

KNOLL

Installation and Operating Instructions

Hinge band conveyor type S

GB

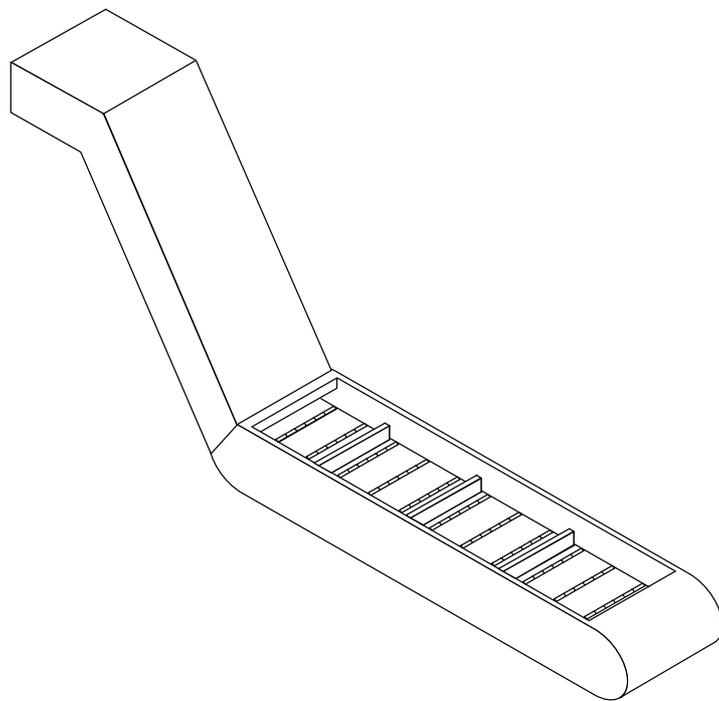


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1 Description of machine and functions

Function

- Conveying metal shavings and small parts
- Prepurifying the cooling lubricant (for wet processing)

Scope

- Decentral use in single and interlinked machine tools
- Central use for waste disposal from machine groups and entire production areas
- Suitable for long swarfs, snarl chips, wool-type filings, dry and wet processing

Mode of operation

- Loose material falls in feed opening onto the endless hinge band
- Continuous transfer of the loose material to the discharge opening
- Throwing the loose material at the discharge opening into the container or another conveyer for removal.



- **Do not use the plant for other than the intended purposes.**
- **Note the Regulation for the Prevention of Accidents (Unfallverhütungsvorschrift) VBG 10 when operating the plant.**
- **The discharge station must be visible during machine controlled operation.**

Noise level: < 70 dB(A)

Optional equipment

- Coolant tank
- Coolant purification systems (e.g. magnetic separator, centrifugal separator, band filter, superfine strainer)
- Low lift and jetting pumps for purification elements and machines
- Swarf mill
- Brush-off device
- Sustainer
- Chip carriage
- Sieve drum
- Piping with aggregates, valves, etc.

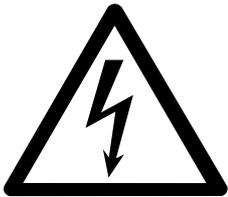
Since nearly every plant is constructed for the special needs of the customer, deviations from the form and position of the parts and structural components described in this documentation may occur. In this case the operating instructions should be applied analogously.

2 Danger and safety instructions

2.1 General instructions



- Always observe all statements and instructions in the operating instructions delivered with the plant.
- It is forbidden for unqualified persons to work at the plant.
- Observe correct fastening if components were installed by customer.
- Never bypass safety contrivances (e.g. safety clutch).
- The operation of safety contrivances must always be guaranteed.



- Work on the electrical plant may only be carried out by qualified personnel.
- Observe the relevant VDE requirements and connection requirements of the responsible Electricity Board.



- Do not stand in or reach into the feed opening.

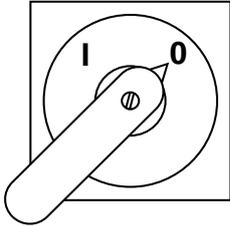


- Do not reach into the discharge opening.

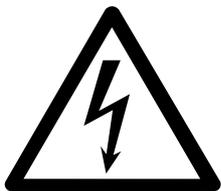


- Cover the scraper belt and all driving elements before starting.
- Do not remove covers while plant is in operation.

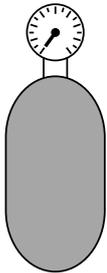
2.2 Instructions for repair and maintenance work and for malfunctions



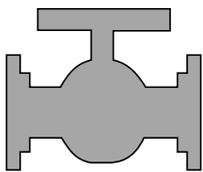
- Switch off the main switch.
- Secure the plant against being started accidentally.



- Ensure that the plant is dead.



- Depressurize the plant.



- Close pipe valves.
- Remove all noxious materials.
- Coolants must not enter the environment.



- When handling chips, wear protective clothing, safety boots and protective gloves.

3 Unpacking and handling

3.1 Unpacking



Scraper conveyors over 8 m in length are delivered in several container parts.

The hinge bands of divided conveyors are rolled up on separate pallets.

For conveyors in several parts, scraper belts are rolled up on separate pallets.

Small parts (screws, sealings etc.) are delivered loose in the scraper conveyor container or in separate packing.

If mounting rails are required for inserting the hinge band, they are fastened to the hinge band or pre-mounted on the hinge band conveyor and lacquered in red.

Mounting rails must absolutely be preserved because the hinge band cannot be inserted without them.

3.2 Handling



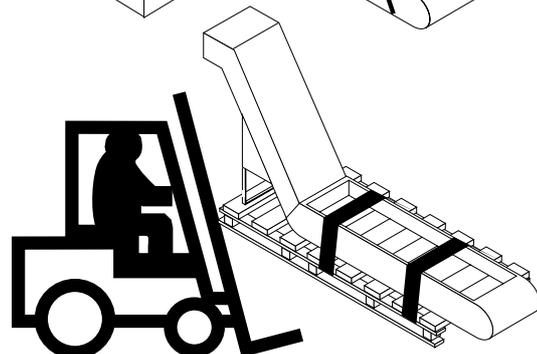
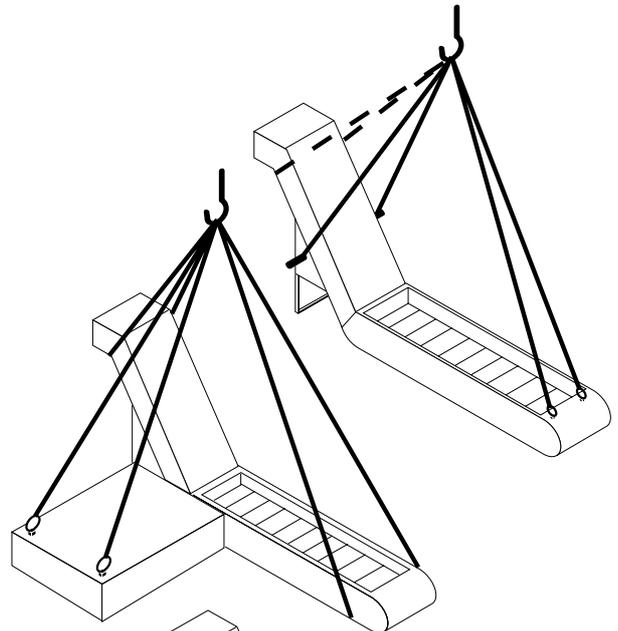
- **Do not stop beneath suspended loads!**

- **By crane:**

Always transport by crane if no longer in the original packing. Use the suspension devices provided (e.g. eye hooks, lifting screws)

- **By stacker truck:**

Only in the original packing and with the greatest of care.



