# OPERATING INSTRUCTIONS

## Semi Mobile Crushing Station

## Manual 6

## Maintenance

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**Annex 1:** **Lubrication plan**

**Annex 2:** **Control- and Maintenance plan**

# 1 MAINTENANCE

## 1.1 Basic Safety Notes

**IMPORTANT**

**Please note the information in the manual 1 "Use of machine according to intended purpose" and manual 2 "Basic safety requirements".**

**The supplied documentation of attachment parts (e.g. gearbox, motors etc.) supplements the following statements and should be understood as obligatory.**

Make sure to adhere to the setting, maintenance and inspection activities and intervals plus data on replacement of parts and components contained in the operation manual. All those activities should be accomplished only by **qualified personnel** (skilled work force).

**Qualified personnel** (skilled work force) are persons who have been authorized by the responsible for maintaining the safety of the components/ plant, to perform such activities and to detect and avoid possible dangers as a result of their training, experience, instruction or familiarity with the relevant Standards, regulations, accident prevention measures and operating conditions.

**NOTE**

**Data on lubrication points, lubricants, filling volume and frequency of lubrication may be found in the lubrication chart in Appendix 1.**

**Data on maintenance actions and frequencies may be found in the maintenance plan in Appendix 2.**

**During all work with or on the equipment the rules on the avoidance of wastes and the correct disposal or recycling of wastes shall be observed.**

**Substances like**

- **Hydraulic fluids**
- **Oils and greases**
- **Coolants**
- **Solvent-containing cleaning agents**

**required for installation, repair and maintenance work must not get into the soil or enter the sewage system.**

**These fluids must be collected in suitable vessels before they are disposed of properly.**

WARNING

**WARNING! OVERPRESSURE**

**Prior to repair or maintenance, the equipment items and pressure lines to be opened must be relieved from pressure.**

**Work should be carried out only by skilled workers.**

WARNING

**CAUTION, HOT LIQUIDS AND VAPOURS**

**Be careful when handling hot substances. Risk of skin burns and scalds.**

DANGER

DANGER

**POTENTIAL HAZARDS CAUSED BY ELECTRIC POWER**

**POTENTIAL RISK OF AUTOMATIC OR UNINTENDED START OF MACHINE**

**Only qualified electricians should carry out work on the power supply system.**

**Make sure that machine and plant equipment subject to compulsory inspections, repair and maintenance work are isolated from power before such work is carried out. To be sure, check the isolated equipment items if they are still under voltage. Earth and short-circuit them and isolate other equipment in the vicinity from power supply.**

**Prior to all repair and erection work, the equipment and its components should be isolated from power supply so that drives cannot be started by mistake while repair work is carried out.**

**All cable connections of components to be replaced must be disconnected. After reassembly, cable connections must be made again!**

DANGER

**DANGER FOR THE DRIFT STABILITY**

**Suitable measures must be taken to ensure at any time that all repair and maintenance work can be safely accomplished without impairing the stability of the overall machine. If brakes are removed, additional fixtures (e.g. clamping devices) must be used that have the same effect.**

WARNING

**WARNING, DANGER OF SQUEEZING INJURIES**

**Utmost care is required when suspending or threading-in auxiliary tools for lifting of loads (chains, lifting belts, ropes). Note the risk of squeezing-off limbs.**

DANGER

**CAUTION, SUSPENDED LOADS!**

**Nominate only well-experienced persons for suspension of loads and for giving instructions to the crane operator. The person giving instructions to the crane operator must be positioned so that it is in sight contact with the crane operator or may communicate with him through a radiotelephone set.**

**When replacement of single parts or larger components is required, the parts must be safely fitted to the hoisting gear and handled so that all risks are excluded. Only suitable hoisting gears and load carrying attachments in technically sound condition and with sufficient hoisting capacity shall be used.**

**For handling of plant components only the provided suspension points and marked eyebolts shall be used.**

**Persons must not stay or work under suspended loads.**

**It is prohibited to transport persons together with the load or on the load suspension devices.**

DANGER

**ATTENTION IN CASE OF WORK IN ELEVATED POSITIONS!**

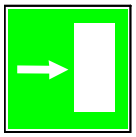
**Never use equipment parts for climbing.**

**When work in overhead positions is required, use only tested and approved equipment for protection against falling down.**

**In case of repair or maintenance work in elevated positions the workforce may fall down and suffer heavy injuries or even death.**

**Therefore, use only approved climbing aids and working platforms.**

DANGER



**DANGER DUE TO BLOCKED ESCAPE ROUTES**

**Keep escape routes free from all obstacles: never put down or store components in escape routes and observe the applicable safety rules.**

IMPORTANT

**Damage to the paint must be eliminated according to the paint specification after having finished maintenance works.**

## 1.2 Ropes and Rope Fixtures

- Ropes must be kept under supervision while they are in operation and while they are not used. This is applicable not only to the ropes but also to the rope fixtures, rope connections and rope guides.
- In case of wire rope fixtures, the specified number of rope clips must not be reduced.

| Nominal size (rope) | Required torque for tightening [Nm] | Tensile force required in the rope clip thread [N] | Required number of wire rope clips |
|---|---|---|---|
| 5 | 2,20 | 2300 | 5 |
| 6,5 | 3,85 | 3200 | 5 |
| 8 | 6,60 | 4700 | 6 |
| 10 | 9,90 | 7100 | 6 |
| 13 | 36,30 | 15400 | 6 |
| 16 | 53,90 | 21000 | 6 |
| 19 | 74,47 | 28900 | 6 |
| 22 | 117,70 | 40800 | 7 |
| 26 | 161,70 | 47600 | 7 |
| 30 | 233,20 | 62300 | 8 |
| 34 | 325,60 | 79200 | 8 |
| 40 | 399,30 | 89800 | 8 |

## 1.3 Torques for Tightening of Bolts

| Bolt size | Bolt property class 10.9 Tightening moment to be applied $M_A$ [Nm] | Bolt property class 8.8 Tightening moment to be applied $M_A$ [Nm] |
|---|---|---|
| M8 | | 20 |
| M10 | | 40 |
| M12 | 100 | 70 |
| M16 | 250 | 170 |
| M20 | 450 | 300 |
| M22 | 650 | 450 |
| M24 | 800 | 600 |
| M27 | 1250 | 900 |
| M30 | 1650 | 1200 |
| M36 | 2800 | 2100 |

MA = Required torque for tightening with torque wrench
All torques for tightening are applicable to bolts with metric thread according DIN 13, nut with $MoS_2$ treated

## 1.4 Repair

### 1.4.1 Basic Safety Notes

**DANGER**

**DANGER FOR THE STABILITY!**

**All repair work must be realized only at wind speeds up to maximum 5 m/s. During the repairs, the wind speed must not exceed 10 m/s!**

**DANGER**

**DANGER DUE TO UNINTENDED RE-START!**

**Prior to repair, the conveying routes affected and upstream conveyors of machines must be made empty. Suitable actions are required to ensure that such equipment cannot be started by mistake.**

**Starting of the electrical or hydraulic drives of the assembly groups that are being worked on, must be excluded.**

**DANGER**

**DANGER FOR THE STABILITY!**

**In case repair work technology makes it necessary to erect piles between ground level and machine, the load carrying capacity of soil must be calculated before the piles are erected (the permitted ground pressure need to be complied).**

**The piles must be erected on a ground level sufficiently able to take the maximum load.**

**The size of the piles must be selected according to the permitted ground pressure and the imposed load.**

**The piles must be secured against overturning.**

**In this process need to be ensured that the piles are positioned vertically and centrically under the support points.**

**DANGER**

**DANGER FOR THE STABILITY!**

**In case of using mobile lifting devices, the load carrying capacity of soil must be calculated before (the permitted ground pressure need to be complied).**

**DANGER**

**DANGER DUE TO OBJECTS FALLING DOWN!**

**For all repair works it is forbidden to stay under the repair area! This area has to be closed off across a large area.**

**Falling objects may cause severe bodily injury or loss of life.**

DANGER

**WARNING! RISK OF INJURIES CAUSED BY SPRING TENSION/CHAIN TENSION!**

**When installing or removing components under mechanical stresses, persons might suffer injuries and equipment parts may become damaged or even destroyed.**

**Before performing work on such components suitable action should be taken to exclude such potential risks.**

DANGER

**RISK OF SQUEEZING-OFF LIMBS**

**The conveying belt is always under tension, even while a belt conveyor is switched off. In the case of works where the conveyor belt exerts a direct or indirect effect, pretension must be neutralized by relieving the conveyor belt before starting the work. This might result in a short movement of the conveyor belt and the take-up device.**

DANGER

**RISK OF SQUEEZING-OFF LIMBS**

**For all belt-drive repair works suitable measures (e.g. belt clamps) have to be used to secure the conveyor belt against self-actuated movement.**

DANGER

**DANGER DUE TO MISSING OR NOT CORECTLY INSTALLED SAFETY APPLIANCES**

**After repair all safety devices must be checked for mounting and function and a start-up test without transported material must be realized!**

DANGER

**DANGER FOR THE STABILITY!**

**Repair works at**

- **Spherical bearings of the bridge segments**
- **Hoisting -and levelling cylinder**
- **Main carrying construction**

**As well as the disassebly of machine parts of the crawler drive notably affect the stability of the entire plant. That is why these works may only be carried out after having consulted the company FAM and only by qualified maintenance personnel.**

**Non-observance of this instruction may lead to damages at the plant, severe or even fatal injuries.**

**IMPORTANT**

**In case of repair where fitting bolts or fitting bolt connections are to be removed, the parts concerned shall be properly marked so that they can be re-installed in the correct positions!**

**If the fitting bolt connections have been removed, in the course of reassembly they should be replaced by new bolts with a thicker fitting shaft. Conjointly the holes should be bored to a larger size.**

## 1.5 Apron Feeder AF 2200X15

### 1.5.1 Replacement of Drive Unit

NOTE

**For documentation of the drive unit see Manual 7, Register 7.1.1.**

DANGER

DANGER

**POTENTIAL HAZARDS CAUSED BY ELECTRIC POWER**

**POTENTIAL RISK OF AUTOMATIC OR UNINTENDED START OF MACHINE**

**Only qualified electricians should carry out work on the power supply system.**

**Make sure that machine and plant equipment subject to compulsory inspections, repair and maintenance work are isolated from power before such work is carried out. To be sure, check the isolated equipment items if they are still under voltage. Earth and short-circuit them and isolate other equipment in the vicinity from power supply.**

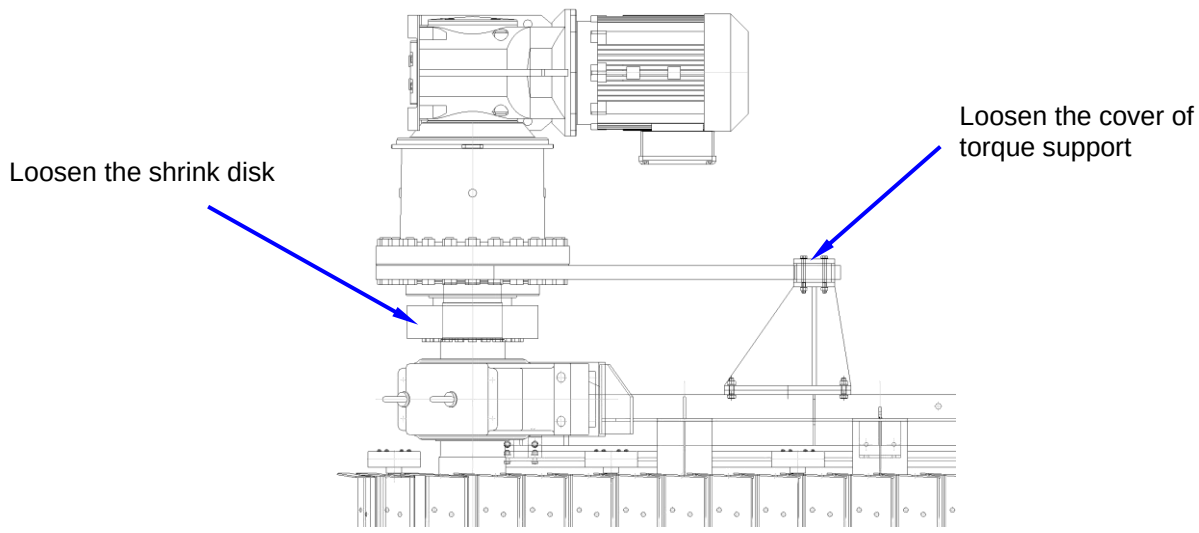
**Prior to all repair and erection work, the equipment and its components should be isolated from power supply so that drives cannot be started by mistake while repair work is carried out.**

**All cable connections of components to be replaced must be disconnected. After reassembly, cable connections must be made again!**

DANGER

**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the apron feeder, the adjacent spillage conveyor and the impact crusher in a way preventing the machine from any undesired movements.**



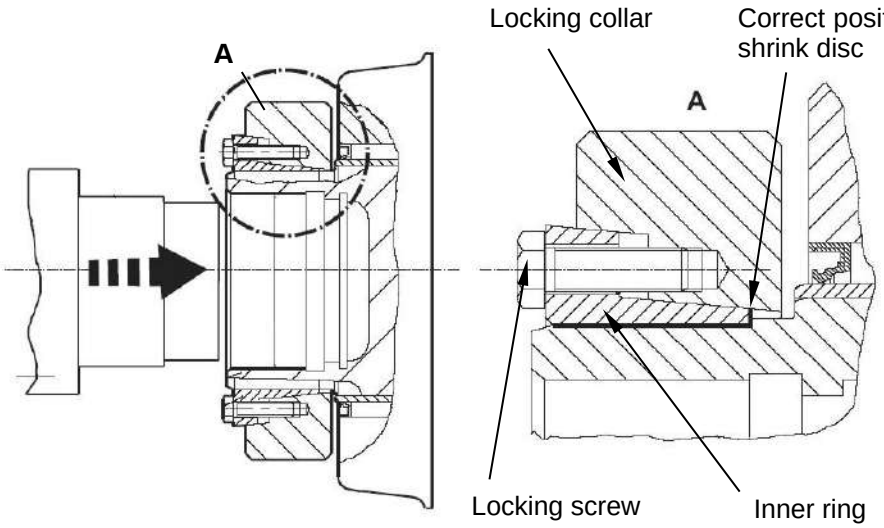
- Remove all cable connections from the drive unit.
- Use lifting eyes for suspension of the drive unit to the hoist gear and secure it against tilting over. When choosing the hoisting and slinging equipment, take account of the drive unit weight (approx. 2780 kg)!
- Loosen the locking screws of the shrink disc evenly and one after the other.
- Undo the fasteners of the torque support.
- Use a pulling device to carefully pull off the drive unit. If the locking collar does not come away from the inner ring automatically, it is possible to undo a few locking screws and screw them into the adjacent forcing threads.
- Pull the shrink disc off the hub, observing the following:
  - Any rust that may have formed between the hub and the end of the shaft must be removed beforehand.
- Lift the drive unit and put it safely down on the ground.

