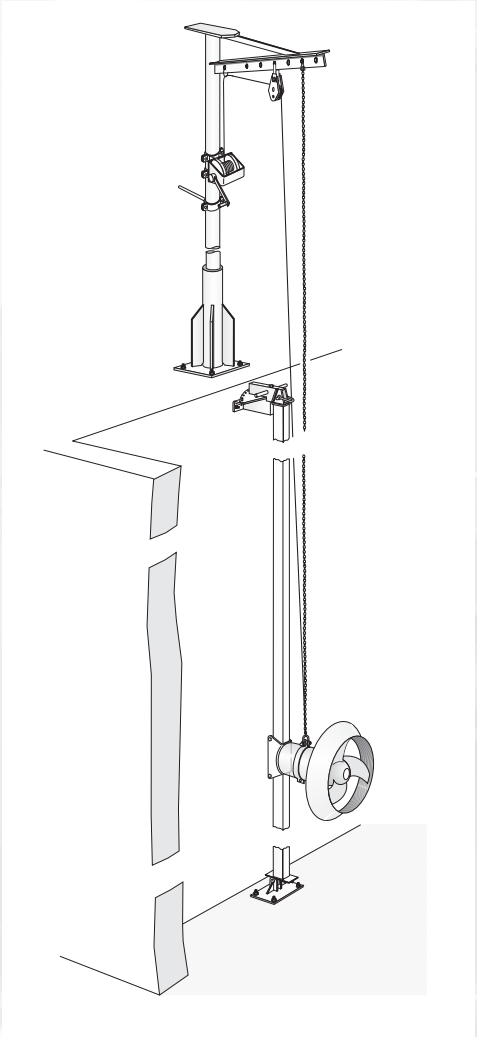
FLYGT

# Installation, care and maintenance

## Single guide bar system



Flygt

ITT Industries

893066/04

FLYGT
An ITT Industries company

**EU declaration of conformity**

**Manufacturer:** Company name: ITT Flygt AB
Address: S-361 80 EMMABODA SWEDEN Telephone: + 46 471 170 00

**Hereby certify that:**

**Davit:**

| Type: | Part number: |
|---|---|
| 150 kg | 623 11 00/01, 622 98 00/01, 623 04 00/01 |
| 300 kg | 624 27 00/01, 623 55 00/01, 623 59 00/01 |
| 320 kg | 624 26 00/01, 623 55 00/01, 623 59 00/01 |
| 600 kg | 624 28 00/01, 623 55 00/01, 623 59 00/01 |

* has been manufactured in accordance with the COUNCIL'S DIRECTIVE concerning convergence of the legislation of Member States with regard to Machinery (98/37/EC (89/392/EEC) + 91/368/EEC + 93/44/EEC + 93/68/EEC), EMC (89/336/EEC).
* has been manufactured in accordance with the following harmonized standards and technical spec. EN 292/1, EN 292/2.
* National standard DIN 15018 Teil 1, DIN 15020 Blatt 1+2, DIN 15021, VBG 8, VBG 9, VBG 9a (Davit 300, 320, 600 kg).
* National standard NF E 52110 (Davi1150 kg).

Title: Product Line Manager Name: Lars Frisk

Company name: ITT Flygt AB Signature: Lars Frisk Date: 2000-06-08

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**This "Installation, Care and Maintenance" applies to single guide bar systems for the 4600-series, 4630 - 4680.**

# INTRODUCTION

## GUARANTEE

ITT Flygt undertakes to remedy faults in products sold by ITT Flygt provided:

— That the fault is due to defects in design, materials or workmanship;

— That the fault is reported to ITT Flygt or ITT Flygt's representative during the guarantee period;

— That the product is used only under conditions described in the care and maintenance instructions and in applications for which it is intended;

— That the monitoring equipment incorporated in the product is correctly connected;

— That all service and repair work is done by a workshop authorized by ITT Flygt;

— That genuine ITT Flygt parts are used.

Hence, the guarantee does not cover faults caused by deficient maintenance, improper installation, incorrectly executed repair work or normal wear and tear.

ITT Flygt assumes no liability for either bodily injuries, material damages or economic losses beyond what is stated above.

ITT Flygt guarantees that a spare parts stock will be kept for 15 years after the manufacture of this product has been discontinued.

The manufacturer reserves the right to alter performance, specification or design without notice.

## TRANSPORTATION AND STORAGE

If the lifting and handling accessories are not installed at the time when they are received, they should be stored in a room free from moisture.

During transportation and handling it is important to avoid impacts that might deform accessories or damage their anticorrosive coating.

## SAFETY PRECAUTIONS

In order to minimize the risk of accidents in connection with the service and installation work, the following rules should be followed:

1. Never work alone. Use a lifting harness (part No. 84 33 02), a safety line (part No. 84 33 03) and a respirator (part No. 84 33 01), as required. Do not ignore the risk of drawing!
2. Make sure that there is sufficient oxygen and that there are no poisonous gases present.
3. Check the explosion risk before welding or using electric hand tools.
4. Do not ignore health hazards. Observe strict cleanliness.
5. Bear in mind the risk of electrical accidents.
6 Make sure that the lifting equipment is in good condition.
7. Provide a suitable barrier around the work area, for example a guard rail.
8. Make sure that you have a clear path of retreat!
9. Use a safety helmet, safety goggles and protective shoes.
10. All personnel who work with sewage systems should be vaccinated against diseases that can occur.
11. A first-aid kit must be handy.
12. The weight of certain accessories requires the use of suitable handling equipment.

Follow all other health and safety rules and local codes and practices.

ATTENTION!
In order to avoid accidents, warning signs, for rotating propellers and machines that start automatically must be positioned visibly.
The area in the proximinity of the machines should be fenced off.

## HANDLING EQUIPMENT

Lifting equipment is required for handling the mixer.

The lifting device should not have a lifting capacity which is greater than twice the weight of the mixer.

Oversized lifting equipment could cause damage if the mixer gets stuck when being lifted.

Make sure that the lifting equipment is securely anchored.

**WARNING!** Keep out from suspended load.

Comply with the instructions for using chemical dowels of the Spit Maxi EA or similar type.

Observe in particular:

— do not drill the holes too close the concrete edge.

— the proximity of the clear edge of the concrete (see layout and civil engineering recess drawings).

— the drying time of the chemical capsules, ranging from 20 minutes to 5 hours in dry concrete depending on ambient temperature.

For more information, see manufacturer's instructions entitled "Chemical dowel, rules for definition and identification of use and placing".

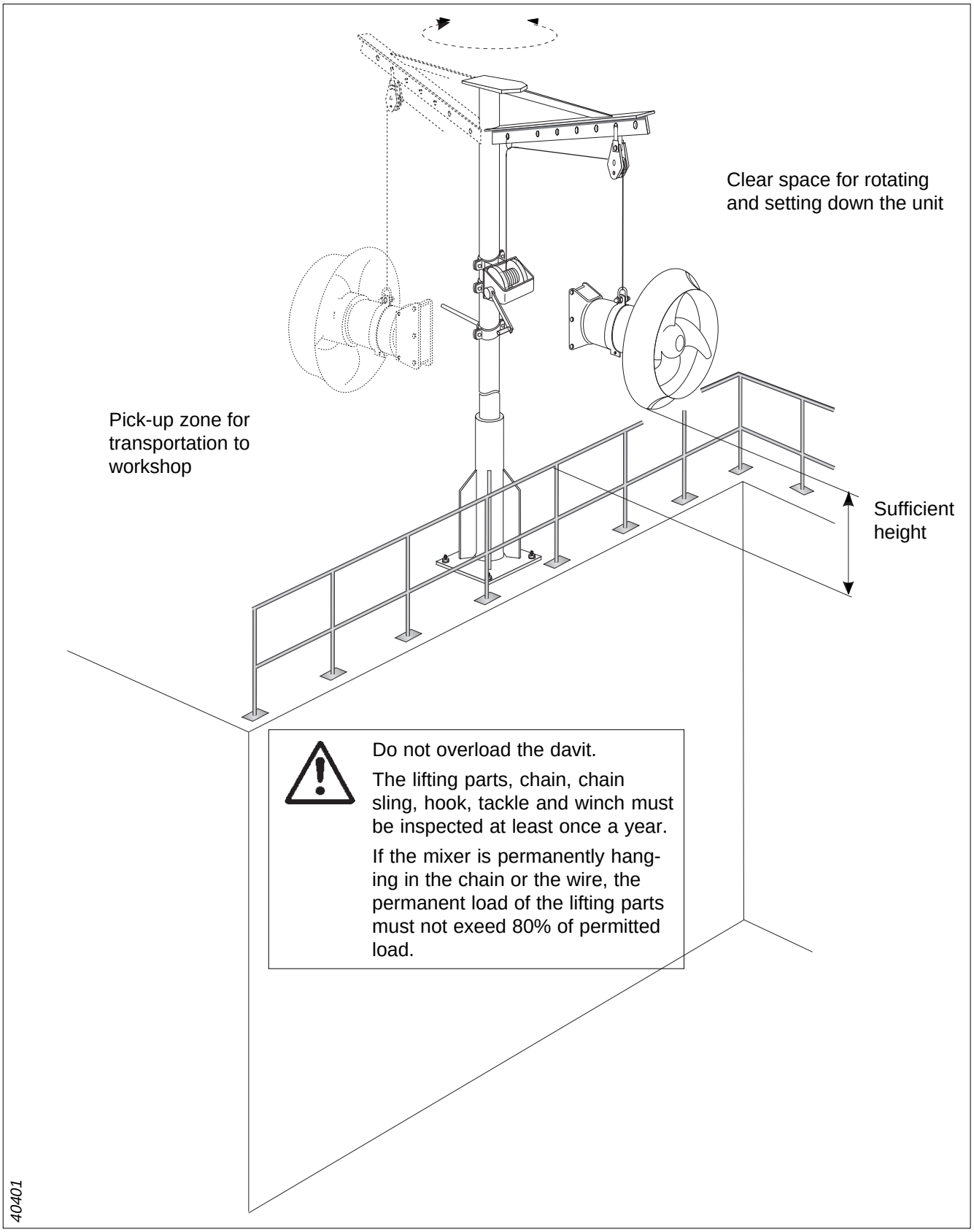
# LIFTING SYSTEM

**Materials**

| **Stainless steel** | **Galvanized steel, hot dip** |
|---|---|
| EN1.4432 | EN1.0038 |
| ASTM 316L | ASTM-A 36 |

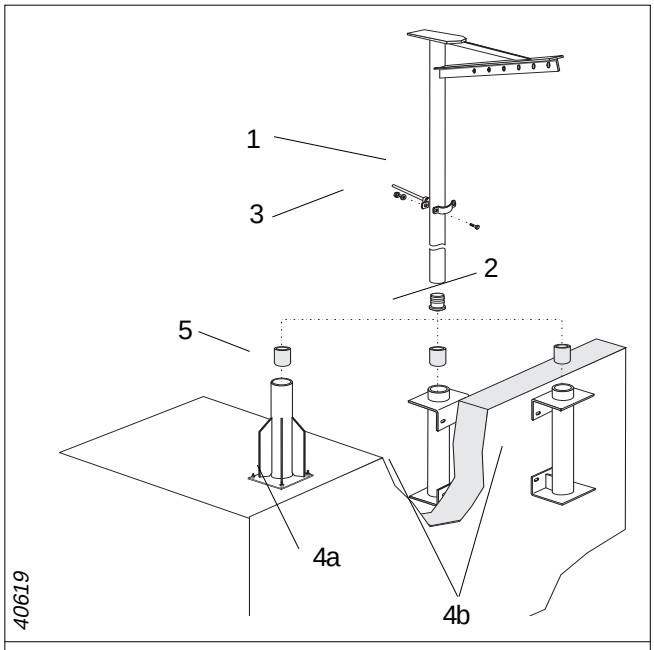
## 1. ENVIRONMENT OF LIFTING SYSTEM

To be able to use the lifting accessories properly for handling the mixer, it is important to arrange sufficient space around the davit:



## 2. LIFTING SYSTEM

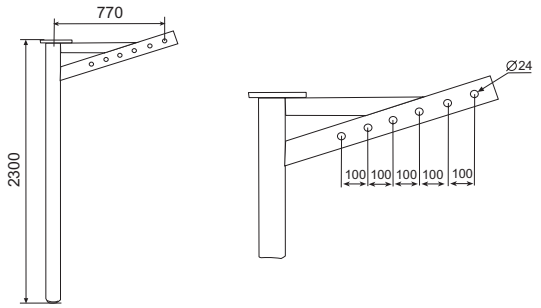
## General description, davit 150



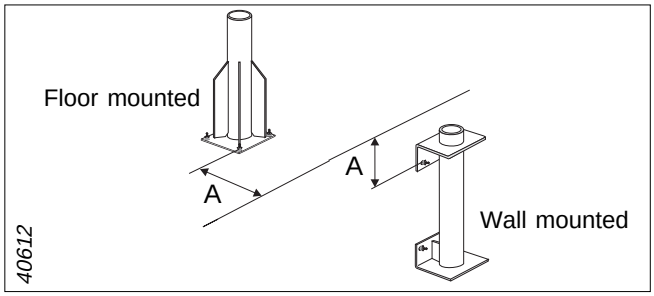

**Nomenclature**

| | |
|---|---|
| 1 | Davit |
| 2 | Sleeve |
| 3 | Operating bar |
| 4a | Davit holder, floor mounted |
| 4b | Davit holder, wall mounted |
| 5 | Sleeve |

**Davit 150** dimension, in mm



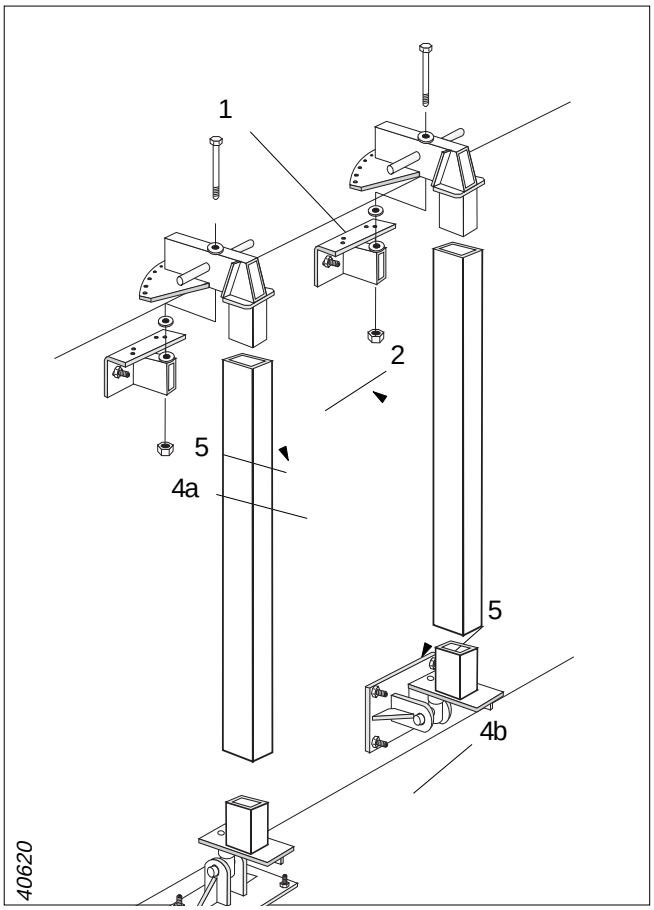

## Erection procedure, davit 150



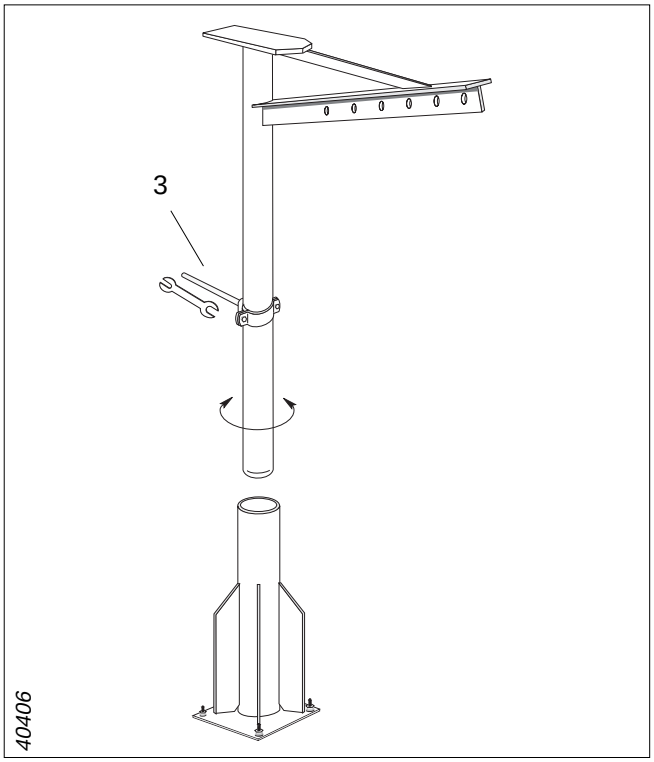

1) Position the davit holder (4) according to the layout and civil engineering recess drawings.