4 Assembly and installation



- Put plant on even ground!
- Ensure a firm and secure position.
- Secure the plant against being started accidentally.

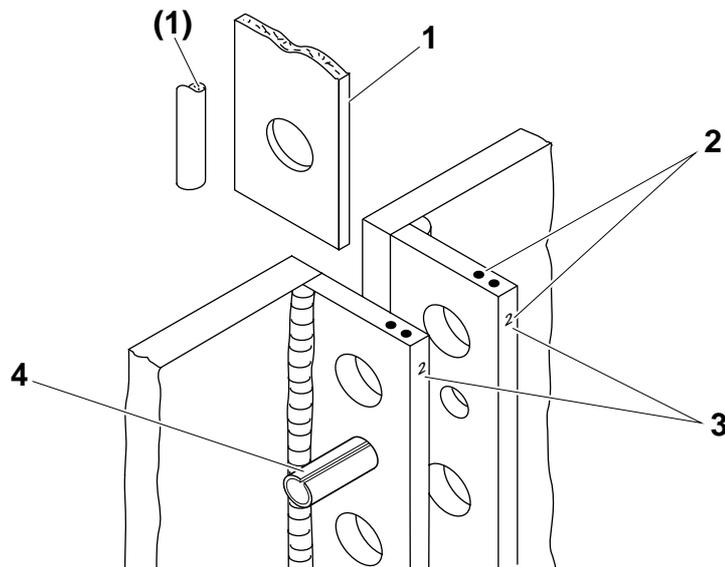
4.1 Screwing together several container parts

- Join container parts at the joint locations and align in parallel.



Note identification markings (2) of the container flanges.

The identification marking (numbers or symbols) must agree with that of the opposite flange (3).



- Insert the sealings supplied (1) and join container parts completely.
- Align the containers such that all bore holes are in alignment with the container flanges opposite.
- Insert but do not tighten hexagon head screws and hexagon nuts.
- Drive in preassembled rollpin spring (4).
- Tighten hexagon head screws

4.2 Electrical connection

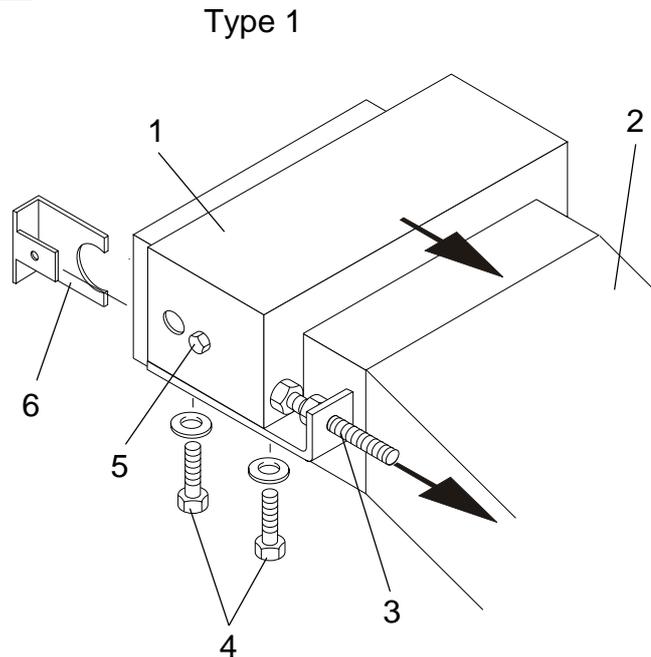
- Connect power supply to motor(s) and pump(s)
- Note the correct direction of rotation (see arrow)

4.3 Loosening tension device hinge band

type 1

Model with flange bearing:

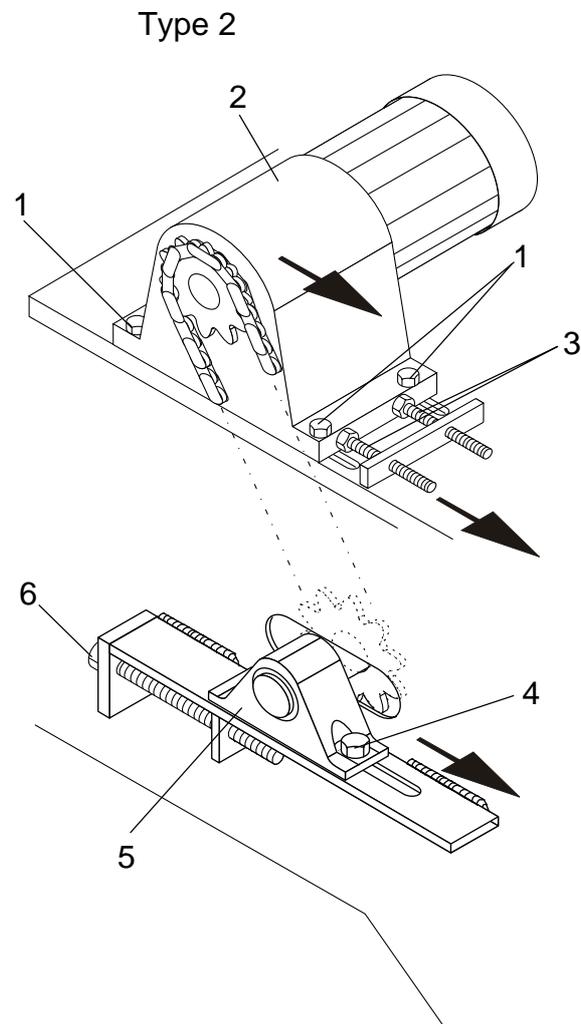
- Remove the top coverings (2)
- Loosen the fastening screws (4) on both sides of the gearing end frame but do not unscrew completely
- Loosen clamping bolts (3) on both sides of the gearing end frame and turn backward completely
- Loosen hexagon head cap screw (5) on both sides and remove hand guard (6)
- Push backward gearing end frame (1) against the conveying direction to the stop
- Tighten fastening screws (4) on both sides of the gearing end frame
- Mount hinge band mounting rails (see Chapter 4.4)



type 2

Model with pedestal bearing:

- Dismantle protective covering at the drive
- Loosen the fastening screws (1) on the drive motor (2)
- Turn back clamping bolts (3) on both sides
- Release the tension of the drive chain by moving the drive motor in the direction of the arrow (2)
- Loosen the fastening screws (4) on the pedestal bearing
- On both sides, evenly screw in the clamping screws (6) and tighten the hinge band in the direction of the arrow
- Tighten the fastening screws (4) at the pedestal bearing
- Mount hinge band mounting rails (see Chapter 4.4)

