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INSTALLATION, WELDING AND MAINTENANCE

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WELDING INSTRUCTIONS

General safety instructions

Before starting installation or removal, read all instructions completely. All persons performing maintenance and welding work must wear O.S.H.A. approved head protection, safety glasses, safety shoes and work gloves suitable to the task being performed. Work pieces must be securely held and supported. Ventilation and fume extraction must be good. All parts outweigh 25 kg (55 pounds) are designed with a lifting eye for use of lifting aid equipment.

Some advice about welding

First of all, clean the parts to weld. The surfaces to weld must be free from dirt, scale, rust, grease, paint, water etc. Grind the fitting surfaces of the adapter and cutting edge smooth. The top leg of the adapter must be in full contact with the top surface and bevel on the cutting edge in order to minimize residual stresses in the joint. Preheat the adapter as well as the cutting edge, extending 75 mm / 2.96 inches from the adapter, to recommended temperature shown in table B. Preheating will reduce the risk of hydrogen cracking, minimize the shrinkage stresses and avoid deformation.

It is recommended to preheat from the bottom side using burners with insulating blankets on the top side. The temperature shall be measured 75 mm / 2.96 inches from the welding area and on the opposite side of the heated side by using a temperature indicating crayon or an infrared thermometer. Maintain the temperature throughout the welding process. It is important to prevent hardness loss in the adapter and cutting edge by not exceeding the temperatures of 200-250 °C (424 - 546 °F). Keep on welding all adapters completely without any longer stops.

Let the work piece cool down slowly afterwords, not faster than 50 °C (106 °F) per hour. It is highly recommended to keep insulating blankets on the piece after finising welding.

Always use dry and undamaged electrodes. Electrodes in open package should be kept in a heating container at 100 °C (212 °F). If electrodes have become damp they should be dried in an oven for 8-10 hours at a temperature of 200 - 250 °C (424-546 °F). If the electrodes are damaged by humidity to the extent that they begin to rust, they should be discarded. Use soft welding consumables with a yield strength of up to 500 MPa. Such welding consumables reduce the residual stress level in the joint and thus the risk of hydrogen cracking.

General welding

Method	Filler material
MMA	AWS A5:1 E-7016, E-7018
	DIN 1913 E51 53 B10
	ISO 2560 E51 5B 120 20H
	UNE-AN 499 E423, E46B
	OK 48.00, OK 53.68
MIG / MAG	AWS A5.18 ER 70S-X
	DIN 8559 SG2
	UNE-EN 440 G46M, G50M
	OK Autorod 12.51, 12.64
FCAW	AWS A5.20 E 70 T5
	DIN 8559 SGB1 C 5254
	OK Tubrod 15.00

Table A

Preheating

Item	Preheating temp.
W10	200 °C / 424 °F
W20	200 °C / 424 °F
W25	200 °C / 424 °F
W30	200 °C / 424 °F
W40	200 °C / 424 °F
W50	200 °C / 424 °F
Heel shroud	150 °C / 334 °F

Table B

PREPARING THE LIP AND SIDE PLATES

The front edge of the lip must be beveled according to Figure 1. Cut the side plates to fit the shape of the upper adapter leg according to Figure 2 and table C.

When a V or spade nose lip is used we recommend producing a drawing to get the exact form and dimension of the front edge showing the number and position of the adapters, see Figure 3 and table D.

