INSTRUCTION MANUAL

Mobiscreen

MS 20 D

Please retain for further use!

Product identification

Model	Mobiscreen
Type	MS 20 D
Commission number	4111000000
Order number	K0570201
Year of manufacture	2012

Customer registrations

Inventory no.

Location

Manufacturer's address

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Document number of the instruction manual:	K0570201 / 4111000000

Purpose of the document

The purpose of these operating instructions is to provide information on all important issues relating to the technical design and safe operation of your machine.
Like us, you are also required to give close attention to these operating instructions prior to commissioning. This is necessary to operate your machine economically and to avoid damages and injuries. Unfortunately we cannot accept any liability for faults and damages that can be attributed to inadequate knowledge of the operating instructions.
In cases of doubt, please contact our in-house consultants or our branches and dealers both at home and abroad. We will be delighted to provide you with further assistance.

Organisation of the operating instructions

The operating instructions are divided into chapters, which deal with the various types of machine application. This division will make it easy for you to find the desired information.

Additional documents

In addition to these operating instructions, the original operating instructions must be used for certain vendor parts. We wish to expressly state at this point that these original operating instructions must be used with care. Although these operating instructions are designed for the relevant component, deviations in placement and functioning can occur as a result of installation in the system.

The following original documentation is also provided:

Operating instructions for power unit	**2x**
Operating instructions for motor monitoring unit	**2x**
Circuit diagrams for electrical control system	**2x**
Functional description for electrical control system	**2x**
Operating instructions for radio remote control (optional)	**1x**
Operating instructions for frequency converter (optional)	**2x**

Table of Contents

1 Product description

1.1 Application and intended use

The MS 20D mobile screen plant is solely intended for the purpose of pre-sorting or screening mid-d-le-hard natural stones, rubble and asphalt and has a max. feed size of 150 mm (5.9 in) in length.

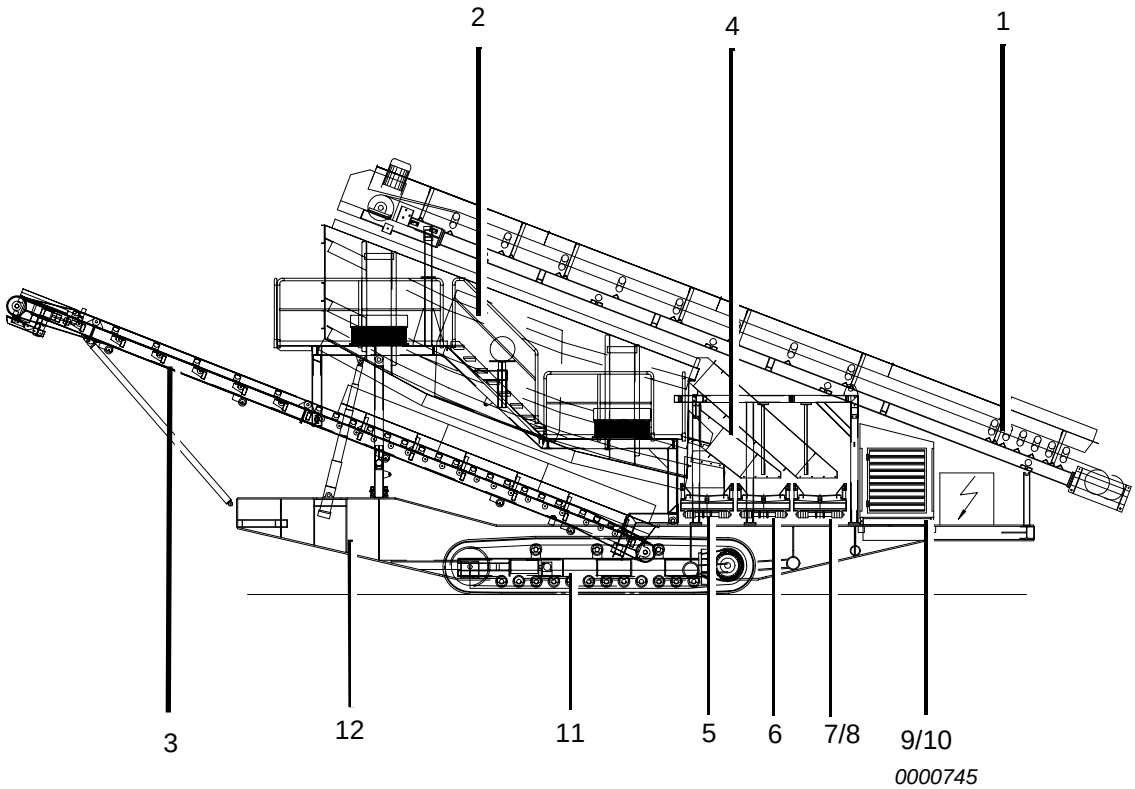
Any further use, such as the screening of contaminated materials, wood, scrap, coal, metal parts, etc., is contrary to the intended use of the machine.

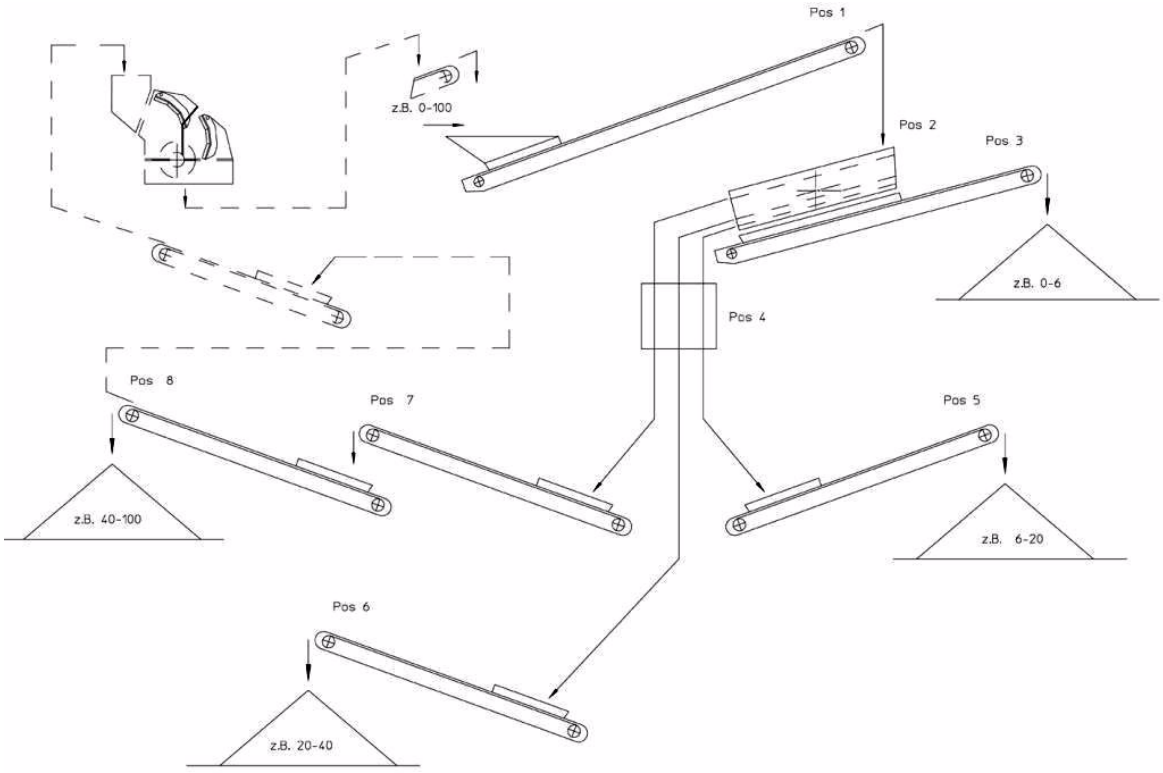
The manufacturer does not accept responsibility for any resulting damage. The user alone bears the risk.

Included in the intended use:

- adherence to all instructions in the instruction manual and
- performance of inspection and maintenance work.

1.2 Machine overview





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1	**Feeding conveyor**	**8**	**Side discharge conveyor (hydraulically swivel-mounted)**
2	**Vibrating screen**	**9**	**Diesel generator**
3	**Discharge conveyor**	**10**	**Electrical control (not displayed)**
4	**Chute**	**11**	**Crawler running gear**
5	**Discharge conveyor, lower deck**	**12**	**Chassis**
6	**Side discharge conveyor (hydraulical-- ly swivel-mounted)**		
7	**Discharge conveyor, upper deck**		

1.3 Precautionary measures

In the event of incorrect use of the plant, improper operation or faulty repairs, the plant itself or pro-d-ucts located nearby may be damaged or destroyed. Persons who are in the hazard area are liable to incur severe or fatal injuries.

Thus this instruction manual must be read thoroughly and it is imperative to observe the relevant

safety instructions.

1.4 Conformity

The plant corresponds in its setup to valid EC Directives, as well as appropriate European standards. The development, manufacture and installation of the plant has been carried out with the utmost care.

1.5 Product designation

As the plant contains various individual machines, several type plates are used for the designation and these are found on the respective individual machines.

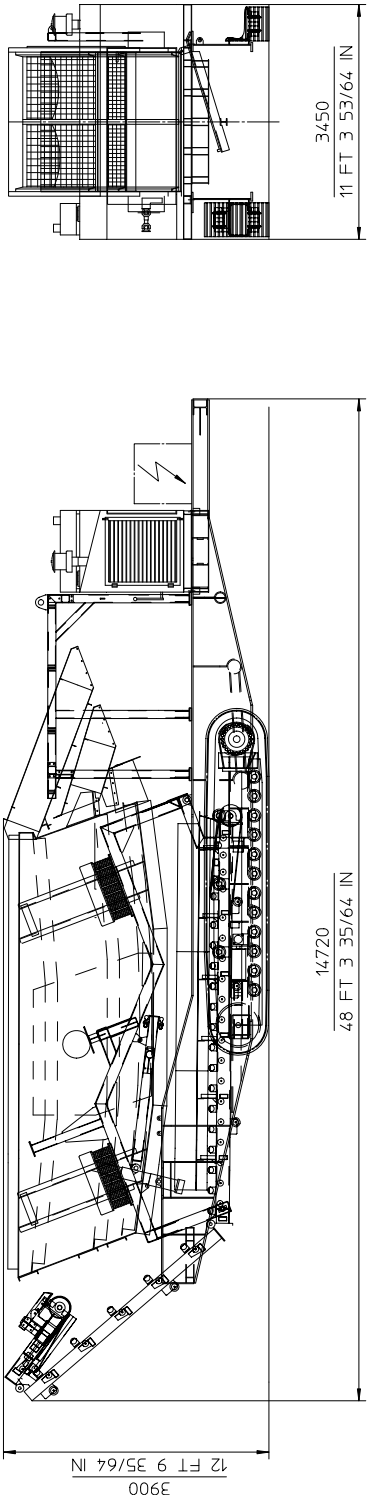
1.6 Technical details

All important technical details regarding the entire plant are given. These provide information on the performance and installation of the plant.

1.6.1 Mobiscreen plant

Charged material	Rubble, demolished concrete, asphalt, natural stone
Feed size	Depending on charged material, up to 150 mm (5.9 in) in length
Feed capacity	Up to 650 t/h (716 sh tons) depending on the charged material and grain sizes to be screened
Total weight	40,000 kg (88,800 lbs) (no options)
Gradeability (permissible gradients)	Longitudinal: 22% (forwards / backwards)
with fully installed plant	Transverse: 17% (lateral)

1.6.2 Transport and erection area



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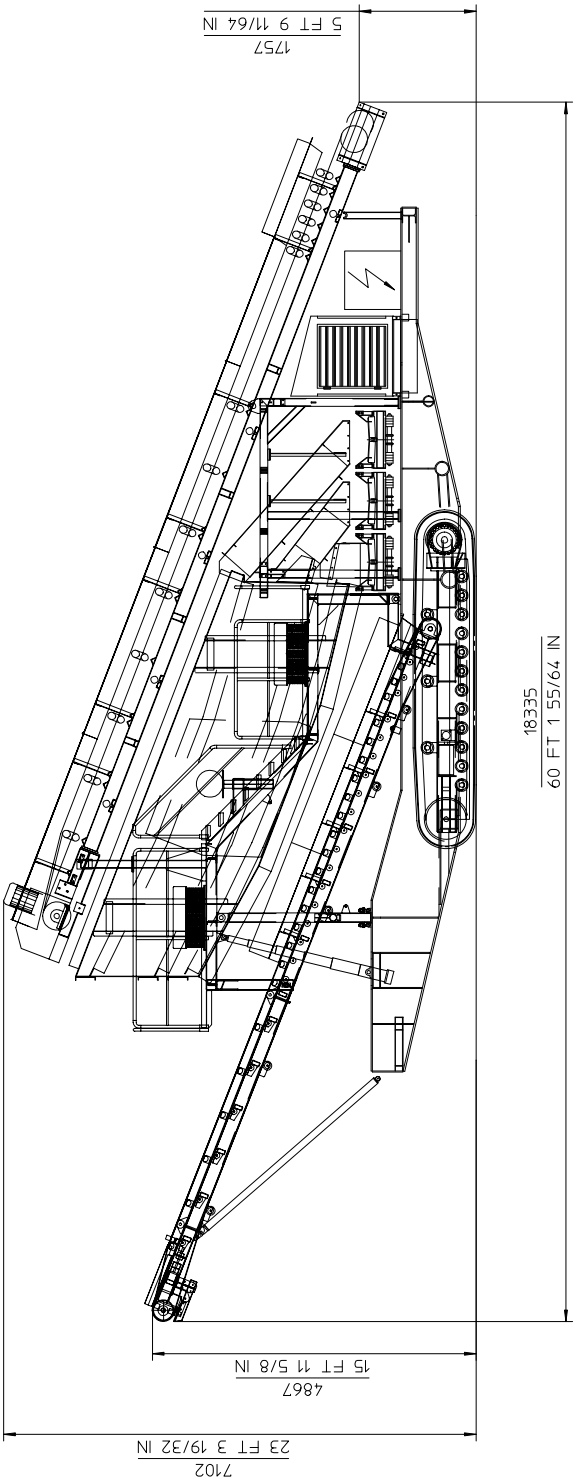
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15 FT 11 5/8 IN
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23 FT 3 19/32 IN
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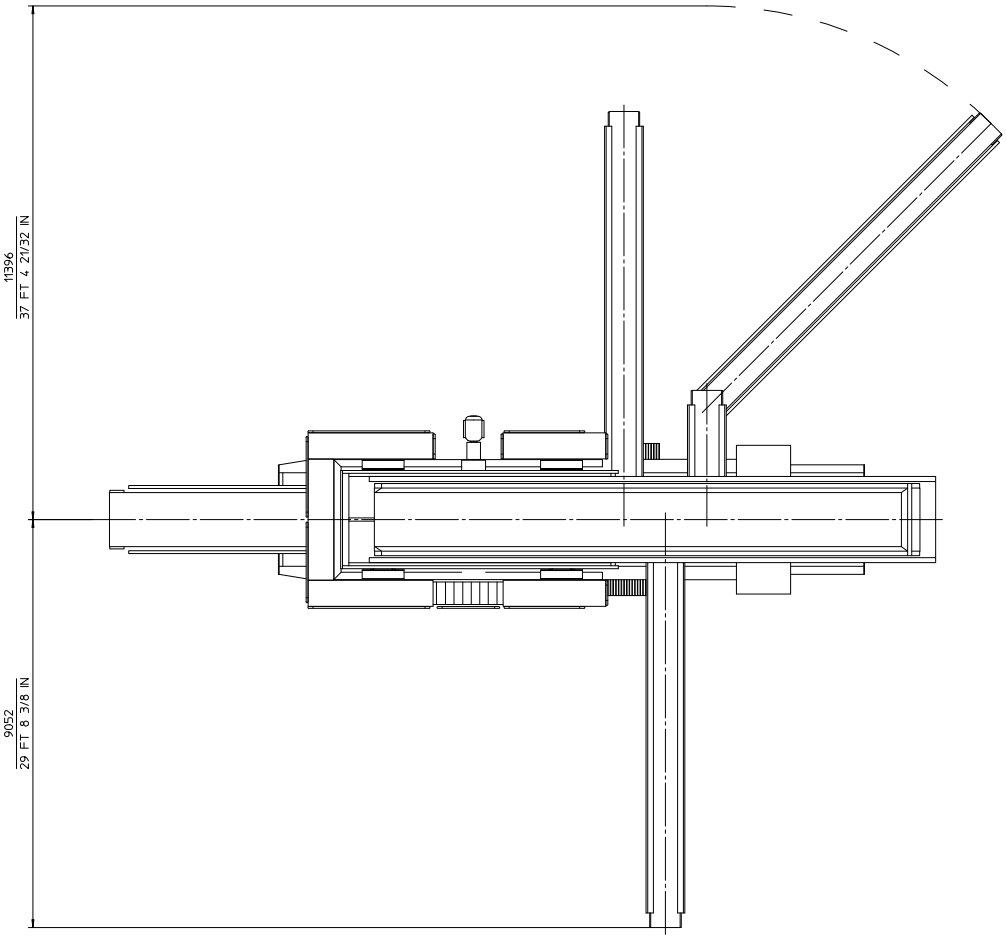

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2 Safety regulations

2.1 General

Knowledge of the essential safety instructions and safety regulations is a basic prerequisite for the safe use and trouble-free operation of the machine.

The safety instructions in this section make up the general part. Extra instructions are given directly before the relevant operations.

- This instruction manual contains the most important information required to operate the ma-- chine safely.
- The safety information must be observed by all persons who are working at the machine.

2.2 Symbol and notice explanation

In the instruction manual the following terms and symbols are used for hazards:

⚠ DANGER!

This symbol means imminent danger.

Failure to comply with these instructions may lead to severe or fatal in-- jury.

⚠ WARNING!

This symbol means possible danger.

Failure to comply with these instructions may lead to severe or fatal in-- jury.

⚠ CAUTION!

This symbol means imminent danger.

Failure to comply with these instructions may lead to personal injury or material damage.

NOTE!

This symbol means possible danger.

Failure to comply with these instructions may lead to personal injury or material damage.

IMPORTANT!

Under this symbol, suggestions and tips for use and other particularly useful information is found.

These symbols and notices help you to optimally use all functions on the machine and make your work easier.

2.3 Responsibility of the operator

- The operating company is obligated to only permit persons to work at the machine who

  - are aware of the essential regulations with regard to workplace safety and accident prevention and are familiar with the use of the machine.

  - have read and understood the safety section and the warning notices in this instruction manual and have confirmed so with their signature.
- The work is controlled at regular intervals to ensure that safety procedures are being followed.

2.4 Responsibilities of the personnel

All persons who are commissioned to work at the machine are obliged before beginning work

- to observe the basic regulations with regard to work safety and accident prevention,
- to read the safety section and the warning notices in the instruction manual and confirm their understanding of these with their signature,
- to obtain information about the operation before using the machine.

2.5 Organisational measures

- The necessary personal protective equipment must be provided by the operator.
- All existing safety devices must be checked regularly.

2.6 Informal safety measures

- The instruction manual must be **permanently retained at the site** of the machine. It must be easily accessible to the operators at all times.
- Supplementary to the instruction manual, the general and local regulations on accident prevention and environmental protection must be provided and adhered to.

- All safety instructions and hazard warnings must be kept at the machine and must be legible.
- With every change of owner or when the machine is on loan to other persons, the instruction manual must be handed over and its importance pointed out.

2.7 Training of personnel

All activities at the plant must only be carried out by authorised personnel.

The authorised personnel must:

- have reached the age of 18.
- be trained in first aid and be able to administer it.
- have read and understood the safety manual.
- be familiar with and know how to apply the accident prevent regulations and safety instructions for the plant.
- be trained and instructed on how to conduct themselves in the event of a fault.
- have the physical and mental ability to perform the tasks and activities at the plant for which they are responsible.
- be trained and instructed in the tasks and activities at the plant in their area of responsibility.
- have understood and be able to practically implement the technical documentation on the tasks and activities at the plant for which they are responsible.

Read the following before initial operation of the plant:

- the instruction manual.
- the safety manual.

The plant can only be operated and moved by persons who, in addition:

- have received instruction in operation and moving the plant.
- have provided the operating company with proof of their ability to perform the work.
- can be expected to reliably carry out the tasks assigned to them.
- They have to be appointed by the plant's owner to operate and move the plant.

2.8 Risks and dangers when using the machine

The machine is built using the best available technology and in accordance with the recognised safe-- ty regulations. However, through its use danger to the life and well-being of the operator or third party may arise, as well as material damage.

- The machine is only to be used
  - for its intended purpose
  - and when it is in perfect condition with regard to safety.
- Faults which compromise safety must be eliminated immediately.

2.9 Maintenance and inspection, repairs

- All maintenance and repair work must be carried out when the **machine is disconnected from the power supply**.
  At the same time, the machine must be safeguarded against unintentional restart.
  - Lock switch cabinet
  - Turn off main switch
  - Remove ignition key from machine
  - Attach warning sign on the machine to warn against restart
- Compulsory maintenance and inspection work must be carried out in accordance with sched-- ule.
- Operators must be informed before beginning maintenance and repair work.
- Disconnect all machines, upstream and downstream plant components and service mediums such as hydraulic oil and safeguard against unintentional startup.
- When replacing large components, carefully attach and secure them to hoisting devices.
- Check security of all screw connections.
- Doors and flaps of the machine must only be opened after moving parts are stationary.
- Once maintenance work is finished, check whether all safety devices are working properly.

2.10 Guard devices

- Safety devices must not be bridged or avoided.
- Before the machine is switched on, all safety devices must be properly attached and function-- ing.
- Safety devices must only be removed
  - after the machine has shut down and
  - safeguarded against its unintentional restart.
- In the case of delivery of part components, the safety devices must be fitted by the operator in accordance with regulations.

2.11 Safety measures during normal operation

- Only operate the machine when all safety devices are fully functional.
- Before switching on the machine, ensure that nobody can be put at risk from starting up the machine.
- Inspect the machine at least once a day for noticeable external damage and check the opera-- tion of safety devices.

2.12 Danger due to electrical power

- Work on the electrical system must only be carried out by qualified electricians.
- The electrical equipment of the machine must be checked regularly. Loose connections and damaged cables must be replaced immediately.
- The switch cabinet must be kept locked at all times. Access only permitted by authorised per-- sonnel with key or appropriate tool.

- If work on live parts is necessary, then a second person must be present who can switch off the main switch in case of emergency.

2.13 Hazards resulting from hydraulic energy

- Only trained experts with special knowledge and experience in hydraulics may work on hydrau-- lic devices.
- System sections and pressure lines that need to be opened must be depressurised before commencing repair work.
- Replace hydraulic-hose lines at appropriate intervals, even if no safety-relevant defects are de-- tectable.

2.14 Particular dangers

Risk of tipping due to subsidence or exceeding of the permissible drive inclination.

Machine can crush persons located beneath it.

- ⇒ Only erect and move the machine on safe, solid ground.
- ⇒ Do not exceed permissible drive inclinations

Risk of injury due to falling material.

People can be killed or buried.

- ⇒ Do not stand within the discharge area of running belts.
- ⇒ Feed hopper area forbidden during loading.
- ⇒ Wear a safety helmet.

Injuries due to reaching into the unbalance of the screening machine or into the conveyor belts.

Limbs can be torn out.

- ⇒ Only execute maintenance work when the machine is stationary.
- ⇒ Never bypass safety devices.

Injuries due to slipping on the polluted machine.

Very serious fractures can result.

- ⇒ Keep machine and platforms clean.
- ⇒ Use stable ladders and the operator platform.

Injuries due to reaching into or falling into the crusher.

Risk of fatal injury!

- ⇒ Never eliminate blockages when the crusher is running.
- ⇒ Never climb on the vibrating conveyor chute during operation.
- ⇒ Never reach into the running crusher with bars.

Eye injuries due to stone chips, dust, reinforcing steel.

Permanent eye damage can result.

⇒ Wear safety goggles.

Eye injuries and scalds due to squirting hydraulic oil.

Can result in burns and blindness.

- ⇒ Always switch off and depressurise the hydraulics before performing maintenance and repair work
- ⇒ Replace defective hydraulic hoses immediately.

Danger from touching electric lines.

Can result in lethal electric shock.

- ⇒ Repairs to the electrical system must be performed by a skilled electrician.
- ⇒ Replace damaged cables immediately.
- ⇒ Keep switch cabinets closed.

Injuries due to trapping between the machine and a shovel loader or excavator.

Fatal crushing injuries can result.