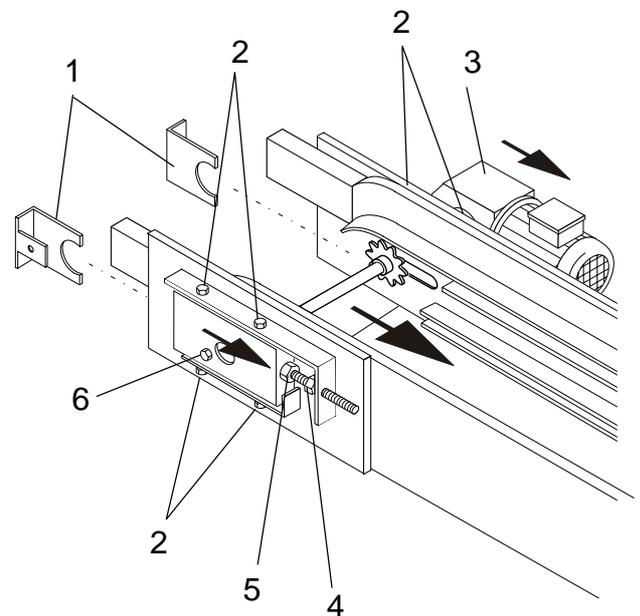


Type 3

Model with band support:

- Disassemble hand guard (1) on the left and on the right by removing the fastening screw (6)
- Loosen the fastening screws (2) on both sides of the drive motor (3) but do not unscrew completely
- Loosen lock nuts (4) of the clamping bolts (5)
- Turn back the clamping bolts (5) completely
- Push backward the drive motor against the conveying direction (direction of arrow) to the stop
- Tighten fastening screws (2) on both sides of the drive motor
- Mount mounting rails (see chapter 4.4)

Type 3

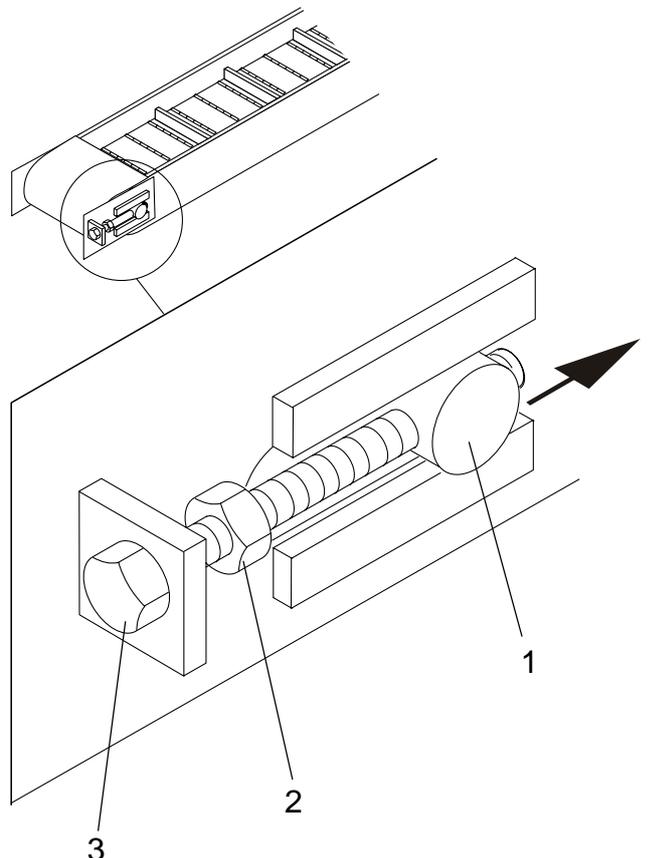


Type 4

Deflection side model:

- Loosen lock nuts (2) of the clamping bolts (3) on both sides
- Open the clamping bolts (3) at the guide roller as far as possible
- Press the guide roller (1) towards the discharge opening (direction of arrow)
- Fix clamping bolts (3) with lock nuts (2) in loosened position on both sides
- Mount mounting rails (see chapter 4.4)

Type 4



4.4 Mounting the hinged band



For heavy, divided hinge bands, mounting rails (2) are included in the delivery. The hinge band cannot be inserted without mounting rails!
Keep mounting rails (2) !

- Position the beginning of the hinge band (3) on the mounting rails (2)



The driver webs (6) of the hinge band point upward in conveying direction.
The side rims (5) of the hinge band must be closed at the back (against conveying direction).

- Turn the drawing chain wheel (1) so that the first roller (3) of the hollow pin chain can be pushed into a tooth space
- Insert the hinge band into the container (4)
- Insert the hinge band up to the guide sprocket wheel using the drive motor in jogging skip or the crank handle

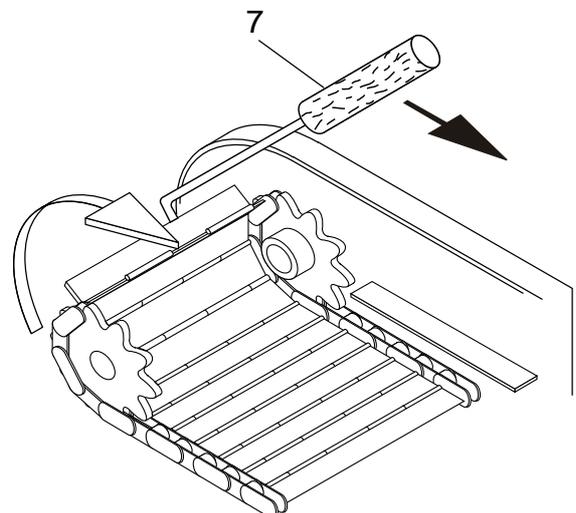
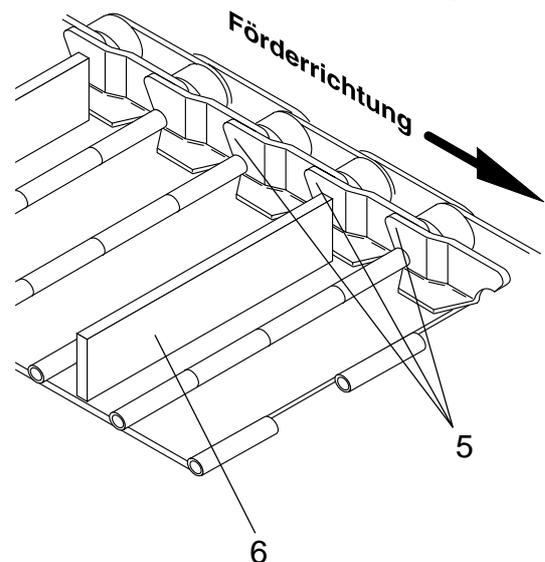
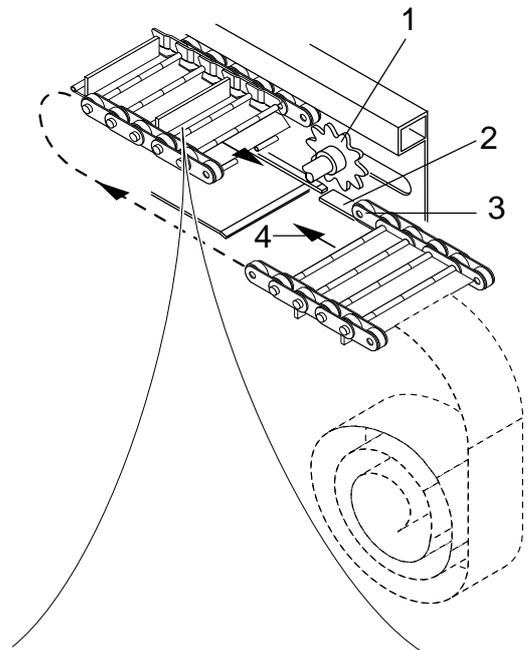


- **Danger of injuries during the inserting procedure:**
- **Never touch movable parts of the hinge band conveyor with the hands!**
- **Do not pull or push the hinge band without the proper tools!**



If the hinge band jams and piles up:
Briefly change the sense of rotation of drive motor or crank handle.

