

Brief instruction

Instruction protocol
(translation of the original instruction protocol)

Double Shaft Slow Speed Shredder Rewelding the shredding shafts



Machine no.:	33xxx
Date:	2021-09-06
Year of manufacture:	XXXX
Document version:	2.0

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Wear limits shredding shafts

1 Wear limits shredding shafts

DANGER

Before proceeding with any maintenance, repair or cleaning task, ensure that the machine cannot start unintentionally!

There is a risk of extremely serious and possibly fatal injuries.

- Turn the ignition key to position "0" and remove the key from the ignition lock. Set the battery master switch to "OFF". Use the multiple locking device including the prohibition sign and padlock to secure the switches.
- Press all of the EMERGENCY STOP buttons of the entire TYRON.
- Detailed information can be found in the chapter *Safety*, section: *Conduct in the event of an emergency and Guards and safety devices*.

CAUTION

Be careful when checking the shredding tools!

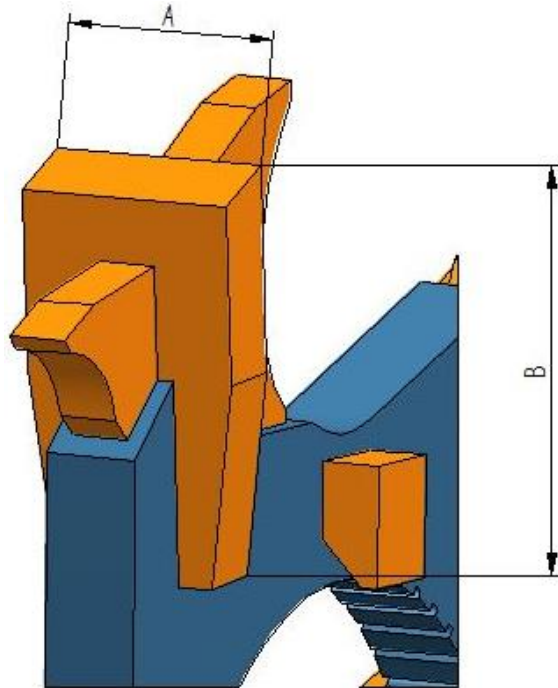
There is a risk of injury due to cutting and pinching.

- Always wear cut-resistant protective gloves during this type of maintenance work.

Note

Since it is virtually impossible to measure the following dimensions in the field, corresponding gauges are supplied by HAAS.

1.1 Main blade dimensions



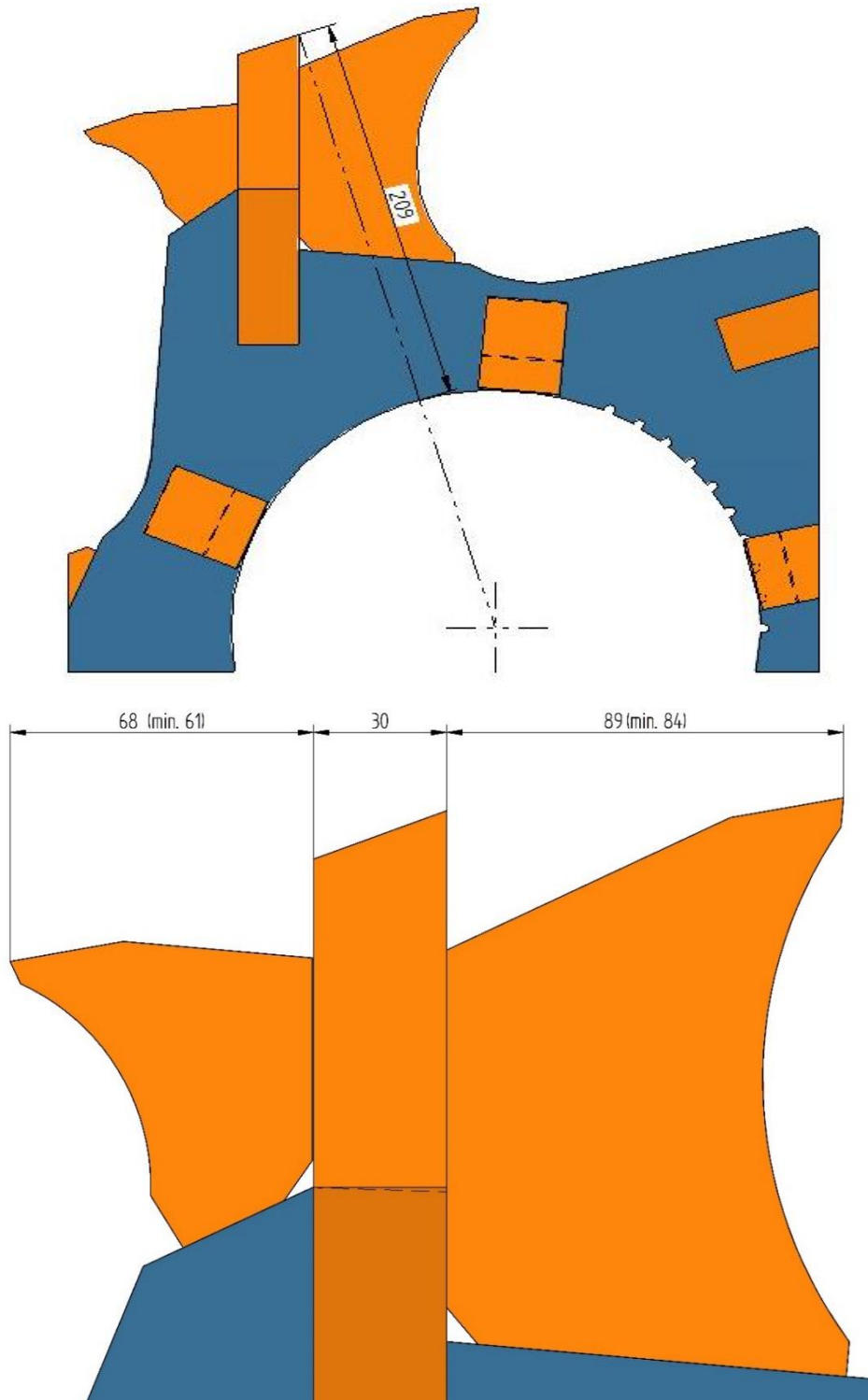
Rotor type (main blades)

		worn mm (in)	upon delivery mm (in)
9R	A	82 (3,23)	92 (3,62)
9R	W	165 (6,50)	170 (6,69)
7R	A	100 (3,94)	110 (4,33)
7R	W	165 (6,50)	170 (6,69)

Wear limits shredding shafts

1.2 Blades

All dimensions in mm!



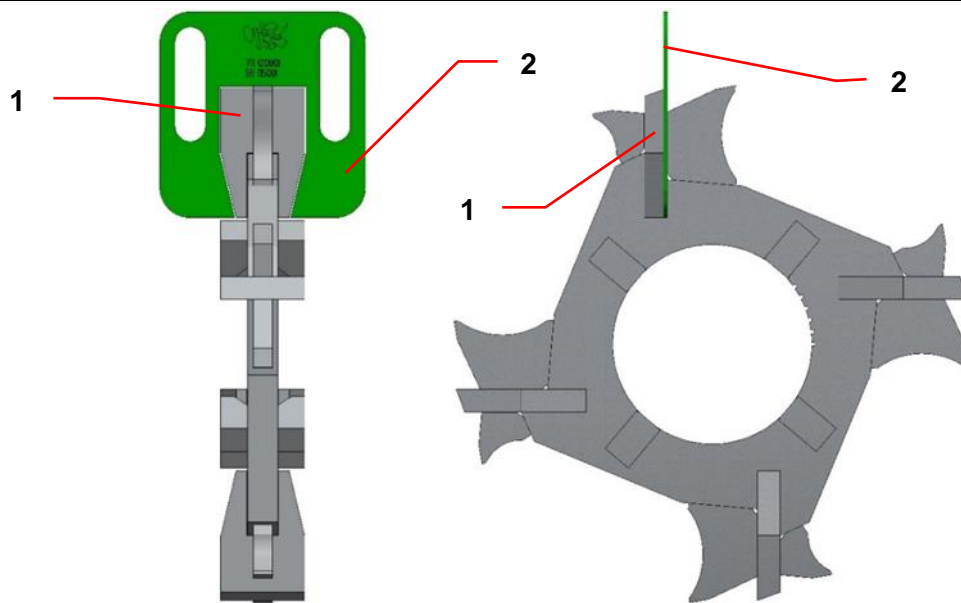
1.3 Checking wear limits using the build-up welding template

Appropriate build-up welding templates from HAAS are available for checking wear limits on the tool holder.

It is quick and easy to check the wear on the blades using these build-up welding templates prior to appropriate build-up welding.

1.4 Build-up welding template for the main blade

1.



Legend:

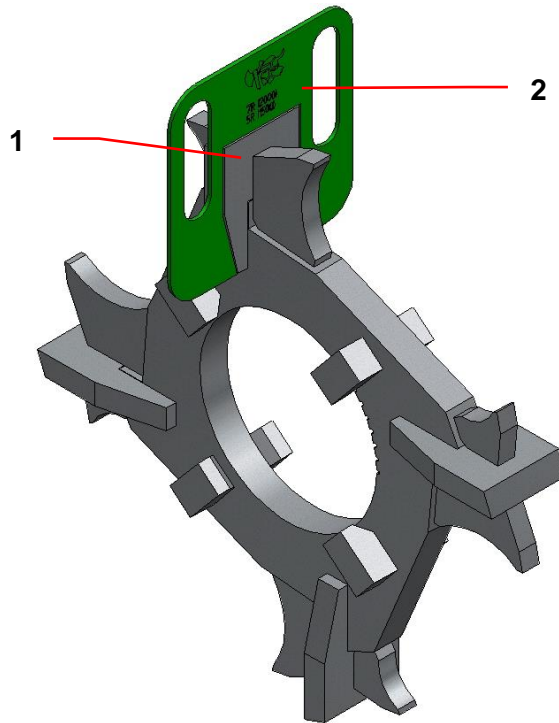
1 = Main blade

2 = Build-up welding template

Place the build-up welding template longitudinally over the main blade.

Wear limits shredding shafts

2.



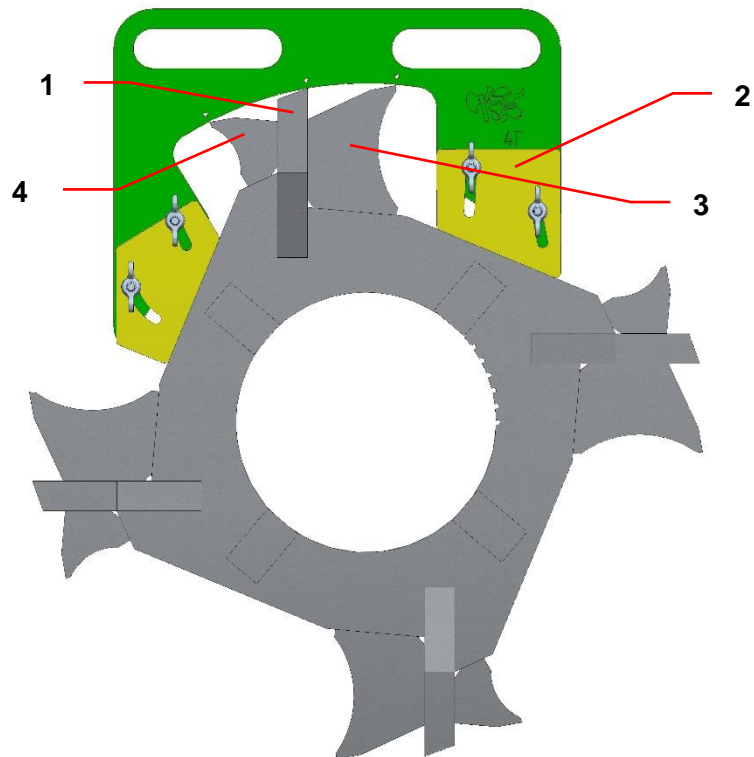
Legend:	
1 = Main blade	2 = Build-up welding template

The build-up welding template fits perfectly around the outer edges of the main blade.

3. If the build-up welding template no longer fits adequately around the outer edges of the main blade:
 - Build-up weld the main blade until the build-up welding template again fits perfectly around the outer edges of the main blade.

1.5 Build-up welding template for the main, primary shredding and secondary shredding blade

1.



