

## Method of operation

### 2.1. Crowns

The crowner is suitable for processing both standard and twist-off crowns. This closer can also be changed over with the aid of a conversion kit to handle ring pulls.

#### Twist-off crowns



The standard crowns to be processed are described in standard DIN 6099. There are two crowns – the 26F with a height of 6,0 mm and the 26H with a height of 6,75 mm. The outer diameter is 32.1 +/- 0.2 mm and the inner diameter 26.15 +/- 0.15 mm. The metal is 0.25 mm thick. The material is tinplate with a glued-on PVC-free seal or with injected elastic sealing material. The 26F crown is predominantly used.

The twist-off crown is only available with a height of 6.0 mm and it corresponds to the measurements of the 26F standard crown. This closure has the advantage that the bottle can be opened and then closed again without needing to use any aids.

29 sized crowns are used for sealing wine bottles.

#### Ring pull



If crowns with a height of 6.0 mm are to be used instead of those with a height of 6.75 mm, then conversion parts will be needed. The sorter, crown feed unit and sealing heads all need to be converted. In detail, the following areas must be converted:

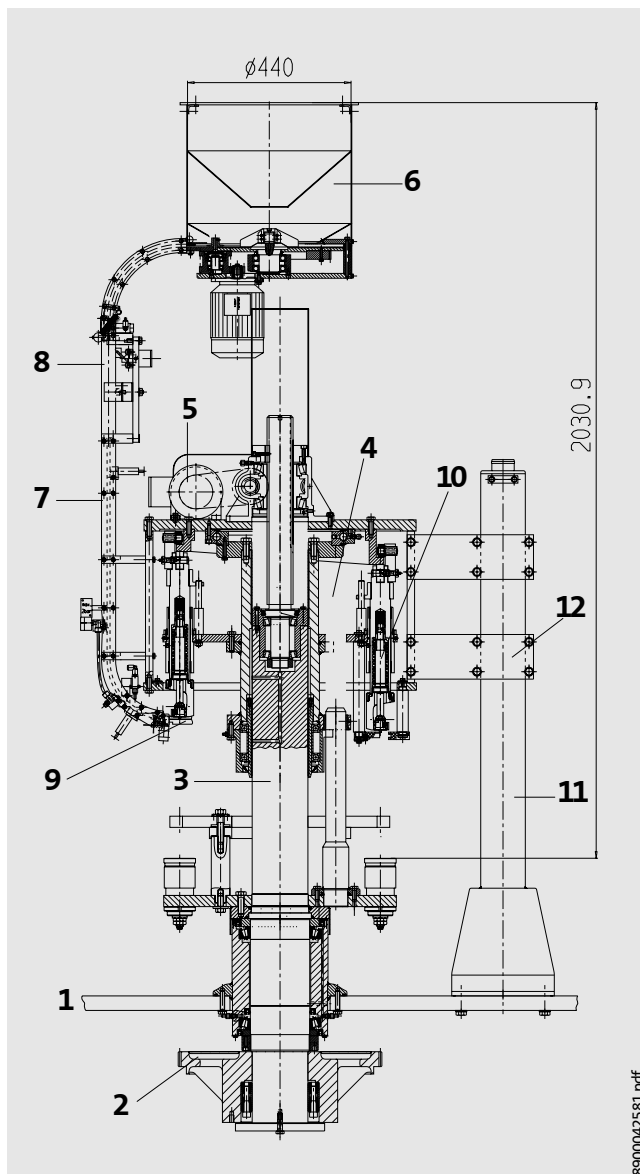
- Sorter distance
- Crown chute, sorter discharge
- Twist tube
- Crown chute up to the transfer position
- Plunger in the sealing head

If crowns with an inner diameter of 29 mm are to be processed, the crown transfer plate and neck guide must also be changed over.

## Method of operation

### 2.2. Crownner structure

Crowners are available in sizes ranging from a diameter of 360 mm (4 sealing heads) up to 1080 mm (39 sealing heads). Nowadays, crowners are manufactured in standard sizes with a pitch of 360, 540, 720 and 1080 mm. The agitators are classified according to the required outputs. A 440 mm diameter is suitable for up to 45,000 bottles per hour and a 500 mm diameter up to 80,000 bottles per hour.



- 1 Filler table plate
- 2 The machine is driven by the gearwheel of the filler drive
- 3 Main bearing with rotating drive shaft, driving pin and bottle plates
- 4 Top part with lifting cam and plungers
- 5 Motorised height adjustment unit, with probe depending on the design
- 6 Agitator with synchronised drive
- 7 Closure feed chute
- 8 Twist tube
- 9 Crown transfer plate
- 10 Sealing head
- 11 Antitorsion support
- 12 Pneumatic or manual clamp