   Fix the davit holder (4) with chemical dowels (M12), torque 60 Nm.

   A=min. 55 mm, recomended 110 mm.

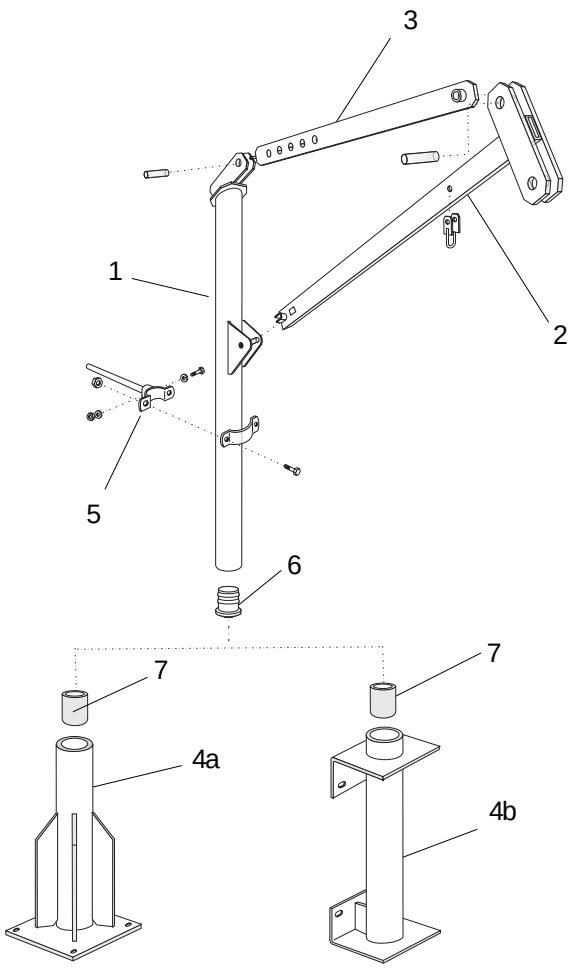



2) Check that the sleeve (2) and (5) are in the pipe end and in the top of the davit holder. Install the davit (1) in the davit holder (4a/4b).




3) Slide the operating bar (3) to such a position on the davit as to make it easy to adjust the system. Allow for davit rotation movements involved in installing and removing the mixer. Use the clamp to secure the operating bar (3) in position.

# General description, davit 320, 600

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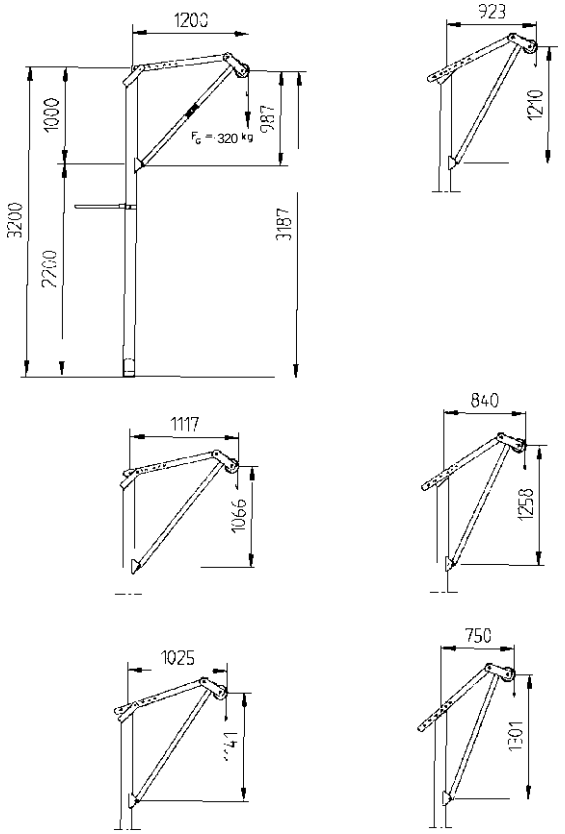
| Nomenclature | |
|---|---|
| 1 | Davit pipe |
| 2 | Lifting davit unit |
| 3 | Lock plate unit |
| 4a | Davit holder, floor mounted |
| 4b | Davit holder, wall mounted |
| 5 | Operating bar |
| 6 | Sleeve |
| 7 | Sleeve |

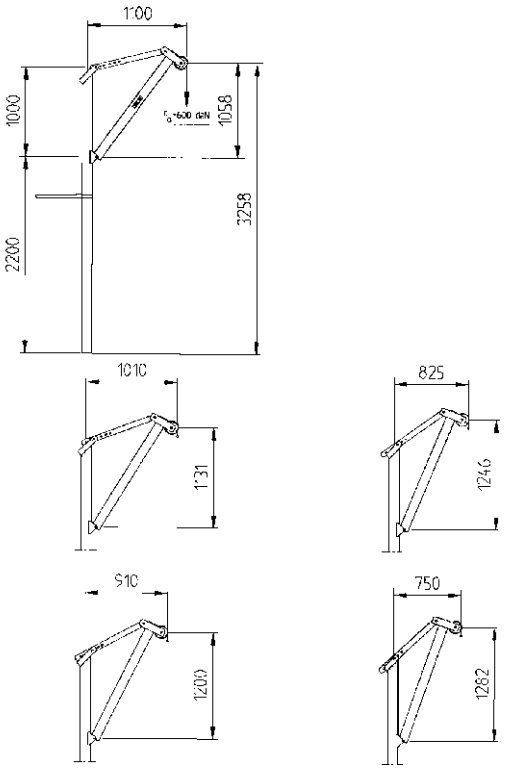
**Davit 320**

dimension, mm

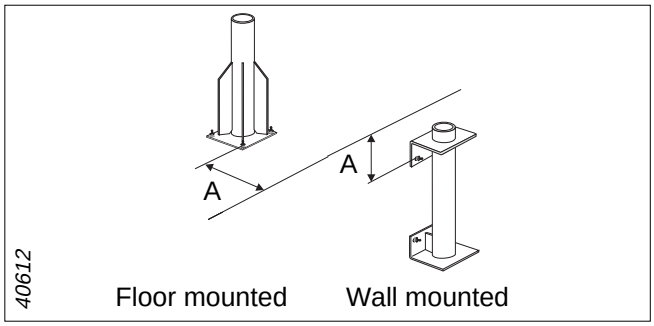



**Davit 600**

dimension, mm



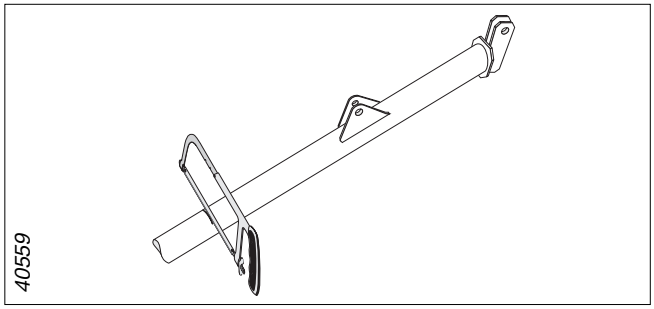
## Erection procedure, davit 350 and 600



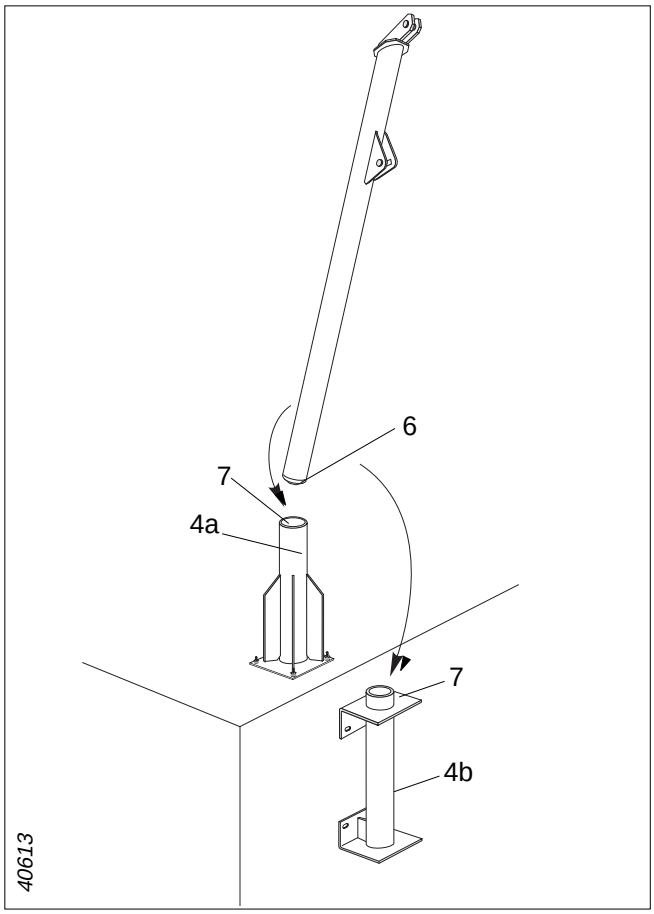

1) Position the holder (4a/4b) according to the layout and civil engineering recess drawings.

Fix the davit holder (4a/4b) with chemical dowels (M16), torque 120 Nm.

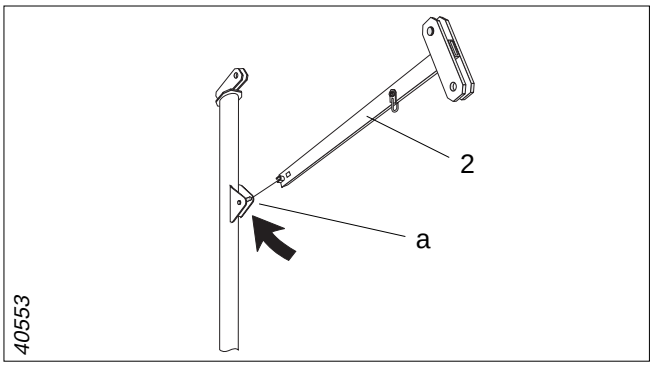
A=min 65 mm, recomended 125 mm.



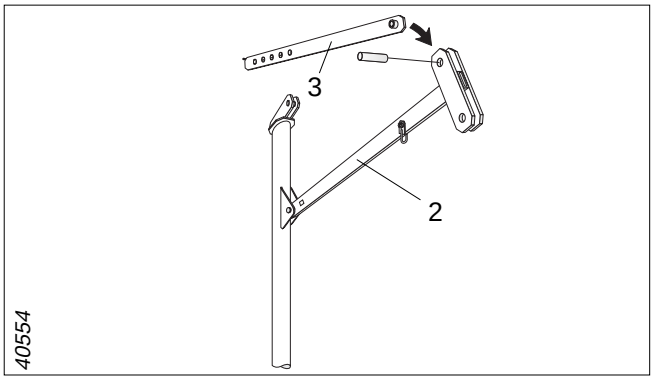

2) If required adjust the pipe to proper length. Remove the sleeve and cut the pipe. Reassemble the sleeve.



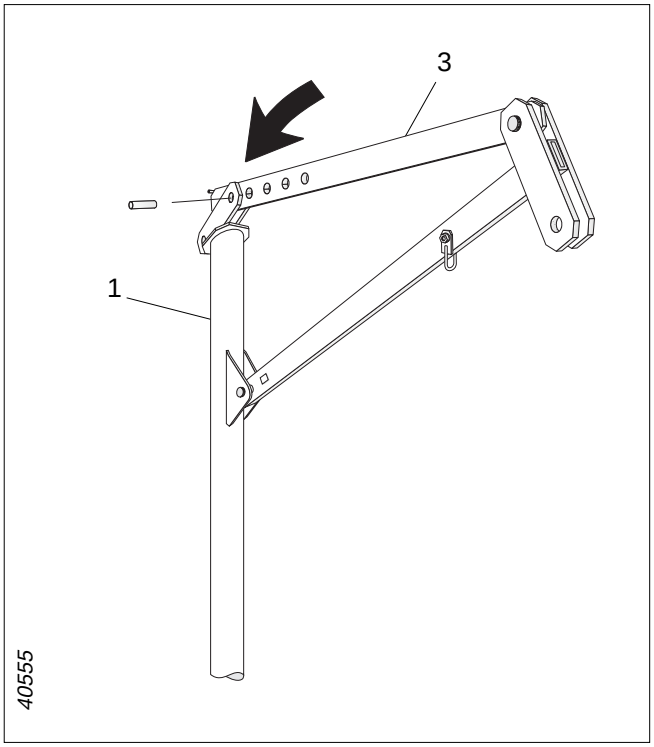

3) Check that the sleeve (6) and (7) are in the pipe end and in the top of the davit holder. Install the pipe in the davit holder (4a/4b).




4) Lift upp the lifting davit unit (2) and put it in the bracket a.
Secure the lifting davit unit ( 2) with the pin.




5) Fix the lifting davit unit (2) and lock plate unit (3) together with the pin and secure it.




6) Choose hole (see picture on page 8) in the lock plate unit (3) and fit it together with davit pipe (1) using the pin to secure it.

# 2. LIFTING EQUIPMENT

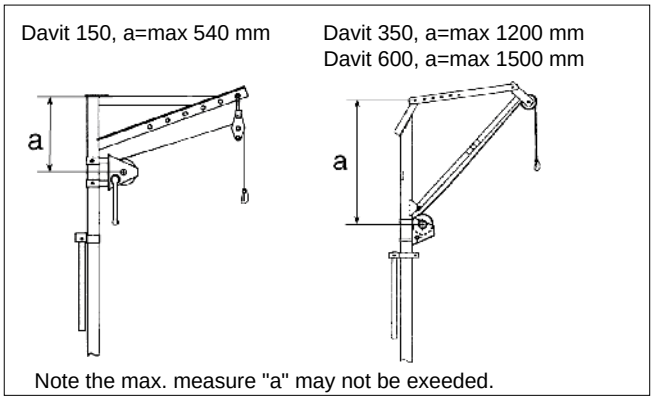
IMPORTANT: the lifting accessories should never be used for suspending persons or equipment that is operating.

## Winch

**The various types of winches used:**

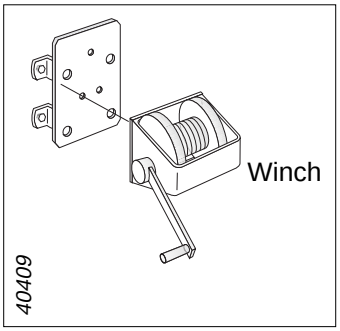
Winch for 4630 - 4640 maximum load 80 kg
Winch for 4650 - 4660 maximum load 350 or 600 kg
For each of these winches there is a purpose-made winch bracket.
The winches are CE-marked and approved.

