

# Counterweight

## WCW16 & WCW25 (1:1 & 2:1)

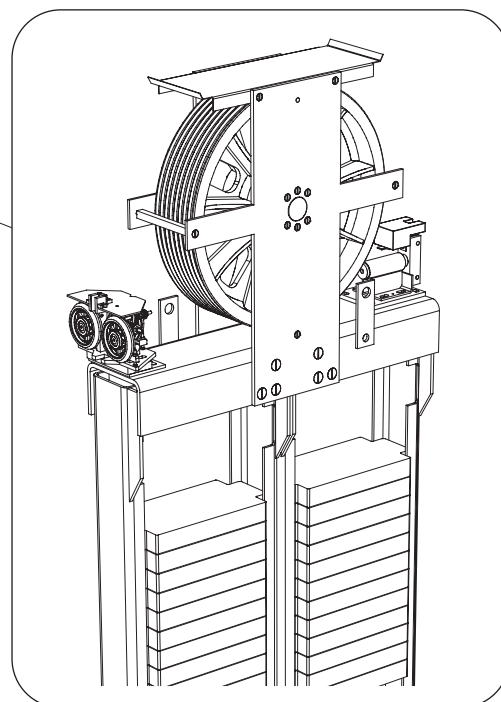
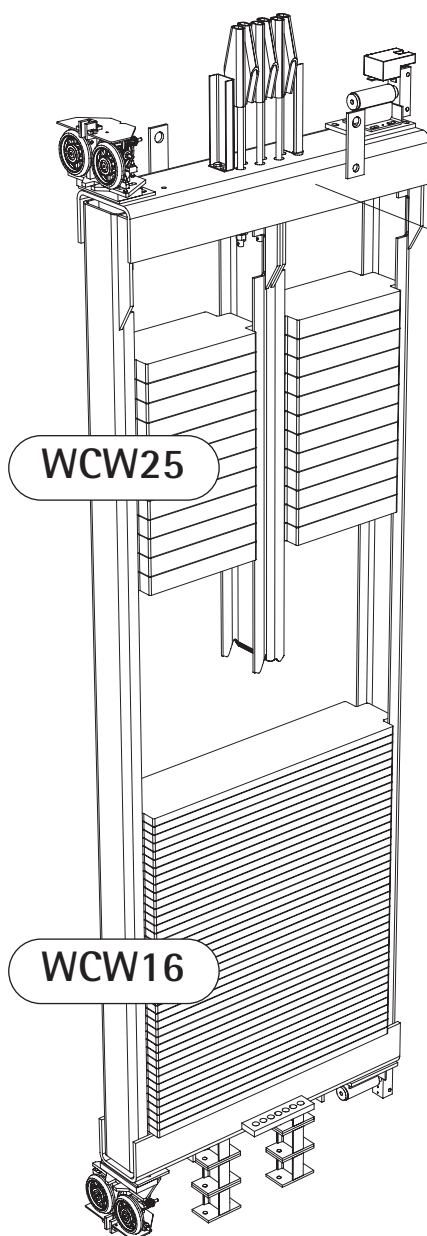
Operating instructions

Blatt/sheet D412MGB.000  
Datum/date 16.04.2002  
Stand/version C-23.07.2015  
Geprüft/approved WAT/MZE



## Counterweight Frame

### WCW16 & WCW25 (1:1 & 2:1 Suspension)



D412MGB 07.2015

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We reserve the right to make alterations with respect to the specifications and figures in this manual.



# Counterweight

## WCW16 & WCW25 (1:1 & 2:1)

### Operating instructions

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# Counterweight

## WCW16 & WCW25 (1:1 & 2:1)

### Operating instructions

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Datum/date 16.04.2002  
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## 1 General information prior to installation

### 1.1 Description and functions

The counterweight frame series WCW is a counterweight used for passenger-, passenger-goods and freight traction drive elevators.

In side or rear arrangement it is guided in the opposite direction to the lift car movement by at least two guides.

The counterweight WCW16 & WCW25, which is available with 1:1 and 2:1 suspension, is developed for constructions for higher loads and better ride-comfort. Because of its amount of options and modular assembly it is ideal for all elevator concepts.

The counterweight consists of a welded frame and layered inserts (so-called filler bits). Their number varies according to the material used and the total weight.

The counterweight frame operating range is defined as follows:

#### WCW16:

- Total weight  $\leq 4400$  kg ( $C \leq 970$  mm)  
 $\leq 4000$  kg ( $970 < C \leq 1070$  mm)

#### WCW25:

- Total weight  $\leq 7000$  kg

#### General:

- Height of frame  $\leq 6000$  mm
- Dist. betw. guides  $\leq 1070$  mm
- Nom. speed 4.0 m/s (2:1 susp.)  
7.0 m/s (1:1 susp.)
- Guide shoes Sliding guide shoe  
Roller guide shoe

#### Further options:

- Buffer spacers
- Earth quake package (for seismic risk zone)
- Filler weights
- Safety gear devices Type WCWSG

### 1.2 Liability and guarantee

This instruction handbook is written for people who are familiar with lift servicing and installation. Sufficient knowledge of lifts is essential.

WITTUR accept no responsibility for damage caused by improper handling, or for damage caused as a result of actions other than those stated in these operating instructions.

The WITTUR guarantee may be voided if parts other than those described in these instructions are installed.

Unless stated otherwise, the following are not permissible due to technical safety reasons:

- to use a buffer other than the prescribed one
- carrying out modifications, of any kind
- to install the counterweight differently to the description in these operating instructions
- to use the counterweight for a load and speed range different to that prescribed
- carrying out faulty or improper maintenance, maintenance or inspection checks
- using unsuitable accessories, spare parts or operating material which has neither been released by the WITTUR Company nor consists of original WITTUR spare parts

# Counterweight

## WCW16 & WCW25 (1:1 & 2:1)

### Operating instructions

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### 1.3 Safety precautions

WITTUR machine installation or repair engineers are chiefly responsible for the safe operation of machinery.

It is essential to comply with and keep abreast of all safety rules and legal obligations in order to avoid personal / product damage during installation, maintenance and repair work.

Important safety advice and danger warnings are emphasized with the following symbols:



General danger warning



High danger risk warning (i.e. crushing edge, cutting edge etc.).



Risk of damage to machinery parts (i.e. due to incorrect installation, or such like).



Important information sign

These operating instructions belong with the whole installation and must be kept in a safe place at all times (i.e. machine room).

The proper assembly and installation of WITTUR counterweights requires correspondingly well trained fitting engineers. The responsibility of training lies with the company appointed to carry out the work.

### Before starting installation work:



Only properly trained personnel may carry out work, or be allowed access to the installation site.

- Attach safety devices to guard against falling (platform or harnesses)
- Cover any floor openings
- Secure installation tools or objects against accidental falling
- Lift shaft openings should be cordoned off and suitable warning signs should be erected when working in shaft openings
- Work involving electrical equipment should only be carried out by an electrical engineer or qualified personnel.

### 1.4 Preparation

Before beginning installation work it is in your own interest to ascertain the constructional and spatial conditions. Where (workshop or on site) and when which installation operations can or must be carried out. It is recommended therefore, taking into account all the given circumstances, to plan the various operational sequences in advance, rather than carrying them out prematurely and in an unconsidered manner.

On receipt of the delivery, the goods or components should be checked for correctness and completeness with the order sheet.