- ⇒ Do not stand between the machine and the loading device.

2.15 Structural modifications to the machine

- No modifications, additions or conversions may be made to the machine without the manufacturer's permission. This also applies for welding work to structural components.
- All conversion measures require written confirmation from the manufacturer.
- Machine components that are not in perfect condition must be replaced immediately.
- Only use genuine Kleemann spare and wearing parts.

2.16 Cleaning the machine and disposal

- The materials and substances must be handled and disposed of appropriately, particularly when
  - Working on lubricating systems and lubricating devices and

- Cleaning with solvents.

2.17 Vibrations

During its operation, the machine is subject to stress from vibrations. On the maintenance platforms, which can only be used for maintenance purposes, vibration acceleration occurs.

2.18 Noise

A considerable continuous sound pressure level is generated by the machine.
Hearing protection is therefore necessary in the area of the machine in order to avoid damage to hearing.

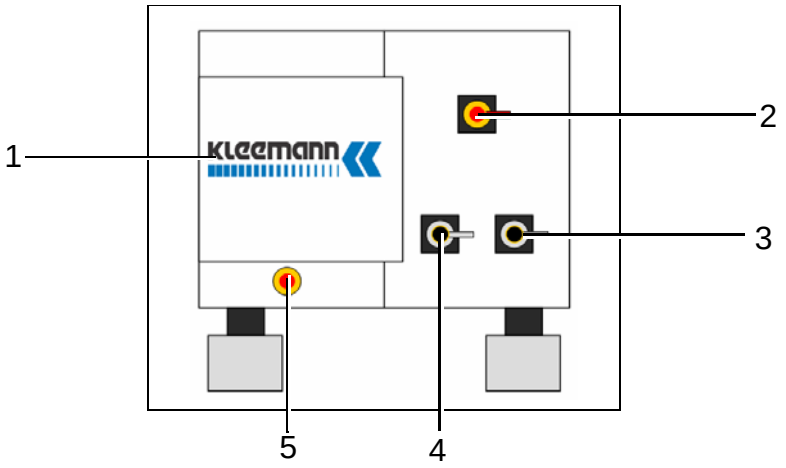
2.19 Warranty and liability

As a basic principle our "General Terms and Conditions of Sale and Delivery" apply. These are available to the operator no later than at conclusion of contract. Warranty and liability claims in the case of personal and material damage are ruled out if they are caused by one or more of the following:

- use of machine other than its intended purpose
- improper installation, startup, operation and maintenance of machine
- use of machine with defective safety devices or safety devices not fitted according to the rules or non-functional safety and protective devices
- non-use of original Kleemann replacement and wearing parts
- non-compliance with information in the operating manual with regard to transport, installation and removal, start-up, positioning and rigging, operation, maintenance and inspection, and repairs.
- structural changes made to machine without manufacturer's authorisation
- inadequate inspection of machine parts that are subject to wear and tear
- repairs carried out improperly
- catastrophes caused by impact of foreign material and Acts of God.

3 Operating and display elements

3.1 Switch cabinet



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No.	Designation	Function
1	Control panel	Control and monitoring of the complete system (see “Control panel”)
2	Main switch	Disconnects all loads from the generator. Exception: Exempt circuits (see “Exempt circuits”). Main switch can be locked with a padlock
3	Diesel main switch	Machine driven by diesel generator
4	Main switch of upstream machine	Machine driven via upstream machine, e.g. Mobirex
5	Emergency-stop	General emergency stop (see “Emergency-stop”)

⚠ CAUTION!

Damage to property!

Electronics within the switch cabinet will be damaged by dirt.

Keep switch cabinet closed during operation.

3.2 Socket-outlets on the switch cabinet

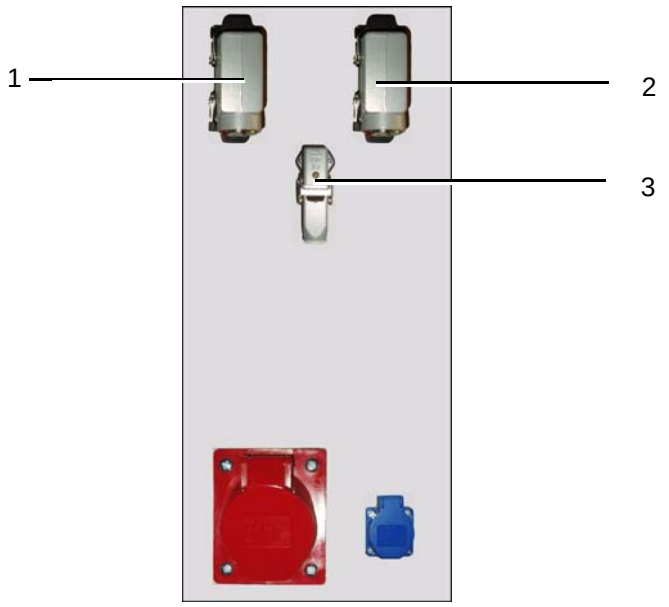
⚠ CAUTION!

Damage to property!

Risk of damage to the contacts.

Only insert connectors for socket-outlets in de-energised state.

Contacts must be clean and tidy.



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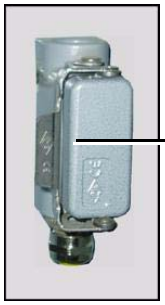

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No.	Designation	Function
1	Locking	Connection for locking a connected upstream machine (e.g. Mobirex) electrically
2	Socket	Drive for additional conveyor
3	Emergency Stop	Emergency Stop for additional conveyor
4	Drive socket outlet	Connection for manual control

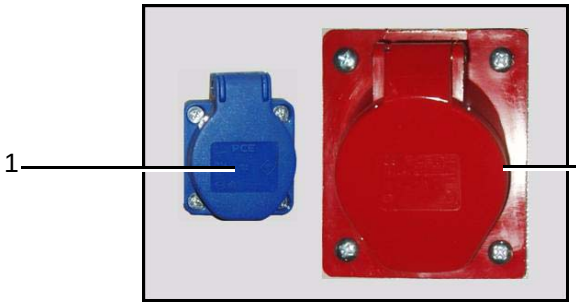
3.3 External circuits

⚠ WARNING!

Electrical voltage!

Socket-outlets of external circuits are live even when the main switch is switched off!

To switch off the complete unit, press emergency-stop on switch cabinet.



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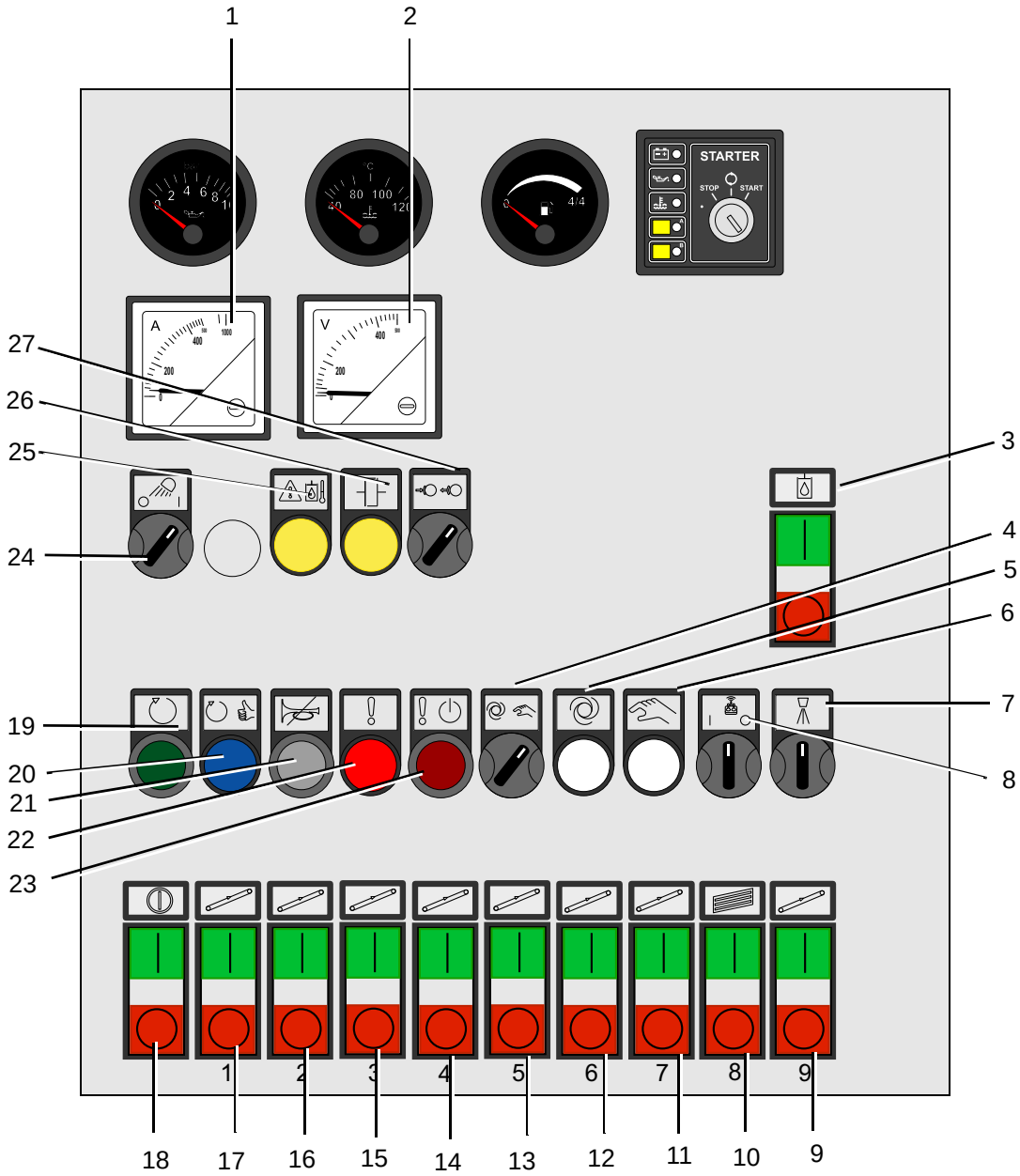
No.	Designation	Function
1	Socket-outlet	Service socket-outlet (230V / 16A)
2	Socket-outlet	Service socket-outlet (400V / 32A)

3.4 Operator panel



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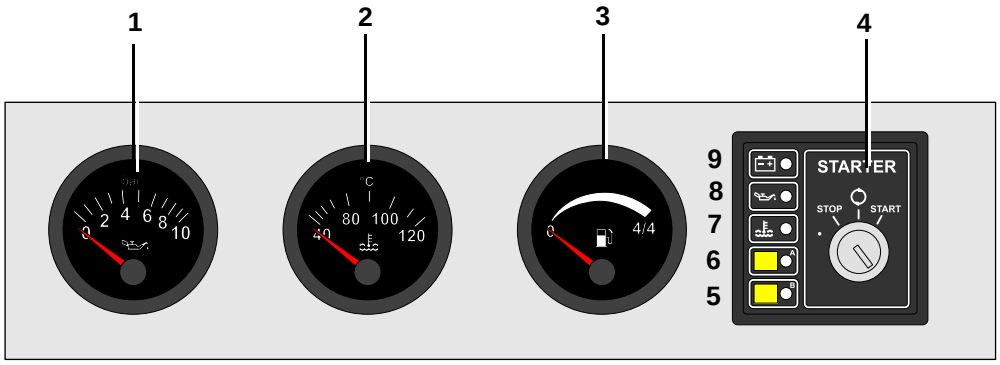
No.	Designation	Function
1	Current meter	Displays current consumption
2	Voltage meter	Displays voltage
3	Hydraulic system	ON / OFF pushbutton for hydraulics
4	Automatic mode / manual mode	Selector switch to change between automatic and manual operating mode. In manual mode position, the sequential locking device of the machine is switched off
5	Automatic mode	Indicates position of operating mode selector switch in "automatic"
6	Manual mode	Indicates position of operating mode selector switch in "manual"
7	Water pump	Monitoring switch for turning water pump ON and OFF
8	Radio ON/OFF	ON/OFF switch for radio remote control
9	Conveyor belt 9	On/Off pushbutton for conveyor belt
10	Screen 8	ON / OFF pushbutton for vibrating screen
11	Conveyor belt 7	On/Off pushbutton for conveyor belt
12	Conveyor belt 6	On/Off pushbutton for conveyor belt
13	Conveyor belt 5	On/Off pushbutton for conveyor belt
14	Conveyor belt 4	On/Off pushbutton for conveyor belt
15	Conveyor belt 3	On/Off pushbutton for conveyor belt
16	Conveyor belt 2	On/Off pushbutton for conveyor belt
17	Conveyor belt 1	On/Off pushbutton for conveyor belt
18	Plant On	ON / OFF pushbutton for plant
19	Start release	Pushbutton to initiate start release
20	Start release	Lights up as soon as plant is ready to start
21	Acknowledge siren	Pushbutton to acknowledge siren
22	Fault	Lights up in event of plant faults
23	Acknowledge fault / emergency off	Pushbutton for acknowledging faults / emergency off
24	Lighting	Monitoring switch for turning lighting ON and OFF
25	Hydraulic system	Lights up in event of excess temperature
26	Coupling	Lights up when coupling is engaged
27	Open / Close brakes	Monitoring switch for opening and closing brakes

3.4.1 Engine monitoring

The engine monitoring system is a separate operator panel, which is integrated in the operator panel

of the switch cabinet.



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No.	Description	Function
1	Oil pressure display	Displays oil pressure
2	Coolant temperature display	Displays coolant temperature
3	Fuel gauge	Displays amount of fuel
4	Key switch	Starts and stops the diesel generator
5	Control lamp B	Indicates a contaminated air filter =>engine switches off automatically
6	Control lamp A	Indicates insufficient coolant =>engine switches off automatically
7	Control lamp overtemperature	Indicates an excessive coolant temperature =>engine switches off automatically
8	Control lamp for oil pressure	Indicates a drop in lube oil pressure below the permissible value. =>engine switches off automatically
9	Control lamp - ignition	Lights up when ignition is switched on

3.5 Frequency converter

3.5.1 Frequency converter main switch

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The main switch of the frequency converter is fitted in the switch cabinet. It can be accessed after opening the switch cabinet door.

⚠ CAUTION!

Danger of material damage!

Switching over the frequency converter main switch with the plant run-- ning can result in damage to the electrical system.

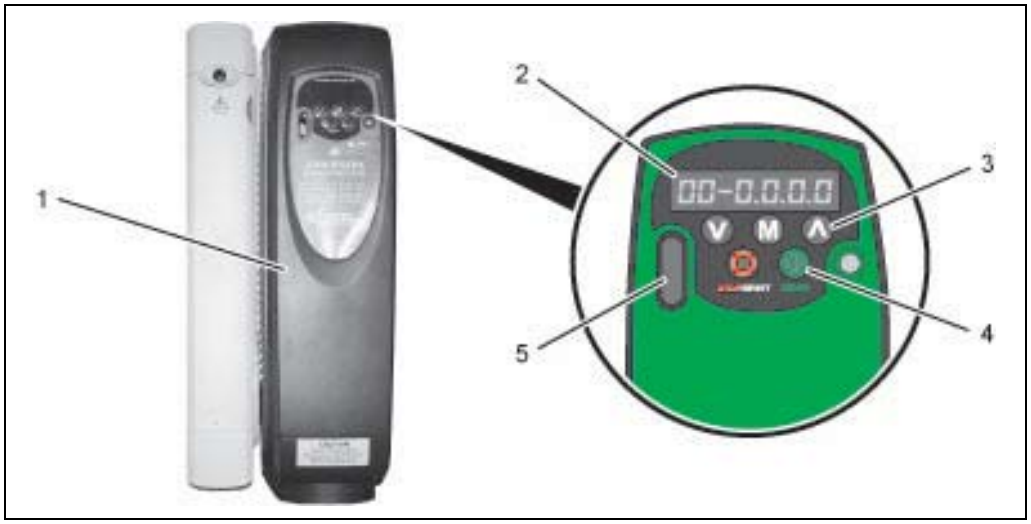
Switch off plant components, diesel generator and the main switch of the plant.

- **Only switch over the frequency converter main switch when the pant is energised.**

The main switch has two switching positions:

- Switching position 1 = network operation: all consumers are supplied by the diesel generator at the rated frequency.
- Switching position 2 = frequency converter operation: the consumers connected to the fre-- quency converter are controlled by the frequency converter.

3.5.2 Frequency converter operating unit



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[1] Frequency converter housing

[2] Display

[3] Programming buttons

[4] Operating buttons

[5] Slot for Smartstick/Logicstick (option)

The three-phase current frequency converter permits speed control of the vibration motors of the fee-der trough.

The frequency converter is operated by the programming and operating buttons. The display is divi-d-ed into two display fields on the left and right. The left-hand display field shows the current parame-ter; the right-hand display shows the corresponding value.
The display can be viewed through a window in the switch cabinet door. The switch cabinet door must be opened to operate the operating unit.

Mode button

The mode button is used to change the operating unit mode. Three different modes can be selected:

- Status mode
  - Speed display
  - Load display
- Parameter display mode
- Parameter input mode

Arrow keys

The arrow keys are used to increase and reduce the speed of the vibration mo-- tors. They are also used to select parameters and process their values.

Start button

Pressing the start button switches the frequency converter on.

Stop button

Pressing the stop button switches the frequency converter off.

3.5.2.1 Display windows

Operating statuses (status mode)

Left display field	Status	Description
	Converter ready	Converter is enabled and ready to start.
	Converter disa- b-led	Converter is blocked due to missing enable or fault shutdown.
	Fault shutdown of converter	The fault shutdown of the converter has been trip-ped. Fault shutdown code is displayed in the right-hand display field.
	DC injection bra-k- ing	DC injection braking is active.
	Network failure	Failure of the power network.

Speed displays

Left display field	Description
	Drive output frequency in Hz.
	Motor speed in rpm.
	User-defined motor speed.

Load displays

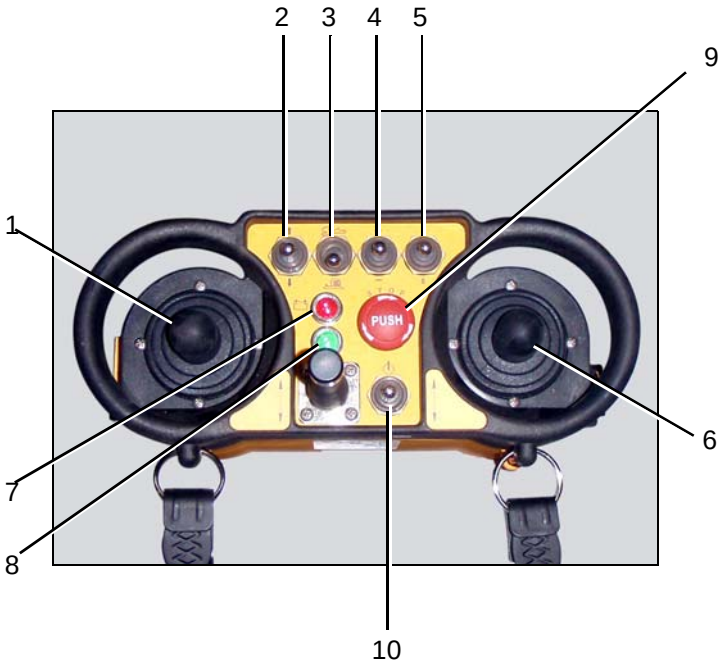
Left display field	Description
	Active load current as a % of motor rated current.
	Converter output current per phase in A.

3.6 Radio control (optional)

DAN-

Risk of fatal injury due to bulky dimensions of the plant!

- **Risk of fatal injury to persons during operation of the plant due to its bulky dimensions.**
- **Plant is only to be operated with the assistance of a reliable banksman.**
- **Keep constant eye contact with banksman during machine operation.**



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No.	Description
1	Left crawler control forwards/backwards
2	Has no function
3	Crawler slow / fast
4	Feeder trough frequency slow / fast
5	Feeder trough on / off
6	Right crawler control forwards / backwards
7	Battery warning light LED
8	LED operation display
9	Unlocking emergency off
10	Has no function
11	Switch horn on / off (option)
12	Switch on radio remote control

With the radio remote control, the plant can be operated from a distance of approx. 30 m (100 ft). To operate the radio remote control, the "radio" monitoring switch on the switch cabinet must be set accordingly. The plant must also be manually switched on at the switch cabinet by radio remote control.

Activating the radio control

- Switch on radio control using rotary knob (10) on the side
- Unlock emergency stop (8)
- Acknowledge emergency stop (9)

NOTE!

If the plant is operated by radio remote control, generally activate the radio before switching on the plant.

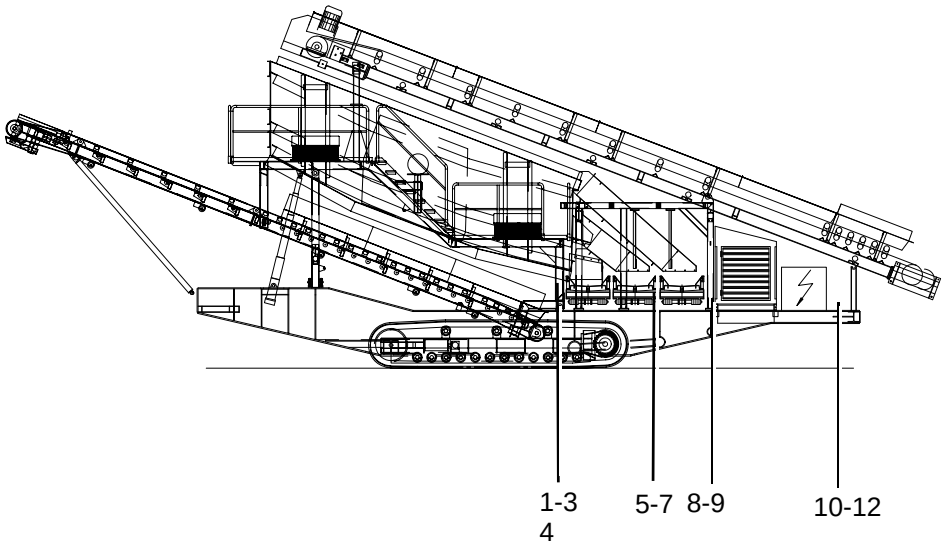
⚠ CAUTION!

Caution! Material damage!

Risk of damaging the receiver electronics!

For welding work on the plant, disconnect control cable from receiver.

3.7 Socket outlets on the chassis



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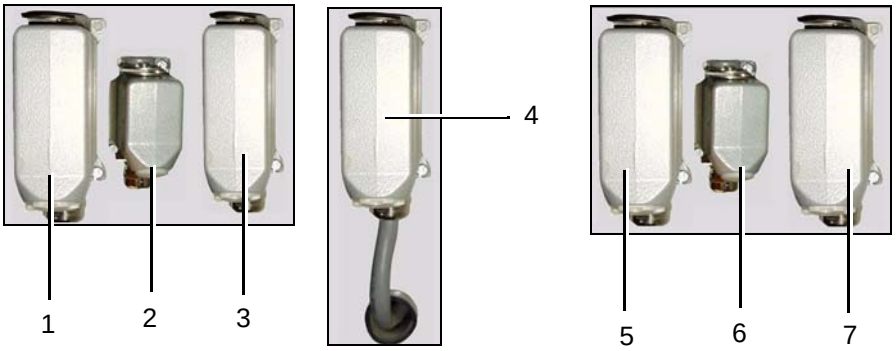

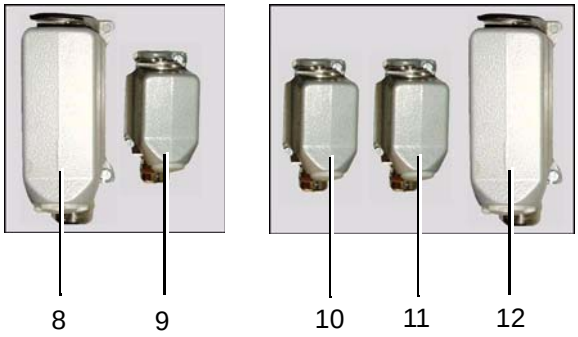

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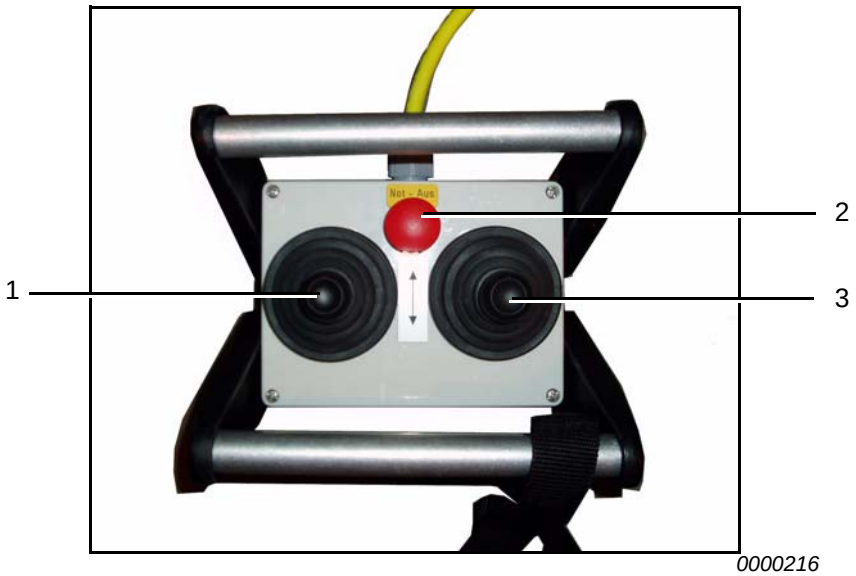
No.	Description	Function
1	Socket outlet	Side discharge conveyor (long belt) drive
2	Socket outlet	Side discharge conveyor (long belt) emergency stop
3	Socket outlet	Lighting
4	Socket outlet	Right side discharge conveyor (short belt) drive
5	Socket outlet	Left side discharge conveyor (short belt) drive
6	Socket outlet	Right side discharge conveyor (swivel belt) emergency stop
7	Socket outlet	Right side discharge conveyor (swivel belt) drive
8	Socket outlet	Left side discharge conveyor (swivel belt) drive
9	Socket outlet	Left side discharge conveyor (swivel belt) emergency stop
10	Socket outlet	Emergency-stop 1 for feeding conveyor
11	Socket outlet	Emergency-stop 2 for feeding conveyor
12	Socket outlet	Drive for feeding conveyor

NOTE!