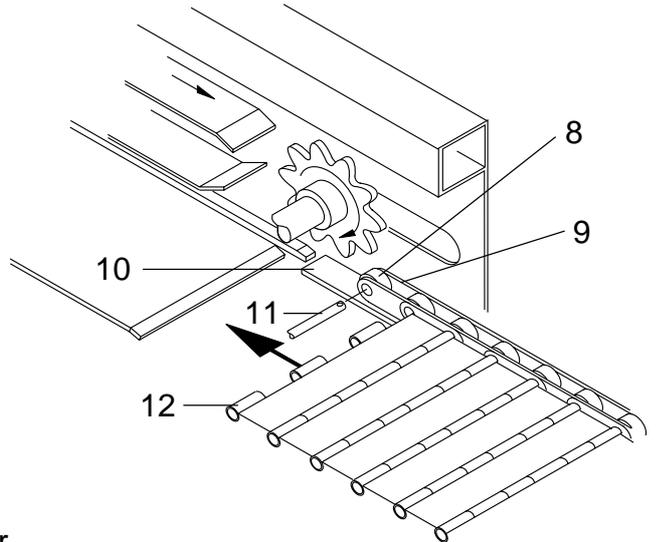
- When the hinge band has reached the guide sprocket wheel:
- Use a hook (7) or a suitable tool to pull the hinge band around the chain wheel. At the same time, switch on or slowly move on the drive motor in jogging skip





- **Danger of injuries!**
- **Never pull the hinge band around the guide sprocket wheel by hand**

- Continue the inserting procedure until the beginning of the hinge band has reached the drawing chain wheels.
- Steadily pull the hinge band with a hook or a suitable tool in conveying direction to avoid piling up or jamming.
- Switch off the drive motor
- **Only Type S2:**
Insert a roller (8) between the cover plates (9) of the hollow pin chains and fasten with locking bolts (11). Blocking of the hinge band (12) is thus rendered more difficult



Depending on the hinge band size, two or more people are needed for inserting. The drive motor or a crank handle can be used for inserting. See chapter 6.2 for mounting the crank handle

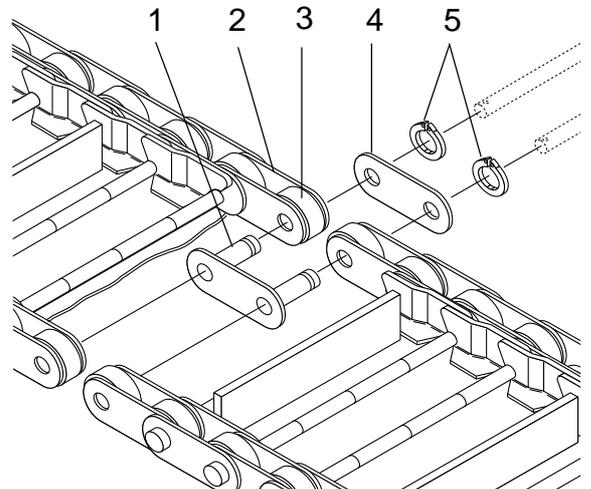
4.5 Mounting the shackle type connectors

- Insert the roller (3) between the cover plates (2) of the hollow pin chain (only required for Type S2)
- Connect the ends of the hollow pin chains with shackle type connectors (1)



The bolts of the shackle type connectors (1) point outward.

- Place the cover plates (4) onto the inserted shackle type connectors
- Mount the locking rings (5)
- Remove the mounting rails

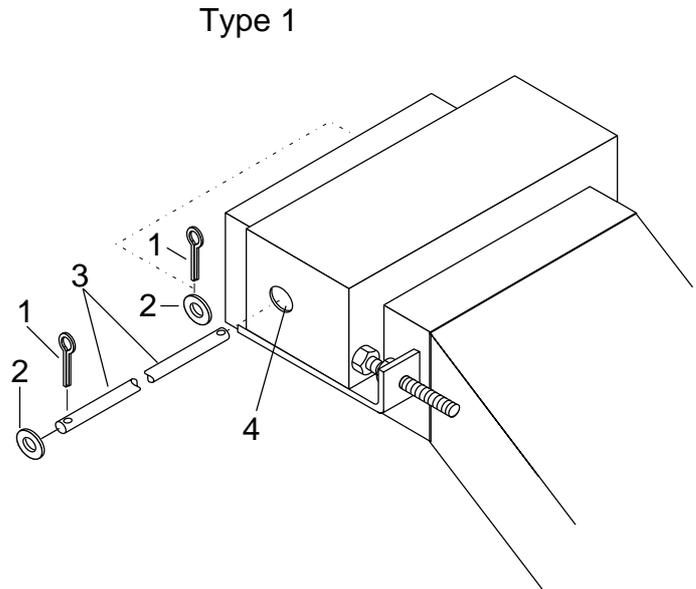


4.6 Mounting the locking bolts

Type 1

Model with flange bearing:

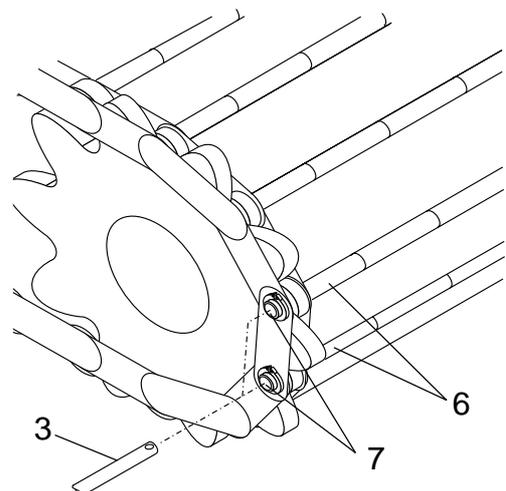
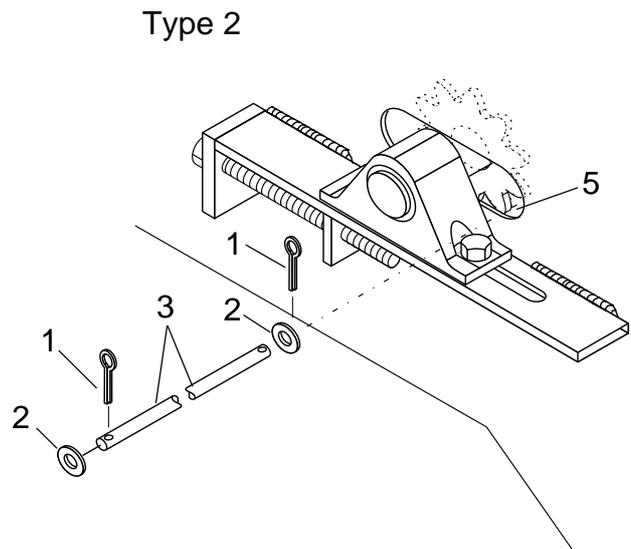
- Turn the hinge band such that the connecting brackets of the hinge band plates are flush with the mounting boring (4)
- Mount a washer (2) with split-pin (1) on the locking bolt (3)
- Join the hinge band plates.
- Put the locking bolts (3) through the shackle type connectors (7) and the connecting brackets (6) of the joint hinge band plates
- Mount the second washer (2) and split-pin (1) on the locking bolt