Furthermore check:

- that the factory and order number correspond
- the rail head width and model
- the total weight
- the rope pulley diameter, the number of rope grooves and rope groove diameter are suited to the ropes

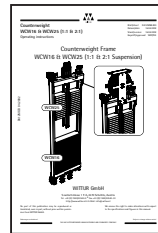
# Counterweight WCW16 & WCW25 (1:1 & 2:1) Operating instructions

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Datum/date 16.04.2002  
Stand/version 16.04.2002  
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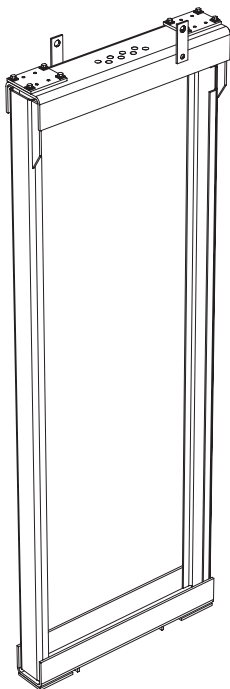
## 1.5 Content of supply

After delivery, check the counterweight frame for damage and for full delivery of parts. The content of supply covers:

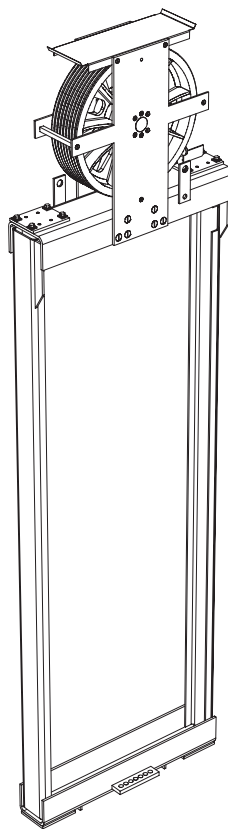
- Counterweight operating instructions manual
- Guide shoe operating instructions manual
- Counterweight frame (welded and pre-assembled)



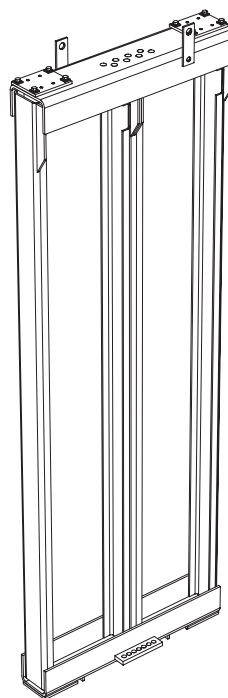
WCW16 1:1  
Suspension



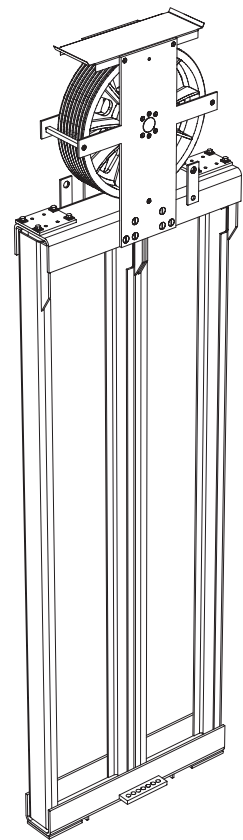
WCW16 2:1  
Suspension



WCW25 1:1  
Suspension



WCW25 2:1  
Suspension



# Counterweight

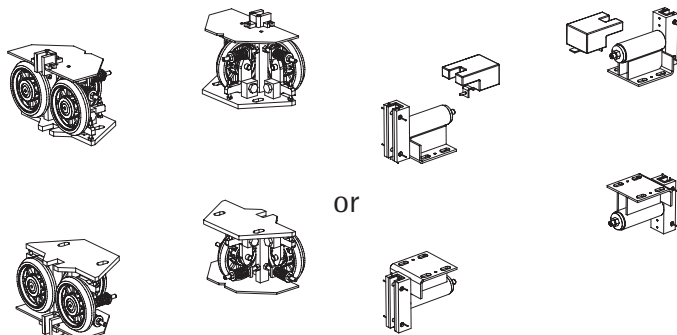
## WCW16 & WCW25 (1:1 & 2:1)

### Operating instructions

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#### Accessories:

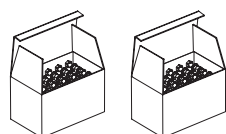
- Guide shoes



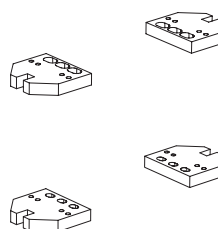
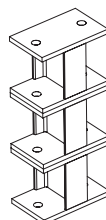
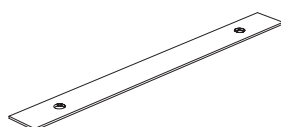
- Rope fasteners (for 1:1 suspension) - welded or caste type according country regulations

- Buffer spacer

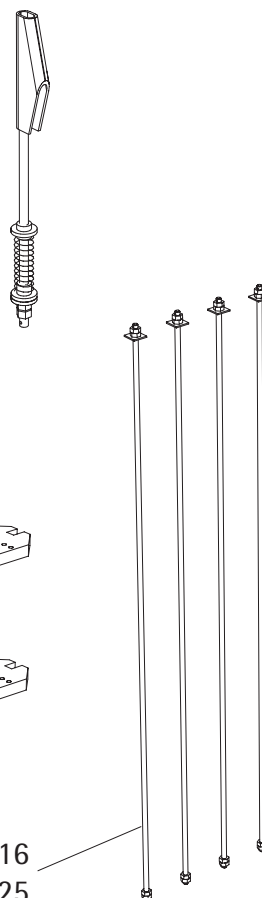
- Screw packages



- Earth quake package (tie rods, positioning device, restraining plates, stiffener flat, ...)



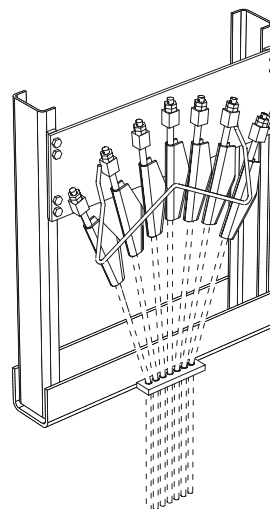
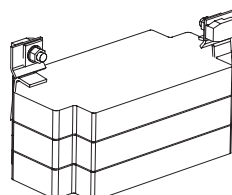
2 pcs. Tie rods if WCW16  
 4 pcs. Tie rods if WCW25



- Compensation rope fixing support (incl. rope fasteners)

- Filler bit fixings (different versions)

- Filler bits



# Counterweight

## WCW16 & WCW25 (1:1 & 2:1)

Operating instructions

Blatt/sheet D412MGB.006  
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## 2 Installation



If the counterweight incorporates safety gear, move straight to section 2.2!



The guide rails should have been already properly set. The distance between the guide rails should be checked before installing the counterweight frame.

### 2.1 Lifting the counterweight frame into the shaft

The counterweight frame is delivered welded and pre-assembled.

#### Procedure:

- (1) Lift the frame into the shaft between the guide rails using a hoist block
- (2) Fit the guide shoes (for setting refer to operating instruction manuals of guide shoes).



Note the correct position of the frame in the shaft – the filler bits loading cut-outs in the vertical beams should face towards the car (check layout drawing).



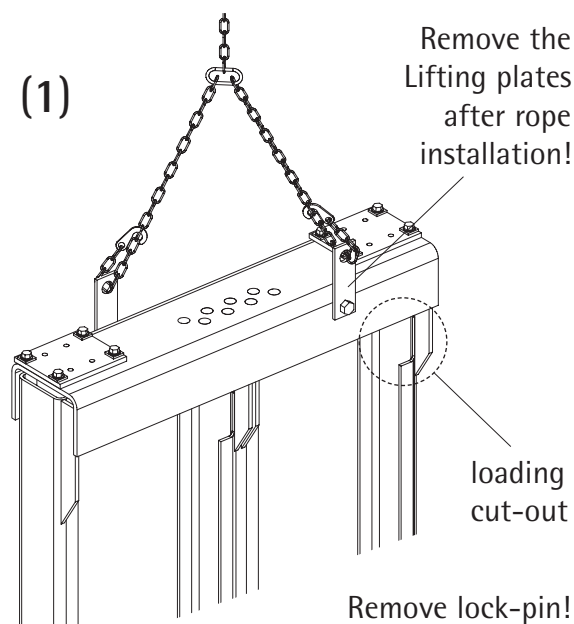
In case of counterweight is used in seismic risk zones, additional restraining plates (30mm thick plate) will be placed between guide shoe and crosshead beam of the frame.



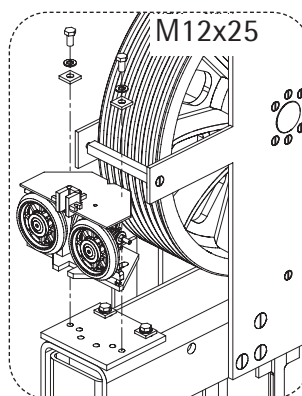
Take care of tightening torque  
Screw M12: 80Nm  
Screw M16: 195Nm

- (3) Lower the frame on to a support frame or installation support.
  - Always use the frame's lifting plates when lifting the frame.
  - Check the loading figures for the support frames from the relevant documentation.
  - The frame should be secured with a hoisting cloth (or chain) attached either to the hoisting block or the nearest guide fixing. This retainer should only be removed after the suspension ropes have been fitted.

