing.

➤ Tilt up the Folding brackets K and stand them spaced the specified centre-to-centre distance apart (see shop drawing / assembly plan).

➤ Secure them so that they cannot topple over.

➤ The length of the scaffolding tubes used will depend on the centre-to-centre spacing of the brackets.

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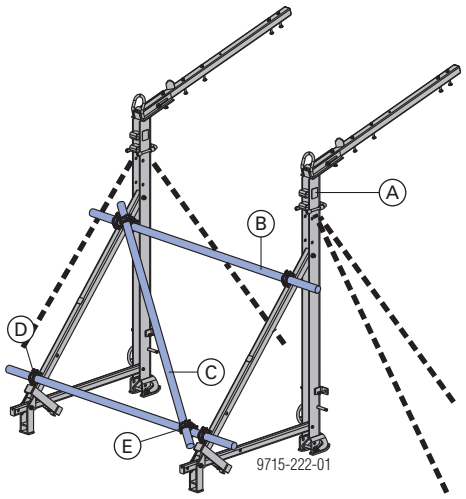
➤ Brace the Folding brackets K in the horizontal, with 4 screw-on couplers and 2 scaffolding tubes.

➤ Mount a scaffolding tube as a diagonal stiffening reinforcement between the brackets, using 2 swivel couplers.



A	Folding platform K
B	Scaffolding tube 48.3mm (length = centre-to-centre distance + 20 cm)
C	Scaffolding tube 48.3mm (length = centre-to-centre distance + 50 cm)
D	Screw-on coupler 48mm 50
E	Swivel coupler 48mm

Distance between screw-on coupler and swivel coupler: max. 160 mm.

This set-up scheme is for platform units with 2 brackets. On platform units with 3 brackets, the number of couplers and scaffolding tubes will need to be adjusted accordingly.

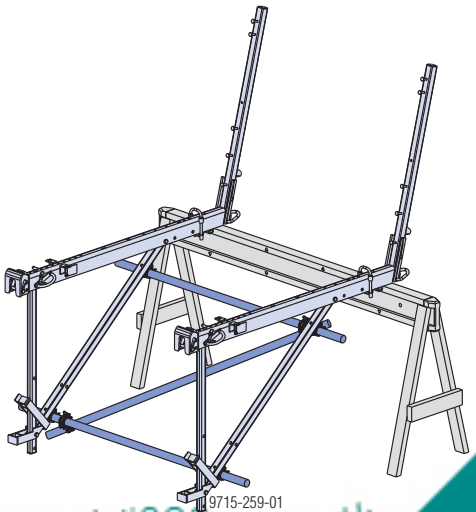
Attaching the platform decking

Note:

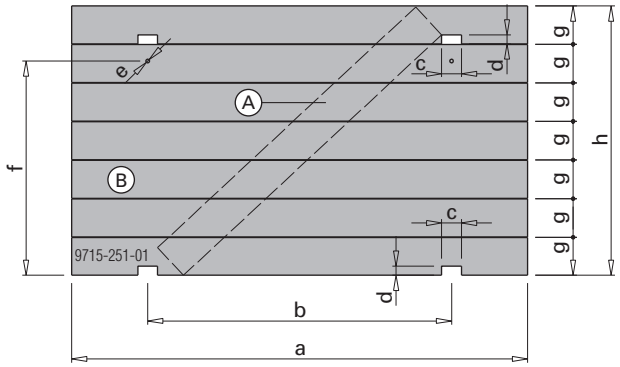
The plank and board thicknesses given here comply with the C24 category of EN 338.

In Germany, wooden deck-boards must bear the "Ü-symbol" mark of conformity.

➤ Place the braced Folding brackets K onto a trestle.



➤ Lay deck-boards onto the bracket. (Cut them to size as shown in the illustration)



a ... length of platform
b ... centre-to-centre distance
c ... 13 cm
d ... 6 cm
e ... 2.4 cm
f ... 141 cm
g ... 25 cm
h ... 177 cm

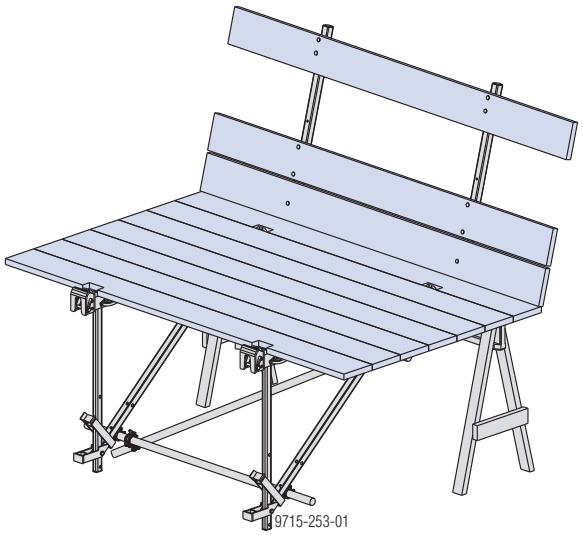
A	Diagonal board
B	Plank, 25x5 cm

➤ Attach each deck-board with one M 10x70 square bolt on each bracket (6 bolts are included with each Folding bracket K).

➤ Fix a diagonal board to the underside, between the brackets (with 2 nails in each deck-board)

➤ Attach guard rails so as to comply with the applicable national regulations

➤ On each bracket, fasten handrail planks onto the handrail post using square bolts M 10x110, spring washers A 10 and hexagon nuts M 10.



➤ Mount the Connection shoe K (see "Climbing scaffold – set-up procedure with Folding platforms K").

Note:

In corner zones, or where the corners are not right-angled, the platform planking must be trimmed accordingly.

Mount passage units as shown in the shop drawing / assembly plan.

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Erecting the formwork

After the first casting section, the formwork is completed in the steps outlined below. This makes it possible to place the formwork onto the folding platform.

Framed formwork

e.g. framed formwork Framax Xlife

Follow the directions in the "Framed formwork Framax Xlife" User Information booklet!

- A hard, flat, firm surface is needed!
- Tightening torque of the couplers for the bracing tubes: 50 Nm

Tools needed:

- Universal tool box 15.0

Preparing the vertical Multi-purpose waling

Length of the Multipurpose waling:

The Multi-purpose waling WS10 Top50 must be long enough to project up through the pouring platform which will later be mounted to the formwork.

It must also be long enough to permit the necessary excess length beyond the bottom of the formwork.

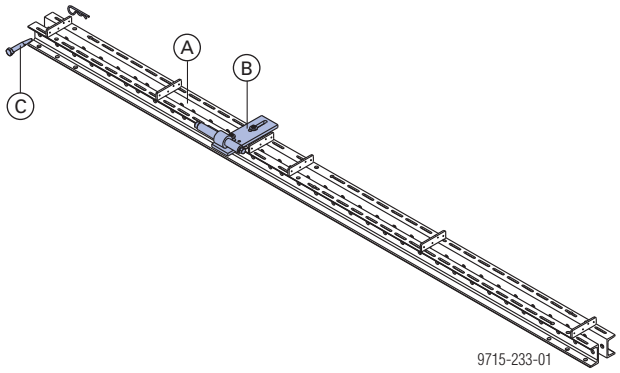
Required nuts & bolts etc.

- 2 hexagonal bolts M 10x45
- 2 limpet washers 11 DIN 434
- 2 hexagon nuts M 10
- 1 washer R 11

(not included with product)

➤ Screw an Adjusting spindle M36 into the hole-grid on the vertical Multi-purpose waling WS10 Top50. (Position as shown in shop drawing / assembly plan)

➤ Push a Connecting pin 10cm into the top hole in the Multipurpose waling WS10 Top50, and secure it with a Spring cotter 5mm.

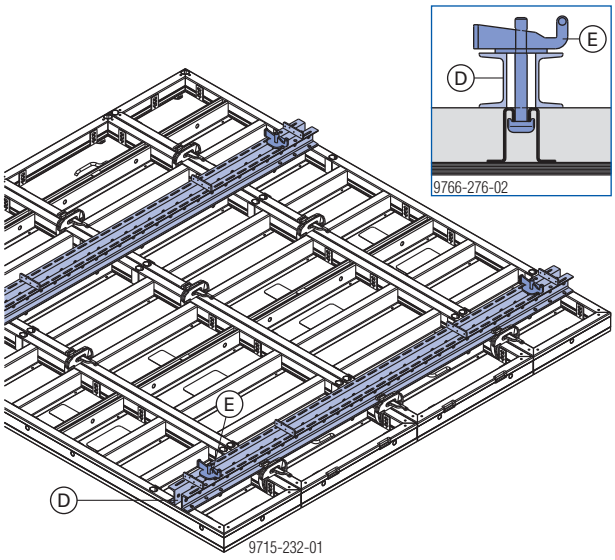


A Multi-purpose waling WS10 Top 50
B Adjusting spindle M36
C Connecting pin 10cm + Spring cotter 5mm

Preparing the formwork

➤ Set the gang-form down on a flat surface, with the form-ply facing downwards.

➤ Fix Multi-purpose walings WS10 Top50 in the waling profiles of the framed formwork panels, using Framax wedge clamps.



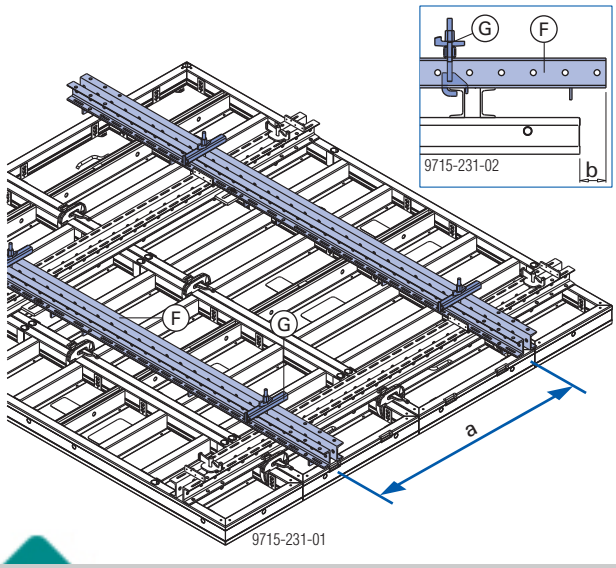
The length of the Multi-purpose waling WS10 Top50 will depend on the width of the gang-form.

D Multi-purpose waling WS10 Top50
E Framax wedge clamp

Mounting Multi-purpose walings to the formwork

➤ Lay down vertical Multi-purpose walings WS10 Top50 spaced apart at the centre-to-centre distance "a" of the brackets (use an assembly template).

➤ Adjust the overlap dimension "b" as shown in the shop drawing / assembly plan. Use Waling-to-bracket holders to fix the Multi-purpose walings at right-angles.



F Multi-purpose waling WS10 Top50
G Waling-to-bracket holder 9-15cm

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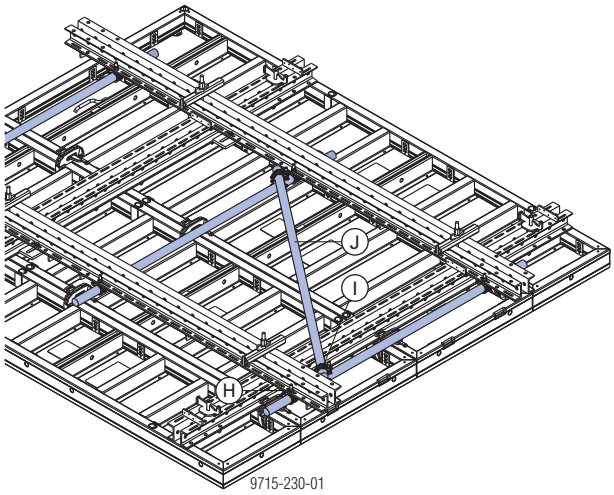
Example:

- Suspension point 30 cm beneath the concrete edge
- Formwork overlap 10 cm

b = 7.8 cm

Fitting the bracing

➤ Brace the vertical Multi-purpose walings in the horizontal and the diagonal.



The length of the scaffolding tubes used will depend on the centre-to-centre spacing of the brackets.

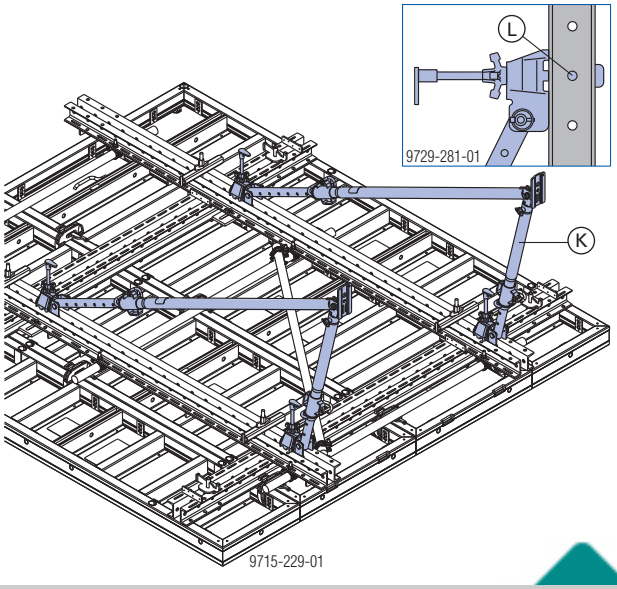
H	Screw-on couplers 48mm 50 (x6)
I	Swivel couplers 48mm (x2)
J	Scaffolding tubes 48.3mm (x4)

Distance between screw-on coupler and swivel coupler: max. 160 mm.

This set-up scheme is for platform units with 2 brackets. On platform units with 3 brackets, the number of couplers and scaffolding tubes will need to be adjusted accordingly.

Fitting the panel struts

➤ Fix a Panel strut 340 in the Multi-purpose waling with a Connecting pin 10cm, and secure this with a Spring cotter 5mm.