In order to operate or move the plant without a side discharge conveyor, a dummy plug must be inserted in the "Emergency-stop" socket outlet of the side discharge conveyor.

3.8 Power drive



0000216

No.	Designation	Function
1	Control lever left	Left chain forwards/backwards
2	Emergency stop	Triggering of an emergency stop signal
3	Control lever right	Right chain forwards/backwards

3.9 Emergency-stop

3.9.1 Emergency stop buttons

⚠ WARNING!

The functioning of the emergency stop buttons must be checked daily.

⚠ WARNING!

Loads that are connected to the socket-outlets of exempt circuits and to socket-outlet 0X1 for follow-up machines are not switched off by the emergency-stop.

Injuries due to connected machines.

=>Switch off the diesel generator in emergencies!

0000226

Press emergency-stop in case of danger!

All drives, except the crusher, are stopped immediately.

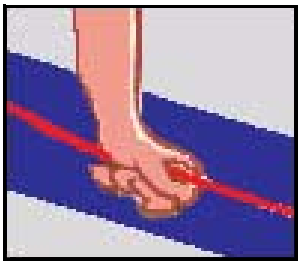
To stop the crusher immediately, press the **“Crusher” button** on the switch cabinet or the **emergency stop button on the switch cabinet.**

Pressing the emergency stop button on the switch cabinet stops the entire unit.

Releasing the emergency stop button

- turn clockwise
- and pull out

3.9.2 Emergency pull-wire



0000225

Pull the emergency pull-wire in case of danger!

All drives, except the crusher, are stopped immediately.

To stop the crusher immediately, press the **“Crusher” button** on the switch cabinet or the **emergency stop button on the switch cabinet.**

Pressing the emergency stop button on the switch cabinet stops the entire unit.

Releasing the pull-wire switch

- Return pull-wire switch lever to central position

or

- pull the button out

3.10 Operating modes

⚠ CAUTION!

Accidental activation of a machine in manual mode can cause personal injuries and/or material congestion.

For this reason, only use "Manual" mode in exceptional cases and with due care.

There are two operating modes:

- Automatic mode
- Manual mode

The operating modes are switched over using a selector switch at the switch cabinet.

Automatic mode:
Normal operating mode

All machines are locked electrically and can only be switched on against the conveying direction. This prevents material congestion.

Manual mode:
Special operating mode for repair work and moving the plant.

The electric interlock is disabled. The individual machines can be switched on and off as desired.

4 Commissioning

4.1 Safety information

⚠ WARNING!

Incorrect installation may lead to personal injury or damage to machine when starting up.

- **Before switching on machine, ensure that**
  - **nobody is in hazard area,**
  - **the immediate shutdown of machine is guaranteed (emergency stop function).**
- **The machine may only be set up by persons with a sound knowledge of the machine.**
- **The operator (machinist) accepts full responsibility for the safety of persons who are in the hazard area of the machine.**

4.2 Installation

Before the system can be operated, it must be moved from the transport position to the work position. The activities described below must be performed for this purpose.

⚠ WARNING!

Risk of injury and damage to property through incorrect use of hoisting machinery and lifting tackle.

If transporting by crane, always use suitable cargo gear. Check proper condition of chains, ropes etc. beforehand.

Standing under suspended loads is forbidden.

Personal protective gear, e.g. helmet, safety shoes, gloves etc. must be worn during system installation.

During installation and dismantling, chains or ropes must be attached to fixed components with slip-resistant fastenings. The mounting must be located in the centre of gravity.

Installation and dismantling must be carried out by skilled personnel.

4.2.1 Erecting the machine

⚠ CAUTION!

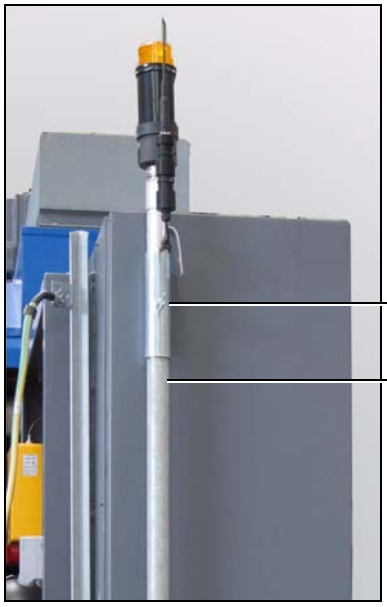
Damage to property!

Risk of the machine tipping due to sinking on soft surface or unsuitable erection.

- **Always erect the machine on a stable and solid surface**
- **Position the machine horizontally**
- **Machine must not rock**
- **The crusher must not rock on the chassis during operation**
- **The surface must be level (spread fine material over the ground and then level)**

If the machine or crusher rocks, reposition the machine and / or re-level the surface.

4.2.2 Extending the warning light



0002102

- Loosen wing screw (1) and push up retaining pipe (2).
- Tighten wing screw (1).

4.2.3 Earth the machine

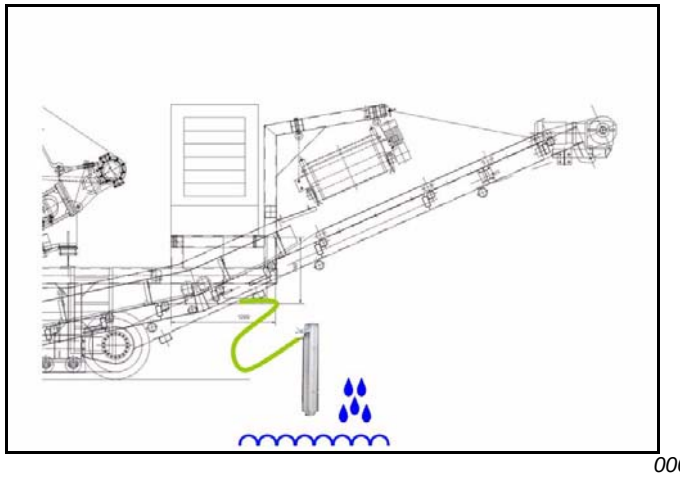
The machine must be earthed to ensure optimal connection of the protective earth conductor with the ground. This also prevents static charges due to the belts.

⚠ WARNING!

There is a risk of electric shock from unearthed or incorrectly earthed systems!

After each new erection, the system must be professionally earthed and levelled in accordance with the applicable guidelines.

If the ground is dry, the soil around the earthing rod must be watered.



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Please note:

- Earth stake must be firmly positioned and must not wobble.
- Remove the earth connection before moving the machine.
- Defective earth connections must be replaced immediately.

4.2.4 Folding and lowering main discharge conveyor

⚠ WARNING!

Danger of injury in lifting and lowering area, as well as in folding area!

Persons in lifting and lowering area of screen, as well as in folding area of conveyor, may be at risk from crushing injuries.

Do not stand in danger zone during lifting and lowering of screen or when belt is being folded.

- Clean contact surfaces
- Secure main discharge conveyor at eyelets provided using suitable hoisting gear

0000755

- Fold out front part of main discharge conveyor
- Fit screws to folding point
- Remove transportation safety devices
- Fold down main discharge conveyor
- Fit screws to folding point

0000756

- Mount supports (2)
- Open ventilation of conveyor drive
- Tension conveyor belt, if necessary

4.2.5 Lifting the screen

⚠ WARNING!

Danger of injury in lifting and lowering area, as well as in folding area!

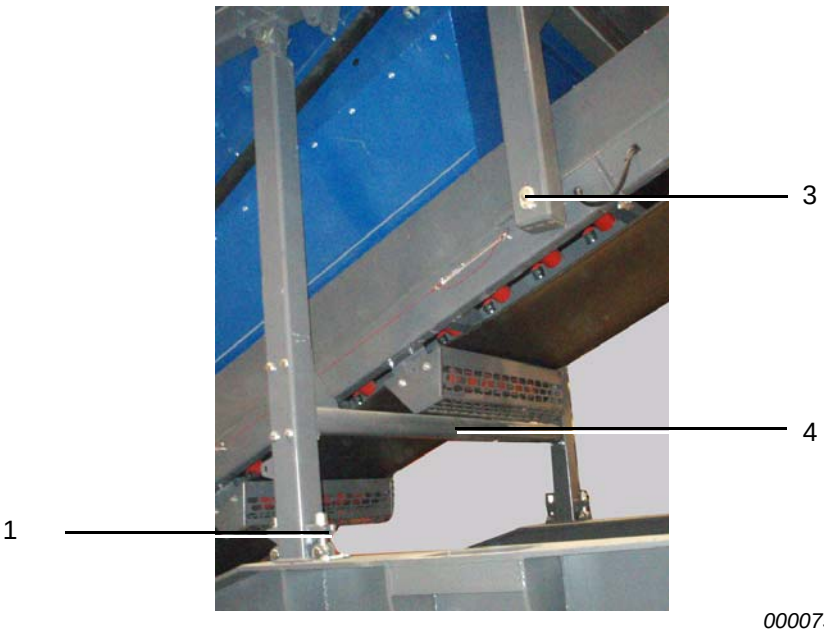
Persons in lifting and lowering area of screen, as well as in folding area of conveyor, may be at risk from crushing injuries.

Do not stand in danger zone during lifting and lowering of screen or when belt is being folded.

- Clean contact surfaces
- Fold out eye bolts (1)
- Secure screen using suitable hoisting gear

0000757

- Remove transport securing device (2) from supports
- Fold down supports
- Lift screen until supports are positioned correctly on chassis



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- Mount supports on chassis using eye bolts (1)
- Attach and secure bolts (3)
- Mount crossbeam (4)

4.2.6 Installing feeding conveyor

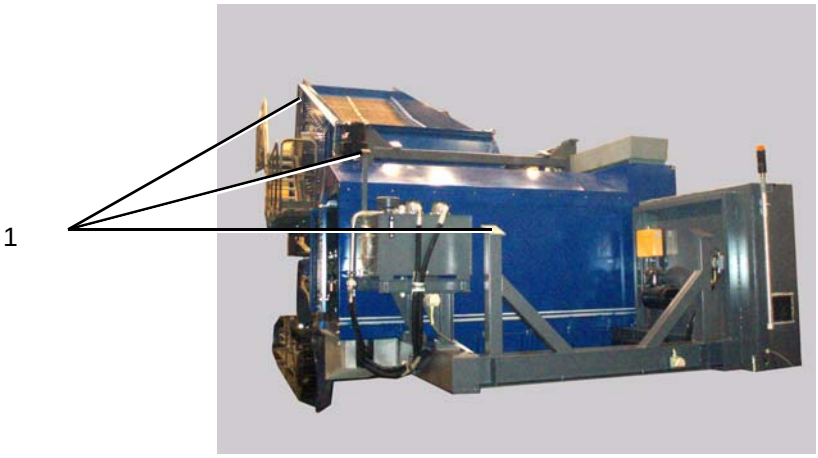
⚠ WARNING!

Risk of injury in installation area!

Persons in installation area of conveyor may be at risk from crushing in-- juries.

Do not stand in danger zone when conveyor is being installed.

- Clean contact surfaces
- Attach feeding conveyor to suitable hoisting gear



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- Lift feeding conveyor onto mounting (1) on chassis
- Install feeding conveyor

0000839

- Install hopper (2)

4.2.7 Installing frame (optional)

- Clean contact surfaces
- Preassemble frame
- Attach frame to suitable hoisting gear

0000840

- Lift frame onto mounting on chassis
- Install frame

0000841

4.2.8 Side discharge conveyor (short)

⚠ WARNING!

Risk of injury in installation area!

Persons in installation area of belt conveyor may be at risk from crus-h-ing injuries.

Do not stand in danger zone when belt conveyor is being installed.

- Remove feed hopper if installed
- Attach belt conveyor to suitable hoisting gear using eyelets provided

0000849

- Lift and secure belt conveyor into mounting on chassis (1)
- Install feed hopper
- Insert electrical connections and emergency-stop into respective socket outlets on chassis (see chapter "Socket outlets on the chassis")

4.2.9 Side discharge conveyor, swivel-mounted (optional)

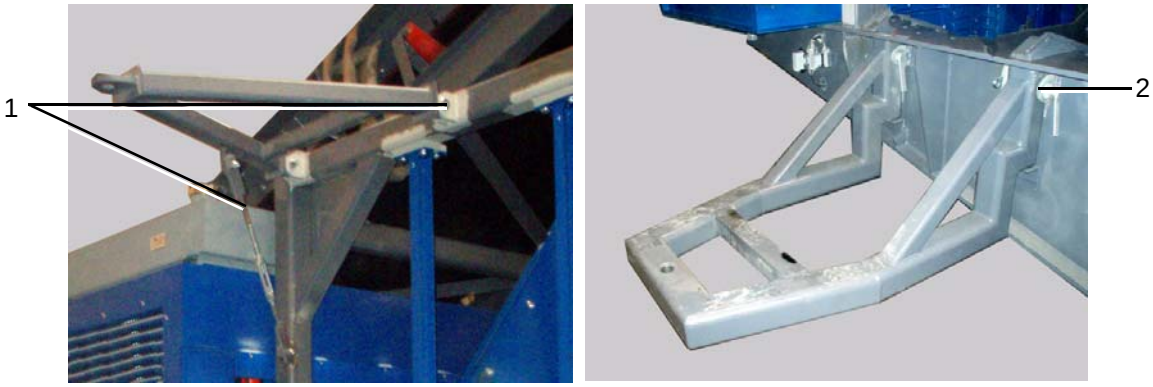
⚠ WARNING!

Risk of injury in installation area!

Persons in installation area of belt conveyor may be at risk from crus-h-ing injuries.

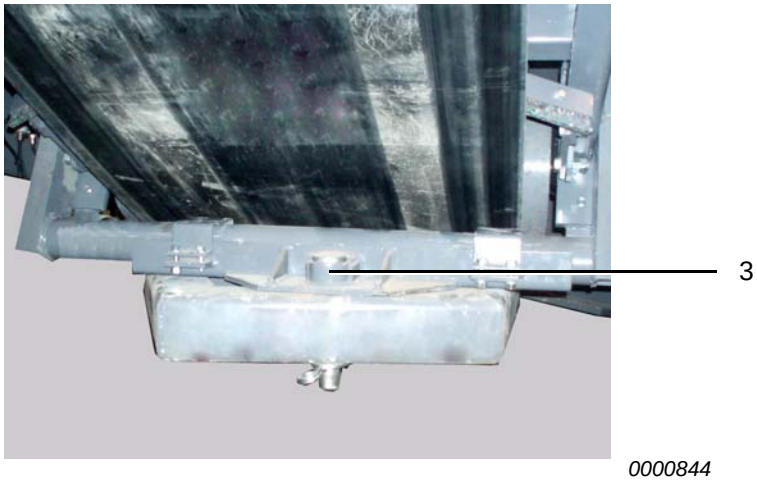
Do not stand in danger zone when belt conveyor is being installed.

- Remove feed hopper if installed



0000843 *0000842*

- Attach (1) and secure (2) upper and lower part of mounting on chassis
- Attach belt conveyor to suitable hoisting gear using eyelets provided



0000844

- Lift and secure belt conveyor into lower mounting (3)

0000845

- Install and secure belt suspension (4)
- Install feed hopper
- Insert electrical connections and emergency-stop into respective socket outlets on chassis (see chapter "Socket outlets on the chassis")

4.2.10 Side discharge conveyor, fixed (optional)

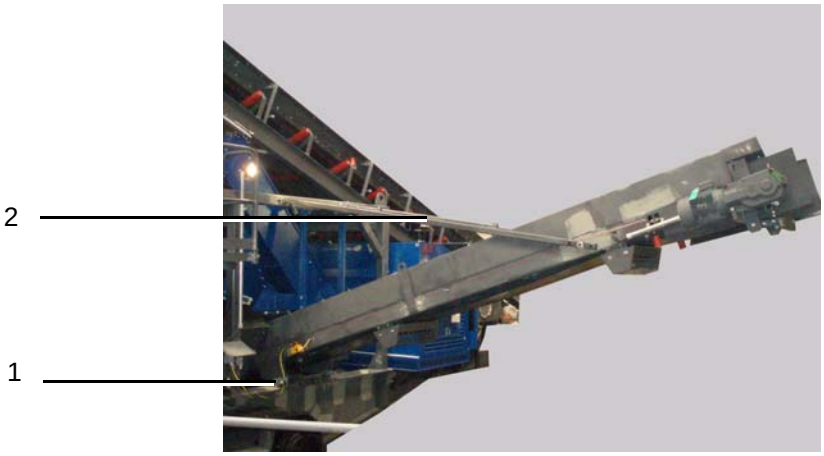
⚠ WARNING!

Risk of injury in installation area!

Persons in installation area of belt conveyor may be at risk from crus-h-ing injuries.

Do not stand in danger zone when belt conveyor is being installed.

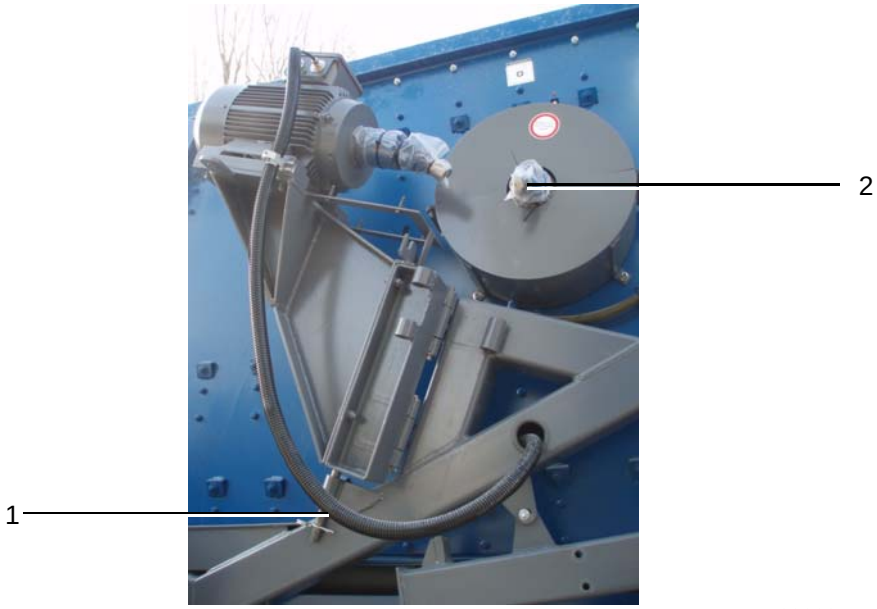
- Remove feed hopper if installed
- Attach belt conveyor to suitable hoisting gear using eyelets provided



0000844

- Lift and secure belt conveyor into mounting on chassis (1)
- Install and secure belt suspension (2)
- Install feed hopper
- Insert electrical connections and emergency-stop into respective socket outlets on chassis (see chapter "Socket outlets on the chassis")

4.2.11 Installing screen drive



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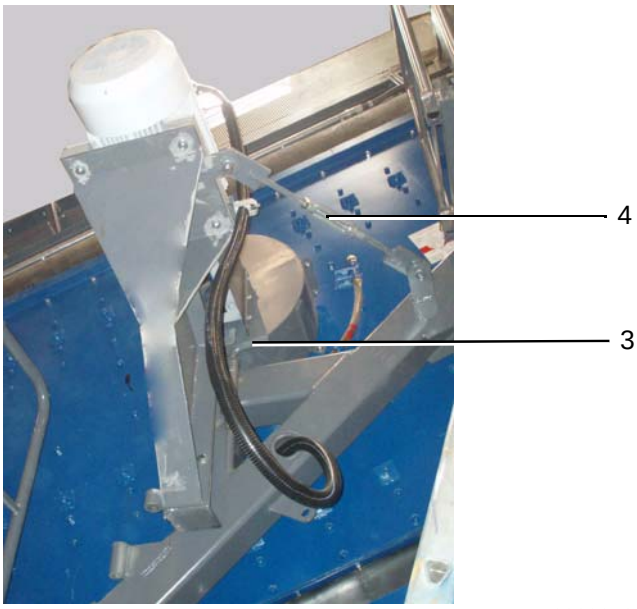
- Remove transport securing device (1)
- Rotate drive carefully in direction of screen

NOTE!

Note markings on drive shaft.

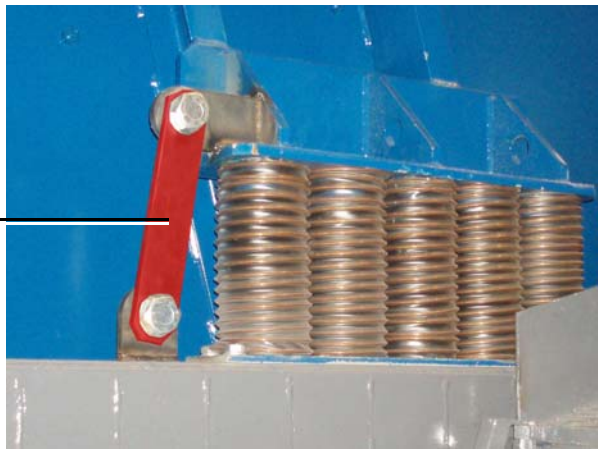
- At the same time, insert drive shaft into counterpiece (2)



0000848

- Secure screen drive using bolts (3)
- Install suspension (4)
- Connect drive to electrical power supply
- Attach drive shaft guard

4.2.12 Screen machine



0000731

- Remove transport securing device (1)

4.2.13 Mounting platforms, ladders and stairs

⚠ WARNING!

Risk of injury!

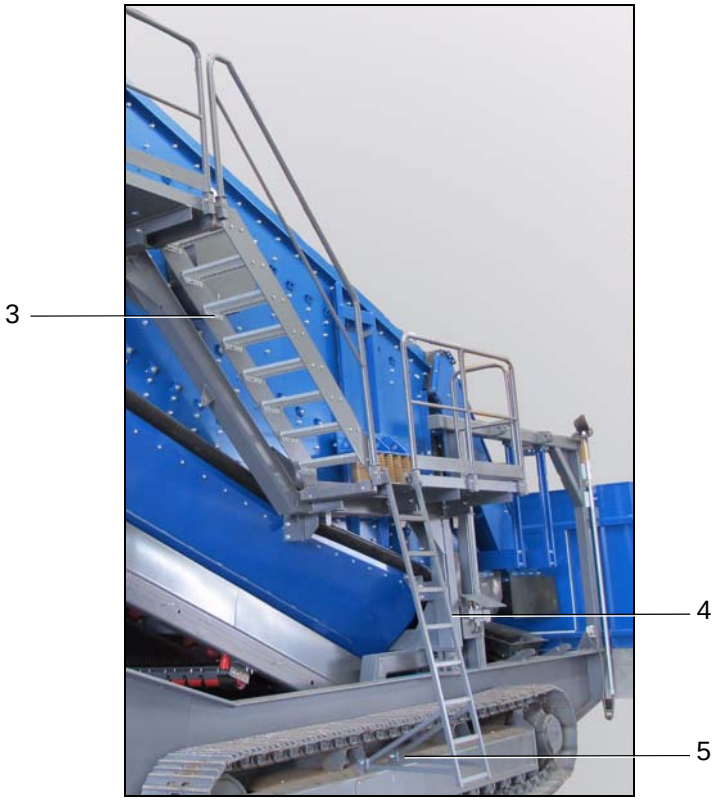
Persons are at risk of injury and falling during the mounting of the platforms.