Type 2

Model with pedestal bearing:

- Turn the hinge band such that the connecting brackets (6) of the hinge band plates are accessible through the oblong hole (5)
- Mount a washer (2) with split-pin (1) on the locking bolt (3)
- Join the hinge band plates
- Put the locking bolts (3) through the shackle type connectors (7) and the connecting brackets (6) of the joint hinge band plates
- Mount the second washer (2) and split-pin (1) on the locking bolt

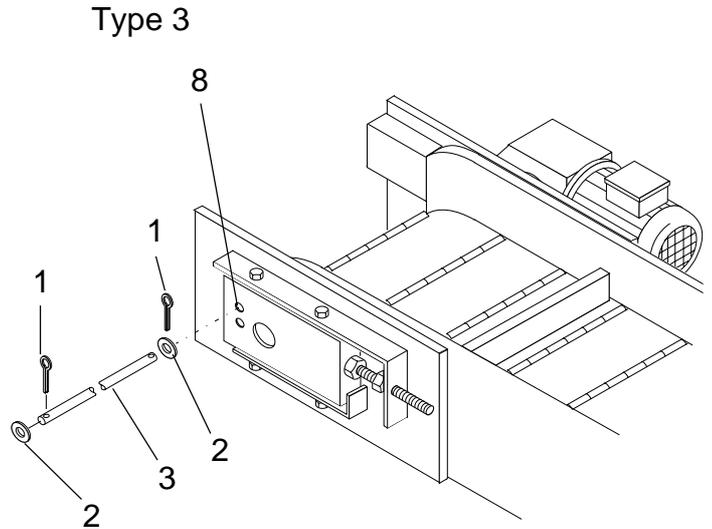


Dismantling is carried out in reverse order

Type 3

with band support:

- Turn the hinge band such that the connecting brackets of the hinge band plate are in flush with the mounting boring (8)
- Mount a washer (2) with split-pin (1) on the locking bolt (3)
- Join the hinge band plates
- Put the locking bolts (3) through the shackle type connectors (7) and the connecting brackets (6) of the joint hinge band plates
- Mount the second washer (2) and split-pin (1) on the locking bolts

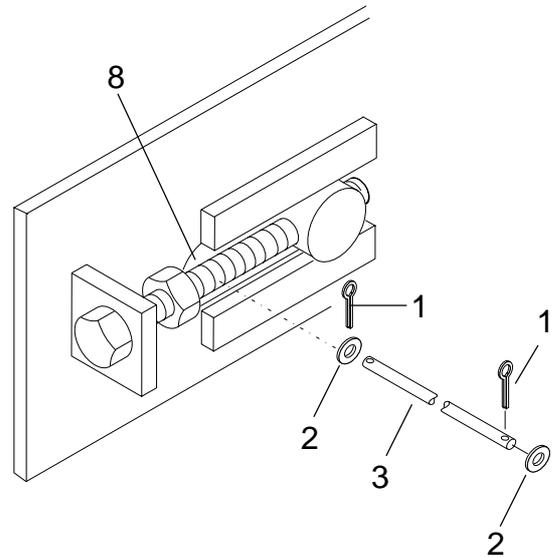


Type 4

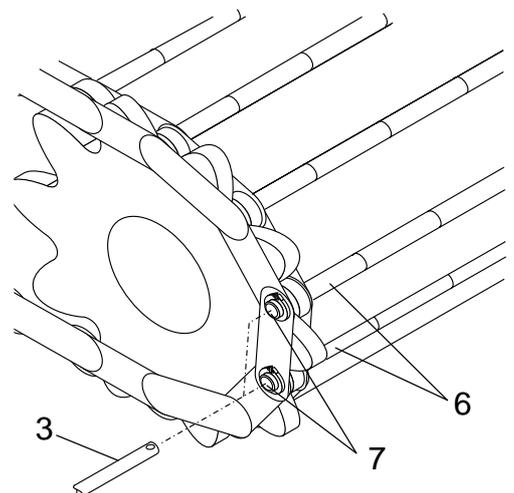
Deflection side model:

- Turn the hinge band such that the connecting brackets (6) of the hinge band plates are accessible through the oblong hole (8)
- Mount a washer (2) with split-pin (1) on the locking bolt (3)
- Join the hinge band plates
- Put the locking bolts (3) through the shackles type connectors (7) and the connecting brackets (6) of the joint hinged band plates
- Mount the second washer (2) and split-pin (1) on the locking bolt

Type 4



Dismantling is carried out in reverse order.

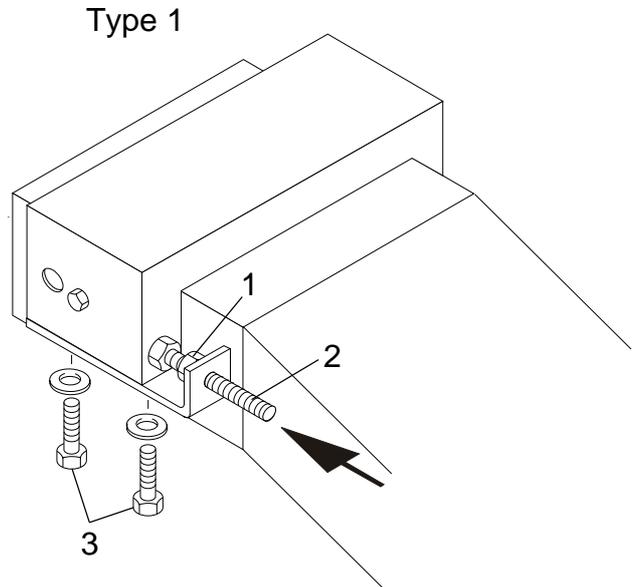


4.7 Tensioning the hinge band

Type 1

Model with flange bearing:

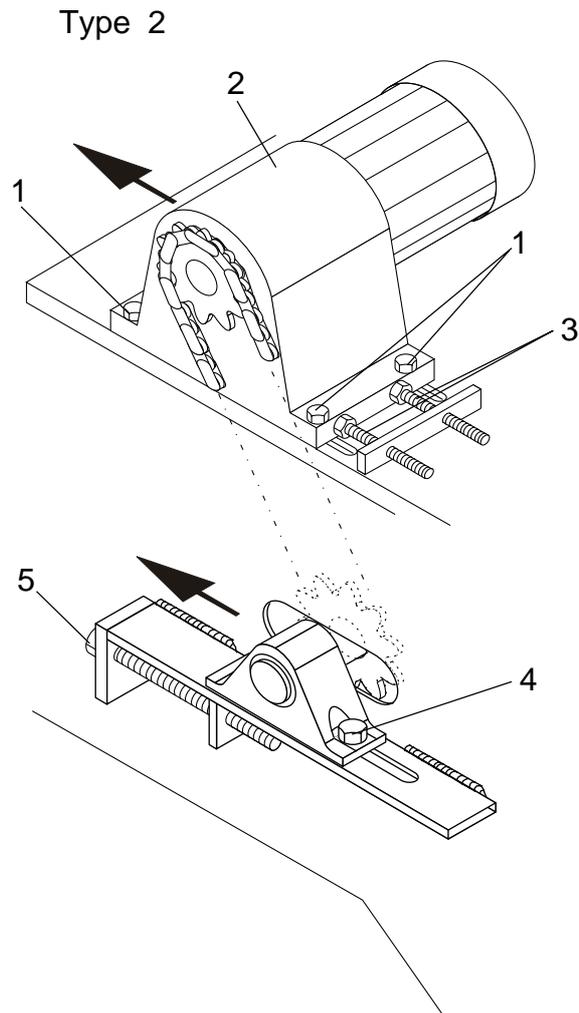
- Loosen the fastening screws (3) on both sides of the gearing end frame
- Loosen the lock nuts (1) of the clamping bolts (2) on both sides
- On both sides, evenly screw in the clamping bolts in the direction of the arrow
- Check hinge band tension as described in chapter 6.3
- Tighten the lock nuts of the clamping screws
- Tighten the fastening screws (3) at the gear end frame