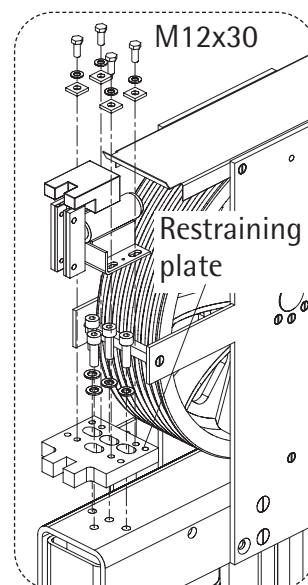
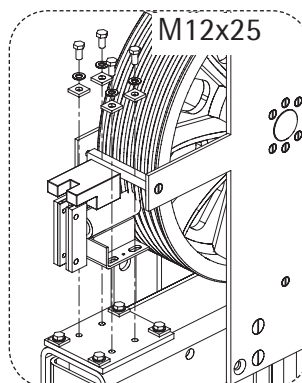
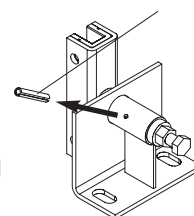
(1)



Remove lock-pin!



(2)





# Counterweight

## WCW16 & WCW25 (1:1 & 2:1)

Operating instructions

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### 2.2 If Safety gear is included

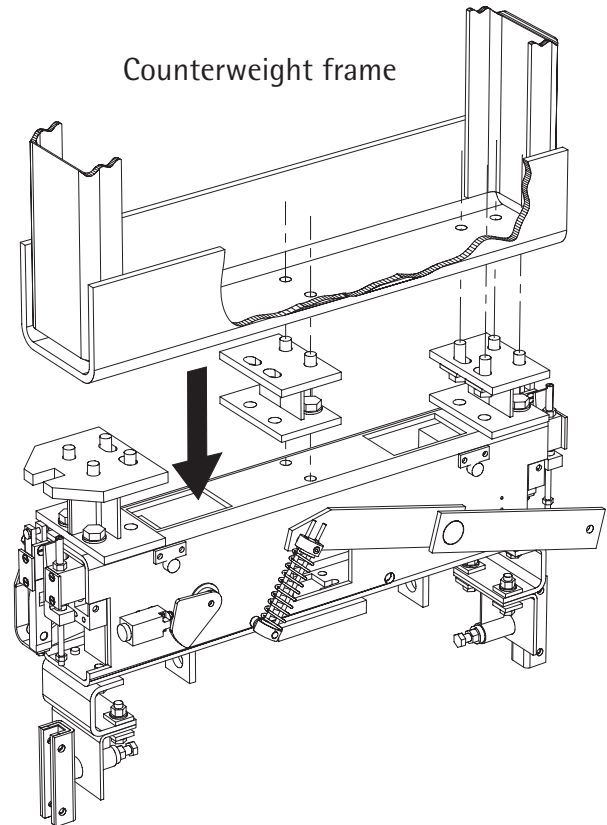


Move on to section 2.3 if safety gear is not included!

- (1) Fit the counterweight safety gear into the guide rails (refer to operating instruction manuals of safety gear).
- (2) Lift the frame (see section 2.1) using a hoist block and place on top of the safety gear between the guide rails.
- (3) Fix the upper guide shoes
- (4) Fit the counterweight frame to the safety gear



Take care of tightening torque  
Screw M16: 195Nm

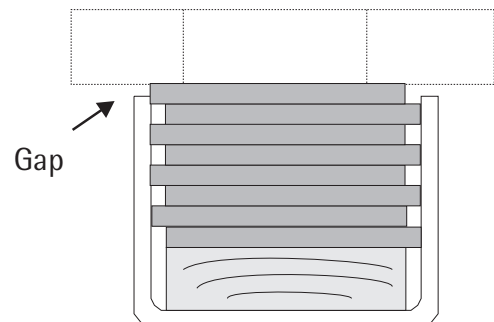


### 2.3 Loading counterweight filler bits

- (1) Load the counterweight frame with the filler bits



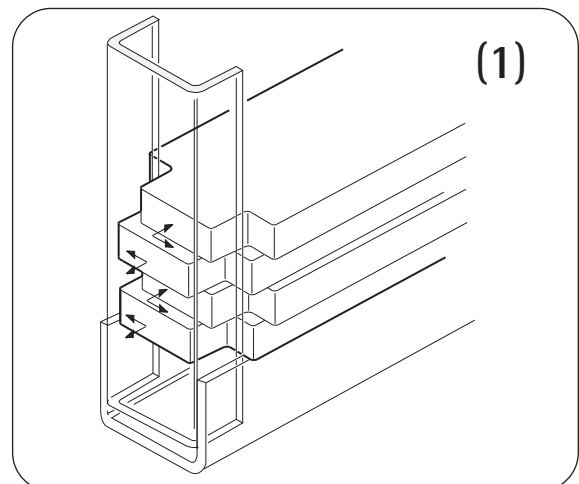
If filler bits capable of fitting inside the lower beam are supplied, load these first. There should be a gap, as shown in the drawing beside, between the top edge of the lower beam and the first wide filler bit.



The filler bits should overlap one another, as shown in the picture.



This ensures that the counterweight is balanced and prevents noise being generated by bits shaking about.





# Counterweight

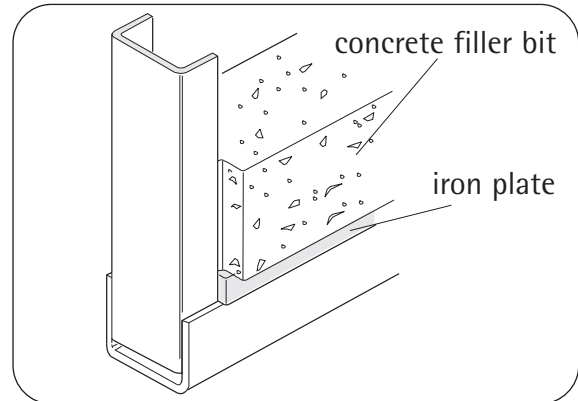
## WCW16 & WCW25 (1:1 & 2:1)

### Operating instructions

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 Datum/date 16.04.2002  
 Stand/version 16.04.2002  
 Geprüft/approved WAT/MZE

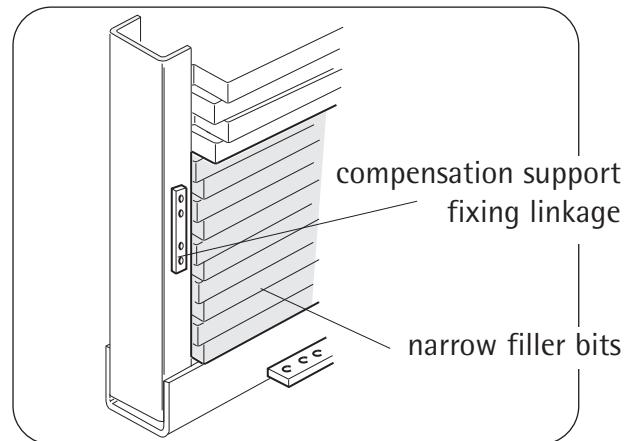
#### 2.3.1 Using concrete counterweight filler bits

Concrete bits should be loaded on top of a steel or cast iron plate.



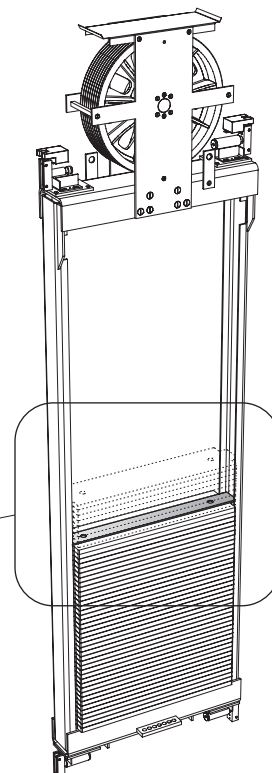
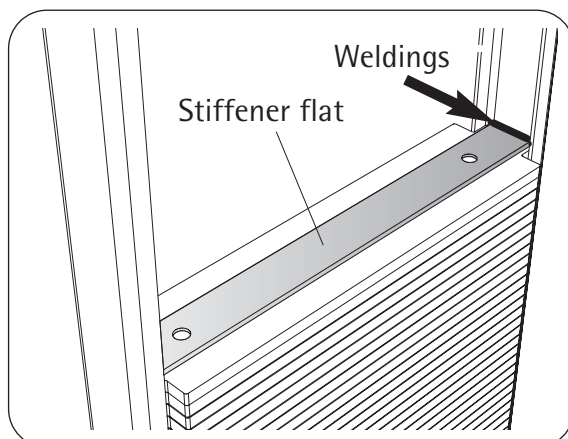
#### 2.3.2 When the counterweight is to be fitted with compensation ropes

If there are different filler bits delivered, than the narrow filler bits should be loaded first to enable the compensating ropes to be fitted.