- **Use suitable hoisting gear and tackle.**
- **Use secure climbing aids, e.g. ladders or lifting platforms.**
- **Do not stand in the danger zone when platforms are folded up.**
- **Take special care when mounting platforms and handrails.**

0002103

Mounting the platforms

- Attach platform to suitable lifting apparatus and fold up to horizontal position.
- Secure platform with locking pin and spring clip on bracket (2).
- Screw in securing bolts between platform and support (1) and tighten to prescribed torque.



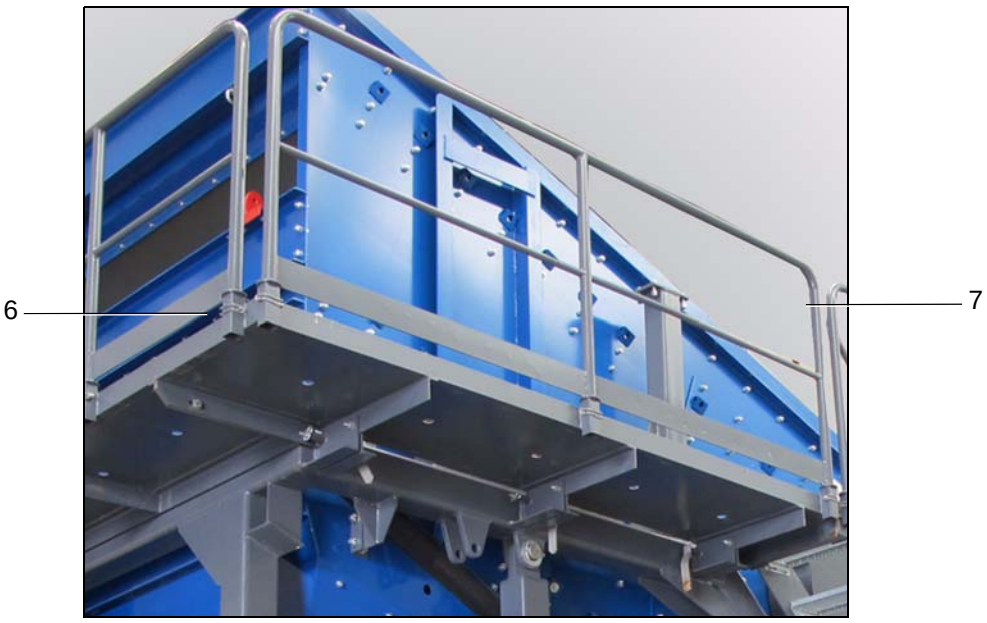
0002100

Mounting access steps

- Attach access steps (3) to suitable lifting apparatus and carefully lift into position at the dedicated brackets on the platforms of the screen.
- Screw in securing bolts between access steps and platforms and tighten to prescribed torque.

Mounting ladder

- Insert ladder (4) in platform.
- Screw in securing bolts between support of ladder and dedicated brackets on chassis beam (5) and tighten to prescribed torque.
- Screw in securing bolts between cage and dedicated brackets on chassis beam (5) and tighten to prescribed torque.



0002100

Mounting handrail sections

- Lift up handrail sections (7) using suitable lifting apparatus to platforms and access steps.
- Insert handrail sections (7) and secure with clip pins (6).

4.3 Inspection

The following inspections and checks must be carried out after every transport and installation of the machine.

⚠ CAUTION!

Danger due to foreign material in conveying devices!

Forgotten parts, e.g. tools or equipment, in conveyors may lead to disruptions and accidents.

=>After installation, check entire passage of material flow for foreign materials and remove them.
Main switch must be switched off during inspections.

4.3.1 Checks with the machine stationary

Oil levels:
Diesel motor:

- Before checking the oil level, the motor must be stationary for at least 5 minutes.
- For approved oil grade, please see operating instructions for the diesel generator.

Fuel level:

- The fuel gauge on the switch cabinet indicates the fuel level
- Top up the fuel if required (see “Operation” chapter)

Cooling water level:

⚠ WARNING!

Risk of scalding

Hot steam and water can escape when the cooling water tank is opened, causing scalds.

=>Open the cover of the expansion tank slowly, to allow the pressure to reduce.

⚠ WARNING!

Risk of poisoning

Anti-corrosion and antifreeze agents are toxic.

=>Do not ingest cooling water or bring it into contact with food.

For prescribed coolant please see diesel generator operating instructions.

Please note:

- Only use ready-mixed coolant that is nitrite-free and approved by the manufacturer.
- When topping up larger quantities of coolant, never pour cold coolant into a warm motor, as this can cause cracks in the motor.

Spraying system level (option):
The level of the spraying system must be checked to prevent dry running of the pump.

- Check the suction hose to ensure that water is present up to the level of the pump.
- If the water level is lower:
  - Fill up the water tank
  - Fill the suction line

Transport belts:

- Check transport belts for damage
- Eliminate any defects.

Safety devices:

- Check that protective covers and devices are present, are in proper condition and are firmly located.

Damages:

- Check the system for damages and soiling.
  - Repair any damage.
  - Eliminate soiling.

Retighten loose screws:
If you find any loose screw connections, tighten them immediately.

Tightening torques:

Thread	M10	M12	M16	M20	M24	M30
Tightening torque [Nm]	50	90	230	450	750	1450
[lf-ft]	(37)	66)	(170)	(332)	(553)	(1069)

Service openings:
All service openings must be firmly closed.

This applies particularly for

- Doors and flaps on the crusher
- Service flap on the discharge belt conveyor
- Service flap on the large belt guard

Vibrating screen:
A crude check of the oil level can be performed using the oil level hose. The hose is usually laid in the form of a loop and consequently enables an oil column to be seen even if the bearing is already empty.

- Ensure the machine is horizontal.
- Clean the oil hose
- Check oil level
- The oil column in the oil level hose must be significantly higher than the oil hose filling plug. If this is not the case, check the exact oil level (see section “Maintenance”).

Screen covers:

- Check for wear

- Visual inspection of screen covers.
  Note

Mesh cover:	signs of wear on welded hard coatings, bent profiles
Rubber cover:	thin sections, tears, holes
Wire mesh:	torn wires, holes, thin sections

- Replace the relevant cover if excessive wear is noted (see section “Maintenance”)

- Profile rubbers

- If the profile rubbers on the runners have slipped, move them back into their correct position immediately.
- Replace any damaged or missing profile rubbers immediately to prevent damage to the screen cover

Vibrating screen springs:

- Check that the vibrating screen springs are positioned correctly in the spring cups or on the spring bolts
- If the spring is not positioned correctly, or is defective or is missing entirely, remedy the situa-- tion accordingly (see section “Maintenance”)

4.3.2 Test run without material

When carrying out a test run without material, all machines are switched on in succession against the conveying direction. The correct functioning of each individual machine must be checked before swit-ching on the next machine.

If an error occurs, the system must be switched off immediately and the error eliminated.

⚠ WARNING!

Risk of injury to persons in the system's danger area.

Persons who linger in the danger area during operation may be injured.

=>Before switching the system on, make sure that no persons are loca-t-ed in the system's danger areas.

For information on the individual operating steps, please see the "Operation" chapter.

The performance of all test runs enables comprehensive checking of all important machine functions.

NOTE!

All emergency stop buttons must be released, otherwise it will not be possible to start the system.

Test run for generator mode:

1. Select "automatic" operating mode.
2. Switch on generator.
3. Activate main switch for "diesel generator".
4. Switch on main switch.
5. Turn "Brake open/ closed" selector switch to "closed".
6. Press the "Acknowledge malfunction / emergency-off" pushbutton.
7. Press "Plant on" pushbutton.
8. Press "Ready to start".
   - Start-up warning sounds
   - "Start release" lights up
9. Switch all drive systems to run against conveying direction (from left to right).
10. Check that the machines work in the correct manner.
11. Press emergency-off pushbutton on chassis.
12. Monitor deactivation.

All drive systems switch off immediately.

13. Unlock emergency off.
14. Switch off the plant.
15. Switch off main switch.
16. Switch off generator.

Test run for mains operation:

1. Select "automatic" operating mode.
2. Switch on generator.
3. Activate main switch of upstream machine, e.g. "Mobirex".
4. Switch on main switch.
5. Turn "Brake open/ closed" selector switch to "closed".
6. Press the "Acknowledge malfunction / emergency-off" pushbutton.
7. Press "Plant on" pushbutton.
8. Press "Ready to start".
   - Start-up warning sounds
   - "Start release" lights up
9. Switch all drive systems to run against conveying direction (from left to right).
10. Check that the machines work in the correct manner.
11. Press emergency-off pushbutton on chassis.
12. Monitor deactivation.
    All drive systems switch off immediately.
13. Unlock emergency off.
14. Switch off the plant.
15. Switch off main switch.
16. Switch off generator.

4.3.3 "Repair" test run

⚠ CAUTION!

Inadvertently switching on the machine in manual mode could lead to injuries and/or material congestion.

Therefore, only employ "manual" operating mode in exceptional circumstances and with due care and attention.

1. Select "manual" operating mode.
2. Select "Brake on".
3. Switch on generator.
4. Switch on main switch.
5. Press the "Acknowledge malfunction / emergency-off" pushbutton.
6. Press "Plant on" pushbutton.
7. Press "Ready to start".
   - Start-up warning sounds.
   - "Start release" lamp lights up.
8. All drives can be switched on individually.

5 Operation

5.1 Safety information

DANGER!

Failure to follow the above-mentioned safety instructions may lead to severe injuries and also material damage which is not covered under warranty.

- Risk of fatal injury!
  While the machine is running there is a risk of getting caught and crushed between machines, which can lead to fatal injuries.
  Only work on the plant and unblock material congestion when the diesel generator is switched off.
  - Secure the plant against reactivation.
  - Attach warning sign.
- Risk of injury to persons in hazard area of plant system.
  Persons in the hazard area during operation of the machine may be injured.
  => Before switching on the plant, ensure that no persons are in the hazard zones.
- The operator (machinist) accepts full responsibility with regard to the safety of persons who are in the hazard area.
- Operation of plant only with personal protective equipment.
- With the exception of "plant movement", all operations must be performed in "automatic" operating mode.
- After completion of work and during breaks, the machine must be switched off and the switch cabinet (operator panel) must be locked.
- Only persons familiar with the machine and those authorised to do so may operate the machine.
- In situations that pose a risk to man or machine, actuate the nearest emergency stop switch immediately.
- Switch cabinets and service doors must always be kept locked.

5.2 Switch-on

Switch-on involves two different consecutive stages. Switch-on of the generator and switch-on of the complete system. The system can only be switched on when the generator is running. Sometimes it may be necessary to operate the generator on its own for maintenance work.

5.2.1 Switching on generator

- Turn key switch to "Start".

5.2.2 Switching on plant

⚠ WARNING!

Risk of injury due to falling material!

Persons in hopper feeding area or discharge zones of conveyor belt may be at risk from injury due to falling material.

- **Do not stand in hopper feeding area or discharge area of conveyor belt.**
- **Wear protective helmet.**

NOTE!

All emergency-stop pushbuttons must be unlocked. Otherwise, the plant cannot be started.

Procedure

1. Select "Operation" operating mode
2. Switch on generator

NOTE!

For generator mode, turn on main switch "Diesel aggregate". Turn on mains switch for upstream plant, e.g. "Mobirex".

3. Turn on main switch "Diesel aggregate"
4. Turn on main switch
5. Press the "Acknowledge fault / emergency-stop" pushbutton
6. Press "Plant ON" pushbutton
7. Press "Start release" pushbutton
   - Start-up warning sounds
   - "Start release" lights up
8. Switch on all drives against conveying direction (from left to right)

5.3 Switch-off

A distinction is also made between the system and the generator when switching off.

IMPORTANT!

The crusher must be run idle before switching off. Otherwise material jams and blockages can result.

5.3.1 Switch off machine

- Allow screen to run empty
- Switch off drives in the conveying direction
- Push the “Installation off” button
- Turn off main switch
- Switch off generator

5.3.2 Switch off generator

IMPORTANT!

Motor should coast down for at least 4 min in no-load operation

= Cool down function.

- Turn the key to the left => Motor stop

5.4 Refueling

⚠ WARNING!

Fire hazard!

Fuel can ignite during refueling.

=>Smoking and naked light are not permitted during refueling.

5.5 Operating the plant

It is possible to drive the plant at any time, also when the platforms are extended and the side dis-char-ge conveyors are mounted.

⚠ CAUTION!

Danger of material damage!

The drive shaft of the screen drive and the magnetic separator may incur damage.

- **Before operating the plant, the transport securing devices must be mounted on the magnetic separator and screen box.**

⚠ WARNING!

Danger due to complex system!

Risk of fatal injury to persons in area of operation of the plant due to its bulky dimensions.

- **Operation of plant only to be carried out with the assistance of a reli-a-ble banksman.**
- **Retain constant eye contact with the banksman.**

⚠ CAUTION!

Danger of material damage!

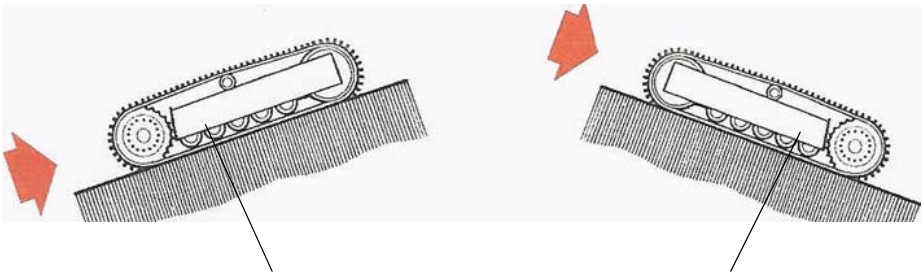
Chains may seize up or freeze and break.

- **Move the plant at least 10 m (33 ft) in each direction every day to avoid chains from seizing.**
- **Never drive plant with chains that are seized up or frozen.**

Important information for driving on inclines and gradients:

NOTE!

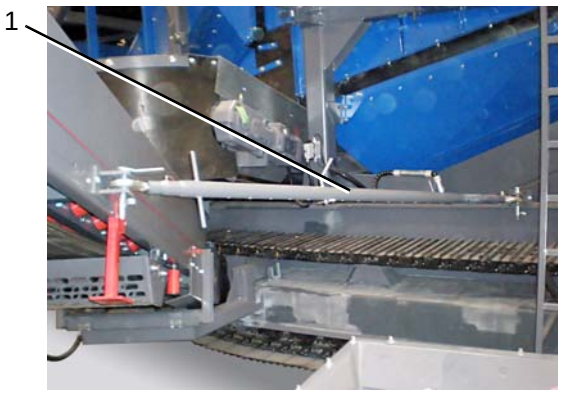
During operation and for larger inclines or gradients, a minimum tank of approx. 300 l (80 gal) is required so the engine does not stall.



Gradients: Drive lower

Inclines: Drive lower

5.5.1 Conditions



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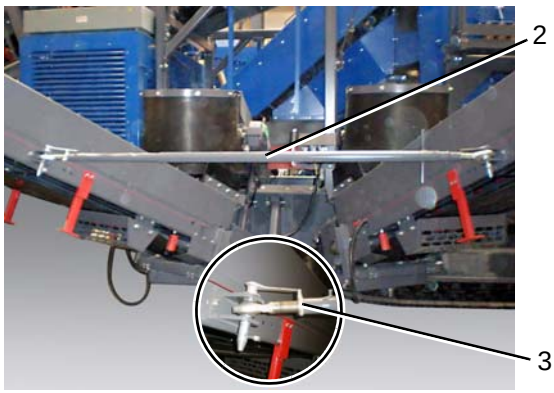

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- All belt conveyors must be operated with an empty load.
- Attach telescope bars (1) to the two side discharge conveyors and secure with locking pins and cotter pins at the belt conveyors and chassis.
- Adjust the telescope bar (2) to a suitable length, attach between the two side discharge con-veyors and pretension.
- Tighten counternut (3) and secure telescope bar with locking pins and cotter pins.

  - The side discharge conveyors must be secured against movement during operation.
- Remove earthing.
- The running gear must be kept clean (no dirt and stones between rotors and rollers)
  -> Danger of chain breaking

-> Remove material caking

- The running gear must have ease of movement.
  Never drive with seized up or frozen chains.
- The chain must be tensioned.

NOTE!

Ensure ground clearance for the plant!

- The track must be clear and free of obstacles.
- The subsurface must be stable (note weight).
- The banksman must be assertive.
- Driving uphill preferably with the rotor in front, downhill with the drive wheel in front.

5.5.2 Parking the plant

- Park the plant on a flat and stable surface.
- If parking on a diagonal surface can not be avoided, the chains must be blocked.

5.5.3 Moving

⚠ CAUTION!

Material damage!

The chain may slip from the drive or the wheel when moving or turning the plant.

The slipping of the chain reduces the service life of the chain and may lead to the malfunction of the gearbox and the hydraulic drive system.

- **Chain must not slip on chain wheel. Only operate when chain is taut. Retension chain if necessary.**
- **Note the direction of movement when driving on slopes or inclines.**

Moving with drive control

- Start generator
- Turn on main switch
- Insert drive control into socket outlet in the switch cabinet housing
- Press "Plant ON" pushbutton
- Press "Acknowledge fault / emergency-stop" pushbutton

- Press "Coupling ON" pushbutton
- Moving: The crawlers are set in motion using the two levers of the drive control. The left lever is for the left crawler, the right lever for the right crawler. The crawler always moves in the direction in which the lever is moved. The speed is proportional to the deflection of the levers.

Moving with radio

- Start generator
- Turn on main switch
- Press "Plant ON" pushbutton
- Press "Acknowledge fault / emergency-stop" pushbutton
- Press "Coupling ON" pushbutton
- Switch on hand-held transmitter
  - Activate side rotary knob
  - Unlock emergency stop
  - Acknowledge emergency-stop (green button on the side)
- Turn radio monitoring switch to "Radio ON"
- Moving: The crawlers are set in motion using the two levers of the radio control. The left lever is for the left crawler, the right lever for the right crawler. The crawler always moves in the direction in which the lever is moved. The speed is proportional to the deflection of the levers.

5.6 Screening
Important information for machine operator!

- Risk of fatal injury by flying stones!
  During loading there is the risk of flying rocks in area of feed hopper.
  Ensure no persons are in the hazard area.
- Risk of fatal injury!
  There is a risk of fatal injury when clearing material jams while machine is running.
  - Never unblock material jams using hands or other objects while machine is running.
  - Do not enter vibrating screen or mount vibrating conveyor trough outlet.
- Never open service doors while machine is running.
- Material jams and blockages!
  In order to avoid material jams, only load material in specified feed sizes.
- Risk of destruction of loading devices!

Never use diggers or loading shovels to remove bridging (blockages) in area of material feed.

DANGER!

Failure to follow the above-mentioned safety instructions may lead to severe injuries and also material damage which is not covered under warranty.

5.7 Starting the screening process

WARNING!

Risk of injury!

Before starting the system, make sure that no persons in the vicinity can be put at risk. Warn all persons in the vicinity before starting up the system.

1. Select "automatic" operating mode.
2. Switch on generator.
3. For generation operation, activate main switch of "diesel generator". For mains operation, activate main switch of upstream machine, e.g. "Mobirex".
4. Switch on main switch.
5. Press the "Acknowledge malfunction / emergency-off" pushbutton.
6. Press "Plant on" pushbutton.
7. Press "Ready to start".
   - Start-up warning sounds.
   - "Start release" light appears.
8. Switch all drive systems to run against conveying direction (from left to right).
9. Check that the machines work in the correct manner.
10. Feed material.
11. Screening.

5.7.1 Charging

⚠ WARNING!

Risk of fatal injury!

Incorrect charging can result in blockages or overfilling of the system! Incorrect elimination of such faults can result in fatal injury.

- **Never eliminate blockages when the system is running.**
- **Always maintain a safe distance from the machine, so that there is no danger from the feed material.**
- **Never reach into the running system with bars or the like.**

Prerequisites for fault-free processing and optimum attainable output of the crusher are

- Feed material in the specified amount
- Control the feed unit so that feed material is charged evenly.

NOTE!

Load the feed band so that it always holds a bed of material. Continuing to feed the belt when idle will result in deformation.

- Avoid charging the system with damp, loamy or earthy material where possible.

5.7.2 Eliminating material congestion

⚠ WARNING!

Danger from material congestion

Intervention in the plant system when it is running may lead to serious or fatal injuries.

- **Eliminate material congestion when the plant is not running.**
- **Do not enter vibrating screen or mount belt conveyor.**
- **Never open service doors and flaps when the plant is running.**
- **Allow the vibrating screen to come to a complete halt.**
- **Switch off the plant, remove the key and secure against reactivation.**
- **Attach appropriate warning sign in a clearly visible area.**
- **Wear protective equipment.**
- **Observe the safety instructions.**

⚠ CAUTION!

Risk of destruction of loading devices!

Never use diggers or loading shovels to remove bridging (blockages) in area of material feed.

After elimination of material congestion, the following final tasks must be carried out:

- Remove all tools used from plant machines and components.
- Reinstall disassembled guard devices and components, ensuring they are correctly fitted.
- Ensure that there are no more persons in the hazard area.

5.7.3 Clearing stockpiles

The height and volume of the stockpiles must be monitored. The stockpile must not extend as far as the system. The distance between stockpile and conveyor belt must be at least 250 mm (0.82 ft.

If wheel loaders are used for clearing, take care not to damage the system.

5.7.4 Winter operation

NOTE!

In the event of frost there is a risk of seals and scrapers freezing.

Before switching the system on, always check the free movement of scrapers and seals that come into contact with moving parts.

IMPORTANT!

Check antifreeze and cooling water in the motor.

5.8 Water pump (option)

⚠ CAUTION!

Damage to property!

Operating the water pump without water will damage it.

Contaminated water will damage the water pump.

Such damages are not covered by warranty.

Only operate the water pump with clean water.

⚠ CAUTION!

Damage to property!

Freezing water can cause damage to the water pump.

If there is a risk of frost, drain the water pump completely.

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Suction operation

When operating the water pump in suction mode (e.g. suction of water tanks), please note the follo-w-ing points:

- Tank and water must be clean
- Suction line maximum 5 m (16 ft) long
- Fill water pump with water before putting into operation
- Water may only be fed to the water pump via a filter installed on-site

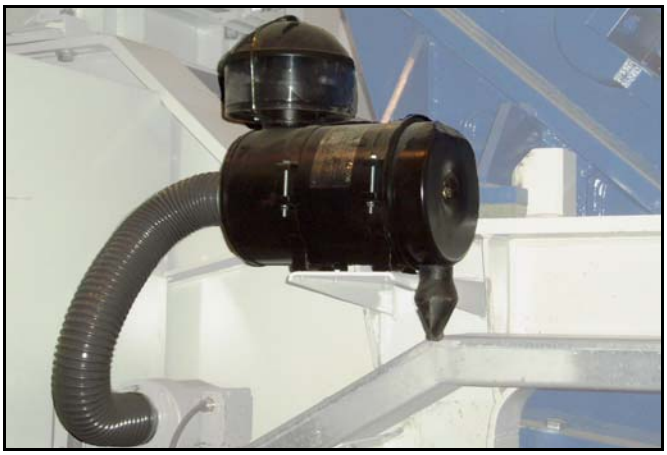
Operation via existing water system

Maximum pressure of the water system: 4 bar (58 psi)

Operation

- Switch water pump on and off with the button on the switch cabinet
- Switch desired spraying on and off with relevant lever

5.9 Switch cabinet overpressure system



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The overpressure system builds up an overpressure in the electrical switch cabinet. As a result, no dust penetrates the electrical switch cabinet. The overpressure system only functions if no leaks are present.

- Keep the switch cabinet properly closed during operation
- Regularly check the air hoses for damage and replace if necessary
- Clean the air filter at least once a week, more often if necessary

6 Maintenance

6.1 Safety information

⚠ WARNING!