Type 2

Model with pedestal bearing:

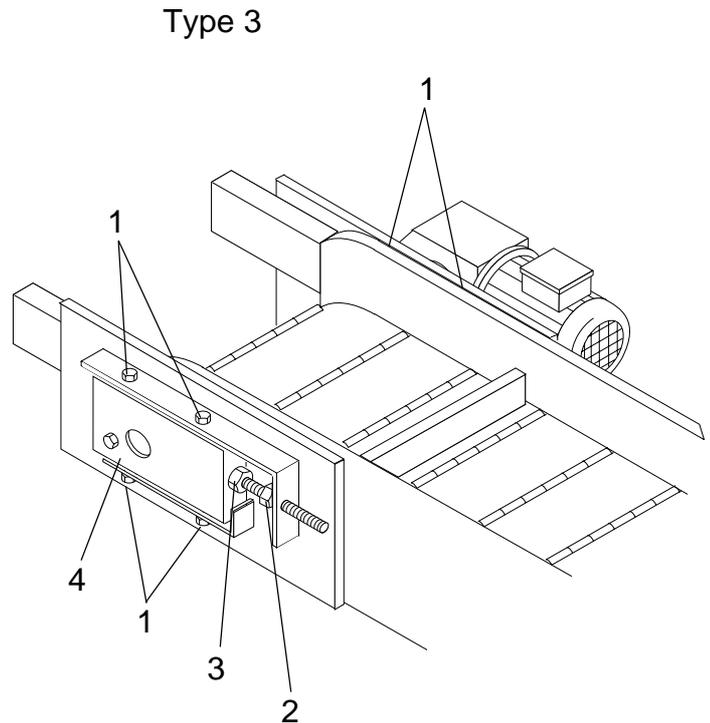
- Loosen the fastening screws (1) at the drive motor (2)
- Turn back the clamping bolts (3) on both sides
- Loosen the fastening screws (4) on the pedestal bearing on both sides
- On both sides, evenly screw in the clamping bolts (5) and tension the hinge band in the direction of the arrow
- Check hinge band tension (see chapter 6.3)
- Tighten the fastening screws (4) at the pedestal bearing
- Tension the drive chain by means of the clamping bolts (3) by moving the drive motor (2) in the direction of the arrow
- Check the chain tension of the drive chain (see chapter 8)



Type 3

with band support:

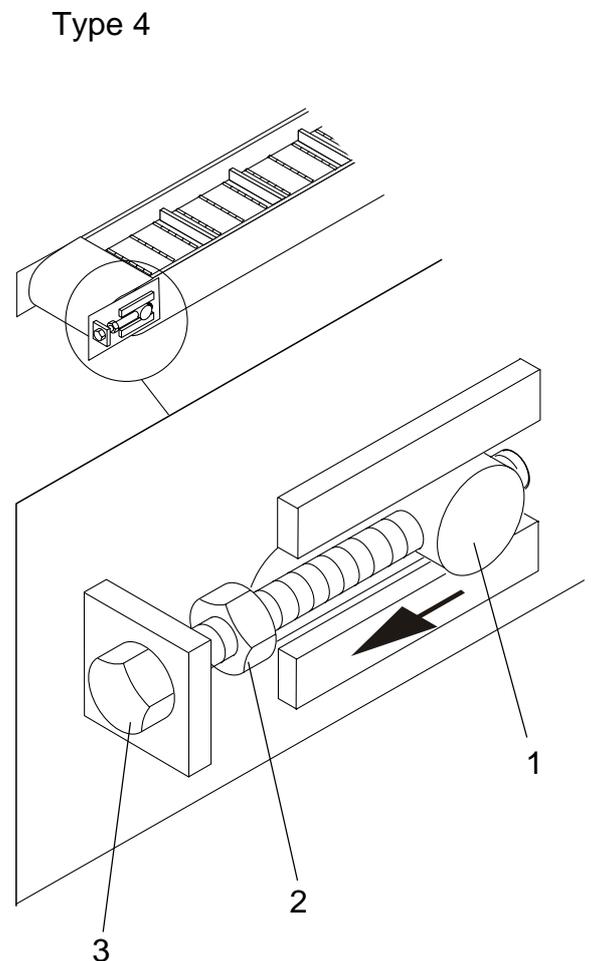
- Loosen the fastening screws (1) on both sides of the gearing end frame (4), but do not unscrew completely
- Loosen the lock nut (2) of the clamping bolt (3) on both sides
- On both sides, **evenly** tighten the clamping bolts while checking the hinge band tension continuously as described in chapter 6.3
- Tighten lock nuts (3)
- Tighten fastening screws (1) on both sides of the gearing end frame (4)



Type 4

Deflection model:

- Loosen lock nuts (2) on both sides
- On both sides, **evenly** tighten the clamping bolts (3) in the direction of the arrow
- Check hinge band tension continuously as described in chapter 6.3
- Check the adjustment of the guide roller (1) (see chapter 6.3)
- Tighten lock nuts (2)



5 Switching on and operating

5.1 Before initial operation

- Electrical components must be connected by qualified personnel (note voltage, frequency, strength of current and direction of rotation)
- Do a leak test on pipings for liquids (possible transport damage)
- Set all switches at "0" or "OFF"
- Fill up with required liquids (coolants, lubricants, oils, etc.)
- The entire installation must be free of coarse parts (tools, etc.)