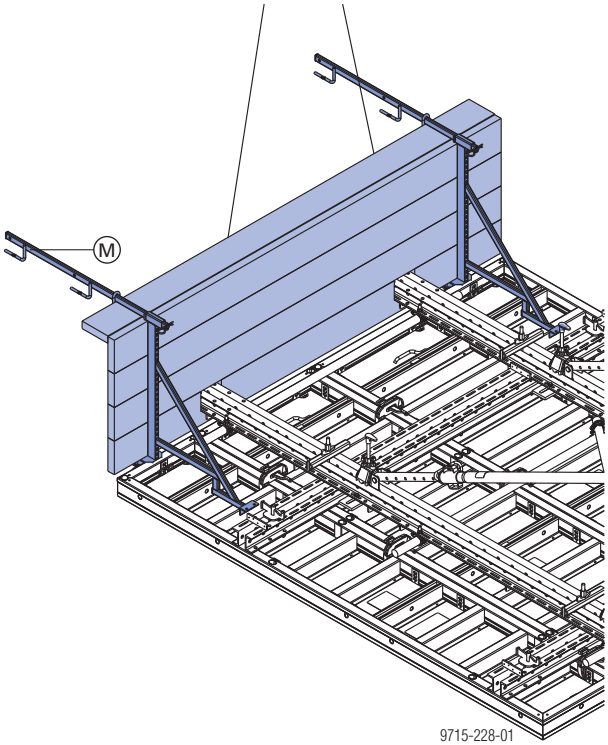


K	Panel strut 340
L	Connecting pin 10cm + Spring cotter 5mm

Mounting the pouring platform

➤ Attach Framax brackets and mount deck-boards.

➤ Also mount guard-rail boards, except where they would get in the way of the lifting chains when the gang-form is lifted into the upright.



M	Framax bracket 90

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Timber-beam formwork

e.g. Large-area formwork Top50

Follow the directions in the "Doka large-area formwork Top50" User Information!

- A hard, flat, firm surface is needed!
- Tightening torque of the couplers for the bracing tubes: 50 Nm

Tools needed:

- Universal tool box 15.0

Preparing the vertical Multi-purpose waling

Length of the Multipurpose waling:

The Multi-purpose waling WS10 Top50 must be long enough to project up through the pouring platform which will later be mounted to the formwork.

It must also be long enough to permit the necessary excess length beyond the bottom of the formwork.

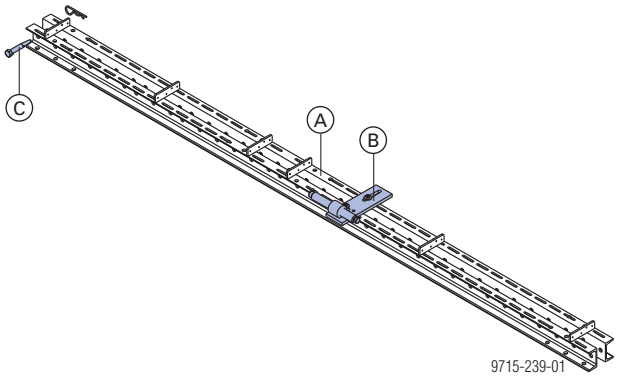
Required nuts & bolts etc.

- 2 hexagonal bolts M 10x45
- 2 limpet washers 11 DIN 434
- 2 hexagon nuts M 10
- 1 washer R 11

(not included with product)

➤ Screw an Adjusting spindle M36 into the hole-grid on the vertical Multi-purpose waling WS10 Top50. (Position as shown in shop drawing / assembly plan)

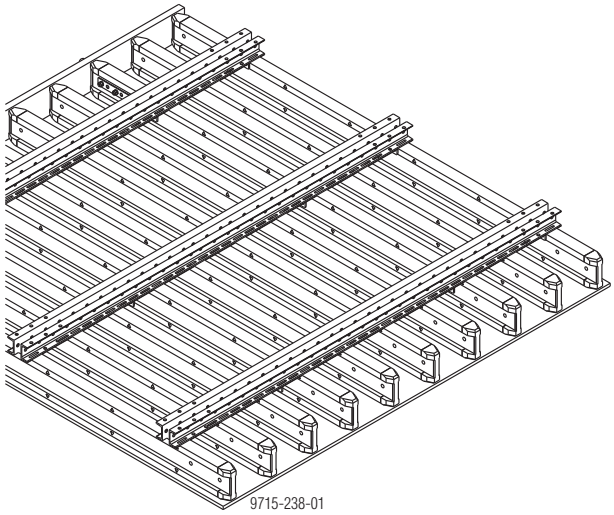
➤ Push a Connecting pin 10cm into the top hole in the Multipurpose waling WS10 Top50, and secure it with a Spring cotter 5mm.



A Multi-purpose waling WS10 Top 50
B Adjusting spindle M36
C Connecting pin 10cm + Spring cotter 5mm

Preparing the formwork

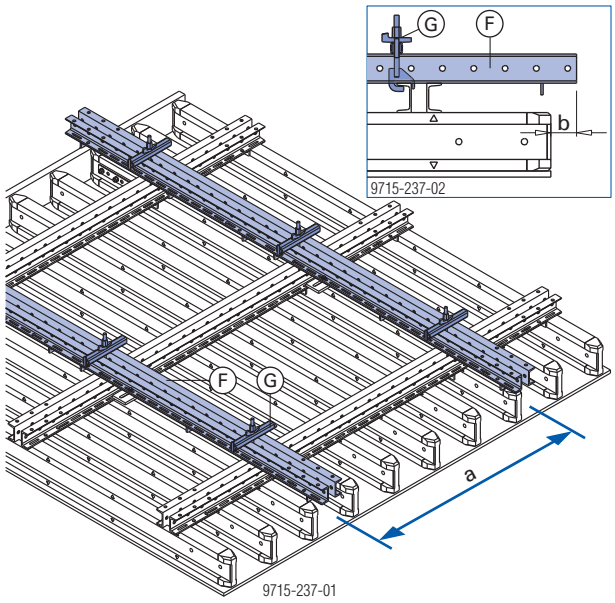
➤ Set the formwork element down on a flat surface, with the form-ply facing downwards.



Mounting Multi-purpose walings to the formwork

➤ Lay down vertical Multi-purpose walings WS10 Top50 spaced apart at the centre-to-centre distance "a" of the brackets (use an assembly template).

➤ Adjust the overlap dimension "b" as shown in the shop drawing / assembly plan. Use Waling-to-bracket holders to fix the Multi-purpose walings at right-angles.



F Multi-purpose waling WS10 Top50
G Waling-to-bracket holder 9-15cm

Example:

- Suspension point 30 cm beneath the concrete edge
- Formwork overlap 10 cm

b = 7.8 cm

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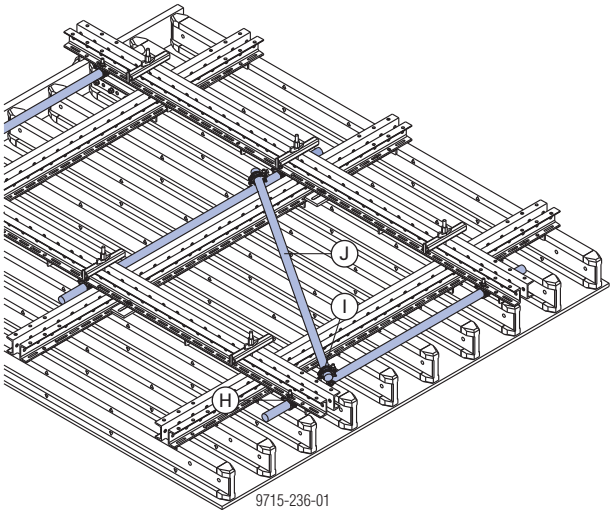
Fitting the bracing

➤ Brace the vertical Multi-purpose walings in the horizontal and the diagonal.



The length of the scaffolding tubes used will depend on the centre-to-centre spacing of the brackets.

H Screw-on couplers 48mm 50 (x6)

I Swivel couplers 48mm (x2)

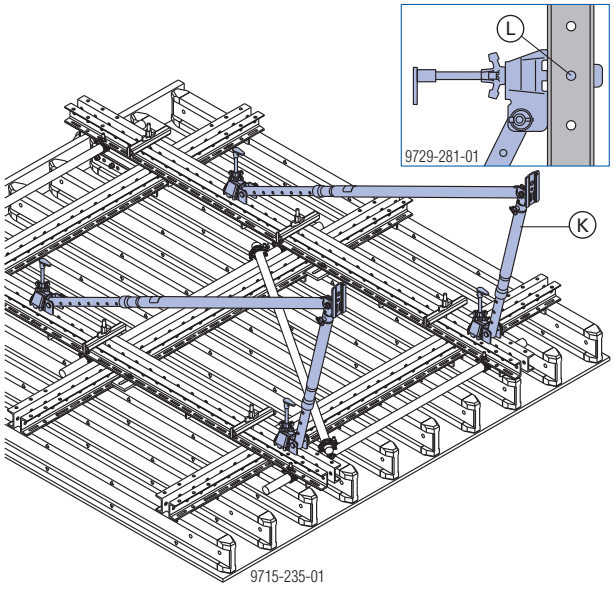
J Scaffolding tubes 48.3mm (x4)

Distance between screw-on coupler and swivel coupler: max. 160 mm.

This set-up scheme is for platform units with 2 brackets. On platform units with 3 brackets, the number of couplers and scaffolding tubes will need to be adjusted accordingly.

Fitting the panel struts

➤ Fix a Panel strut 340 in the Multi-purpose waling with a Connecting pin 10cm, and secure this with a Spring cotter 5mm.



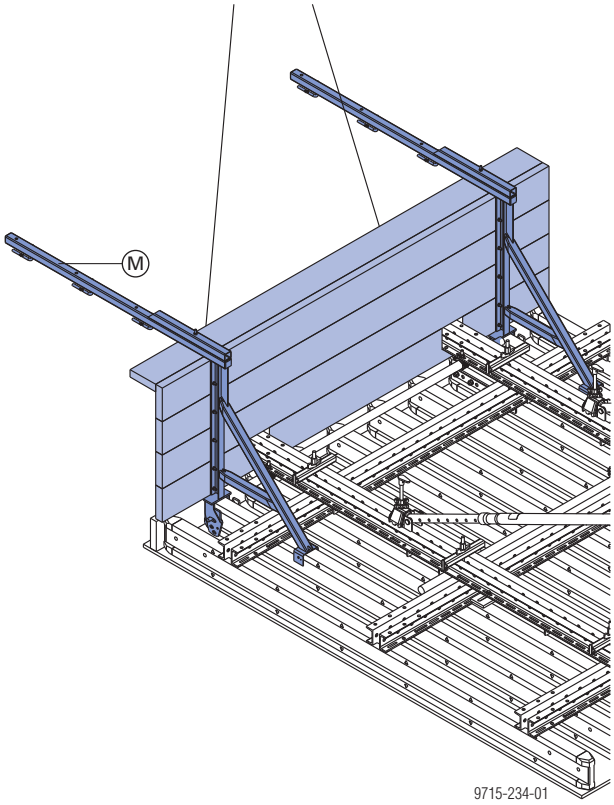
K Panel strut 340

L Connecting pin 10cm + Spring cotter 5mm

Mounting the pouring platform

➤ Attach Universal brackets and mount deck-boards.

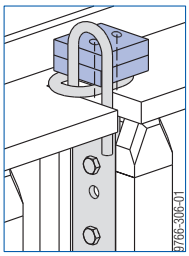
➤ Also mount guard-rail boards, except where they would get in the way of the lifting chains when the gang-form is lifted into the upright.



M Universal bracket 90

Making it impossible to use any of the forbidden suspension methods when carrying out standard lifting of the unit as a whole:

➤ e.g. nail on a board in such a way that the crane suspension tackle cannot be hung into place in the lifting-bracket.



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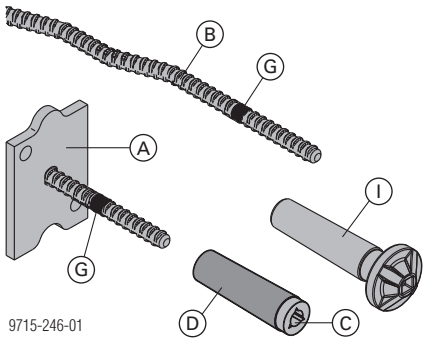
Anchoring on the structure

Components:



A	Stop-anchor 15.0 (expendable anchoring component)
B	Pigtail anchor 15.0 (expendable anchoring component)
C	Positioning cone 15.0 5cm
D	Sealing sleeve 15.0 5cm (expendable anchoring component)
G	Depth mark
I	Suspension cone 15.0 5cm

WARNING
Sensitive rod steel!
- ➤ Never weld or heat tie-rods.
- ➤ Tie rods that are damaged or have been weakened by corrosion or wear must be withdrawn from use.
- ➤ Only use approved tie-rods.

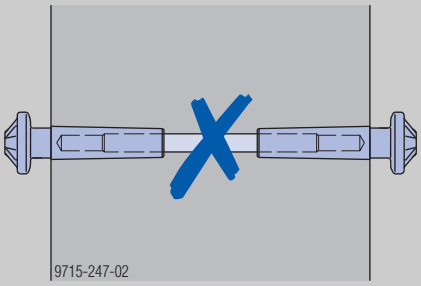
Preferably, **stop-anchors (A)** are used, or – depending on the characteristics of the structure – **pigtail anchors (B)** .

Risk of formwork falling off if two cones are fitted opposite one another and joined with a tie-rod.

Unscrewing the anchoring component on one side may cause the anchoring point on the opposite side to shear off.

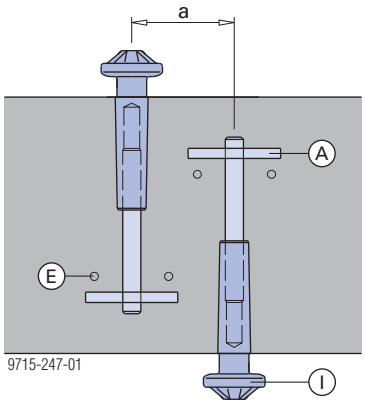
- ➤ Every suspension point must have its own separate anchorage.

Exception: Suspension points prepared with a "Stop-anchor double-ended 15.0"



Note:
Where climbing formwork is used on both sides, the Stop-anchors must be located at an offset to one another, as necessitated by the thickness of the wall.

Plan view



a ... min. 100 mm

A	Stop-anchor 15.0
E	Extra reinforcement steel
I	Suspension cone 15.0 5cm

- Depth of concrete cover on "cone" side of wall: 5.0 cm
- Depth of concrete cover on "stop-anchor" side of a wall of the minimum thickness: 2 cm

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Dimensioning the suspension point

The required **cube compressive strength** of the concrete at the time of loading must be **specified** separately for each project **by the structural designer**. It will depend on the following factors:

- load actually occurring
- length of stop-anchor or pigtail anchor
- reinforcement / extra reinforcement steel
- distance from edge

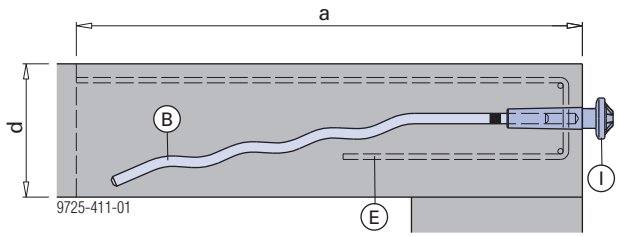
The introduction of the forces, the transfer of these forces into the structure, and the stability of the overall construction, must all be verified by the structural designer.