Bevel recommendation

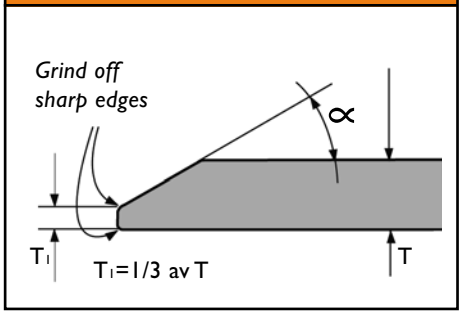


Fig. 1

Bevel ∝	
W10	30 °
W20	30 °
W25	30 °
W30	30 °
W40	30 °
W50	30 °

Table C

Side plates

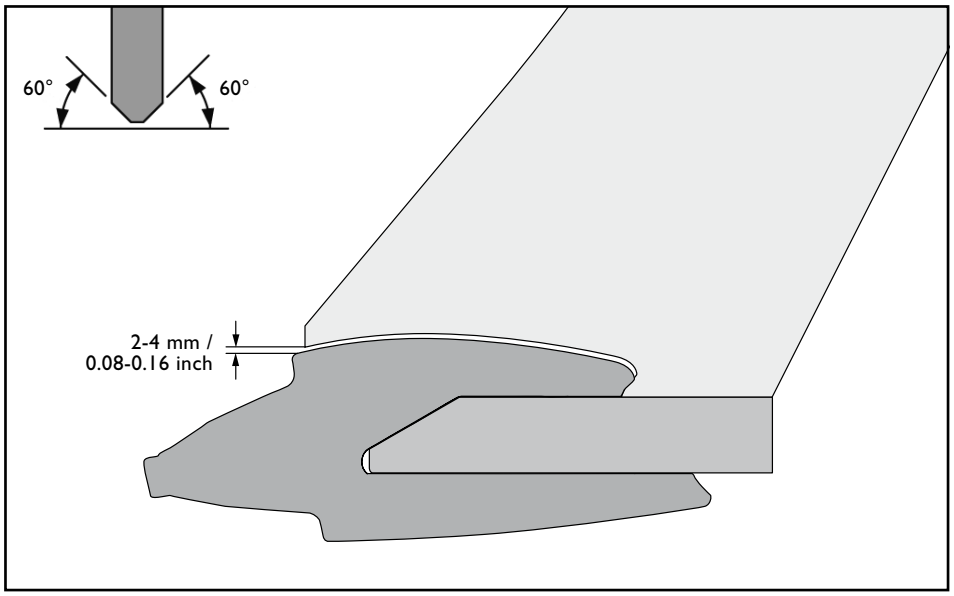


Fig. 2

Lip

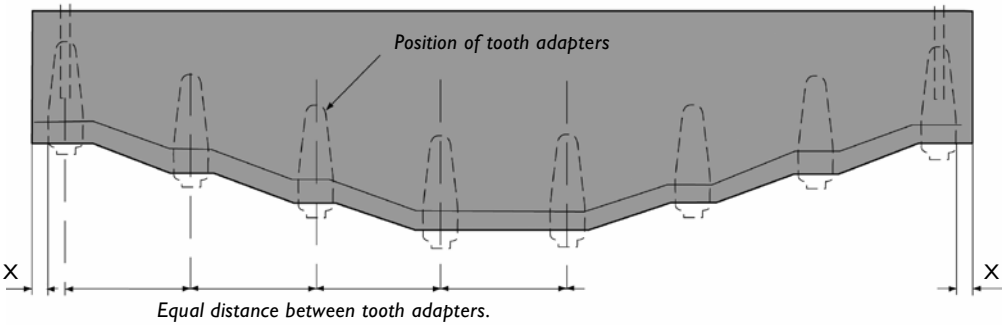


Fig. 3

Recommended placement of corner adapters	
Size	**DIM X**
W10	15 mm / 0.59 in
W20	20 mm / 0.79 in
W25	25 mm / 0.99 in
W30	25 mm / 0.99 in
W40	40 mm / 1.57 in
W50	50 mm / 1.97 in

Table D

WELDING THE ADAPTERS

Positioning of adapters

Position the adapters with equal spacing along the lip and tack weld them into postion, see Figures 4 and 5. Minimum lenght of the tack weld should be 50 mm / 2 inches and placed to the bottom of the weld groove in the adapter.

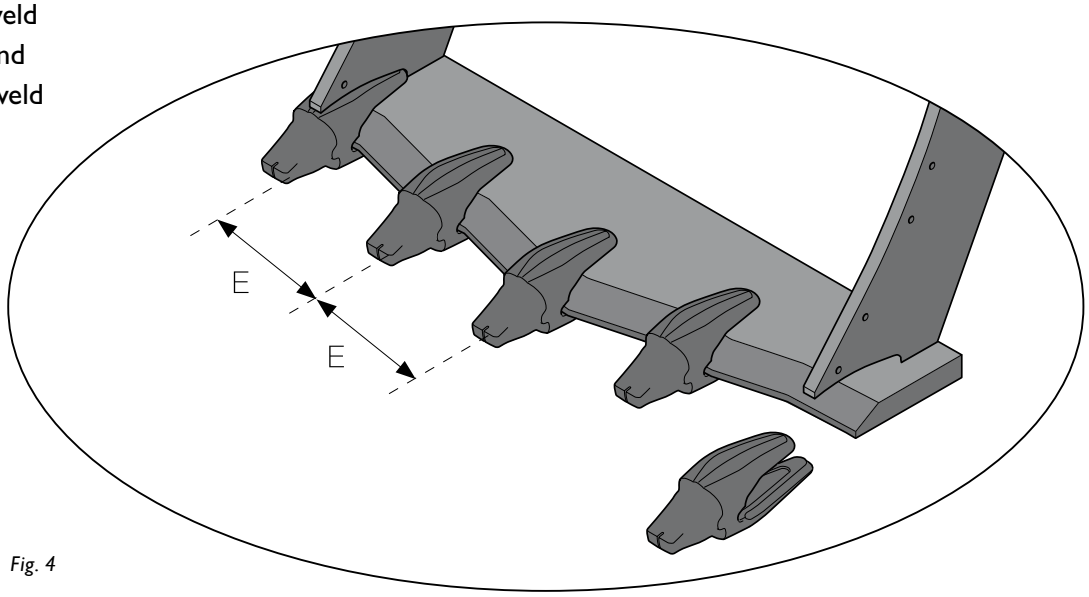


Fig. 4

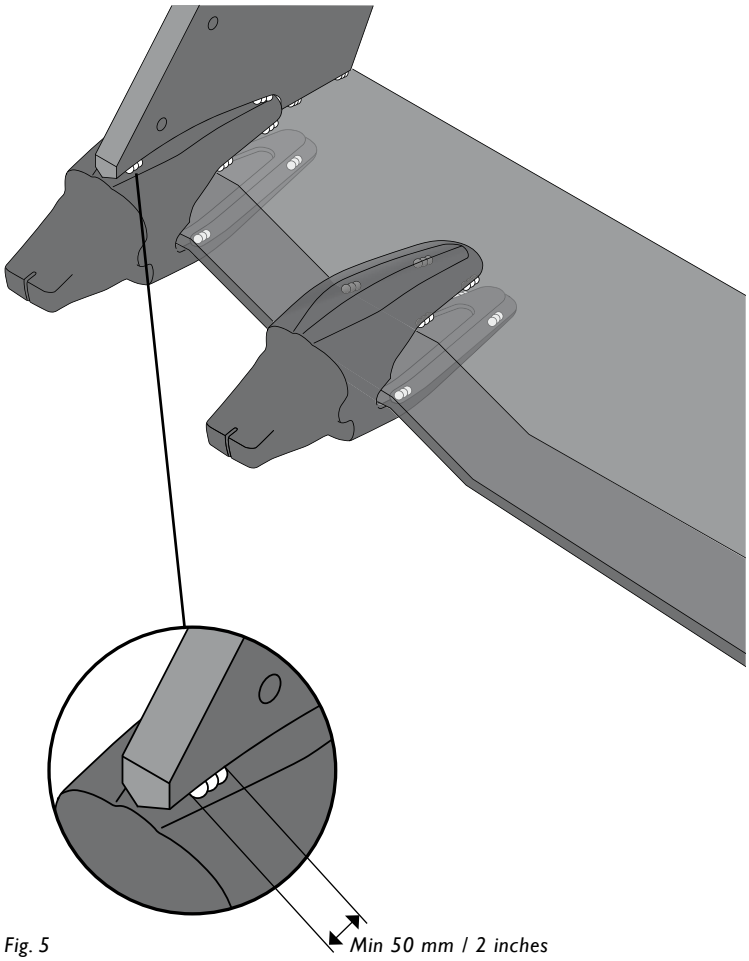


Fig. 5

Please note:
Tack welding for installing adapters are not different from the main weldings. The welding procedure and filler materials must be the same.