Legend:

1 = Main blade

2 = Build-up welding template

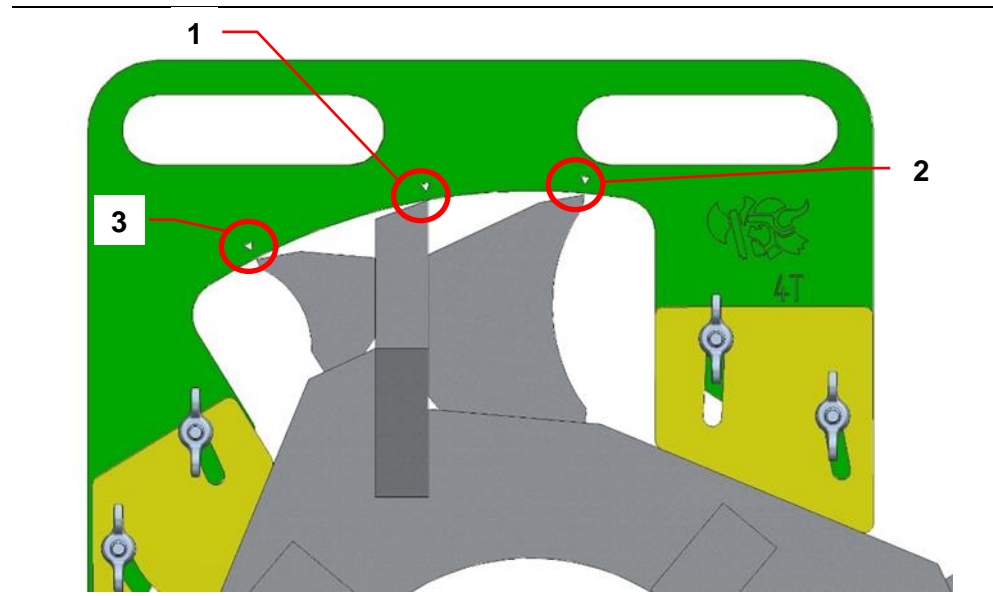
3 = Primary shredding blade

4 = Secondary shredding blade

Place the build-up welding template longitudinally over the whole blade (main, primary shredding and secondary shredding blade).

Wear limits shredding shafts

2.



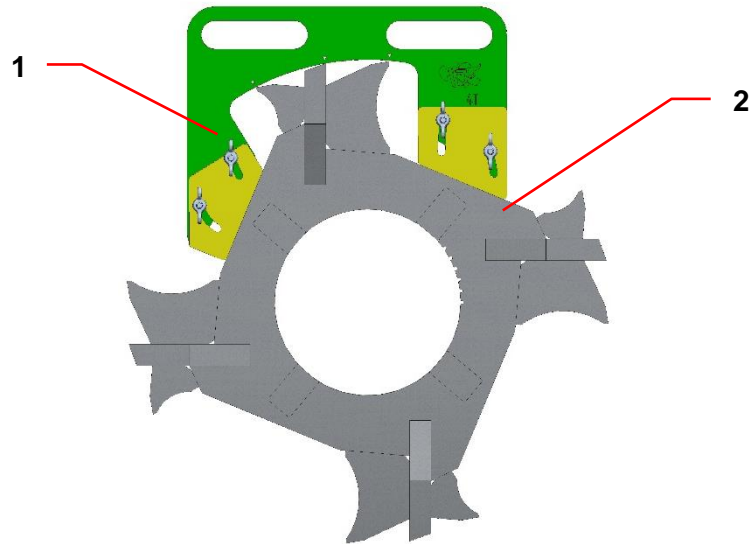
Legend:	
1 = Build-up welding template marking point on the edge of the main blade	2 = Build-up welding template marking point on the edge of the primary shredding blade
3 = Build-up welding template marking point on the edge of the secondary shredding blade	

The three marking points on the build-up welding template are used for orientation when positioning on the blades.

Place the centrally positioned marking point of the build-up welding template on the highest edge of the main blade.

Place the two outer marking points on the highest outer edges of the primary and secondary shredding blades.

3.



Legend:

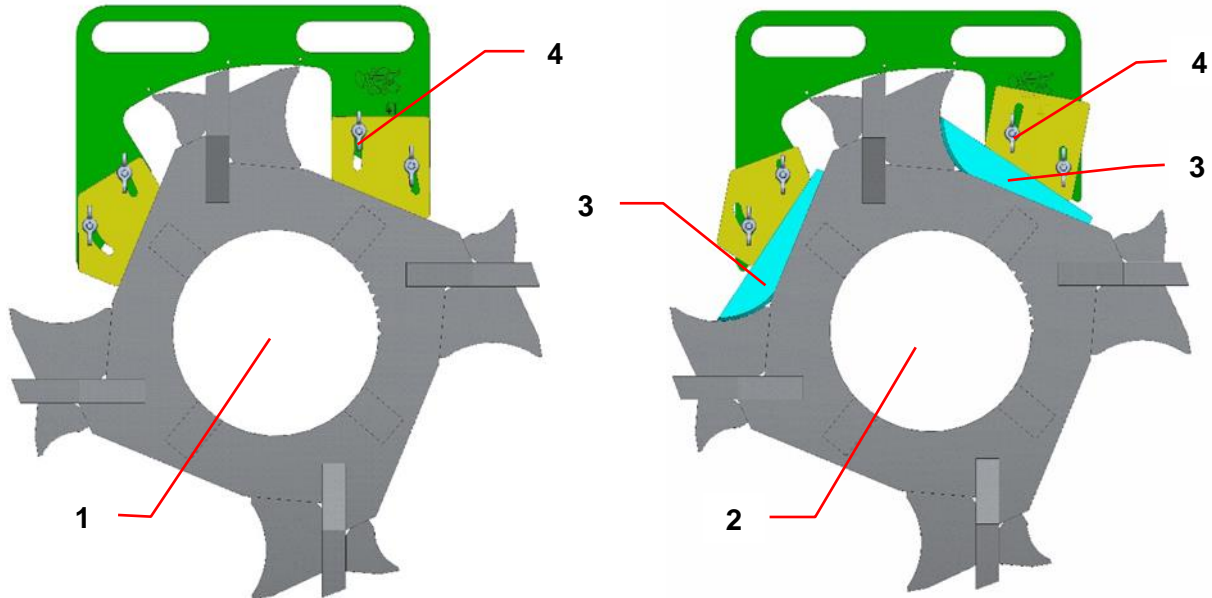
1 = Build-up welding template

2 = Tool holder

The bottom part of the build-up welding template lies exactly on the tool holder.

Wear limits shredding shafts

4.



Legend:

1 = Tool holder without bag filler

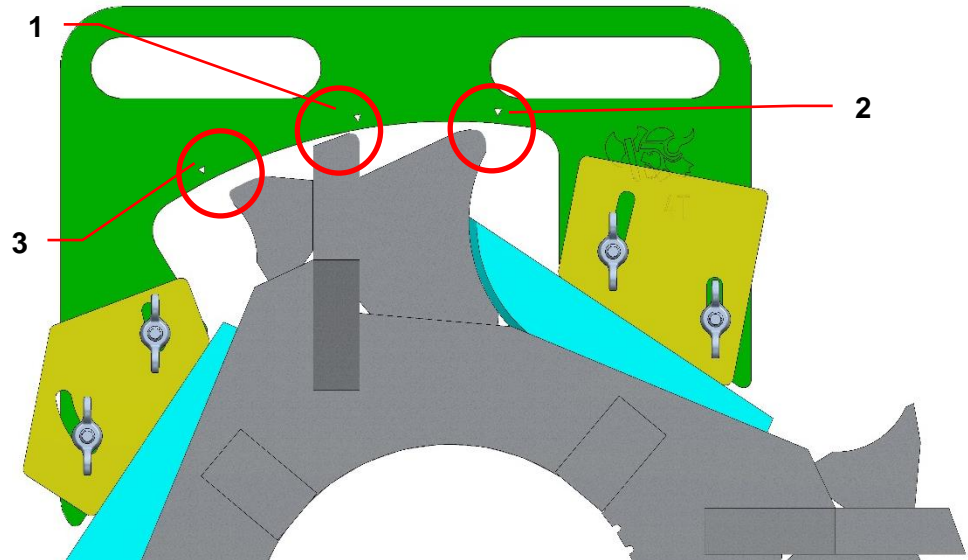
2 = Tool holder with bag filler

3 = Bag filler

4 = Screws of the build-up welding template

Adjust the fit of the build-up welding template using the screws on the tool holder. Dependent on whether there are bag fillers present between the blades on the tool holder or not.

5.



Legend:	
1 = Build-up welding template marking point for main blade	2 = Build-up welding template marking point for primary shredding blade
3 = Build-up welding template marking point for secondary shredding blade	

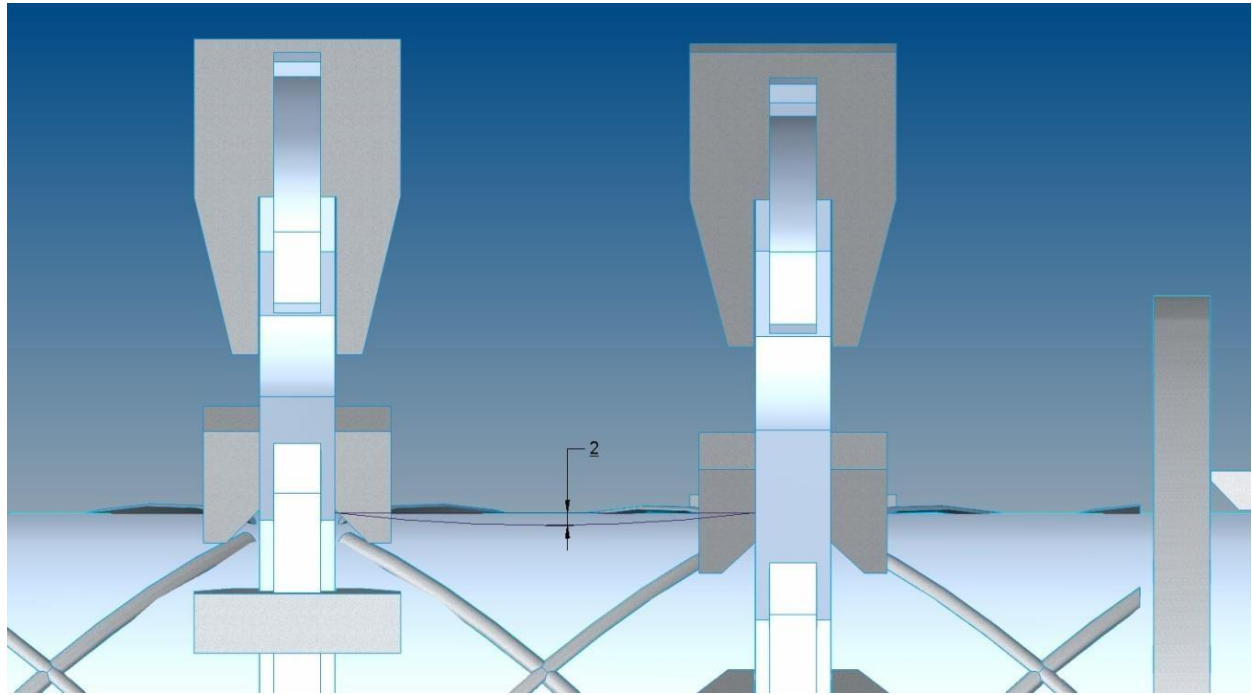
The marking points of the build-up welding template are no longer located on the highest outer edges of the blades:

Build up the main, primary shredding and secondary shredding blades by welding until the marking points of the build-up welding template once again lie against the highest outer edges of the blades.