The required cube compressive strength $f_{ck,cube,current}$ must be at least 10 N/mm², however.

Anchoring systems

	Minimum wall thickness
Stop-anchor 15.0 40cm	47 cm
Stop-anchor 15.0 16cm	23 cm
Stop-anchor 15.0 11.5cm	19 cm

It is also possible to use a pigtail anchor for a positioning point / suspension point in the floor-slab, instead of a stop-anchor.



d ... min. 16.0 cm
a ... 74.0 cm (where there is 5 cm concrete cover on both sides)

B	Pigtail anchor 15.0
E	Longitudinal reinforcement and U-reinforcements, min. diam. 8 mm, spaced max. 15 cm apart
I	Suspension cone 15.0 5cm

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Preparing the positioning point and suspension point

➤ **Warning** against not screwing in the parts (e.g. stop anchors or pigtail anchors) far enough into the positioning cones: This may subsequently lead to reduced load-bearing capacity and to the failure of the suspension point - resulting in injury and damage.

➤ Always screw in components until they fully engage. When correctly fitted, there will still be 1 cm of thread visible between the part and the depth mark on the stop anchor or pigtail anchor.

➤ Make sure that the parts then used for the suspension point are for the same depth of concrete cover.

➤ Do not use the positioning cone as a rod connector

➤ Do not place concrete directly above the pigtail or stop-anchors.

➤ Do not allow the vibrator to touch the pigtail or stop-anchors.

These measures prevent the anchors working loose during pouring and vibration.

Make marks on the top edge of the formwork so that you can easily see where the anchoring points are during pouring.

- The axis of the positioning cone must be at right-angles to the surface of the concrete – maximum angle of deviation 2°.
- Tolerance for locating the positioning points and suspension points: ±10 mm in the horizontal and the vertical.

Cones and accessories are also available for a 2 cm depth of concrete cover.
The articles in question are:

- Suspension cone 15.0 Art.n° 581970000
- Cantilever positioning cone 15.0 Art.n° 581698000
- Positioning cone 15.0 Art.n° 581960000
- Sealing sleeve 15.0 Art.n° 581989000
- Sealing sleeve S 15.0 Art.n° 581696000

These suspension points are prepared in a similar way to the instructions given for the Suspension cone 15.0/5cm.
However, special care must be taken to ensure that components for different depths of concrete cover are kept strictly separate (see warnings above)!

Tools needed:

- Reversible ratchet 1/2"
- Positioning-cone spanner 15.0 DK

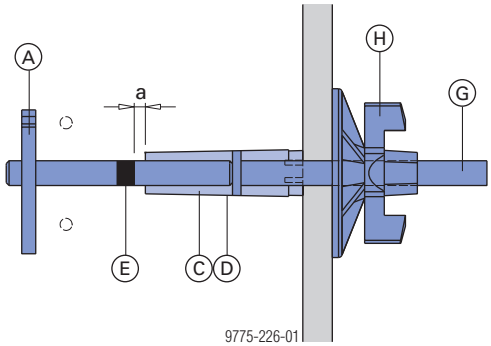
Positioning point with Positioning cone 15.0 5cm (with hole drilled through form-ply)

How to mount:

➤ Drill a diam. 18 mm hole in the form-ply (position as shown in shop drawing / assembly plan).

➤ Screw the stop-anchor or pigtail anchor into the positioning cone until fully engaged.

➤ Insert a Tie-rod 15.0 (length approx. 20 cm) through the hole drilled in the form-ply, screw it into the positioning cone and tighten it with a Super-plate 15.0.



a ... 1 cm

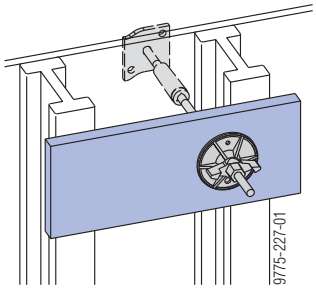
A	Stop-anchor 15.0 or Pigtail anchor 15.0
C	Positioning cone 15.0 5cm
D	Sealing sleeve 15.0 5cm
E	Depth mark
G	Tie-rod 15.0mm
H	Super-plate 15.0

1 cm distance between depth mark and cone.

Note:

Positioning cones 15.0 5cm are supplied together with Sealing sleeves 15.0 5cm. **Every time** the positioning cones are **re-used**, fit them with **new sealing sleeves** first!

If the positioning-point is located too close to a Doka beam, a board can be nailed to this and the adjoining beam to provide a support surface for the Super-plate.



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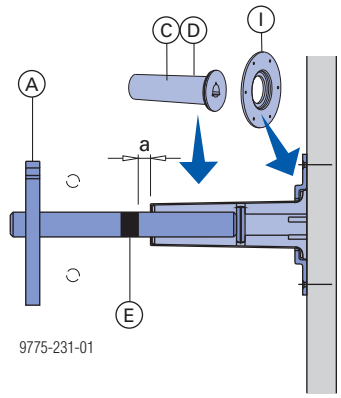
Positioning point with Cantilever positioning cone 15.0 5cm (with no hole drilled through form-ply)

For special applications only, when it is not possible to drill through the form-ply (e.g. where there are Doka beams or formwork panel frame profiles directly behind the positioning-point).



a ... 1 cm

A	Stop-anchor 15.0 or Pigtail anchor 15.0
C	Cantilever positioning cone 15.0 5cm
D	Sealing sleeve S 15.0 5cm
E	Depth mark
I	Fixing plate 15.0

Important note:

It is not permitted to use the Fixing plate 15.0 more than once in the same position, as it cannot be fixed firmly and securely in the old nail-holes.

How to mount:

- Nail a Cantilever positioning cone to the form-ply using a Fixing plate 15.0 (position as shown in project plan).
- Screw the Stop-anchor or pigtail anchor into the Cantilever positioning cone until fully engaged.

1 cm distance between depth mark and cone.

The following items are needed for this type of positioning-point:

- Cantilever positioning cone 15.0 5cm
- Sealing sleeve S 15.0 5cm
- Fixing plate 15.0

Note:

Cantilever positioning cones 15.0 5cm are supplied together with Sealing sleeves S 15.0 5cm. **Every time** the positioning cones are **re-used**, fit them with **new sealing sleeves** first!

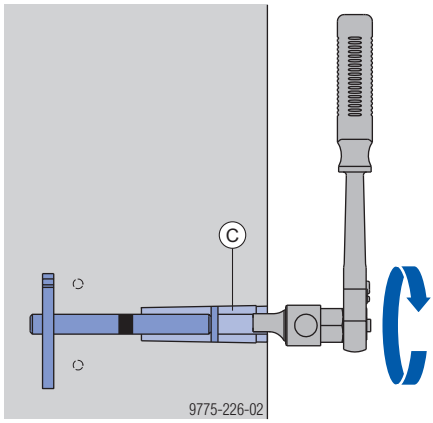
Before pouring

- Check all positioning points and suspension points once again.

- The axis of the positioning cone must be at right-angles to the surface of the concrete – maximum angle of deviation 2°.
- Tolerance for locating the positioning points and suspension points: ±10 mm in the horizontal and the vertical.
- 1 cm distance between depth mark and cone = full screw-in depth.

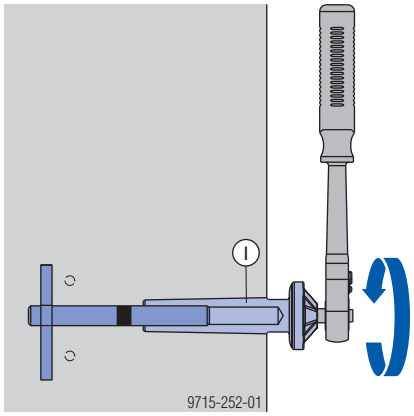
Suspension point

- Unscrew the Positioning cone, using a Reversible ratchet 1/2" and a Positioning-cone spanner 15.0 DK.



C	Positioning cone 15.0 5cm

- Screw in Suspension cone 15.0 until fully engaged, and tighten using Reversible ratchet 1/2".



I	Suspension cone 15.0 5cm

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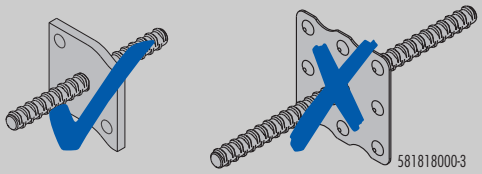
Other possible anchorages

Anchor points with no offset

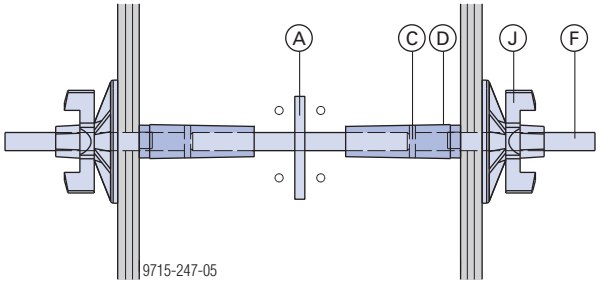
Anchor points with no offset are prepared using the "Stop-anchor double-ended 15.0".

Risk of confusion!

➤ Do NOT on any account use Water stops G 15.0 for this application.

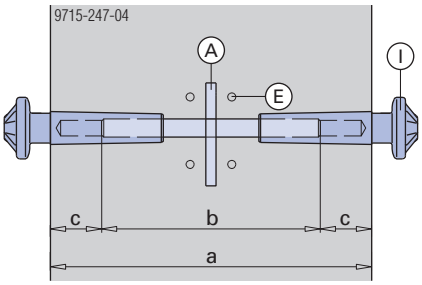


Positioning point



A	Stop-anchor double-ended 15.0
C	Positioning cone 15.0 5cm
D	Sealing sleeve
F	Tie-rod 15.0mm
J	Super-plate 15.0

Suspension point



a ... 25 - 70 cm
b... Order length = wall thickness 'a' - 2 x depth of concrete cover 'c'
c ... Depth of concrete cover 5 cm

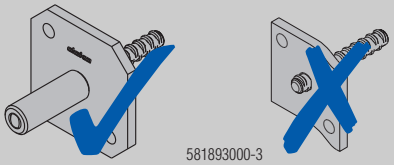
A	Stop-anchor double-ended 15.0
E	Extra reinforcement steel
I	Suspension cone 15.0 5cm

Thin walls

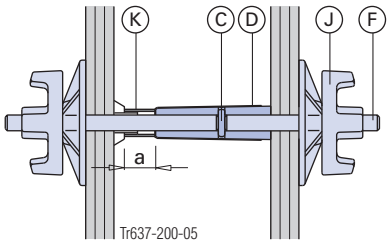
Wall thicknesses of 15 to 16 cm are prepared using the Wall anchor 15.0 16cm.

DANGER

➤ Do NOT on any account use Stop-anchors 15.0 for this application.



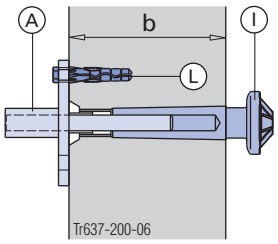
Positioning point



a ... 3-4 cm

C	Positioning cone 15.0 5cm
D	Sealing sleeve
F	Tie-rod 15.0mm
J	Super-plate 15.0
K	Universal cone 22mm + Plastic tube 22mm

Suspension point



b ... 15 - 16 cm

A	Wall anchor 15.0/16cm
I	Suspension cone 15.0 5cm
L	Hexagon timber screw 10x50 + dowel Ø12

Note:

The Wall anchor 15.0/16cm must be ordered under special-article n° 580100000.

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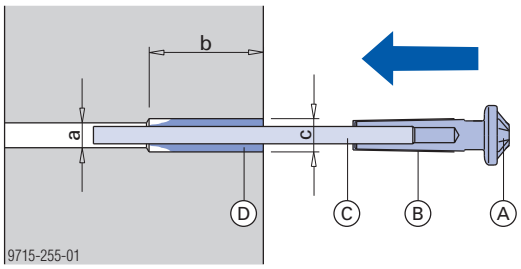
Retrofitting a safe suspension point

e.g. if the crew forgot to prepare a positioning-point.

- ➤ Drill a hole of diam. 25 mm.
- ➤ Drill a hole of diam. 35 mm and 115 mm depth.
- ➤ Screw the tie-rod into the Suspension cone until fully engaged, and put the rod part-way into the hole.
- ➤ Paste the ready-mix mortar (site-provided) into the drilled hole with a spatula.



a ... 25 mm
b ... 115 mm
c ... 35 mm

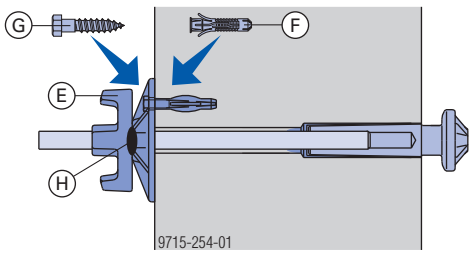
A	Suspension cone 15.0 5cm
B	Sealing sleeve 15.0 5cm
C	Tie-rod 15.0mm
D	Ready-mix mortar

- ➤ Insert the unit so that the Universal climbing cone is flush with the concrete surface.
  Scrape away the excess ready-mix mortar with the spatula.

Important note:

- ➤ Weld a seam onto the Super-plate to join the nut and the plate. Do this BEFORE screwing the Super-plate onto the tie-rod.

- ➤ On the other side of the concrete wall, screw on the Superplate (now welded together) and secure it with a screw and dowel so that it cannot be unscrewed.



E	Super-plate 15.0
F	Dowel, Ø12
G	Hexagon timber screw 10x50
H	Weld-seam

Dimensioning the suspension point

The required **cube compressive strength** of the concrete and ready-mix mortar at the time of loading must be **specified** separately for each project **by the structural designer**. It will depend on the following factors:

- load actually occurring
- wall thickness
- reinforcement / extra reinforcement steel
- distance from edge

The introduction of the forces, the transfer of these forces into the structure, and the stability of the overall construction, must all be verified by the structural designer.

The required cube compressive strength $f_{ck,cube,current}$ must be at least 10 N/mm², however.