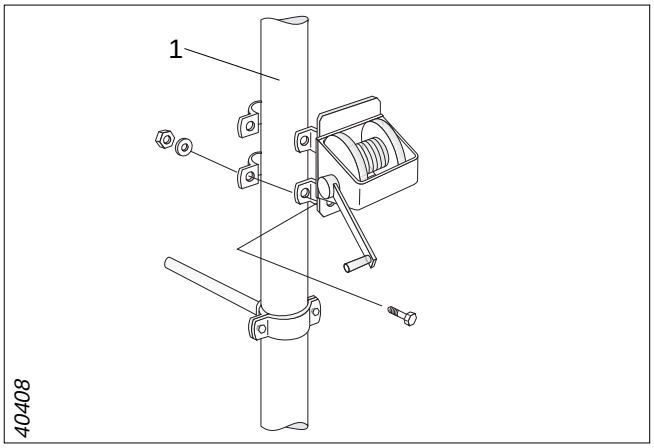
**Erection procedure, winch to the davit pipe**




1) Use the bolts provided to fix the winch to the bracket.

   Check that the “top” and “bottom” marks on the winch bracket are correctly oriented.



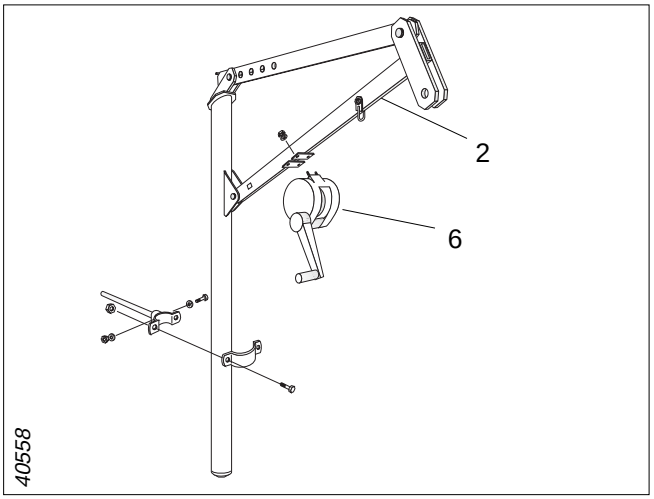

2) Fix the winch to the davit so that:

   - it is easy for the operator to adjust (height setting)

   - the centre of the drum is on the centreline of the davit arm

   Use the clamping nuts to lock it in position on the davit pipe (1).

**Erection procedure, winch to the davit unit**




1) Fix the winch to the lifting davit unit (2) so that:

   - it is easy for the operator to adjust (height setting)

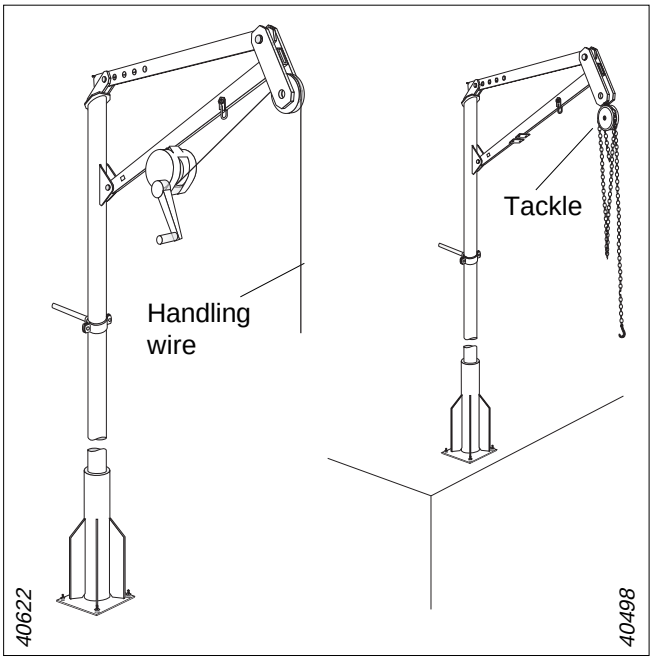
   - the center of the drum is on the centerline of the davit arm

   Use the brackets and fit the winch to the lifting davit unit (2). Winch winding handle on the right.

## Chain, block and tackle

Calibrated lifting chain max. load 500 or 1000 kg in 5, 9 or 20 m length.
Chain links with abbreviature hook and shackle max. load 500 or 1000 kg, length 0,75 m. Corner block max. load 400 kg. Block and tackle max. load 500 or 1000 kg.
Chain, block and tackle are CE-marked and approved.

**Erection procedure**




1) Place the cord pulley and tackle so that the handling chain or wire will be vertical.

**Note:** the lifting accessories may be used for installing the guide accessories.

# SINGLE GUIDE BAR SYSTEM

**Materials**

| **Stainless steel** | **Galvanized steel, hot dip** |
|---|---|
| EN1.4432 | EN1.0038 |
| ASTM 316L | ASTM-A 36 |

## 1. GUIDE BAR USED

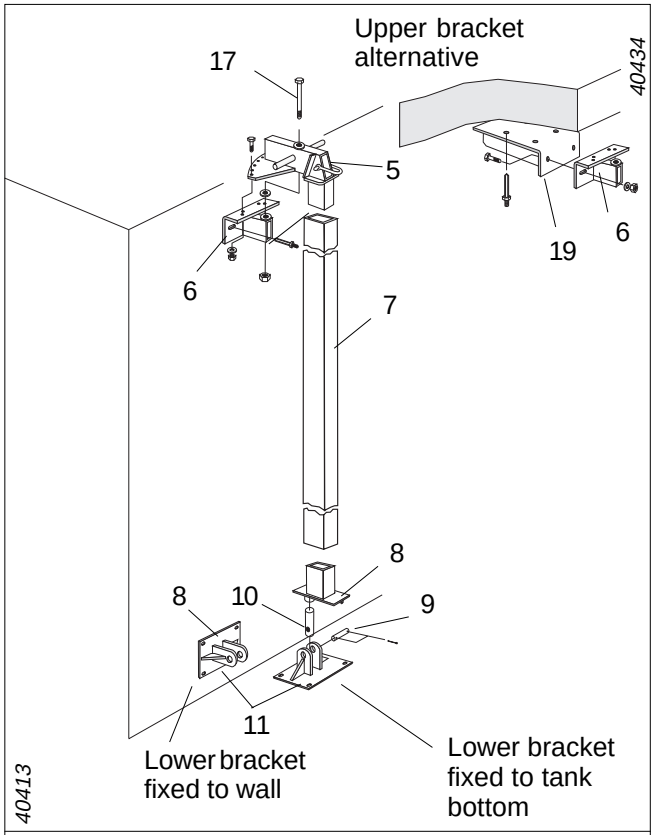
Type of Spit• or similar chemical dowel used for erecting guide systems, depending on the mixer concerned: The length of a standard guide bar is 3 or 6 m.

## 2. GUIDE BAR SYSTEM UP TO 6 m AND WITHOUT INTERMEDIATE SUPPORT

### Davit holder outside the tank

**General description**

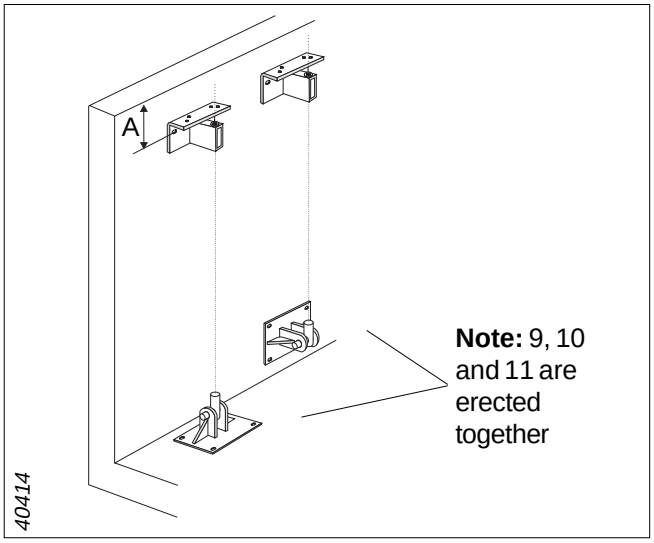
The lower bracket is fixed to the bottom or the wall of the tank.



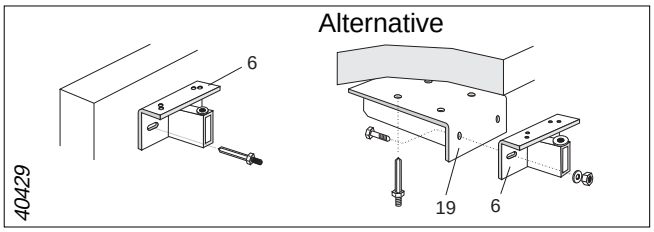

**Nomenclature**

| | |
|---|---|
| 5 | Upper guide |
| 6 | Upper bracket |
| 7 | Guide bar |
| 8 | Lower guide |
| 9 | Lower bracket pin |
| 10 | Lower guide pin |
| 11 | Lower bracket |
| 17 | Upper guide retaining bolt |
| 19 | Upper bracket, under floor |

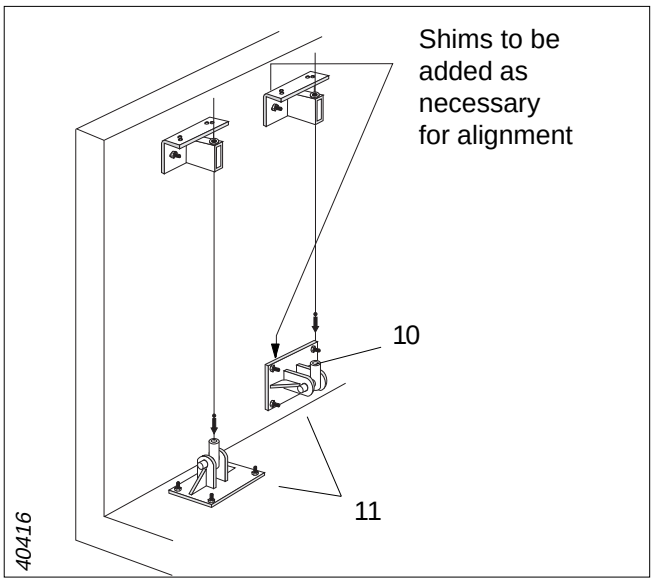
**Erection procedure**



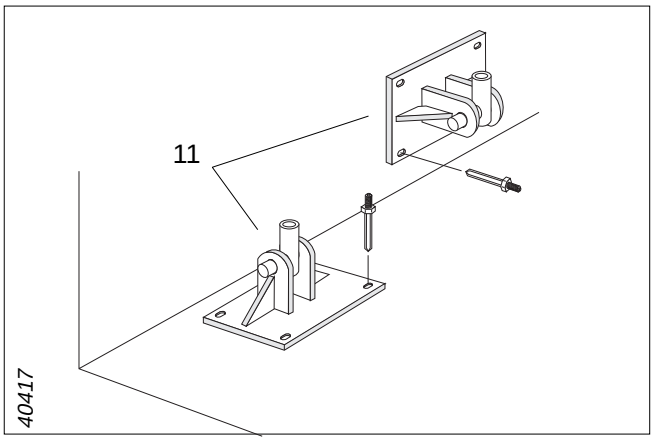

1) Position the brackets (6) and (11) by means of the layout and civil engineering drawings.
A=min 65 mm, recomended 125 mm.
**Note:** in the majority of cases, the guide bars are aligned with the centerline of the davit.



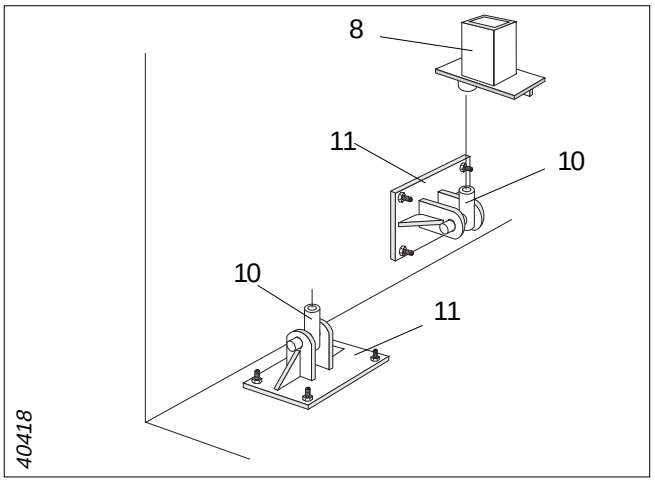

2) Fix the upper bracket (6/19).



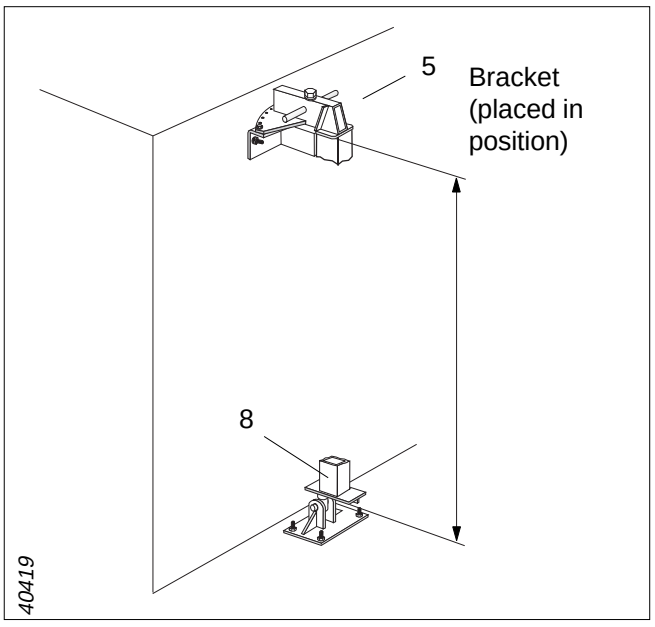

3) Check the positioning of the lower bracket (11).
Use a plumb line to check that the pin (10) (on the tank bottom or on the wall) is properly aligned with the centerline of the upper support (6).
If the lower bracket (11) is installed on the wall, it may be necessary to put metal shims under one of the brackets in order to achieve a vertical axis of rotation.




4) Fix the lower bracket (11).

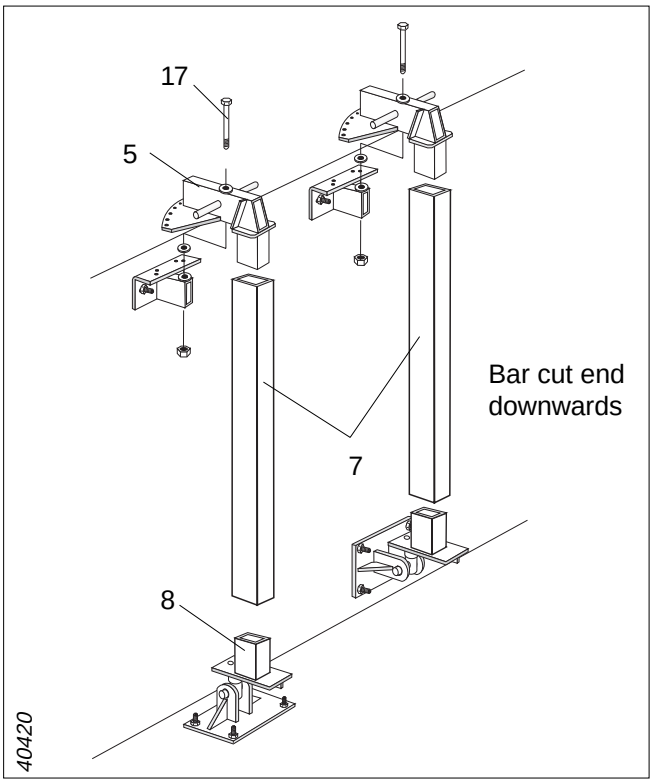



5) Fit the lower guide (8) onto the lower bracket (11) by positioning it on the pin (10).