#### 2.3.3 Welding stiffener in the middle of the filler bits stack

! If the counterweight frame is used in seismic risk zone, a stiffener flat have to be welded to the uprights in the middle of the filler bits stack total height - afterwards, go on with loading filler bits!



# Counterweight

## WCW16 & WCW25 (1:1 & 2:1)

Operating instructions

Blatt/sheet D412MGB.009  
 Datum/date 16.04.2002  
 Stand/version 16.04.2002  
 Geprüft/approved WAT/MZE

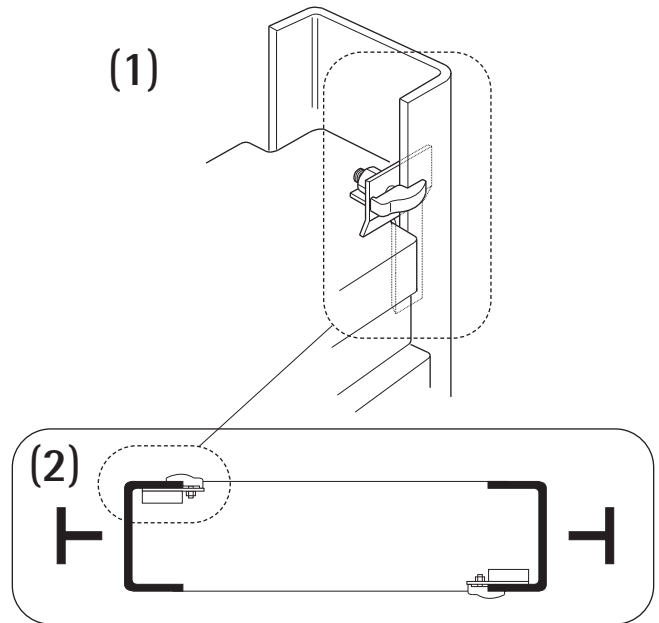
### 2.4 Locking filler bits

#### 2.4.1 Standard locking

(1) Slacken off the clip bolt nut and insert the lock between the upright beam and the counterweight filler bits as shown in the picture; tighten the nut.

(2) Fit a similar lock in the same way to the opposite corner

! Take care of tightening torque  
 Screw M16: 195Nm

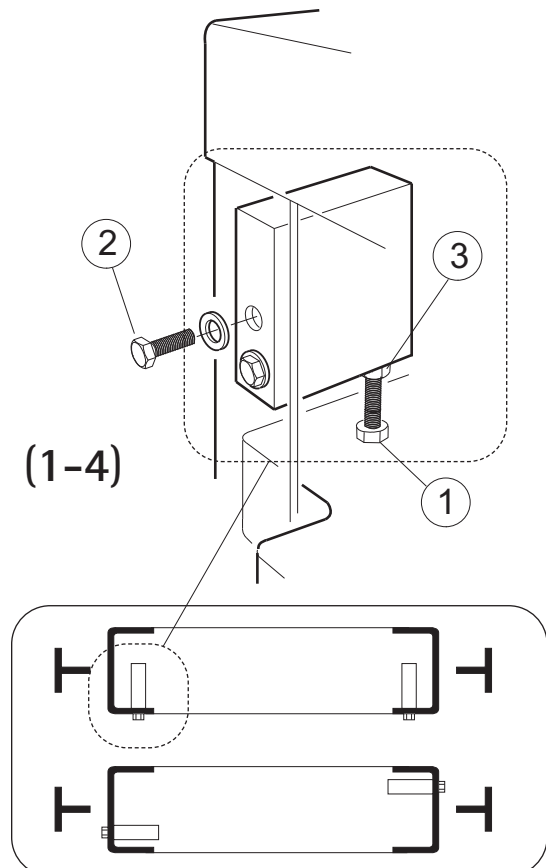


#### 2.4.2 Locking procedure when having welded extra-weights or when using compensating ropes

This locking procedure is delivered when welded extra-weights are ordered or the counterweight is fitted with compensation ropes (locks coincide with the channel in the upright beam). Locks are normally fitted from the car side.

! If locks coincide with the channel in the upright beam, they should be fitted from the guide rail side on **opposite corners** (see picture).

- (1) Screw the bolt (1) in, mark off, and drill the fixing holes for the M12 bolts (2).
- (2) Fit the lock and tighten the bolts (2).
- (3) Undo bolt (1) sufficient turns so that it tightens against the counterweight filler bit.
- (4) Tighten the lock nut (3).



# Counterweight

## WCW16 & WCW25 (1:1 & 2:1)

### Operating instructions

Blatt/sheet D412MGB.010  
 Datum/date 16.04.2002  
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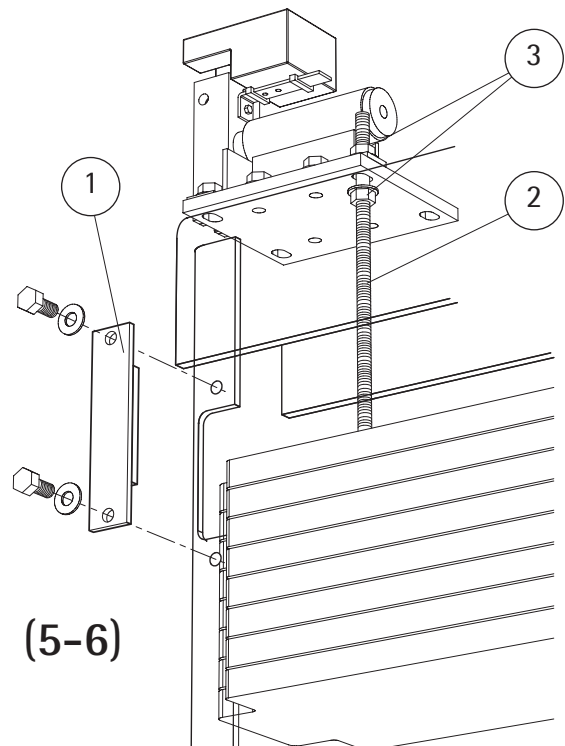
#### 2.4.3 Locking procedure when the counterweight frame is full (bits reach as high as the cutout)

When the counterweight frame is full, the loading cut-out is to be covered with a piece of flat bar, and bolts passing through the upper beam are used to lock the filler bits in place.

- (5) Mount the plate (1) to the cut-out with screws M12x25
- (6) Tighten the M12x250 threaded bar (2) through the hole in the guide shoe adapter plate and tapped hole in the upper beam against the counterweight filler bit - counter with delivered nuts (3).



Fit the second bar crosswise.



# Counterweight

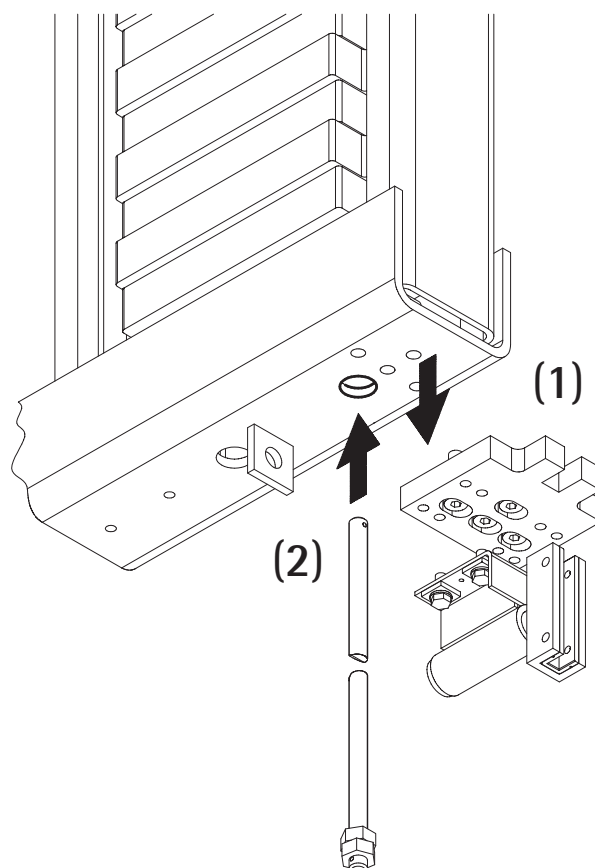
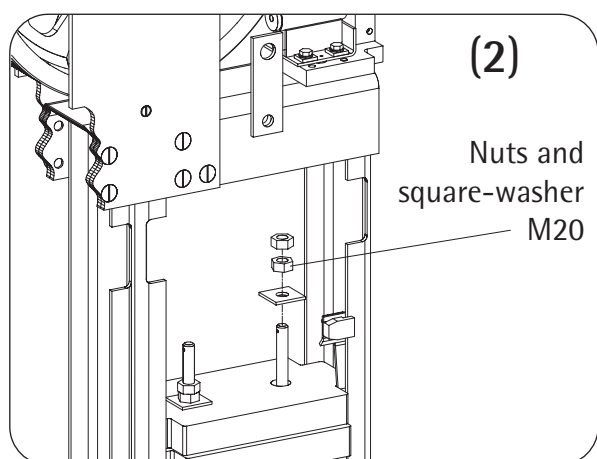
## WCW16 & WCW25 (1:1 & 2:1)