**DANGER**

**CAUTION, SUSPENDED LOADS!**

**Persons are not permitted to stay or work under suspended loads. Every movement must be continuously monitored by several persons. The operator and monitoring personnel must always remain in contact.**

- Bring the components to the repair site for further disassembly.
- Re-assemble the unit in reversed order under observance of following instructions:
  - Degrease the hub and the shaft. The outside surface of the hub can only be greased in the area of the shrink disc seat.
  - Check the correct position of the shrink disc. The shrink disc is positioned correctly when it is in contact with the shaft shoulder.
  - Push carefully the drive unit at the hub onto the shaft. Perform the mounting operation slowly to allow the compressed air to escape around the outside of the shaft.
  - Tighten all locking screws at evenly spaced intervals until the front lateral surfaces of the locking collar and inner ring are in alignment.
  - Note the tightening torques.




**IMPORTANT**

**For further information regarding assembly/disassembly of the drive unit please refer to the manufacturer documentation (see Assembly and Operating Instructions for the drive unit PHF072 KF157 DRE280S4).**

**For the bolt securing of the torque support a new split pin must be used! After reassembly the split pin ends must be bent open.**

- Restore all electrical connections.
- Test operation of the equipment without conveyed material.

**IMPORTANT**

**After reassembly inspect the gear unit oil level in accordance with the lubrication schedule. Add oil if needed.**

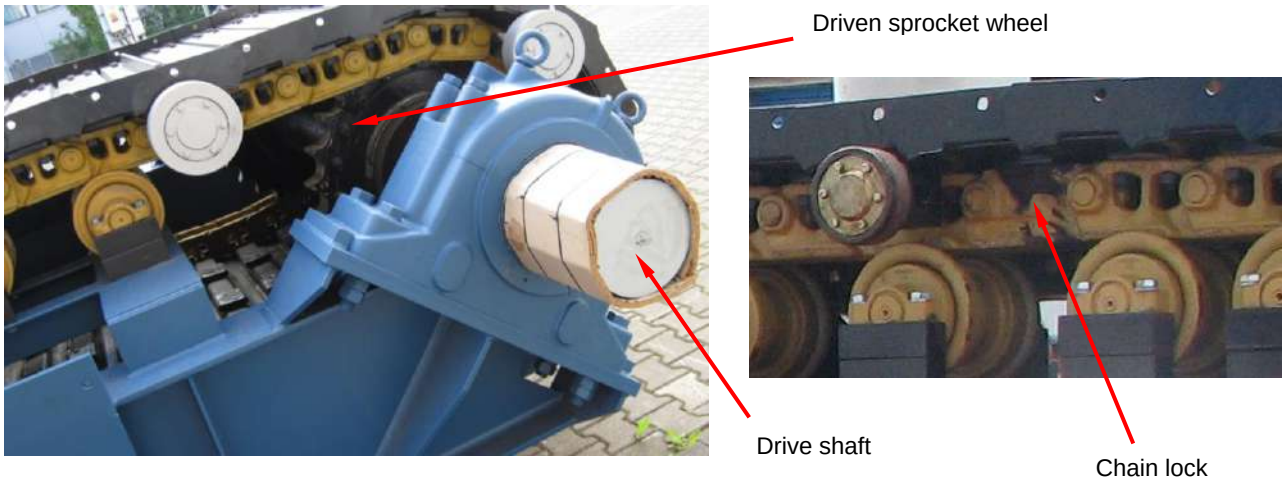
## 1.5.2 Replacement of Drive Shaft with Drive Sprockets

**DANGER**

**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the apron feeder, the adjacent spillage conveyor and the impact crusher in a way preventing the machine from any undesired movements.**

- Advance the chain in a way that the chain locks to be opened are positioned above the drive sprockets.




- Isolate the drive unit of apron feeder from power supply and secure it against unintended start-up.

**WARNING**

**WARNING, DANGER OF SQUEEZING INJURIES**

**Work may only be started after power cutoff. Otherwise there is a danger of squeezing-off limbs.**

- Remove safety guards and attachment parts.
- Remove discharge hood and discharge box.
- Dismount the drive unit (see Chapter 1.5.1).
- Relieve the chain from tension (see Chapter 1.5.5).
- Sling the apron over the chain locks to a hoisting gear (approx. weight 128 kg) and secure against movement.
- Use a hoisting gear to secure the lower chain strands in the area of chain locks to be opened against falling down

**WARNING**

**WARNING, DANGER OF SQUEEZING INJURIES**

**Utmost care is required when suspending or threading-in auxiliary tools for lifting of loads (chains, lifting belts, ropes). Note the risk of squeezing-off limbs.**

- Open the chain locks by taking out the apron bolts and remove the apron.

**DANGER**

**CAUTION, SUSPENDED LOADS!**

**Persons are not permitted to stay or work under suspended loads. Every movement must be continuously monitored by several persons. The operator and monitoring personnel must always remain in contact.**

- Let down the lower chain strands and fix them in their position.
- Use a hoisting gear to lift carefully the upper chain strands and fix them in their position.
- Secure the driving shaft (approx. weight 1734 kg) by means of a hoisting gear.

**WARNING**

**WARNING, DANGER OF SQUEEZING INJURIES**

**Utmost care is required when suspending or threading-in auxiliary tools for lifting of loads (chains, lifting belts, ropes). Note the risk of squeezing-off limbs.**

- Unscrew the bearing bolts and lift out the drive shaft by means of a hoisting gear.

**DANGER**

**CAUTION, SUSPENDED LOADS!**

**Persons are not permitted to stay or work under suspended loads. Every movement must be continuously monitored by several persons. The operator and monitoring personnel must always remain in contact.**

- Bring the components to the repair site for further disassembly.
  - Pull off the bearing with auxiliary device.
  - Dismount the drive sprockets by loosening the taper key.
- Re-assembly of the components is performed in the reversed order under observance of following instructions:
  - Note the tightening torque of the bearing bolts M36 =2100 Nm
  - Re-installation of the aprons.
  - Tension the chain (see Chapter 1.5.4).

### 1.5.3 Replacement of Chain Strands

NOTE

**For documentation of the chain strands see Manual 7, Register 7.1.2.**

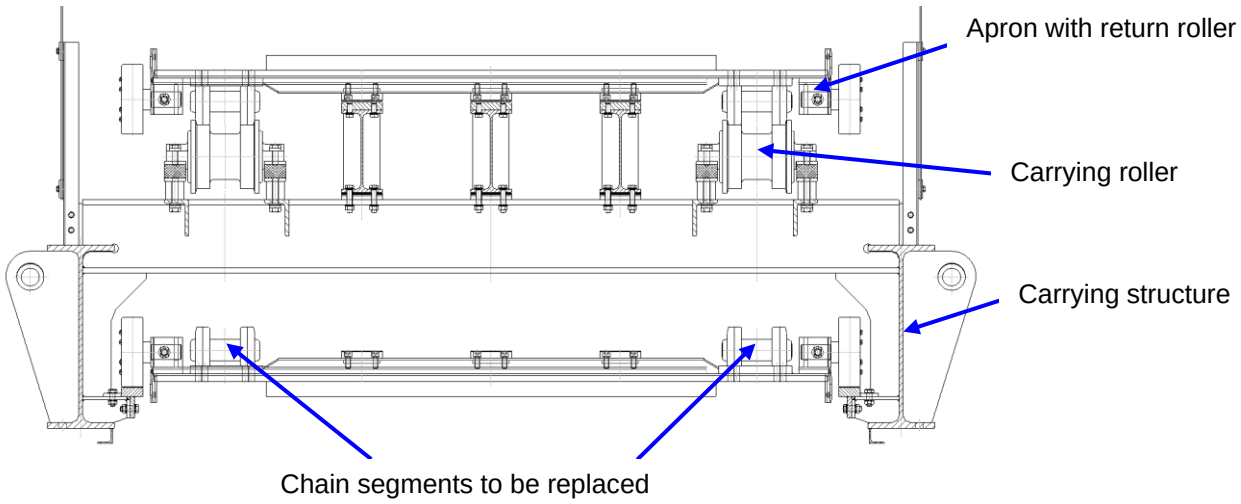
DANGER

**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the apron feeder, the adjacent spillage conveyor and the impact crusher in a way preventing the machine from any undesired movements.**

NOTE

**Each of the two chains of the apron feeder consists of two chain segments which are linked by chain locks. The following instruction describes the procedure of replacing two of the chain segments running side by side.**



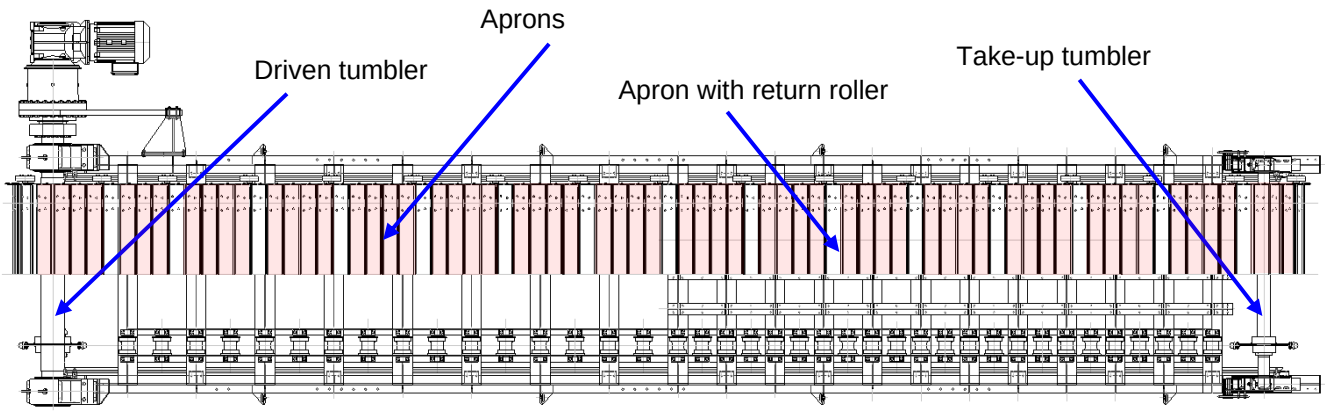

- Suspend protective guard of the take-up tumbler to a suitable hoisting gear and secure it. When selecting the chain hoists and slinging equipment, take account of the protective guard weight (180 kg).
- Dismount protective guard, lift it by means of the hoisting gear and put down safely on the ground.

DANGER

**CAUTION, SUSPENDED LOADS!**

**Persons are not permitted to stay or work under suspended loads. Every movement must be continuously monitored by several persons. The operator and monitoring personnel must always remain in contact.**

- Dismantle aprons except aprons with return rollers and aprons with chain locks.




- Move gradually the apron feeder as long as one apron with the chain link is positioned frontally at the reversal point of the chain at the take-up tumbler. The chain segments to be replaced are located in the lower run.
- Isolate the drive unit from power supply and secure it against unintended start-up.
- Use a hoisting gear to secure the lower run chain strand next to the chain lock to be opened.

**WARNING**

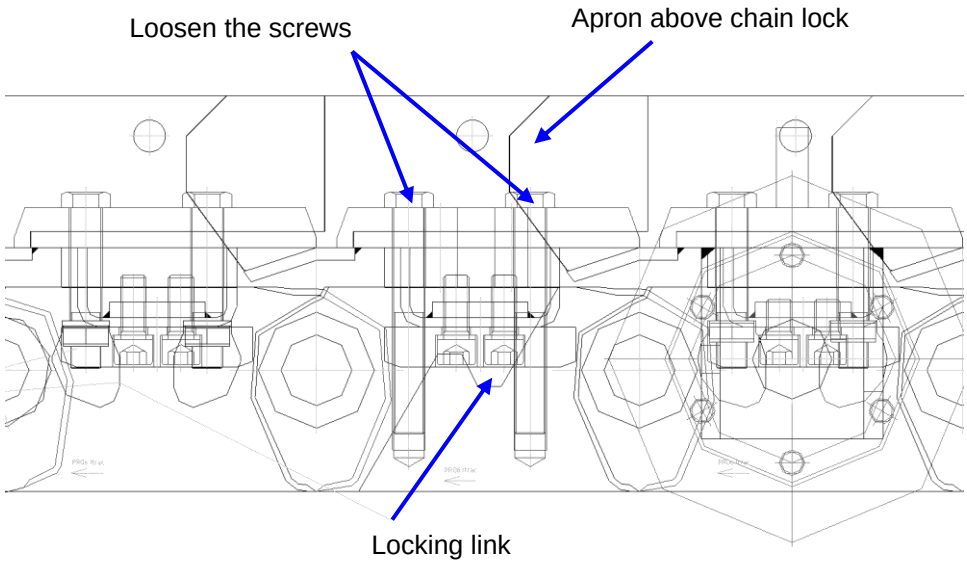
**WARNING, DANGER OF SQUEEZING INJURIES**

**Opening and closing of the chain must be performed by an authorized specialist company.**

- Relieve the chain from tension (see Chapter 1.5.5).

**NOTE**

**Prior to chain opening, it is necessary to fix the take-up tumbler in its position. For this purpose, tighten again the fastening screws between the bearing block of the take-up tumbler and the carrying frame.**




- Open the chain by undoing the screwed connection of the apron above the chain lock (weight 128 kg) and put down carefully the lower chain strand (lower run).
- Repeat this procedure with the other chain.
- Fasten the new chain strands to the ends of the old chains in the upper run.

**WARNING**

**WARNING, DANGER OF SQUEEZING INJURIES**

**Utmost care is required when suspending or threading-in auxiliary tools for lifting of loads (chains, lifting belts, ropes). Note the risk of squeezing-off limbs.**

**HINWEIS**

**Position the chain strands in a way so that plugs in the chain bolts face outwards.**

- Sling the old chains (single mass 1200 kg) in the lower run to the hoisting gear.

- Move gradually the apron feeder in the conveying direction. In order to avoid damages of the carrying frame, the chain segments should run in the lower run over a beam (e.g., wooden beam) positioned at the take-up tumbler and be carefully pulled out by means of a hoisting gear.