## Method of operation

### 2.3. Path taken by closures from the sorter to the sealing head

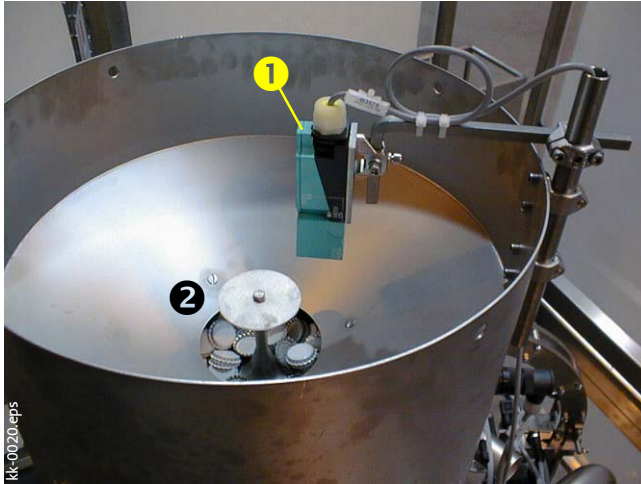
#### 2.3.1. Crownier, top part



Overview

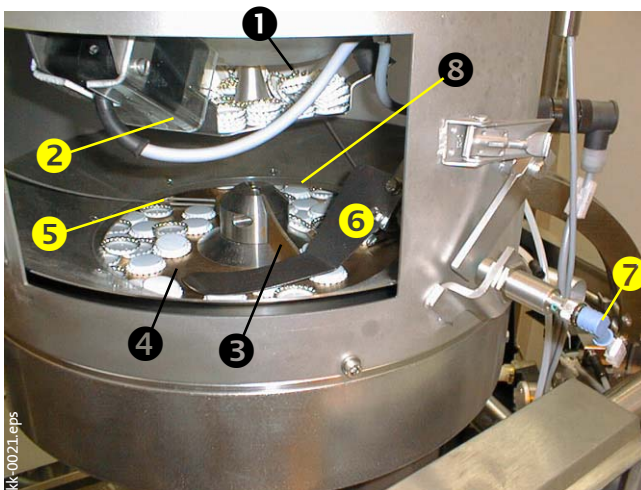
## Method of operation

### 2.3.2. Agitator



#### Agitator hopper

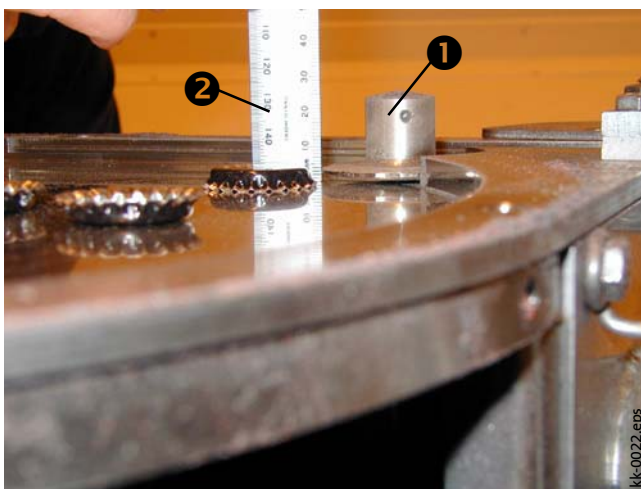
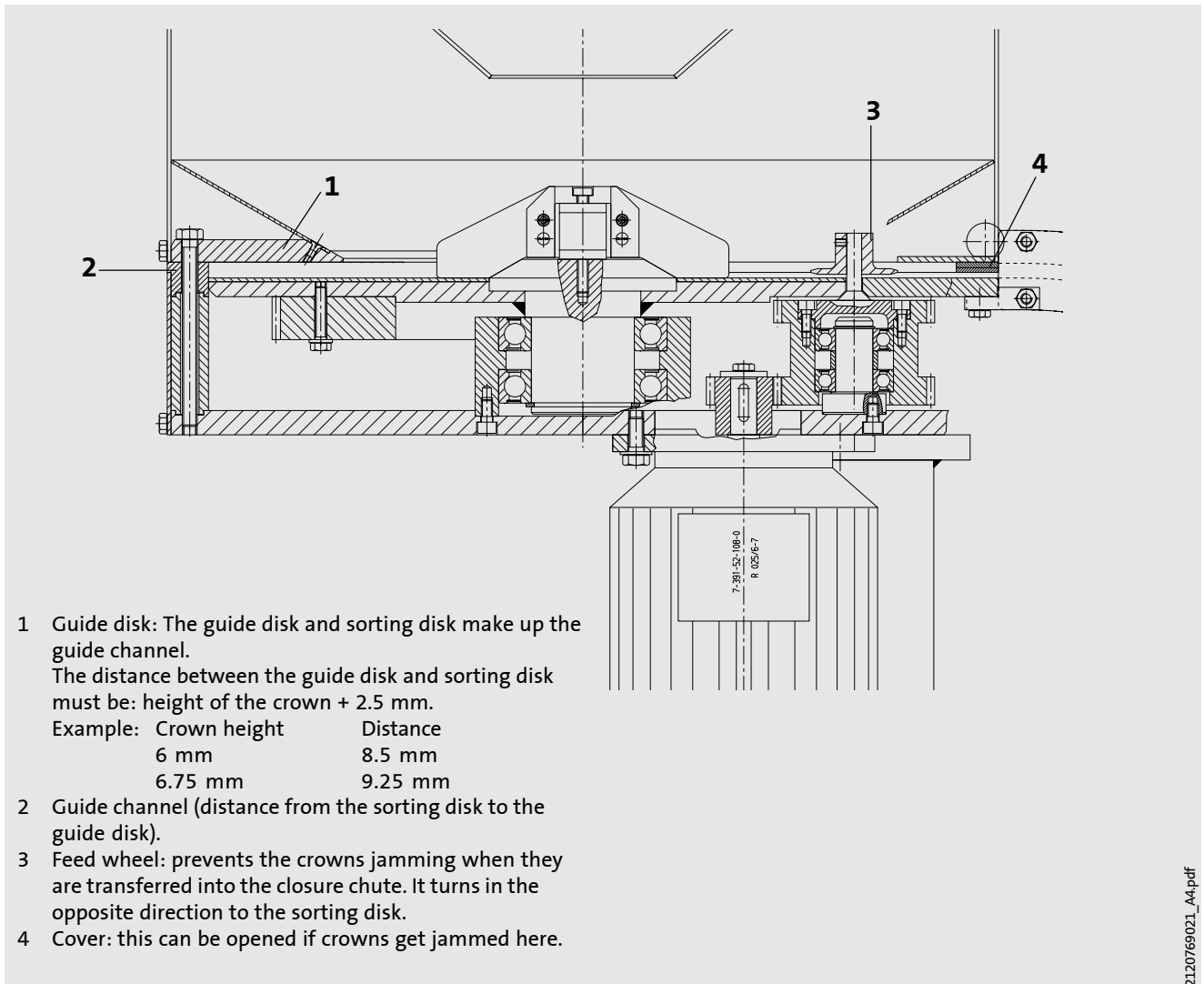
- 1 Sensor for controlling the flow of crowns to the agitator hopper.  
If there are too many crowns in the hopper, the sensor shuts off the flow.
- 2 Hopper base with an opening leading to the agitator.



#### Agitator

- 1 Opening from the hopper to the actual agitator.
- 2 Vibrator: the vibrating motion transports the crowns from the hopper into the agitator.
- 3 Rotary agitator blade: it guides the crowns outwards via the rotary sorting disk.
- 4 Rotary sorting disk.
- 5 Agitator hooks (2 hooks): for releasing any crowns which have become jammed. They must be at the most 0.5 mm away from the sorting disk.
- 6 Paddle: the paddle is lifted by the crowns and controls the vibrator. The paddle movement is registered by an external proximity detector via a rocker.
- 7 Proximity detector.
- 8 Guide disk.