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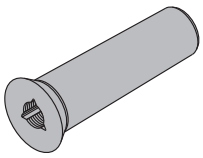
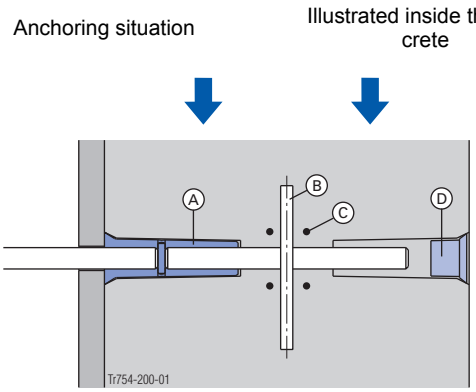
Suspension point for fair-faced concrete

The Fair-faced concrete positioning cone 15.0 5cm is particularly suitable for fair-faced concrete projects where the form-tie points and suspension points are required to make a uniform hole-pattern.



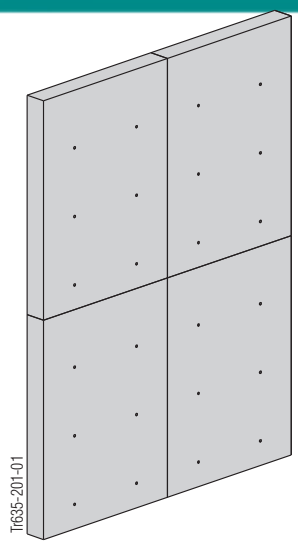
Safety warning:
The Fair-faced concrete positioning cone may only be used on suspension points that are located within a maximum of 80 cm from the top edge of the concrete. The reason for this restriction is the reduced load-bearing capacity of such suspension points, due to the shallower screw-in depth of the end of the tie-rod nearest the form-ply.



A	Fair-faced concrete positioning cone 15.0 5cm
B	Stop-anchor double-ended 15.0
C	Extra reinforcementsteel
D	Fair-faced concrete plug 41mm

If it is intended to use this type of suspension point, a Doka technician must be contacted before the project starts.

Result (in terms of appearance):



The form-tie points and/or suspension points have a uniform, regular hole-pattern.

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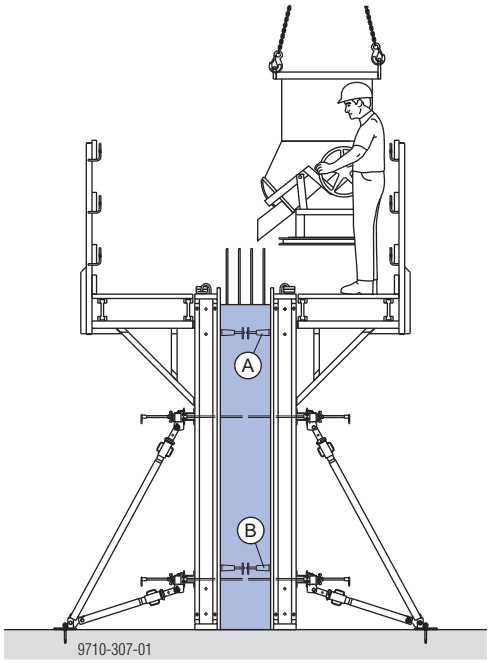
Starting up

For instructions on tying and joining the formwork elements, and on cleaning them and using concrete release agents, see the User Information booklets "Doka large-area formwork Top50" and "Doka framed formwork Framax Xlife".

1st casting section

- ➤ Apply concrete release agent and set up one side of the formwork.
- ➤ Mount the positioning-points.
- ➤ Mount positioning-points for the wind-bracing.
- ➤ Place the reinforcement.
- ➤ Close the formwork and tie it.
- ➤ Pour the 1st section.



A Positioning point
B Positioning point for wind bracing

- ➤ Strike the formwork.
- ➤ Clean the formwork.
- ➤ Set the gang-form down on a flat surface, with the form-ply facing downwards.
- ➤ Prepare the formwork for the climbing operation (see "Erecting the formwork").

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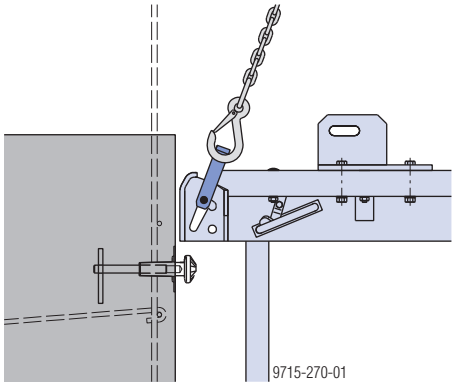
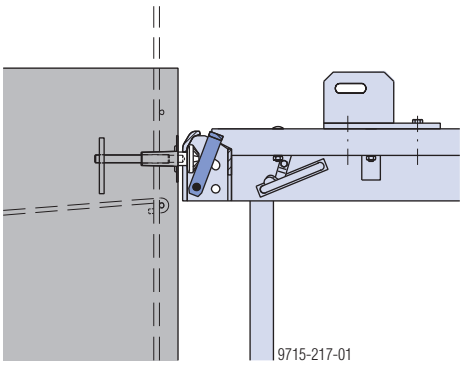
2nd casting section

- Remove the positioning cone.
- Prepare the suspension points.
- Raise the prepared climbing scaffold with a four-part lifting chain (e.g. Doka 4-part chain 3.20m).



This raises the front lifting bows, opening the lift-out guard.

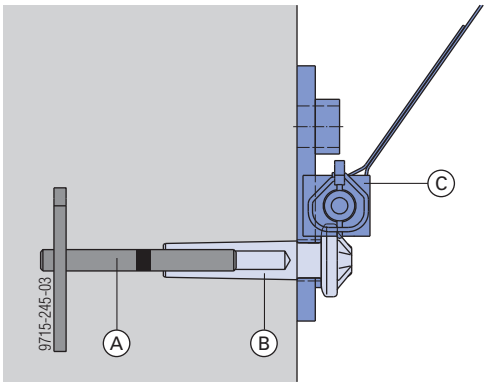
- Once the climbing scaffold has been hung into place on the suspension cone, the load is removed from the four-part lifting chain.



The lifting bows drop into the starting position, automatically securing the platform against accidental lift-out.

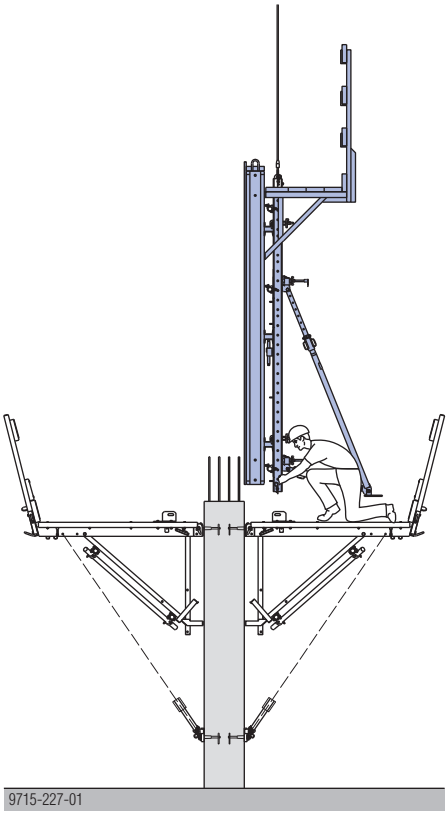
"Locked" position = lifting bow is flush with decking.

- Fix the Wind bracing MF/150F/K 6.00m in the Folding bracket with a Pin for Folding bracket A and a Spring cotter 5mm. Alternatively, an M 16x90 hexagon screw with an M 16 nut (site-provided) can be used.
- Fasten the tensioning unit of the Wind bracing MF/150F/K 6.00m to the structure, i.e. to the positioning-point prepared with a suspension cone.



A	Stop-anchor 15.0
B	Suspension cone 15.0 5cm
C	Wind bracing MF/150F/K 6.00m

- Tighten the Wind bracing MF/150F/K 6.00m.
- Attach the lifting chain to the vertical multipurpose walings.
- Place the pre-assembled formwork onto the working platform, and fix it in place.



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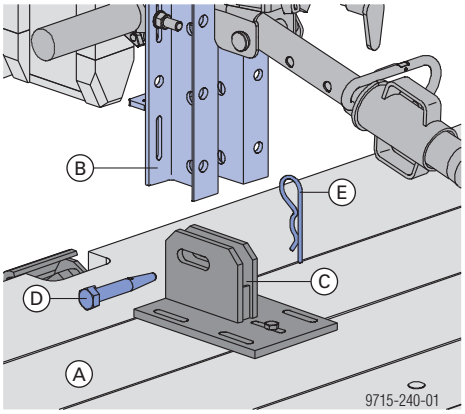
➤ Bolt the vertical Multi-purpose waling WS10 Top 50 into the Connection shoe K with a Connecting pin 10 cm, and secure this with a Spring cotter 5mm.



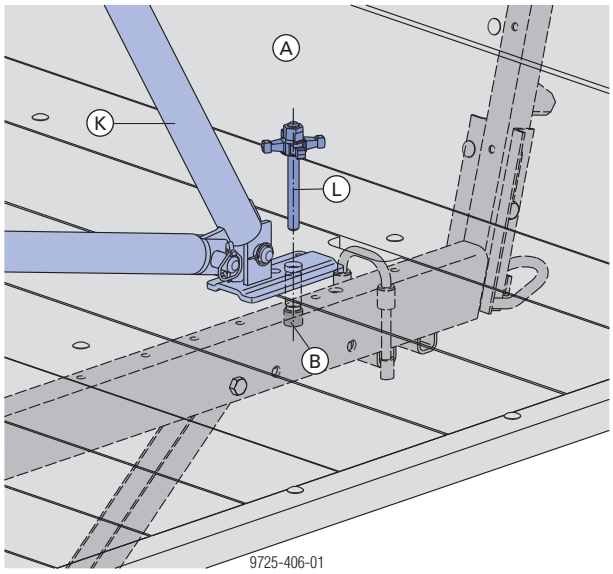
A	Folding platform K
B	Multi-purpose waling WS10 Top50
C	Connection shoe K
D	Connecting pin 10cm
E	Spring cotter 5mm

CAUTION

The panel struts on the folding platform must:

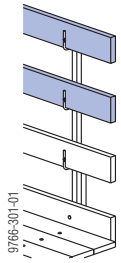
- ➤ only be positioned in the axis of the bracket
- ➤ only be fitted into the special connection sockets, and
- ➤ only be fixed with star-screws **(L)** .
  Tie-rod 15.0mm is forbidden!

➤ Fix the panel strut in the connection socket of the folding platform using a star screw.



A	Folding platform K
B	Connection socket
K	Panel strut
L	Star screw

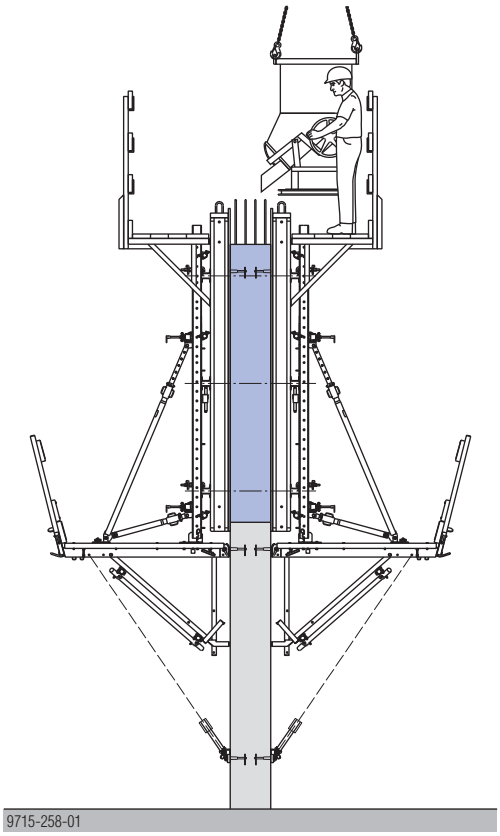
➤ Fasten both the top guard-rail boards to the Universal brackets or Framax brackets.



➤ Place the reinforcement.

➤ Close the formwork and tie it.

➤ Pour the 2nd section.



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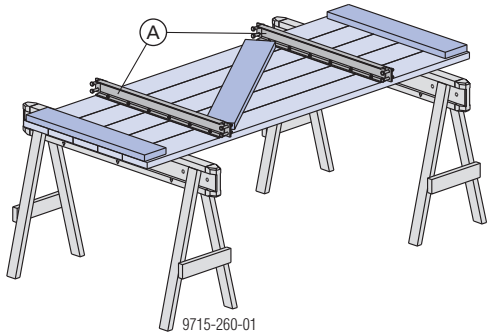
Suspended platform

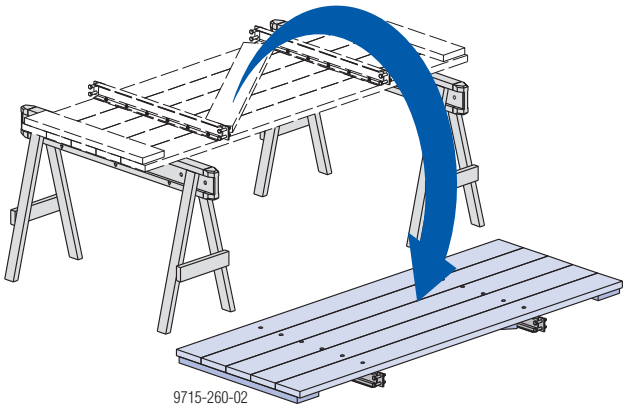
Preparing the platform decking

- Place the deck-boards on trestles.
- Place platform profiles onto the deck-boards, spaced apart at the centre-distance of the brackets.
- Fasten the platform profiles to the deck-boards with M 10x70 square bolts.
- Fix planks to the ends of the platforms, and diagonally between the platform profiles. (2 nails per deck-board)



A Platform profiles

- Turn over the pre-assembled decking and set it down on the ground.



Note:
In corner zones, or where the corners are not right-angled, the platform planking must be trimmed accordingly.