Welding sequence

Start welding the adapter in the middle, progressing alternately on each side towards the corner, in order to minimize distorsions on cutting edge, see Figure 6.

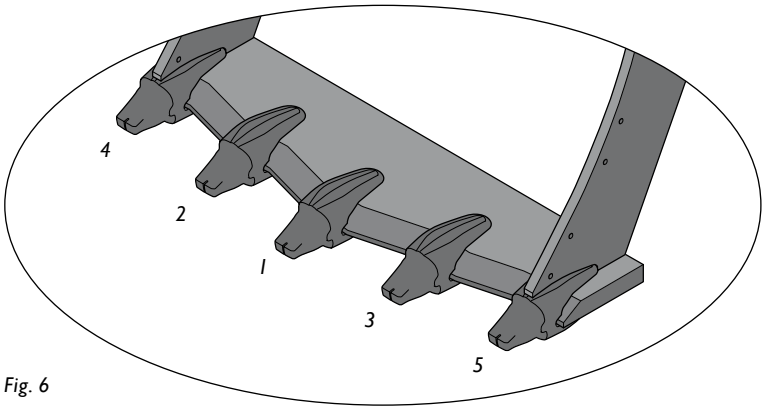


Fig. 6

Weld the adapters starting with the bottom leg first. Vary the length of the beads so that the starts and stops are not at exactly the same location. Follow welding sequences as shown in Figure 7.

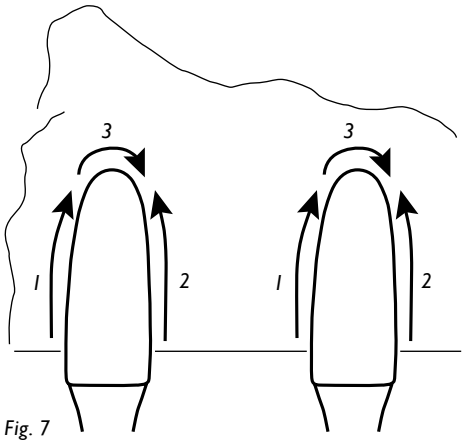


Fig. 7

Weld with small multiple runs following the weld groove in the adapter. Place the root beam at the bottom of the groove and continue welding as shown in sequences filling up to the groove in Figure 8 by alternating between bottom and top leg at the adapter. Clean each beam before applying next pass of weld; use a hammer for slag removal and a steel brush. Welding defect such as cracks, slag inclusions, porosities, overlaps and undercuts shall be removed by grinding.

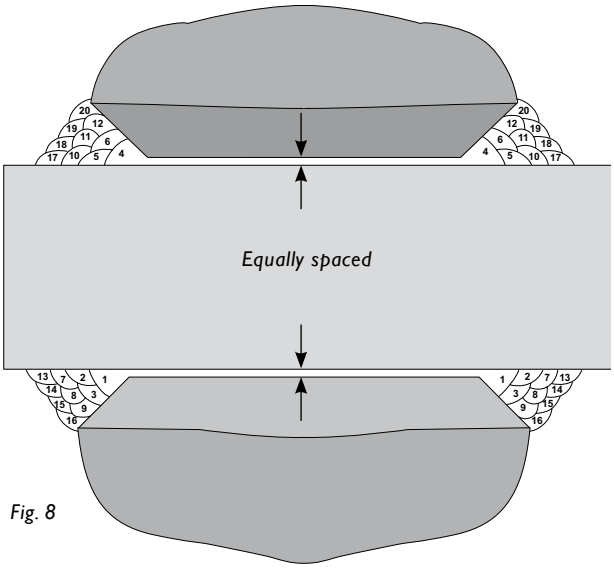


Fig. 8

Critical area

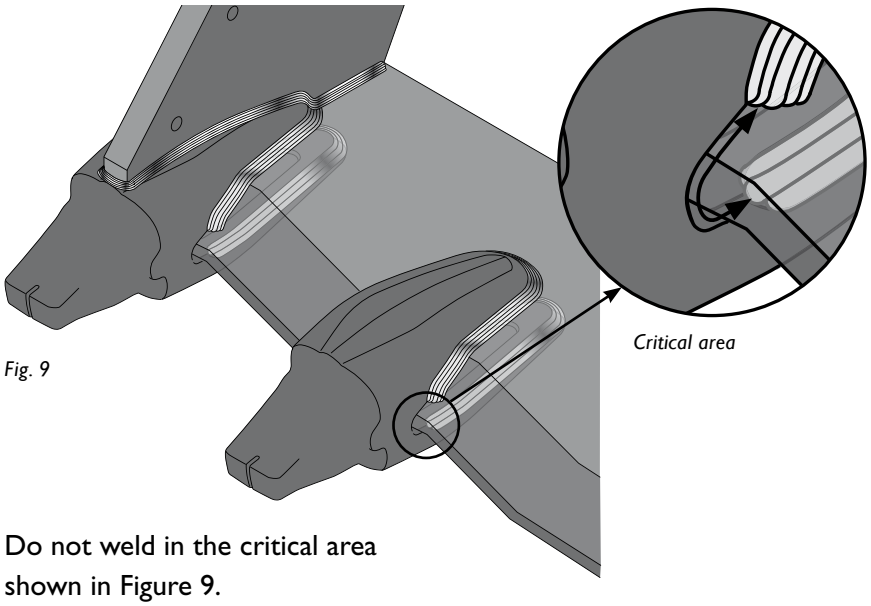


Fig. 9

Do not weld in the critical area shown in Figure 9.

Finishing of welds

Apply enough runs of weld to reach recommended size of welding as per figure Figure 10 and table E.