## Method of operation



- 1 Feed wheel.
- 2 Adjustment of the feed wheel: the feed wheel must touch the crowns exactly half way up so that they are not pressed up nor down, but are loosely pushed into the crown chute.

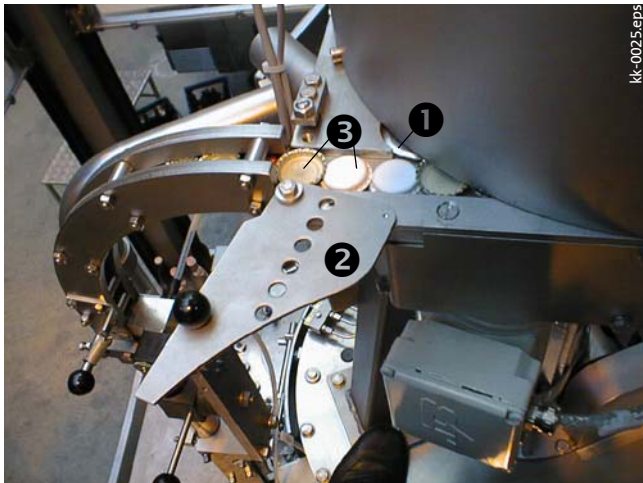


## Method of operation

### 2.3.3. Closure chute, twist tube

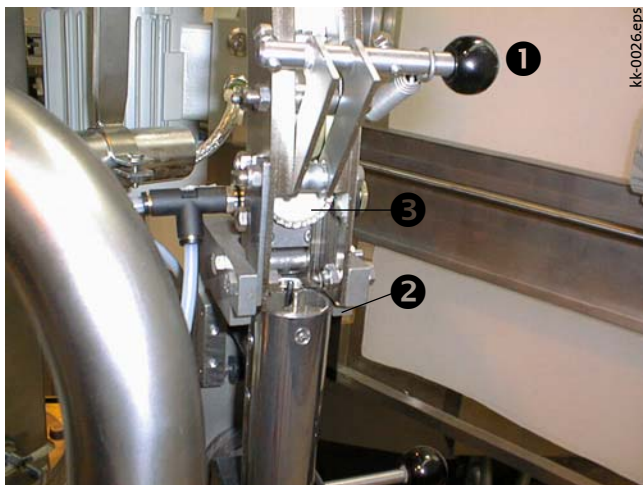


The closure chute feeds the closures from the sorter to the plunger.



The closures exit the sorter and are fed into the top closure chute

- 1 Feed wheel.
- 2 Bent closures can be removed by opening the cover.
- 3 Crowns which have still to be sorted.



Area where the closures are transferred from the top closure chute into the twist tube

- 1 Flap for removing bent closures (opened here).
- 2 Top end of the twist tube.
- 3 Jammed closure: the closure is jammed by a top closure stopper positioned behind it. This happens once the closures in the bottom closure chute back up as far as the twist tube.

## Method of operation



### Twist tube

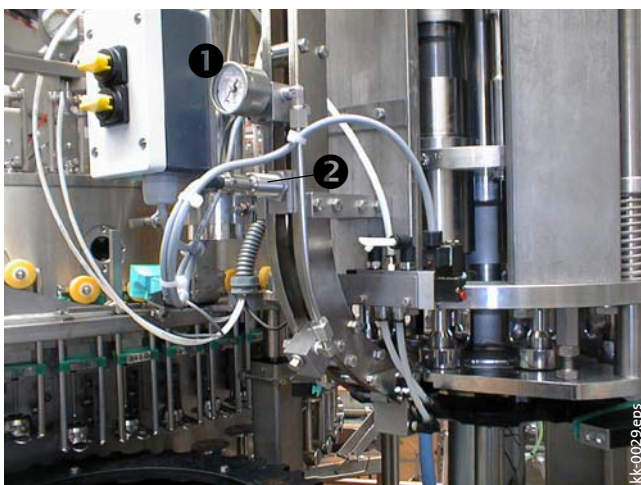
The twist tube turns the crowns which are positioned incorrectly.

- 1 Twist tube.
- 2 Twist tube clamp.
- 3 Lever for releasing the clamp.



### Pipe for emptying the sorter

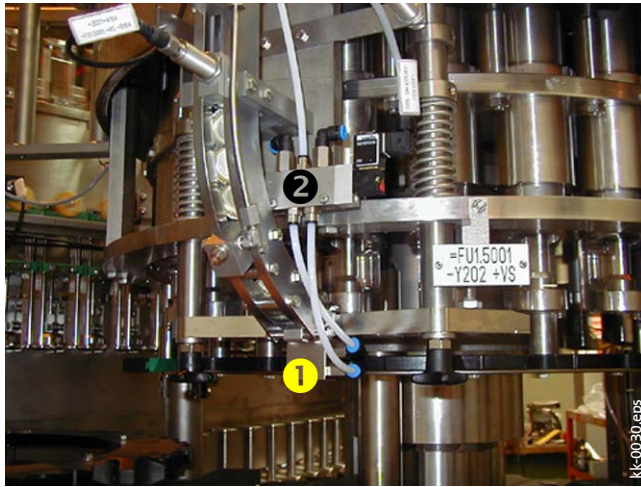
The pipe is also used instead of the twist tube. Once the sorter is turned ON, it is emptied through the pipe.



### Bottom closure chute with transition to the crown transfer plate

- 1 Manometer for blowing the closures with sterile air: the sterile air is used for blowing off dust and feeding the closures to the crown transfer plate.
- 2 Closure monitoring system: for monitoring the flow of crowns synchronous to the bottle present signal. If the closure monitoring system does not register any closure movement even though there are bottles present, the machine is stopped automatically after 3 pitches.