5.2 Switching on



- **Make sure that nobody is in the danger area of the hinge band conveyor!**
- **For the operation of the installation, the regulations for prevention of accidents VBG 10 must be observed!**
- **All danger areas accessible to people must be covered!**

Sequence for switching on:

- Lifting pump(s)*
- Low lift pump(s)*
- Scraper conveyor
- Auxiliary aggregates (swarf mill, sieve drum, magnetic drum etc.)*
- Jetting pump(s)*

5.3 Switching off



Switch off scraper conveyors with coolant system with a time delay of approx. 5 mins. to the processing machine (purification of the coolant)

Sequence for switching off:

- Jetting pump(s)*
- Low lift pump(s)*
- Lifting pump(s)*
- Auxiliary aggregates (swarf mill, sieve drum, magnetic drum etc.)*
- Scraper conveyor

*if supplied with this model

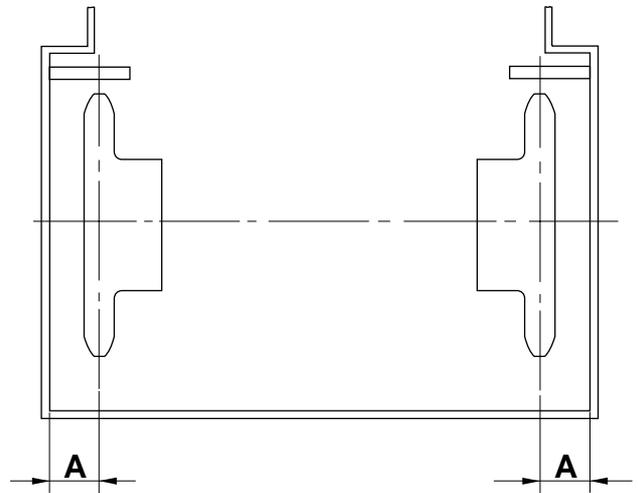
6 Maintenance

6.1 Adjusting the drive shaft



Only necessary if distance "A" is not the same on both sides

- Loosen the axial shaft locks on both sides of the drive shaft bearings
- Move the chain wheels with the shaft in an axial direction until distance "A" is the same on both sides
- Fasten the axial shaft locks on both sides



6.2 Attaching the manual crank



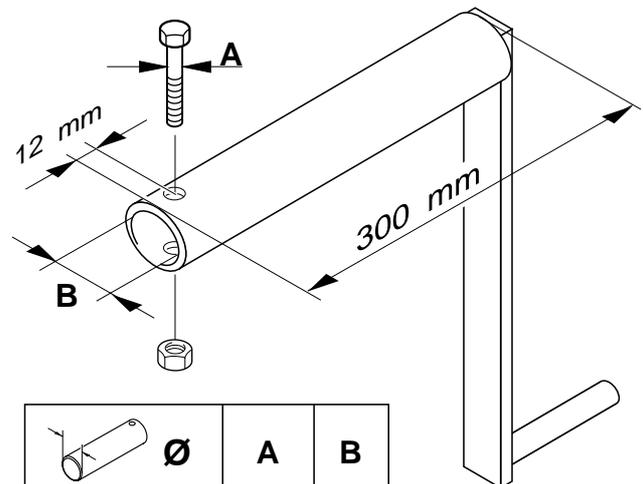
Examples for the use of the crank handle:

Aligning the hinge band for dismantling

Loosening coarse parts blocking the hinge band

Reversing mode when not possible with drive motor

- Loosen connection between drive motor and safety clutch. If necessary remove drive motor.
- Expel the rollpin spring of the safety clutch
- Remove the safety clutch from the drive shaft
- Attach the manual crank to the drive shaft and insert hexagon head screw. If necessary make manual crank as illustrated.



 Ø	A	B
25	M8	26
35	M10	36

6.3 Checking the hinge band tension

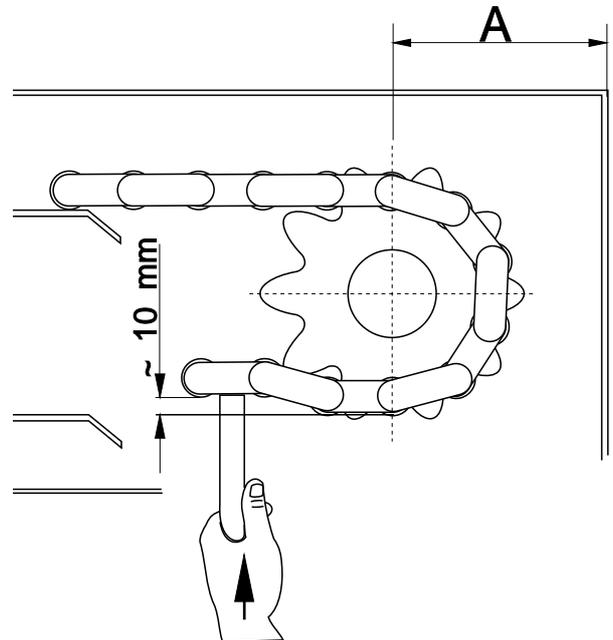
- Switch off the hinge band conveyor and secure against unintended start-up
- Check the hinge band tension between the drive shaft and container bottom



Hinge band tension:

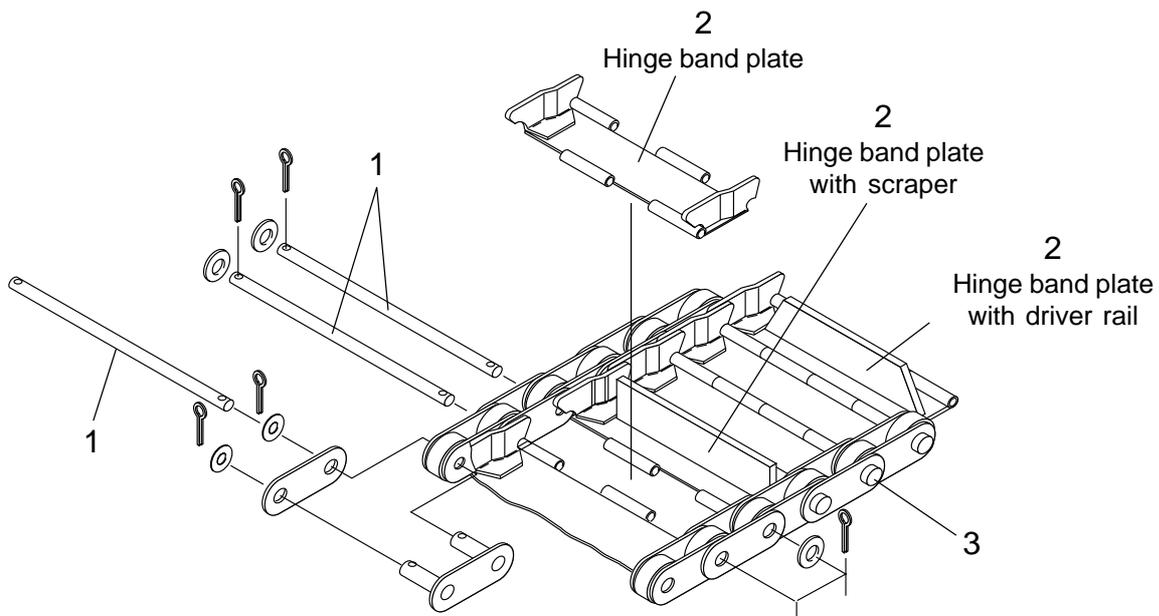
When applying moderate pressure from below, the hinge band must give approx. 10 mm

Dimension A must be the same on both sides



6.4 Changing individual hinge band plates

- Dismantle the hinge band
- Cut off the heads (3) of the connecting bolts (1) using appropriate tools (e.g. by means of a abrasive cutting-off machine, saw, etc.) on one side
- Pull the connecting bolts (1) out of the hinge band plate
- Remove hinge band plate (2)



To install a new hinge band, clamping bolts (1) (with borings), washers and split-pins have to be used.

Mind the length of the connecting bolts such as they do not rub at the container.