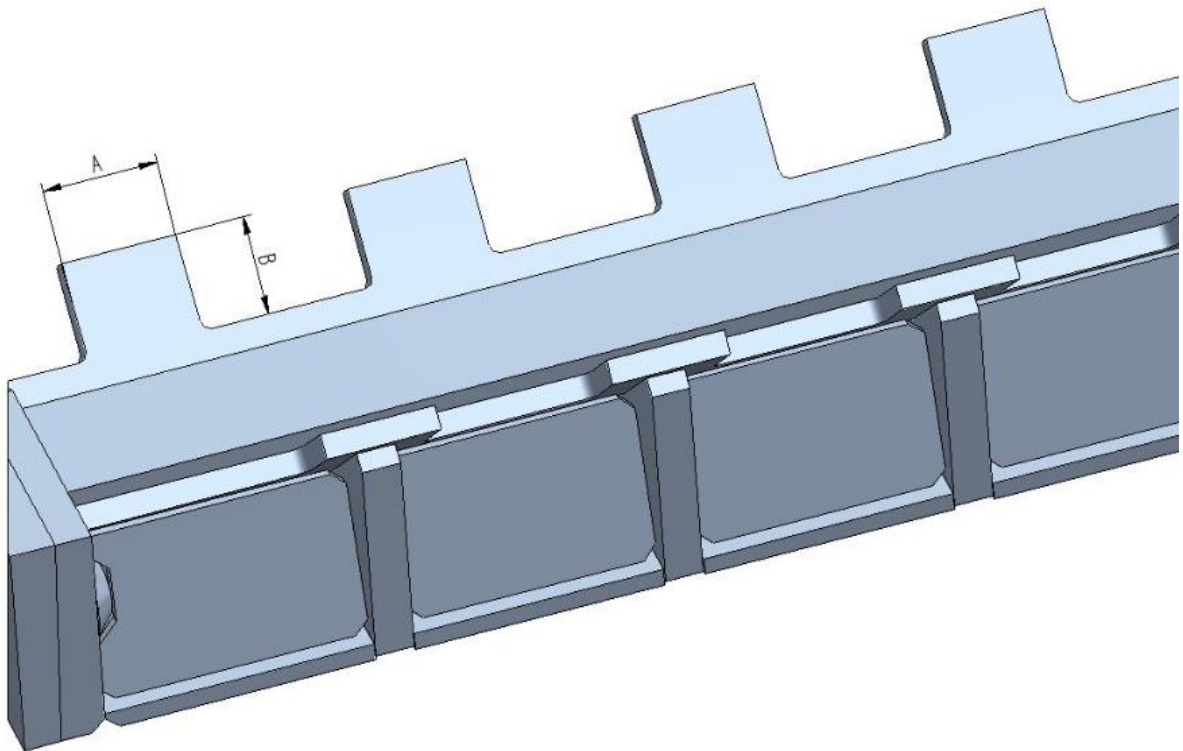
Wear limits shredding shafts

1.6 Shaft wear

All dimensions in mm!



1.7 Breaker bar wear



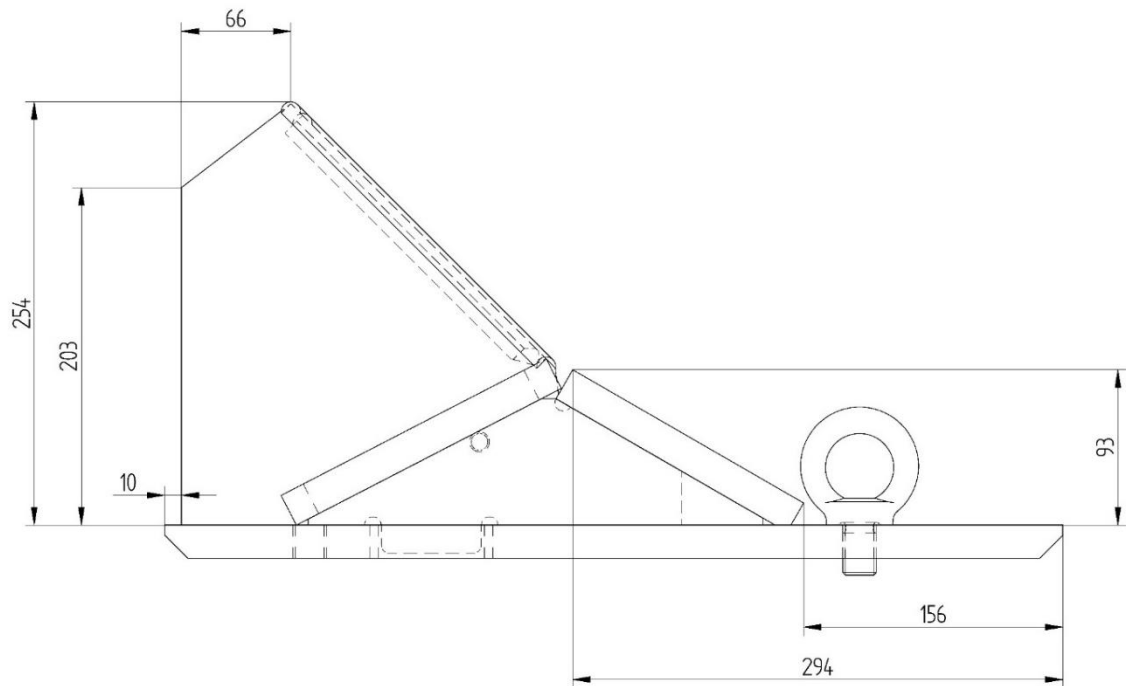
Rotor type (breaker bar)

TYRON 2000 2.0		worn mm (in)	upon delivery mm (in)
9R - short	A	81 (3,19)	91 (3,58)
9R - short	B	80 (3,15)	86 (3,38)
9R - long	A	81 (3,19)	91 (3,58)
9R - long	B	121 (4,76)	131 (5,16)
7R - short	A	73 (2,87)	83 (3,27)
7R - short	B	78 (3,07)	84 (3,31)
7R - long	A	73 (2,87)	83 (3,27)
7R - long	B	121 (4,76)	131 (5,16)

Wear limits shredding shafts

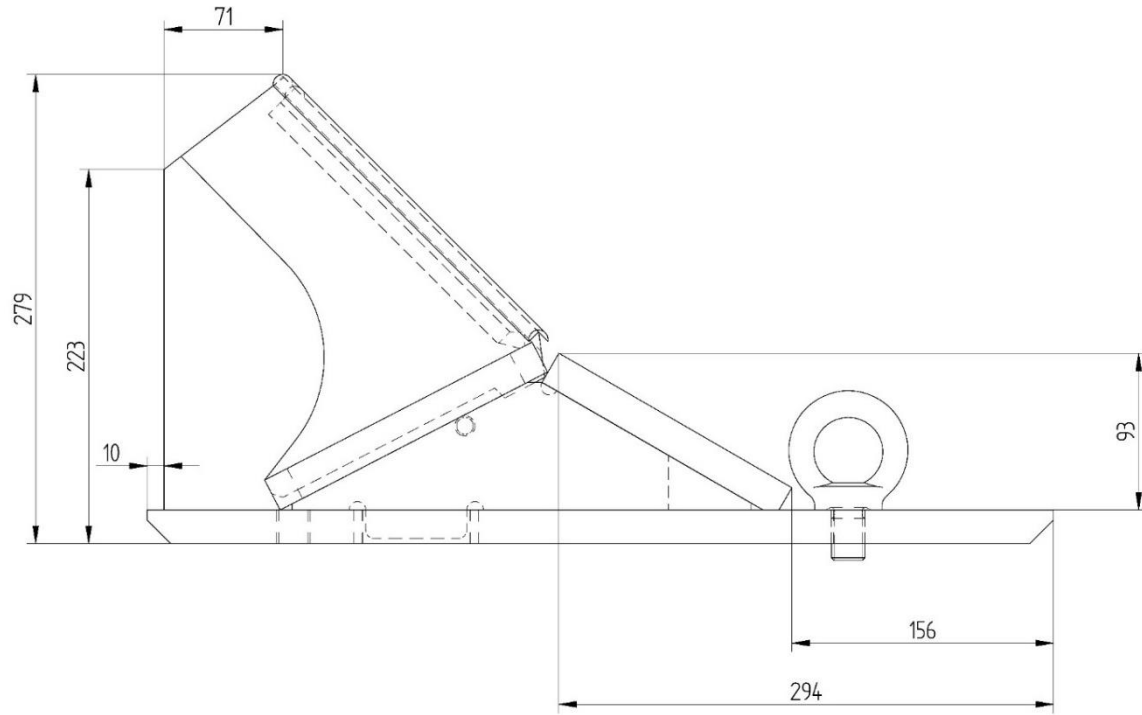
1.8 Original dimensions of the narrow counter-comb

All dimensions in mm!



1.9 Original dimensions of the wide counter-comb

All dimensions in mm!



Rewelding shredding shafts

2 Rewelding shredding shafts

2.1 Securing and locking the machine so that it cannot be started

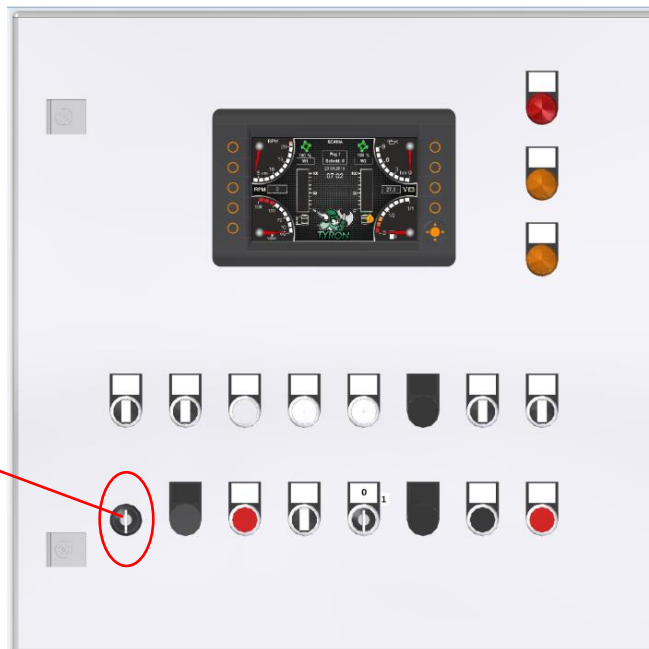
⚠ DANGER

Prior to performing any maintenance, repair or cleaning tasks, the machine must be secured and locked so that it cannot be started!

There is a risk of extremely serious and possibly fatal injuries.

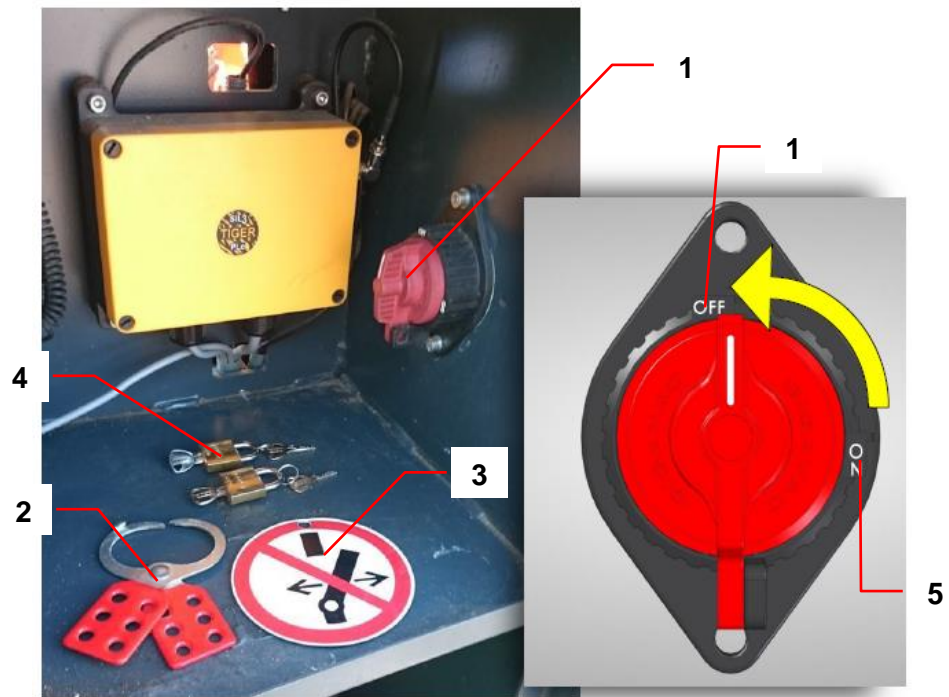
- Turn the ignition key to position "0" and remove the key from the ignition lock. Set the battery master switch to "OFF". Use the multiple locking device including the prohibition sign and padlock to secure the switch.
- Press all of the EMERGENCY STOP buttons of the entire TYRON.