Risk of fatal injury!

Only carry out repair work or maintenance work when machine is turned off!

- **Safeguard against unauthorised start-up of machine:**
- **Lock switch cabinet**
- **Switch off and lock main switch.**
- **Attach warning sign against restart.**

NOTE!

Those responsible must ensure that during maintenance work, machine is inoperative and they must safeguard the machine against its unau-tho-rised restart.

IMPORTANT!

Ensure that all work is carried out with the utmost cleanliness.

Throttle valves and pressure relief valves set by Kleemann GmbH may only be changed by personnel trained by Kleemann. It is forbidden to remove seals from safety valves.

Work on the crushing machine or hydraulics system must only be carried out when the machine has been switched off.

6.2 Maintenance schedule

Maintenance task	First time	Interval Time	Interval h	Minimum
Vibrating screen				
Check screen covers (wear + tension)		Daily		
Listen to bearings, check for heating		Daily		
Check oil level		Daily		
Oil change	500 hrs/ 6 months		1000 hrs	Annually
Grease screen machine			50 hrs	
Tighten cardan shaft bolts	50 hrs			Annually
Lubricate cardan shaft			50 hrs	
Tighten screen bearing bolts	50 hrs			Annually
Check stroke	Commis-- sioning	Monthly		
Belt conveyor				
Check conveyor belts		Daily		
Adjusting the scraper rubber		As required		
Adjust seal rubber		As required		
Change oil in belt drives	500 hrs		2,000 hrs	1.5 years
Belt drive axial motor oil change			10,000 hrs	
Clean drain screw and magnet filter	2,000 hrs		10,000 hrs	
Lubricate feeding belt conveyor (tail pulley)			50 hrs	
Change grease in pillow block bearings (side discharge belt conveyor / main discharge belt conveyor / feeding belt conveyor drive)			20,000 hrs	2 years
Check pillow block bearing sealing lips		Weekly		
Hydraulics				
Check hydraulic lines for leaks and damage	100 hrs	As required		
Change return filter	500 hrs		1,000 hrs	
Hydraulics oil level check		Daily		
Hydraulics oil change or oil analysis	500 hrs		2,000 hrs	

Maintenance task	First time	Interval Time	Interval h	Minimum
Crawler-track chassis				
Check oil level of planetary gear		Monthly	200 hrs	
Planetary gear oil change	200 hrs		2,000 hrs	Annually
Check chain tension		As required		
Check transmission for leaks		Daily		
Fixing of track rollers		Monthly		
Fixing of baseplates		Monthly		
Electrical cabinet				
Clean switch cabinet		As required		
Terminals and connecting bolts	50 hrs	As required		
Replace seal rubber on switch cabinet doors				Annually
Check rubber air spring pressure		3 months		
Switch cabinet overpressure system				
Function / check hoses		Daily		
Clean air filter		Weekly		
General				
Leak detection		Daily		
Tightening screw connections		As required		
Replace defective lubricating nipples		As required		
Check hydraulics for leaks		Daily		
Testing the electrical indicator lights (if present)		Daily		
Testing the EMERGENCY STOP		Daily		
Diesel generator				
See separate instructions				

6.3 Fluids and lubricants

The fluids and lubricants tables contains a comparison of the respective products of the same spec-i-fications of different brands.

The order in which the brands are listed bears no relation to the quality of the products.

The listed brands are simply an abstract of the fluids and lubricants available on the market. During a future revision, this selection can be changed.

A complete presentation of the individual fluids and lubricants with all data and approvals, e.g. from combustion engine and gearbox manufacturers, is not possible for reasons of space.

The specification details take DIN and ISO standards, in particular, into consideration.

The fluids and lubricants table is designed to provide initial orientation for servicing KLEEMANN plants and machines. However, it does not replace the advice of a lubrication specialist or the recom--mendation of the engine and gearbox manufacturers.

For environmental protection reasons, it is absolutely necessary to dispose of used oil in accordance with the specifications after every service or oil change.

Fluids and lubricants for special application conditions are not included in this lubricant table.

NOTE!

We shall only assume liability for our plants and machines if the listed fluids and lubricants, or their verifiable equivalents, have been used!

6.3.0.1 Screens

Operating material	Specifications	Brand	Product
Lube oil -28 °C to +80 °C (-18 °F to +176 °F)	DIN 51517, ISO VG 68	EMKA	Indus CLP 68-M
		BP	Energol GR-PX 68
		ESSO	Spartan EP 68
		Fuchs	Renolin CLP 68
		MOBIL	Mobilgear 626
		SHELL	Omala Oel 68

Operating material	Specifications	Brand	Product
Grease -30 °C to +130 °C (-22 °F to +266 °F)	ISO NLGI 2	EMKA	Lagerstar EP2
		BP	Energrease LS-2
		ESSO	Beacon EP 2
		Fuchs	Renolit F EP 2
		MOBIL	Mobilux EP 2
		SHELL	Alvania EP 2

6.3.0.2 Conveyor unit

Operating material	Specifications	Brand	Product
Gear oil -35 °C to +60 °C (-31 °F to +140 °F)	ISO VG 150	EMKA	CLP HC 150
		AVIA	Syntogear PE 150
		CASTROL	Alphasyn T 150
		Fuchs	Renolin Unisyn CKC 150
		KLÜBER	Klübersynth GEM 4 150 N
		MOBIL	Mobilgear SHC XMP 150
		SHELL	Omala HD 150
Grease -30 °C to +130 °C (-22 °F to +266 °F)	ISO NLGI 2	EMKA	Lagerstar EP2
		BP	Energrease LS-2
		ESSO	Beacon EP 2
		Fuchs	Renolit F EP 2
		MOBIL	Mobilux EP 2
		SHELL	Alvania EP 2

6.3.0.3 Drive system

Operating material	Specifications	Brand	Product
Gear oil for track drive -57 °C to +90 °C (-70 °F to +194 °F)	DIN 51517, ISO VG 150	EMKA	Renolin Unisyn CLP 150
		BP Enersyn	HTX 175
		Fuchs	Unisyn CLP 150
		MOBIL	SHC 629
Grease for chain tightener -30 °C to +130 °C (-22 °F to +266 °F)	ISO NLGI 2	EMKA	Lagerstar EP2
		BP	Energrease LS-2
		ESSO	Beacon EP 2
		Fuchs	Renolit F EP 2
		MOBIL	Mobilux EP 2
		SHELL	Alvania EP 2

6.3.1 Diesel Fuels

At low temperature, paraffin separations can cause obstruction in the fuel supply resulting in malfunc--tions.

Below outside temperatures of 0 °C, use winter diesel fuel (up to -15 °C). In many cases, diesel fuel with additives with an application temperature of up to approx. -20 °C is offered.

At outside temperatures below 0 °C, the temperature properties of diesel fuel can be improved as a preventive measure by adding petroleum. A maximum of 20% can be added.

When refueling, the petroleum must be filled first so that it mixes with the diesel fuel.

⚠ CAUTION!

Danger of engine damage

The addition of petroleum to diesel fuels (winter diesel fuel) already ad-apted to low outside temperatures can result in engine damage.

- **Only add petroleum to summer diesel fuels.**
- **Do not add any other flow improvers or benzene.**

Necessary properties of diesel fuel

Property	Requirement
Viscosity at 40 °C	2.0 - 4.5 mm2/s (cSt)
Density at 15 °C	0.82 - 0.86 kg/dm3
Sulfur content (percent by weight)	maximum 0.3 %
Ignitability (cetane number)	at least 49
Flash point	56 °C
Complies with standard EN 590	ASTM D 975 Grade No. 1-D and 2-D

IMPORTANT!

It is essential also to note and observe the specifications in the manuf-acturer's documentation.

6.4 General maintenance tasks

6.4.1 Testing the EMERGENCY STOP

⚠ WARNING!

The functioning of the emergency stop buttons must be checked daily.

The emergency stop function must be tested without material. Otherwise the immediate switch-off of all belts and conveyors will block the crusher or belts. Eliminating obstructions causes unnecessary additional hazards

Check:

- Run machine empty
- Switch on screen and all conveyors
- Push Emergency Stop button

- Machine must stop immediately
  Diesel generator will continue to run
- With Emergency Stop button on control cabinet:
  Diesel generator will stop immediately
- Release Emergency Stop button again

6.4.2 Retightening screw connections

If loose screw connections are identified during inspection and maintenance work or during the ma--chine's operation, they must be retightened immediately. See table for tightening torques.

In addition, after certain maintenance and repair work the respective screws must be retightened after a specific service life. The details can be found in the specifications.

Screw 8.8	M10	M12	M16	M20	M24	M30
Torques Nm (lb ft)	**51 Nm (38 lb ft)**	**87 Nm (65 lb ft)**	**214 Nm (158 lb ft)**	**430 Nm (318 lb ft)**	**743 Nm (548 lb ft)**	**1350 Nm (996 lb ft)**

6.4.3 Check hydraulics for leaks

DANGER!

Danger of serious physical injury!

Hydraulic fluid is under high pressure. When working on the hydraulic system, squirting hydraulic oil can result in very serious eye injuries or other injuries.

- **Only tighten screw fittings and connections when the system is de--pressurised.**

- Regularly check all hydraulic lines, hydraulic cylinders, hydraulic pumps and oil tanks for oil loss and leaks.
- Tighten or replace leaky screw connections.
- Replace cracked or brittle hoses.
- Repair or replace leaky hydraulic components.
- Regularly free the oil tank vent of dirt and dust, in order to avoid obstruction.

6.4.4 Testing the electrical indicator lights

Testing the indicator lights is necessary to guarantee reliable verification of the machine's operating state. Defective lamps can cause false assumptions, resulting in considerable danger.

6.5 Vibrating screen

6.5.1 Checking screen liners (wear and tear + tension)

NOTE!

Screen liners are specially adapted to customer requirements, and are thus special parts. Please order these parts in good time (delivery time).

Wear and tear inspection:
Wear and tear of screen liners can only be recognised by visual inspection. In addition, liners must be tested for the following:

Grid liner:	**Signs of wear and tear of welded-on hard layers, twisted profiles**
Rubber liner:	**Thin areas, cracks, holes**
Wire mesh:	**Torn off wires, holes, thin areas**

- In the case of severe wear and tear replace the respective liner.

Checking for tension:

⚠ WARNING!

Risk of fatal injury by moving and rotating machine parts!

When inspecting machine during its operation there is a high accident risk caused by getting caught and objects becoming coiled around mo-v-ing parts.

- **Inspections must only be carried out by qualified and competent per--sons.**
- **Only approach machine if machine poses no hazard.**

Screen's tension is best checked by listening.

Important

- Screen liner must be fitted neatly over entire area of screen frame.
- Ensure screen is completely empty so that any interfering noise is kept to a minimum.

Listen out for the following noises:

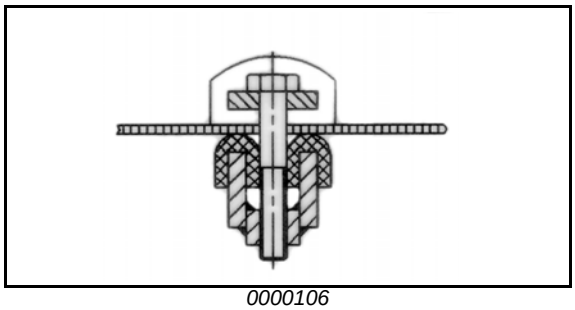
Grid liner :	**Rattling of screws or the entire screen liner**
Rubber liner :	**Knocking of the liner**
Wire mesh:	**Rattling of the screen liner**

- Should one of these noises occur, tighten or tension respective liner. Loose liners cause flap-- ping cracks and damage to machine!

Liners and fastening screws can also be tested for security by tapping. However, it is **imperative that this is carried out when the machine is stationary.**

6.5.2 Clamping systems

Central clamp



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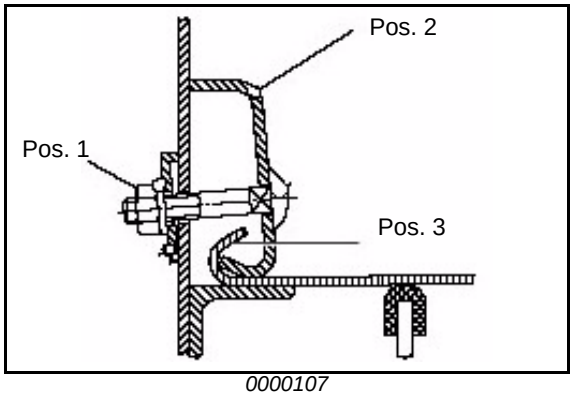
- **Unclamp screen liner along length of screen.**

Transverse clamping



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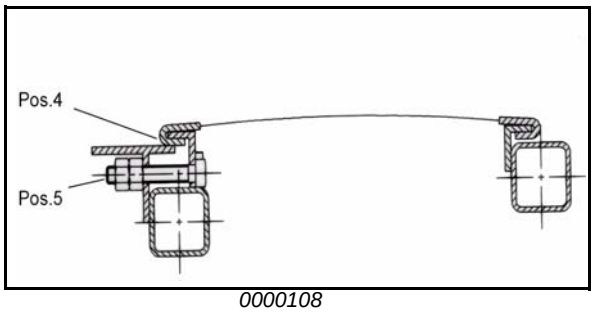
- **Using a screw (pos. 1) press clamping bracket (pos. 2) into transverse clamping folds of screen liner (pos. 3). Screen liner is thus clamped between side walls, trans- ver-se to direction of flow.**

IMPORTANT!

If screen liner is fitted with both central and transverse clamps, central clamps are unclamped first. Afterwards liner is clamped at bracket (pos. 2) between side walls.

Longitudinal clamp



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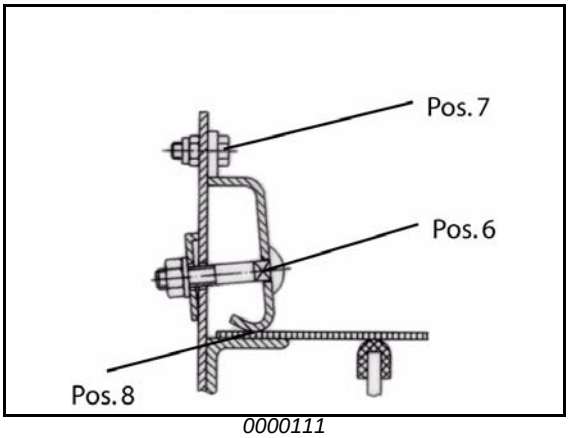
- **Screen liner is designed with a clamping fold. Clamping folds are inserted into bra-cket and moving clamping rail (pos. 4). Screen liner is clamped in direction of flow using screws (pos. 5) at clamping rail.**

Wedge clamp



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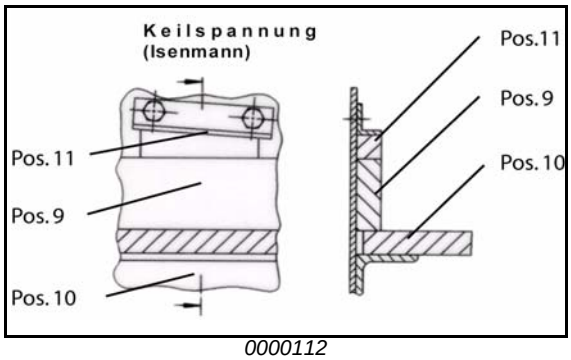
- **Screen liner is fixed onto frame with a clam-p-ing bracket (pos. 6) and contact stop (pos. 7). Contact stop can be mounted in two different positions due to its excentric drill hole. Depending on thickness of screen bea-ring, contact stop might have to be rotat-ed.**

  Secure screen bearing using screws (pos. 8) at clamping bracket (pos. 6).



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- **A wedge (pos.9) is driven between contact stop (pos. 10) and wedge angle (pos. 11). Screen liner is thereby secured on frame.**

6.5.3 Oil service for vibrating screen

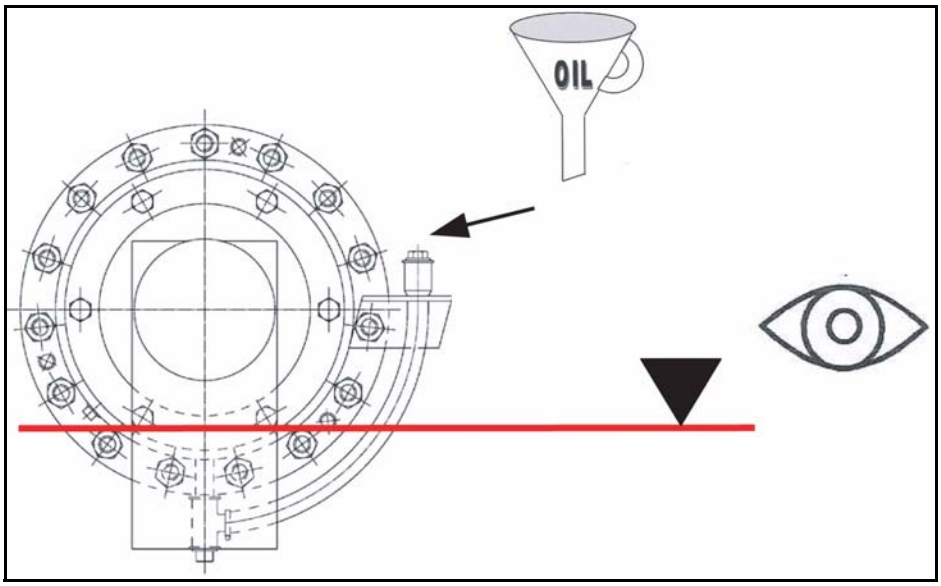
Note:

- Only carry out oil checks when machine is at operating temperature.
- Machine must be horizontal.
- Use correct oil.

Checking oil level:

A rough oil level check can be carried out using oil level hose. The hose is fitted like a siphon. Thus an oil column also indicates when the bearing is almost empty.

- Oil column in oil level hose is clearly above connection seal
  ⇒ Oil level ok
- Oil column in oil level hose is same as connection seal or lower
  ⇒ Carry out precise oil level check



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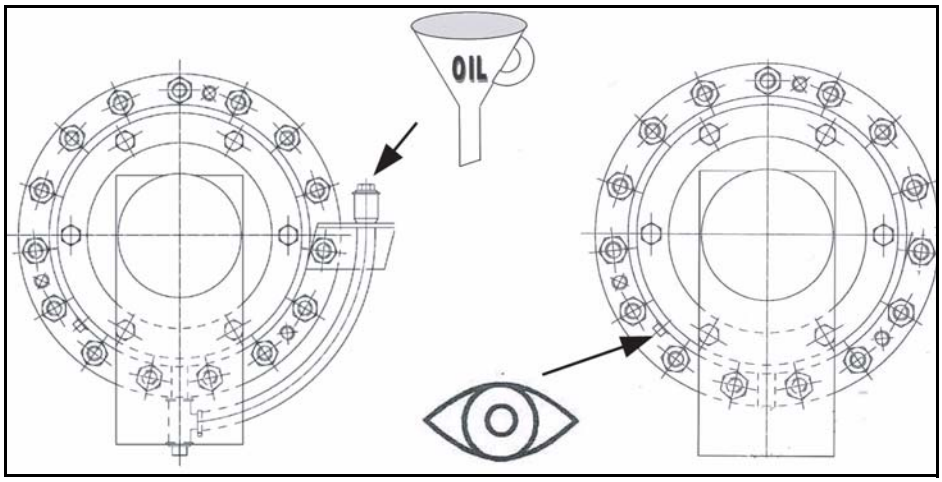
Precise oil level check:

- Remove dirt from inspection plug area.
- Remove inspection plug.
- Oil must emerge from inspection hole.
  ⇒ If no oil emerges, then oil must be added.

Adding oil: (as required)

- Place collecting container under inspection plug.
- Remove inspection plug and filler plug.
- Add oil into filler hose until it emerges from inspection plug.
- As oil is slowly distributed to both sides of the bearing, a precise oil level check must be carried out roughly half hour after filling.



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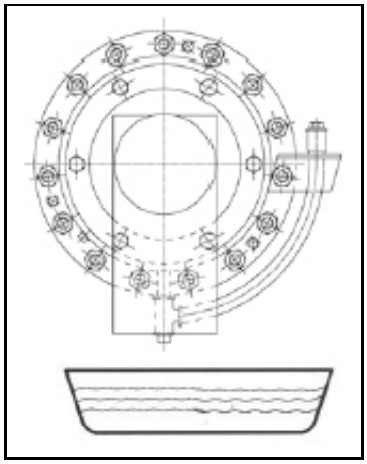
NOTE!

As oil is slowly distributed to both sides of the bearing a precise oil level check must be carried out roughly half hour after filling.

Changing oil:

- Place a suitable oil collecting container (minimum 20 L (5.3 gal)) under drain plug.



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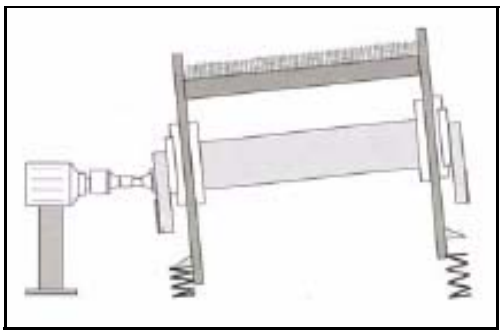
- Remove drain plug (fitted on both sides) ⇒ Drain oil.
- Tilt screener for complete draining.



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- Add oil (see section "Adding oil").

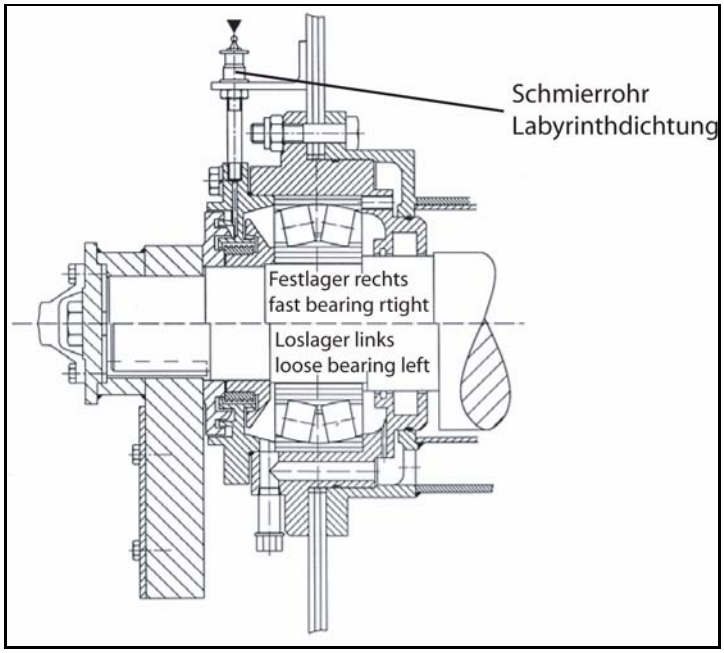
6.5.4 Lubricating vibrating screen (grease)

Lubricating screener with grease is limited to greasing labyrinth seals and universal joint shaft.

External labyrinths of both bearings must be lubricated.

External labyrinths

- Grease respective labyrinth using a grease gun (anti-friction bearing grease) until 1 cm (0.4 in) of grease emerges from gap.



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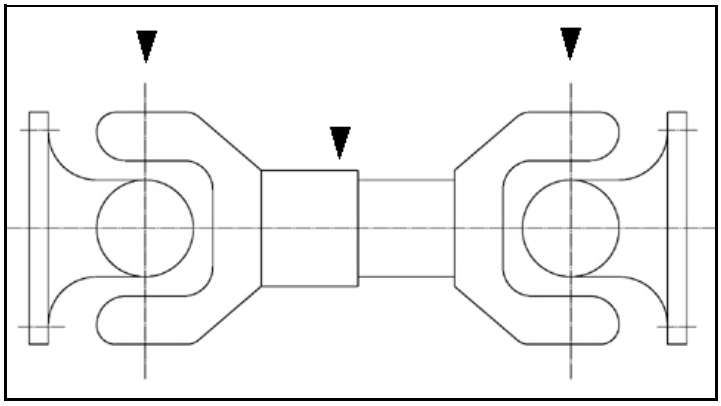
IMPORTANT!

Refer to section "Repairs - Emerging oil"

Universal joint shaft

- Grease using a grease gun until grease emerges at joints.



0000117

- Lubrication interval: 50 h

6.6 Belt conveyor

6.6.1 Checking the conveyor belts

⚠ WARNING!