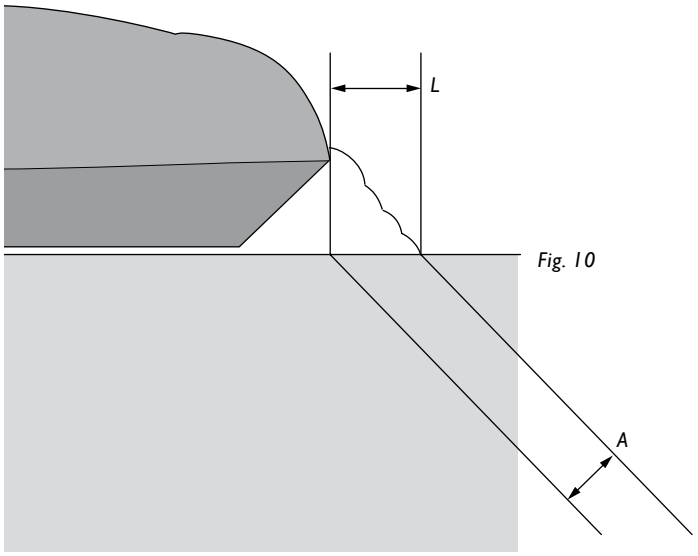


Fig. 10

When the assembly is cold, grind the welds smooth as shown in Figure 11.

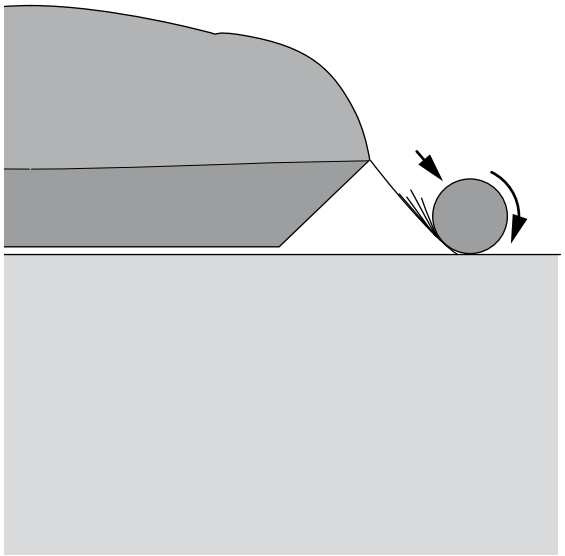


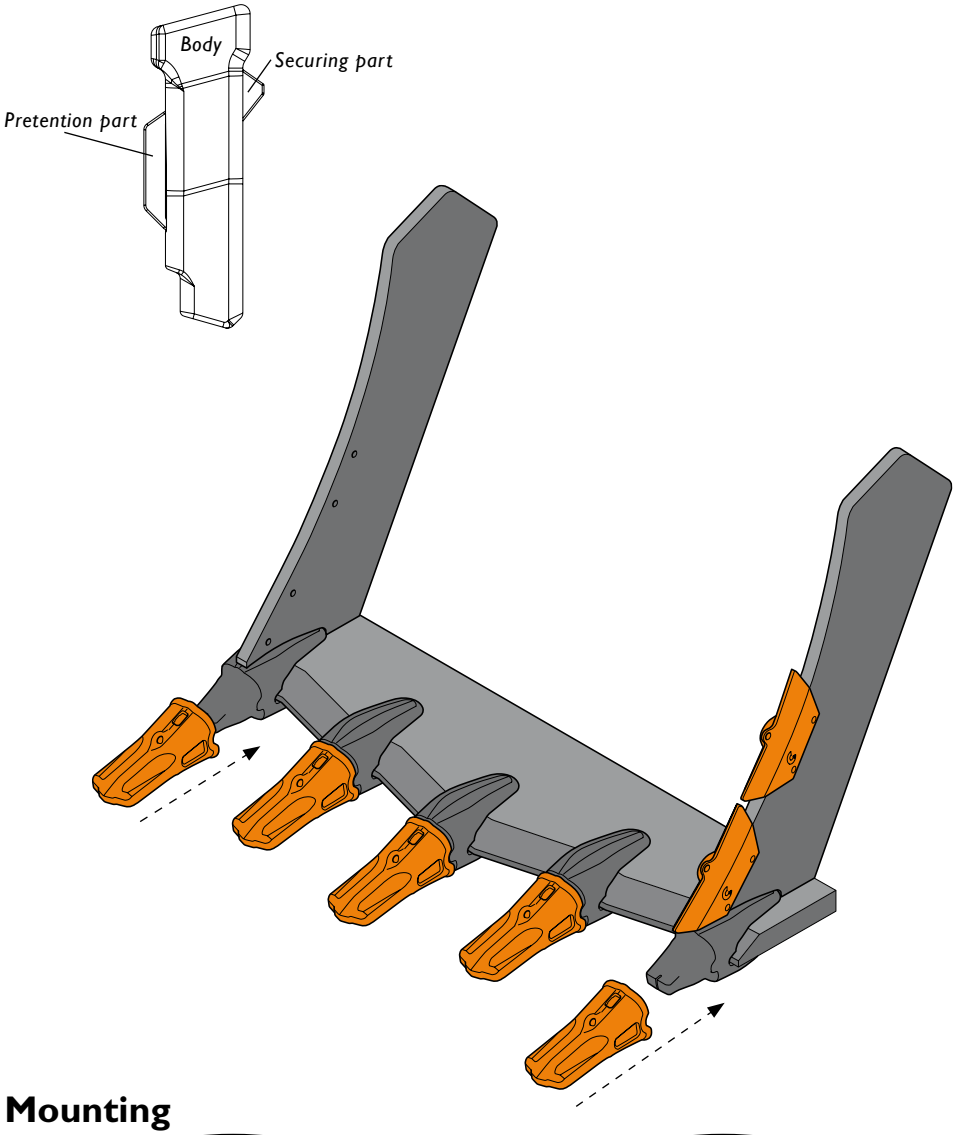
Fig. 11

Recommended welding size		
Size	**L**	**A**
W10	14 mm / 0.55 in	10 mm / 0.39 in
W20	16 mm / 0.63 in	12 mm / 0.47 in
W25	18 mm / 0.71 in	13 mm / 0.51 in
W30	20 mm / 0.79 in	14 mm / 0.55 in
W40	21 mm / 0.83 in	15 mm / 0.59 in
W50	22 mm / 0.87 in	16 mm / 0.63 in