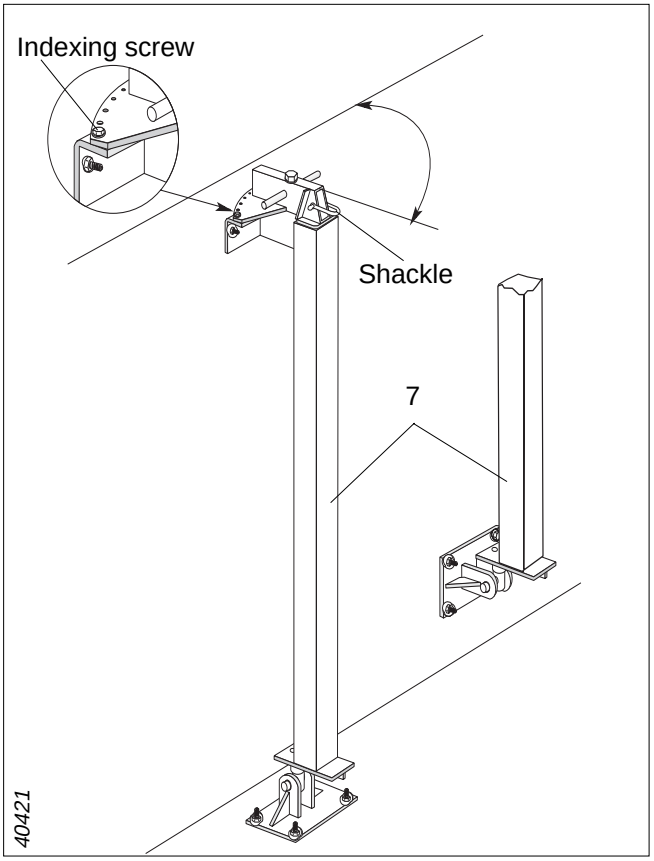



6) Measure the distance between the lower guide (8) and the upper guide (5) when they are in position. Subtract 1 cm from the measurement to arrive at the dimension at which the guide bar (7) should be cut.

**Note:** The cut end of the guide bar should point downwards.




7) Insert the bar (7) into the lower guide (8), then engage the upper guide (5).
Insert the bolt (17) but leave it untightened to make it easy to rotate the guide bar (7).



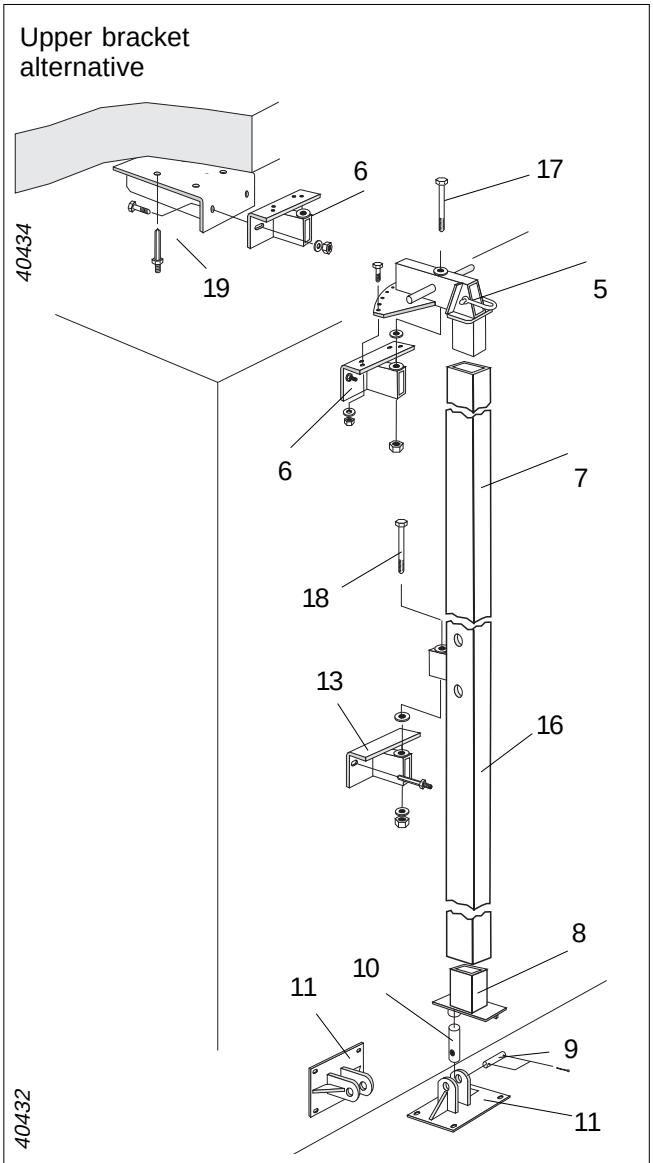

8) Oriente the guide bar (7) perpendicular to the tank wall and insert the indexing screw. Angle, see page 23. Fit a shackle to the upper bracket.

The guide system is ready to receive the mixer.

# 3. GUIDE BAR SYSTEM OVER 6 m

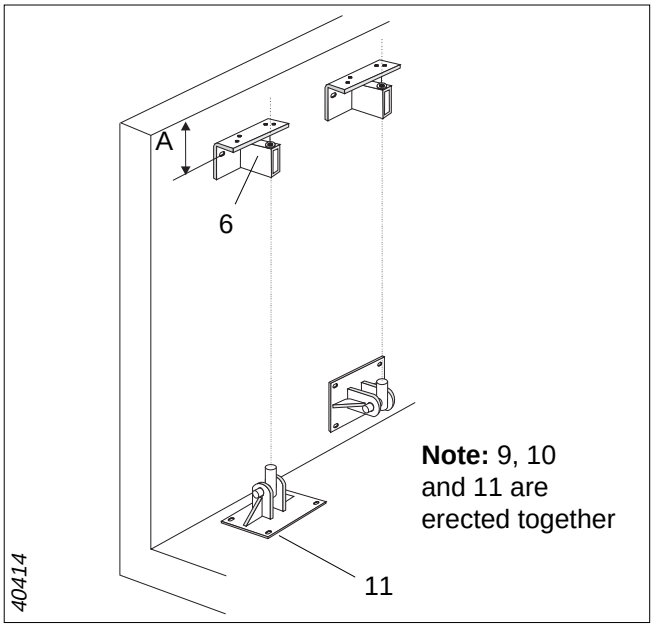
## General description

The lower bracket is fixed to the tank bottom or to the wall.




| Nomenclature | |
|---|---|
| 5 | Upper guide |
| 6 | Upper bracket |
| 7 | Guide bar |
| 8 | Lower guide |
| 9 | Lower bracket pin |
| 10 | Lower guide pin |
| 11 | Lower bracket |
| 13 | Intermediate bracket |
| 16 | Extension bar |
| 17 | Upper guide retaining bolt |
| 18 | Intermediate guide retaining bolt |
| 19 | Upper bracket, under floor |

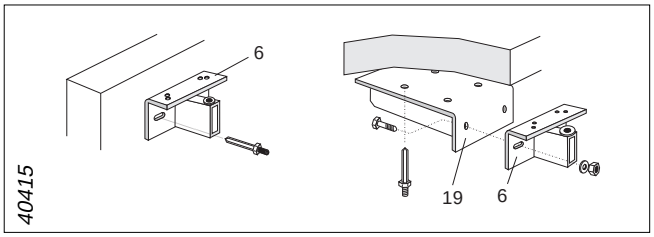
## Erection procedure



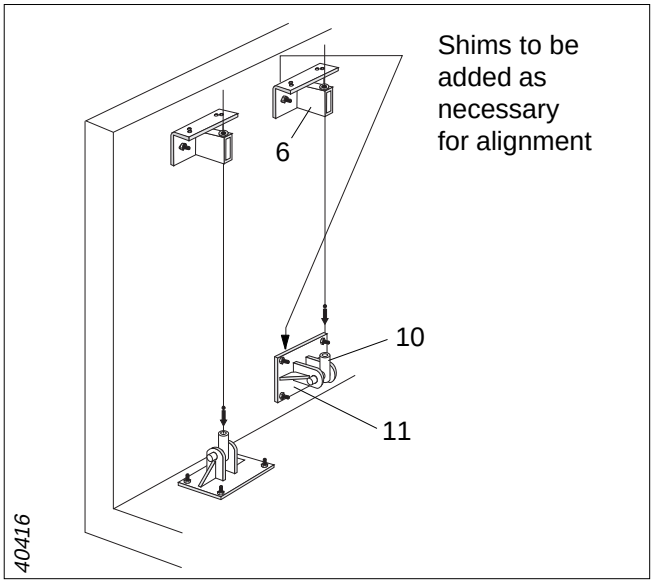

1) Position the brackets (6) and (11) by means of the layout and civil engineering drawings.

   A=min 65 mm, recomended 125 mm.

**Note:** in the majority of cases, the guide bars are aligned with the centerline of the davit.

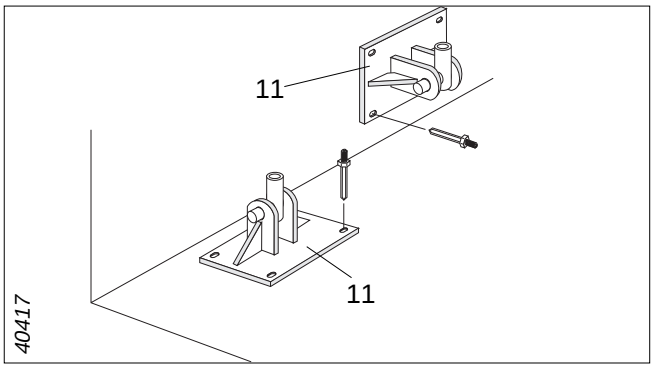



2) Fix the upper bracket (6/19).

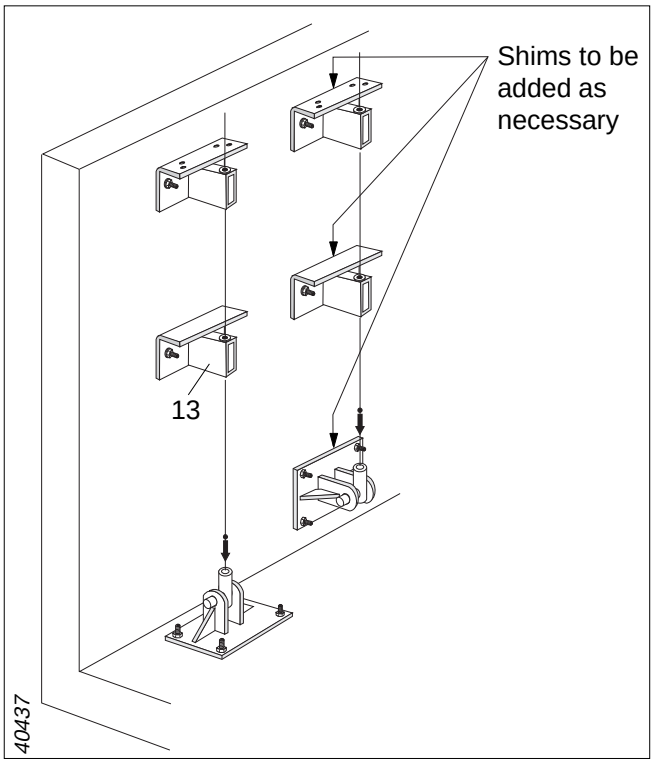



3) Use a plumb line to check that the pin (10) (on the tank bottom or on the wall) is properly aligned with the centerline of the upper bracket (6).

   If the lower bracket (11) is installed on the wall, it may be necessary to insert metal shims under one of the brackets in order to achieve a vertical axis of rotation.




4) Fix the lower bracket (11).

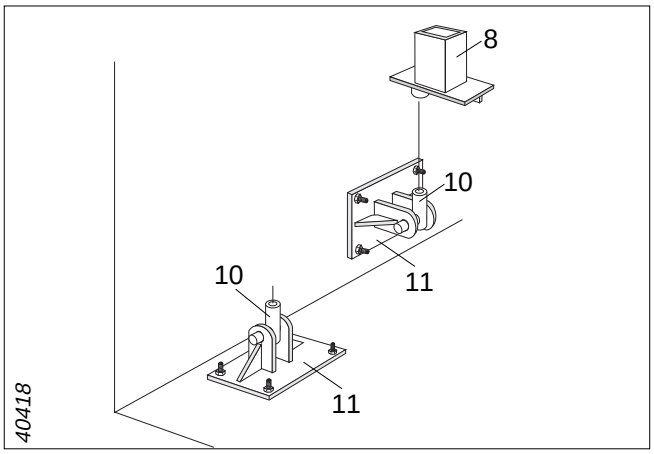



5) Position the intermediate bracket (13) by means of the layout and civil engineering drawings.

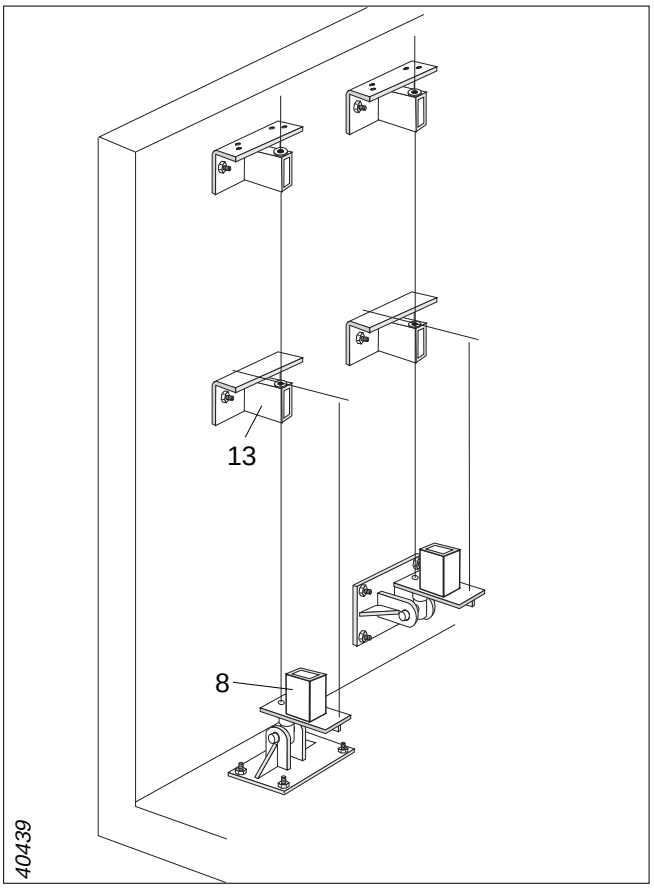
Use a plumb line to verify its alignment with the lower and upper brackets.

If necessary, add shims under the brackets so that they are exactly aligned.

- Then fix the intermediate bracket (13).

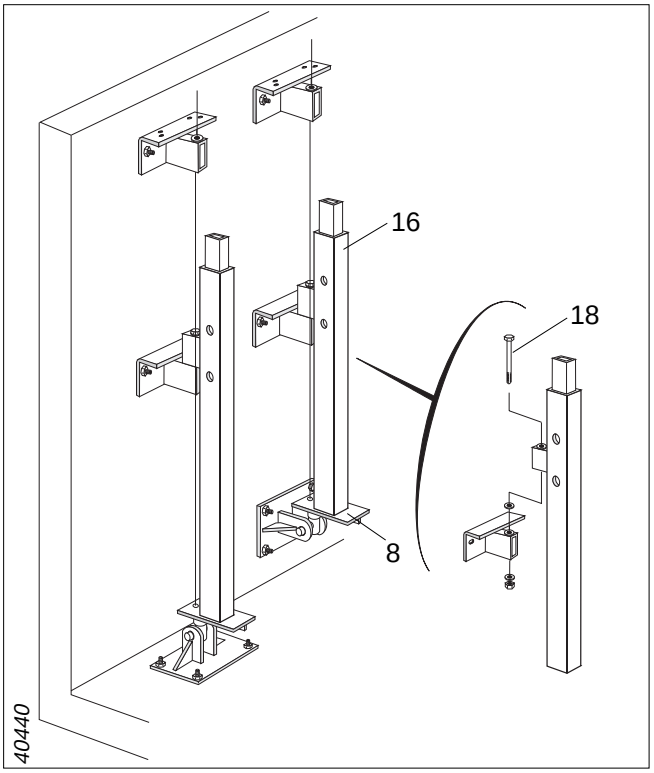



6) Fit the lower guide (8) onto the lower bracket (11) by positioning it on the pin (10).