### Operating instructions

Blatt/sheet D412MGB.011  
 Datum/date 16.04.2002  
 Stand/version 16.04.2002  
 Geprüft/approved WAT/MZE

## 2.5 Installing the tie rods (earth quake package)

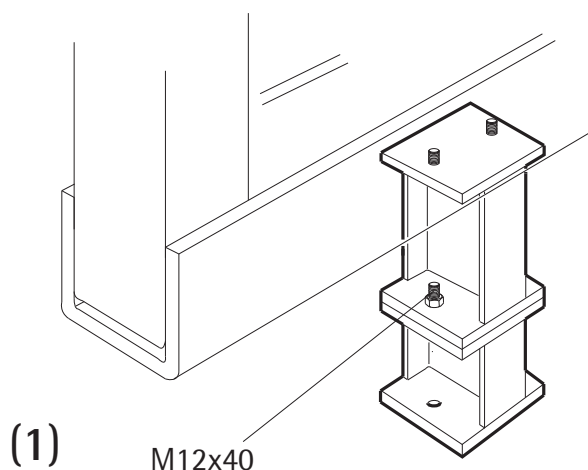
- (1) Re-mount the lower guide shoes and restraining plates
- (2) Pull the tie rods up through the counterweight frame and filler bits and attach it to the top of the stack
- (3) Re-fit the lower restraining plates and guide shoes



## 2.6 Buffer spacers

- (1) Buffer spacers are made of steel. Bolt the pieces to the lower beam of the counterweight frame.

! Take care of tightening torque  
 Screw M12: 80Nm



# Counterweight

## WCW16 & WCW25 (1:1 & 2:1)

### Operating instructions

Blatt/sheet D412MGB.012  
 Datum/date 16.04.2002  
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 Geprüft/approved WAT/MZE

## 2.7 Roping of the counterweight

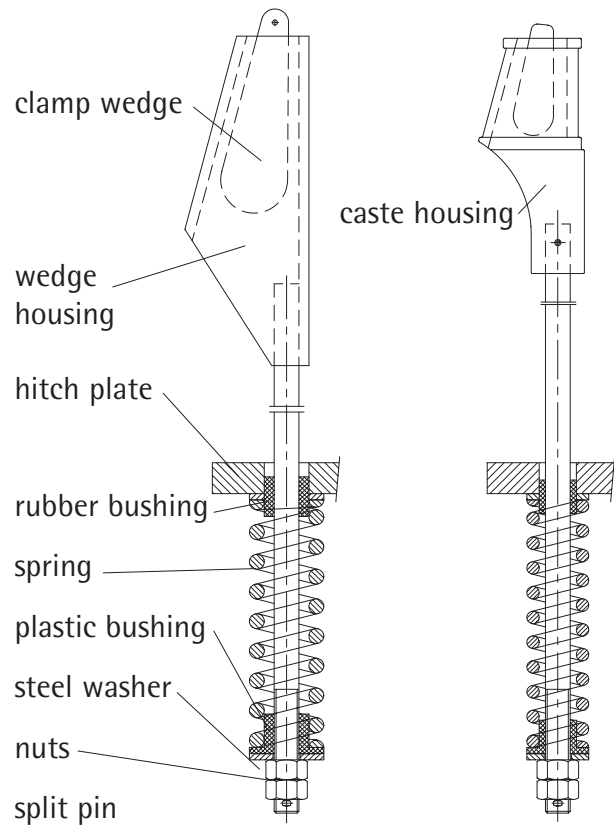
### 2.7.1 1:1 Suspension



Rope anchor assembly (depending on country code) see figure besides:

EN81, NZS, GOST

ANSI, CSA, SAA



Rope arrangement depending on number of ropes see figure besides:

4 x D8 / D10 / D13 / D16



7 x D8 / D10 / D13 / D16



5 x D8 / D10 / D13 / D16



8 x D8 / D10 / D13 / D16



6 x D8 / D10 / D13 / D16



9 x D8 / D10 / D13 / D16



# Counterweight

## WCW16 & WCW25 (1:1 & 2:1)

### Operating instructions

Blatt/sheet D412MGB.013  
 Datum/date 16.04.2002  
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#### (1) Fasten the ropes to the rope anchor:

- Make a loop on the rope by feeding the end of the rope through the socket and then feed it back. Do not twist the rope, just turn it back.
- Insert the wedge and pull the loop into the socket
- Simultaneously with an other person pulling the ends of the rope, secure proper seating by hammering the wedge with wooden block.

#### (2) Equalize the tension of ropes



After all ropes are installed as described above, let the weight of the car and/or counterweight rest on ropes to seat the wedges and ropes into the socket firmly. If any rope is tighter than the others, it can be equalized as follows:

- Tap the wedge outwards until the rope slides, using a hammer and a drift pin, which is inserted into the top of the rope socket between

#### (3) Secure the rope tail-end

Properly made tail-end securing will prevent wedge from falling out if rope suddenly get loose.



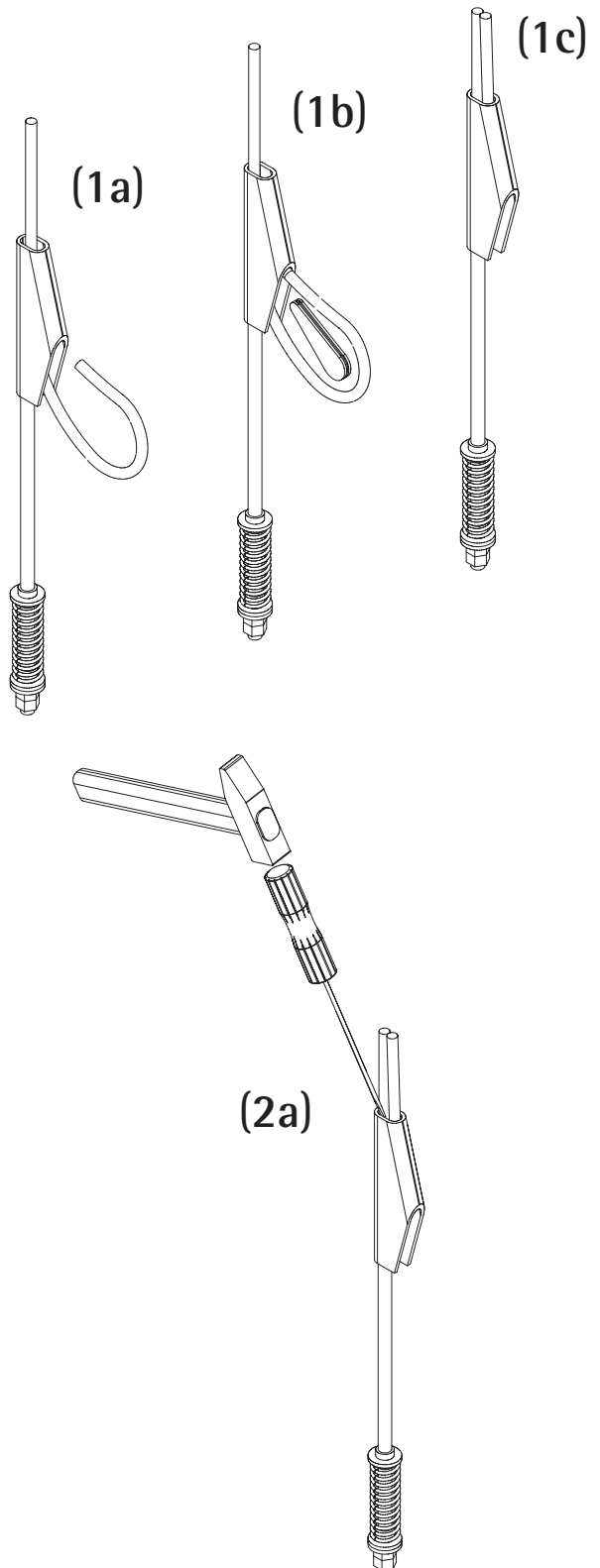
Be aware of local laws and regulations concerning tail-end handling methods.