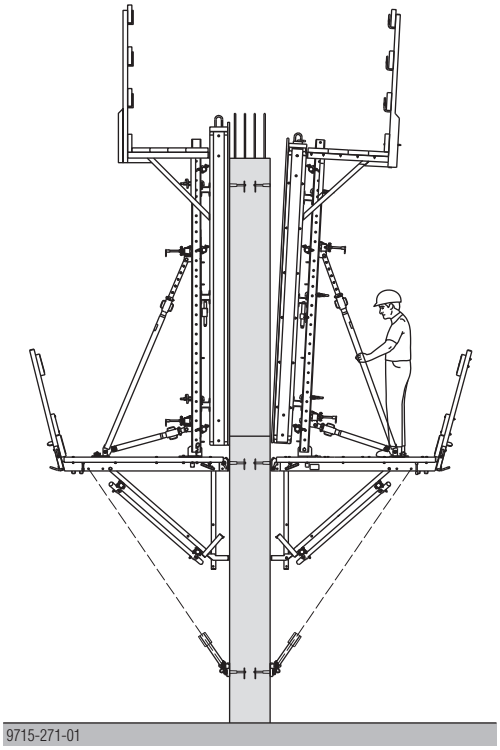
Items needed:

Item	Designation	N° of items	
		Folding platform K 3.00m	Folding platform K 4.50m
A	Suspended platform 120 4.30m	2	3
B	Planks and guard-rail boards*	--	--

The lengthening piece is supplied knocked-down, incl. all necessary fixing items (except for *).
* site-provided

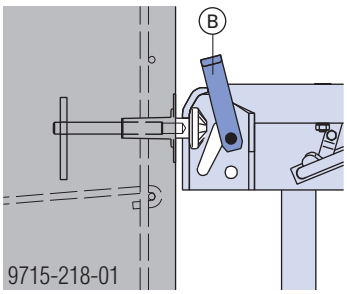
Striking

- Take out the form-ties and undo the connectors to the adjacent panels.
- Dismount the Super-plate and the threaded rod from positioning-points where a hole had to be drilled through the form-ply.
- Tilt back the formwork with the panel strut.



- Remove the positioning cone.
- Prepare the suspension points.
- Dismount the "Wind bracing".
- Attach the lifting chain to the vertical multipurpose walings.
- Before repositioning, move the lifting bow of the Folding platform K into the stand-by position (locked in the short slot).

Before repositioning



B Lifting bow

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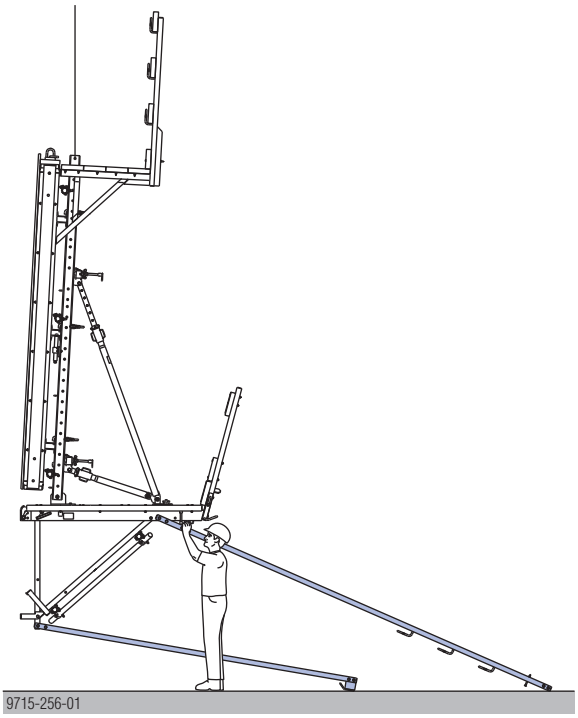
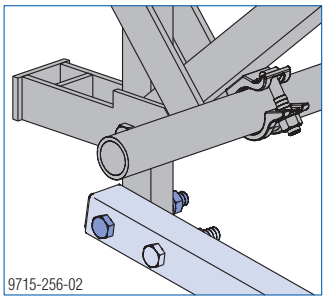
Mounting the suspended platform

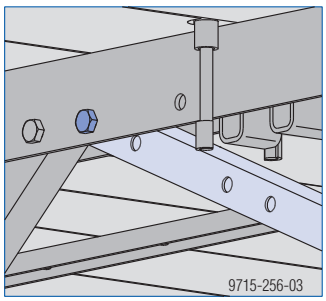
➤ Detach the entire climbing unit by crane.



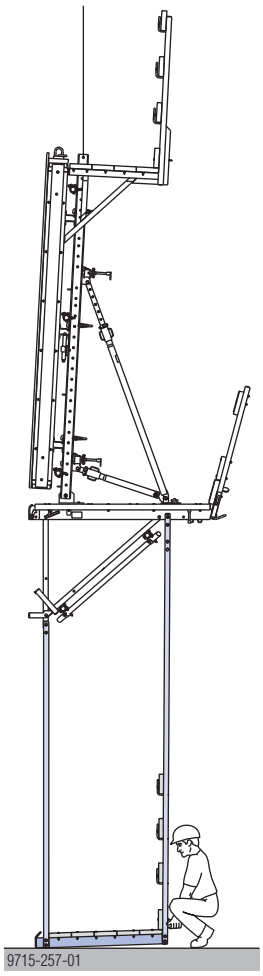
➤ Bolt on the inside suspension tube with an M 16x120 hexagon screw.

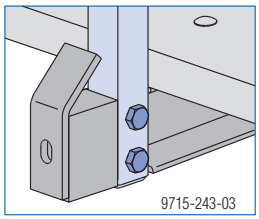


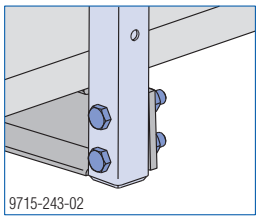
➤ Bolt on the outside suspension tube with an M 16x90 hexagon screw.



➤ Mount the platform profiles, each with 4 hexagonal bolts M16x90.







➤ Use an M10x120 square bolt to attach a guard-rail board (min. 15x3 cm) as a toeboard.

➤ Insert guard-rail boards (min. 15x3 cm) into the handrail post plates and fix them with 28x65 nails.

Note:

The plank and board thicknesses given here comply with the C24 category of EN 338.

In Germany, wooden deck-boards must bear the "Ü-symbol" mark of conformity.

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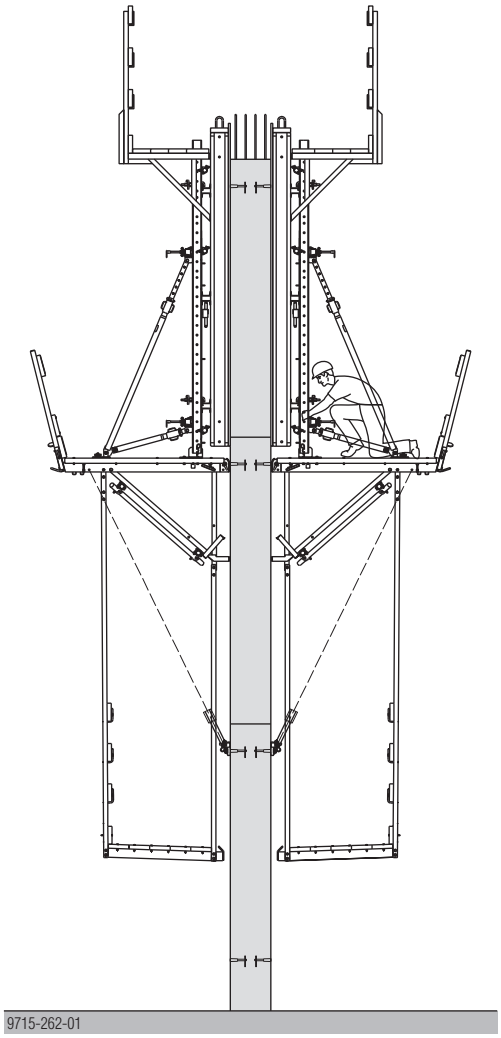
Subsequent casting sections

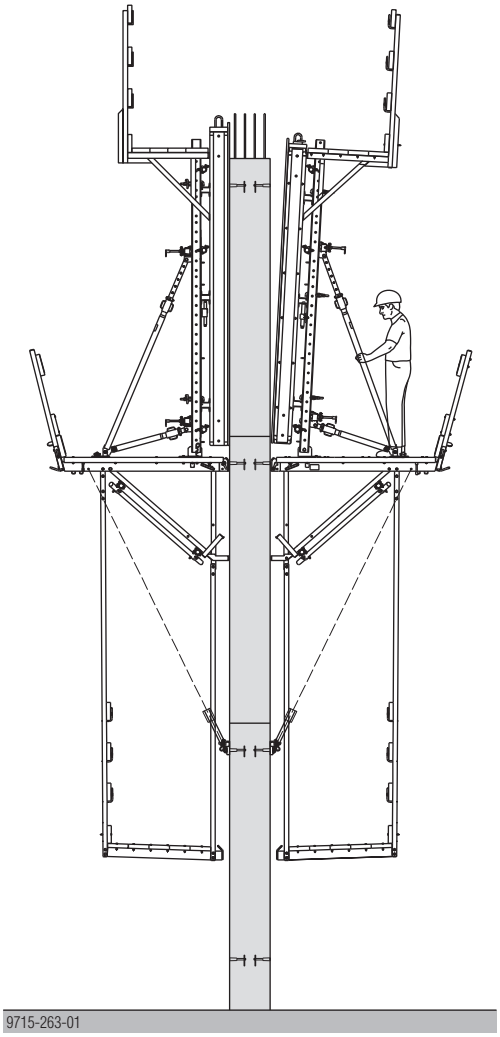
Striking the formwork without a crane

➤ Take out the form-ties and undo the connectors to the adjacent panels.

➤ Dismount the Super-plate and the threaded rod from positioning-points where a hole had to be drilled through the form-ply.



➤ Tilt back the formwork with the panel strut.



➤ Remove the positioning cone.

➤ Prepare the suspension points.

➤ Dismount the "Wind bracing".

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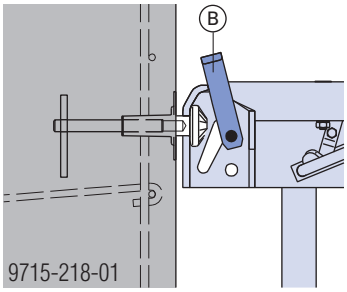
How to lift

The formwork elements, climbing scaffolds, pouring platforms and suspended platforms are firmly interconnected. They are lifted and repositioned as a complete unit, in one crane cycle. This reduces the repositioning time, and thus the crane times.

➤ Attach the lifting chain to the vertical multipurpose walings.

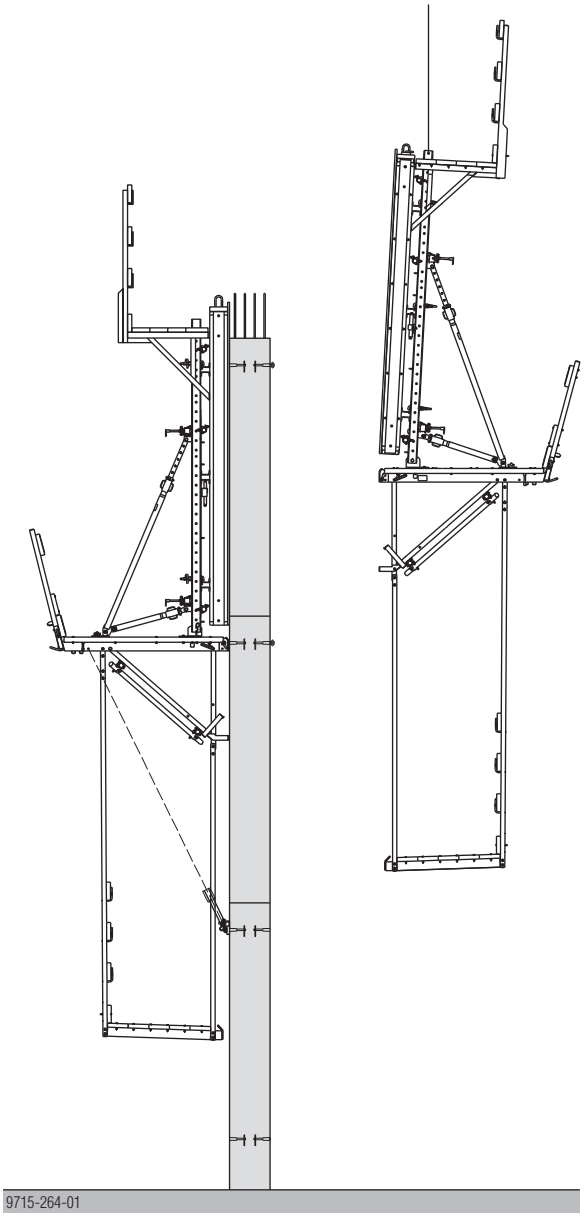
➤ Before repositioning, move the lifting bow of the Folding platform K into the stand-by position (locked in the short slot).

Before repositioning



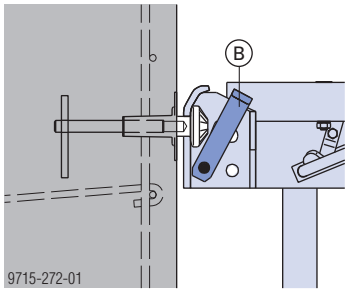
B Lifting bow

➤ Lift the climbing unit by crane ("passenger transportation" is forbidden!) and hang it into place on the prepared suspension points.



➤ Move the lifting bow into the locked position (locked in the long slot – lifting bow flush with decking).

After suspending the climbing unit



B Lifting bow

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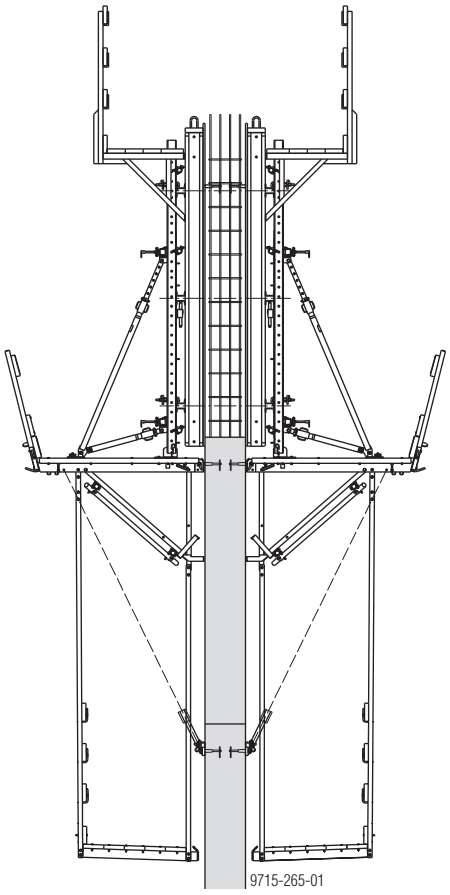
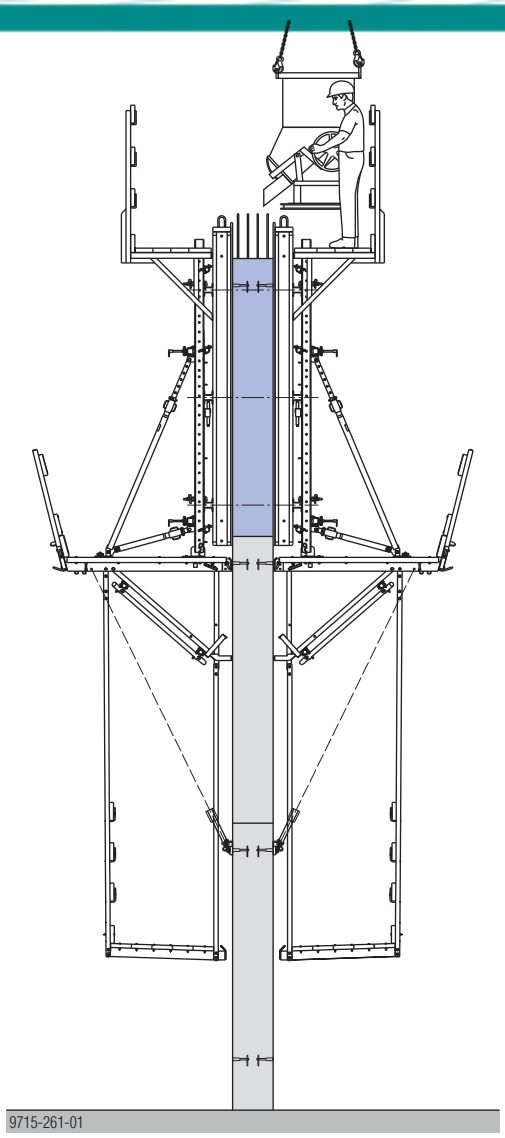
➤ Next section is poured.