**DANGER**

**CAUTION, SUSPENDED LOADS!**

**Persons are not permitted to stay or work under suspended loads. Every movement must be continuously monitored by several persons. The operator and monitoring personnel must always remain in contact.**

- Dismount step-by-step the aprons with return rollers from the lower chain strand (lower run) and fasten them on the new chain strand in the upper run.
- After the end position of the new chain strands has been reached, detach the old chain segments from the new ones at the chain lock.
- Bring the both chain strands in the upper and lower run together at the reversal point of the chain at the take-up tumbler using rope hoists and connect them with each other in the chain lock.
- After the new chain strands have been installed, it is possible to mount aprons (128 kg and 147 kg).
- Re-install protective guard of the take-up tumbler.
- Loosen the screwed connection between the bearing block of the take-up tumbler and the carrying frame.
- Tension the chain (see Chapter 1.5.4).

**DANGER**

**When the conveyor moves, no persons shall be present on or in the apron feeder. Note the higher risk of injuries.**

## 1.5.4 Setting Chain Pre-tension

**NOTE**

**For information regarding chain tensioning refer to drawing no. 09136447.**

**NOTE**

**For documentation of the tensioning device see Manual 7, Register 7.1.3.**

**DANGER**

**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the apron feeder, the adjacent spillage conveyor and the impact crusher in a way preventing the machine from any undesired movements.**

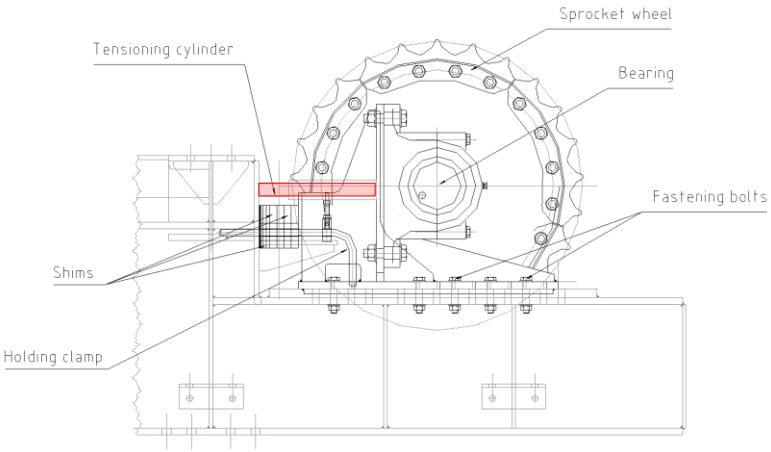
**IMPORTANT**

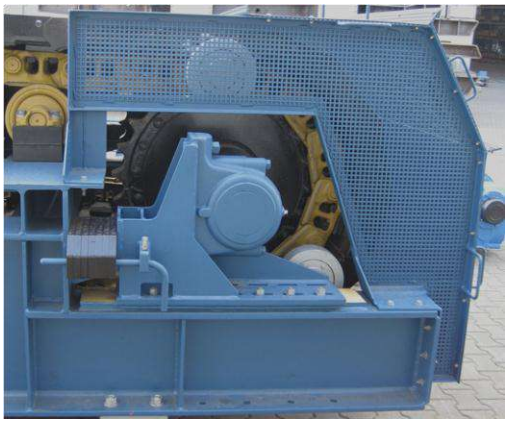
**The tension of the apron chains can be adjusted by the take-up sprocket wheels stepwise.**

**This tension adjustment is effected by hydraulic cylinders.**

**The maximum admissible tension force on each side is 100 kN.**

➢ Arrange the hydraulic cylinders in level of the bearing axis as shown in the drawing and pre-stress them slightly.



- Loosen the fastening bolts between take-up sprocket wheels and carrying frame (do not remove the fastening bolts).
- Before loosening the fastening bolts make sure that the tensioning cylinders provide sufficient initial tension in order to avoid jamming of the fastening bolts.
- Re-adjust as well the fastening bolts between take-up sprocket wheels and carrying frame.
- Shift the take-up sprocket wheel until the desired position is reached. Make sure that the take-up sprocket is shifted evenly and simultaneously on both sides in order to avoid jamming and tripping from the guide arrangement.
- Add or remove shim plates and secure them by means of holding clamps.
- Bolt together take-up sprocket wheels and supporting frame.
- Remove the hydraulic cylinders.
- Perform test operation of the apron feeder without conveyed material.

### 1.5.5 Relieving the Chain from Tension

**NOTE**

**For documentation of the tensioning device see Manual 7, Register 7.1.3.**

**DANGER**

**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the apron feeder, the adjacent spillage conveyor and the impact crusher in a way preventing the machine from any undesired movements.**

**The chain can be relieved from tension by means of two hydraulic cylinders as follows:**

- Position the tensioning cylinders in level of the bearing axis.
- Pre-stress slightly the tensioning cylinders.
- Loosen the fastening bolts between bearing block and carrying frame (do not take remove the screws).
- Before loosening the fastening bolts make sure that the tensioning cylinders provide sufficient initial tension in order to avoid jamming of the fastening bolts.
- If necessary, adjust the fastening screws between bearing block and carrying frame.
- Remove the shim plates.
- In order to fix the take-up tumbler tighten again the fastening screws between bearing block and carrying frame.
- Relieve the tensioning cylinders from tension and remove them.

### 1.5.6 Replacement of Gear Rim Segments

**DANGER**

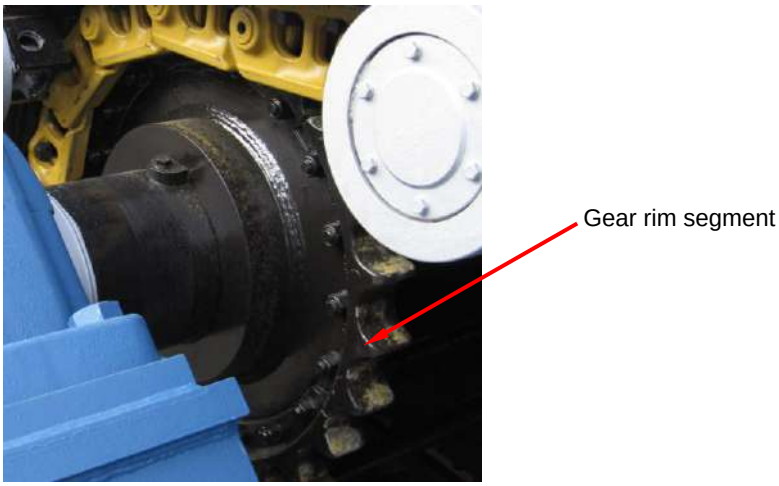
**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the apron feeder, the adjacent spillage conveyor and the impact crusher in a way preventing the machine from any undesired movements.**

**NOTE**

**Replacement of gear rim segments is performed at the take-up tumbler or at the driven tumbler.**

- Remove protective gratings (on the left and right side)
- If necessary, remove protective hood of the take-up tumbler, note the protective hood weight (180 kg).
- Move the gear rim segment to be replaced so that it is not in engagement with the chain.




- Isolate the drive unit of apron feeder from power supply and secure it against unintended start-up.

**WARNING**

**WARNING, DANGER OF SQUEEZING INJURIES**

**Work may only be started after power cutoff. Otherwise there is a danger of squeezing-off limbs.**

- Sling the apron strands to a hoisting gear and secure against movement.
- Undo the bolted connections between the gear rim segment and sprocket wheel.

➢ Pull out the gear rim segment (approx. 11 kg) to the side and put it safely down.

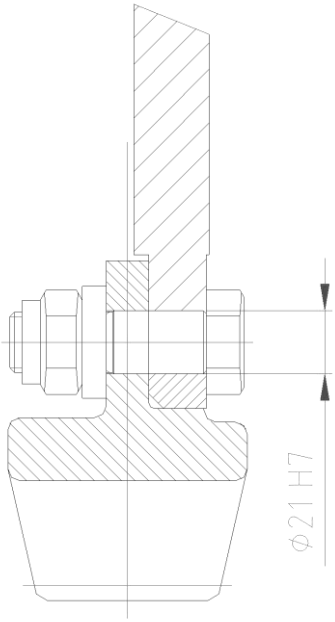
**DANGER**

**CAUTION, SUSPENDED LOADS!**

**Persons are not permitted to stay or work under suspended loads. Every movement must be continuously monitored by several persons. The operator and monitoring personnel must always remain in contact.**

➢ Re-assembly of the components is performed in the reversed order under observance of following instructions:

– Ream the new gear rim segment in installed condition together with the chain wheel bore to Ø21 H7 (see sketch).




**IMPORTANT**

**New screw connections must be used for the reassembly of the tooth segments!**

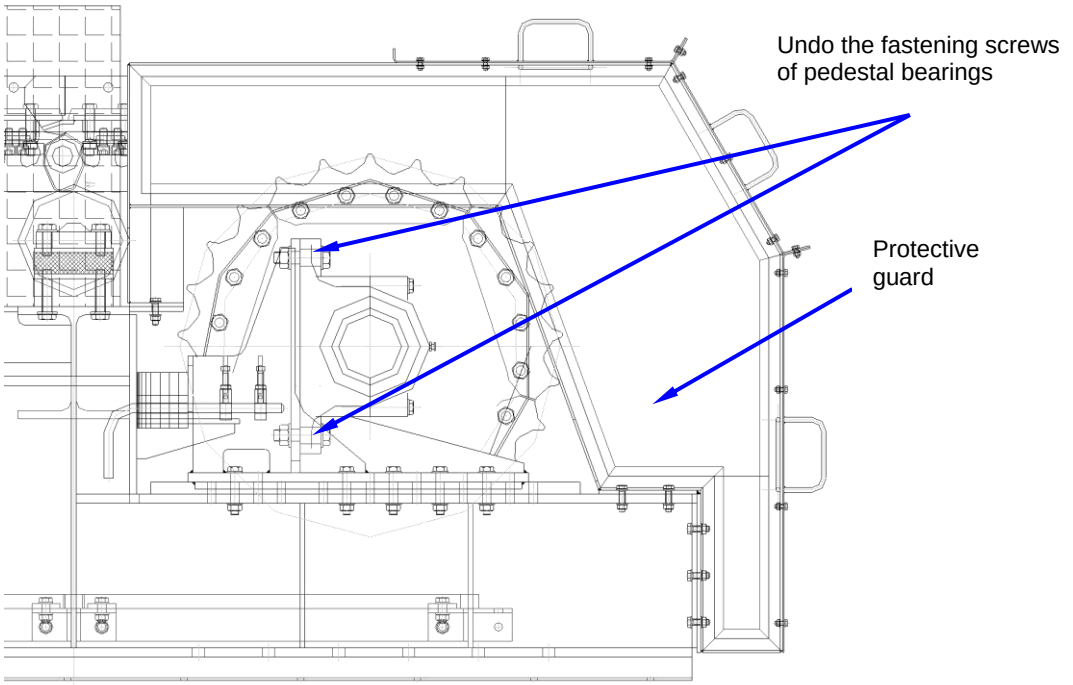
**Tighten the fixing bolts M20x65 of the tooth segments with the prescribed torque of 165 Nm and lock the nuts by locknuts!**

## 1.5.7 Removal of Take-up Tumbler Shaft

**DANGER**

**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the apron feeder, the adjacent spillage conveyor and the impact crusher in a way preventing the machine from any undesired movements.**




- Remove protective guard taking into consideration the weight of the protective guard (180 kg).
- Move the apron feeder as far as one of the two aprons with the chain lock is positioned at the reversal point of the chain at the take-up sprocket.
- Isolate the drive unit from power supply and secure it against unintended start-up.

**WARNING**

**<u>WARNING, DANGER OF SQUEEZING INJURIES</u>**

**Work may only be started after power cutoff. Otherwise there is a danger of squeezing-off limbs.**

- Completely relieve the chain from tension (see Chapter 1.5.5).
- Sling the apron above the chain locks to a hoisting gear (approx. weight 128 kg).
- Use a hoisting gear to secure the lower chain strands in the area of chain locks to be opened against falling down

**WARNING**

**WARNING, DANGER OF SQUEEZING INJURIES**

**Utmost care is required when suspending or threading-in auxiliary tools for lifting of loads (chains, lifting belts, ropes). Note the risk of squeezing-off limbs.**

- Open the chain locks by unscrewing the apron bolt connections, remove the apron.
- Put the lower chain strands (lower run) down on the ground.
- Use a hoisting gear to lift the upper chain strands (upper run) from the wheel sprockets and secure them against moving.
- Secure the take-up shaft with sprocket wheels including gear rims (total mass approx. 1095 kg) by means of a hoisting gear.
- Loosen fastening screws of pedestal bearings and use a hoisting gear to lift out and lower the take-up shaft.

**DANGER**

**CAUTION, SUSPENDED LOADS!**

**Persons are not permitted to stay or work under suspended loads. Every movement must be continuously monitored by several persons. The operator and monitoring personnel must always remain in contact.**

- Bring the components to the repair site.
- Re-assembly is performed in the reversed order under observance of following instructions:
  - Note the tightening torque of the pedestal bearing bolts
  - Re-installation of the aprons.
  - Tension the chain (see Chapter 1.5.4)

## 1.5.8 Replacement of Feeder Aprons

NOTE

**For information regarding apron replacing refer to drawing no. 09255162.**

DANGER

**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the apron feeder, the adjacent spillage conveyor and the impact crusher in a way preventing the machine from any undesired movements.**

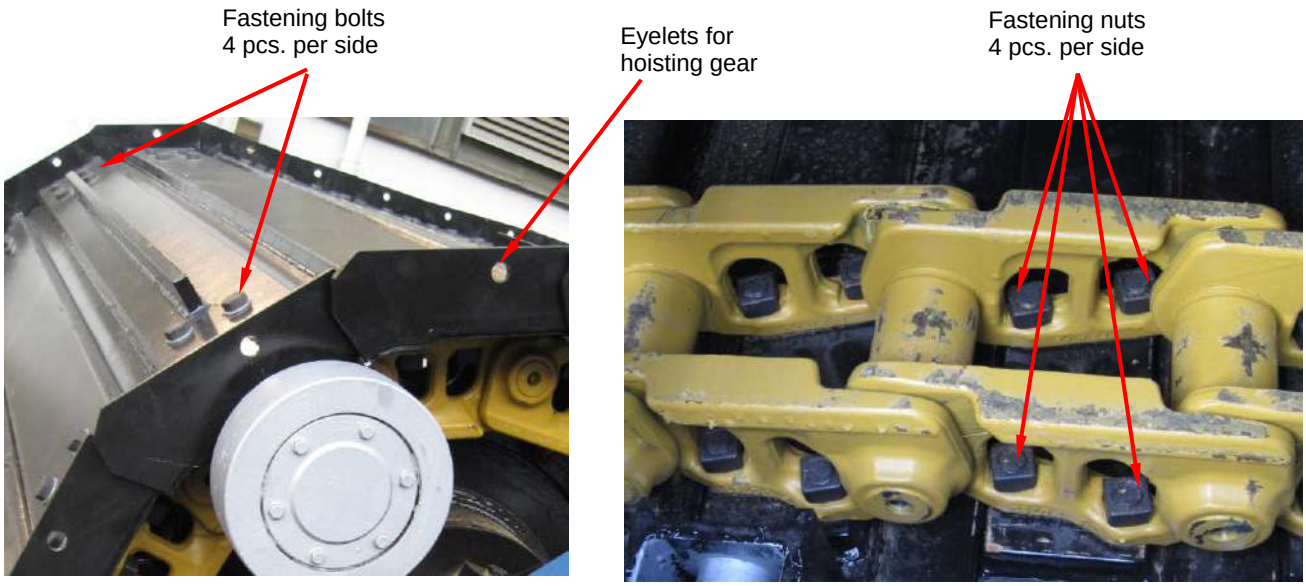
IMPORTANT

**Replacement of feeder aprons is possible only directly on the drive or take-up tumbler in curved condition of the chain.**

**It is recommended to carry out replacement of aprons on the take-up tumbler to avoid disassembly of the discharge box.**

**When the discharge box is removed, replacement is also possible on the drive tumbler.**

- Move the apron feeder as far as the apron to be replaced is positioned at the vertex of the take-up sprocket.
- Isolate the drive unit from power supply and secure it against unintended start-up.
- Sling the apron to a hoisting gear (weight approx. 128 or 147 kg), undo the fastening bolts and take out the apron.