13



Legend:

13 = Ignition key



Legend:

1 = Battery master switch in "OFF" position (vertical)

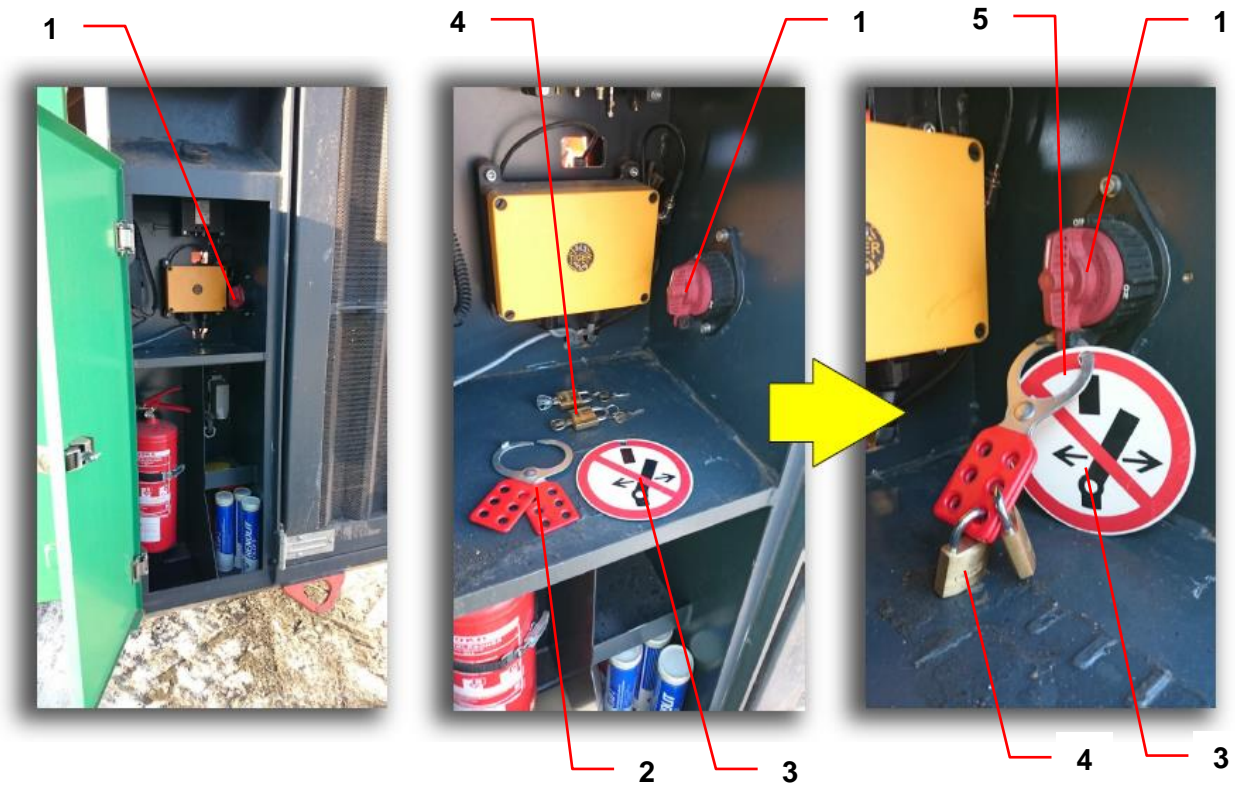
2 = Multiple locking device for 6 padlocks

3 = Prohibition sign (metal plate)
Caution: Repair work in progress. Do not switch on machine.

4 = Padlocks

5 = "ON" position (horizontal)

Rewelding shredding shafts



Legend:

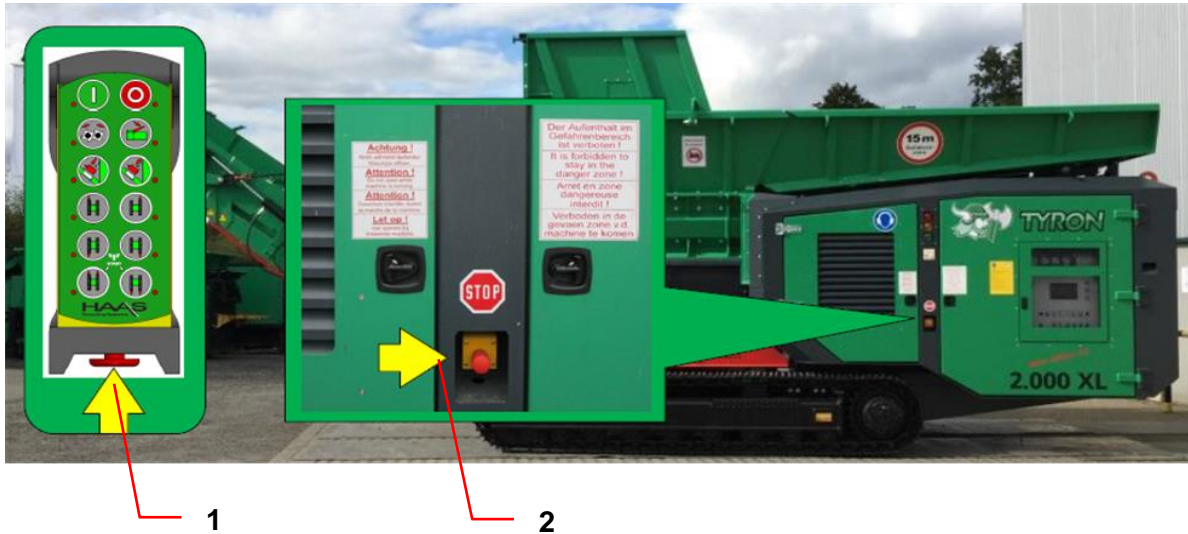
1 = Battery master switch in "OFF" position (vertical)

2 = Multiple locking device for 6 padlocks

3 = Prohibition sign (metal plate)
Caution: Repair work in progress. Do not switch on machine.

4 = Padlocks

5 = Attachment of prohibition sign to multiple locking device and battery master switch



Legend:

1 = EMERGENCY STOP button on the remote control

2 = EMERGENCY STOP buttons on both sides of the machine

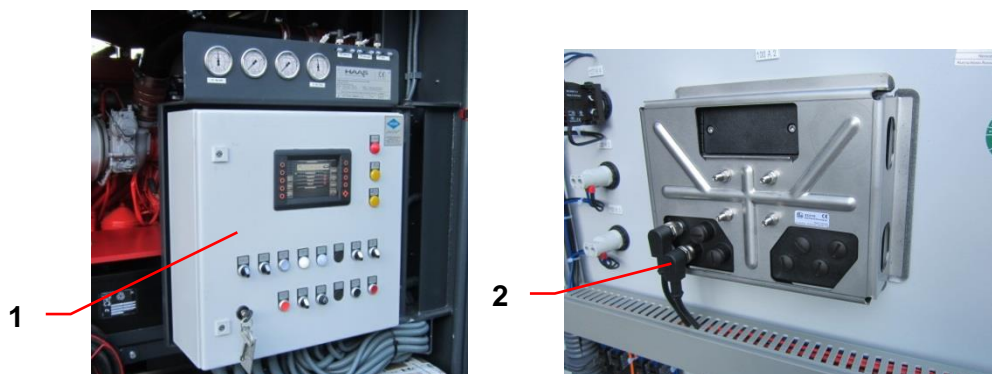
2.2 Disconnection of the connectors

NOTICE

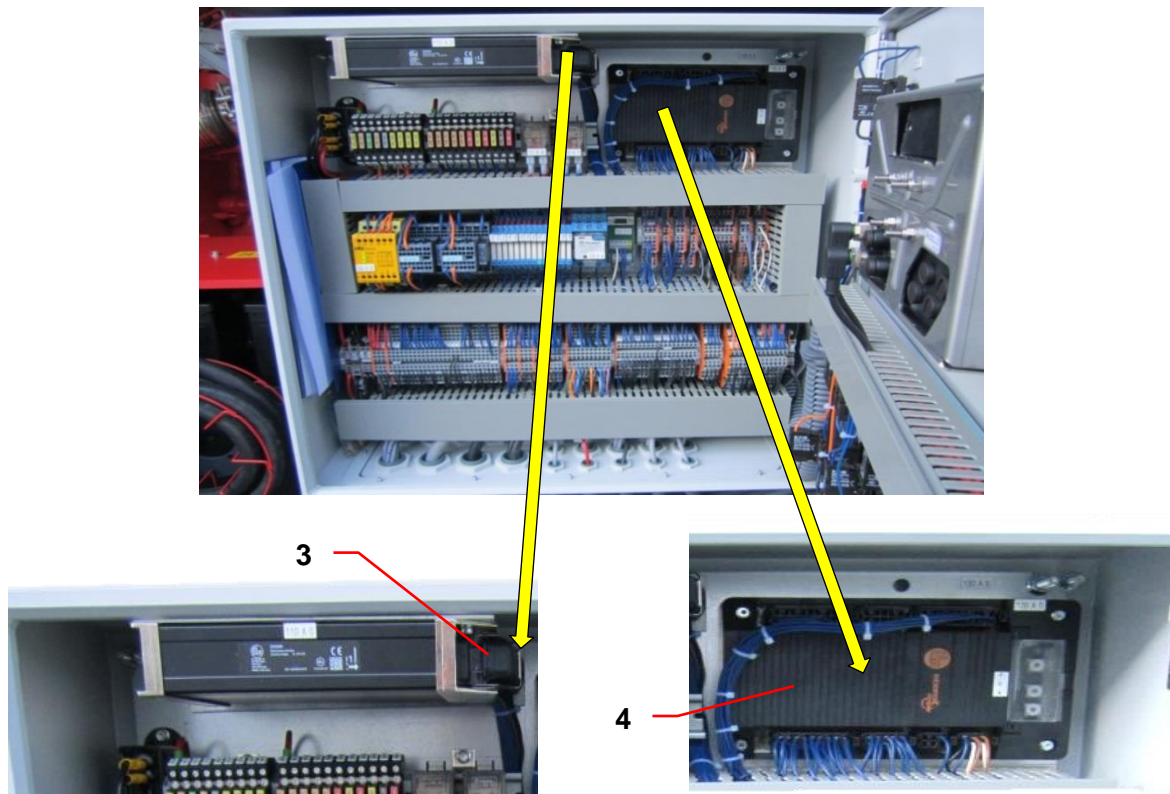
Be careful when disconnecting the connectors!

Damage to the control system is possible.

- Be careful when disconnecting the connectors to prevent damage to the control system.



Rewelding shredding shafts



Legend:

1 = Control cabinet with display	2 = Back of the display with connectors
3 = Control connector with securing clip	4 = Connector at the control unit

- Open the control cabinet with the display.
- Disconnect the connectors at the back of the display.
- Open the securing clip and remove the control connector.
- Disconnect all of the connectors at the control unit.

2.3 Trapped-key interlocking system for opening the transfer flaps

⚠ DANGER

Danger caused by the manipulation of the trapped-key interlocking system!

There is a risk of extremely serious and possibly fatal injuries.

- Do not change the trapped-key interlocking system in any way.

NOTICE

Avoid losing a key!

When a key is lost, the machine will no longer operate.

- Remove the keys and insert them directly into their respective bolt lock so that they cannot get lost.
- Use the trapped-key interlocking system only for opening and closing the transfer flaps.

The trapped-key interlocking system prevents the start of the machine when the transfer flaps are open.

The system uses 2 keys of one switch unit. If the upper key 1 is removed from the switch unit, the EMERGENCY STOP will be activated.

The key that has been pulled out of the switch unit can be used to unlock one of the two transfer flaps.

To open the other transfer flap, pull the second key out of the switch unit.

The two keys are solely intended for this specific machine.



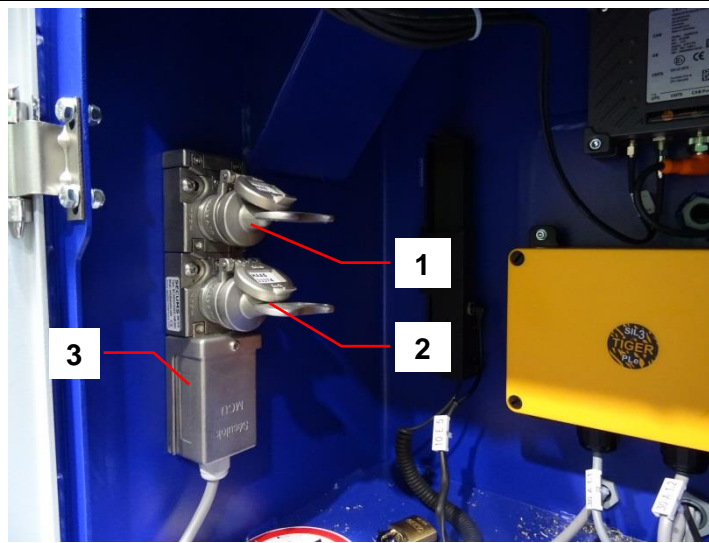
Rewelding shredding shafts



Legend:

1 = Bolt lock

2 = Transfer flap



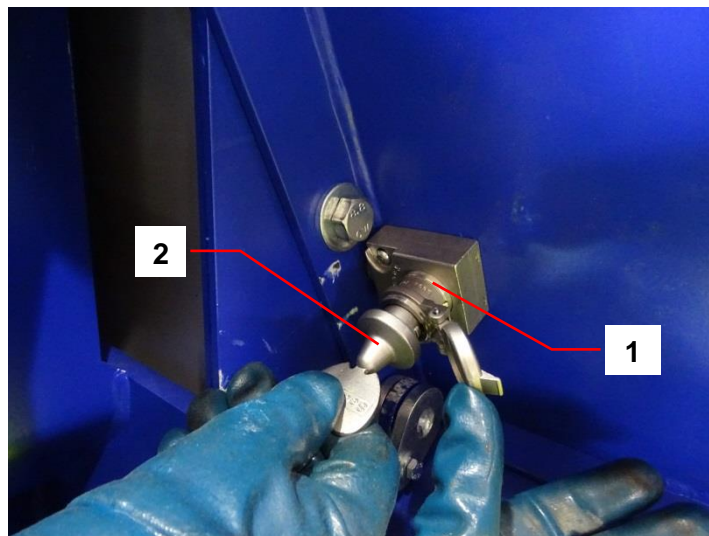
Legend:

1 = Key 1

2 = Key 2

3 = Switch unit with 2 keys

- For each side of the transfer flaps, one key must be removed.
- Key 1 must be removed first in order to open one side of the transfer flaps. In order to open the opposite transfer flaps, remove key 2.