Erecting the formwork without a crane

➤ Mount the "Wind bracing", and tighten it.
➤ Clean the formwork and apply concrete release agent.
➤ Mount the positioning-points.
➤ Place the reinforcement.
➤ Plumb and align the formwork element or panel, using panel struts and adjusting spindles.
➤ Close the formwork and tie it.





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Plumbing & aligning the formwork

Adjusting the formwork

In order to permit exact adjustment of the formwork elements in relation to one another and to the structure, they are adjustable in both the vertical and the horizontal.

Tools needed:

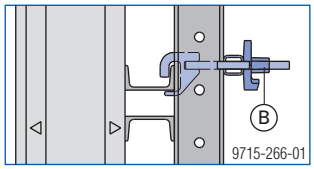
- Hammer
- Reversible ratchet 1/2"
- Box nut 24 and
- Fork wrench 13/17 (for the threaded joins on the adjusting spindles)

Preparing the adjusting operation

➤ Take the load off the panel strut.

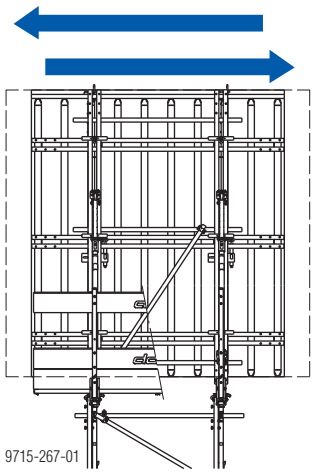
➤ Detach the formwork from the concrete.

➤ Loosen the **Waling-to-bracket holders (B)** with a blow of the hammer.



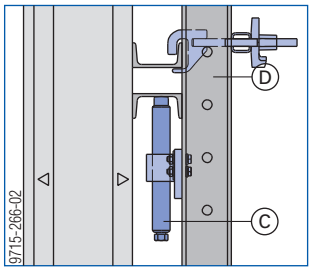
Length adjustment

➤ Push the formwork to either side.



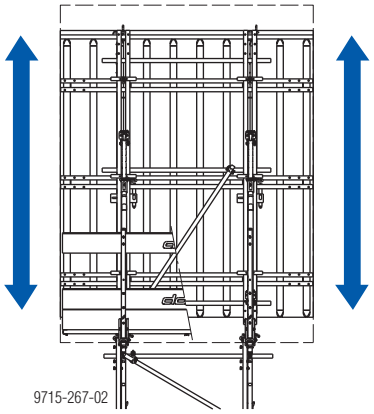
Height and angle adjustment

The **Adjusting spindles M36 (C)** permit a vertical adjustment range of approx. 150 mm. Also, the adjusting spindles can be relocated in the hole-grid of the Multipurpose waling WS10 Top50 **(D)** .



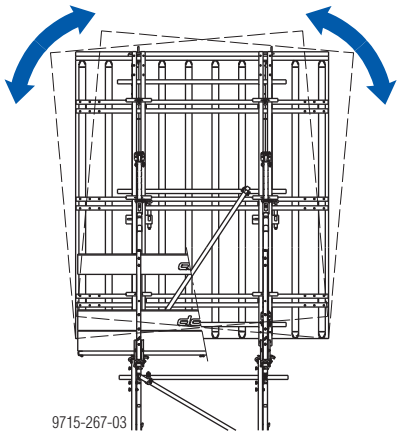
Height adjustment

➤ Turn both adjusting spindles.



Side angle adjustment

➤ Only turn one adjusting spindle.



Ending the adjusting operation

➤ Tighten the waling-to-bracket holders with the hammer.

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Resetting by crane

Instructions for safe resetting of the entire unit

Important note:

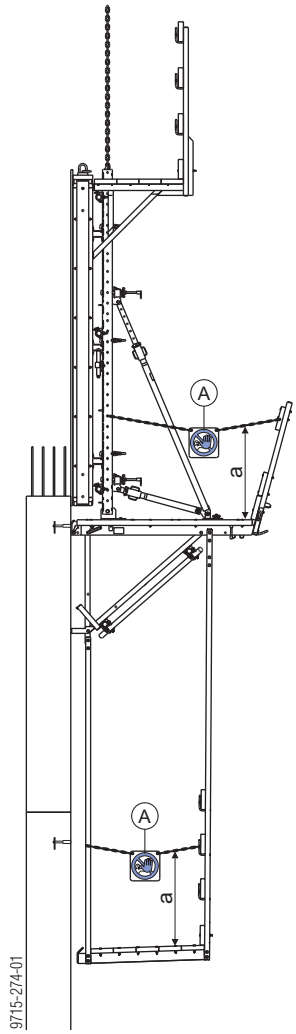
- **Before lifting:** Remove any loose items from the formwork and platforms
- "Passenger transportation" is forbidden!
- Observe all regulations applying to the operation of cranes where higher wind speeds are experienced.
- Angle of inclination β: max. 30°
- Vertical Multi-purpose walings must be adequately **braced against oblique pull (B)** .
- **Tightening torque of the couplers (C) : 50 Nm**
- When using balancing lifting beams, ensure that these have sufficient load-bearing capacity!
- When one climbing unit is lifted and repositioned, this opens up exposed fall-hazard locations on the remaining units. These exposed locations must be made safe by putting up an access prohibition barrier.

  This access prohibition barrier must be fixed at least 2.0 m before the drop-off edge.

- The personnel in charge of the repositioning operation are responsible for positioning the access prohibition barriers correctly.
- During the lifting/repositioning cycle, no site personnel are allowed to be on the units to be climbed, or on adjacent units for repositioning.
- Persons operating the climbing formwork must use personal protective equipment during the lifting operation.

Length of chain = at least the space between the slinging points

This automatically leads to the required angle of inclinationβ.



a ... 1.00 - 1.20 m

A "No entry" prohibition sign 300x300mm

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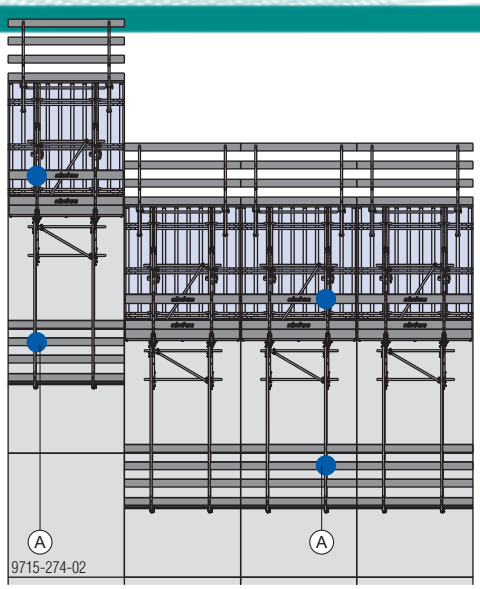
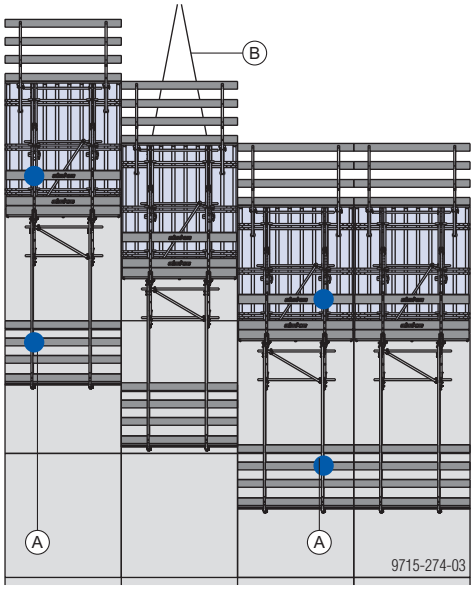
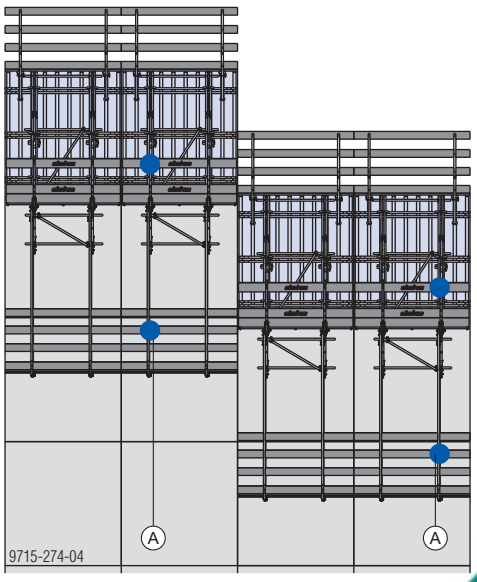
Initial situation



Hoist the unit for repositioning up to the next section.



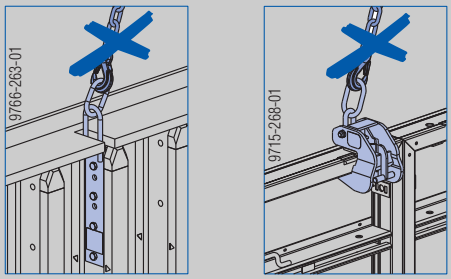
Horizontal repositioning of the barriers



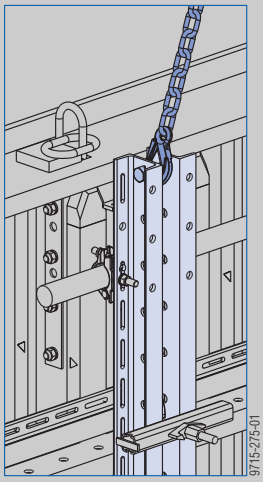
A Warning sign "No entry" 300x300mm
B Crane suspension tackle

WARNING

➤ Any **lifting-brackets** on the formwork elements, or **Framax lifting hooks**, must **not** be used for lifting the unit as a whole.

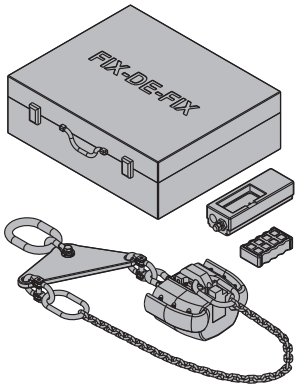


➤ Attach the lifting chain to the Connecting pin 10cm of the Multipurpose waling.



The suspension methods shown above are only needed for assembling and dismantling the formwork elements or panels.

The **Fix-De-Fix 3150kg remote uncoupling system** makes it possible to detach slinging chains by remote-control from ground level. Follow the directions in the Operating Instructions!



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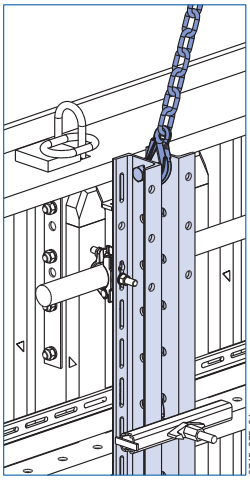
Repositioning the entire unit

When repositioning the Climbing formwork K or units assembled from it (e.g. formwork element with Multi-purpose walings), the lifting crane must always be attached to the vertical Multi-purpose waling. For this, a Connecting pin 10cm must be inserted into the top hole in the Multipurpose waling and secured with a Spring cotter 5mm.

➤ Tilt back the formwork with the panel strut.

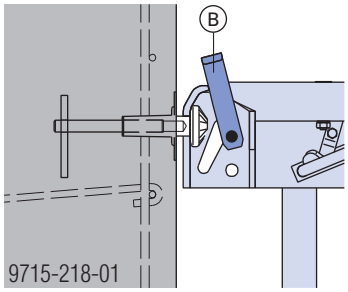
Before every repositioning operation, check to make sure that the vertical Multi-purpose walings WS10 Top50 are each bolted into a Connection shoe K with a Connecting pin 10 cm that has been secured with a Spring cotter 5mm!

➤ Attach the lifting chain to the Connecting pin 10cm of the Multipurpose waling.



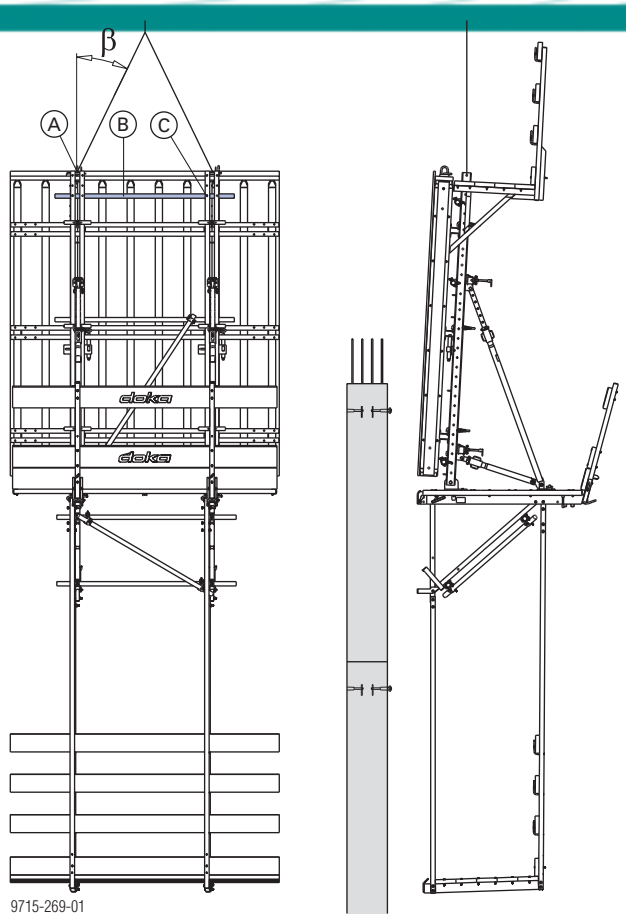
➤ Dismount the "Wind bracing".