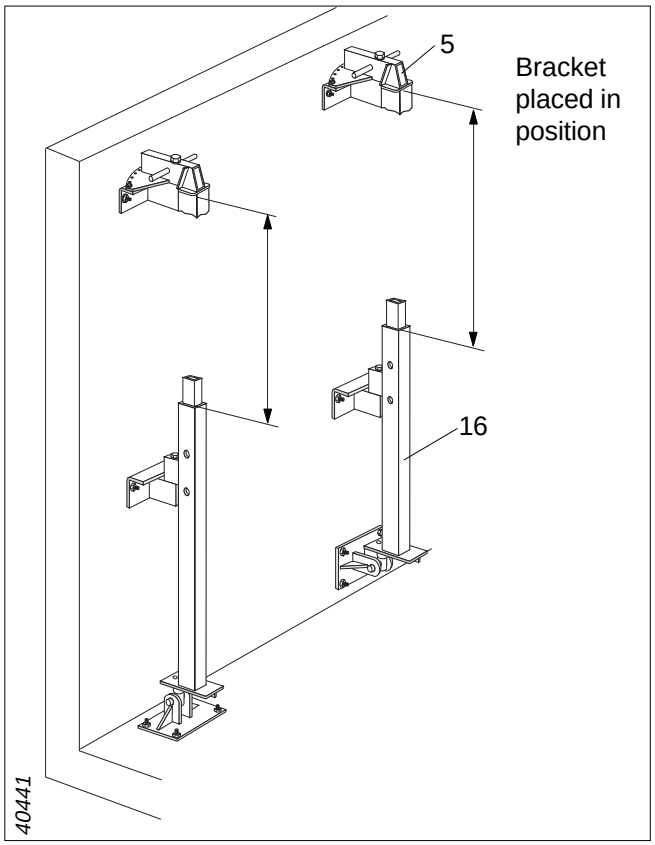



7) If the lower extension bar (16) has to be shortened, measure the distance between the intermediate bracket (13) and the lower guide (8) and cut the bar.

In the majority of cases, this bar does not overlap.

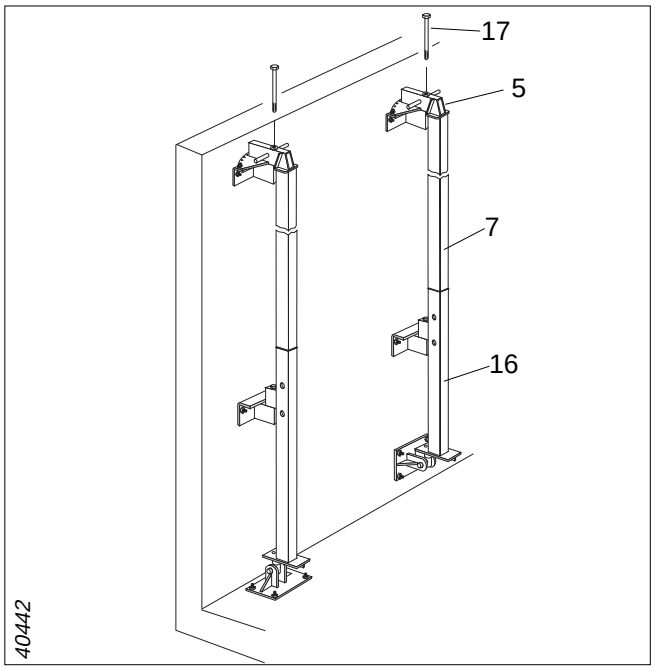



8) Insert the lower extension bar (16) into the lower guide (8) and place the bolt (18) in position but leave it untightened to make it easy to rotate the bar.



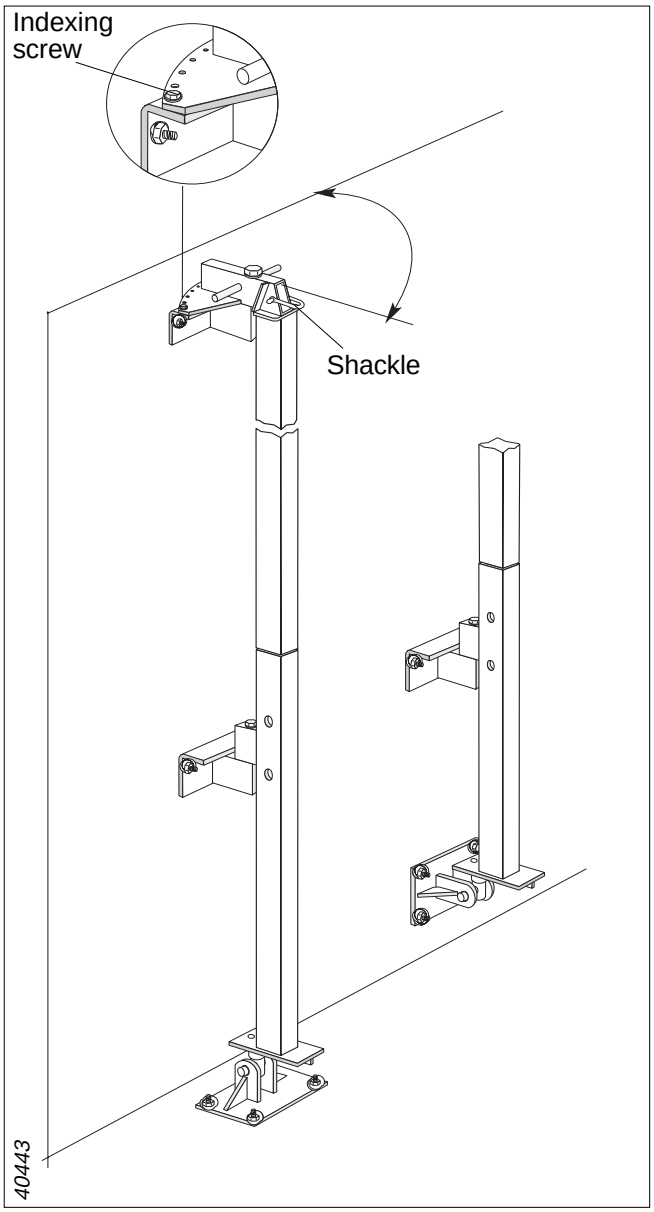

9) If the upper guide bar (7) has to be cut, measure the distance between the edge of the lower extension bar (16) and the upper guide (5) when they are in position. Subtract 1 cm from the measurement to arrive at the dimension at which the upper guide bar (7) should be cut.

**Note:** The cut end of the guide bar should point downwards.




10) Insert the upper guide bar (7) into the lower guide (8), then engage the upper guide (5).

Insert the bolt (17) but leave it untightened to make it easy to rotate the guide bar (7)+ (16).

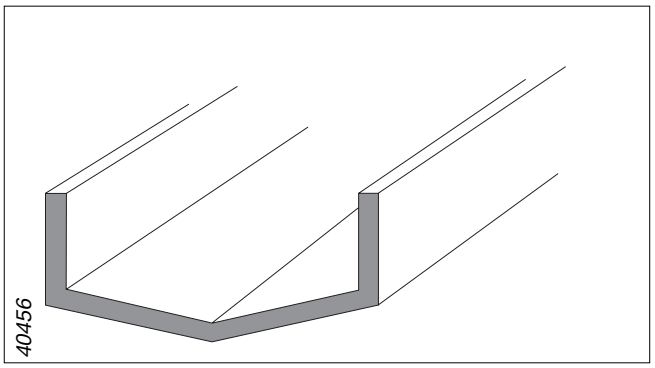



11) Oriente the complete guide bar perpendicular to the tank wall and insert the indexing screw. Angle, see page 23.

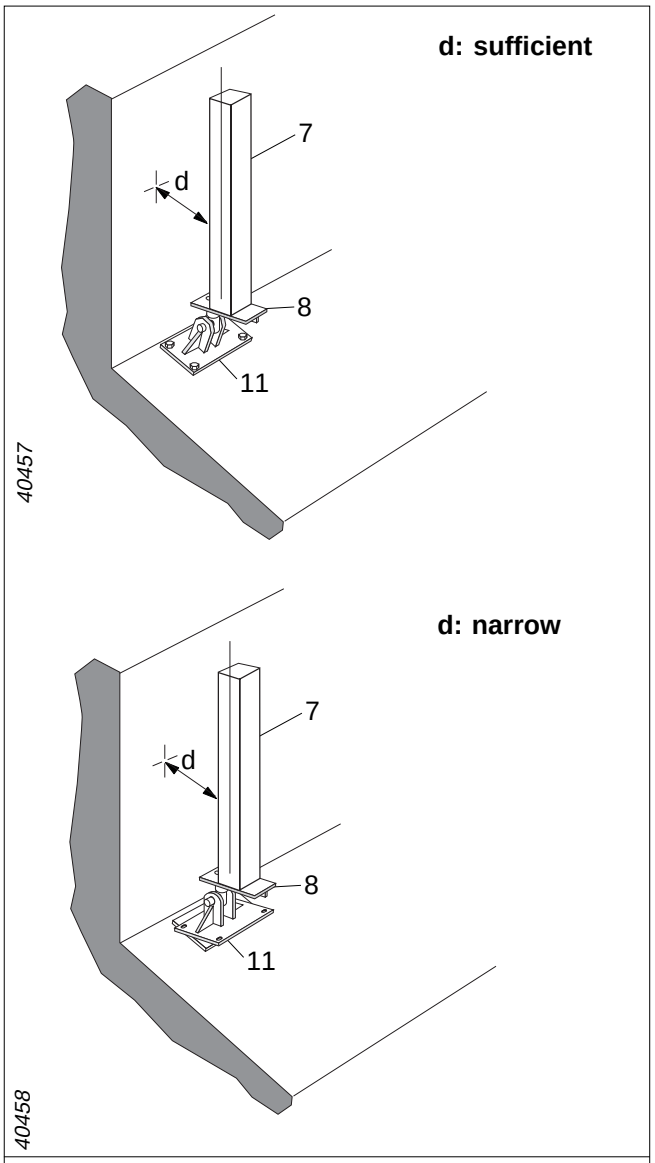
Fit a shackle to the upper bracket.

The guide system is ready to receive the mixer.

## 4. INSTALLATION ON SLOPING BOTTOM



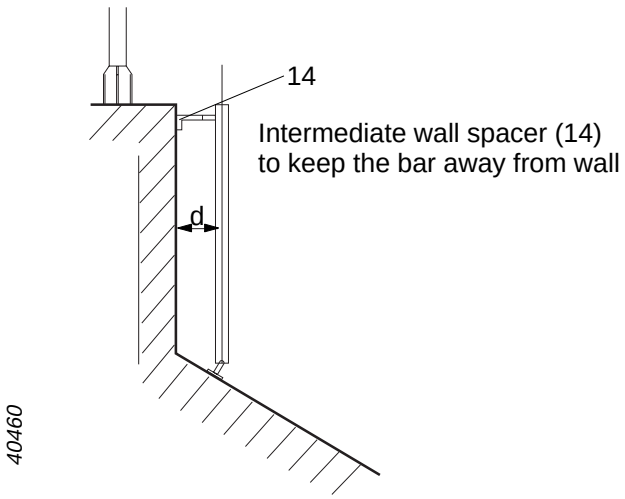

If the tank bottom slopes and it is desired to fix the guide bar to it, the erection of the guide system is modified.



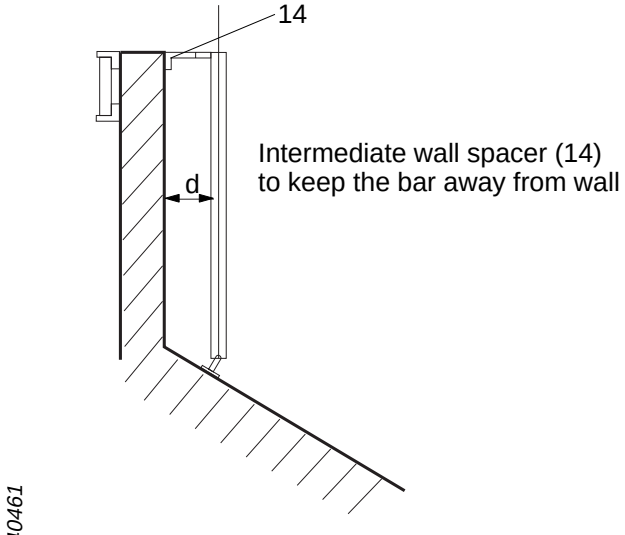

| Nomenclature | |
|---|---|
| 7 | Guide bar |
| 8 | Lower guide |
| 11 | Lower bracket |

It is in fact necessary to separate the guide bar from the wall in order to allow rotation of the lower bracket.

**Horizontal davit holder floor mounted**




**Davit holder outside the tank**

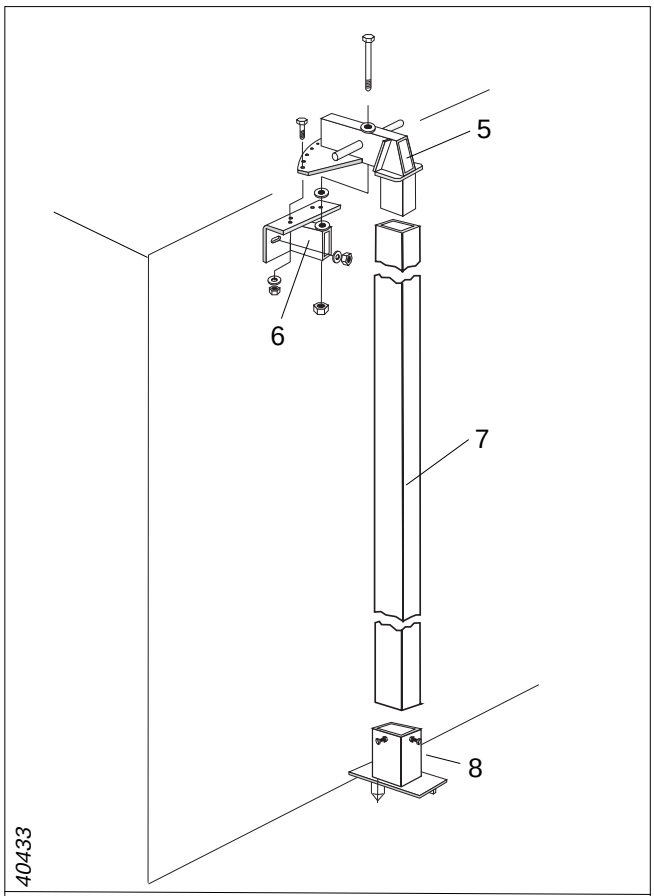



The guide bar is separated from the wall by using intermediate wall spacers (14) or an installation with davit holder inside the tank

# 5. GUIDE BAR SYSTEM FOR INSTALLATION IN A FILLED TANK

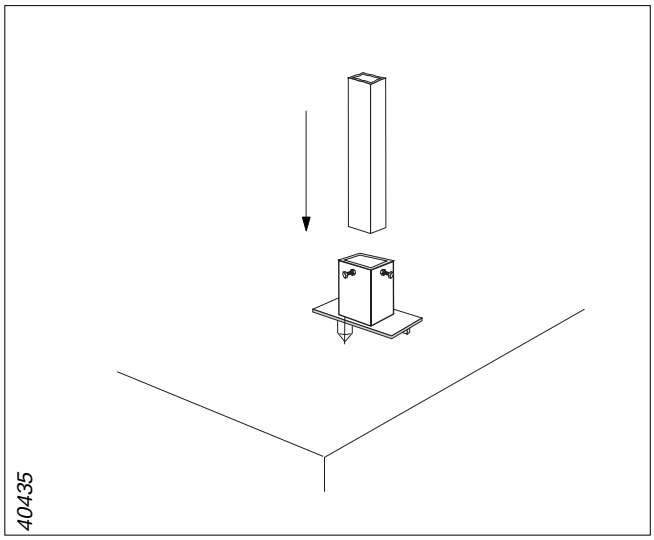
**General description**

No bottom plate is used.