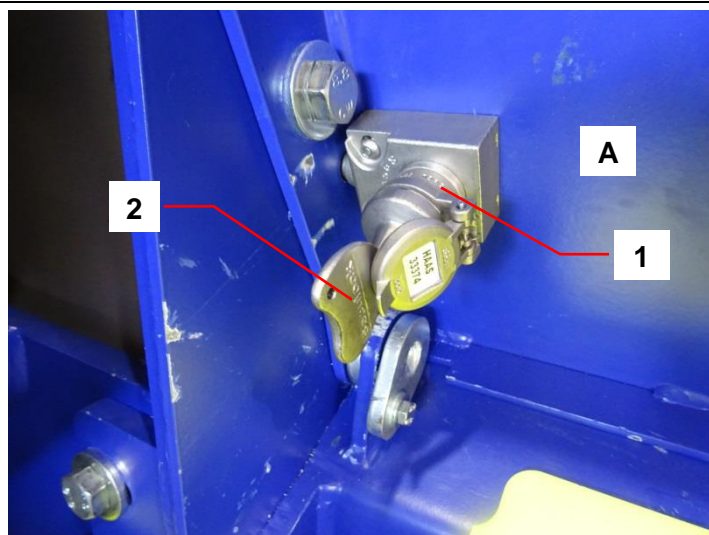


Legend:

1 = Bolt lock

2 = Key

- Insert key 1 or key 2 into the bolt lock.
- To unlock the transfer flaps, turn the key clockwise.



Legend:

1 = Bolt lock

2 = Key position "transfer flap unlocked"

Rewelding shredding shafts

2.4 Opening the transfer flaps

⚠ WARNING

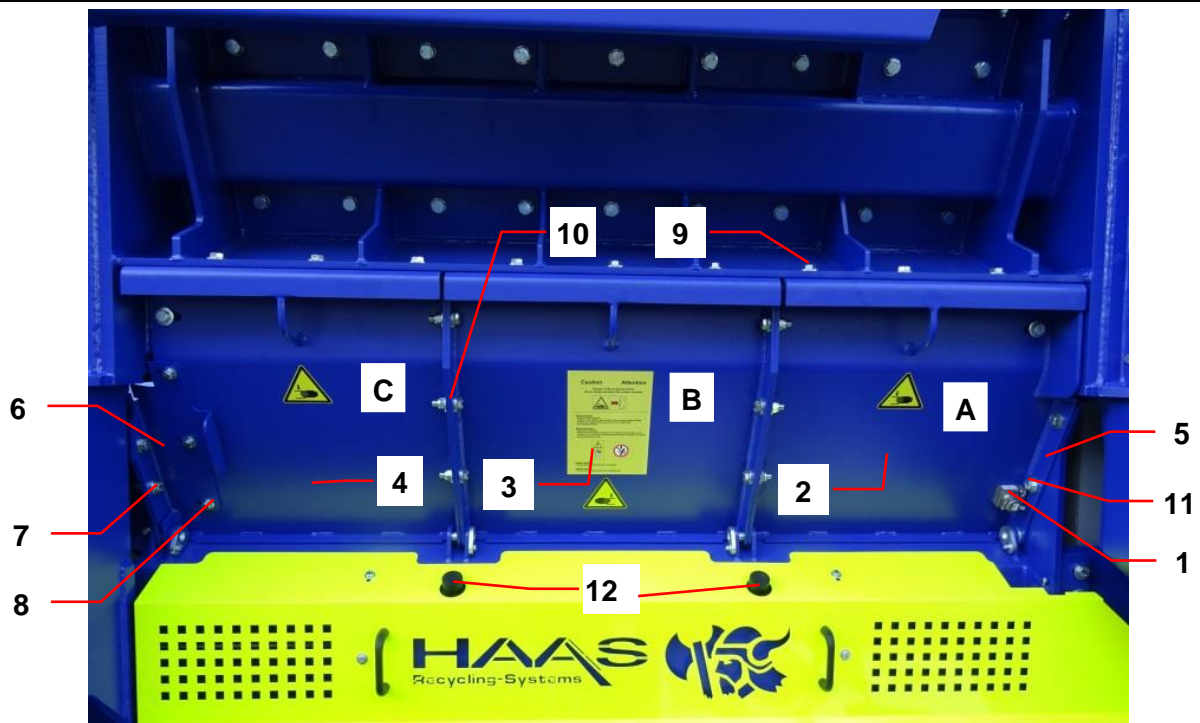
The transfer flaps may slam down!

There is a risk of injury from impact or crushing.

- When removing the last bolt, ensure to hold on to each transfer flap.

Opening the transfer flaps.

The 3 transfer flaps are designed to ensure they can only be opened in a predetermined sequence.



Legend:

1 = Bolt lock	2 = Transfer flap A
3 = Transfer flap B	4 = Transfer flap C
5 = Back panel	6 = Slider
7 = Bolted connection, front end, for 6	8 = Bolted connection, flush, for 6
9 = Bolted connection, upper edge	10 = Bolted connection, flanges
11 = Bolted connection, back panel	12 = Rubber buffer

ATTENTION

Replace any damaged screws/bolts!

Components may become loose.

- Damaged screws/bolts must be replaced without delay.



Note

Loosen the screws with an impact wrench.

- Start with transfer flap "A" with the bolt lock.



1. First, loosen the bolted connection of the back panel.
2. Then, loosen the bolted connection of the flanges.



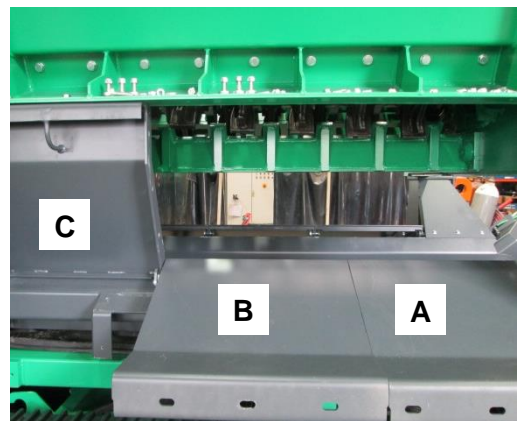
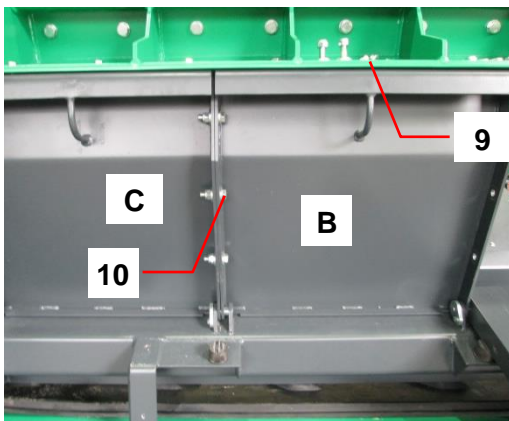
3. Loosen the "Bolted connection, upper edge", but leave the last "Bolt, upper edge" in place for safety reasons.

Rewelding shredding shafts



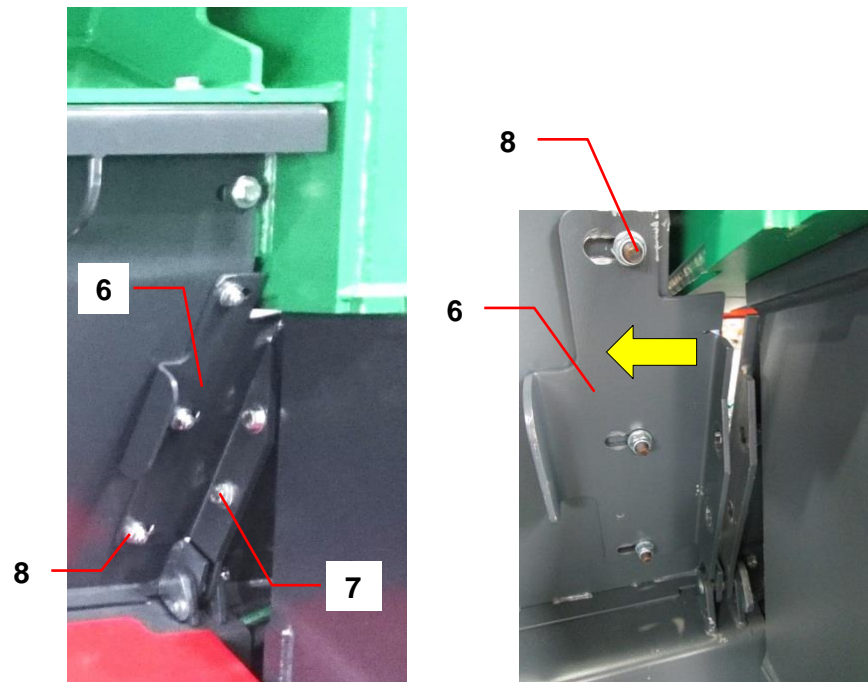
4. Hold the transfer flap and flange together with one hand.
5. Remove the last "Bolt, upper edge".
6. Fold down flap A.

Opening flap B



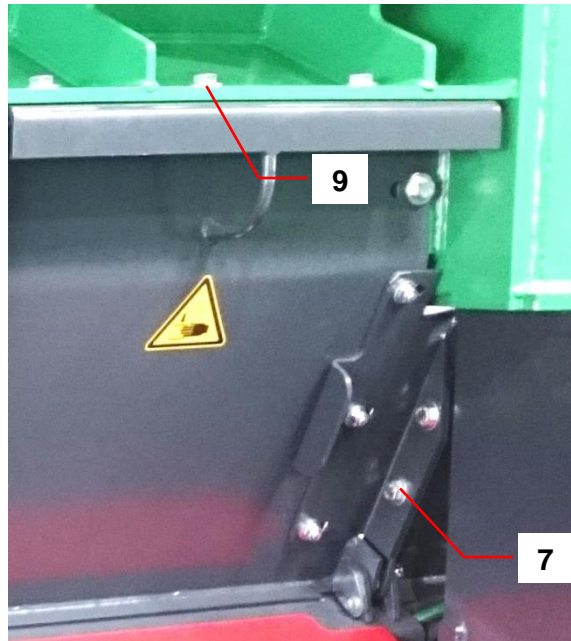
7. Remove/set aside the bolts of "Bolted connection, flanges" of pos. 10 joining flap B and flap C.
8. Loosen the "Bolted connection, upper edge" of pos. 9 of flap B, but leave the last "Bolt, upper edge" in place for safety reasons.
9. Hold the transfer flap and flange together with one hand.
10. Remove the last "Bolt, upper edge".
11. Fold down flap B.