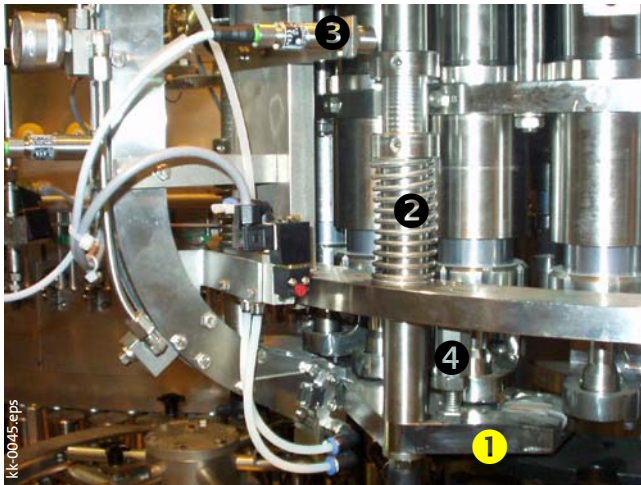
## Method of operation



### Bottom crown stopper

Enables the path for the closures to the transfer plate synchronous to the bottle present signal.

- 1 Bottom crown stopper.
- 2 Solenoid valve for controlling the crown stopper.



### Crown transfer plate

The closures are transferred from the closure chute to the sealing heads via the crown transfer plate.

- 1 Crown transfer plate.
- 2 Spring-loaded support (2 supports): the springs allow the transfer plate to be lowered if glass or crowns get jammed between it and the sealing head.
- 3 Support monitoring device.
- 4 Adjustment screws (2 screws) for adjusting the distance between the crown transfer plate and the sealing heads.
  - Distance: 0.3 – 0.5 mm.
  - Both ends must be set identically.
  - Check this at several sealing heads.



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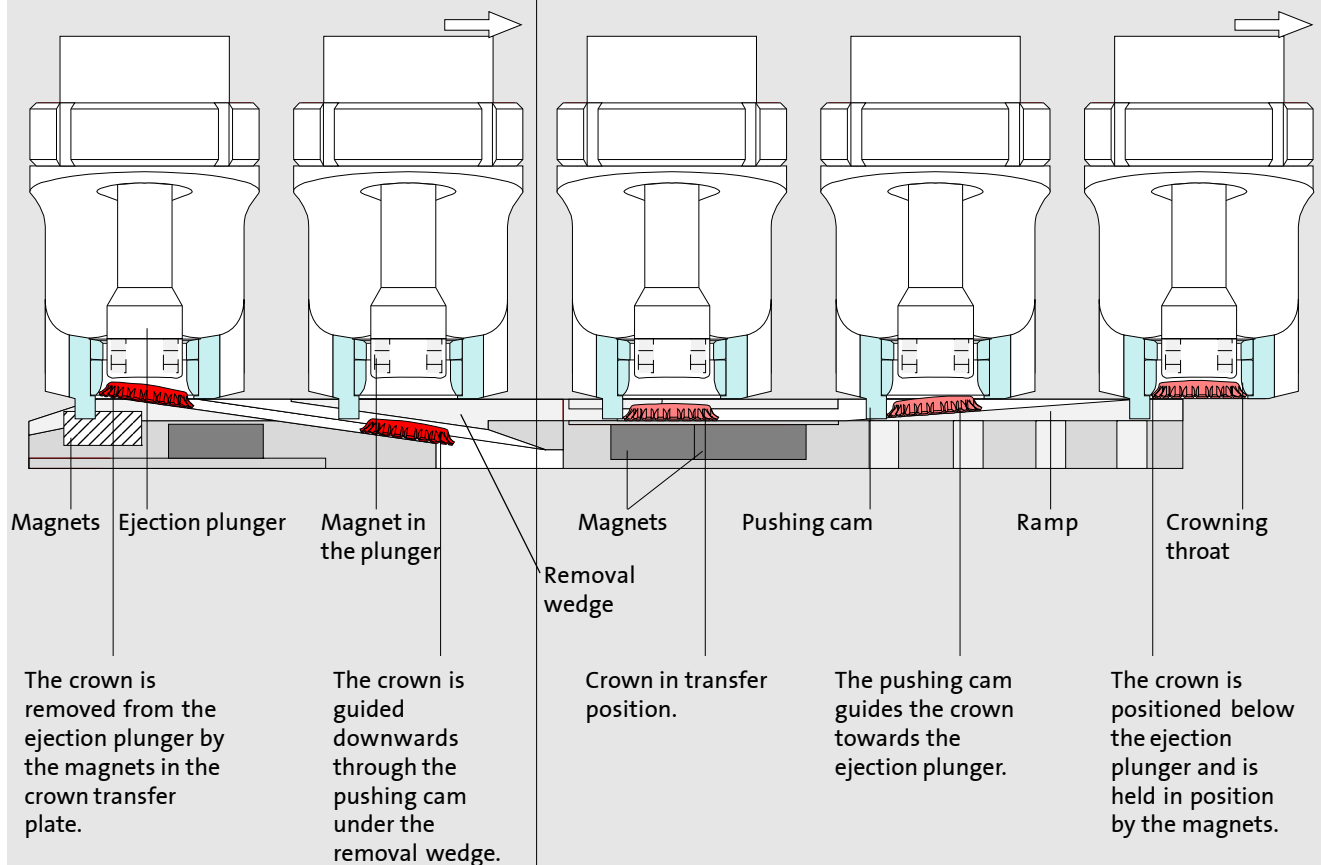
### 2.3.4. Crown transfer

#### Removal of non-production crowns

Those crowns which are not used are pulled away from the plunger magnet using stronger magnets incorporated in the crown transfer plate and guided downwards.