Risk of being pulled in!

When performing visual inspections on the running conveyor belt, there is a danger of limbs being pulled in.

- **Maintain safety distance**
- **Only perform adjustments when the belt is stationary**

- Run the belts and check for damage from a safe distance (visual inspection)

Attention must be paid to the following defects

- Edge damage

- Cover plate damage
- Fabric damage
- Detachment of endless connections
- Rubbing points
- Scoring
- Excessively strong or weak belt tensioning
  =>too weak: Belt will hang down between the carrier rollers
  =>too strong: Vibration of the bottom strand
- Slipping of the drive pulley
- Seized carrier rollers
- Worn carrier rollers
- Seized guide pulleys
- Unusual noises
- Skew running of the belt
- Trapped lumps of material
- Loose screw connections
- Contamination
- Jagged scrapers
- Worn sealing lips
- Seized scrapers (Storage)
- Off-centre conveyed material feed

- If you suspect damages or defects, stop the belt, lock the main switch and investigate the ex-tent of the damage with the system stationary
- Eliminate any defects

6.6.2 Adjusting the scraper rubber

DANGER!

Risk of fatal injury!

Only perform repairs or maintenance work with the machine switched off!

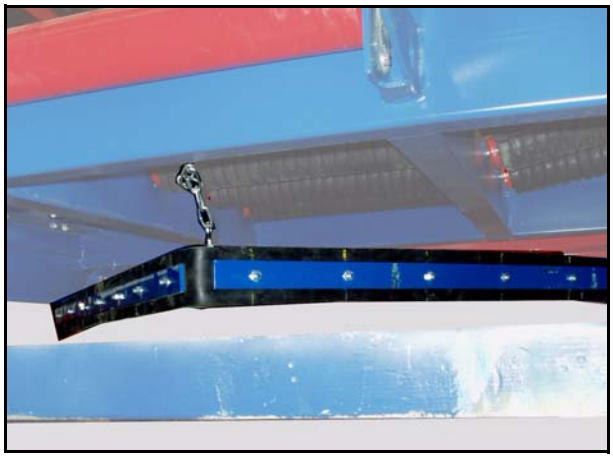
Protect against unauthorised starting:

- **Lock the switch cabinet**
- **Switch off and lock the main switch**
- **Affix warning sign to guard against re-starting**

NOTE!

The person responsible must ensure that the system is stationary and has been protected against unauthorised starting during the mainte--nance work.

Wedge scraper



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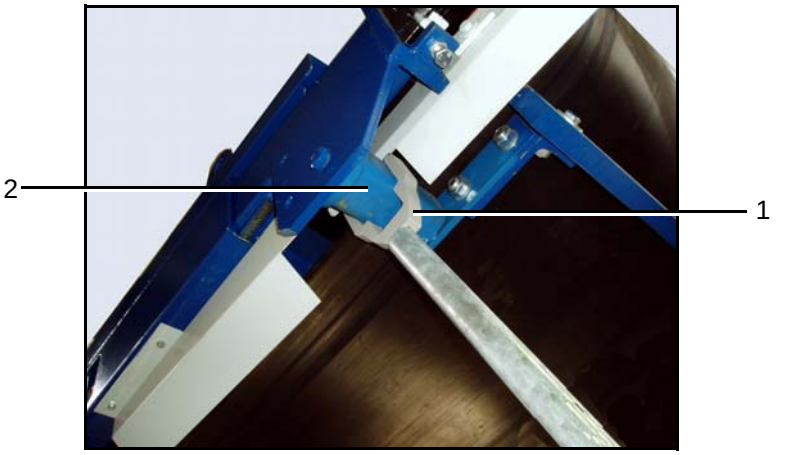
The wedge scraper is an internal belt scraper which readjusts itself automatically on account of its own dead weight.

Regularly check the scraper lip for wear.

Front scraper
with clamping elements that guarantee the pressure of the scraper lip

Adjusting the front scraper



0000173

- Place the spanner (1) on the clamping element (2)
- Loosen mounting screw of clamping element
- Press on the scraper with the spanner by turning the clamping element
- Tighten mounting screw
- Repeat this process with the clamping element on the other side

6.6.3 Adjusting the sliding strips

DANGER!

Risk of fatal injury!

Only perform repairs or maintenance work with the machine switched off!

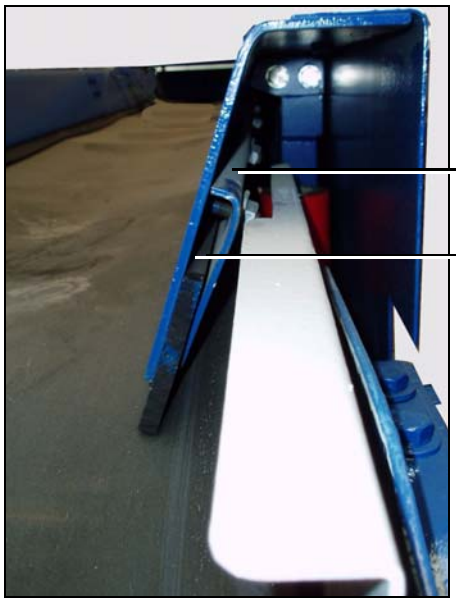
Protect against unauthorised starting:

- **Lock the switch cabinet**
- **Switch off and lock the main switch**
- **Affix warning sign to guard against re-starting**

NOTE!

The person responsible must ensure that the system is stationary and has been protected against unauthorised starting during the mainte-- nance work.

The sliding strips seal the material guide rail to the conveyor belts. The sliding strips must be adjusted when the distance from the belt becomes too large.



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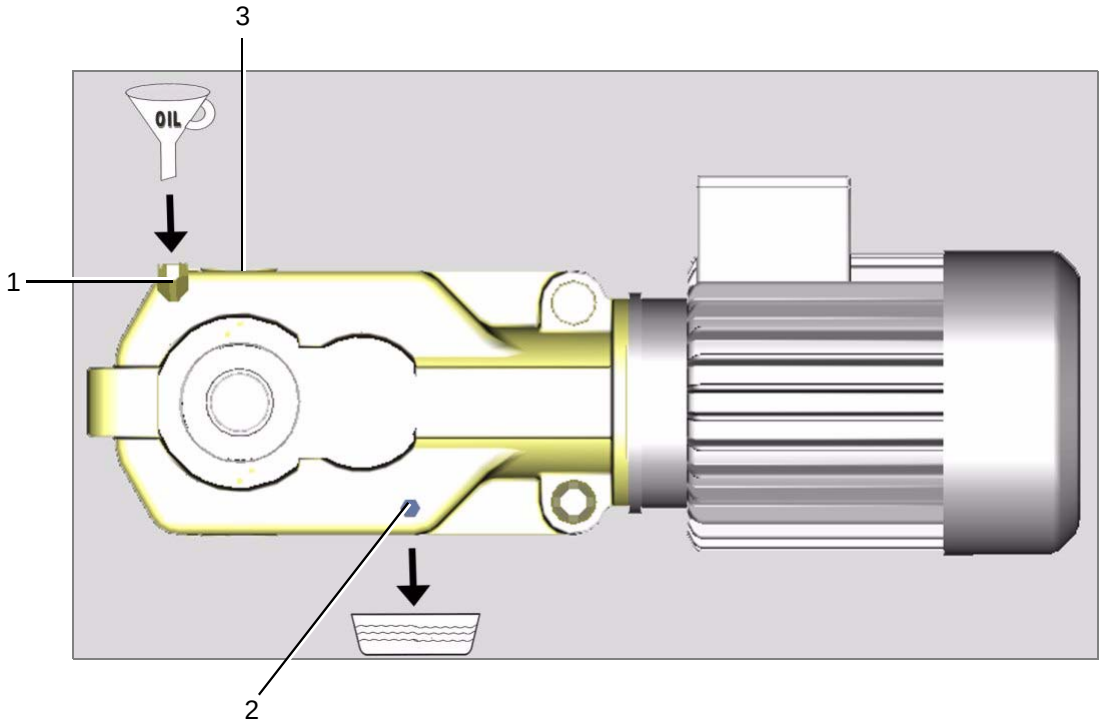
- Remove the belt (only necessary for side discharge belt conveyor)
- Unscrew the guard plates
- Loosen the clamping plates (1)
- Adjust or replace sliding strip (2)
- Tighten clamping plates
- Screw on guard plates
- Fit belt (only for side discharge belt conveyor)

IMPORTANT!

You can make the sliding strips yourself, using an old conveyor belt of appropriate thickness.

6.6.4 Belt drive oil service



0000171

No.	Designation
1	**Bleed screw**
2	**Drain screw**
3	**Motor nameplate**

Oil level check

It is not normally possible to perform an oil level check, as the motors are installed at an angle and therefore the oil inspection holes are not congruent. If a large leak is detected in a gear motor, the oil quantity should be checked as follows:

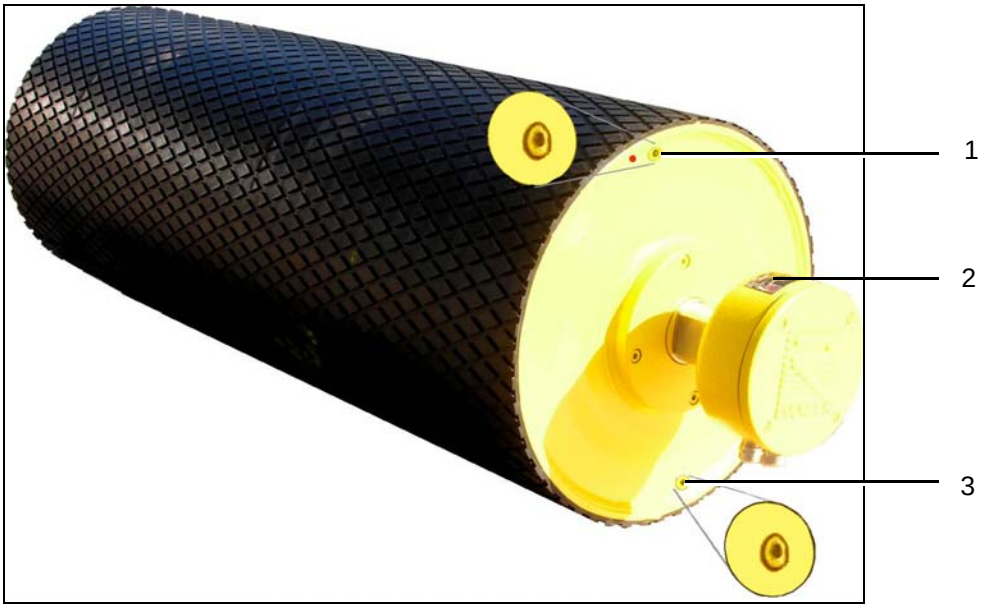
- Clean the gear motor, paying particular attention to the bleed screw (1) and the oil drain-screw (2)
- Remove bleed screw
- Remove drain screw, drain oil and collect in a clean container
- Measure oil quantity. For correct oil quantity, see motor nameplate (3)
- Insert drain screw and tighten
- Top up oil and replace any shortfall

- Insert bleed screw and tighten
- Check transmission for leaks

Change oil

- Clean the gear motor, paying particular attention to the bleed screw (1) and the oil drain -screw (2)
- Remove bleed screw
- Remove drain screw, drain oil and collect in a clean container
- Insert drain screw and tighten
- Add new oil, for oil quantity see motor nameplate (3)
- Insert bleed screw and tighten
- Check transmission for leaks

6.6.5 Belt drive – axial motor oil service



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No.	Designation
1	Drain screw and magnet filter (red dot)
2	Motor nameplate
3	Bleed screw

Maintenance intervals

Cleaning the drain screws and magnet filter:	2000 hrs after first commissioning, then after every oil change
Oil change:	every 10,000 hrs

Oil quantities in litres

	**Oil quantity in litres [L]**					
RL [mm]	**Type**					

	Oil quantity in litres [L]					
	220M&220H		320M&320H			400M
	0,37-0,55 kW 1,1-1,5 kW	0,75 kW 2,2-5,5 kW	0,75-3,0 kW	4,0 - 5,5 kW	7,5 kW	
550	4.25	5.25	3.75	8.5	10.5	
600	4.50	5.50	4.00	9.0	11.0	8.0
650	4.75	5.75	4.25	9.5	12.0	8.5
700	5.00	6.00	4.50	10.0	13.0	9.0
750	5.25	6.25	5.00	10.5	13.5	9.5
800	5.50	6.50	5.50	11.0	14.0	10.0
850	5.75	6.75	5.75	11.5	15.0	10.5
900	6.00	7.00	6.00	12.0	16.0	11.0
950	6.25	7.25	6.25	13.0	17.0	11.5
1000	6.50	7.50	6.50	14.0	18.0	12.5
1050	6.75	7.75	6.75	14.5	18.5	13.5
1100	7.00	8.00	7.00	15.0	19.0	14.0
1150	7.25	8.25	7.50	16.5	20.5	14.5
1200	7.50	8.50	8.00	18.0	23.0	15.0
1250	7.75	8.75	8.50	19.0	24.0	15.5
1300	8.00	9.00	9.00	20.0	25.0	16.0
1350	8.25	9.25	9.50	21.0	26.5	17.0
1400	8.50	9.50	10.00	22.0	28.0	18.0

Oil quantities in gallons

	Oil quantity in gallons [gal]					
RL [in]	Type					
	220M&220H		320M&320H			400M
	0,37-0,55 kW 1,1-1,5 kW	0,75 kW 2,2-5,5 kW	0,75-3,0 kW	4,0 - 5,5 kW	7,5 kW	
21.7	1.12	1.39	0.99	2.25	2.77	
23.6	1.19	1.45	1.06	2.38	2.90	2.11
25.6	1.25	1.52	1.12	2.51	3.17	2.25
27.6	1.32	1.59	1.19	2.64	3.43	2.38
29.5	1.39	1.65	1.25	2.77	3.57	2.51
31.5	1.45	1.72	1.45	2.91	3.70	2.64
33.5	1.52	1.78	1.52	3.04	3.96	2.77
35.4	1.59	1.85	1.59	3.17	4.23	2.91
37.4	1.65	1.92	1.65	3.43	4.49	3.04
39.4	1.72	1.98	1.72	3.70	4.76	3.30
41.3	1.78	2.05	1.78	3.83	4.89	3.57
43.3	1.85	2.11	1.85	3.96	5.02	3.70
45.3	1.92	2.18	1.98	4.36	5.42	3.83
47.2	1.98	2.25	2.11	4.76	6.08	3.06
49.2	2.05	2.31	2.25	5.02	6.34	4.10
51.2	2.11	2.38	2.38	5.28	6.61	4.23
53.1	2.18	2.44	2.51	5.55	7.00	4.49
55.1	2.25	2.51	2.64	5.81	7.40	4.76

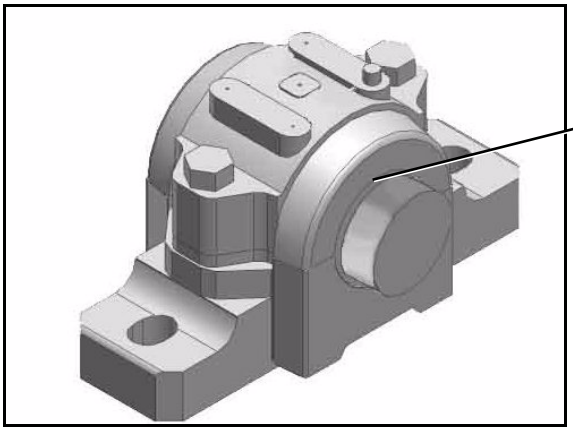
Checking the oil level

It is not possible to check the oil level. If you notice that a geared motor is leaking large amounts of oil, check the oil level as follows:

- Clean the axial motor, particularly around the oil drain screw (1) (red dot) and the bleed screw (3)
- Remove the bleed screw
- Remove the drain screw, drain the oil into a clean container
- Check how much oil is in the container See the oil volume table for the correct oil quantity
- Insert and tighten drain screw
- Fill with oil and top up if necessary
- Insert and tighten bleed screw
- Check motor for leaks

6.6.6 Lubricating the belt conveyor

- Ensure maximum cleanliness
- Avoid touching the conveyor belt with oil and grease
- Eliminate grease escaping from bearings and seals



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No.	Description
1	Sealing lip

Side discharge belt conveyor / feeding belt conveyor (drive pully)

- Pillow block bearings are maintenance-free (grease change 2000 h; 2 years)
- Check sealing lips of pillow block bearings weekly

NOTE!

Replace defective sealing lips immediately. Otherwise there is a risk of bearing damage.

Feeding belt conveyor (tail pulley)

Lubricating interval: 50 hrs

Grie

NOTE!

For easy acces you find several lubricating nipple on the inside bearing of the tail pulley. It is sufficient to lubricate just one of them.

- Grease lubricating nipple (1) with a grease gun

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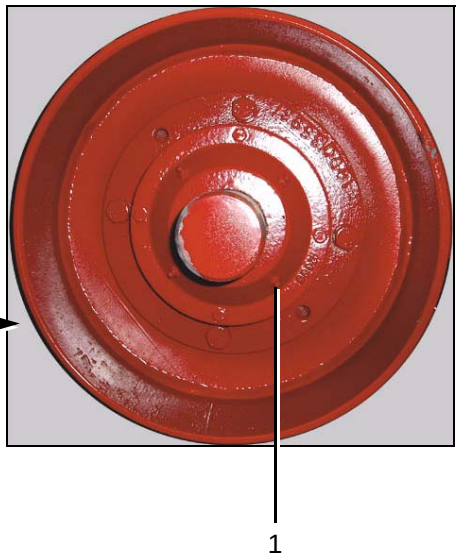

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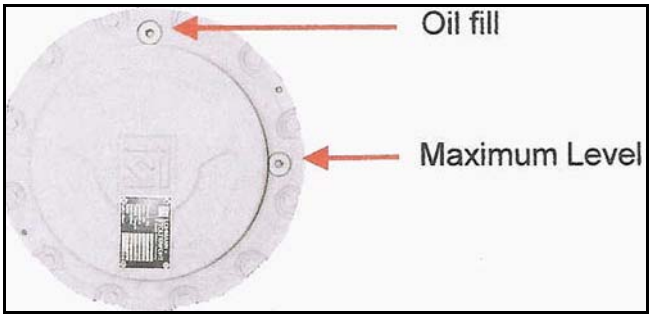
6.7 Crawler-track chassis

6.7.1 Planetary gear oil service

- Position the machine so that the filling hole is at the top and the outlet is at the side (inspection plug)
  Inscription is stamped into the housing



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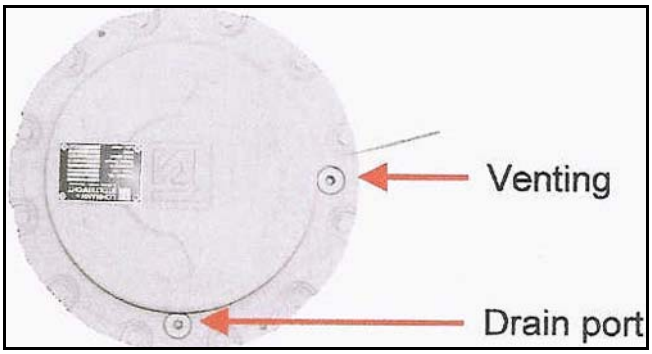
Oil level check

- Remove inspection plug

  - If no oil emerges,

  - use an Allen wrench to check how far below the inspection hole the oil level is (do not let the Allen wrench fall in).
- Top up oil if required

Oil change



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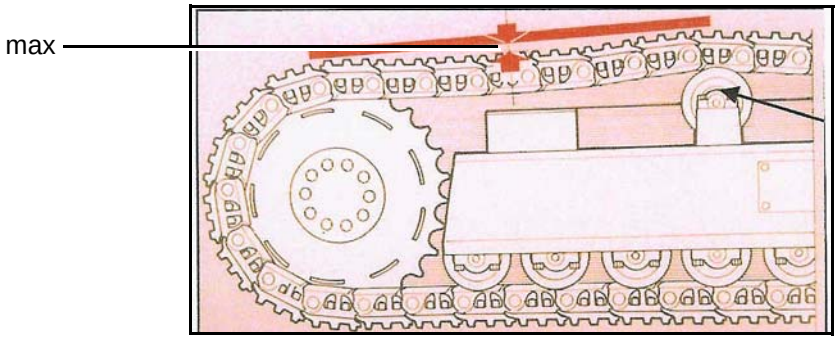
- Remove inspection and drain plugs
- Collect oil in suitable receptacle
- Fit drain plug
- Pour oil into the filling hole up to the height of the inspection plug
- Fit inspection plug

6.7.2 Chain tension

Inspection



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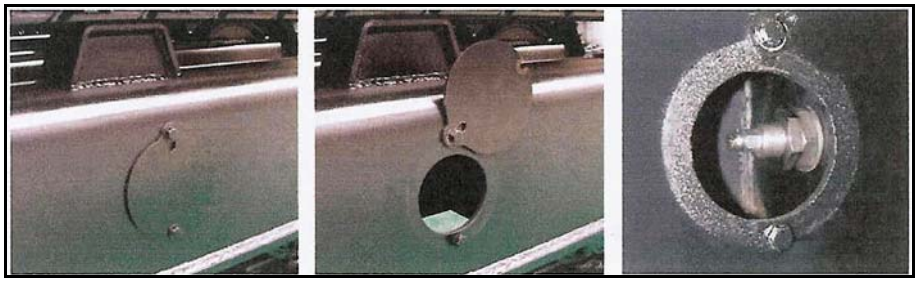
- Extend the chain on level ground
  Chain should be load-free if possible
- Check whether the upper section of the chain is clearly sagging
- If the chain is sagging more than 3 - 4 cm (1.2 in - 1.6 in) at the lowest point, it must be re-tensioned

Tensioning the chain



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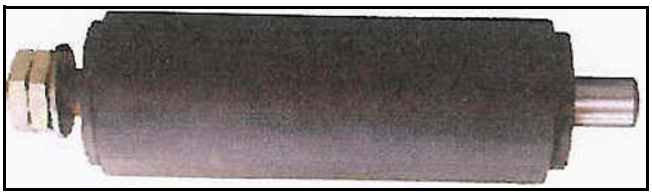
- Check chain for damage
- Unscrew chain tensioner cover
- Push on sliding coupling
- Tension chain by forcing in grease with a grease gun
  Check changes in chain tension during tensioning
  Ideally use an electric grease gun
- Remove sliding coupling
- Screw on chain tensioner cover

6.7.3 Chain tensioner



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⚠ WARNING!

Risk of injury!

There is a very high risk of accident when carrying out repairs to the chain tensioner. Repairs must be carried out in a specialist workshop. Do not under any circumstances attempt to open the inner cylinder.

6.7.4 Check transmission for leaks

The planetary gear and the hydraulic chain drives must be checked for leaks daily. If escaping oil is detected, the damage must be eliminated immediately.

6.7.5 Checking the fixing of the track rollers and baseplates

- Tap the screws to check the fixing of the track rollers
- If the screws move, tighten them immediately.
- Replace defective screws immediately

6.8 Hydraulic system

Safety information

⚠ DANGER!

Danger of serious physical injury!

Hydraulic fluid is under high pressure. When working on the hydraulic system, squirting hydraulic oil can result in very serious eye injuries or other injuries.

Work on the hydraulic system must be carried out with the system de--pressurised.

In the event of injuries consult a doctor immediately, due to the risk of infection.

1. Hydraulic system is under high pressure!
2. Use suitable aids for detecting leaks, due to risk of injury!
3. Before carrying out work on the hydraulic system, the system must be depressurised.
4. The motor must be switched off prior to carrying out work on the hydraulic system

NOTE!

Ensure safe and environmentally sound disposal of lubricants and filters!

6.8.1 Hydraulic filter

The hydraulic system is equipped with two suction filters, a return filter and a tank air filter.