**DANGER**

**CAUTION, SUSPENDED LOADS!**

**Persons are not permitted to stay or work under suspended loads. Every movement must be continuously monitored by several persons. The operator and monitoring personnel must always remain in contact.**

- Install the new apron as follows:
  - Apply graphite lubricant to the bolt thread and to the lower side of head.
  - Screw on the self-locking chain nuts so that the rounded edges are facing the chain member.
  - Tighten the bolts (3/4"-16x99) with the specified torque of 320 ±40 Nm.
  - Re-tighten each bolt with another half a turn.

**IMPORTANT**

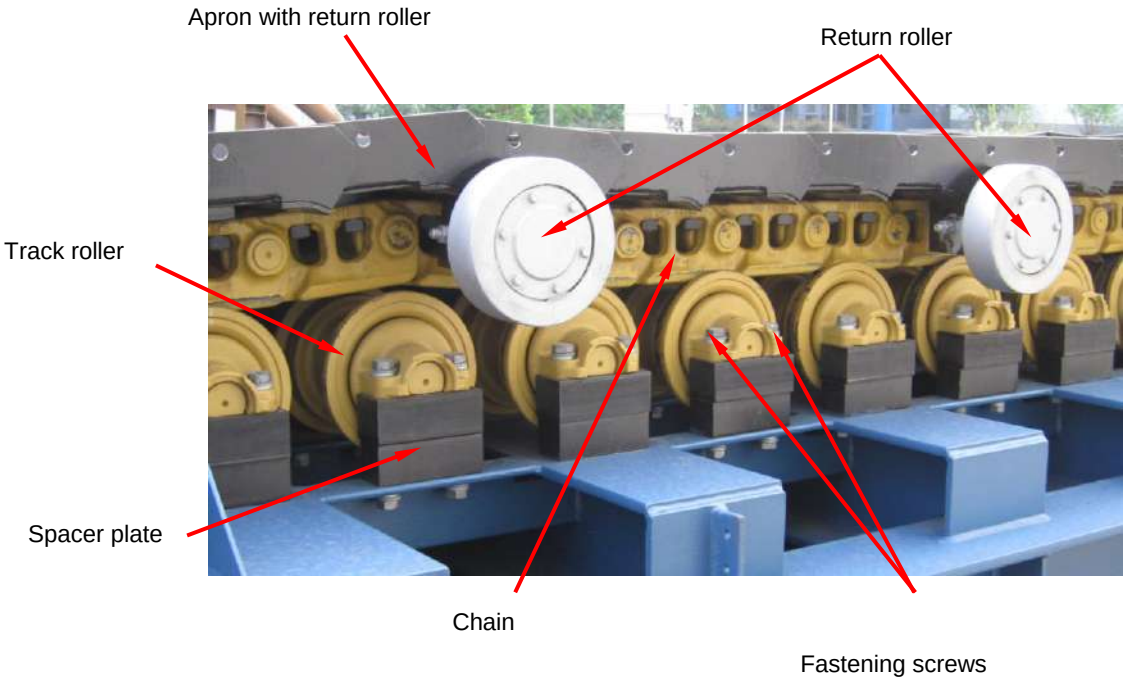
**Tightening torque of the aprons must be documented during assembly.**

### 1.5.9 Replacement of Track Rollers

**DANGER**

**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the apron feeder, the adjacent spillage conveyor and the impact crusher in a way preventing the machine from any undesired movements.**




- Dismantle protective guards
- Remove aprons between two aprons with return rollers
- Move gradually the apron feeder as far as this assembly opening is positioned in the upper run above the track roller to be replaced.
- Isolate the drive unit from power supply and secure it against unintended start-up.

**WARNING**

**WARNING, DANGER OF SQUEEZING INJURIES**

**Work may only be started after power cutoff. Otherwise there is a danger of squeezing-off limbs.**

- Relieve the chain from tension (see Chapter 1.5.5).

- Sling the chain strand in the work area to a hoisting gear and lift it until the track roller is free.

**WARNING**

**WARNING, DANGER OF SQUEEZING INJURIES**

**Utmost care is required when suspending or threading-in auxiliary tools for lifting of loads (chains, lifting belts, ropes). Note the risk of squeezing-off limbs.**

- Support the chain by means of suitable devices and secure it in its position.
- Loosen fastening screws of the track roller.
- Sling the track roller (approx. 51 kg) to a hoisting gear.
- Loosen fastening screws of the spacer plates.
- Lift the track roller to some 2-3 mm.
- Draw out the spacer plates.
- Use the hoisting gear to pull out the track roller and lower it to the ground.

**DANGER**

**CAUTION, SUSPENDED LOADS!**

**Persons are not permitted to stay or work under suspended loads. Every movement must be continuously monitored by several persons. The operator and monitoring personnel must always remain in contact.**

- Re-assembly is performed in the reversed order under observance of following instructions:
  - Make sure to observe the torques for tightening of fixing parts.

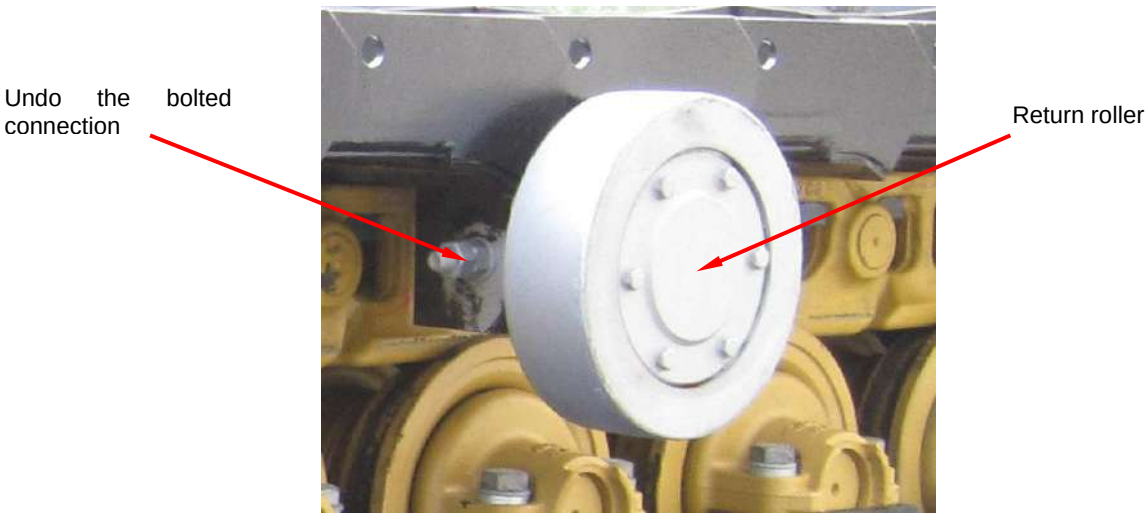
## 1.5.10 Replacement of Return Rollers

**DANGER**

**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the apron feeder, the adjacent spillage conveyor and the impact crusher in a way preventing the machine from any undesired movements.**

- Dismantle protective guards
- Move the return roller to be replaced in the upper run.
- Isolate the drive unit from power supply and secure it against unintended start-up.




- Undo the bolted connection and pull out the return roller (approx. weight 24 kg) to the side.
- Re-assembly is performed in the reversed order under observance of following instructions:

– Make sure to observe the torques for tightening of the bolted connection.

## 1.5.11 Replacement of Wear Plates

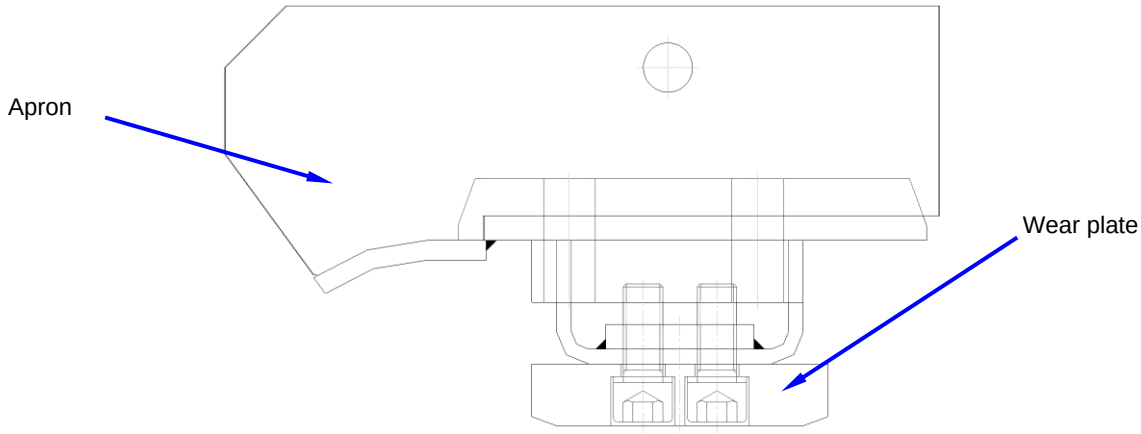
**DANGER**

**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the apron feeder, the adjacent spillage conveyor and the impact crusher in a way preventing the machine from any undesired movements.**

### 1.5.11.1 Replacement of apron wear plates

- Move the apron with defective wear plate out of the feeding zone and position it so that the bolted connection of the wear plate and apron gets accessible between track rollers.
- Isolate the drive unit from power supply and secure it against unintended start-up.




- Undo the bolted connection and take out the wear plate to the side.
- Re-assembly is performed in the reversed order under observance of following instructions:

– Make sure to observe the torques for tightening of wear plates.

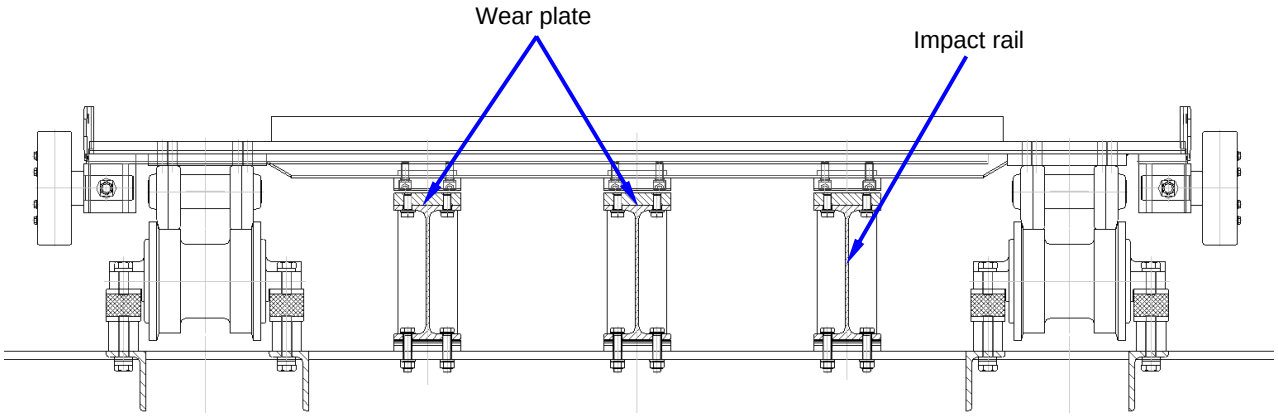
### 1.5.11.2 Replacement of wear plates of impact segments

- Dismantle the protective hood (180 kg) of the take-up tumbler as well as protective grating and lower them to the ground.

**DANGER**

**CAUTION, SUSPENDED LOADS!**

**Persons are not permitted to stay or work under suspended loads. Every movement must be continuously monitored by several persons. The operator and monitoring personnel must always remain in contact.**




- Remove various aprons according to the length of wear plates to be replaced.
- Move this opening in the upper run so that it is positioned above the wear plates to be replaced.
- Isolate the drive unit from power supply and secure it against unintended start-up.
- Undo the fastening screws of the wear plates at the impact rail segment.
- Remove the wear plates.
- Re-assembly is performed in the reversed order under observance of following instructions:
  - Make sure to observe the torques for tightening the screws.