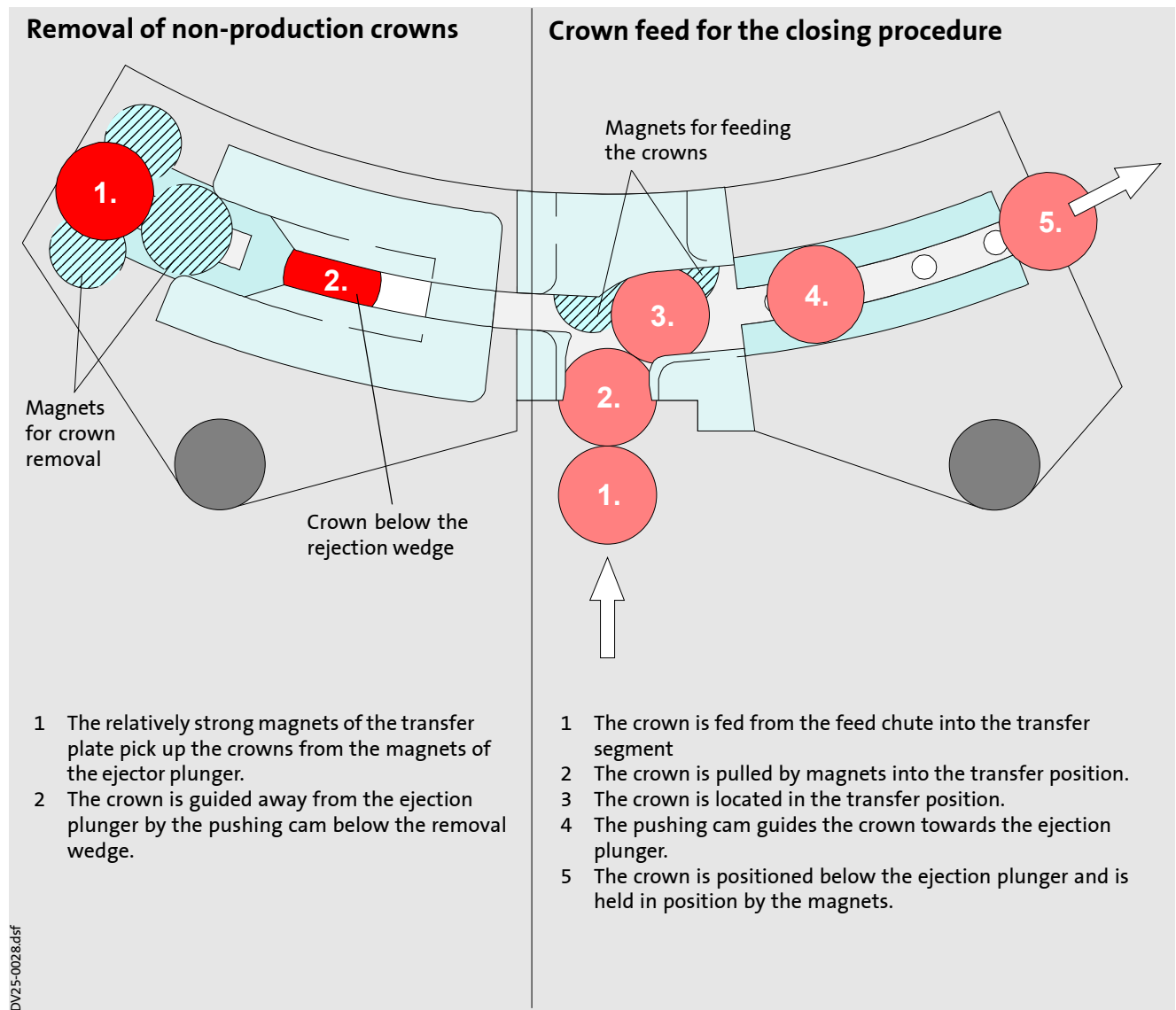
#### Crown feed for the closing procedure

During closing, the crowns are conveyed via the lifting ramp to the closer plunger where they are then attracted by the magnet in the plunger.



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## Method of operation



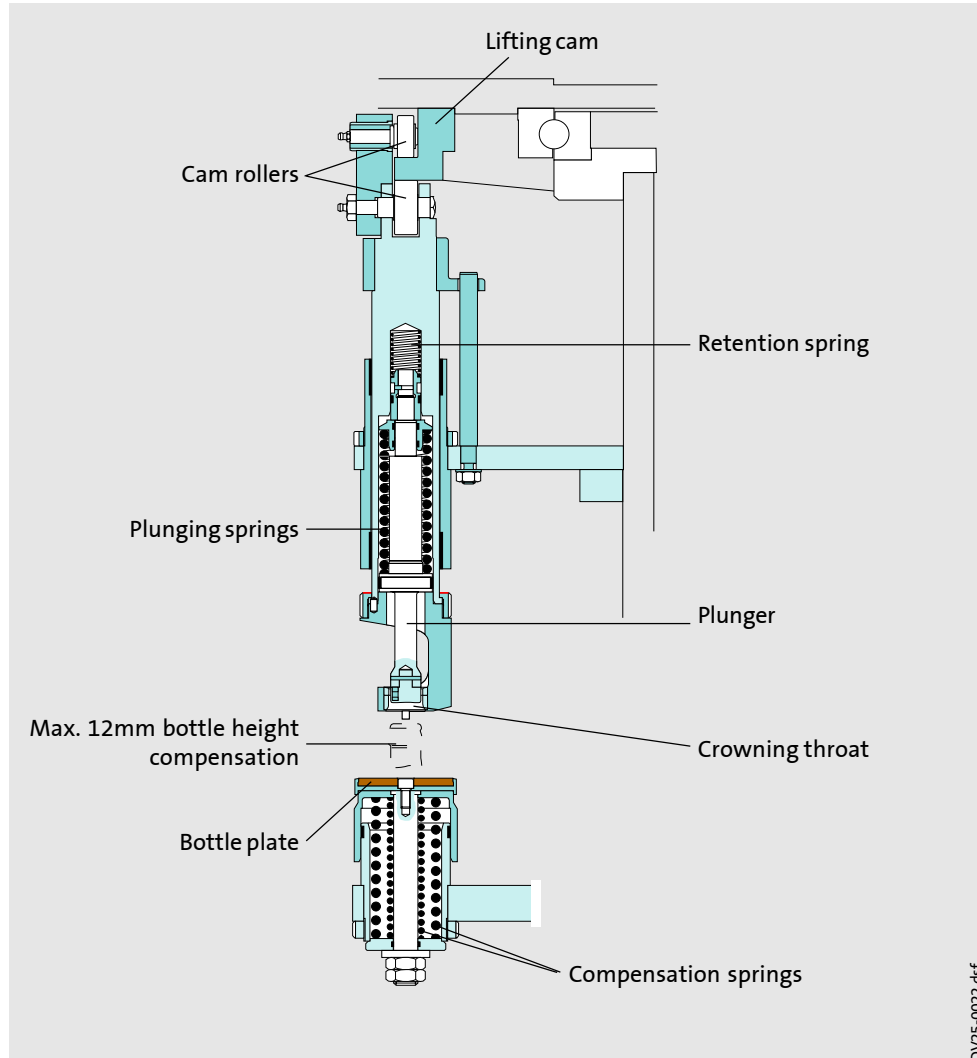
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The parts shown in blue are hard metal inserts which should be changed over after every 12,000 hours.