Opening flap C

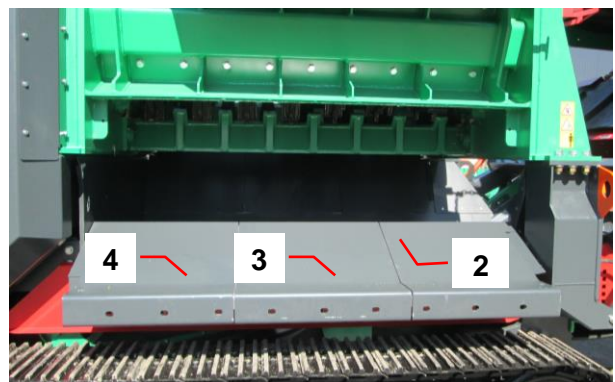
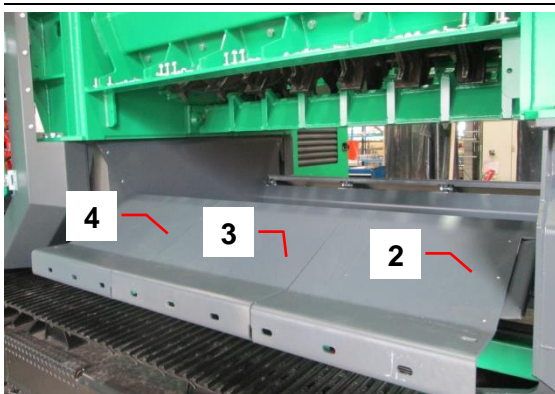


12. Remove/set aside the screws of pos. 6.
13. Slightly loosen the screws of pos. 7.
14. Push the slider forward horizontally.

Rewelding shredding shafts



15. Remove/set aside the bolts of the bolted connection pos. 7, front end, for pos. 6.
16. Loosen the "Bolted connection, upper edge" of pos. 9 of flap C, but leave the last "Bolt, upper edge" in place for safety reasons.
17. Hold the transfer flap and flange together with one hand.
18. Remove the last "Bolt, upper edge".
19. Fold down flap C.



Legend:

Transfer flaps folded down

3 = Transfer flap B

2 = Transfer flap A

4 = Transfer flap C

- The transfer flaps now rest on the rubber buffers.

2.5 Hardfacing of the shredding shafts

DANGER

Be careful when hardfacing the shredding shafts!

Extremely serious injuries are possible.

- Hardfacing the shredding shafts from the direction of the hopper is prohibited.

WARNING

Risk of fire.

Extremely serious and possibly fatal injuries!

- While welding, compliance with fire safety regulation is mandatory!
- Welding areas underneath the workpiece to be welded, for example discharge conveyor belts, must be covered over large areas with suitable welding blankets in order to prevent fire damage.

CAUTION

Be careful when hardfacing the shredding shafts!

Potentially hazardous situations that may lead to slight or minor injuries.

- Only an authorised welder shall be permitted to proceed with the welding of the shredding shafts.
- All welding tasks require the operator to wear special working and protective clothing (personal protective equipment such as head protection, welding gloves, respiratory protection, et cetera).
- When welding, care must be taken not to place flammable materials near the workplace.
- A fire extinguisher must be readily available.

NOTICE

Induction damage to the bearing must be avoided!

An earth fault via the bearing causes damage to the bearing.

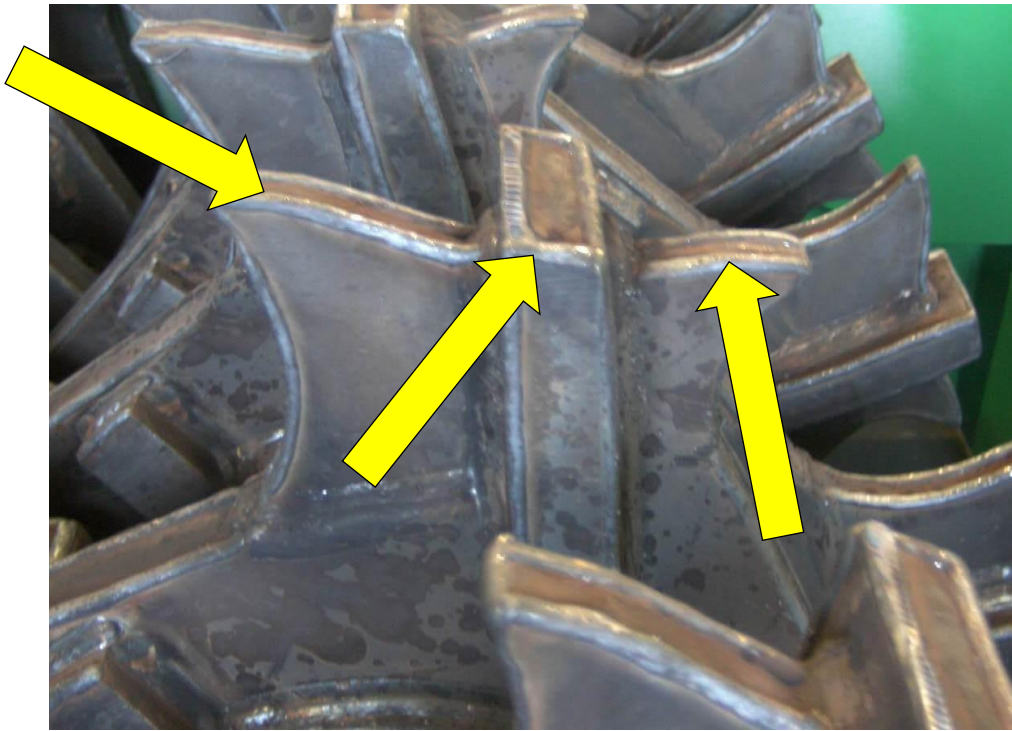
- The earth clamp must always be connected to a bare spot on the part to be welded (shredding shafts) close to the welding point (short current path).
- Ensure that there are no points of contact between the tools after hardfacing. Otherwise, the bearings may be damaged.



Note

For hardfacing the shredding shafts, appropriate templates are available from HAAS.

Rewelding shredding shafts

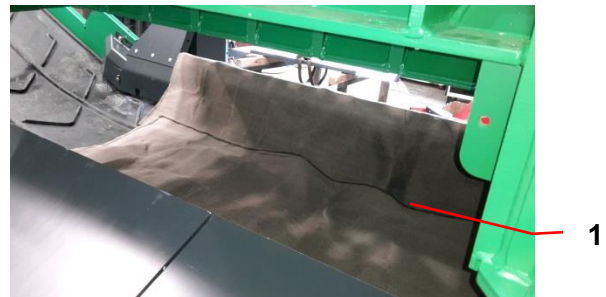
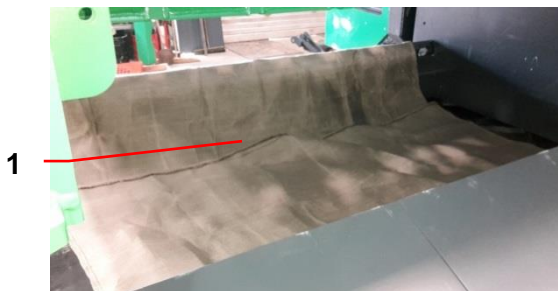
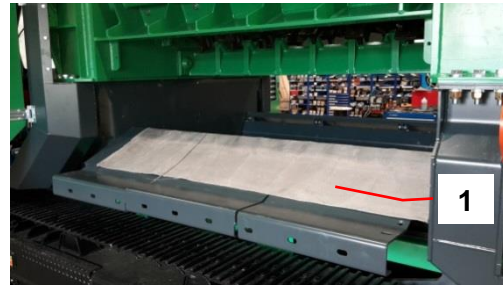
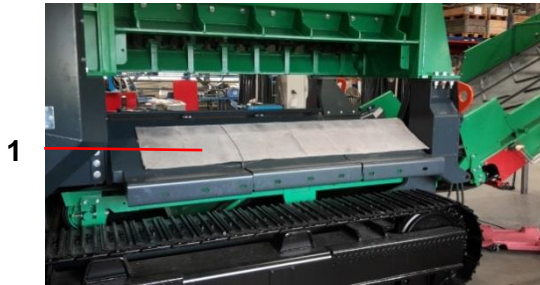


Hardface the edges/surfaces that are marked in the picture with welding wire (hardness approximately 53 HRC).



Note

Hardfacing of the shredding shafts must be performed next to the machine.



Legend:

1 = Welding blanket

2 = Certified welder with personal protective equipment (PPE)
(Head protection, welder's gloves, respiratory protection, et cetera)

Rewelding shredding shafts

For hardfacing, we recommend welding wire with a hardness of approximately 53 HRC. (See the enclosed material data sheet.)

Cross-over welds on the shredding shafts, maximum weld thickness 3-4 mm (0,12 – 0,16 in).

For the installation of new tools, we recommend the following specification:
G 46 4 M G4Si1 (SG3), 1.2 mm (0.05 in) (DIN 8559 SG 3, EN 440-G4Si1)

In this case, the material should be preheated to approximately 250 °C (480 °F) prior to final welding in order to ensure good joining with the base material.

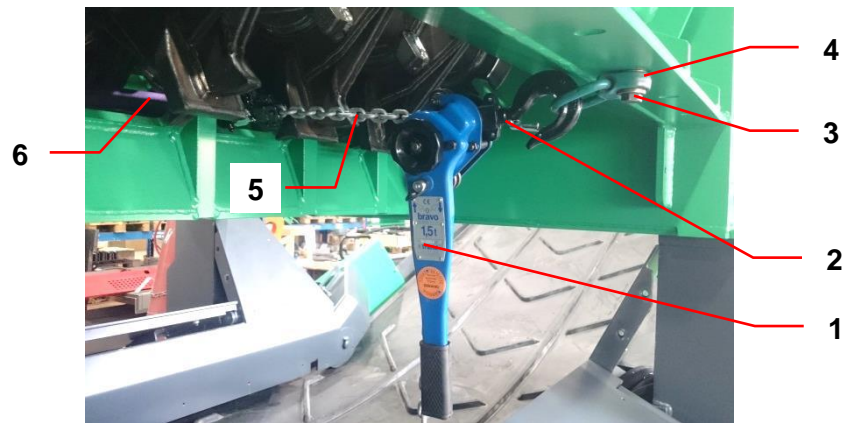


Legend:

1 = Webbing sling

2 = Primary shredding blade behind the webbing sling

- Tighten a webbing sling with a load capacity of up to 2 000 kg (4 409 lb) around two primary shredding blades facing each other at the centre of the shredding shaft that is to be welded.



Legend:

1 = Chain hoist (1 500 kg (1.65 tn))

2 = Rotating hook

3 = Eyelet with bolt

4 = Bore for bolt

5 = Load chain with hook

6 = Webbing sling

- The eyelet with the bolt is screwed into the bore in the frame above the other shredding shaft opposite the webbing sling.
- Hook the hook of the chain hoist into the eyelet.
- Pull the load chain with hook through the primary shredding blade of the shredding shaft.

Rewelding shredding shafts

- Hook the hook into the webbing sling.



Legend:

1 = Webbing sling

2 = Chain hoist

- The up-and-down movement of the chain hoist tightens the chain.
- This tension causes a rotational movement of the shredding shaft.
- Repeat the rotation as often as possible until the entire surface of the shredding shaft has been checked and treated.
- Use the same method to check the second shredding shaft.

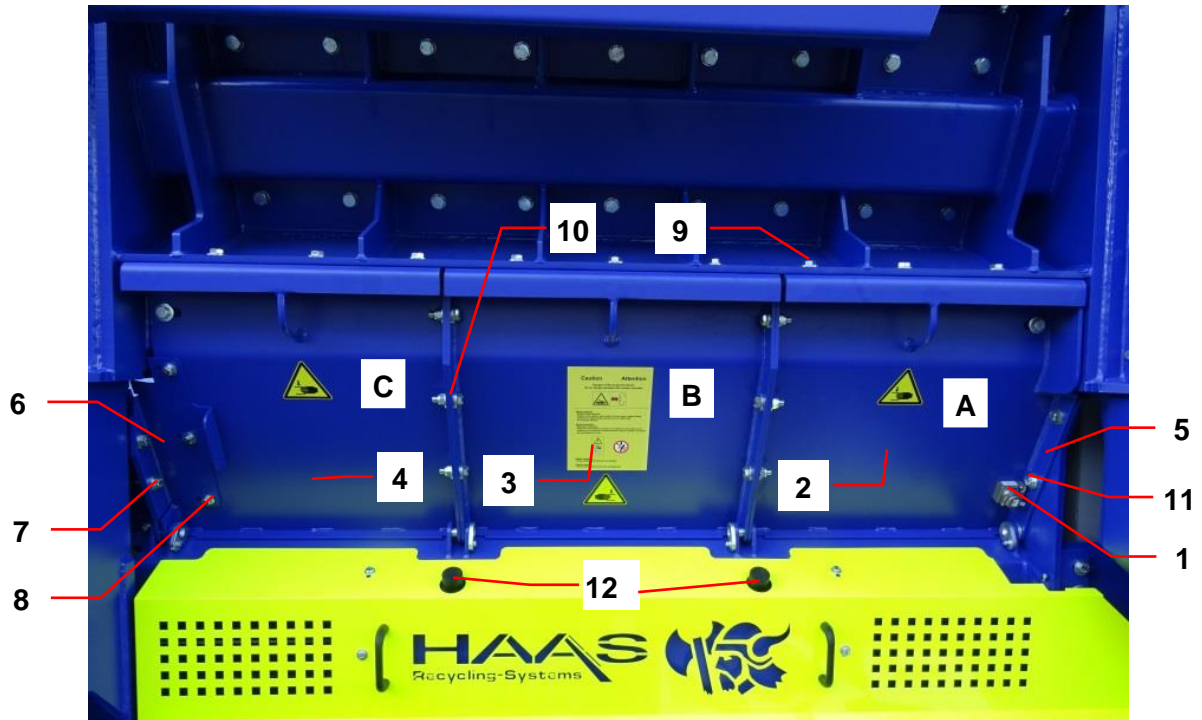
After the hardfacing of the shredding shafts, the area of the machine must be returned to its normal state.