➤ Before repositioning, move the lifting bow of the Folding platform K into the stand-by position (locked in the short slot).



B Lifting bow

➤ Reposition the entire unit by crane.



β ... max. 30°

A Connecting pin 10 cm with Spring cotter 5mm

B Bracing against oblique pull (e.g. scaffolding tube)

C Screw-on coupler

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بهـــــــــــــــار ۱۳۹۴

مقالات تحلیلی آموزشی موسسه ۸۰۸

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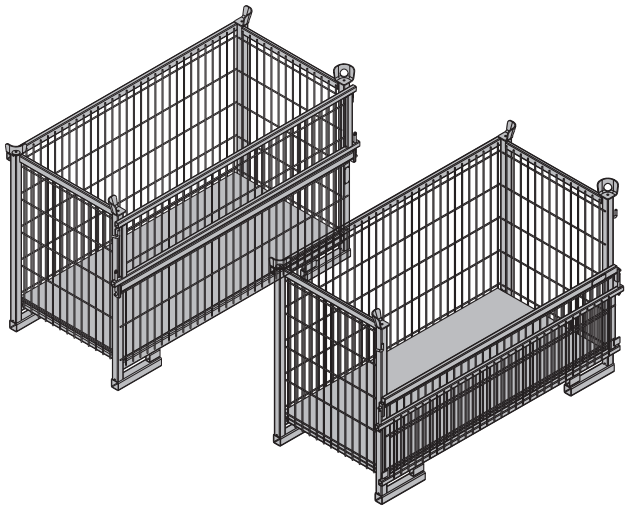
موسسه آموزشی و مهندسی ۸۰۸
آموزشهای تخصصی عمران و معماری

مقالات تحلیلی آموزشی موسسه ۸۰۸

Transporting, stacking and storing

Utilise the benefits of Doka multi-trip packaging on your site.
Multi-trip packaging such as containers, stacking pallets and skeleton transport boxes keep everything in place on the site, minimise time wasted searching for parts, and streamline the storage and transport of system components, small items and accessories.

Doka skeleton transport box 1.70x0.80m



Storage and transport devices for small items:
- durable
- stackable

Suitable transport appliances:
- crane
- pallet stacking truck
- forklift truck

To make the "Doka skeleton transport box" easier to load and unload, one of its sidewalls can be opened.

Max. load: 700 kg
Permitted imposed load: 3150 kg

- Multi-trip packaging items that each contain very different loads must be stacked with the heaviest ones at the bottom and the lightest ones at the top!
- Rating plate must be in place and clearly legible

Using Doka skeleton transport boxes 1.70x0.80m as storage units

Max. n° of boxes on top of one another

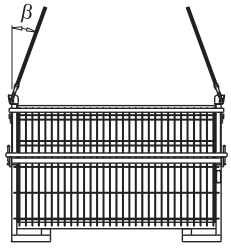
Outdoors (on the site) Floor gradient up to 3%	Indoors Floor gradient up to 1%
2	5
It is not allowed to stack empty pallets on top of one another!	

Using Doka skeleton transport boxes 1.70x0.80m as transport devices

Lifting by crane

➤ Only lift the boxes when their sidewalls are closed!

- Multi-trip packaging items may only be lifted one at a time.
- Use a suitable lifting chain. (Do not exceed the permitted load capacity). e.g: Doka 4-part chain 3.20m.
- Spread-angle β max. 30°!



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Repositioning by forklift truck or pallet stacking truck

The forks can be inserted under either the broadside or the narrowside of the containers.

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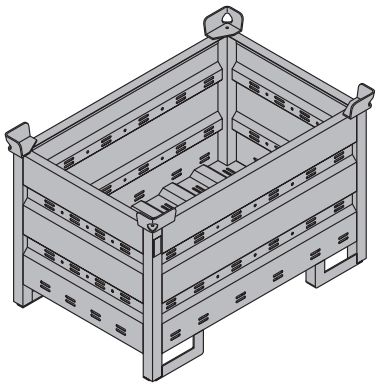
Doka multi-trip transport box 1.20x0.80m galv.



Storage and transport devices for small items:

- durable
- stackable

Suitable transport appliances:

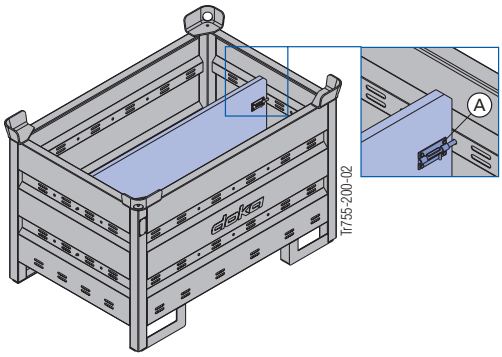
- crane
- pallet stacking truck
- forklift truck

Max. load: 1500 kg Permitted imposed load: 7900 kg

- Multi-trip packaging items that each contain very different loads must be stacked with the heaviest ones at the bottom and the lightest ones at the top!
- Rating plate must be in place and clearly legible

Multi-trip transport box partition

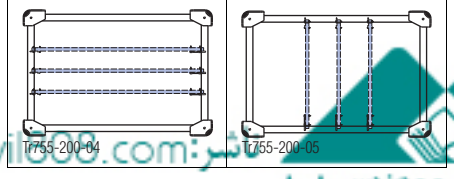
Different items in the Multi-trip transport box can be kept separate with the Multi-trip transport box partitions 1.20m or 0.80m.



A Slide-bolt for fixing the partition

Possible ways of dividing the box

Multi-trip transport box partition	Lengthways	Crossways
1.20m	max. 3 partitions	—
0.80m	—	max. 3 partitions



Using Doka multi-trip transport boxes as storage units

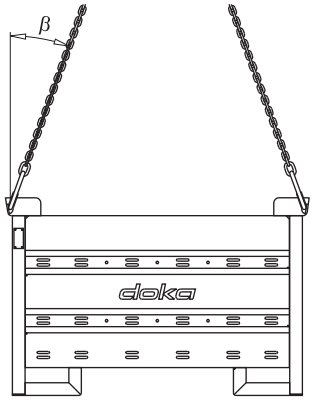
Max. n° of boxes on top of one another

Outdoors (on the site) Floor gradient up to 3%	Indoors Floor gradient up to 1%
3	6
It is not allowed to stack empty pallets on top of one another!	

Using Doka multi-trip transport boxes as transport devices

Lifting by crane

- Multi-trip packaging items may only be lifted one at a time.
- Use a suitable lifting chain. (Do not exceed the permitted load capacity). e.g: Doka 4-part chain 3.20m.
- Spread-angle β max. 30°!



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Repositioning by forklift truck or pallet stacking truck

The forks can be inserted under either the broadside or the narrowside of the containers.

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مقالات تحلیلی آموزشی موسسه ۸۰۸

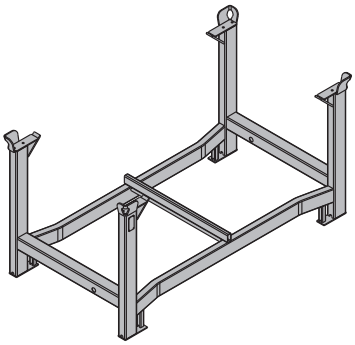
Doka stacking pallet 1.55x0.85m and 1.20x0.80m

Storage and transport devices for long items:
- durable
- stackable

Suitable transport appliances:
- crane
- pallet stacking truck
- forklift truck

The Bolt-on caster set B turns the stacking pallet into a fast and manoeuvrable transport trolley.

Follow the directions in the "Bolt-on castor set B" Operating Instructions!



Max. load: 1100 kg
Permitted imposed load: 5900 kg

- Multi-trip packaging items that each contain very different loads must be stacked with the heaviest ones at the bottom and the lightest ones at the top!
- Rating plate must be in place and clearly legible

Using Doka stacking pallets as storage units

Max. n° of units on top of one another

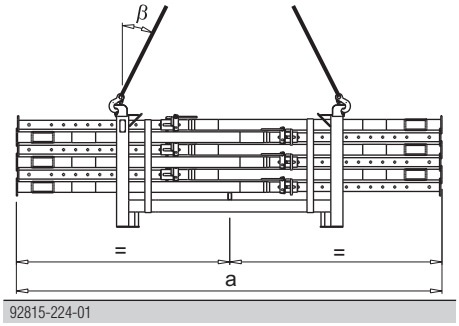
Outdoors (on the site) Floor gradient up to 3%	Indoors Floor gradient up to 1%
2	6
It is not allowed to stack empty pallets on top of one another!	

- **How to use with bolt-on castor set:**
  Always apply the fixing brake when the container is "parked".
  When Doka stacking pallets are stacked, the bottom pallet must NOT be one with a bolt-on caster set mounted to it.

Using Doka stacking pallets as transport devices

Lifting by crane

- Multi-trip packaging items may only be lifted one at a time.
- Use a suitable lifting chain. (Do not exceed the permitted load capacity). e.g: Doka 4-part chain 3.20m.
- Load the items centrically.
- Fasten the load to the stacking pallet so that it cannot slide or tip out.
- When lifting stacking pallets to which Bolt-on castor sets B have been attached, you must also follow the directions in these Operating Instructions!
- Spread-angle β max. 30°!



	a
Doka stacking pallet 1.55x0.85m	max. 4.0 m
Doka stacking pallet 1.20x0.80m	max. 3.0 m

Repositioning by forklift truck or pallet stacking truck

- Load the items centrically.
- Fasten the load to the stacking pallet so that it cannot slide or tip out.

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مقالات تحلیلی آموزشی موسسه ۸۰۸

Doka accessory box

Storage and transport devices for small items:

- durable
- stackable

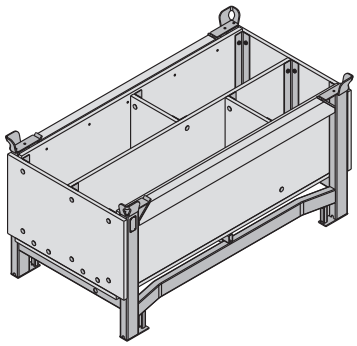
Suitable transport appliances:

- crane
- pallet stacking truck
- forklift truck

The Doka accessory box is the tidy, easy-to-find way of storing and stacking all interconnection and form-tie components.

The Bolt-on caster set B turns the stacking pallet into a fast and manoeuvrable transport trolley.

Follow the directions in the "Bolt-on castor set B" Operating Instructions!



Max. load: 1000 kg
Permitted imposed load: 5530 kg

- Multi-trip packaging items that each contain very different loads must be stacked with the heaviest ones at the bottom and the lightest ones at the top!
- Rating plate must be in place and clearly legible

Doka accessory box as storage units

Max. n° of boxes on top of one another

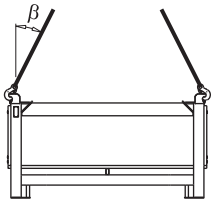
Outdoors (on the site) Floor gradient up to 3%	Indoors Floor gradient up to 1%
3	6
It is not allowed to stack empty pallets on top of one another!	

- **How to use with bolt-on castor set:**
  Always apply the fixing brake when the container is "parked".
  When Doka accessory boxes are stacked, the bottom box must NOT be one with a bolt-on castor set mounted to it.

Doka accessory box as transport devices

Lifting by crane

- Multi-trip packaging items may only be lifted one at a time.
- Use a suitable lifting chain. (Do not exceed the permitted load capacity). e.g: Doka 4-part chain 3.20m.
- When lifting stacking pallets to which Bolt-on castor sets B have been attached, you must also follow the directions in these Operating Instructions!
- Spread-angle β max. 30°!



92816-206-01

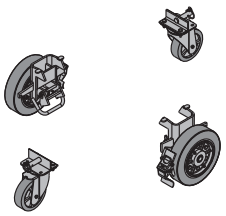
Repositioning by forklift truck or pallet stacking truck

The forks can be inserted under either the broadside or the narrowside of the containers.

Bolt-on castor set B

The Bolt-on caster set B turns the stacking pallet into a fast and manoeuvrable transport trolley.

Suitable for drive-through access openings > 90 cm.



The Bolt-on caster set B can be mounted to the following multi-trip packaging items:

- Doka accessory box
- Doka stacking pallets

Follow the directions in the Operating Instructions!