## Method of operation

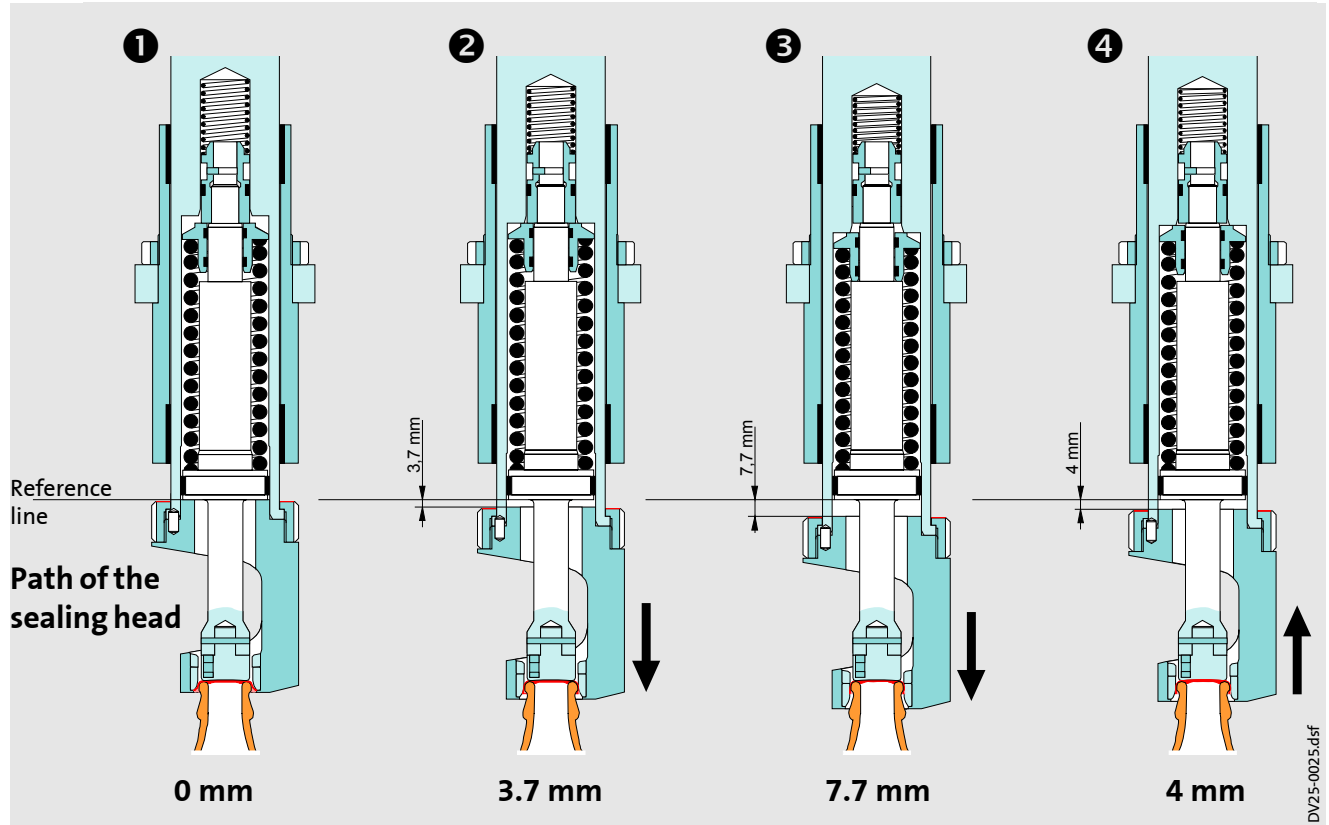
# 2.4. Closing procedure

## 2.4.1. Sealing head: overview



## Method of operation

### 2.4.2. Closing procedure



- 1 Once the crown has been fed from the crown chute into the transfer segment, a magnet is used for its further guidance. A pushing cam is then used to position the crown on the ejection plunger of the crowning head. The sealing head is lowered until the crown in the crowning throat is placed onto the bottle. The bottle then holds it in place.
- 2 Afterwards, only the crowning throat is further lowered. In the first phase, only the force of the retention spring has any effect on the crown.
- 3 In the second crowning phase, the ejection spring is pressed and the bottle is subjected to an increased amount of pressure. The crowning procedure is completed once the crown has been introduced 7.7 mm into the crowning throat. The crown is then located 1 mm in the cylindrical area of the crowning throat and the required crown diameter of between exactly 28.6 and 28.7 mm has been obtained. This completes the closing procedure. The closing force drops once again.
- 4 Controlled using the lifting cam, the crowning head is raised again and the retention spring pushes the ejection plunger back to its initial position.



## Method of operation

### 2.4.3. Closing criteria



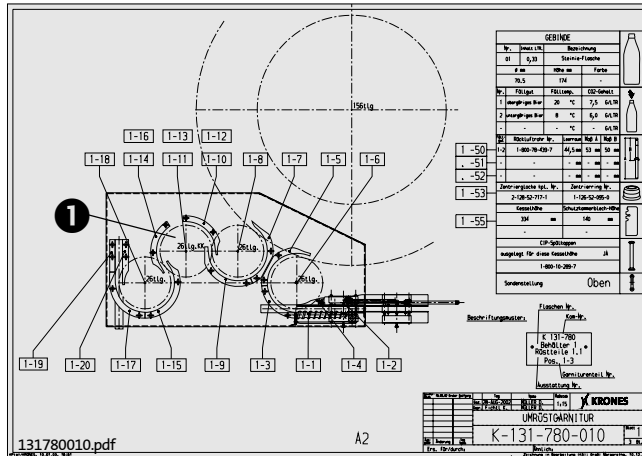
The following criteria are important if the bottle is to be closed correctly:

- The closure must be positioned properly on the neck finish of the bottle
- The coated crown must not be scratched
- Closing measurement of between 28.6 and 28.7 mm
- The twist-off value for a twist-off crown must lie between 4.5 and 9 inch-lbs.