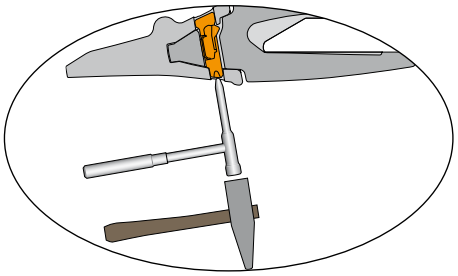
Table E

MOUNTING AND DISMOUNTING LOCK

Mounting and dismounting standard lock

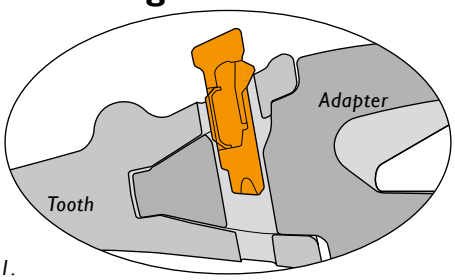


Dismounting

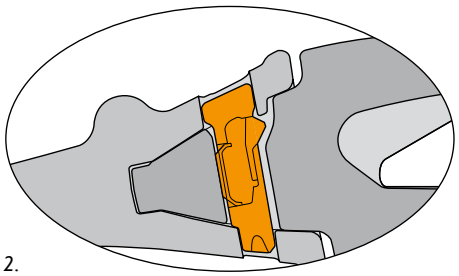


The lock is dismounted from the bottom. Place the dismounting tool in the recess in the lock. Tap the lock until it can be removed by hand.

Mounting



1.



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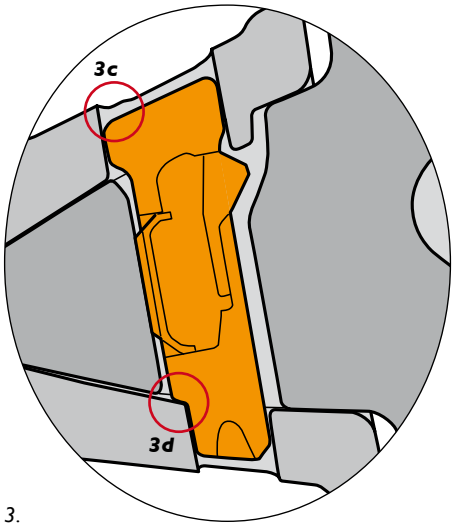


3.

1. The lock shall be mounted with the securing part facing into the bucket. The looking device can be mounted half-way by hand. At this point the tooth is securely attached to the adapter.

2. Tap the lock into place with a sledge hammer. When in place the lock is embedded in the tooth.

3. When lock is correctly mounted the lock should sit below the surface of the tooth (3c) and in (3d) contact at the bottom stop surface.

Mounting mechanical lock

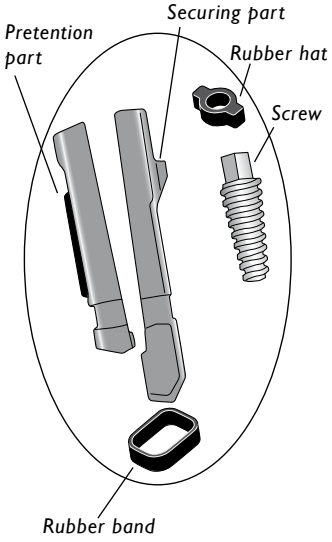
1. Mount the two halves together with the rubberband. Make sure that the tap at the bottom of the pretention half is placed in the groove on the securing part, see picture 1.

2. Place the assembly with the securing part facing into the bucket.

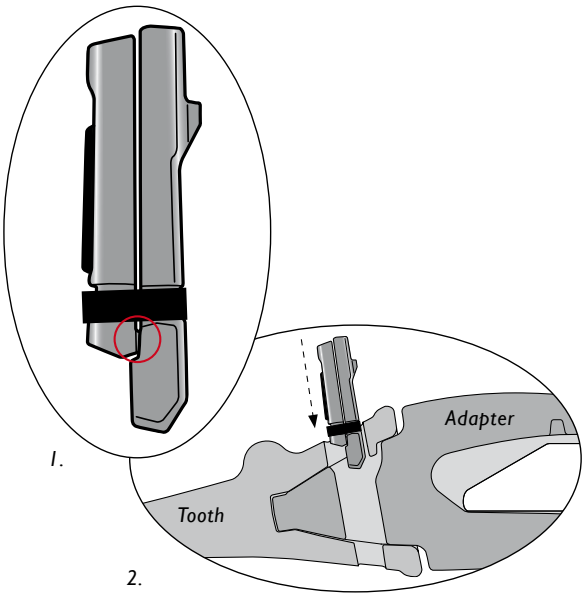
3. Push the assembly down into the adapter by hand. Make sure that the securing part is situated under the tap in the tooth (3a) and that the pretention part is in contact with the stop surface in the tooth (3b).

4. Place the screw in the assembly and tighten to the recommended torque in tabel F.

5. Mount the rubber hat on the head of the screw.



1.



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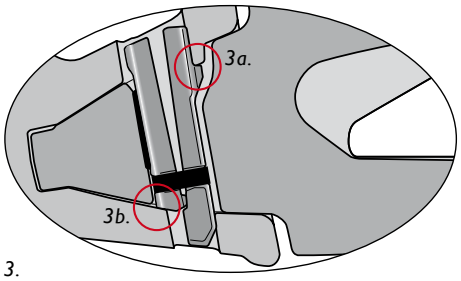

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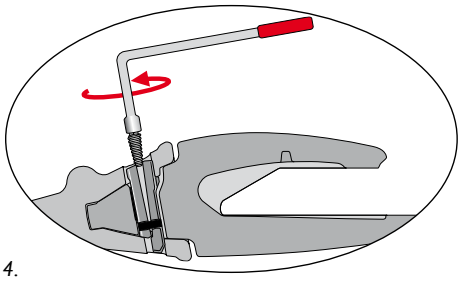
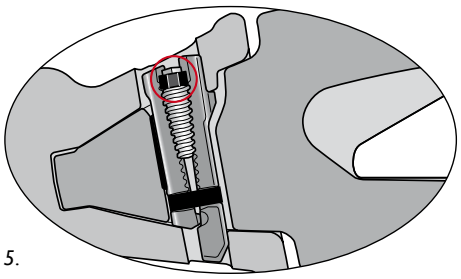


4.