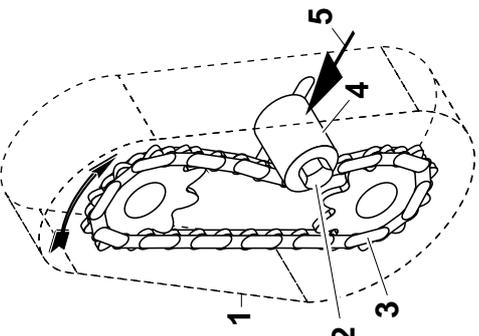
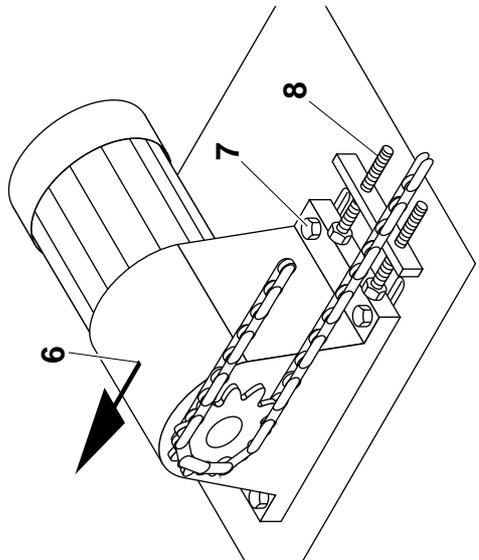
7 Information on coolants / tanks

- Circulate coolants continuously (weekend circulation recommended)
- Do not feed any organic matter
- Avoid foreign oil charge
- Temperature should be below 25°C for emulsion, if possible
- pH-value should be within neutral range
- Hardness of the initial water should not exceed 15° dH
- Hardness due to upgrading must not exceed 20° dH

Cleaning the coolant tanks

- Cleaning intervals greatly depend upon the kind of processing, material, coolant and working hours; no general interval can therefore be specified
A cleaning interval between four and eight weeks is recommended as standard value

8 Maintenance table

Subassembly/ component	Interval	Action	Safety instructions/ remarks
Drive - Drive chain (only for model with flange bearing with chain drive)	3 months	Check tension and tighten if necessary, lubricate drive chain 	Steps: - Remove protective covering (1) - Loosen hexagon head cap screw (2) - Press take-up pulley (4) in the direction of the arrow (5) against drive chain (3) (force of pressure approx. 20 N) - Tighten hexagon head cap screw (2) - Mount protective covering (1)
- Drive chain (only for model with pedestal bearing with chain drive)	3 months	Check tension and tighten if necessary, lubricate drive chain 	- Remove protective covering Loosen hexagon head cap screws (7) - Evenly unscrew hexagon head cap screws (8) in the direction of the arrow (6) until the tension of the drive chain is approx. 20 N - Tighten hexagon head cap screws (7) - Mount protective covering

Subassembly/ component	Interval	Action	Safety instructions/ remarks
- Bearing of drive shaft and lateral axis, chain wheels	---	Check wear and smooth running	Check and replace if necessary when changing the hinge band
Hinge band	3 months	Check tension and tighten if necessary	For setting, see Chapter 4.5
	3 months	Check for damage	Replace damaged parts
Electrical equipment			
- Motor(s)	---	See operating instructions of manufacturer	
- Wiring	3 months	Check for ruptures and damage	Replace defective wiring
- Level switch	3 months	Check function	Exceed both switch points by manual actuation
- Protective gear	3 months	Check function	
Sieve basket	---	Empty and clean	
Pumps	---	See operating instructions of manufacturer	
Containers	6 months	Check for leaks, damage and corrosion	Hazardous substances must in no case penetrate
	6 months	Check stability	Container must be safely and solidly fastened
	---	Check guide rails for wear	Check when changing the hinge band

Subassembly/ component	Interval	Action	Safety instructions/ remarks
Coolant tanks	500 working hours	Check for contamination (sludge deposits) and clean, if need be.	Depending on the tooling method, the interval may be greatly shortened. Coolant tanks are special accessories and are therefore not installed in every plant.

9 Eliminating malfunctions

Malfunction	Possible causes	Remedy
Drive motor races, hinge band does not move	Drive chain torn (for model with chain drive)	Replace drive chain
	Rollpin spring of the safety clutch on the drive sheared off	Drive in new rollpin spring
	Hinge band blocked by large parts, safety clutch has triggered	Remove parts Turn the drive band in reverse direction if necessary (see Chapter 6.2) After restarting, the safety clutch automatically reengages and continues to operate
	Safety clutch defective (loud rattling noise)	Immediately switch off swarf conveyor Inform service technician or replace complete safety clutch Never bridge the safety clutch or modify the setting
	Accumulation of swarfs in front of the guide sprocket wheel	Dismount hinge band and look over installation
Hinge band does not move centrally (strikes the hand guard on one side)	Axial shaft lock loose	Adjust drive shaft (see Chapter 6.1)

10 Accessories

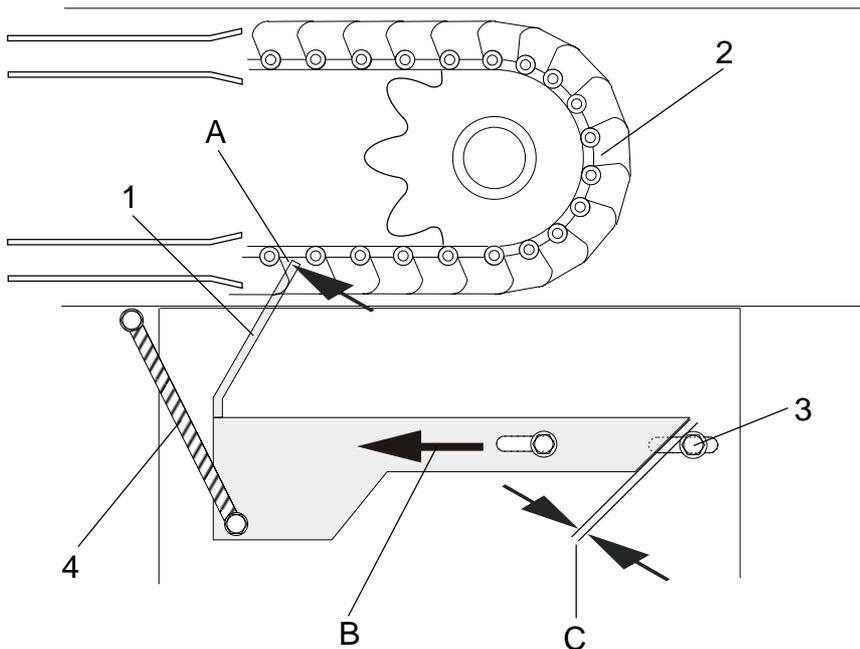
10.1 Stripping device

Scope

- Used in case snarl chips are forming as well as in case chips are conglutinating (e.g. due to oil)

Function

- By means of spring pressure (4) a movable scraper (1) will be moved along the hinge band (2)
- Conglutinated chips will be eliminated



Setting

- The stripping device (1) has to fit close to the hinge band (2) (A)
- Move stripping device fully in the direction of the arrow (B) until it reaches the stop
- Set the adjusting screw (3) to a distance (C) of 2 mm approx between the screw (3) and the scraper (1).

KNOLL

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