## 1.6 Spillage Conveyor KGF 2490x15,1

### 1.6.1 Replacement of Drive Unit

NOTE

**For documentation of the geared motor see Manual 7, Register 7.2.**

DANGER

DANGER

**POTENTIAL HAZARDS CAUSED BY ELECTRIC POWER**

**POTENTIAL RISK OF AUTOMATIC OR UNINTENDED START OF MACHINE**

**Only qualified electricians should carry out work on the power supply system.**

**Make sure that machine and plant equipment subject to compulsory inspections, repair and maintenance work are isolated from power before such work is carried out. To be sure, check the isolated equipment items if they are still under voltage. Earth and short-circuit them and isolate other equipment in the vicinity from power supply.**

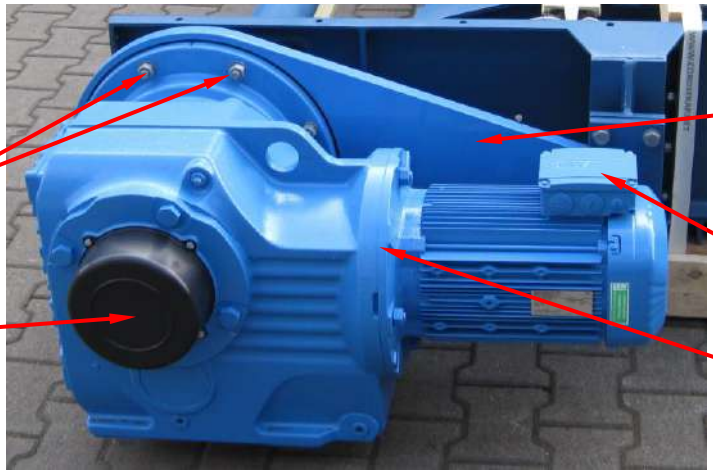
**Prior to all repair and erection work, the equipment and its components should be isolated from power supply so that drives cannot be started by mistake while repair work is carried out.**

**All cable connections of components to be replaced must be disconnected. After reassembly, cable connections must be made again!**

DANGER

**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the spillage conveyor, the adjacent apron feeder and the impact crusher in a way preventing the machine from any undesired movements.**



- Prior to disassembly, make sure that the drive unit is switched off and secured against unintended start-up.
- Disconnect all cables of the drive unit.
- Sling the drive unit to a suitable hoisting gear (approx. weight is 320 kg) and secure it against tilting over.

**WARNING**

**WARNING, DANGER OF SQUEEZING INJURIES**

**Utmost care is required when suspending or threading-in auxiliary tools for lifting of loads (chains, lifting belts, ropes). Note the risk of squeezing-off limbs.**

- Remove the cover cap of the shrink disc
- Loosen the locking screws of the shrink disc evenly and one after the other (see Operating Instructions for the Gear Unit).
- Undo the fasteners of the torque support.
- Undo the screwed connections between the gear flange and geared motor
- Pull off carefully the geared motor and pull off the shrink disc (see Operating Instructions for the Gear Unit).
- Lift the drive unit and put it down on the ground.

**DANGER**

**CAUTION, SUSPENDED LOADS!**

**Persons are not permitted to stay or work under suspended loads. Every movement must be continuously monitored by several persons. The operator and monitoring personnel must always remain in contact.**

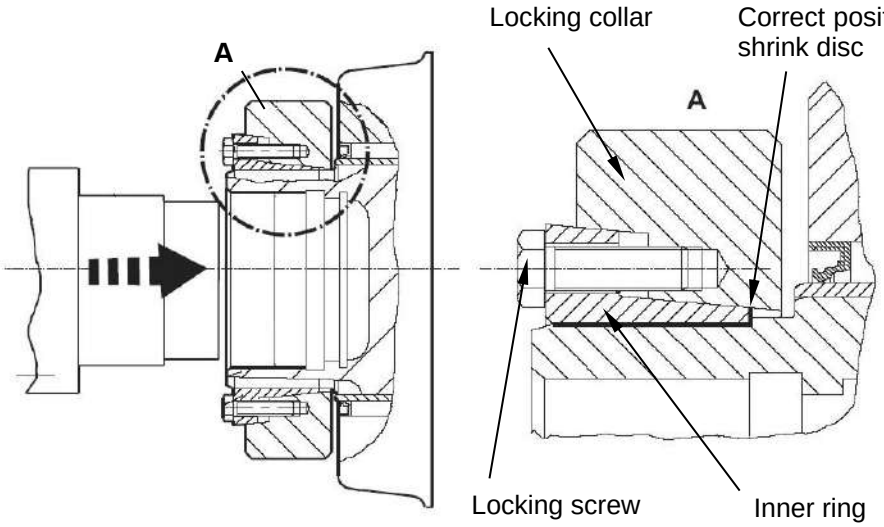
- Bring the components to the repair site for further disassembly.
- Re-assemble the unit in reversed order under observance of following instructions:

– The torque for tightening of tensioning bolts is 59 Nm.

**IMPORTANT**

**During re-assembly of the geared unit note the installation instructions for the shrink disc (see Assembly and Operating Instructions for the gear unit, chapter 4.7, type KHF107) and the cover cap of the shrink disc must be re-installed as well!**

- Restore all electrical connections.




**IMPORTANT**

**After reassembly inspect the gear unit oil level in accordance with the lubrication schedule. Add oil if needed.**

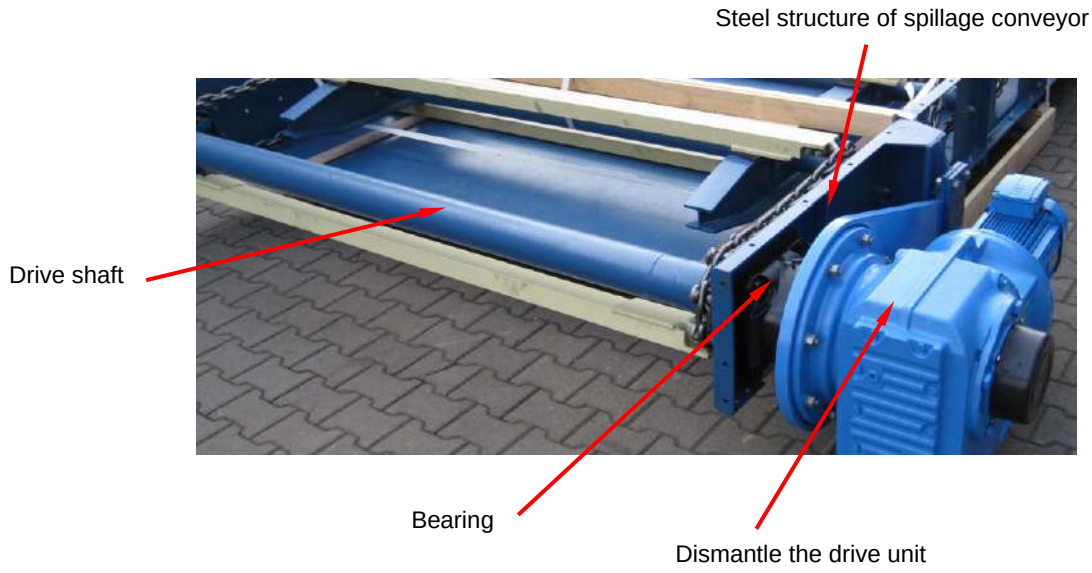
## 1.6.2 Replacement of Drive Shaft with Sprocket Wheels

**DANGER**

**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the spillage conveyor, the adjacent apron feeder and the impact crusher in a way preventing the machine from any undesired movements.**

- Prior to disassembly, make sure that the drive unit is switched off and secured against unintended start-up.
- Dismantle the drive unit of spillage conveyor before taking out the drive shaft (see Chapter 1.6.1).




- Relieve the conveying chains from tension (see Chapter 1.6.6).
- Remove the cover of bearing.
- Secure the drive shaft (approx. 333 kg) by means of a hoisting gear (e.g. a chain hoisting tackle)

**WARNING**

**WARNING, DANGER OF SQUEEZING INJURIES**

**Utmost care is required when suspending or threading-in auxiliary tools for lifting of loads (chains, lifting belts, ropes). Note the risk of squeezing-off limbs.**

- Use the hoisting gear to lift out the drive shaft and to thread it out of the chain. If necessary, open the chains at the sprocket wheels.

**DANGER**

**CAUTION, SUSPENDED LOADS!**

**Persons are not permitted to stay or work under suspended loads. Every movement must be continuously monitored by several persons. The operator and monitoring personnel must always remain in contact.**

- Bring the components to the repair site for further disassembly.
- Re-assemble the unit in reversed order under observance of following instructions:
  - Installation of drive unit (see Operating Instructions for geared motor).
  - Tensioning of chains after completion of all work (see Chapter 1.6.6).

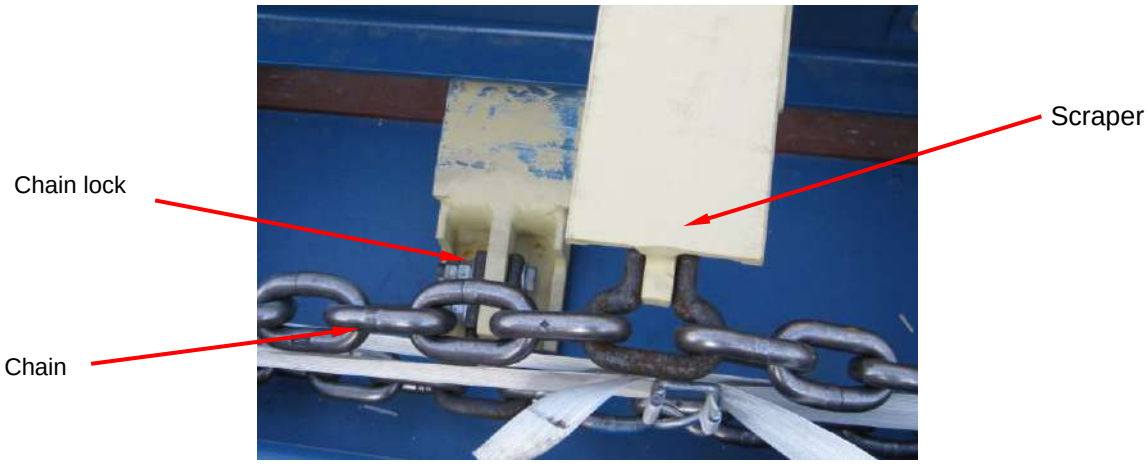
### 1.6.3 Taking out Chain Segment / Scraper

**DANGER**

**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the spillage conveyor, the adjacent apron feeder and the impact crusher in a way preventing the machine from any undesired movements.**

- Prior to disassembly, move the chain so that the chain segment to be replaced is positioned in the upper run.
- Switch off the drive unit and secure it against unintended start-up.




- Relieve the conveying chains from tension (see Chapter 1.6.6)
- Clamp the chains to the left and right of the segment to be replaced.
- Secure the scraper (weight approx. 33 kg) against falling down.

**WARNING**

**WARNING, DANGER OF SQUEEZING INJURIES**

**Utmost care is required when suspending or threading-in auxiliary tools for lifting of loads (chains, lifting belts, ropes). Note the risk of squeezing-off limbs.**

- Remove fastening bolts on the chain locks.
- After that, the scraper to be replaced or the chain segment (the chain lock on the opposite end of the segment to be replaced must also be opened) can be taken out.
- Re-assemble the unit in reversed order under observance of following instructions:
  - Tensioning of chains after completion of all work (see Chapter 1.6.6).

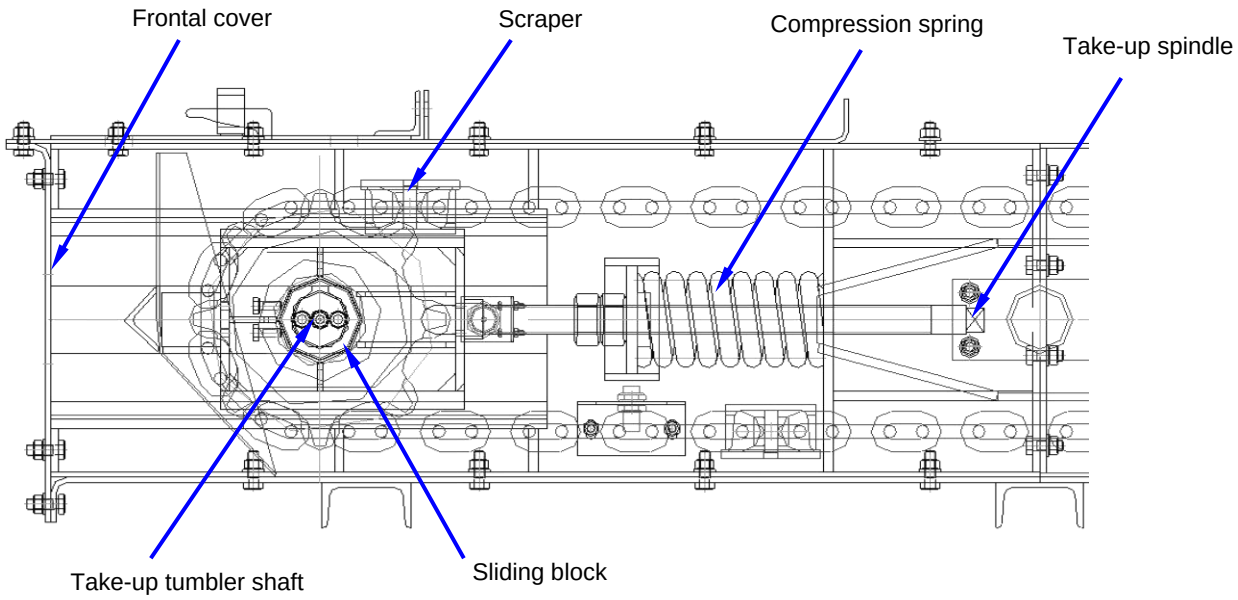
### 1.6.4 Replacement of Take-up Tumbler Shaft with Sprocket Wheels

**DANGER**

**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the spillage conveyor, the adjacent apron feeder and the impact crusher in a way preventing the machine from any undesired movements.**

- Remove the cover of the take-up station.
- Advance the conveyor chain in a way so that the chain disconnection point (scraper bow at the scraper beam) is positioned frontally at the take-up tumbler.
- Switch off the drive unit and secure it against unintended start-up.




- Sling the frontal cover of the steel structure to a hoisting gear and remove it.

**DANGER**

**CAUTION, SUSPENDED LOADS!**

**Persons are not permitted to stay or work under suspended loads. Every movement must be continuously monitored by several persons. The operator and monitoring personnel must always remain in contact.**

- Relieve the conveying chains from tension (see Chapter 1.6.6).
- Secure the chain strands on the both sides of scraper bow in their position.

- Secure the scraper against falling down (weight approx. 33 kg).

**WARNING**

**WARNING, DANGER OF SQUEEZING INJURIES**

**Utmost care is required when suspending or threading-in auxiliary tools for lifting of loads (chains, lifting belts, ropes). Note the risk of squeezing-off limbs.**

- Open the chain by undoing the screwed connections on the both sides of scraper bow and put it safely down.
- Use a suitable hoisting gear to fix the tensioning shaft (approx. weight: 145 kg).

**WARNING**

**WARNING, DANGER OF SQUEEZING INJURIES**

**Utmost care is required when suspending or threading-in auxiliary tools for lifting of loads (chains, lifting belts, ropes). Note the risk of squeezing-off limbs.**

- After removing the tensioning spindle from the tensioning-shaft bearing, the tensioning shaft with sliding blocks can be pushed towards the frontal side and removed from the steel structure.