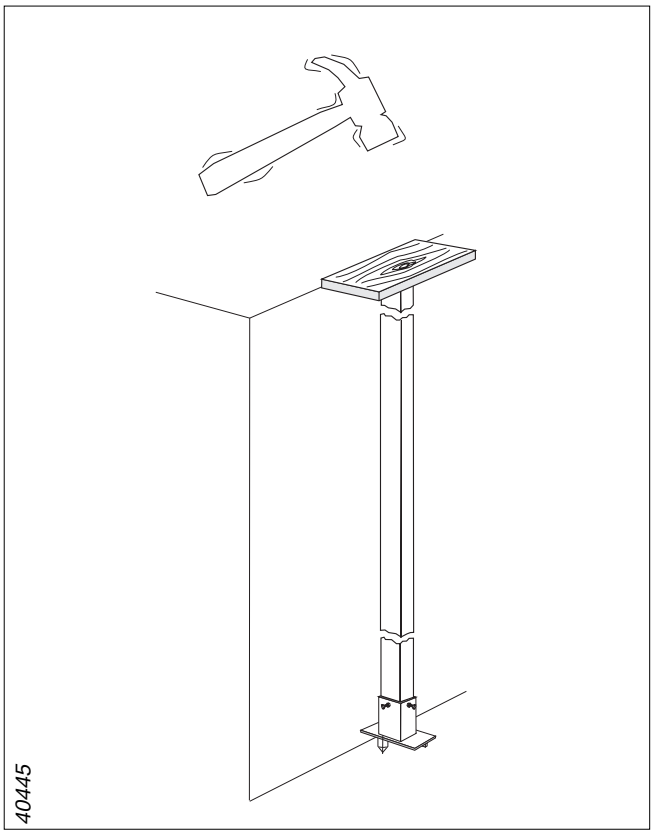



| Nomenclature | |
|---|---|
| 5+6 | Upper bracket |
| 7 | Guide bar |
| 8 | Lower guide |

**Erection procedure**

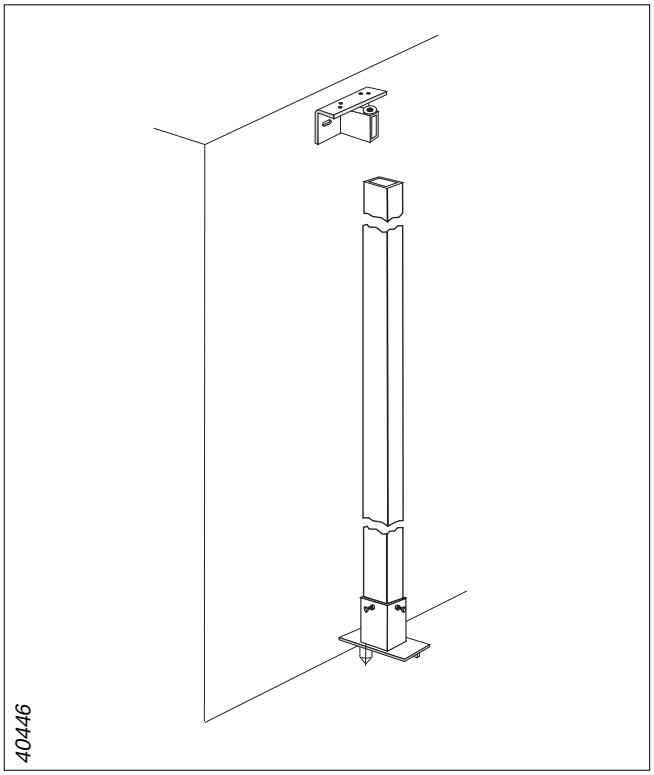



1) Fit the lower guide onto the guide bar by tighting the screws.

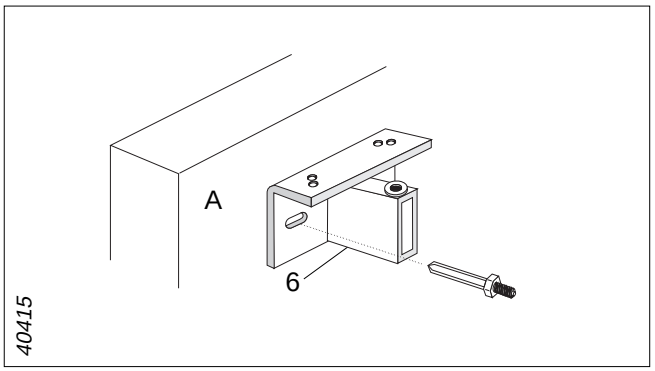



2) Position the guide bar by means of the layout and civil engineering drawings.

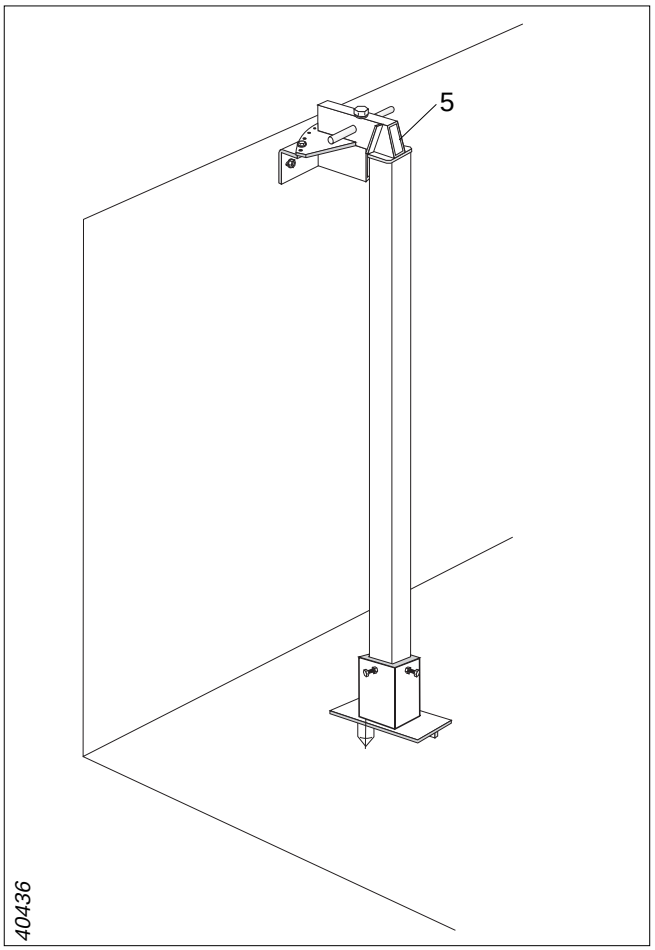
   Secure the dowel of the guide to the tank bottom by tapping on the top of the guide bar while turning the bar. Use a piece of wood or similar so as not to damage the guide bar.



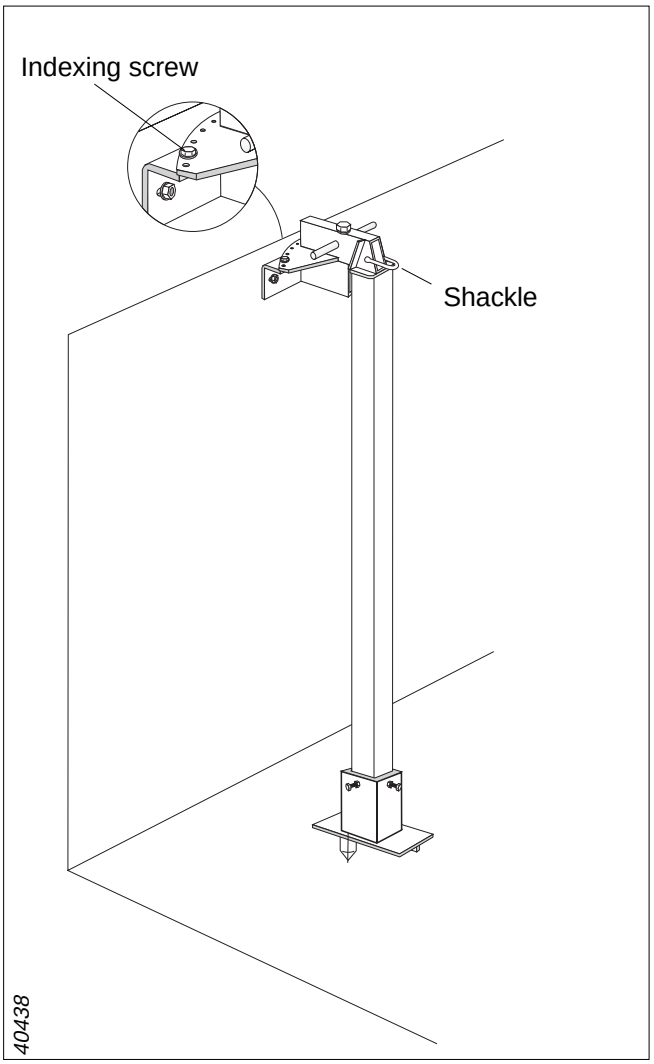

3) Position the upper bracket (6). Use a level to verify that the guide bar is vertical.




4) Fix the upper bracket (6).
A=min 65 mm, recomended 125 mm.




5) Fit the upper bracket (5) onto the guide bar.



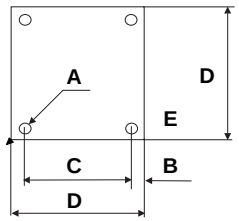

6) Oriente the guide bar perpendicular to the tank wall and insert the indexing screw.

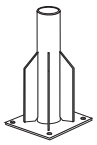
Fit a shackle to the upper bracket.

The guide system is ready to receive the mixer.

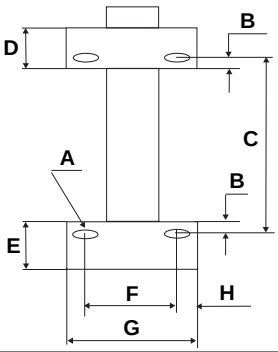
# DIMENSIONS

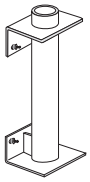
Measurement for mounting of bracket



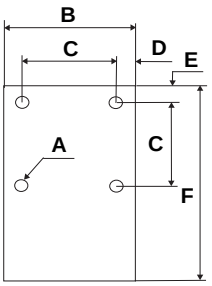



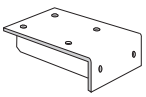
| Guide bar system | A | B | C | D |
|---|---|---|---|---|
| 50x50, 100x50 | Ø14 | 15 | 150 | 180 |
| 100x100, 150x100 | Ø18 | 20 | 300 | 340 |



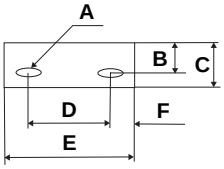



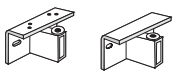
| Guide bar system | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 50x50, 100x50 | Ø14 | 27 | 300 | 70 | 60 | 155 | 210 | 27,5 |
| 100x100, 150x100 | Ø18 | 50 | 600 | 100 | 110 | 190 | 260 | 35 |



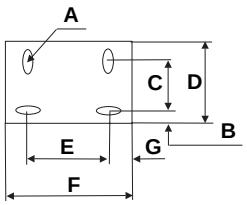



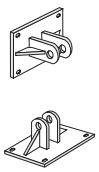
| Guide bar system | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 50x50, 100x50 | Ø15 | 190 | 150 | 20 | 15 | 275 |
| 100x100, 150x100 | Ø19 | 230 | 190 | 20 | 20 | 335 |



| Guide bar system | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 50x50, 100x50 | Ø14 | 30 | 50 | 155 | 210 | 27,5 |
| 100x100, 150x100 | Ø18 | 50 | 100 | 190 | 260 | 35 |



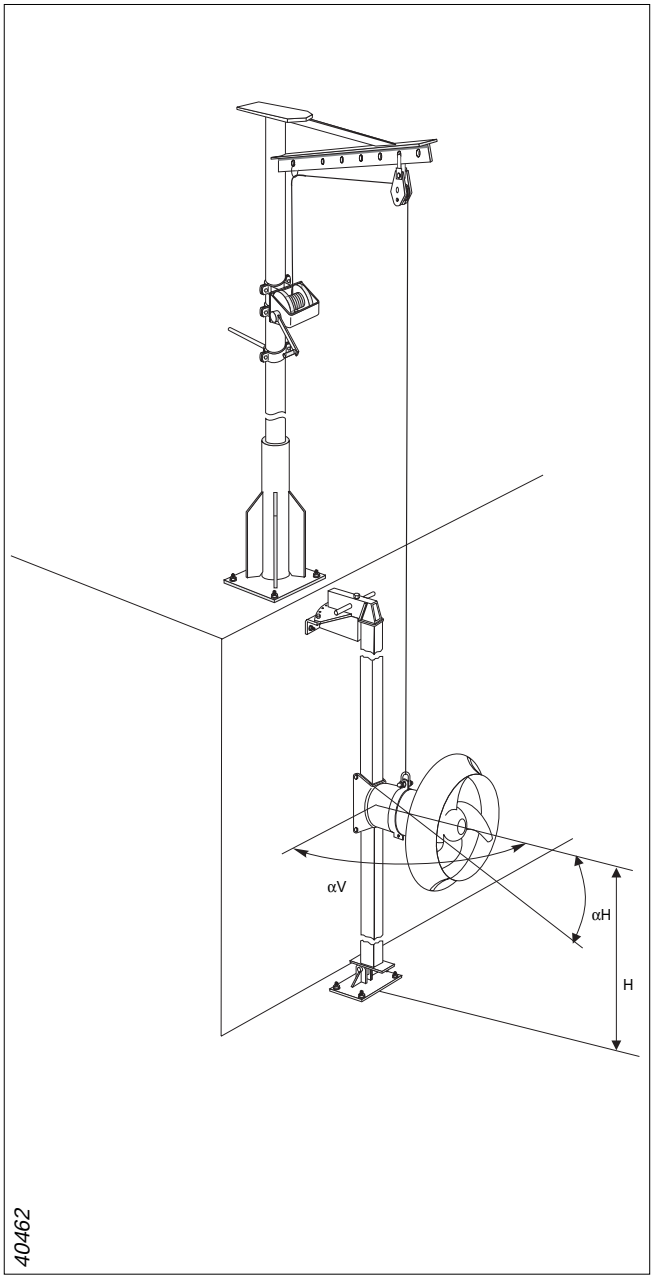



| Guide bar system | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 50x50, 100x50 | Ø14 | 15 | 147,5 | 190 | 160 | 215 | 27,5 |
| 100x100, 150x100 | Ø18 | 25 | 185 | 250 | 200 | 290 | 45 |

# INSTALLING THE MIXER

Before installing the mixer, carry out the checks stated in the installation and maintenance instructions.