This means:

- Remove the welding equipment.
- Clean the work area.

2.6 Closing the transfer flaps

When closing the transfer flaps, proceed in reverse order.



Legend:

1 = Bolt lock	2 = Transfer flap A
3 = Transfer flap B	4 = Transfer flap C
5 = Back panel	6 = Slider
7 = Bolted connection, front end, for 6	8 = Bolted connection, flush, for 6
9 = Bolted connection, upper edge	10 = Bolted connection, flanges
11 = Bolted connection, back panel	12 = Rubber buffer

ATTENTION

Replace any damaged screws/bolts!

Components may become loose.

- Damaged screws/bolts must be replaced without delay.

Rewelding shredding shafts

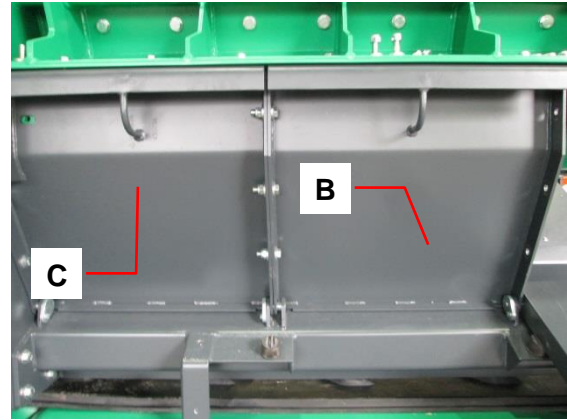
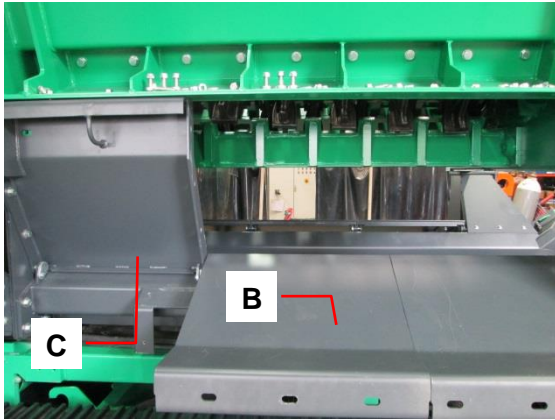


Note

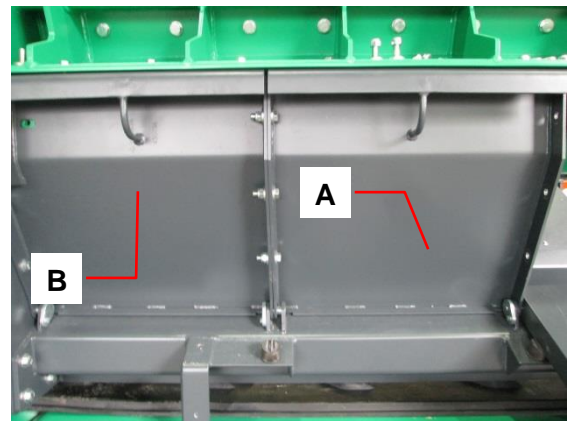
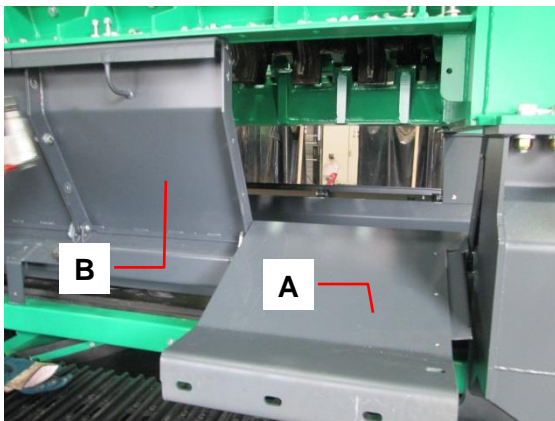
Use an impact wrench to tighten the screws.



1. Close flap C and secure it with the "Bolted connection, upper edge". However, do not tighten the connection too strongly at this point.



2. Close flap B and secure it with the "Bolted connection, upper edge". However, do not tighten the connection too strongly at this point.

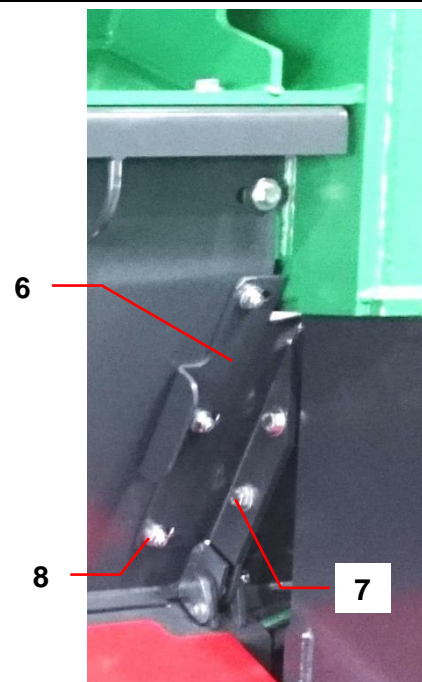
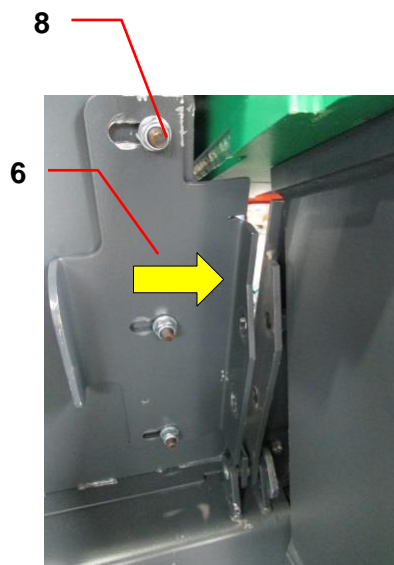


3. Close flap A and secure it with the "Bolted connection, upper edge". However, do not tighten the connection too strongly at this point.

Rewelding shredding shafts

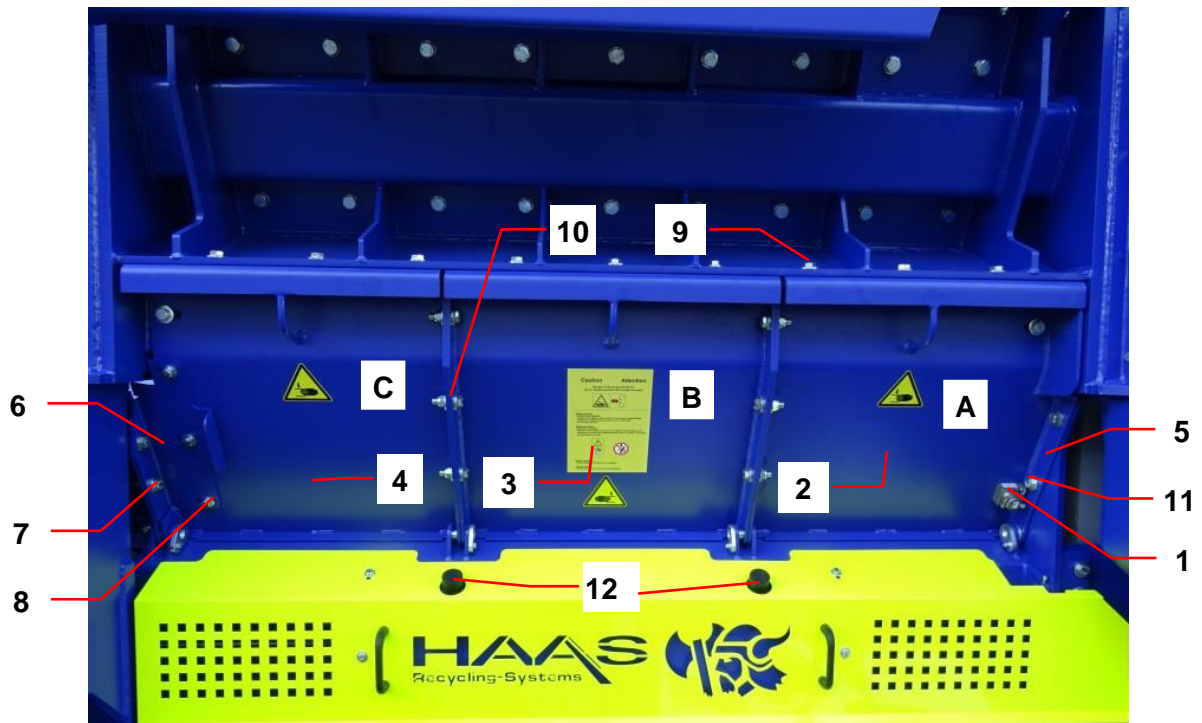


4. Complete the "Bolted connection, back panel".
5. Complete all of the "Bolted connections, flanges".



6. Push the slider forward horizontally.
7. Tighten the screws of pos. 7.
8. Tighten the screws of pos. 8.
9. Tighten all of the "Bolted connections, upper edge".

All of the transfer flaps are closed.



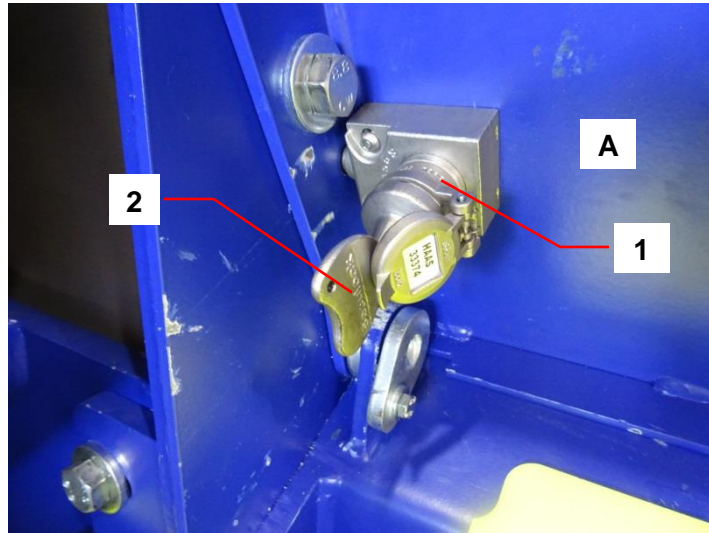
Legend:

1 = Bolt lock	2 = Transfer flap A
3 = Transfer flap B	4 = Transfer flap C
5 = Back panel	6 = Slider
7 = Bolted connection, front end, for 6	8 = Bolted connection, flush, for 6
9 = Bolted connection, upper edge	10 = Bolted connection, flanges
11 = Bolted connection, back panel	12 = Rubber buffer

Rewelding shredding shafts

2.7 Trapped-key interlocking system for closing the transfer flaps

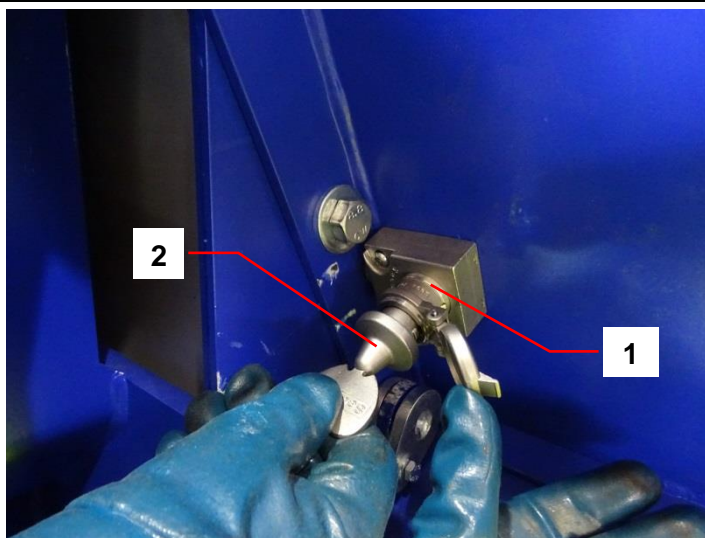
- To lock the transfer flaps, turn the key anti-clockwise.