**DANGER**

**CAUTION, SUSPENDED LOADS!**

**Persons are not permitted to stay or work under suspended loads. Every movement must be continuously monitored by several persons. The operator and monitoring personnel must always remain in contact.**

- Bring the components to the repair site for further disassembly.
- Re-assemble the unit in reversed order under observance of following instructions:
  - Install all front-side covers.
  - Establish the connection between the tensioning shaft bearing and the tensioning spindle.
  - Close the chain and tension it after completion of all work (see Chapter 1.6.6).

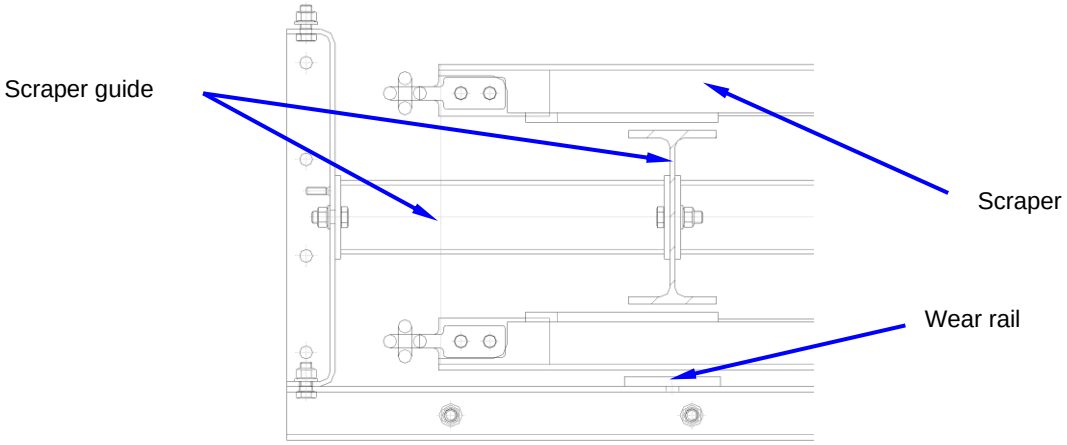
### 1.6.5 Replacement of Wear Rails

**DANGER**

**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the spillage conveyor, the adjacent apron feeder and the impact crusher in a way preventing the machine from any undesired movements.**

- Prior to disassembly, switch off the drive unit and secure it against unintended start-up.




- Relieve the conveying chains (see Chapter 1.6.6).
- Lift the scrapers and conveying chains in the zone of wear rails and scraper guide to be replaced by use of a suitable lifting device or by placing backing plates under the scrapers.

**WARNING**

**WARNING, DANGER OF SQUEEZING INJURIES**

**Utmost care is required when suspending or threading-in auxiliary tools for lifting of loads (chains, lifting belts, ropes). Note the risk of squeezing-off limbs.**

- Once the fasteners are removed, the scraper guide and the wear rail may be taken out.
- Re-assemble the unit in reversed order under observance of following instructions:
  - Install the wear rails.
  - Install the scraper guide.
  - Once the work is completed, tension the chain (see Chapter 1.6.6).

### 1.6.6 Tensioning the Chain

**DANGER**

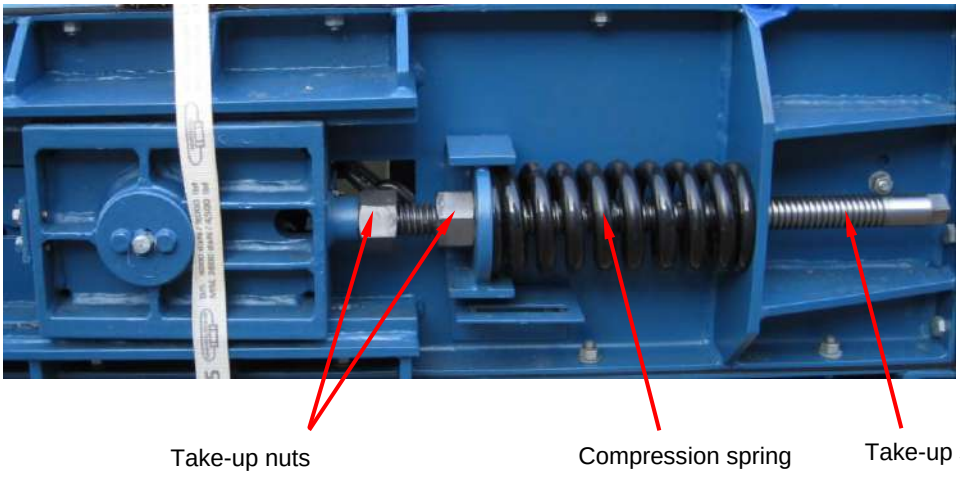
**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the spillage conveyor, the adjacent apron feeder and the impact crusher in a way preventing the machine from any undesired movements.**

- Tensioning of the chain and releasing of the tension is performed via take-up nuts at the take-up spindles.

**IMPORTANT**

**Tensioning and releasing of the tension must be carried out evenly on both tensioning bearings in order to avoid jamming.**




- After the lock nuts of the take-up spindle have been loosened, the take-up tumbler can be shifted by means of the tensioning screw.
- The correct chain tension force is reached if the determined distance dimension between compression spring and take-up frame is set (spring tension = 207 mm).
- Lock the lock nuts.
- Test operation of the equipment without conveyed material.

## 1.7 Impact Crusher PB 1822 PP

### 1.7.1 Replacement of Drive Unit

NOTE

**For documentation of the drive unit see Manual 7, Register 7.3.1.**

DANGER

DANGER

**POTENTIAL HAZARDS CAUSED BY ELECTRIC POWER**

**POTENTIAL RISK OF AUTOMATIC OR UNINTENDED START OF MACHINE**

**Only qualified electricians should carry out work on the power supply system.**

**Make sure that machine and plant equipment subject to compulsory inspections, repair and maintenance work are isolated from power before such work is carried out. To be sure, check the isolated equipment items if they are still under voltage. Earth and short-circuit them and isolate other equipment in the vicinity from power supply.**

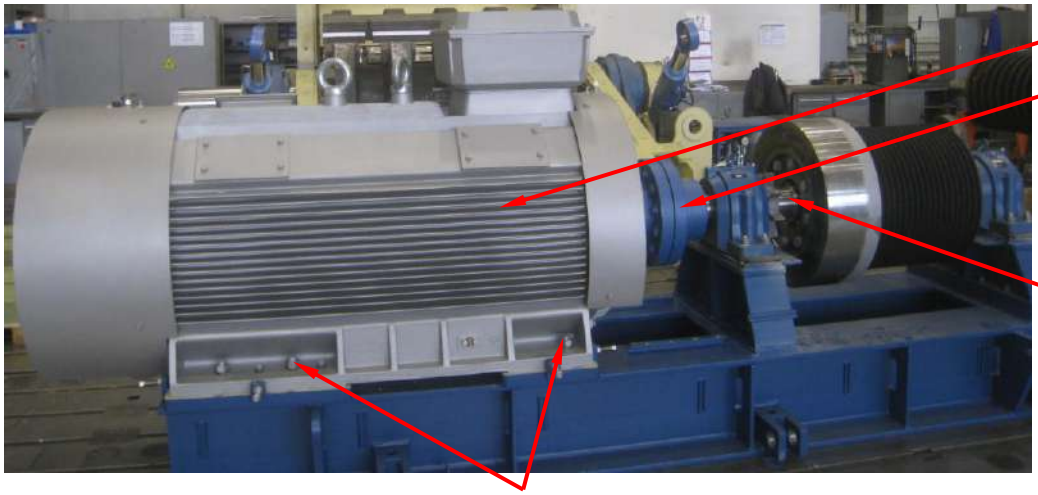
**Prior to all repair and erection work, the equipment and its components should be isolated from power supply so that drives cannot be started by mistake while repair work is carried out.**

**All cable connections of components to be replaced must be disconnected. After reassembly, cable connections must be made again!**

DANGER

**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the impact crusher, the adjacent apron feeder and the spillage conveyor in a way preventing the machine from any undesired movements.**



- Prior to disassembly, make sure that the drive unit is switched off and secured against unintended start-up.
- Remove all cable connections from the drive unit.
- Disassemble the motor (note the instructions of manufacturer!):
  - Suspend the motor (approx. weight 6400 kg) on a suitable hoisting gear.

**WARNING**

**WARNING, DANGER OF SQUEEZING INJURIES**

**Utmost care is required when suspending or threading-in auxiliary tools for lifting of loads (chains, lifting belts, ropes). Note the risk of squeezing-off limbs.**

  - Detach the coupling so that the motor is free.
  - Undo the fastening bolts to the supporting structure.
  - Lift the drive unit and put it safely down on the ground.

**DANGER**

**CAUTION, SUSPENDED LOADS!**

**Persons are not permitted to stay or work under suspended loads. Every movement must be continuously monitored by several persons. The operator and monitoring personnel must always remain in contact.**

- Disassemble the coupling.
  - Sling the coupling (weight 520 kg) to a suitable hoisting gear.
  - Remove the coupling from the V-belt pulley shaft.
- Bring the components to the repair site for further disassembly.
- Re-assemble the unit in reversed order under observance of following instructions:
  - Note the tightening torques.
  - Restore all electrical connections.

## 1.7.2 Opening the Crusher Housing

NOTE

**For documentation of the hydraulic equipment see Manual 7, Register 7.3.3.**

NOTE

**The rear part of the housing may be hydraulically slewed back so that the interior space of crusher can be inspected and the blow bars can be replaced. When the rear part of the housing is slewed back, the distance between the flanges is about 2039 mm.**

DANGER

**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the impact crusher, the adjacent apron feeder and the spillage conveyor in a way preventing the machine from any undesired movements.**

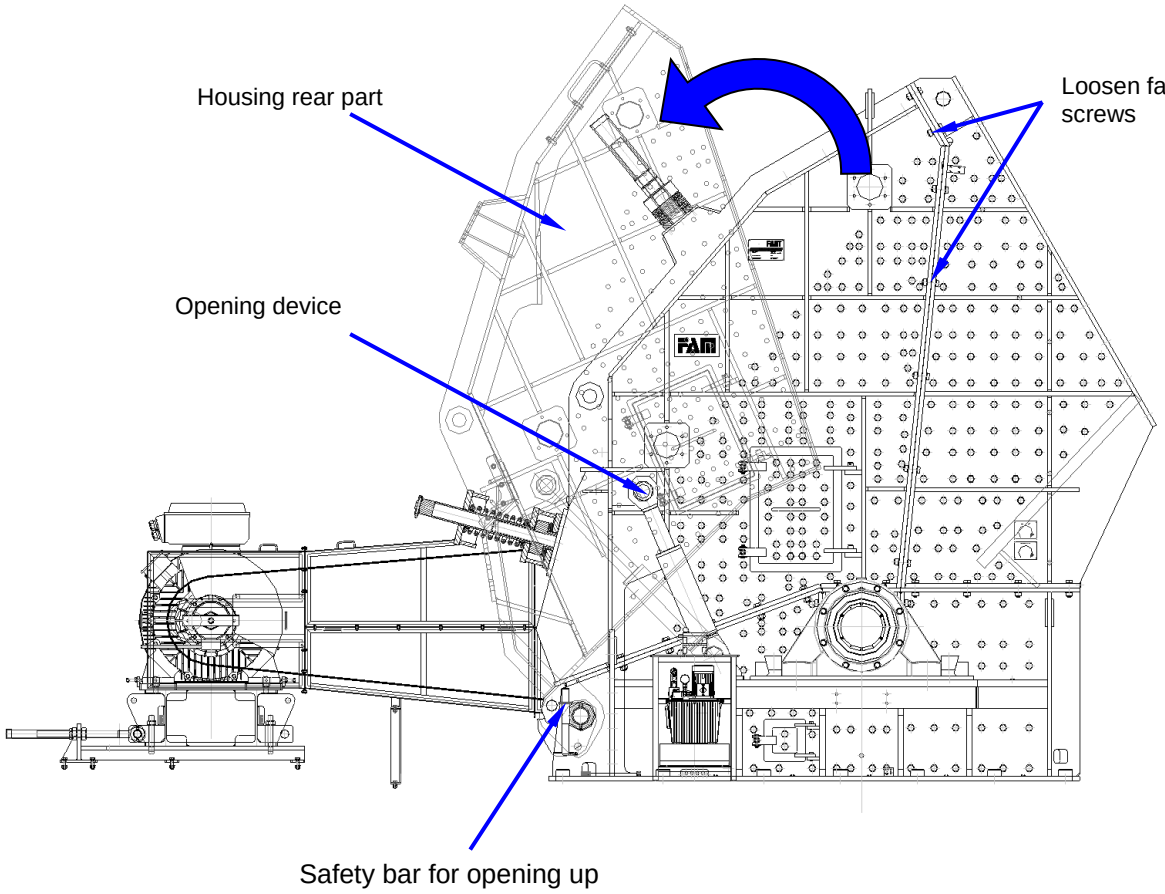
- The impact crusher must be electrically interlocked in such a way that the drive motor cannot be started when the rear part of housing is opened.
- Remove the fastening screws from the flanges between the fixed and moveable parts of the housing.
- Open the manual valve of hydraulic opening device so that the hydraulic cylinders can gradually fold back the rear part of the housing. Use the safety bar for opening-up to secure the housing part in this position.

IMPORTANT

**When operating the hydraulic equipment, make sure that all doors and flaps are closed.**

DANGER

**The machine should be opened, only granting the sight contact of the operator to the crusher.**




- After opening, use the rotor arresting bolt to secure the rotor (at the free shaft end).
- Closing of the housing rear part is performed in reversed order. Make sure that the housing flanges are clean.
- Install the hexagon head bolts.

**IMPORTANT**

**After every fifth opening operation the locking nuts must be replaced by new items.**

- Pull out the spring cotter so that the rotor arresting bolts can be removed and installed in their receptacle provided therefore. The inspection door in the hood should be opened. After that, install the spring cotter in the bore again.