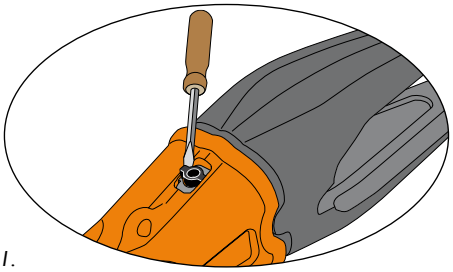


5.

Mounting the screw		
Size	**Max torque**	**Socket**
W10	100 Nm	11 mm / 0.43 in
W20	120 Nm	13 mm / 0.51 in
W25	160 Nm	15 mm / 0.59 in
W30	190 Nm	17 mm / 0.67 in
W40	190 Nm	19 mm / 0.75 in
W50	190 Nm	19 mm / 0.75 in

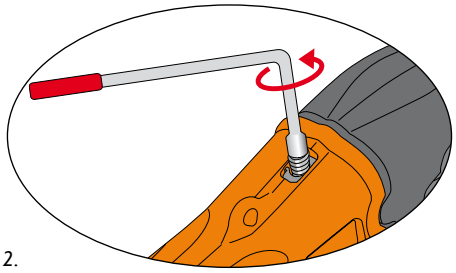
Table F

Dismounting mechanical lock



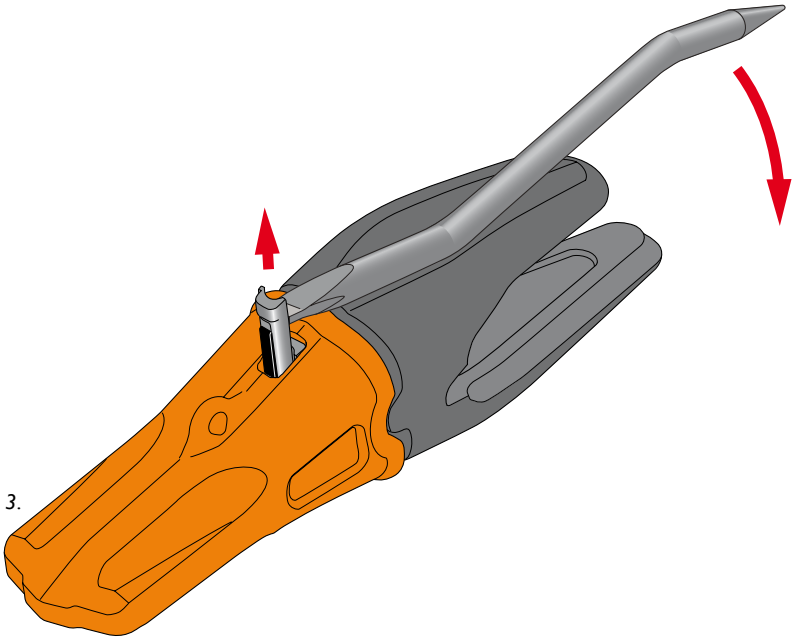
1.

1. Remove the rubber hat. Clean from dirt around the head of the screw.



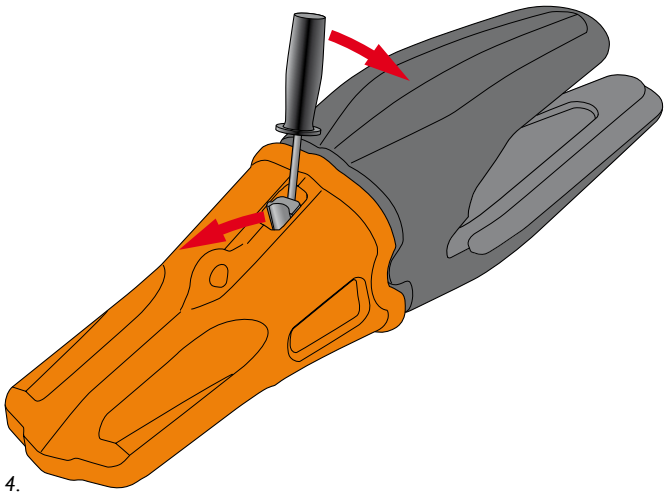
2.

2. Unscrew and remove the screw.



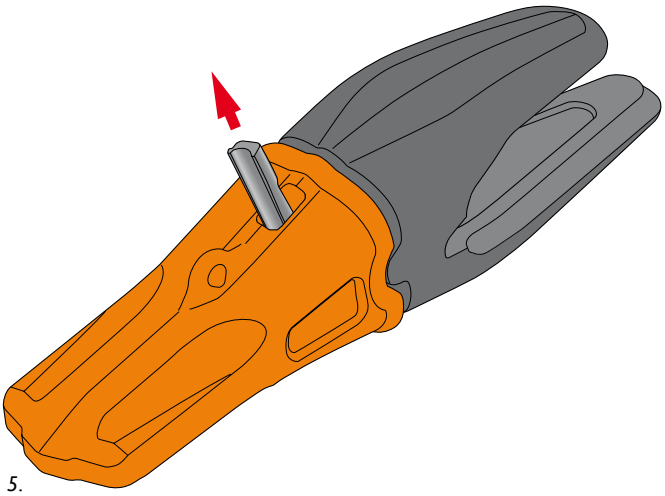
3.

3. Remove the front half of the lock with the tool placed in the groove.



4.

4. Push the securing part forward to release the tap from the tooth.



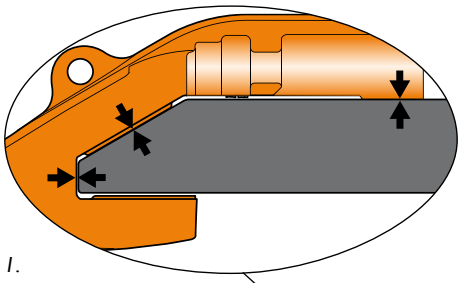
5.