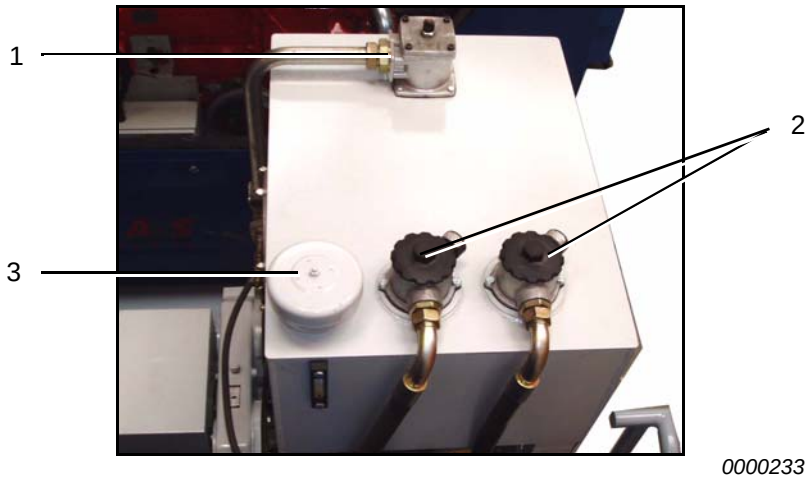
Replacement interval: for the first time 500 hrs
then 1000 hrs

Please note:

- Use the same kind of filter only

Replacing the filter:

- Shut off the machine.
- Remove the cover of the filter housings
- Replace the filter cartridge
- Mount the covers of the filter housing back
- Switch on the hydraulics
- Check filters for leakproofness



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No.	Name
1	Return filter
2	Suction filter
3	Tank air filter

6.8.2 Hydraulic hose lines

Check hydraulic hose lines regularly and in case of damage and aging, replace the old one! The new lines must correspond to the technical requirements of the equipment manufacturer!

Recommended replacing intervals

- Normal requirements: at least every 6 years
- increased requirements (increased application periods, e.g. multi-shift operation, strong ex-- ternal influences): at least every 2 years

Recommended inspection intervals

- Normal requirements: 12 Months
- increased requirements (increased application periods, e.g. multi-shift operation, strong ex-- ternal influences): 6 Months

6.9 Electrical switch cabinet

We recommend that you carry out an occasional check to see that the terminal and connecting bolts in the switch cabinet are firmly located and tighten them if necessary.

The system must also be protected from dust. If there are large dust deposits in the cabinet, these should be removed by aspiration. The seals on the switch cabinet doors must be regularly checked and replaced annually.

DANGER!

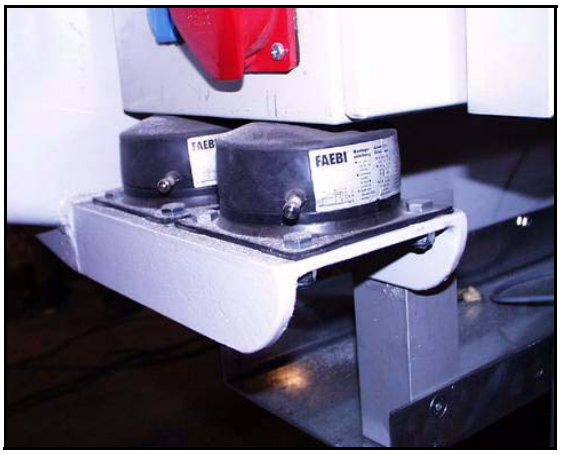
Risk of fatal injury due to electric shock

In the event of contact with live parts, there is a risk of serious injuries due to electric shock!

Before carrying out work on electrical systems,

- **disconnect them from the power supply**
- **protect them against re-starting**
- **ensure that they are disconnected from the power supply**
- **affix maintenance sign**

Switch cabinet mounting



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- Regularly check the rubber air-springs for damage and pressure.

M no.	Type	Pressure	Diameter	Height	Use
M10015053	FAEBI 100	5 bar (72.5 psi)	118 mm (4.6 in)	72 mm (2.8 in)	Double switch cabinet
M10015474	FAEBI 50	3.5 bar (50.7 psi)	80 mm (3.1 in)	60 mm (2.3 in)	Single switch cabinet

NOTE!

Check height of rubber air springs every three months and add more air if required.

7 Repair

7.1 Safety information

- Risk of fatal injury!
  Only carry out repair work or maintenance work when machine is turned off!
  Safeguard against unauthorised start-up of machine:
  - Lock switch cabinet
  - Switch off and lock main switch
  - Attach warning sign against restart.
- Those responsible must ensure that during maintenance work the machine is inoperative and they must safeguard it against its unauthorised restart.
- Retrofitting, welding and repair work to the machine may only be carried out by those commissioned by the manufacturer. When welding, the earth terminal must be located as close as possible to the weld. Otherwise this may lead to destruction of protective earthing system or bearings.
- If electrical or hydraulic components are replaced, then they must be adjusted in accordance with the details on type plate or wiring diagram.
- Conveyor belts and hopper walls must be supported as soon as work starts on valves, cylinders or hydraulic pipes.
- Throttle valves and pressure relief valves set by Kleemann may only be changed by personnel trained by Kleemann. It is forbidden to remove seals from safety valves.

DANGER!

Failure to follow the above-mentioned safety instructions may lead to severe injuries and also material damage which is not covered under warranty.

7.2 Repair work

The following repair work may be carried out by trained and qualified staff themselves. In the case of doubt, however, the manufacturer must be asked for more precise information.

7.3 Vibrating screen

7.3.1 Emerging oil

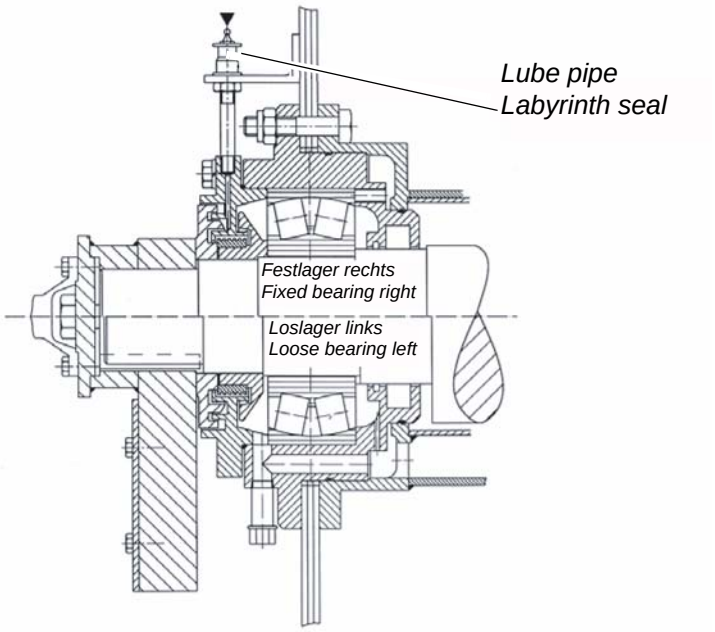
Oil emerging from labyrinth seals can be caused by a number of things.

- Machine is not horizontal.
  Remedy: Align machine horizontally.
- Labyrinths not lubricated.
  Remedy: Lubricate labyrinths.
- Labyrinths over-lubricated.
  Remedy:
  - Do not lubricate labyrinths over a long period (100 h).

IMPORTANT!

During this period carry out daily oil level checks.

- Clean return bushing (1).



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Reason:

The built-in return bushings normally carry the lubricating oil away from the labyrinths to the bearings. Due to over-lubrication the thread of the return bushing becomes clogged and no longer operates ef--ficiently.

7.3.2 Checking vibration amplitude (screener)

⚠ WARNING!

Risk of fatal injury!

If screener is in operation for reading vibration amplitude when unbal-an-ce protection has been removed, there is a high accident risk caused by getting caught between moving parts or objects coiling around parts.

Only check screener with built-in unbalance protection.

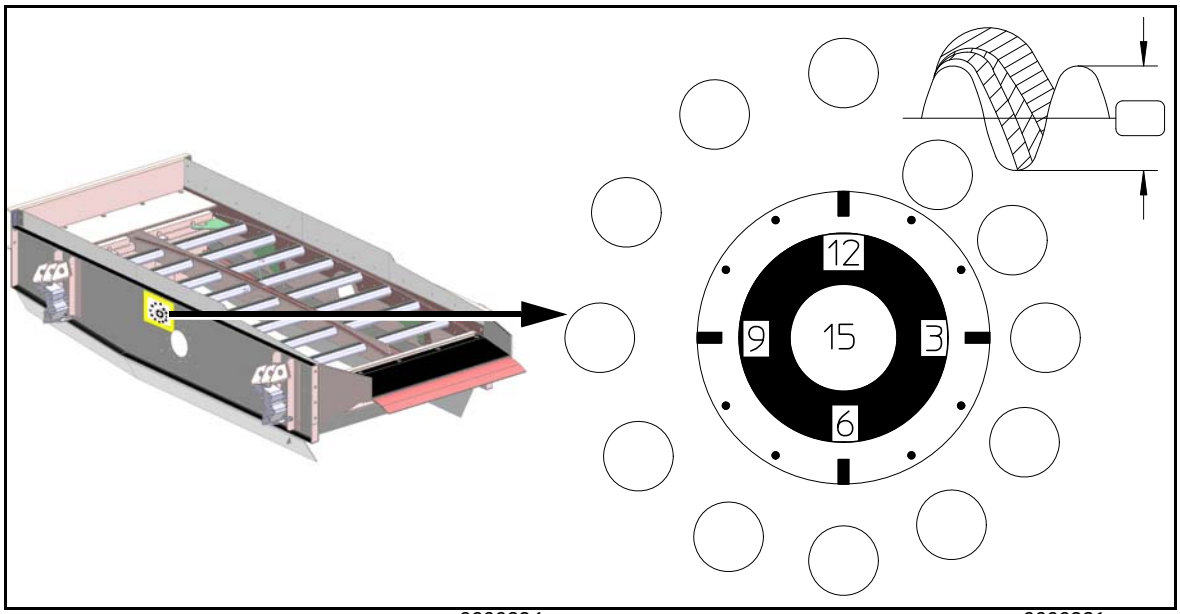
⚠ CAUTION!

Risk of fatal injury and/or material damage!

Incorrectly adjusted unbalances may lead to destruction of machine!

- **All unbalances must be precisely adjusted.**
- **Changes and adjustments to unbalances may only take place after consulting manufacturer.**

Vibration amplitude must be read while screener is operating.



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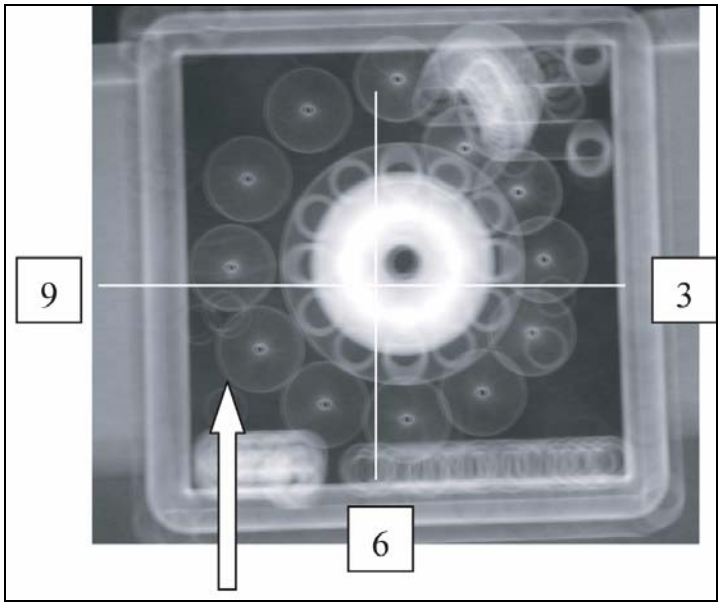
Note:

- Vibration amplitude can be read similar to a clock. One of the 12 small circles makes visual contact with the inner circle. The point of contact gives the vibration amplitude in mm.
- If vibration amplitude is exceeded, it must be reduced.
- Vibration amplitude meter must be fixed in centre of screener above unbalance.



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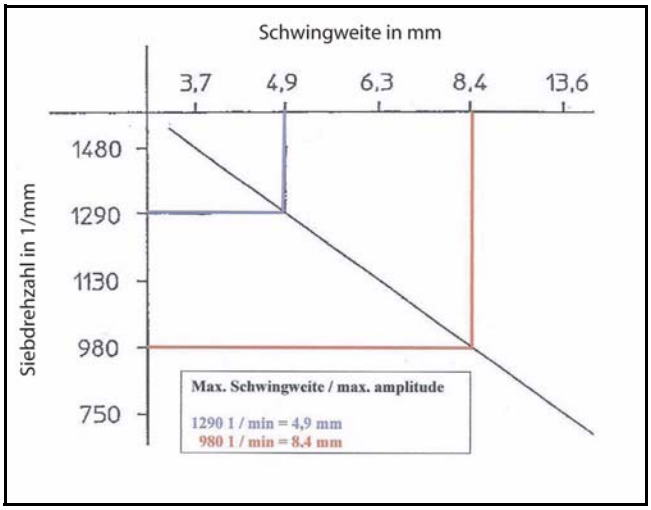
Example: 8 mm vibration amplitude (arrow)

The maximum permissible vibration amplitude depends on the speed of the screener motor. In the following diagram, the maximum permissible vibration amplitudes can be read.

It is not permissible to exceed the values.



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7.3.3 Adjusting rocker width (screen)

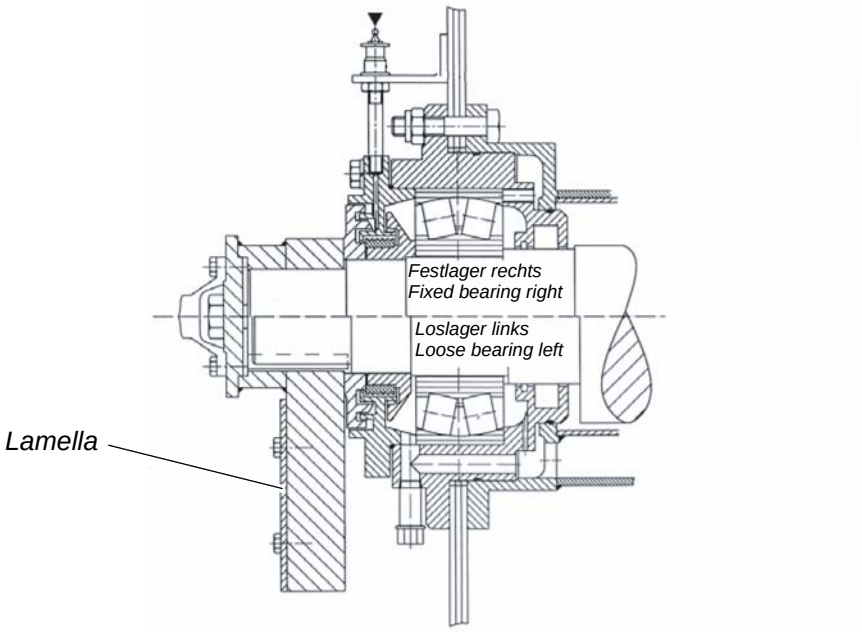
⚠ CAUTION!

Risk of fatal injury and/or material damage!

Incorrectly adjusted unbalances may lead to destruction of machine!

- **All unbalances must be precisely adjusted.**
- **Changes and adjustments to unbalances may only take place after consulting manufacturer.**

Rocker width may be changed with aid of lamellas which are screwed onto external unbalance com-- ponents.



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Adjusting rocker width:

- **Attach additional lamellas** **-> Increase rocker width**
- **Remove lamellas** -> **Reduce rocker width**

NOTE!

The number and size of the lamellas must be the same on both unbal-an-ce components. Otherwise screen vibrates diagonally.

7.3.4 Replacing the screen cover

NOTE!

Whenever a new screen cover has been installed, it should be re-ten--sioned approximately 1 day after it was first tensioned.

Lower screen cover (wire fabric)

Removal

- Switch off machine and turn off main switch
- Remove deflection chute (if fitted) to create more space
- Undo and remove tightening screws
- Lower setting bracket and take out from the bottom
- Push screen cover forwards and detach from front section
- Pull screen cover out to the rear

Check profile rubbers, re-align or replace if necessary

Installation

- Insert new coating
- Attach cover in the rear section
- Insert setting bracket (1) and push through tightening screws from the rear
- Tighten tightening screws a little
- Tension screen cover (see section “Tensioning the screen cover”)
- If removed earlier, refit deflection chute
- Whenever a new screen cover has been installed, re-tension it again approx. one day later

Upper screen cover (bar screen)

Removal

- Switch off machine and lock main switch
- Unscrew deflection chute
- Remove lower screen cover
- Unscrew upper screen cover fastening screws (some screws are screwed in all the way through, some from above)
- Attach screen cover onto shovel loader or crane
- Lift screen cover clear

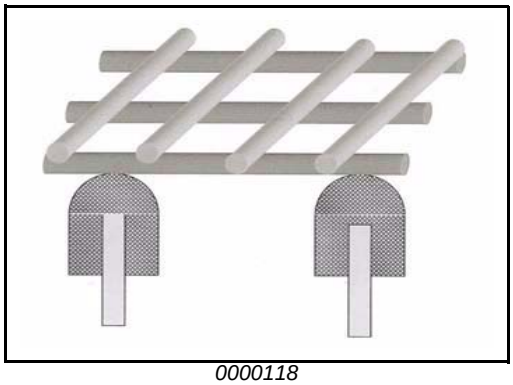
Installation

- Clean contact surface
- Insert new cover
- Insert fastening screw and torque to 420 Nm (310 lb ft);
  use new screws if possible; always use new safety nuts on screws inserted all the way through
- Insert and tension lower screen cover
- Fit deflection chute

7.3.5 Rubber profiles

Damaged or displaced rubber profiles on iron support frame must be replaced immediately in order to avoid damage to screen liners.

Correct!



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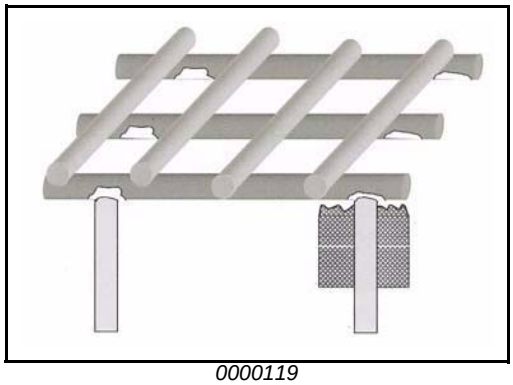
Incorrect!



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7.3.6 Springs

Inspect springs for wear and tear, increasing fatigue, brittleness and cracks.

7.3.7 Sealing elements

Sealing elements must be checked regularly for function, cleanliness, tightness, damage, as well as cracks and brittleness, and must be changed if necessary.

7.3.8 Wear lining

Regular inspections for fastening, abrasion and cleanliness.
Wear lining must be inspected weekly and replaced if worn.

7.3.9 Screen box

⚠ CAUTION!

Material damage!

Machines whose vibration is obstructed cause cracks and destroy the bearing!

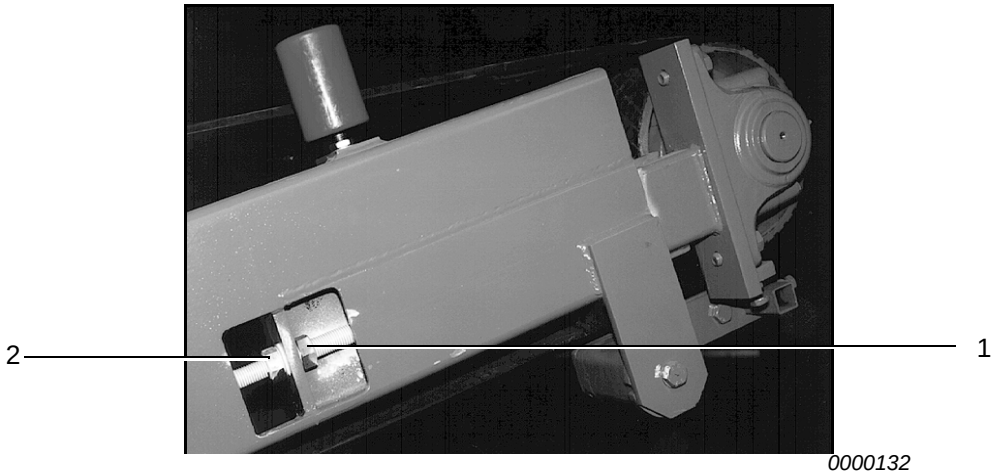
- **Observe minimum distance between firmly anchored and freely vibra-t-ing components.**
- **Clean machine regularly.**

- Regularly check screen box for unobstructed movement, smoothness of running and security.

Belt conveyor

7.3.10 Tension the belts

The belts are tensioned by means of tensioning spindles. Each belt is provided with two spindles.



Brass nuts serve for adjustment:

front => clamping nut (1)

rear => lock nut (2)

Tensioning

- Loosen lock nut (slacken until tensioning path is clear)
- Turn the clamping nut until the belt is tensioned

IMPORTANT!

Evenly adjust both tensioning spindles alternately, so that the drive pul-- ley remains at right angles to the frame.

Otherwise the belt will run skew.

Do not tension the belt too firmly.

- Tighten the lock nut
- Belt tensioning note:
  Excessively strong or weak belt tensioning

  - too weak:
  Belt will hang down between the carrier rollers

- too strong:
  Vibration of the bottom strand

Slacken off

- Loosen lock nut
- Turn the clamping nut until the belt has been slackened sufficiently.

IMPORTANT!

Evenly adjust both tensioning spindles alternately, so that the drive pulley remains at right angles to the frame.

Otherwise the belt will run skew.

- Tighten the lock nut

7.3.11 Changing the belts

In principle there are two different options for changing the belts:

a. Joining of sectioned belt to machine by vulcaniser.
b. Fit endless belt. In the case of endless belts, the conveyor belts must be removed and partially dismantled.

7.3.12 Replacing the scrapers

- Switch off the machine and lock the main switch

Front scraper
Replace plastic strips if necessary

Wedge scraper
Replace plastic strips if necessary

7.3.13 Adjust the belt running

Check the belt running with and without load and adjust if necessary.

⚠ WARNING!

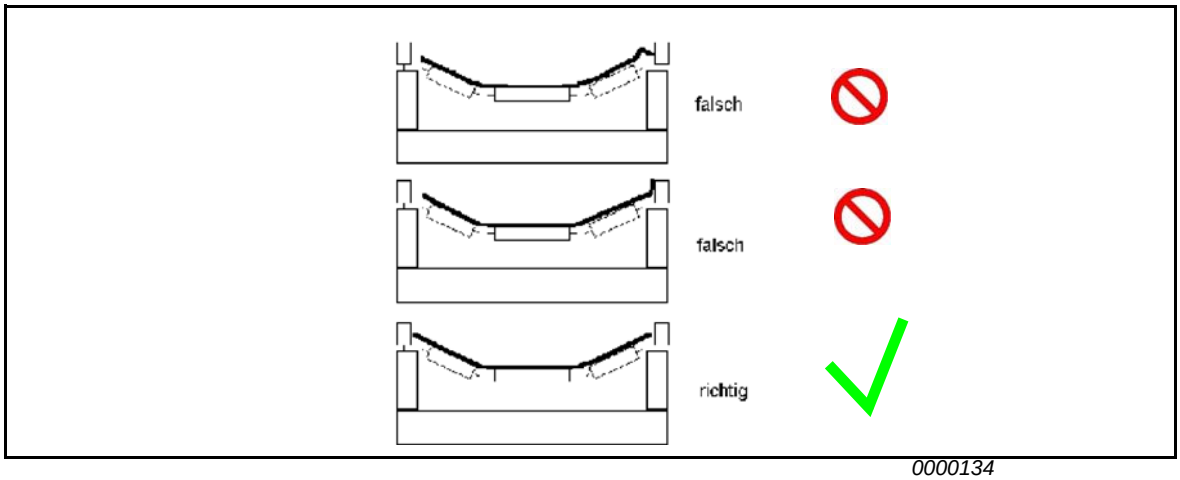
Risk of being pulled in!

When performing checks and adjustments on the running belt there is a risk of being pulled in by the drive pulleys and reverse drums as well as all carrier and bottom belt rollers. Limbs can be torn out.

- **Maintain an adequate safety distance when performing visual checks**
- **Only perform adjustments when the belt is stationary**

Checks

- Check straight-line motion with and without load and adjust if necessary



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- Belt may be positioned on side guide rollers. There must not be any wrinkling or ropiness!