The rope clip is not delivery content of the car frame!



The rope clips should be used and tighten to torque recommended by the manufacturer.



# Counterweight

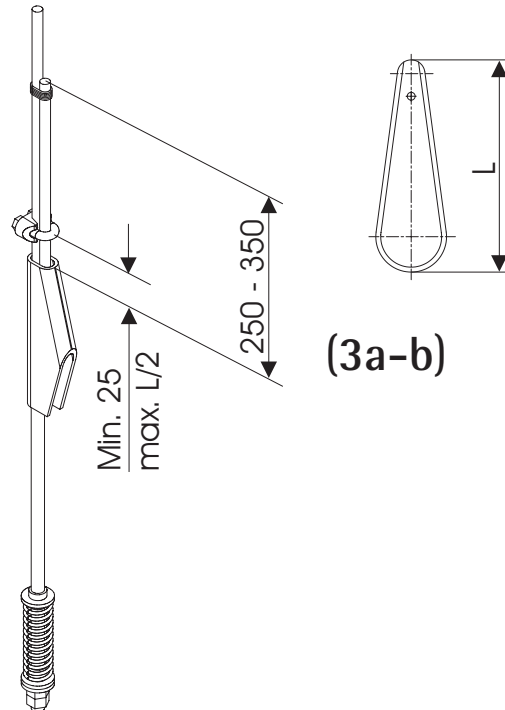
## WCW16 & WCW25 (1:1 & 2:1)

### Operating instructions

Blatt/sheet D412MGB.014  
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One main method is described below but any other acceptable local method can be used.

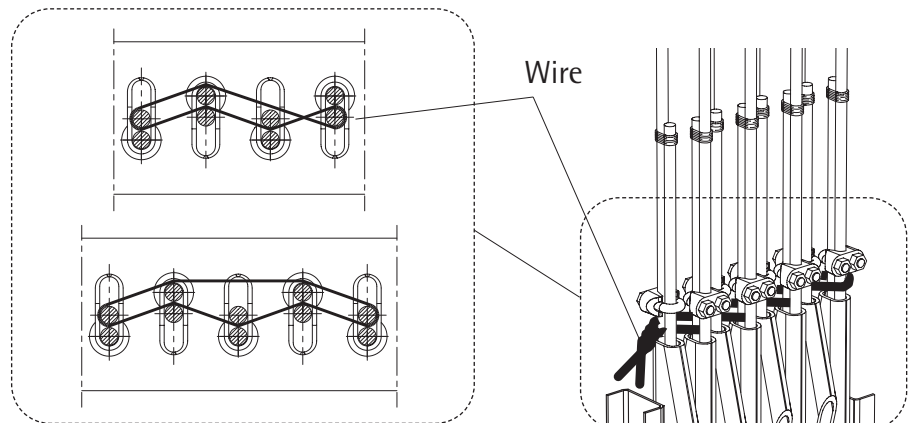
- Secure the tail-end of the rope to the live-end with a rope clip from 25mm to  $L/2$  of the wedge. The U-bolt must be fitted to the dead-end of the rope and the saddle must be fitted to the load bearing end of the rope.
- Tie the tail of the dead-end to the live rope using soft steel wire or bundle binder



(3a-b)



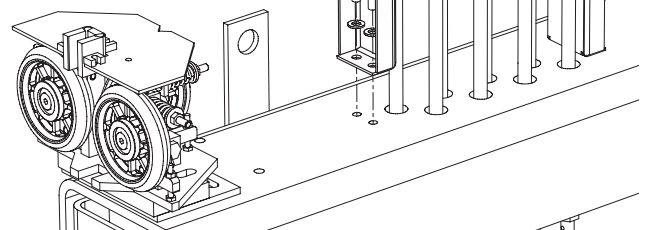
If the wedges are not enough close to each other to prevent full rotation (wedge housing broadens the counterweight when rotating), tie the terminations together using e.g. soft wire. Do not prevent equalization springs working.



Rope turn stop



A rope turn stop is delivered, if rope diameter  $\geq 13\text{mm}$  and country-code is ANSI, CSA, SAA; or rope diameter is 16mm (for every country regulations); or the counterweight is used in seismic risk zone!





# Counterweight

## WCW16 & WCW25 (1:1 & 2:1)

### Operating instructions

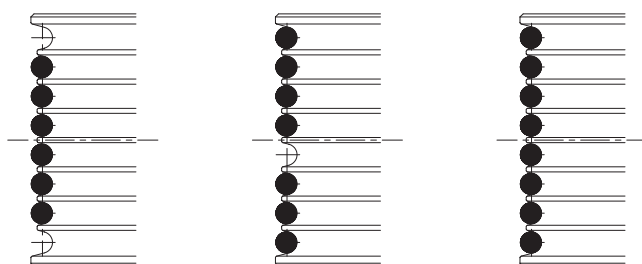
Blatt/sheet D412MGB.015  
Datum/date 16.04.2002  
Stand/version 16.04.2002  
Geprüft/approved WAT/MZE

#### 2.7.2 2:1 Suspension

- (1) Support the pulley from the wall side using a piece of wood or metal (A) before removing plate (B)
- (2) Remove plate (B) after taking out all its fixing screws
- (2a) Remove the rope cover (D) ... delivered if counterweight is used in seismic risk zone.
- (3) Pass the rope round the diverter pulleys

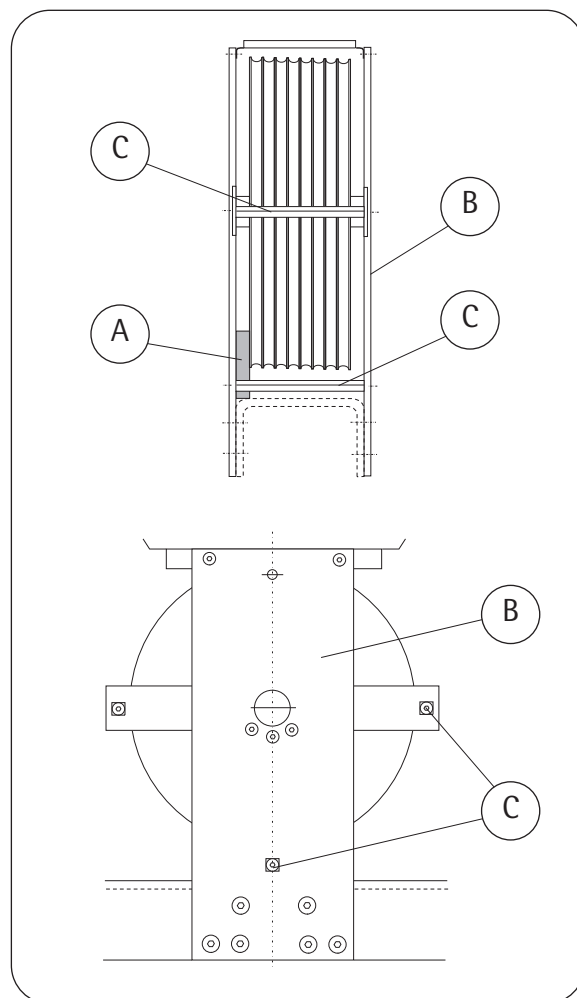


When used number of ropes is less than the number of grooves on the diverter pulley, the ropes are placed according to the figure below.

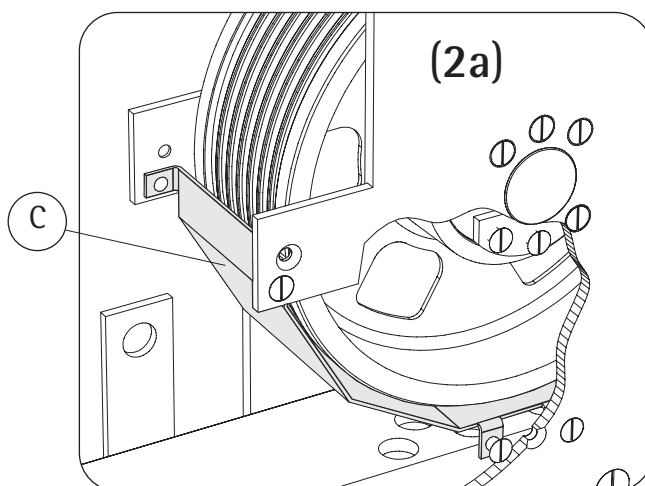


- (4) Replace the cover plate
- (5) Adjust the gap between the rods (C) and ropes to 3 mm!