## 1. POSITIONING THE MIXER, VERTICAL ANGLE




**Note**: When the mixer is running, it is held in position by a wire or chain independent of the lifting equipment.

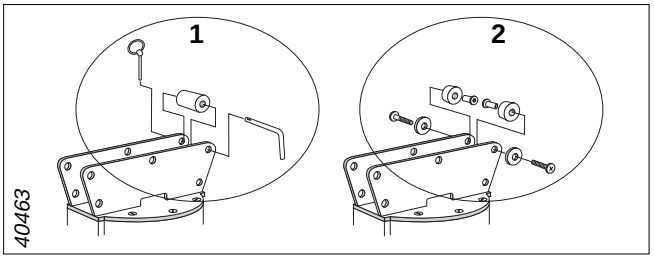
3 parameters to be observed: αV, αH, H

- H : height from tank bottom
- αH : horizontal angle, see page 23.
- αV : vertical angle

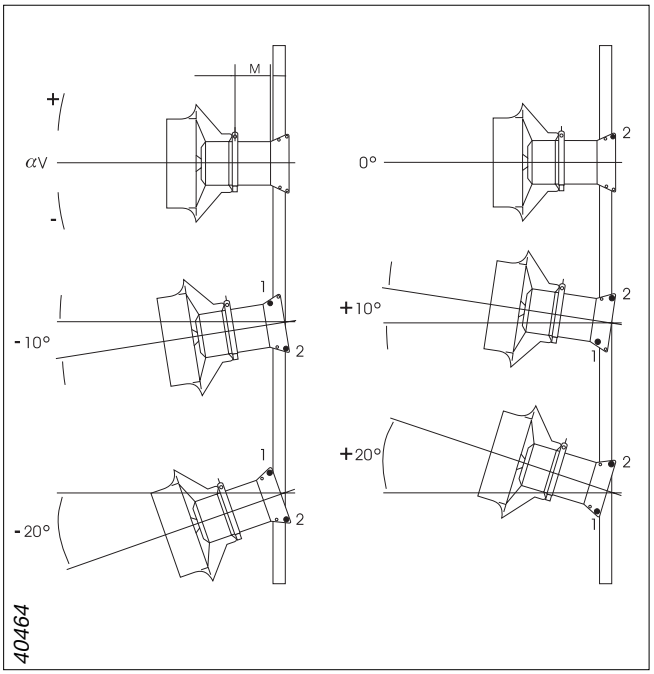
H and αH are set at the stage of placing the unit on the guide system.

**Setting the vertical angle (αV)**

Orientation is by means of a set of rollers situated on the rear guide of the mixer (see installation and maintenance instructions for the unit).




To obtain the desired αV angle, see table below.



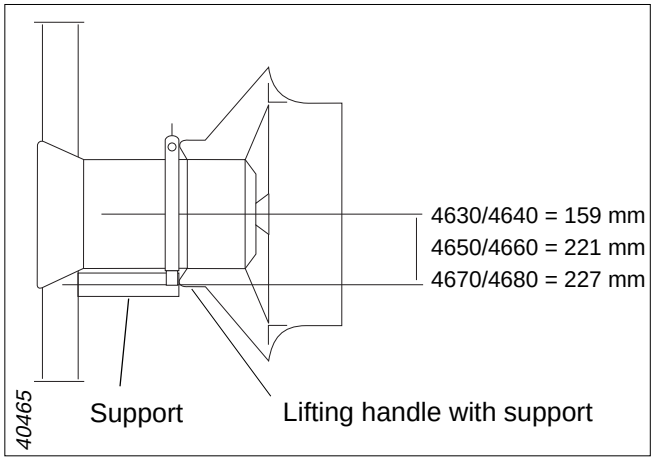

For the positioning of the lifting ring, see table below. The roller **1** is always in front of the guide bar.

**Table of lifting ring clearance dimensions for the 4600 series**

| | | -20 | -10 | 0 | +10 | +20 |
|---|---|---|---|---|---|---|
| **4630** | with jet ring | 142 | 171 | 198 | 198 | 240 |
| | without jet ring | 103 | 132 | 159 | 186 | 215 |
| **4640** | with jet ring | 162 | 191 | 218 | 238 | 280 |
| | without jet ring | 123 | 152 | 179 | 206 | 235 |
| **4650** | with jet ring | 210 | 248 | 283 | 293 | 354 |
| | without jet ring | 147 | 185 | 220 | 255 | 293 |
| **4660** | with jet ring | 265 | 303 | 338 | 373 | 404 |
| | without jet ring | 202 | 240 | 275 | 310 | 348 |
| **4670** | with jet ring | 238 | 266 | 336 | 401 | 401 |
| | without jet ring | 172 | 223 | 270 | 317 | 368 |
| **4680** | with jet ring | 312 | 363 | 410 | 486 | 551 |
| | without jet ring | 249 | 300 | 347 | 394 | 445 |

The “M” dimensions are expressed in mm.

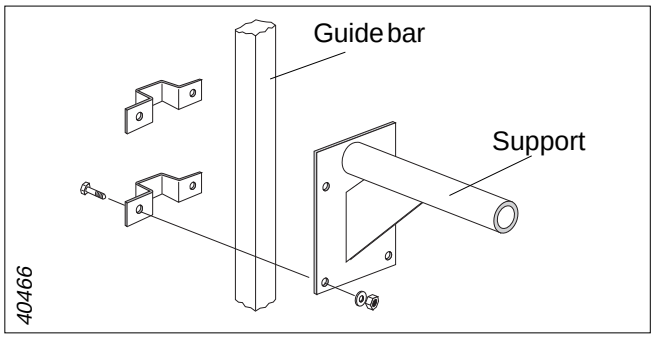
**Using a horizontal support**



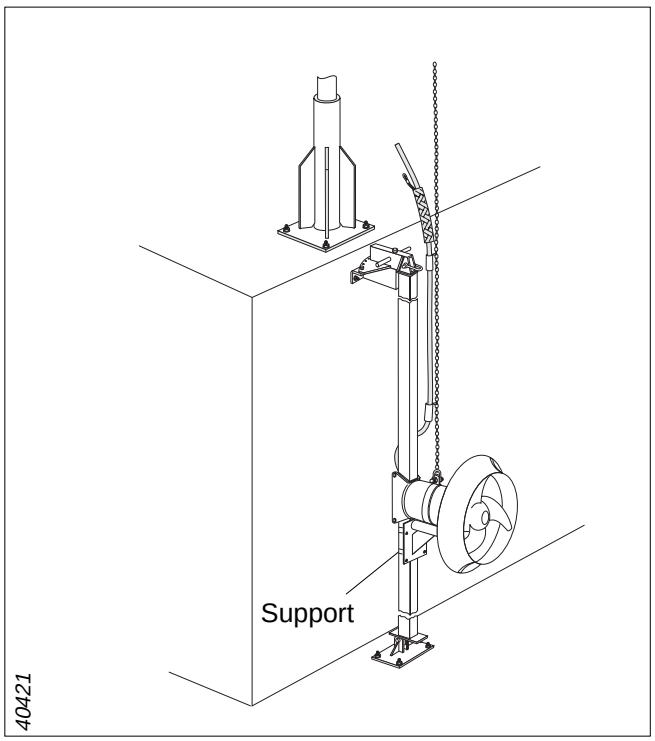

Place in position (check that the mixer is in fact fitted with a buffer bracket).

In addition, in cases where the mixer is held in position by a chain, the use of a chain tensioner to keep the chain taut is recommended.

Mutual friction between chain links may cause premature wear if the chain is not kept taut.



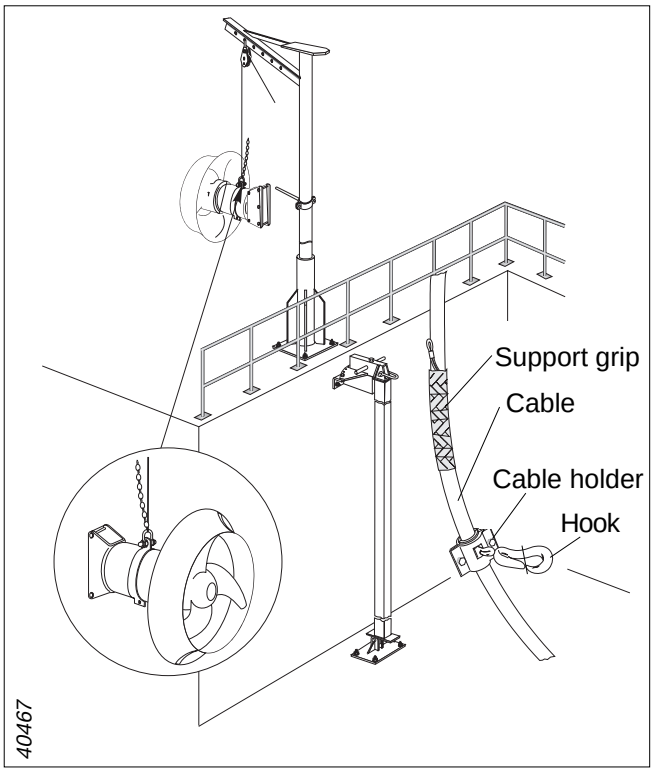

Fix the support to the guide bar.




With support the mixer can't be angled vertically.

## 2. PLACING THE MIXER ON THE GUIDE BAR SYSTEM

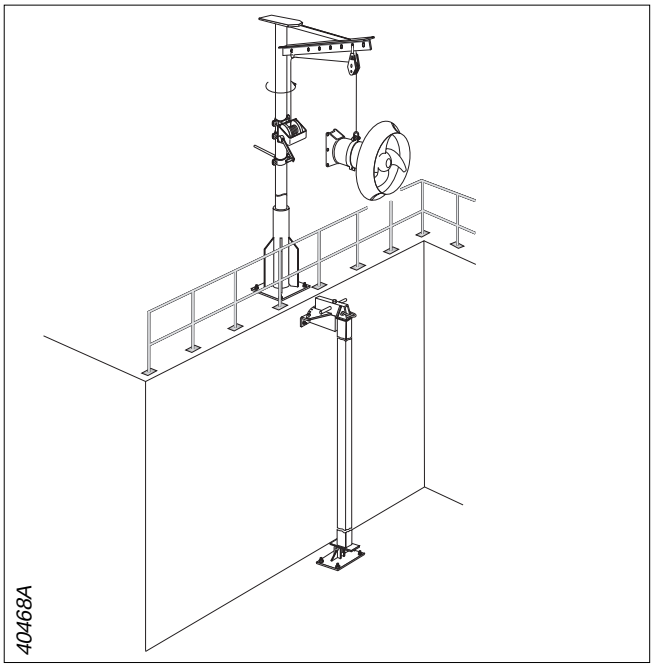
Whatever the type of installation, mixers must always be held in position by a chain or wire.



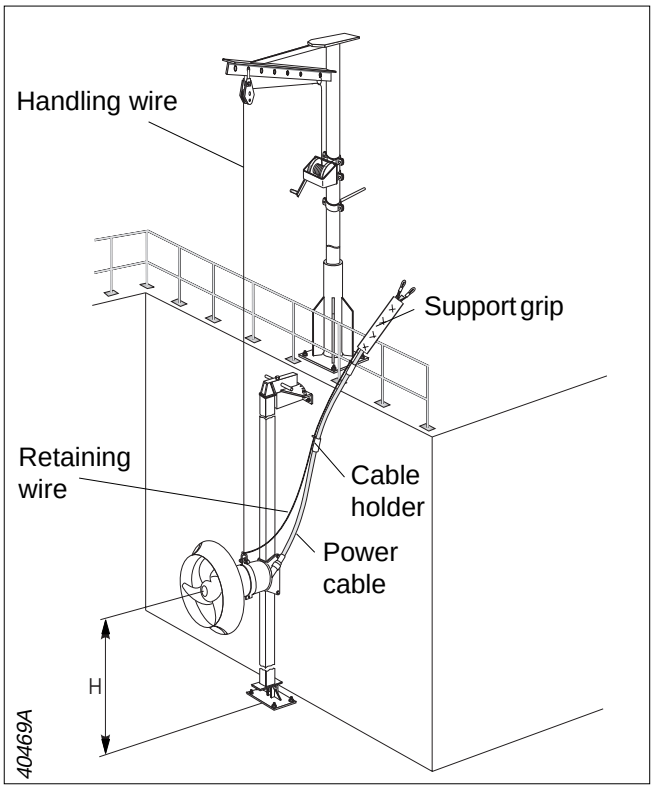

1) Attach the retaining wire or chain to the hole provided in the mixer by means of the shackle recommended by ITT Flygt.

   Attach the handling cable or chain to the unit.

a) Place support grip on the power cable. Place the cable holder on the power cable at intervals of 1,5 m.

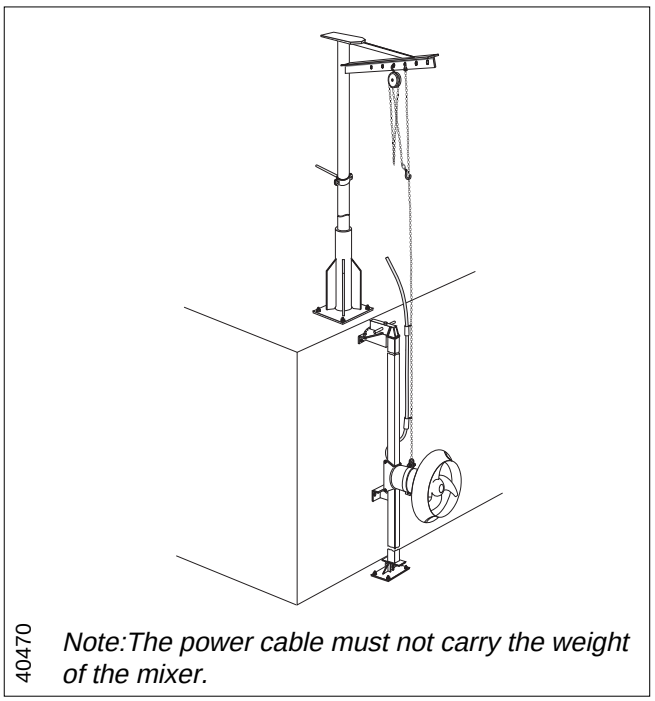



2) Raise the mixer and rotate it by means of the davit handle.




3) Lower the mixer by positioning it on the guide bar to the given height “H” from the tank bottom or to the support.

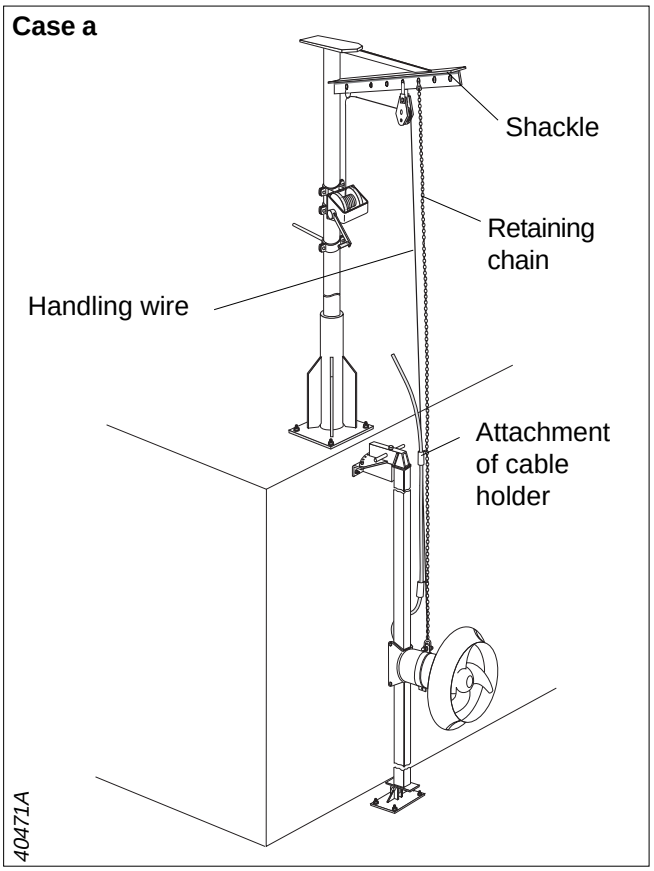
- Lower progressively the retaining chain or wire and the power cable.