5. Lift the securing part and remove the lock.

MOUNTING SHROUDS

Mounting mechanical lip shrouds

1. Place the shroud on the lip. Make sure that there is contact in the three areas as shown in the picture.



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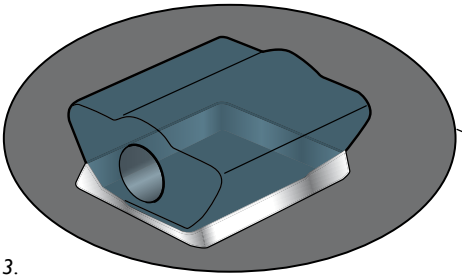
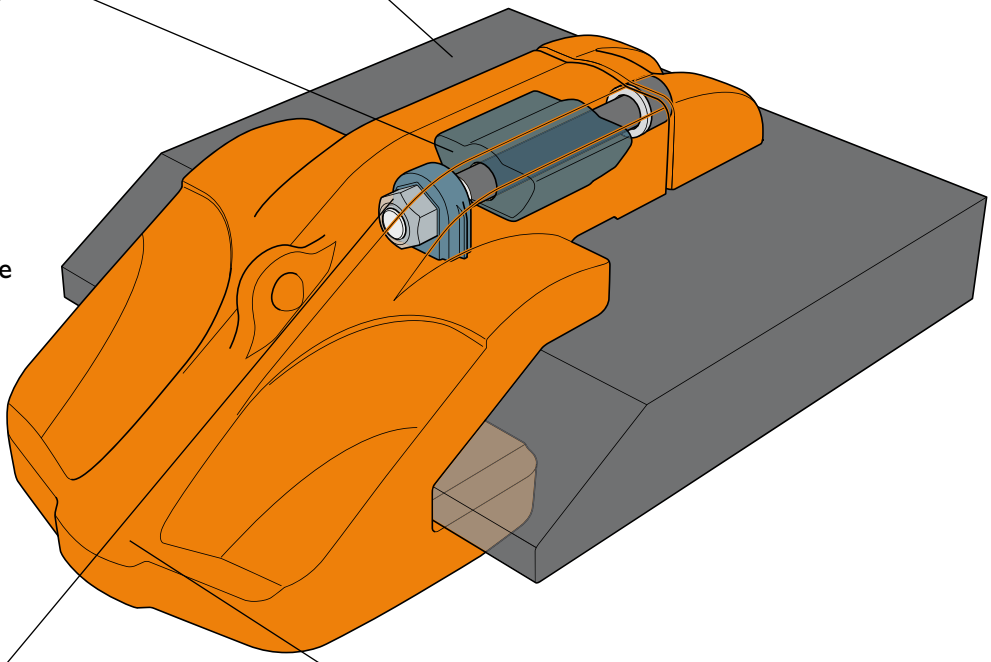
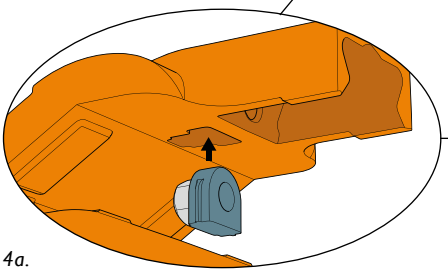


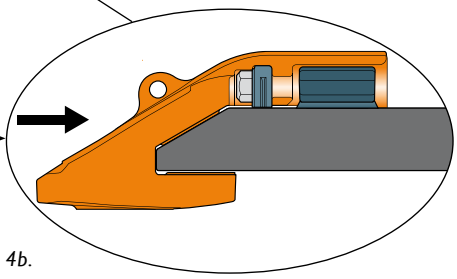
3.

3. After removing the shroud complete welding of rail. Preheat to 150 °C (334 °F).





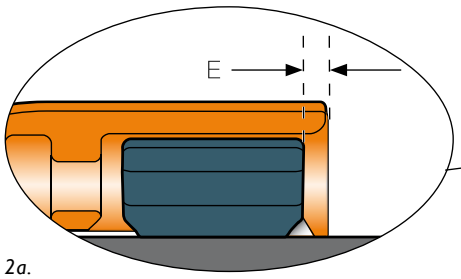
4a.



4b.

4. Place the lock in the recess inside the shroud and slide it back on to the rail.

2. Place the rail inside the slot following the E measurement in Table G.
Spot weld the rail when placement is correct.



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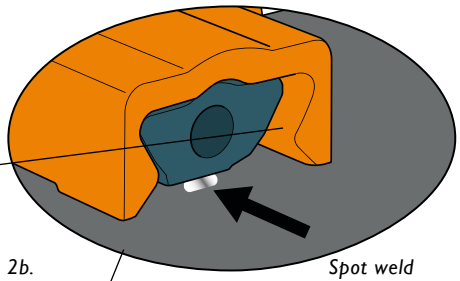
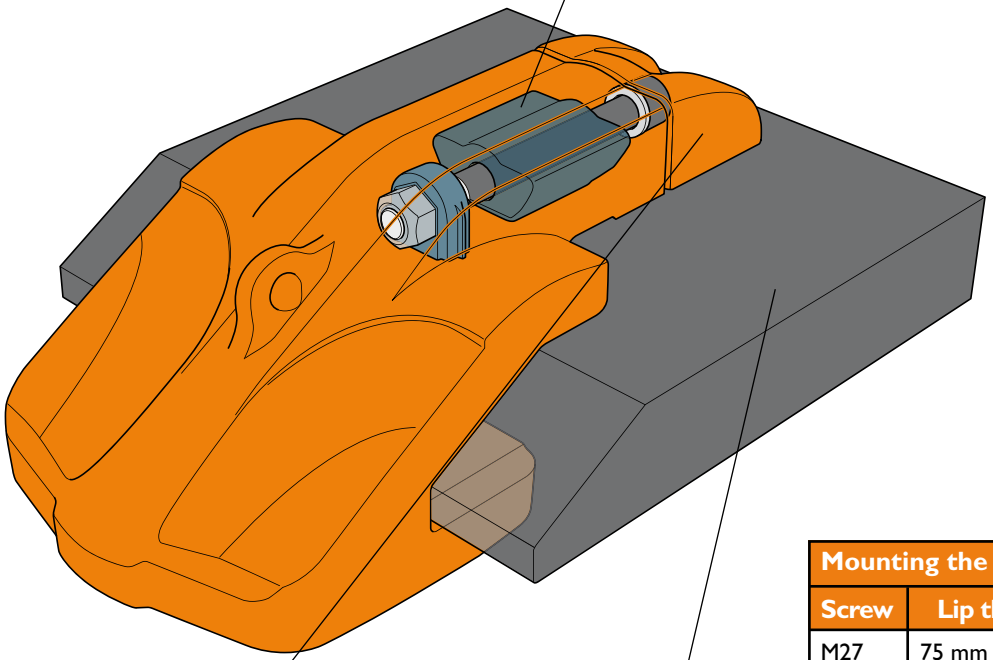