(1-5)



(2a)




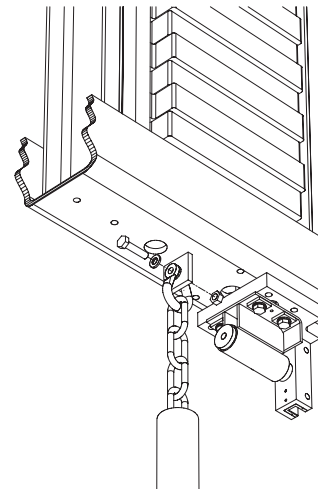
# Counterweight WCW16 & WCW25 (1:1 & 2:1) Operating instructions

Blatt/sheet D412MGB.016  
Datum/date 16.04.2002  
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## 2.8 Mounting compensation chains

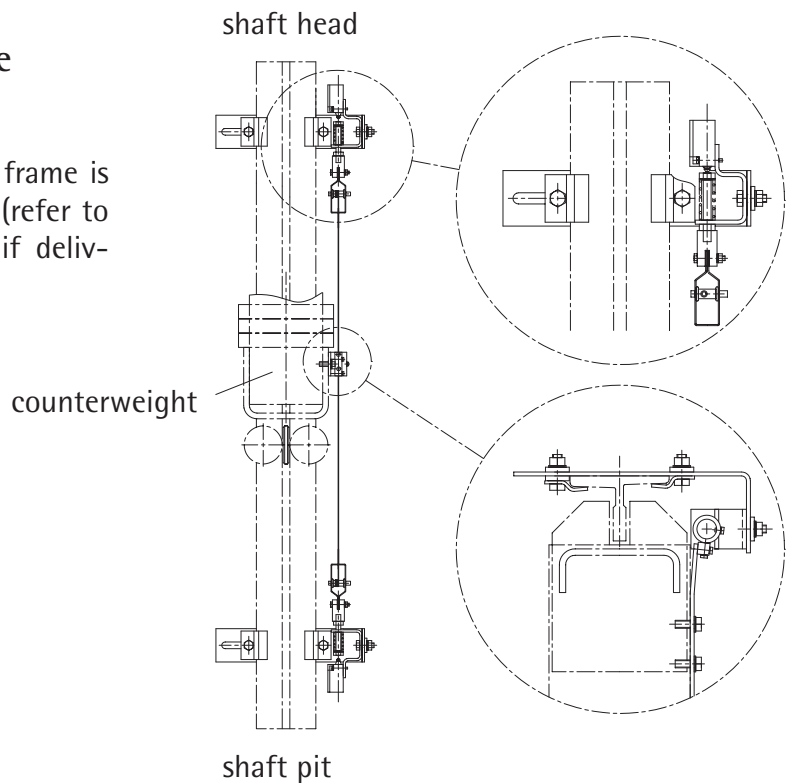
Fix the compensation chains to the fixing supports below the counterweight frame.

 Use fixing materials delivered with the compensation chains (shackles). Take care about correct chain position (refer to the layout-drawing).



## 2.9 Derailment detection device (earth quake package)

This device detects if the counterweight frame is not within its normal operation position (refer to separate operating instruction manuals if delivered).



# Counterweight

## WCW16 & WCW25 (1:1 & 2:1)

### Operating instructions

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 Geprüft/approved WAT/MZE

## 2.10 Compensation rope fixing

In elevators with great travelling heights and higher speeds, compensation ropes are used.

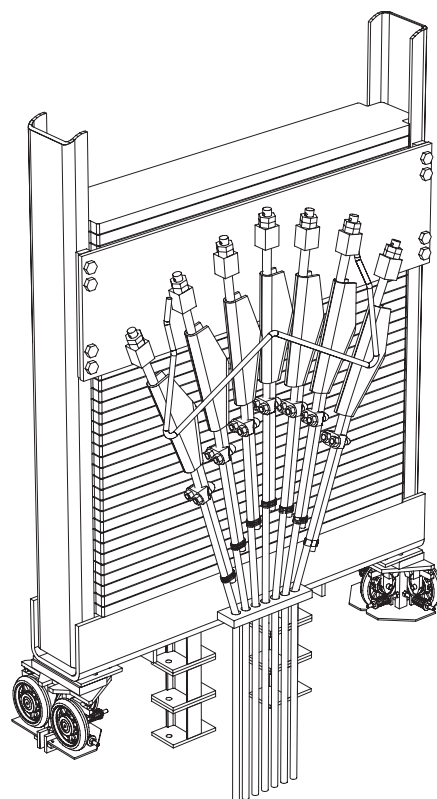
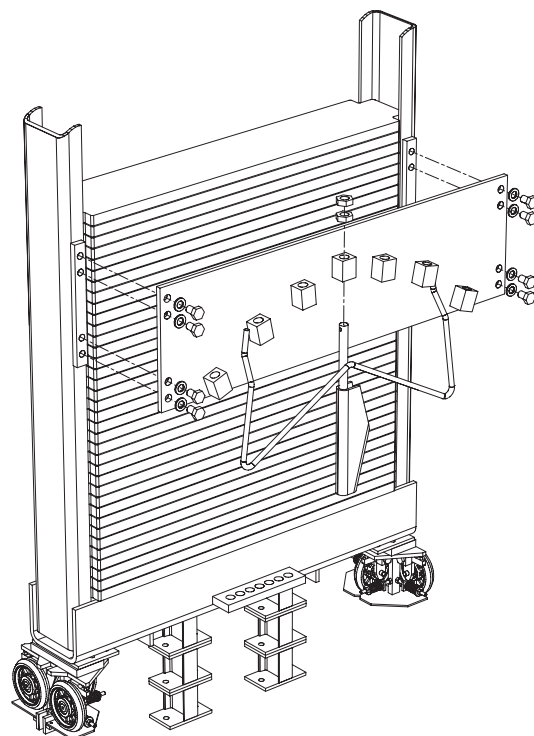
- (1) Mount the support plate to the counterweight frame

! ⚙️ Take care of tightening torque  
 Screw M16: 195Nm

- (2) The ropes have to be installed and tensioned according to the figure besides. The location of the ropes should be co-ordinate with the location of the car side compensation ropes.

👉 For fastening of the compensation ropes to the rope fasteners refer also to the section 2.7.1 - roping of the counterweight.

⚠️ Be aware of local laws and regulations concerning tail-end handling methods. The type and number of rope clips is chosen according to the regulations of the country in question.



# Counterweight

## WCW16 & WCW25 (1:1 & 2:1)

### Operating instructions

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## 3 Function testing

Operational reliability of the installation is assured, assuming that all guide lines were adhered to during proper installation. The quality and function of individual components are subject to thorough inspection and is checked before dispatch from our works. Once installation fitting is complete, the lift counterweight system should undergo an operational test before commissioning or before possible inspection from a technical institute.

### First test run after installation



Before the first test run:  
Clean the guide rails!



Clear all people and objects from the lift shaft before commencing the test run  
**Risk of crushing injuries!**

The entire lift travel path should be slowly travelled (in inspection mode) before the functions tests. Attention should be paid to the clearance of all fastened parts, especially with regards to the guide brackets/safety gear devices. Find and remove any protruding bolts or other dangerous restrictions well in advance.

Make sure there is ample space:

- in the guide bracket area
- between the counterweight and lift car/cabin
- to the counterweight screen in the pit
- to the wall (over the whole travel)

### Counterweight check



Proper operation of the lift installation with regard to regulations and safety can be guaranteed only when the corresponding weight compensation with the counterweight is checked before commissioning.



The counterweight normally corresponds with the lift car plus 50% (40%) of the rated load.

### **Test steps:**

- Load the lift car with test weights up to half the rated load weight (or corresponding value)
- Now move the lift car and counterweight to the same height
- Switch off system and open the brake on the actuator



When there is a state of equilibrium between the counterweight and the loaded lift car, the gear handwinding wheel turns gently in both directions. Lift car or counterweight do not creep down.

If this is not the case, a correction needs to be made to the counterweight by removing or adding counterweight fillers:

### **Lift car creeps down (counterweight lighter):**

- Remove test weights from the lift car until the gear handwinding wheel can be easily turned both ways
- Determine quantity withdrawn and add counterweight fillers accordingly

### **Counterweight creeps down (counterweight heavier):**

- Load more test weights in the lift car until the gear handwinding wheel can be easily turned both ways
- Determine loaded quantity and remove counterweight inserts accordingly



Carry out a test again with half the rated load after correcting the counterweight. Now the filler weights need to be fastened again by "filler clamps".