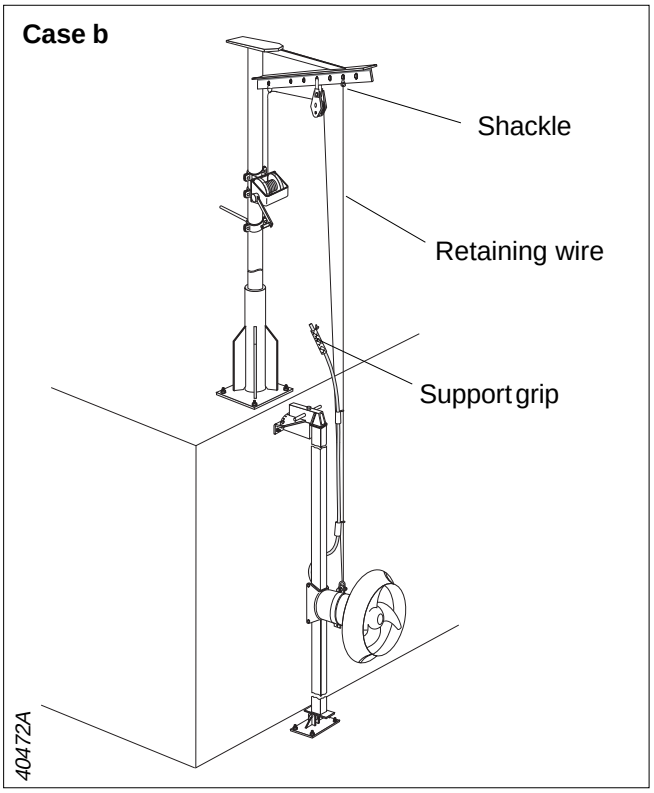

*Note:The power cable must not carry the weight of the mixer.*

4) On the first occasion of fitting a chain, it should be placed in taut position, followed by attaching the cable holder so that the power cable is slightly tensioned.

This is to prevent any possibility of the weight of the unit being imposed on the power cable because of incorrect attachment of the cable holder.

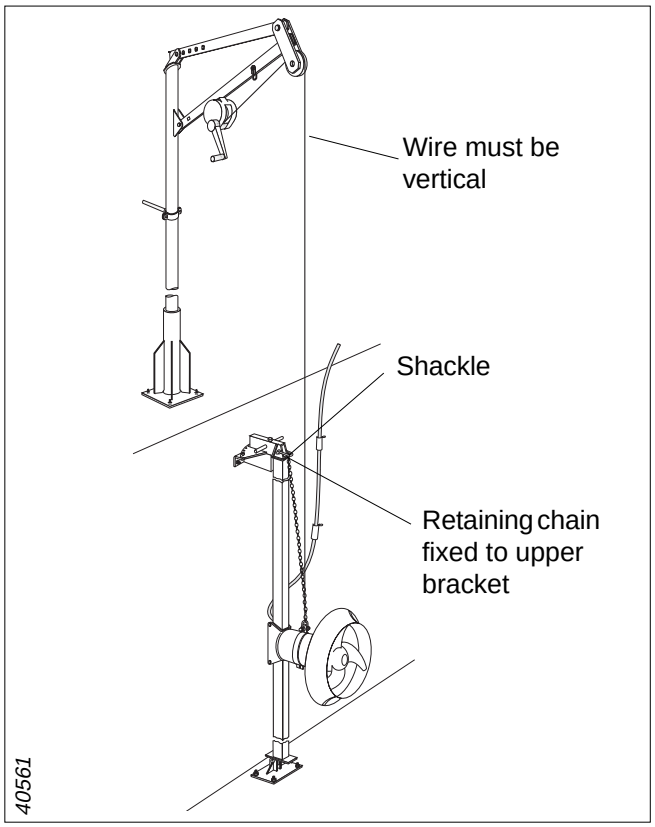



Place the power cable holder on the retaining chain at intervals of 1,5 m while maintaining slight tension on the power cable (mark the links to be attached to).



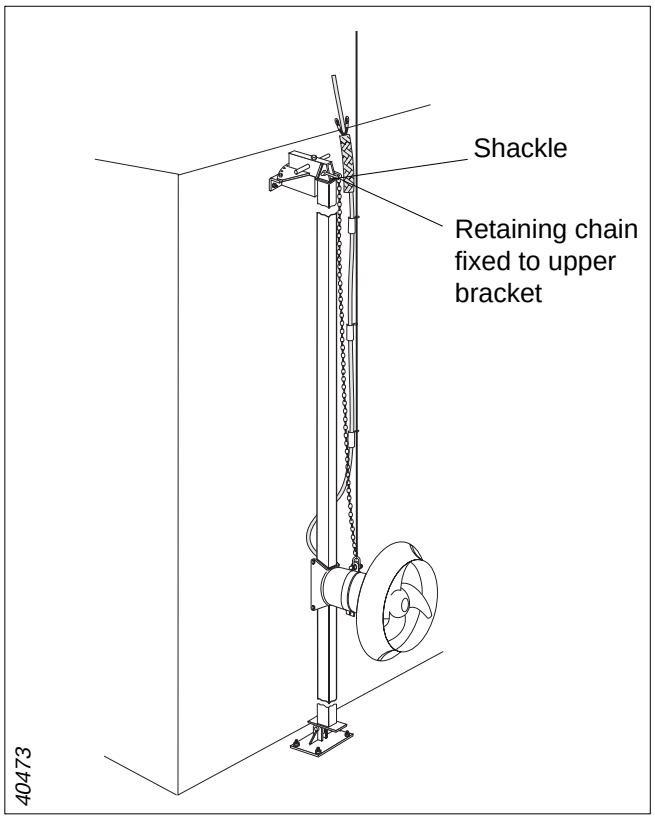

b) In the case of a wire, the grips may be attached by means of the snap hook progressively as the mixer is lowered (*).

(*) in this case it is compulsory for the power cable to be fitted with a support grip above the upper bracket.

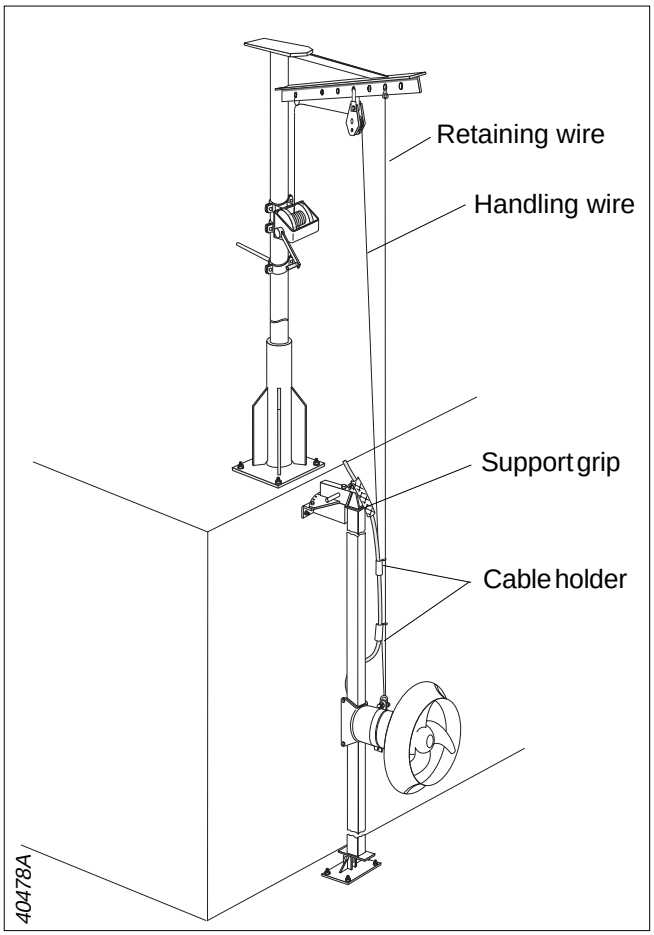



5) Present the retaining chain or cable facing the hole in the davit, thereby allowing it to have a vertical position.

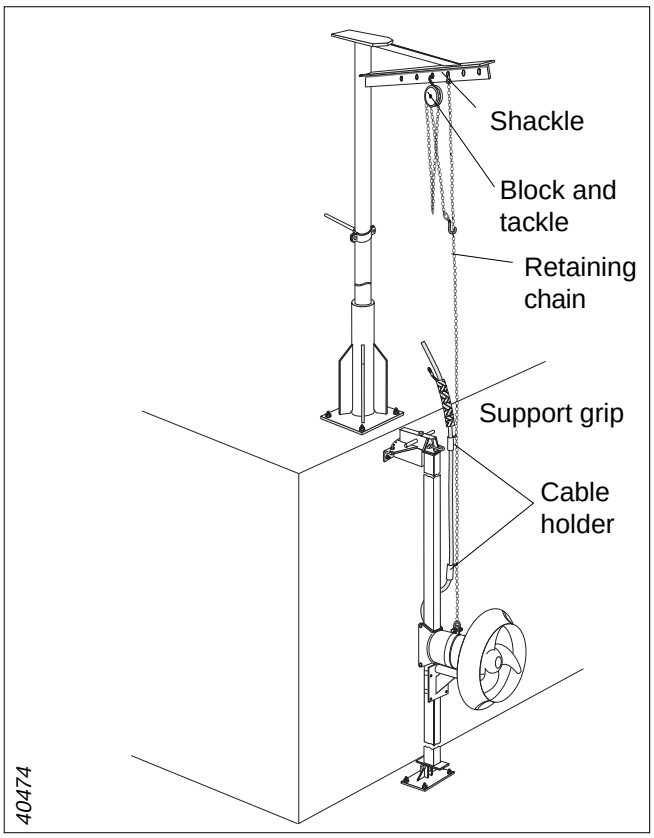
Fix the wire or chain to the upper bracket.




When using externel lifting source or if davit is to be removed, fix the retaining chain to the upper by using shackle. Cable holder and support grip must be used.

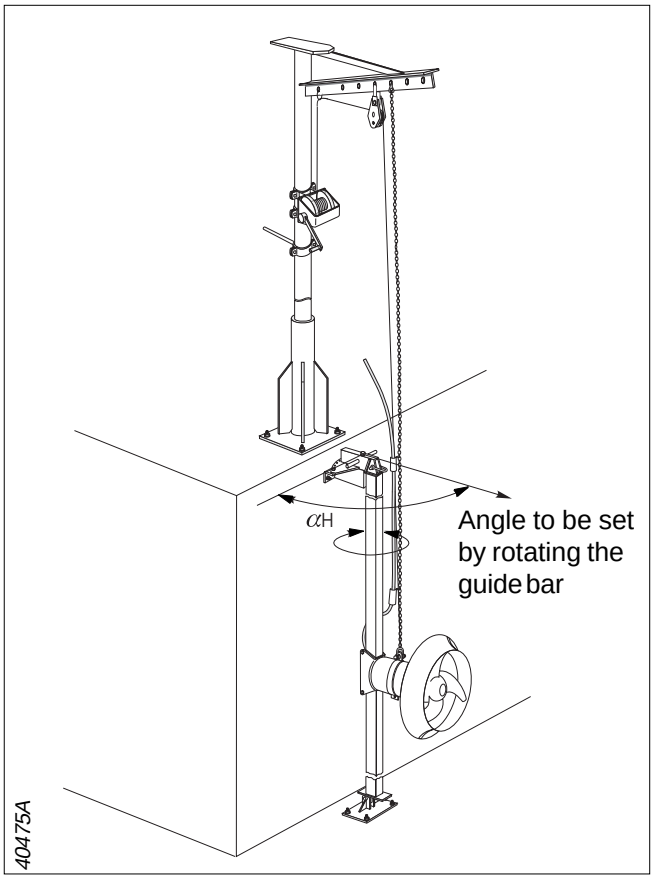


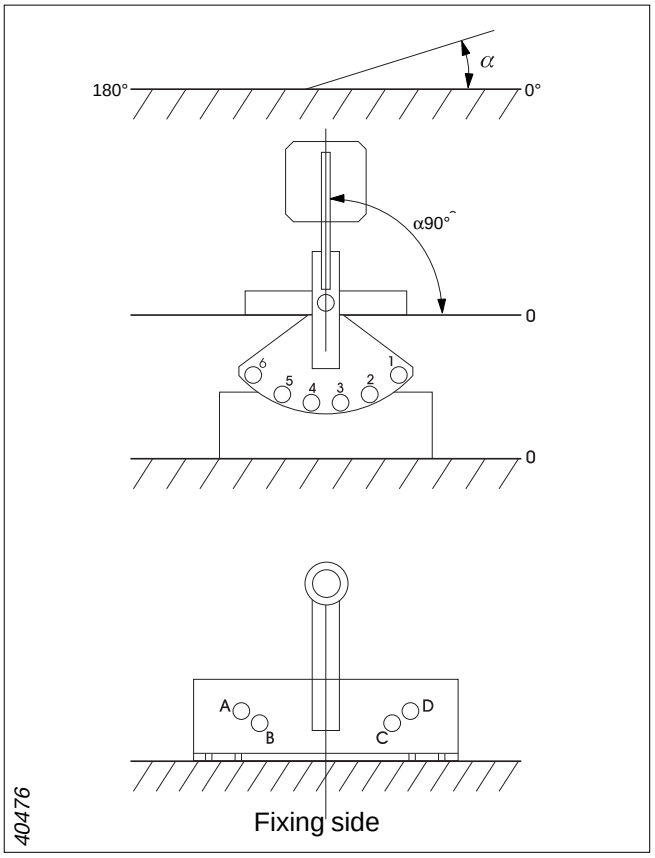

**Note:** It is important to make sure that the lifting chain, wire or power cable is taut enough not to be sucked into the propeller of the mixer.




Tackle and block used for the lifting procedure.

## POSITIONING THE MIXER, HORIZONTAL ANGLE

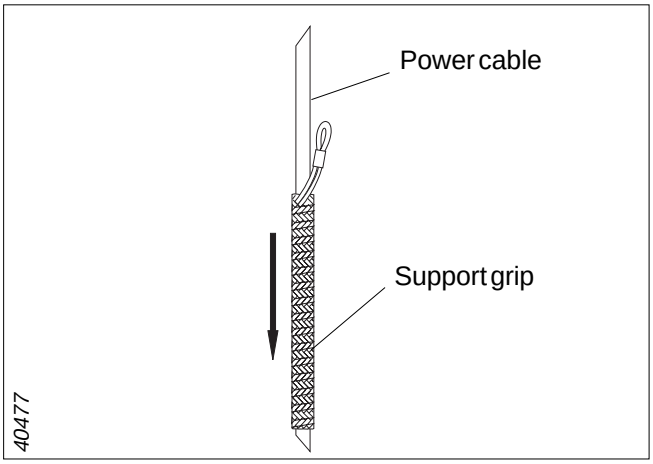



6) Oriente the guide bar according to the direction determined by ITT Flygt and place the indexing screw in the corresponding hole (see table of αH angles.)

**Identification of mixer orientation αH angles**

| αH Angle | Letter | Numeral | Letter | Numeral |
|---|---|---|---|---|
| | | (Other possible combination) | | |
| 0 | A | 1 | | |
| 10 | B | 1 | | |
| 20 | A | 2 | | |
| 30 | B | 2 | | |
| 40 | A | 3 | | |
| 50 | B | 3 | | |
| 60 | A | 4 | | |
| 70 | B | 4 | C | 1 |
| 80 | A | 5 | D | 1 |
| 90 | B | 5 | C | 2 |
| 100 | A | 6 | D | 2 |
| 110 | B | 6 | C | 3 |
| 120 | D | 3 | | |
| 130 | C | 4 | | |
| 140 | D | 4 | | |
| 150 | C | 5 | | |
| 160 | D | 5 | | |
| 170 | C | 6 | | |
| 180 | D | 6 | | |




7) Place the support grip in position on the power cable and attach it by means of the shackle supplied.

**Note:** If the mixer is held in position by wire and not by a chain, it is imperative to place a support grip on the power cable.

The mixer is ready for connecting to the power supply (see manual entitled “Installing, care and maintenance the mixer”).

FLYGT

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Single guide bar system.01.04 Eng. 0.3M. 06.00 PM © FLYGT AB 893066 Novum Grafiska AB, 00.35949