### 1.7.3 Replacement of Blow Bars

**DANGER**

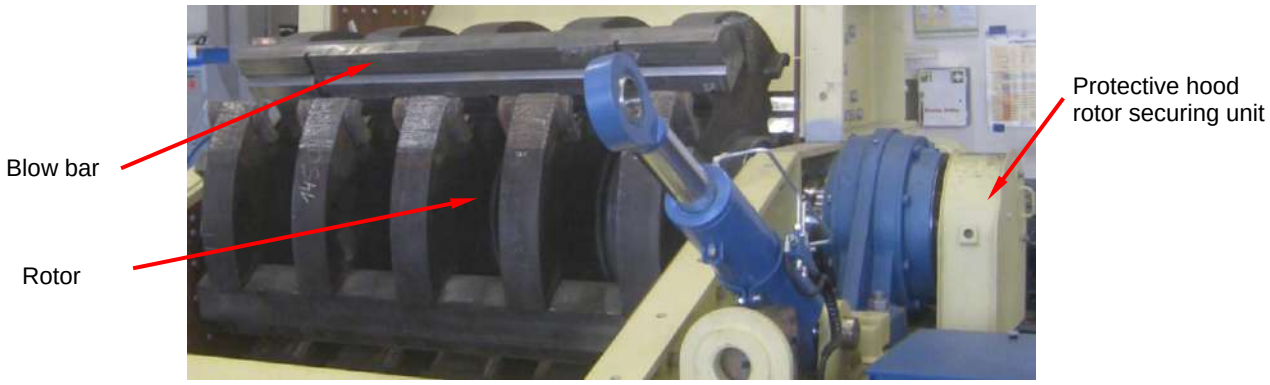
**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the impact crusher, the adjacent apron feeder and the spillage conveyor in a way preventing the machine from any undesired movements.**

**IMPORTANT**

**When replacing single blow bars, note that the blow bar on the opposite side must be replaced as well.**

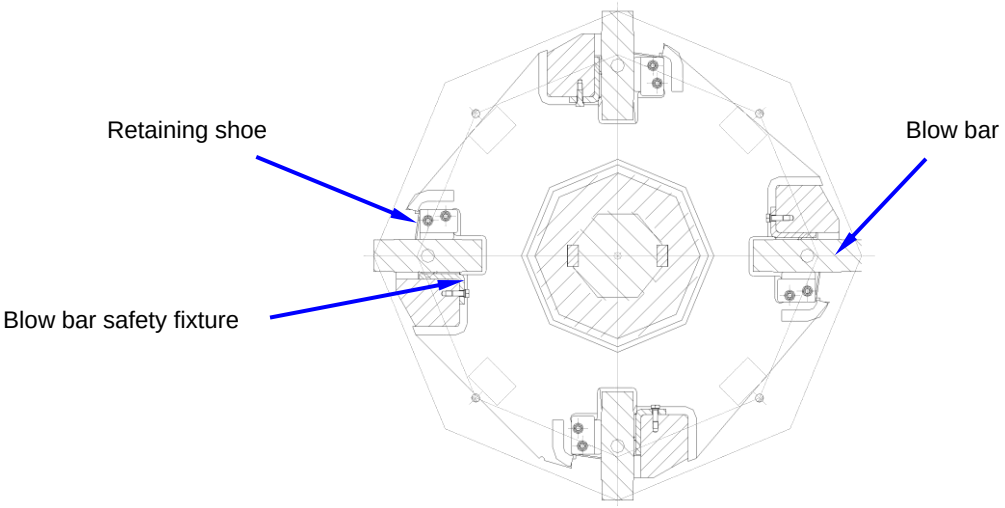
- Open the housing rear part (see Chapter 1.7.2)
- Rotate the rotor until the blow bar to be replaced reaches the angle of approx. 67,5 degrees relating to the rotor (11 o´clock position).
- Switch off the drive unit and secure it against unintended start-up.
- Use the rotor securing pin (at the free shaft end) to arrest the rotor.




- Undo the hexagon head bolts of both blow bar safety fixtures on the left and right side of the rotor and take them out together with the lock washers. Remove the lock plates.
- Remove both temperature sensors on bearing casing.

**IMPORTANT**

**Before removing the blow bars, be sure to mark the positions of retaining shoes in the rotor with steel-stamp numbers, in order to keep the original arrangement when installing the new blow bars.**




➢ Use the supplied auxiliary device for the blow bar disassembly as follows:

– Place the auxiliary device (approx. weight: 105 kg) above the blow bar (approx. weight: 825 kg). Install the pins on the left and right sides.

**WARNING**

**WARNING, DANGER OF SQUEEZING INJURIES**

**Utmost care is required when suspending or threading-in auxiliary tools for lifting of loads (chains, lifting belts, ropes). Note the risk of squeezing-off limbs.**

– Remove the complete unit from the rotor and make sure that heavy oscillations are avoided.

**DANGER**

**CAUTION, SUSPENDED LOADS!**

**Persons are not permitted to stay or work under suspended loads. Every movement must be continuously monitored by several persons. The operator and monitoring personnel must always remain in contact.**

- Take out the rotor securing pin and rotate the rotor to 90° so that it adopts the next position. Replace the next blow bar.
- Repeat this procedure until the desired number of blow bars has been replaced.
- Re-assemble the unit in reversed order under observance of following instructions:

**IMPORTANT**

**When installing the balanced blow bars, it must be ensured that the opposite blow bars have the same weight.**

**IMPORTANT**

**After installation make sure that the blow bars do not contact with impact rockers.**

**If necessary, re-adjust the appropriate crushing gaps.**

### 1.7.4 Replacement of Impact Rockers

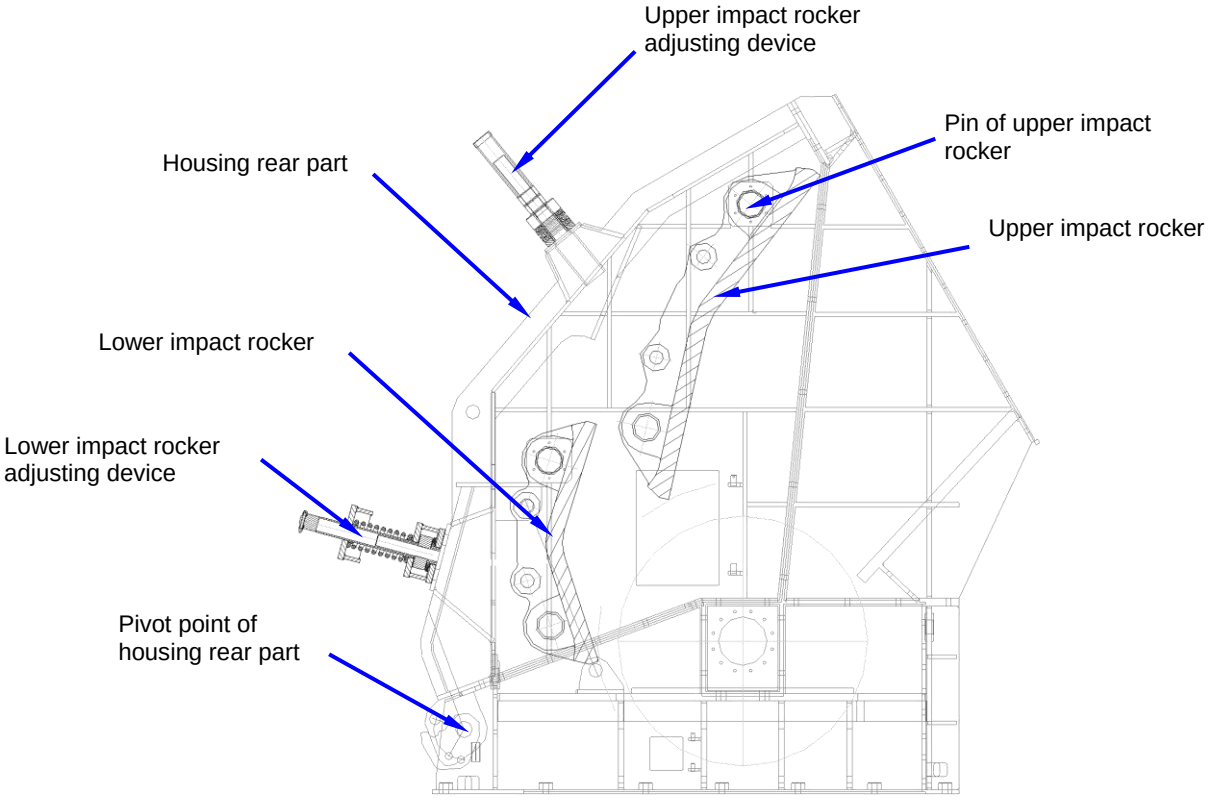
**DANGER**

**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the impact crusher, the adjacent apron feeder and the spillage conveyor in a way preventing the machine from any undesired movements.**

**DANGER**

**The machine should be opened, only granting the sight contact of the operator to the crusher.**



- The rear part of housing must be removed before the impact rockers can be taken out:
  - Remove the hexagon head bolts M 30 (46 mm across flats) from the flanges.
  - Sling the rear part of housing (weight approx. 10600 kg) to a suitable hoisting gear.

**WARNING**

**WARNING, DANGER OF SQUEEZING INJURIES**

**Utmost care is required when suspending or threading-in auxiliary tools for lifting of loads (chains, lifting belts, ropes). Note the risk of squeezing-off limbs.**

  - Remove the pin from the zone of pivot point of rear part, Ø120x450, followed by removal of the rear part of housing.

**DANGER**

**CAUTION, SUSPENDED LOADS!**

**Persons are not permitted to stay or work under suspended loads. Every movement must be continuously monitored by several persons. The operator and monitoring personnel must always remain in contact.**

- Remove the pin of the respective adjusting device, Ø100x620.

**IMPORTANT**

**Note that the impact rockers must be laterally jammed beforehand to avoid oscillation.**

- Sling the rocker (weight of upper rocker: 8258 kg; weight of lower rocker: 5840 kg) through the upper inspection flaps to a suitable hoisting gear.

**WARNING**

**WARNING, DANGER OF SQUEEZING INJURIES**

**Utmost care is required when suspending or threading-in auxiliary tools for lifting of loads (chains, lifting belts, ropes). Note the risk of squeezing-off limbs.**

- Remove the bolts (M24 – 36 mm across flats) and the pins.
- Take out both pins Ø315x552 of the upper impact rocker suspension.
- Turn the impact rockers. The covers of bores must be replaced.

**DANGER**

**CAUTION, SUSPENDED LOADS!**

**Persons are not permitted to stay or work under suspended loads. Every movement must be continuously monitored by several persons. The operator and monitoring personnel must always remain in contact.**

- Re-assemble the unit in reversed order under observance of following instructions:

**IMPORTANT**

**After installation make sure that the blow bars do not contact with impact rockers.**

**If necessary, re-adjust the appropriate crushing gaps.**

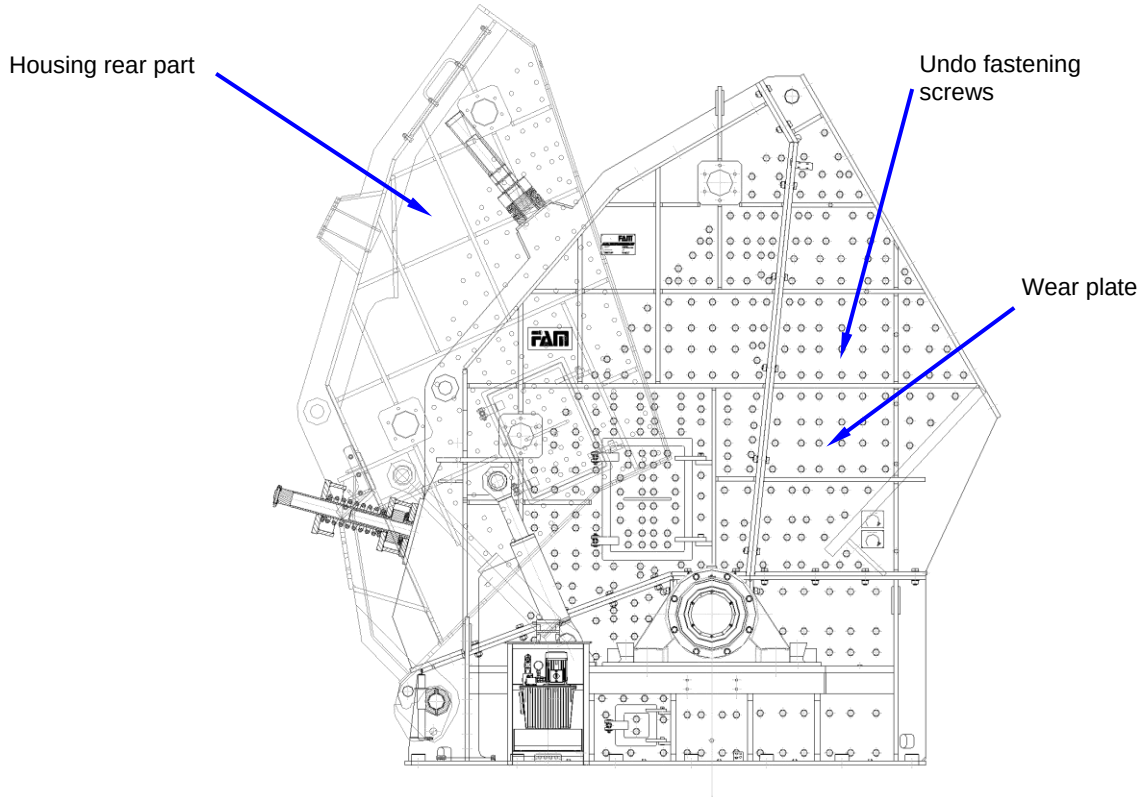
## 1.7.5 Replacement of Wear Plates

**DANGER**

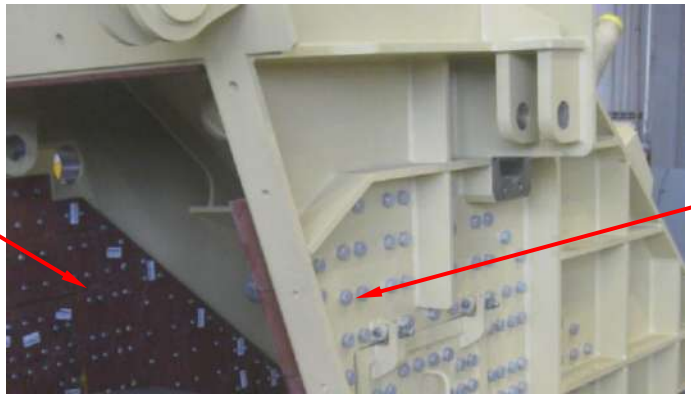
**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the impact crusher, the adjacent apron feeder and the spillage conveyor in a way preventing the machine from any undesired movements.**

- Open the housing rear part (see Chapter 1.7.2)




- Use the rotor arresting bolt to secure the rotor (at the free shaft end)
- Undo the fastening screws between the wear plate and carrying frame