Legend:

1 = Bolt lock

2 = Key position "transfer flap unlocked"



Legend:

1 = Bolt lock

2 = Key

- Remove key 1 or key 2 from the bolt lock.

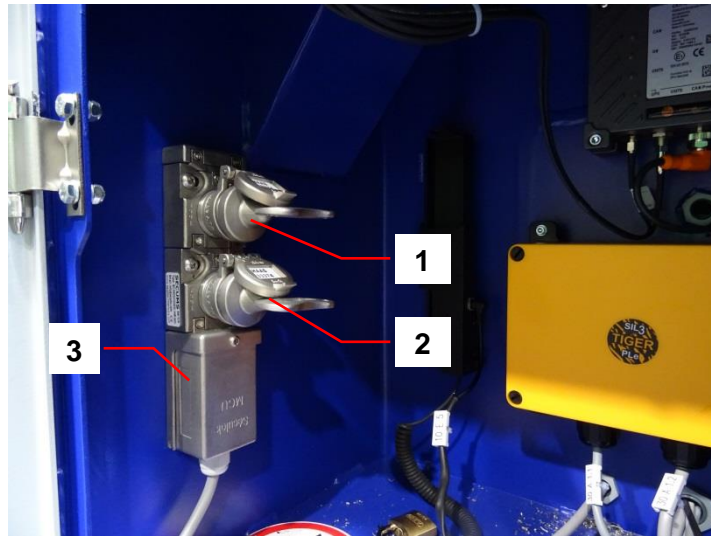


Legend:

1 = Bolt lock

2 = Transfer flap

All transfer flaps are closed.



Legend:

1 = Key 1

2 = Key 2

3 = Switch unit with 2 keys

- First, key 2 must be inserted and turned.
- As long as key 1 is not inserted, key 2 can be inserted and removed repeatedly without any consequences.
- Insert and turn key 1 in the same manner.
- Key 1 cannot be removed at this point.
- As a result, key 2 is trapped and cannot be removed.

The trapped-key interlocking system is reintegrated into the EMERGENCY STOP circuit.

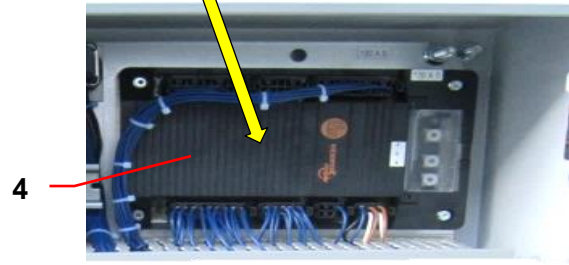
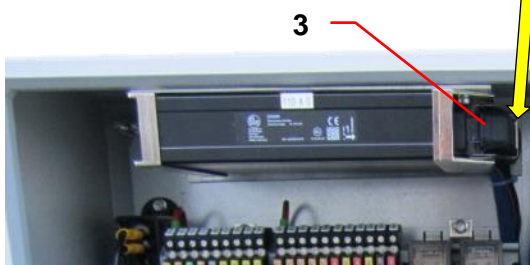
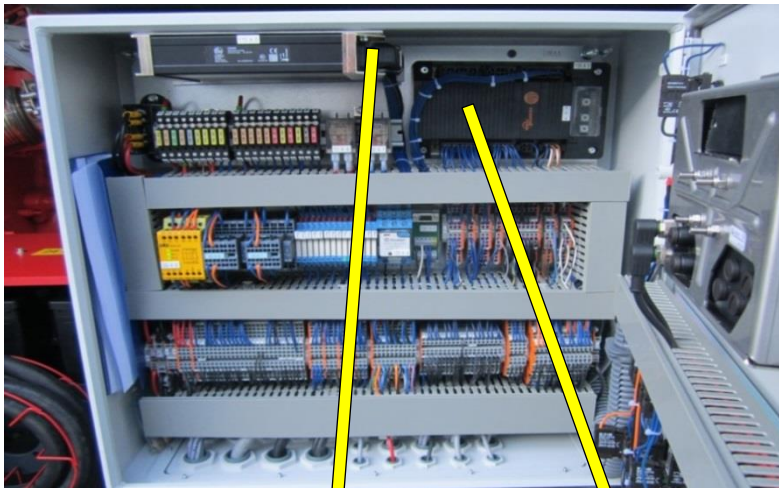
2.8 Connection of the connectors

NOTICE

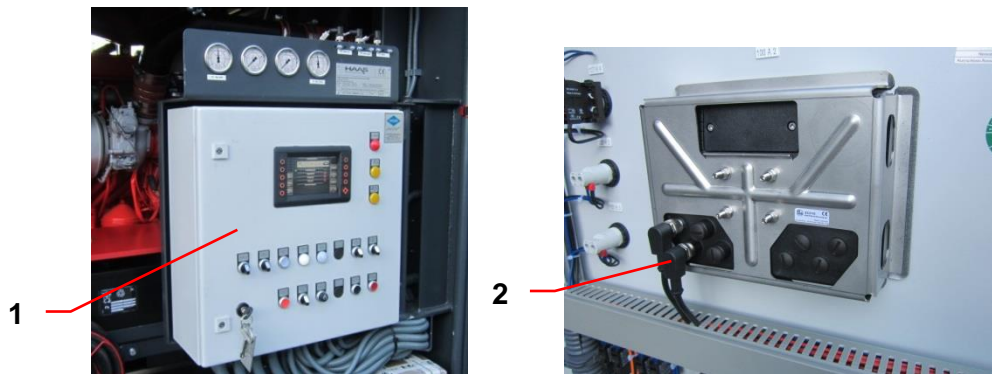
Be careful when connecting the connectors!

Damage to the control system is possible.

- Be careful when connecting the connectors to prevent damage to the control system.



Rewelding shredding shafts



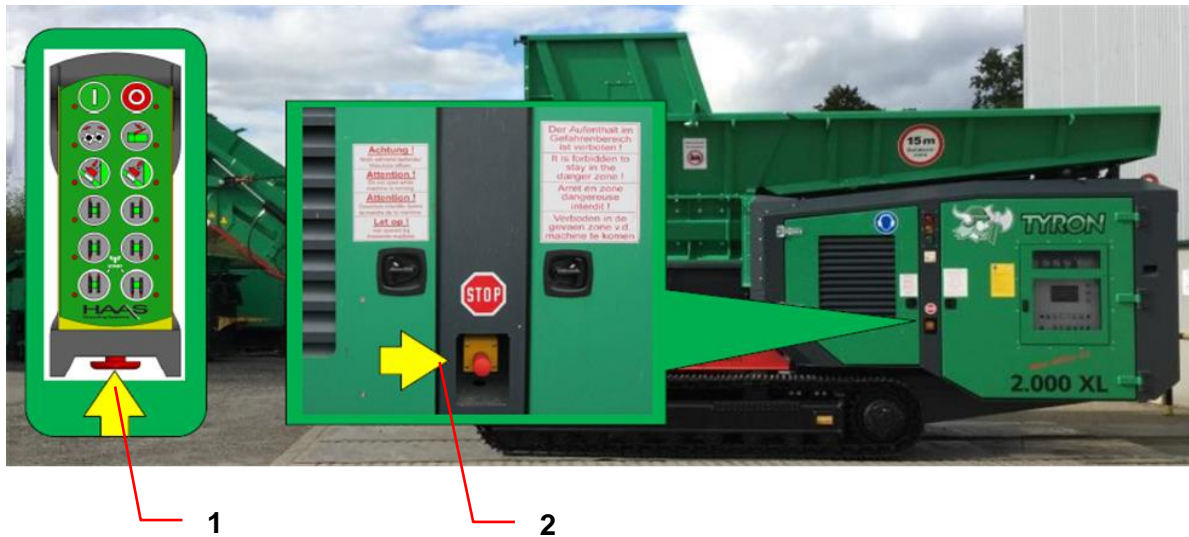
Legend:

1 = Control cabinet with display	2 = Back of the display with connectors
3 = Control connector with securing clip	4 = Connector at the control unit

- Connect all of the connectors at the control unit.
- Connect the control connectors and close the securing clip.
- Connect the connectors at the back of the display.
- Close the control cabinet with the display.

2.9 Recommission the machine

- Unlock the EMERGENCY STOP buttons.



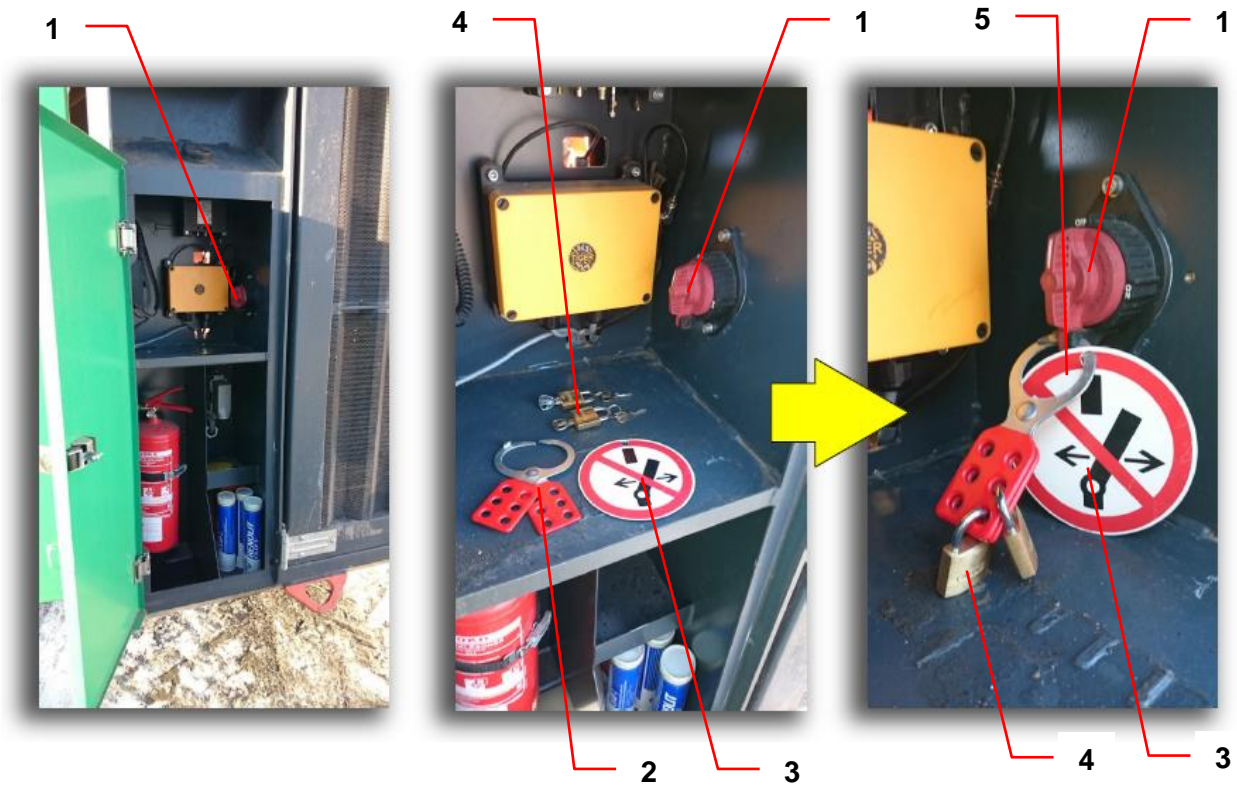
Legend:

1 = EMERGENCY STOP button on the remote control

2 = EMERGENCY STOP buttons on both sides of the machine

- Pull out all of the emergency stop buttons.

Rewelding shredding shafts



Legend:

1 = Battery master switch in "OFF" position (vertical)

3 = Prohibition sign (metal plate)
Caution: Repair work in progress. Do not switch on machine.

5 = Attachment of prohibition sign to multiple locking device and battery master switch

2 = Multiple locking device for 6 padlocks

4 = Padlocks

– Remove all of the padlocks and the multiple locking device.

The machine is ready for use.

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