Reasons for defective belt running

- Inadequate alignment of drive pulleys and reverse drums
- Drums or rollers encrusted with dirt on one side
- Feed and guidance of the conveyed material outside the centre of the belt
- Scrapers positioned skew in the flow delivering the conveyed material over the edge of the belt
- Rubbing of the belt on the supporting structure or on jammed items of conveyed material
- Uneven frictional contact over the belt width due to rain or snow
- Incorrectly executed endless connection of the belt with longitudinal kinking

Adjustment

- Align the drive pulley via the tensioning spindles if necessary
- Adjust the belt tension

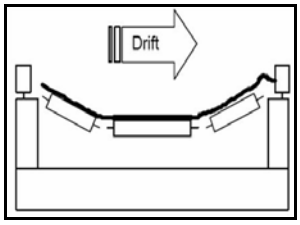
If the defective belt running is due to reasons other than those cited above, then adjust the straight-line motion via the bottom belt rollers

Adjust one or more bottom belt rollers at the point where the belt begins to run skew.

- Loosen the bottom belt roller
- Turn the roller slightly in the slots
- Tighten the bottom belt roller
- No-load test
- Operation at full load

Repeat settings several times if necessary

Example: Drift to the right



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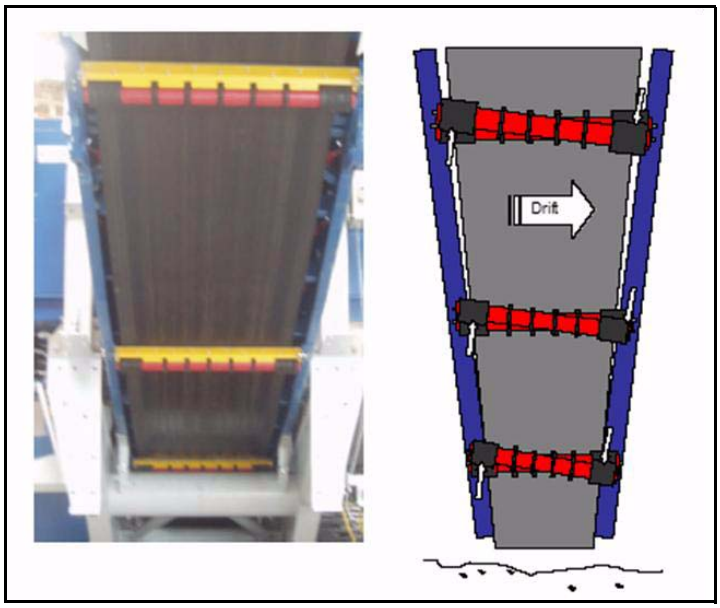

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8 Transport

8.1 Transport between the places of use

If the plant must be driven on public roads, the necessary official permissions for special transport must be obtained. The pertinent regulations must be observed; these differ from country to country.

8.2 Safety information

⚠ WARNING!

Risk of injury and material damage due to incorrect use of hoisting de-- vices and lifting accessories.

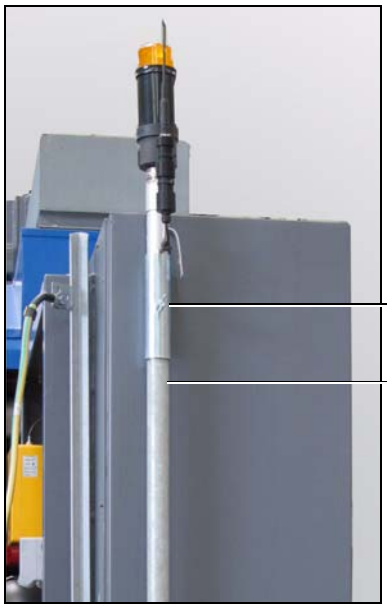
Parts may be transported by crane only with suitable cargo gear. Check that chains, ropes etc. are in proper condition.

- **It is forbidden to stand under hovering loads.**
- **Personal protective equipment, such as helmet, safety shoes, gloves etc. must be worn when installing machine.**
- **During installation/removal chains or ropes must be attached to fixed components so they do not slip. Attachment point must be at centre of gravity.**
- **Only qualified and competent personnel must carry out installation/re-- moval work.**

NOTE!

- **Lifting eyes into which the load hooks can be fitted are provided at ma-- chine for transport. Only hook machine to these lifting eyes.**
- **The lifting eyes are only suitable for the weight of the machine. Addi- ti-onal loads added to the machine are not allowed to be lifted using the-se lifting eyes.**
- **In order to avoid endangering persons or damaging the machine, the machine must be transported with caution. In addition to the following information, the general and local regulations on safety and accident prevention must be observed.**
- **Machine may be transported by crane only with suitable cargo gear (in-- spect ropes, chains etc and ensure they are in perfect condition).**
- **It is forbidden to stand under hovering loads.**
- **During transport the statistical load assumptions must be observed in order to avoid deformations and other damage.**

8.3 Retracting the warning light



0002102

- Loosen wing screw (1) and pull in retaining pipe (2).
- Tighten wing screw (1).
- Secure position with spring pin.

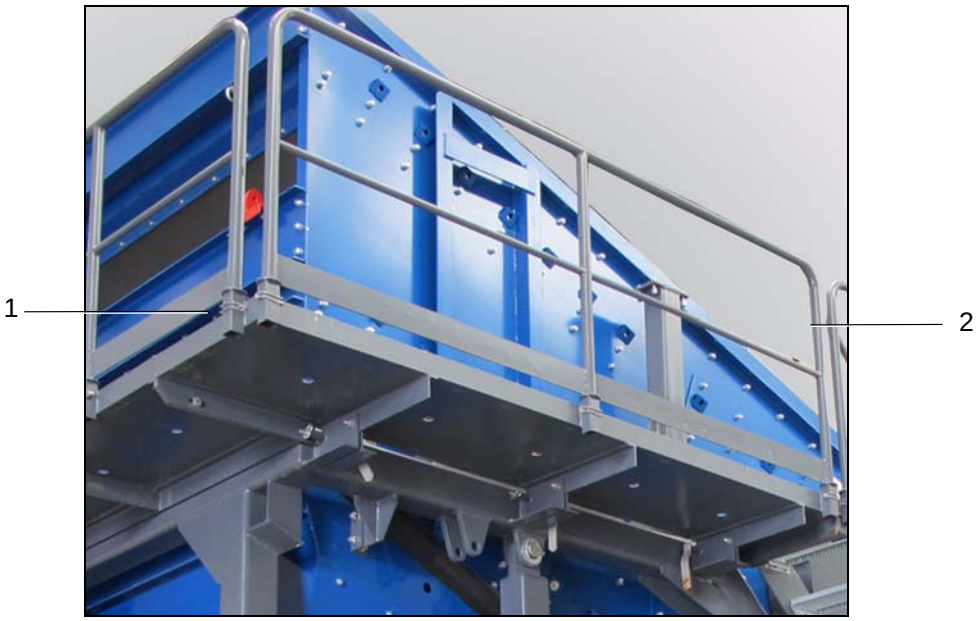
8.4 Removing platforms, ladders and stairs

⚠ WARNING!

Risk of injury!

Persons are at risk of injury and falling during the removal of the platforms.

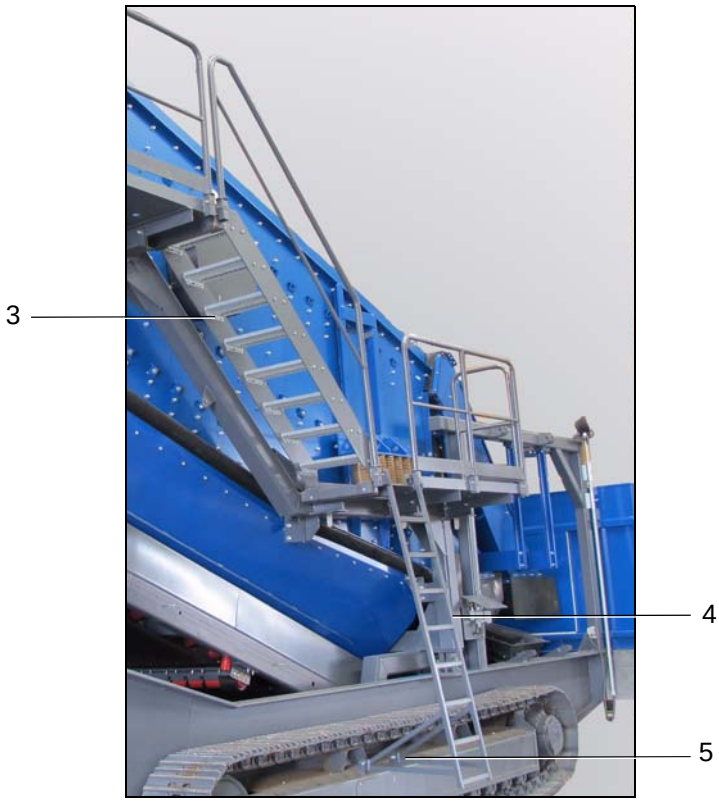
- **Use suitable hoisting gear and tackle.**
- **Use secure climbing aids, e.g. ladders or lifting platforms.**
- **Do not stand in the danger zone when platforms are being folded.**



0002100

Removing handrail sections

- Release clip pin (1).
- Lift out handrail sections (2) using suitable lifting apparatus and place down on suitable device.



0002100

Removing ladder

- Secure cage using suitable lifting apparatus and lifting tackle.
- Unscrew threaded connections on cage and lift out cage from brackets of platform.
- Secure ladder (4) using suitable lifting apparatus and tackle.
- Unscrew threaded connections of ladder (4) on support (5).
- Remove ladder (4) from platform and place on suitable device.

Removing access steps

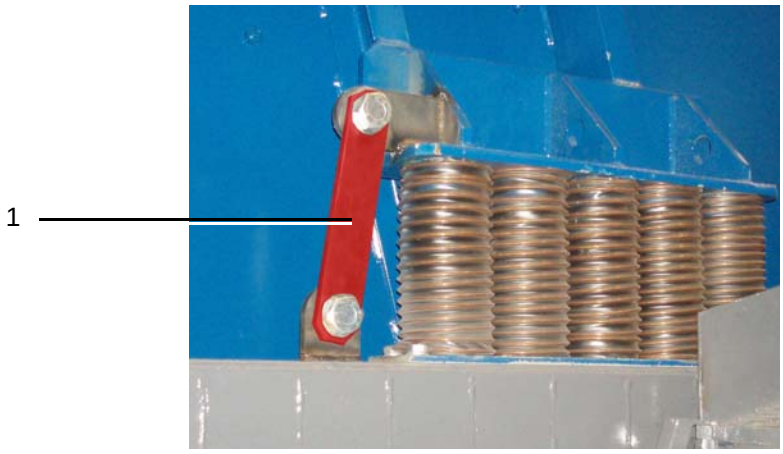
- Secure access steps (3) using suitable lifting apparatus and tackle.
- Remove securing bolts between platforms and access steps.
- Remove access steps (3) between platforms and place on suitable device.

0002103

Removing the platforms

- Secure platform (8) using suitable lifting apparatus and tackle.
- Remove securing bolts (7) from support of platform.
- Remove spring clip and spring pin (6) from support of platform.
- Carefully fold down platform (8) into vertical position.

8.5 Screen machine



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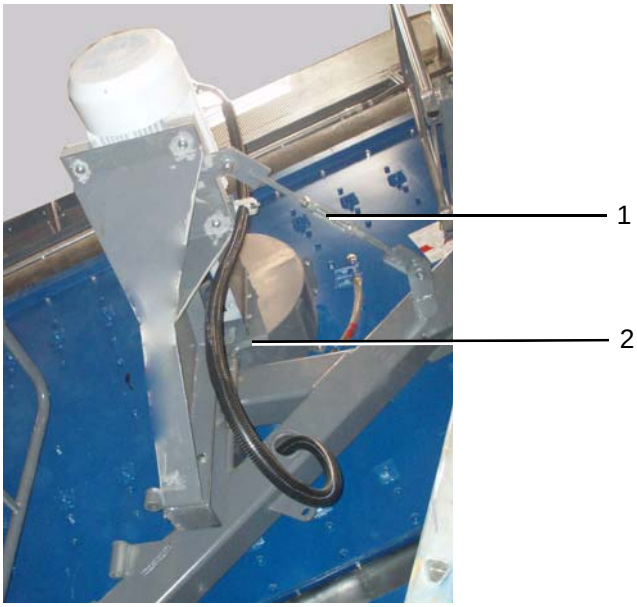
- Assemble the transport securing device (1)

8.6 Removing screen drive

- Remove drive shaft guard
- Unplug electrical connections on drive



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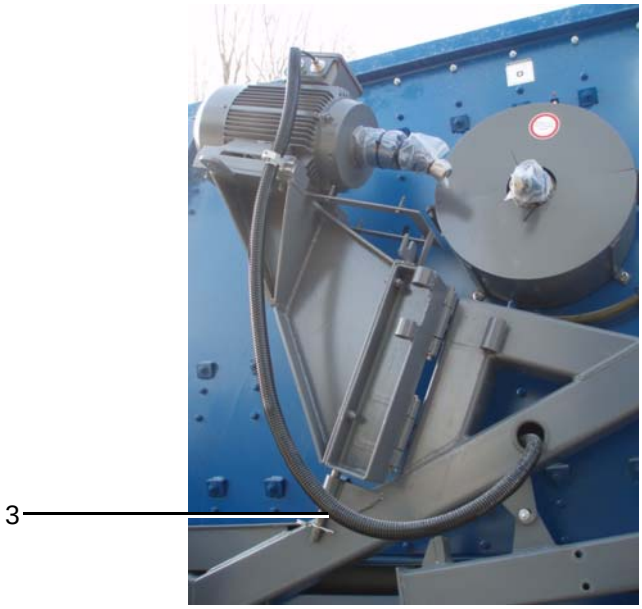
- Remove suspension (1)
- Remove bolts (2)
- Carefully swing drive away



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- Attach transport securing device (3)

8.7 Side discharge conveyor

⚠ WARNING!

Risk of injury in installation area!

Persons in installation area of belt conveyor may be at risk from crus-hing injuries.

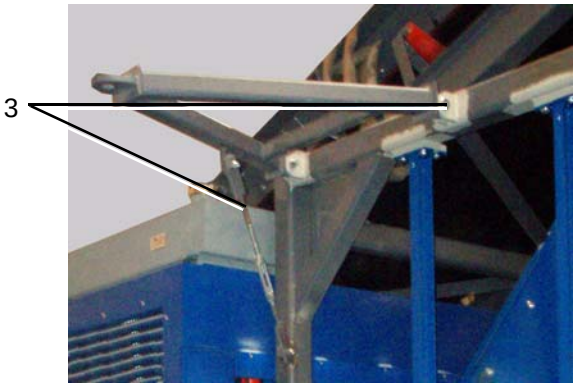
Do not stand in danger zone when belt conveyor is being installed.

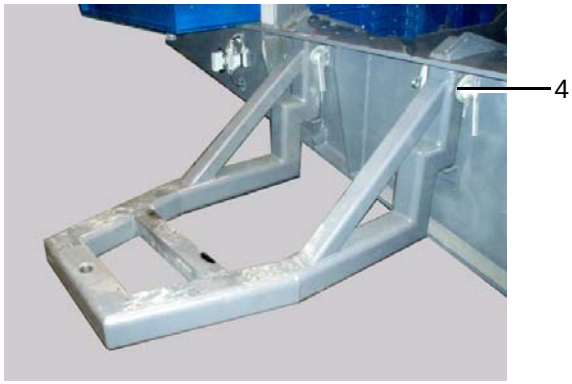
0000845

- Unplug all electrical connections on belt conveyor
- Secure belt conveyor to eyelets provided using suitable hoisting gear
- Remove inlet hopper
- Remove belt suspensions (1)

0000844

- Remove bolts (2) from lower mounting
- Extend belt conveyor using hoisting gear





0000843 *0000842*

- Remove upper (3) and lower (4) part of mounting

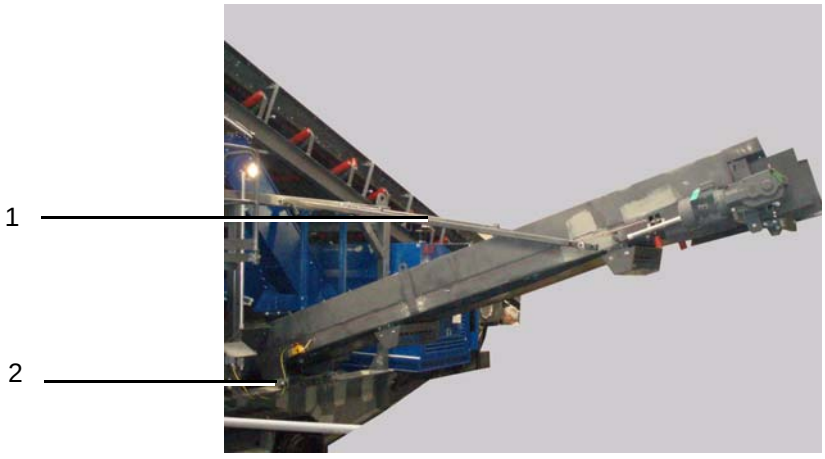
8.8 Side discharge conveyor

⚠ WARNING!

Risk of injury in installation area!

Persons in installation area of belt conveyor may be at risk from crus-h-ing injuries.

Do not stand in danger zone when belt conveyor is being installed.



0000844

- Unplug all electrical connections on belt conveyor

- Secure belt conveyor to eyelets provided using suitable hoisting gear
- Remove inlet hopper
- Remove belt suspensions (1)
- Remove connectors from belt mounting on both sides (2)
- Extend belt conveyor using hoisting gear

8.9 Side discharge conveyor (short)

⚠ WARNING!

Risk of injury in installation area!

Persons in installation area of belt conveyor may be at risk from crus-h-ing injuries.

Do not stand in danger zone when belt conveyor is being installed.

- Unplug all electrical connections on belt conveyor
- Secure feeding conveyor to eyelets provided using suitable hoisting gear
- Remove inlet hopper
- Remove connectors from both sides of belt mounting (1)

0000849

- Remove bolts (2) from lower mounting
- Extend belt conveyor using hoisting gear

8.10 Removing frame (optional)

0000841

- Secure frame using suitable hoisting gear
- Remove screws between chassis and frame
- Lift off frame
- Remove frame
- Lift frame onto mounting on chassis
- Install frame

8.11 Removing feeding conveyor

⚠ WARNING!

Risk of injury in installation area!

Persons in installation area of conveyor may be at risk from crushing in-- juries.

Do not stand in danger zone when conveyor is being installed.

0000839

- Remove feed hopper (1)
- Secure feeding conveyor (2) using suitable hoisting gear
- Remove screws between feeding conveyor and chassis
- Lift off feeding conveyor

0000838

8.11.1 Lowering screen

⚠ WARNING!

Danger of injury in lifting and lowering area, as well as in folding area!

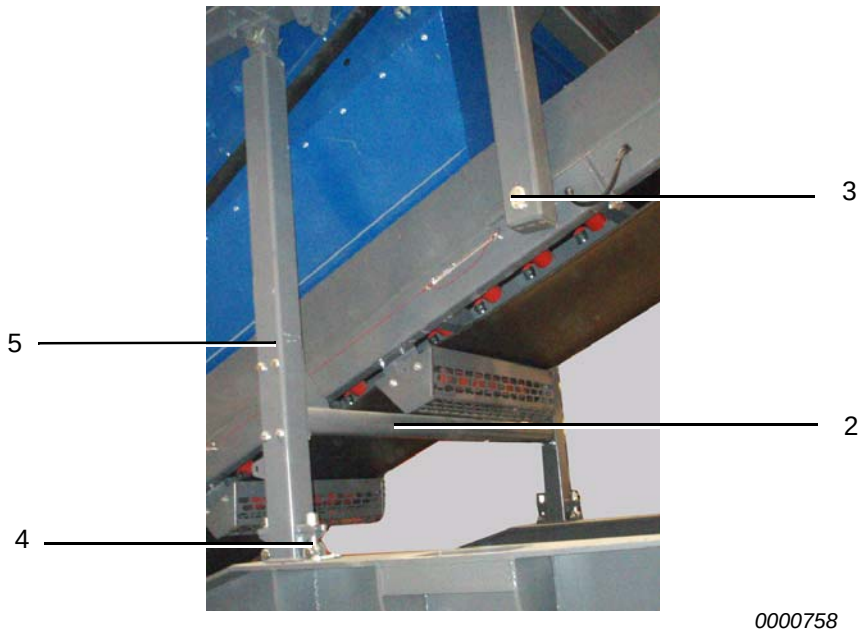
Persons in lifting and lowering area of screen, as well as in folding area of conveyor, may be at risk from crushing injuries.

Do not stand in danger zone during lifting and lowering of screen or when belt is being folded.

- Fold platforms at screen rack
- Secure screen rack using suitable hoisting gear

0000756

- Remove supports (1) on main discharge conveyor



0000758

- Remove crossbeam (2)
- Remove bolts (3)
- Open eye bolts (4)
- Fold support (5) and fit in transport position (6)

0000757

- Lower screen rack

8.12 Folding main discharge conveyor

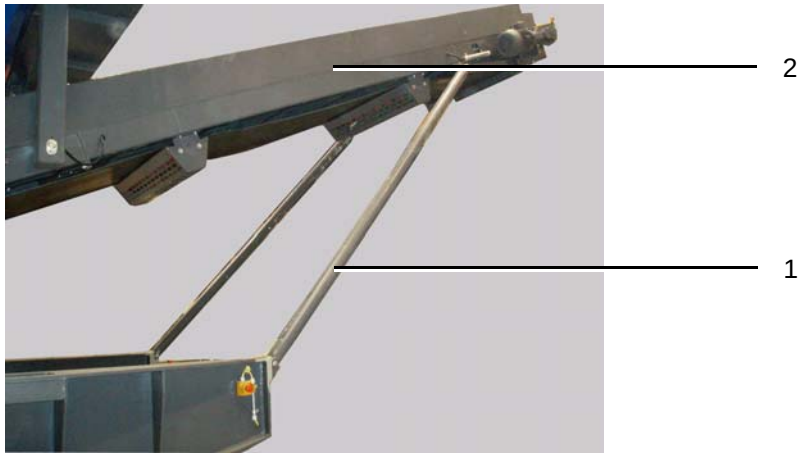
⚠ WARNING!

Danger of injury in lifting and lowering area, as well as in folding area!

Persons in lifting and lowering area of screen, as well as in folding area of conveyor, may be at risk from crushing injuries.

Do not stand in danger zone during lifting and lowering of screen or when belt is being folded.

- Lock ventilation of conveyor drive

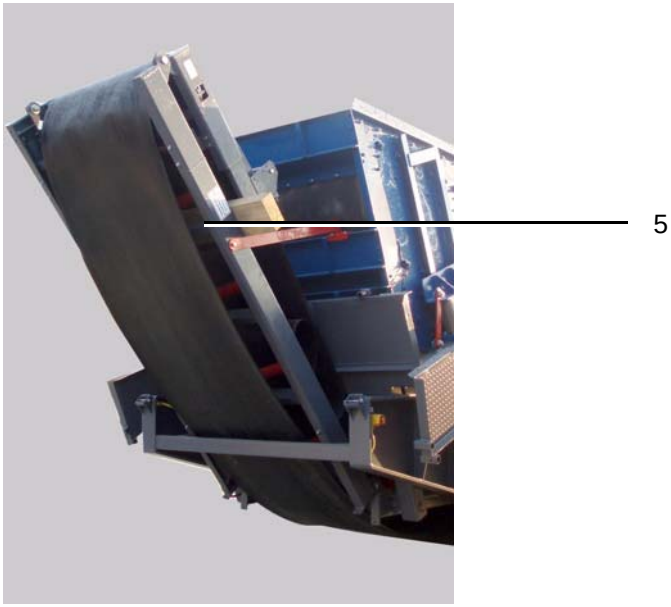


0000756

- Remove supports (1) on main discharge conveyor
- Remove material guides (2)
- Secure main discharge conveyor at eyelets provided using suitable hoisting gear

0000850

- Remove screws from rear folding point (3)
- Folding main discharge conveyor
- Remove screws from front folding point (4)
- Fold front part of main discharge conveyor



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- Attach transport securing device (5)

8.13 Remove earth connection

- Pull the earth stake out of the ground
- Put the earth stake into the fixture

8.14 Power unit

- Close and secure all service doors

9 Storage

Safety information

NOTE!

- **If possible the machine should be stored in closed rooms until final in--stallation.**
- **If the machine is stored outdoors it must be covered with tarpaulin co-v-ers that are open at the bottom to allow run off of any condensation.**
- **Machine must be erected on suitable bases to protect against effect of rising damp.**
- **Electrical components must be stored in closed, dry and frost-protec-t-ed rooms.**
- **A transport and storage period of six months is generally considered as the period beyond which supplementary protective and preserva-ti-on measures must be provided.**

10 Disposal

The system must be correctly disposed of at the end of its life cycle.

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