- When replacing the wear plates, note the following torques for tightening:
  - Side wearing plates with hexagon head bolts M20 – torque for tightening 400 Nm
  - Side wearing plates with hexagon head bolts M30 – torque for tightening 1450 Nm
  - Side wearing plates with hexagon head bolts M36 – torque for tightening 2100 Nm

**IMPORTANT**

**The housing wear plates installed in the area of crushing radius of the rotor are subject to severe wear. Therefore, these wear plates must be checked more frequently for tight fit and wear condition.**

**IMPORTANT**

**When re-installing, the hexagon head bolts must be inserted with a bolt securing adhesive (e.g. Loctite).**

## 1.7.6 Adjustment of Crushing Gap

### 1.7.6.1 Principles

**DANGER**

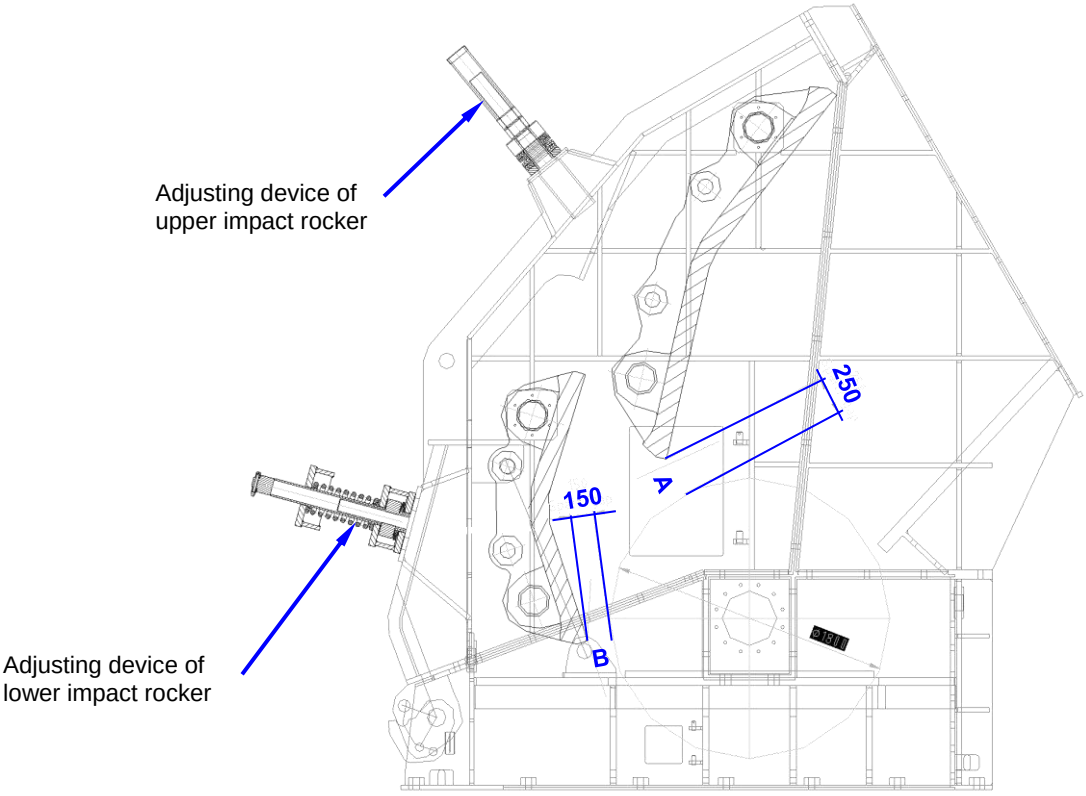
**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the impact crusher, the adjacent apron feeder and the spillage conveyor in a way preventing the machine from any undesired movements.**

**IMPORTANT**

**Check the crushing result through regular analyses. Correct the gap width as appropriate in order to compensate wear.**

**The final grain size distribution can be varied by operating the adjustment spindles for correction of the gap existing between rotor and impact rockers.**



### 1.7.6.2 Adjusting the crushing gap

The final grain size distribution can be varied by operating the adjustment spindles for correction of the gap existing between rotor and impact rockers.

NOTE

| | |
|---|---|
| **Coarse final grain size:** | **Large crusher gap width** |
| **Fine final grain size:** | **Small crusher gap width** |

**The following values have been pre-set by the manufacturer:**

| | |
|---|---|
| **Crusher gap A:** | **250 mm** |
| **Crusher gap B:** | **150 mm** |

**IMPORTANT**

**Adjustment procedures must be carried out evenly to ensure the parallelism of impact rockers relative to the rotor axis!**

NOTE

**Depending on the material to be crushed, the crusher gap pre-set by the manufacturer may be required larger or smaller. The gap width actually required should be determined on site.**

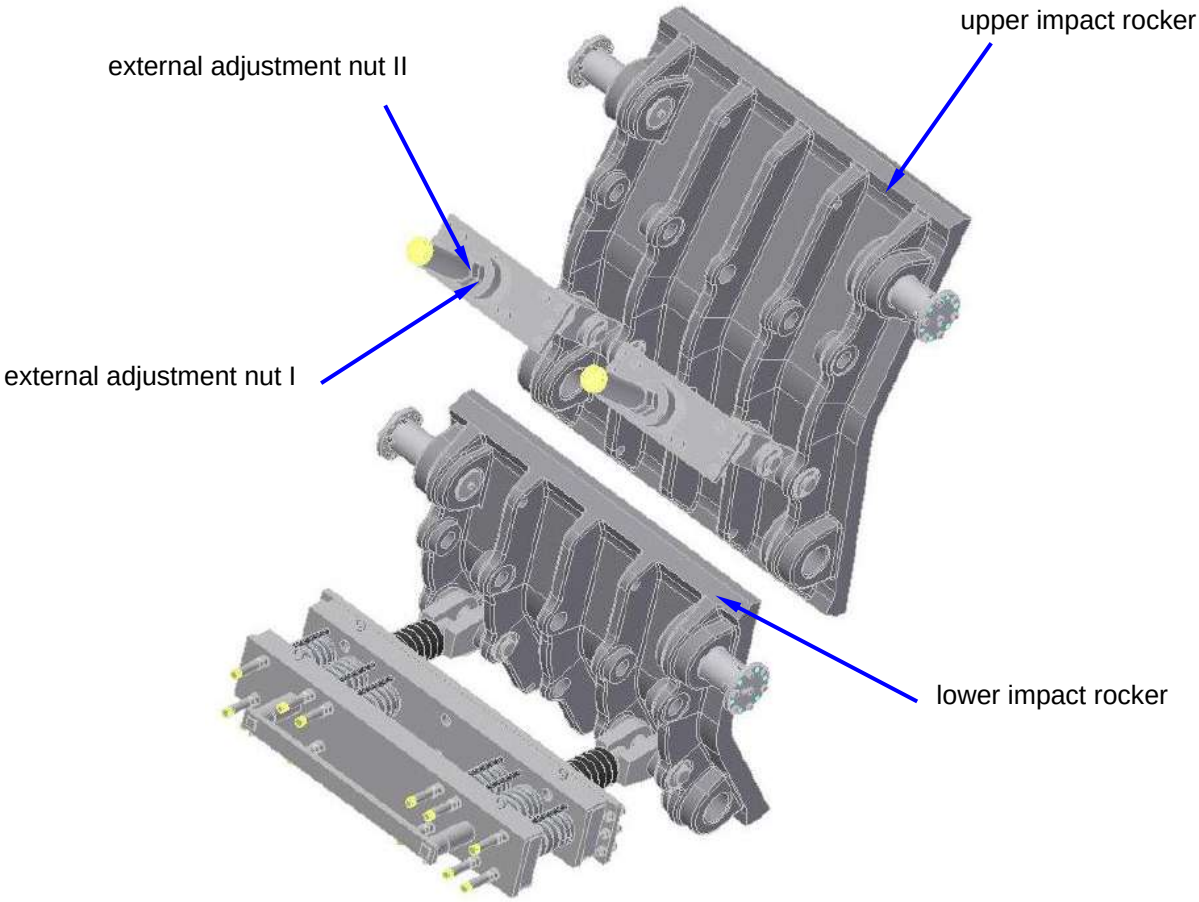
#### *1.7.6.2.1 Increasing the gap*

- With the machine at rest, evenly loosen the external adjustment nuts II on both adjustment spindles by one turn in counterclockwise direction.
- After that, tighten both external adjustment nuts I of both adjustment spindles gradually and evenly up to one turn in clockwise direction.

**IMPORTANT**

**The thread of adjustment spindles has a pitch of 6 mm. One turn of adjustment nut corresponds to a correction of the impact rocker by some 10 mm.**

- Repeat this operation in parallel on both adjustment spindles until the desired crushing gap is obtained.




Adjustment spindles of impact rockers

#### *1.7.6.2.2 Decreasing the gap*

- With the machine at rest, evenly loosen the external adjustment nuts II on both adjustment spindles by one turn in counterclockwise direction.
- After that, loosen both external adjustment nuts I slowly and gradually up to one turn in counterclockwise direction.
- The mass centre of gravity of impact rockers has been designed so that they may slew in by themselves.

**IMPORTANT**

**The thread of adjustment spindles has a pitch of 6 mm. One turn of adjustment nut corresponds to a correction of the impact rocker by some 10 mm.**

- Repeat this operation in parallel on both adjustment spindles until the desired crushing gap is obtained.

#### *1.7.6.2.3 Securing the new gap*

- Once the desired gap width is reached in each single case, tighten the external adjustment nut I gradually and evenly and lock it with the external adjustment nut II.
- Operate the rotor by „HAND“ and check if the blow bars are free, t.i., they do not collide with other parts.

### 1.7.7 Pre-tensioning and Re-tensioning of V-belts

NOTE

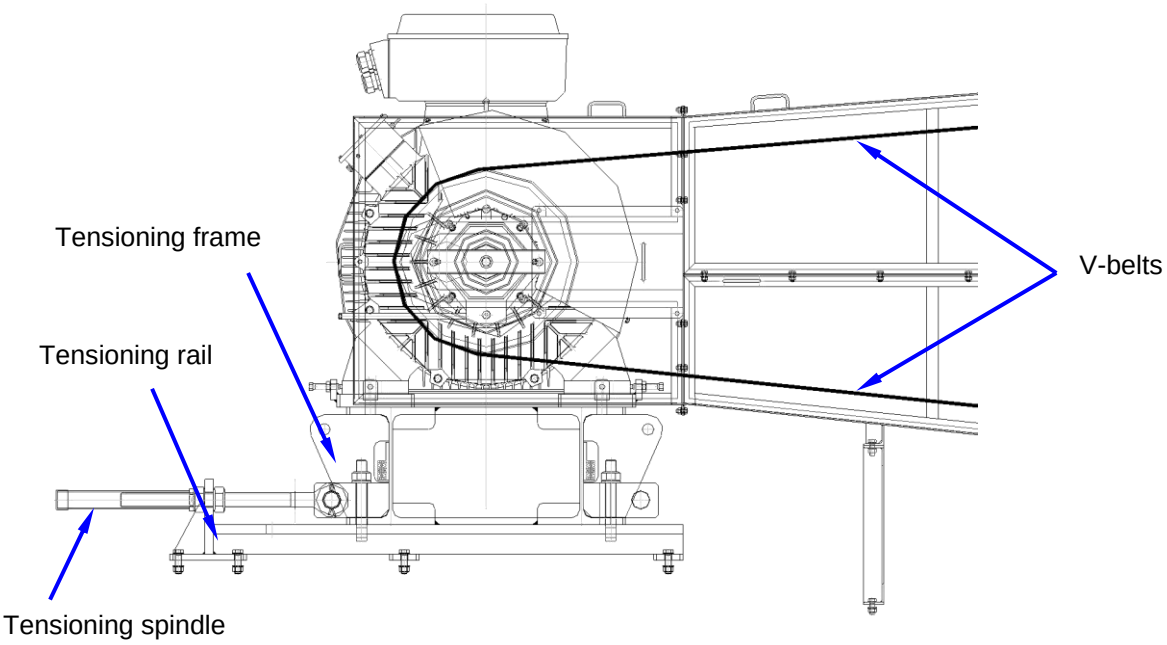
**For documentation of the V-belts see Manual 7, Register 7.3.2.**

DANGER

**Prior to repair work, run the Semi mobile crushing station empty and put it out of operation.**

**Block the impact crusher, the adjacent apron feeder and the spillage conveyor in a way preventing the machine from any undesired movements.**

- Use the rotor arresting bolt to secure the rotor (at the free shaft end).
- Undo the bolted connections between the tensioning frame and the sliding blocks of tensioning rails.



- The tensioning or relieving operation itself is made by means of the three outside tensioning spindles M48 (75 mm across flats). To avoid distortion of the tensioning frame, the tensioning spindles must be operated evenly.
  - Mark the measuring distance **„M“ (1000 mm)** on the free V-belt.
  - Now tension the V-belts until the measuring distance **„M“** of **1000 mm** set during **initial installation** increases to **1009 mm**. In this case the drive is under the correct tension.
  - If the drive must be **re-tensioned**, the V-belts must be relieved from tension again so that they can be re-measured in a tension-free condition. Mark the measuring distance **„M“ (1000 mm)** on the free back of V-belt. Now tension the V-belts until the measuring distance **„M“** increases from **1000 mm** to **1006 mm.** Thus, the drive is re-tensioned correctly.

**WARNING**

**WARNING, DANGER OF SQUEEZING INJURIES**

**During displacement of drive station note that distances are changing. The risk of bruising of limbs is present.**

- After the tensioning operation, be sure that the six fastening bolts of tensioning frame are retightened with a torque of approx. 2100 Nm.

## 1.7.8 Checklist to Be Processed Prior to Start of Crusher

**NOTE**

**Following inspections are required after completion of repair work and prior to start of impact crusher:**

| Item No. | Inspection item | Date | Commissioning Fitter | Operator |
|---|---|---|---|---|
| 1 | Check if all transport locks (marked red) are removed | | | |
| 2 | Check if rotor blocking pin is removed | | | |
| 3 | Check if housing is closed | | | |
| 4 | Verify correct bearing lubrication and greasing of all friction points | | | |
| 5 | Check the correct gap width | | | |
| 6 | Check if machine is clean and free from foreign objects | | | |
| 7 | Check if drive components are in true alignment | | | |
| 8 | Inspect the flexible coupling elements | | | |
| 9 | Check if sense of rotation of motor and rotor is correct | | | |
| 10 | Check if sense of rotation of hydraulic motor is correct | | | |
| 11 | Check if bolts are seated correctly | | | |
| 12 | Start the machine in no-load condition | | | |
| 13 | Note the operational sequence of machine start-up and machine shut-down | | | |