# Counterweight

## WCW16 & WCW25 (1:1 & 2:1)

### Operating instructions

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Datum/date 16.04.2002  
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Geprüft/approved WAT/MZE

## 4 Maintenance, inspection and repair

### 4.1 Maintenance and inspection

The WITTUR counterweight frame requires little servicing.

Inspection checks must be carried out at regular intervals (minimum twice a year with each service) to guarantee safe operation. Alterations, damage or other irregularities should be reported, and repaired if possible. Frequent servicing and control checks not only make operation of the installation safer, but also ensure long and reliable service life.

It is recommended that control checks and servicing be carried out before legally prescribed functional tests (e.g. before TÜV tests).



The lift installation must be immediately taken out of use should any damage or irregularities to the lift car frame arise which could possibly impair operational safety.



Please contact us at WITTUR if you have any problems or queries.



Maintenance work should be expertly carried out with utmost care in order to guarantee safe installation operation.

### WITTUR counterweight frame maintenance and inspection check list

#### General:

- Visual inspection for general irregularities (i.e. dirt build up, corrosion, deformation, fracturing etc.)
- Check the screw connections

#### Lubricators:

- Replenish
- Check the felt inserts for damage, replace if necessary

#### Guides:

- Check inserts or rollers at every service call. Replace the sliding inlays by new one if the running clearance is more than 2mm (refer to the Chapter "Carrying out repairs"). The surface of the roller has to be clean & not broken.

#### Safety gear devices:

- Check the operation of the safety gear device at every service call. Refer to the operating instructions of the installed safety device.
- The surface of the wedge area has to be clean. Wedge and roller must not be cracked.
- Check the overspeed governor rope fixing

#### Rope pulley (2:1):

- Signs of wear on the rope pulley; replace if necessary
- Check the condition of the rope pulley bearings by listening to the running noise (refer to the Chapter "Carrying out repairs")

#### Rope fixings (1:1):

- Check the springs of the rope fixing are not broken.

#### Rope elongation compensation:

- Preserve taken compensating elements (storing in machine room).
- If there is no compensating element, the rope tension should be increased.

# Counterweight

## WCW16 & WCW25 (1:1 & 2:1)

### Operating instructions

Blatt/sheet D412MGB.020  
Datum/date 16.04.2002  
Stand/version 16.04.2002  
Geprüft/approved WAT/MZE

## 4.2 Carrying out repairs



As a rule, damage or deformation of a counterweight frame (i.e. as result of bending or heating) cannot be repaired or straightened. The damaged parts should be replaced. Only use WITTUR spare parts.



Repairs should be expertly carried out with utmost care in order to guarantee safe installation operation.



Follow all the local safety instructions during the maintenance work.

The following repairs should be carried out on site by qualified fitters/service personnel:

- The sanding down of rust (i.e. caused as result of damage to the undercoat) and application of a suitable paint sealant.
- Changing the guides / guide shoe inserts
- Changing the rope pulleys



Please contact WITTUR if for any reason something is unclear, or you encounter damage that cannot be repaired with the help of these instructions.

### 4.2.1 Changing the guides/inserts

The components for the guides which are subject-to-wear (sliding guides: inserts; roller guides: rollers) can be delivered individually as spare parts: (see Chapter "Spare parts").



The distance (play) to the rails (distance between guides) must be readjusted after replacement of the inserts and remounting.

### 4.2.2 Changing the rope pulley

The rope pulleys can be delivered individually as spare parts (refer to "Spare parts" chapter).

Procedures for changing a rope pulley:

- Lower the counterweight onto its contact buffer
- Safeguard the lift car against falling
- Release the ropes
- Unscrew the complete rope pulley / axle / axle bracket unit
- Dismantle rope pulley / axle / axle bracket unit
- Replace the rope pulley, and remount the parts following the instructions above in reverse order

# Counterweight

## WCW16 & WCW25 (1:1 & 2:1)

### Operating instructions

Blatt/sheet D412MGB.021  
 Datum/date 16.04.2002  
 Stand/version 16.04.2002  
 Geprüft/approved WAT/MZE

## 4.3 Spare parts list

Component	Type	Spare part			Number...	Art. No.
Sliding guide shoe	SLG0	Guide shoe	rail width	5 mm	1	160360G05
				9 mm	1	160360G09
	SLG1	Guide shoe	rail width	9 mm	1	92410G09
				16 mm	1	92410G16
	SLG1A	Guide shoe	rail width	9 mm	1	92410G09A
				16 mm	1	92410G16A
	SLG2	Guide shoe	rail width	9 mm	1	92510G09
				16 mm	1	92510G16
	SLG2A	Guide shoe	rail width	9 mm	1	92510G09A
				16 mm	1	92510G16A
	Guide rail lubricator		rail width	5 mm	1	86375G05
				9 mm	1	86375G09
				16 mm	1	86375G16
	Sliding inlay	SLG0		5 mm	1	652437H05
				9 mm	1	652437H09
SLG1, SLG2				9 mm	1	86854H09
Note: Fixing material to be ordered separat				16 mm	1	86854H16
Sliding inlay	SLG1A, SLG2A		9 mm	1	85119H09	
			Note: Fixing material to be ordered separat	16 mm	1	85119H16
Buffer spacer (incl. fixing material)	120x130mm	increment 100mm			1	395954G01
Filler clamp	Clamp + Fixing screw / nut / washer M16			(ref. section 2.4.1)	1	395945G01
	Clamp + Fixing screws / nuts / washers M12			(ref. section 2.4.2)	1	89847G01
	Clamp + Fixing screws / nuts / washers M12			(ref. section 2.4.3)	1	89847G03
Derailment detection	Detection brackets and fixings				1	395932G01
Tie rod	Rod D20mm with Fixing screws / ... M20			(ref. section 2.5)	1	395974G01





# Counterweight

## WCW16 & WCW25 (1:1 & 2:1)

### Operating instructions

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 Geprüft/approved WAT/MZE

Component	Type	Spare part	Number...	Art. No.
Roller guide shoe  *) For e.g. WRG150 type "S" (rail width 16mm only) ... 2 pcs. roller with 27mm width and 1 pcs. roller with 38mm width are required!  For all other types ("L" and 19mm rail width) 3 pcs. roller with 38mm width are required!	WRG80	Guide shoe rail width 9 mm 16 mm	1 1	86800G09 86800G16
	WRG100	Guide shoe rail width 9 mm 16 mm	1 1	604124G09 604124G16
	WRG125	Guide shoe rail width 9 mm 16 mm	1 1	375861G09 375861G16
	WRG150	Guide shoe rail width 16 mm (Type "S") 16 mm (Type "L") 19 mm	1	581271G16S
			1	581271G16L
			1	581271G19
	WRG150HD	rail width 16 mm (Type "S") 16 mm (Type "L") 19 mm	1	600653G16S
			1	600653G16L
			1	600653G19
	Roller for WRG80 (incl. axle)	D80mm / 28mm wide	1	86789G02
Rope pulley (incl. bearings)	Roller for WRG100 (incl. axle)	D100mm / 38mm wide	1	604112G03
	Roller for WRG125 (incl. axle)	D125mm / 38mm wide	1	652535G03
	Roller for WRG150 (incl. axle)	D150mm / 38mm wide D150mm / 27mm wide *	1 1	581274G03 581275G03
			1 1	600655G03 600656G03
	Roller for WRG150HD (incl. axle)	D150mm / 38mm wide D150mm / 27mm wide *	1 1	600655G03 600656G03
Rope anchor (incl. isolation)	DR=410mm	Rope DL=10mm	1	560226G03
	DR=530mm	Rope DL=10mm	1	92467G02
	DR=534mm	Rope DL=13mm	1	378927G01
	DR=656mm	Rope DL=10mm	1	378929G01
		Rope DL=13mm	1	378930G01
		Rope DL=16mm	1	168174G01
	DR=780mm	Rope DL=16mm	1	396421G01
	Welded type (EN81, NZS, GOST)	Rope DL=8mm	1	610253G08
		Rope DL=10mm	1	610253G10
		Rope DL=13mm	1	610253G13
		Rope DL=16mm	1	610253G16
	Casted type (ANSI, CSA, SAA)	Rope DL=10mm	1	611140G10
		Rope DL=13mm	1	611140G13
		Rope DL=16mm	1	611140G16