## Method of operation

### 2.5. Container path



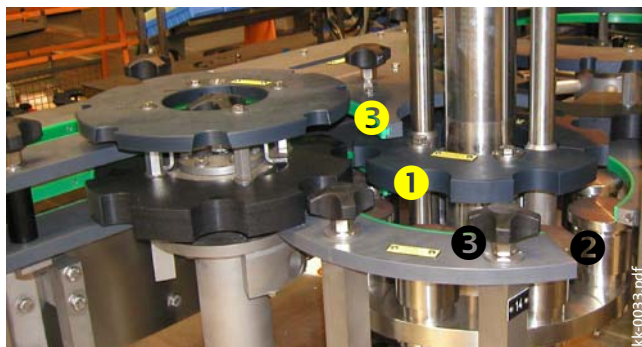
The handling parts data sheet shows all of the handling parts needed for the respective bottle type. The parts are marked with coloured tags and numbers.

The handling parts for the crowner can be found in the handling parts data sheet for the filler.

#### 1 Closer handling parts



- 1 The filler's discharge starwheel is simultaneously the infeed starwheel of the closer. It conveys the containers from the filler to the closer.
- 2 In doing so, the guide should make sure that the containers are conveyed without shaking.
- 3 The discharge starwheel sets the containers onto the discharge conveyor.



- 1 The bottom centre starwheel picks up the containers and centres them underneath the sealing head and on the bottle plate.
- 2 Bottle plate
- 3 The guides hold the containers in the starwheel pockets.

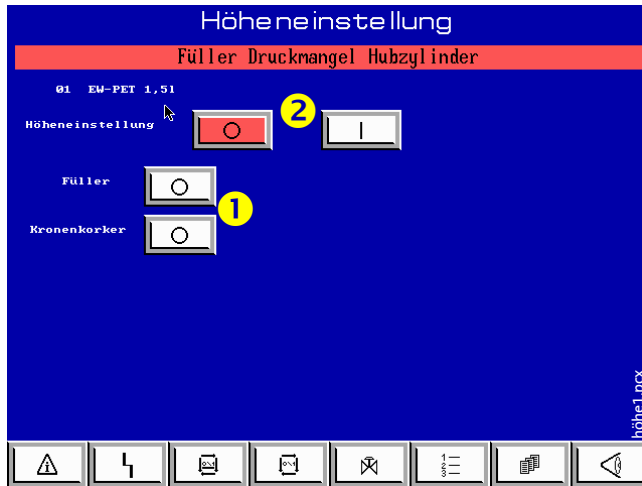


#### Bottle neck guide

- 1 The top centring starwheel ensures that the bottle neck is positioned precisely underneath the crown.
- 2 During this, the guides support the bottle neck against centrifugal force in the starwheel pockets.

## Method of operation

### 2.6. Height adjustment



#### Height adjustment

- 1 Select the machine on which height adjustment is to be performed (filler or closer).
- 2 Turn the height adjustment unit ON or OFF.

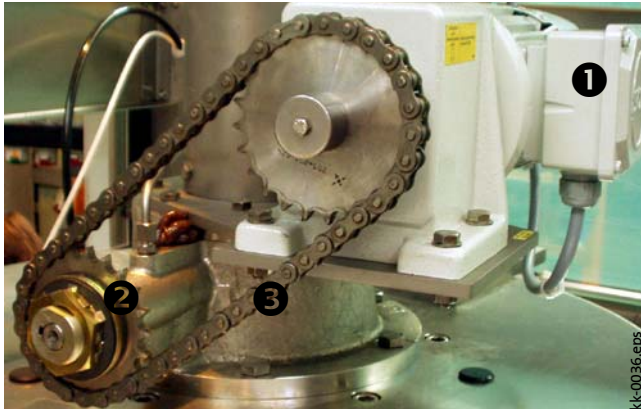


Once the required machine has been selected and the height adjustment unit has been turned ON, the height of the top part of the closer can be adjusted using the switch (1).



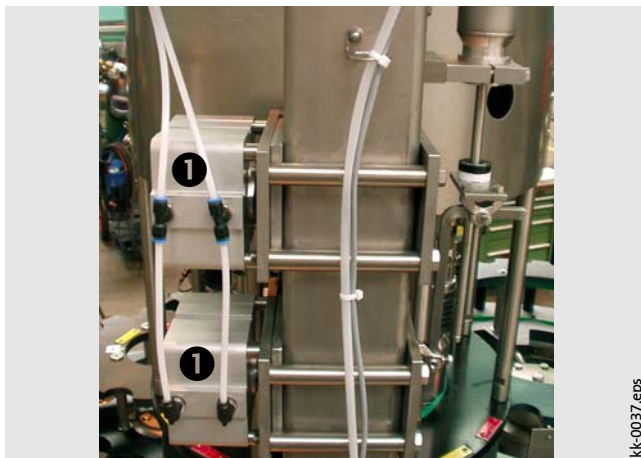
The closer has been adjusted correctly once the pointer has been set to the respective container number on the guide.

## Method of operation



### Height adjustment unit drive

- 1 Motor
- 2 Safety clutch
- 3 Drive chain



### Pneumatic clamp

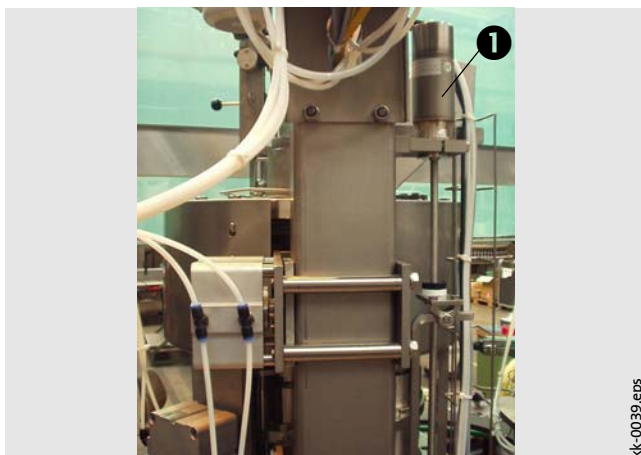
The pneumatic clamp (1) is automatically released during height adjustment and subsequently clamped again.