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مقالات تحلیلی آموزشی موسسه ۸۰۸

	[kg]	Article n°
Doka folding platform K 3.00m	**291.5**	**580442000**
Doka folding platform K 4.50m	**444.5**	**580443000**

Doka-Faltbühne K

Timber parts varnished yellow
Steel parts galvanised
Delivery condition: folded closed

Folding bracket K	**52.4**	**580441000**

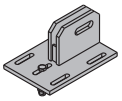
Faltkonsole K

Galvanised
Length: 224 cm
Height: 245 cm
Delivery condition: folded closed

Connection shoe K	**6.4**	**580451000**

Anschlussschuh K

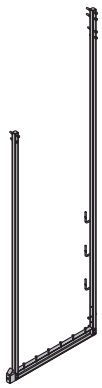
Galvanised
Length: 25 cm
Width: 17 cm



Suspended platform 120 3.30m	**44.0**	**580411000**
Suspended platform 120 4.30m	**52.6**	**580412000**

Hängebühne 120

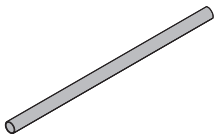
Galvanised
Delivery condition: folded closed



Scaffold tube 48.3mm 1.00m	**3.6**	**682014000**
Scaffold tube 48.3mm 1.50m	**5.4**	**682015000**
Scaffold tube 48.3mm 2.00m	**7.2**	**682016000**
Scaffold tube 48.3mm 2.50m	**9.0**	**682017000**
Scaffold tube 48.3mm 3.00m	**10.8**	**682018000**
Scaffold tube 48.3mm 3.50m	**12.6**	**682019000**
Scaffold tube 48.3mm 4.00m	**14.4**	**682021000**
Scaffold tube 48.3mm 4.50m	**16.2**	**682022000**
Scaffold tube 48.3mm 5.00m	**18.0**	**682023000**
Scaffold tube 48.3mm 5.50m	**19.8**	**682024000**
Scaffold tube 48.3mm 6.00m	**21.6**	**682025000**
Scaffold tube 48.3mm .....m	**3.6**	**682001000**

Gerüstrohr 48,3mm

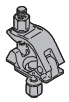
Galvanised



	[kg]	Article n°
Screw-on coupler 48mm 50	**0.84**	**682002000**

Anschraubkupplung 48mm 50

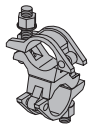
Galvanised
Width-across: 22 mm



Swivel coupler 48mm	**1.5**	**582560000**

Drehkupplung 48mm

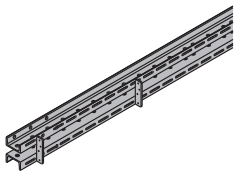
Galvanised
Width-across: 22 mm



Multi-purpose waling WS10 Top50 3.00m	**60.2**	**580011000**
Multi-purpose waling WS10 Top50 3.50m	**68.4**	**580012000**
Multi-purpose waling WS10 Top50 4.00m	**79.4**	**580013000**

Mehrzweckriegel WS10 Top50

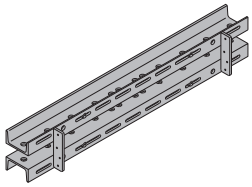
Painted blue



Steel waling WS10 Top50 3.00m	**60.4**	**580048000**
Steel waling WS10 Top50 3.50m	**71.5**	**580050000**
Steel waling WS10 Top50 4.00m	**82.1**	**580052000**

Stahlwandriegel WS10 Top50

Painted blue



Adjusting spindle M36	**6.2**	**500663002**

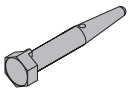
Höhenjustierspindel M36

Galvanised
Length: 31 cm
Height: 29.2 cm

Connecting pin 10cm	**0.34**	**580201000**

Verbindungsbolzen 10cm

Galvanised
Length: 14 cm



Spring cotter 5mm	**0.05**	**580204000**

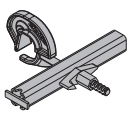
Federvorstecker 5mm

Galvanised
Length: 13 cm

Waling-to-bracket holder 9-15cm	**2.7**	**580625000**

Riegelhalter 9-15cm

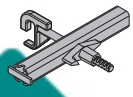
Galvanised



Waling-to-bracket holder	**2.5**	**580526000**

Keilriegelhalter

Galvanised
Length: 26 cm
Height: 31 cm



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	[kg]	Article n°
Framax wedge clamp Framax-Spannklemme Galvanised Length: 21 cm	1.5	588152000
Panel strut 340 Elementstütze 340 consisting of:	30.2	588246000
(A) **Prop head** 2 pcs. Galvanised Length: 40.8 cm Width: 11.8 cm Height: 17.6 cm	3.5	588244000
(B) **Prop shoe** Galvanised Length: 20 cm Width: 11 cm Height: 10 cm	2.1	588245000
(C) **Plumbing strut 340** Galvanised Length: 190 - 341 cm	14.2	588247000
(D) **Adjusting strut 120** Galvanised Length: 80 - 130 cm	7.2	588248000
Galvanised Delivery condition: folded closed		
Universal dismantling tool Universal-Lösewerkzeug Galvanised Length: 75.5 cm	3.7	582768000
Star screw Sternschraube Galvanised Length: 17 cm	0.75	580425000
Wind bracing MF/150F/K 6.00m Windabspannung MF/150F/K 6,00m Galvanised	4.7	580665000
Pin D16/112 Steckbolzen D16/112 Galvanised Length: 16 cm	0.29	500403330

	[kg]	Article n°
Top scaffold bracket L Betonierkonsole L Galvanised Length: 101 cm Height: 159 cm	12.6	587153500
Top scaffold bracket L painted Betonierkonsole L lackiert Painted blue Length: 101 cm Height: 159 cm	12.0	587153000
Universal bracket 90 Universal-Konsole 90 Galvanised Length: 121 cm Height: 235 cm	30.4	580476000
Framax bracket 90 Framax-Konsole 90 Galvanised Width: 103 cm Height: 185 cm Delivery condition: railing included	12.5	588167000
Handrail clamp S Schutzgeländerzwinge S Galvanised Height: 123 - 171 cm	11.5	580470000

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مقالات تحلیلی آموزشی موسسه ۸۰۸

	[kg]	Article n°
Universal railing shackle Universal-Geländerbügel Galvanised Height: 20 cm	**3.0**	**580478000**
Scaffold tube connection Gerüstrohranschluss Galvanised Height: 7 cm	**0.27**	**584375000**
Doka 4-part chain 3.20m Doka-Vierstrangkette 3,20m Follow the directions in the "Operating Instructions"!	**15.0**	**588620000**
Fix-De-Fix remote uncoupling system 3150kg Abhängeautomat Fix-De-Fix 3150kg Follow the directions in the "Operating Instructions"!	**27.0**	**586014000**
Manhole B 70/60cm Bühnendurchstieg B 70/60cm Steel parts galvanised Timber parts varnished yellow Length: 81 cm Width: 71 cm	**22.0**	**581530000**
Warning sign "No entry" 300x300mm Verbotsschild "Zutritt Verboten" 300x300mm	**0.70**	**581575000**

	[kg]	Article n°
Universal tool box 15.0 Universal-Werkzeugbox 15,0 included in scope of supply:	**9.1**	**580392000**
(A) **Reversible ratchet 1/2"** Galvanised Length: 30 cm	**0.73**	**580580000**
(B) **Fork wrench 13/17**	**0.08**	**580577000**
(C) **Fork wrench 22/24**	**0.22**	**580587000**
(D) **Fork wrench 30/32**	**0.80**	**580897000**
(E) **Fork wrench 36/41**	**1.0**	**580586000**
(F) **Ring spanner 17/19**	**0.27**	**580590000**
(G) **Square nut 22**	**0.31**	**580589000**
(H) **Box spanner 41**	**0.99**	**580585000**
(I) **Extension 11cm 1/2"**	**0.20**	**580581000**
(J) **Extension 22cm 1/2"**	**0.31**	**580582000**
(K) **Universal joint coupling**	**0.16**	**580583000**
(L) **Nut for box spanner 19 1/2" L**	**0.16**	**580598000**
(M) **Box nut 13 1/2"**	**0.06**	**580576000**
(N) **Box nut 24 1/2"**	**0.12**	**580584000**
(O) **Box nut 30 1/2"**	**0.20**	**580575000**
(P) **Positioning cone spanner 15.0 DK** Galvanised Length: 8 cm Width-across: 30 mm	**0.30**	**580579000**

Tie rod system 15.0

Tie rod wrench 15.0/20.0 Ankerstabschlüssel 15,0/20,0 Galvanised Length: 37 cm Diameter: 8 cm	**1.9**	**580594000**

Tie rod 15.0mm galvanised 0.50m	**0.72**	**581821000**
Tie rod 15.0mm galvanised 0.75m	**1.1**	**581822000**
Tie rod 15.0mm galvanised 1.00m	**1.4**	**581823000**
Tie rod 15.0mm galvanised 1.25m	**1.8**	**581826000**
Tie rod 15.0mm galvanised 1.50m	**2.2**	**581827000**
Tie rod 15.0mm galvanised 1.75m	**2.5**	**581828000**
Tie rod 15.0mm galvanised 2.00m	**2.9**	**581829000**
Tie rod 15.0mm galvanised 2.50m	**3.6**	**581852000**
Tie rod 15.0mm galvanised .....m	**1.4**	**581824000**
Tie rod 15.0mm non-treated 0.50m	**0.73**	**581870000**
Tie rod 15.0mm non-treated 0.75m	**1.1**	**581871000**
Tie rod 15.0mm non-treated 1.00m	**1.4**	**581874000**
Tie rod 15.0mm non-treated 1.25m	**1.8**	**581886000**
Tie rod 15.0mm non-treated 1.50m	**2.1**	**581876000**
Tie rod 15.0mm non-treated 1.75m	**2.5**	**581887000**
Tie rod 15.0mm non-treated 2.00m	**2.9**	**581875000**
Tie rod 15.0mm non-treated 2.50m	**3.6**	**581877000**
Tie rod 15.0mm non-treated 3.00m	**4.3**	**581878000**
Tie rod 15.0mm non-treated 3.50m	**5.0**	**581888000**
Tie rod 15.0mm non-treated 4.00m	**5.7**	**581879000**
Tie rod 15.0mm non-treated 5.00m	**7.2**	**581880000**
Tie rod 15.0mm non-treated 6.00m	**8.6**	**581881000**
Tie rod 15.0mm non-treated 7.50m	**10.7**	**581882000**
Tie rod 15.0mm non-treated .....m Ankerstab 15,0mm	**1.4**	**581873000**

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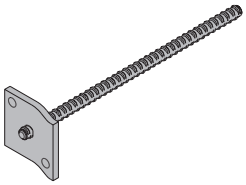
۱۳۹۴

مقالات تحلیلی آموزشی موسسه ۸۰۸

	[kg]	Article n°
Stop anchor 15.0 11.5cm	**0.77**	**581868000**
Stop anchor 15.0 16cm	**0.83**	**581997000**
Stop anchor 15.0 40cm	**1.4**	**581999000**

Sperranker 15,0

Non-treated



Pigtail anchor 15.0	**0.92**	**581984000**

Wellenanker 15,0

Non-treated

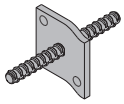
Length: 67 cm

Stop anchor double-ended 15.0 20cm	**1.1**	**581820000**

Sperranker beidseitig 15,0 20cm

Non-treated

Custom lengths can be ordered under the special-component Art.n° 580100000, quoting the designation and the desired length in mm.



Cantilever positioning cone 15.0 5cm	**0.45**	**581699000**

Sperrenvorlauf 15,0 5cm

Length: 11 cm

Diameter: 5 cm

Tool: Positioning cone spanner 15.0 DK

Follow fitting instructions!

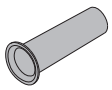
Sealing sleeve S 15.0 5cm	**0.009**	**581697000**

Dichtungshülse S 15,0 5cm

Orange

Length: 11 cm

Diameter: 4.7 cm



Fixing plate 15.0	**0.15**	**581692000**

Nagelblech 15,0

Galvanised

Diameter: 10 cm

Positioning cone 15.0 5cm	**0.43**	**581969000**

Vorlaufkonus 15,0 5cm

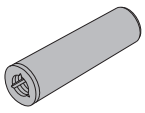
Galvanised

Length: 11 cm

Diameter: 3 cm

Tool: Positioning cone spanner 15.0 DK

Follow fitting instructions!



Fibre concrete plug 30.7mm	**0.03**	**581902000**

Faserbetonstopfen 30,7mm

Grey

Fair-faced concrete positioning cone 15.0 5cm	**0.46**	**581973000**

Sichtbetonvorlauf 15,0 5cm

Galvanised

Length: 11 cm

Diameter: 4.3 cm

Tool: Positioning cone spanner 15.0 DK

Sealing sleeve 15.0 5cm	**0.007**	**581990000**

Dichtungshülse 15,0 5cm

Orange

Length: 10 cm

Diameter: 3 cm

Fair-faced concrete plug 41mm plastic	**0.007**	**581851000**
Fair-faced concrete plug 41mm concrete	**0.05**	**581848000**

Sichtbetonstopfen

Grey

Super plate 15.0	**1.1**	**581966000**

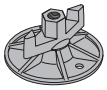
Superplatte 15,0

Galvanised

Height: 6 cm

Diameter: 12 cm

Width-across: 27 mm



Suspension cone 15.0 5cm	**0.88**	**581971000**

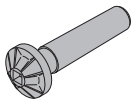
Aufhängekonus 15,0 5cm

Galvanised

Length: 16 cm

Diameter: 6 cm

Follow fitting instructions!



Multi-trip packaging

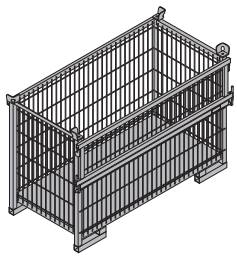
Doka skeleton transport box 1.70x0.80m	**87.0**	**583012000**

Doka-Gitterbox 1,70x0,80m

Galvanised

Height: 113 cm

Follow the directions in the "Operating Instructions"!



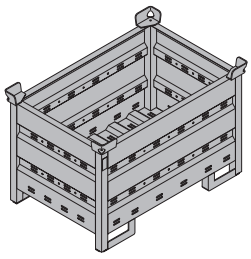
Doka multi-trip transport box 1.20x0.80m	**75.0**	**583011000**

Doka-Mehrwegcontainer 1,20x0,80m

Galvanised

Height: 78 cm

Follow the directions in the "Operating Instructions"!

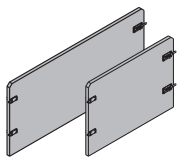


Multi-trip transport box partition 0.80m	**3.7**	**583018000**
Multi-trip transport box partition 1.20m	**5.5**	**583017000**

Mehrwegcontainer Unterteilung

Timber parts varnished yellow

Steel parts galvanised



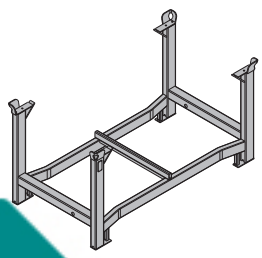
Doka stacking pallet 1.55x0.85m	**42.0**	**586151000**

Doka-Stapelpalette 1,55x0,85m

Galvanised

Height: 77 cm

Follow the directions in the "Operating Instructions"!



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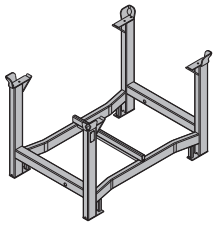
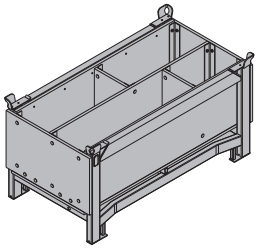
مقالات تحلیلی آموزشی موسسه ۸۰۸

	[kg]	Article n°
Doka stacking pallet 1.20x0.80m Doka-Stapelpalette 1,20x0,80m	**39.5**	**583016000**



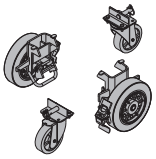
Galvanised
Height: 77 cm
Follow the directions in the "Operating Instructions"!

Doka accessory box Doka-Kleinteilebox	**106.4**	**583010000**



Timber parts varnished yellow
Steel parts galvanised
Length: 154 cm
Width: 83 cm
Height: 77 cm
Follow the directions in the "Operating Instructions"!

Bolt-on castor set B Anklemm-Radsatz B	**33.6**	**586168000**



Painted blue

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