### Height adjustment limit switch

The height adjustment limit switch (2) allows the top part only to be raised to a certain height.

- 1 Pneumatic clamp
- 2 Height adjustment limit switch



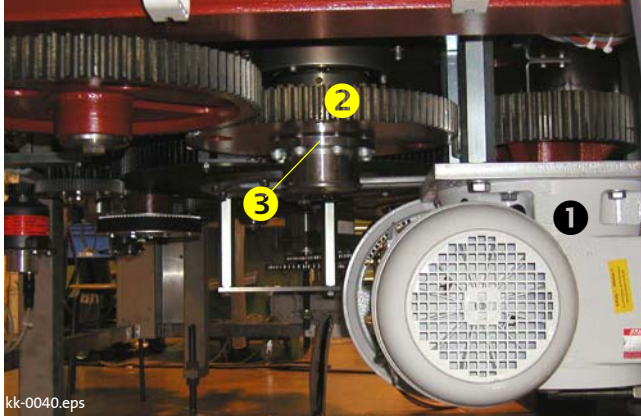
### Probe for height adjustment (optional)

During height adjustment, the height of the top part is registered by a probe (1).  
In this version, the height of the top part is adjusted automatically once the container type has been selected.



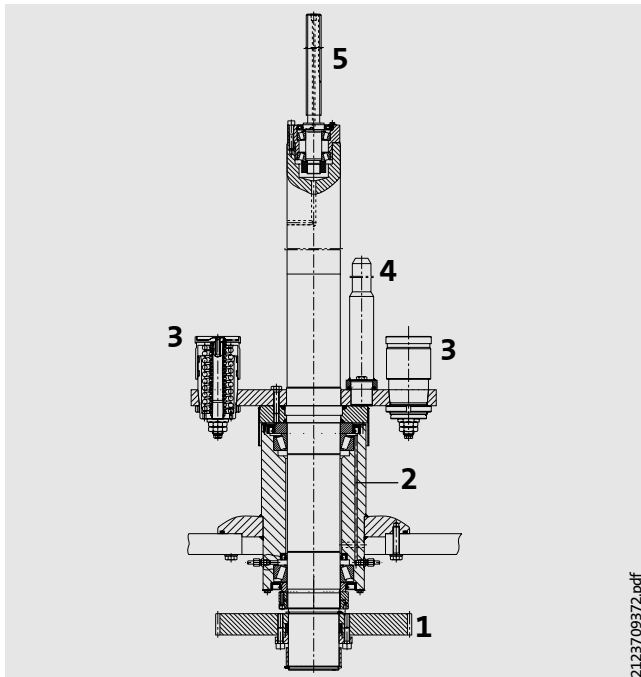
## Method of operation

### 2.7. Drive



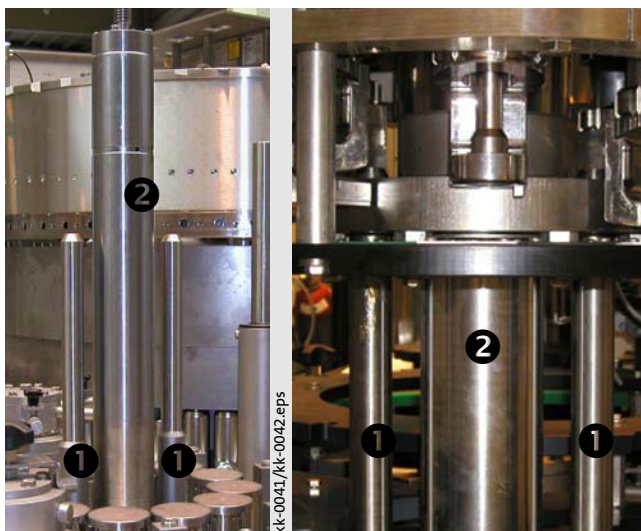
#### The closer is driven by the filler drive

- 1 Closer drive gear
- 2 Toothed wheel to the closer drive
- 3 Clamping set for connecting the toothed wheel with the closer shaft



#### Closer bearing

- 1 Closer, drive gearwheel
- 2 Closer, main bearing
- 3 Spring-loaded bottle plates
- 4 Drive bolts (2 bolts) for driving the closer top part
- 5 Threaded spindle for height adjustment



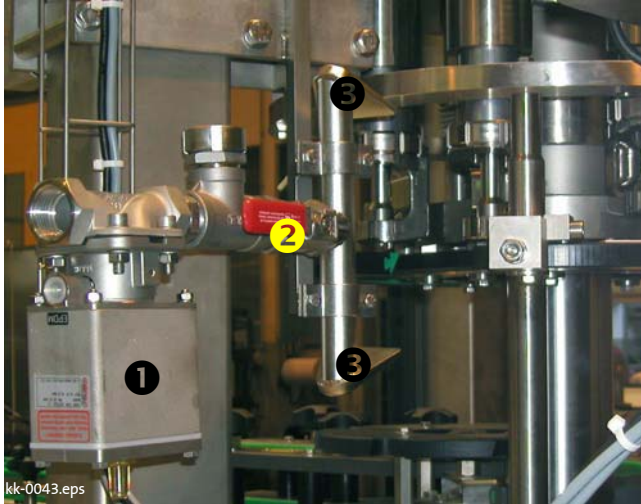
#### Drive of the top part

In fillers which have more than one closer, the top part can be separated by raising it away from the drive.

- 1 Drive bolts (2 bolts)
- 2 Central axis of the closer

## Method of operation

### 2.8. Cold water spraying system for the closer



The cold water spraying system is used for removing residual product from the plunger during production.

- 1 Automatic water shut-off valve
- 2 Manually-activated flow control valve
- 3 Flushing nozzles



- 1 Touch-buttons for operating the cold water spraying system:
  - a Water spraying system OFF
  - b Water spraying system ON
  - c Water spraying system AUTO

The spraying system is started automatically if:

- the container stop has been locked,
- there are no longer any containers in the filler and closer.

Spraying lasts for two closer revolutions (can be programmed by an electrician) at least every 20 minutes (can be programmed by an electrician). If spraying is selected manually, the container stop is firstly locked and the filler is then emptied.

Optional additional equipment:

- Hot water gushing system
- Automatic foam cleaning
- Automatic spray disinfection