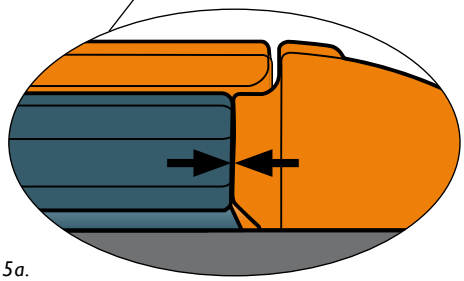
2b.

Spot weld

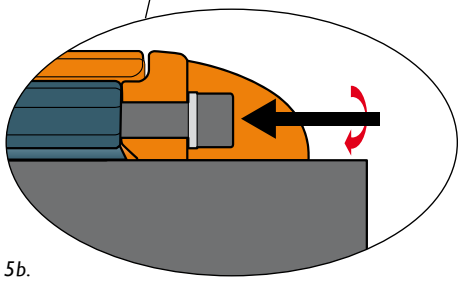


Mounting the screw			
Screw	**Lip thickn.**	**E**	**Max. torque**
M27	75 mm / 2.96 in	15 mm / 0.59 in	1620 Nm
M27	90 mm / 3.55 in	15 mm / 0.59 in	1620 Nm
M30	100 mm / 3.94 in	16 mm / 0.63 in	2210 Nm
M30	120 mm / 4.73 in	19 mm / 0.75 in	2210 Nm

Table G



5a.

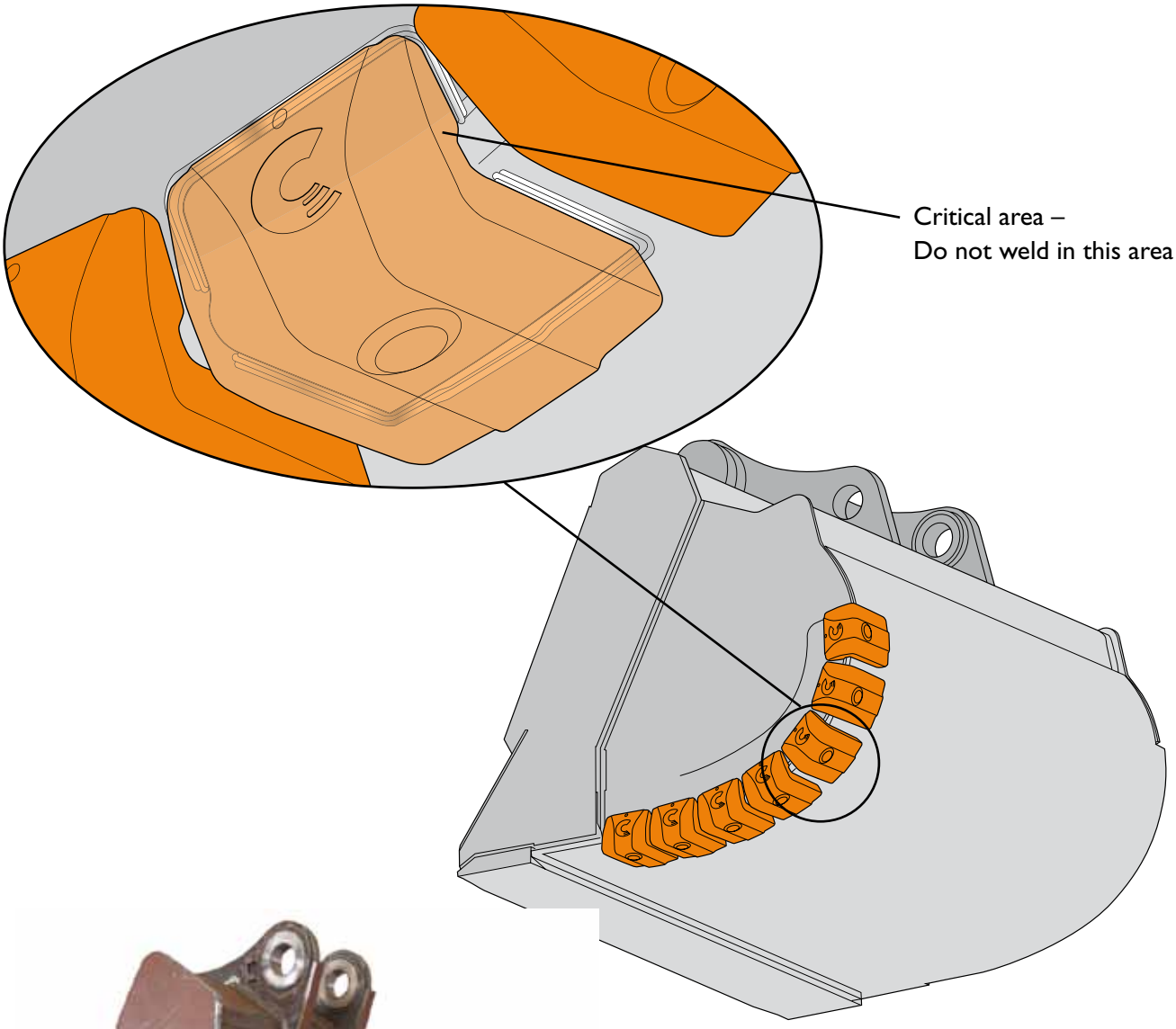


5b.

5. Put the bolt protector in place and tighten the screw to recommended torque in Table G.

Welding heel shrouds

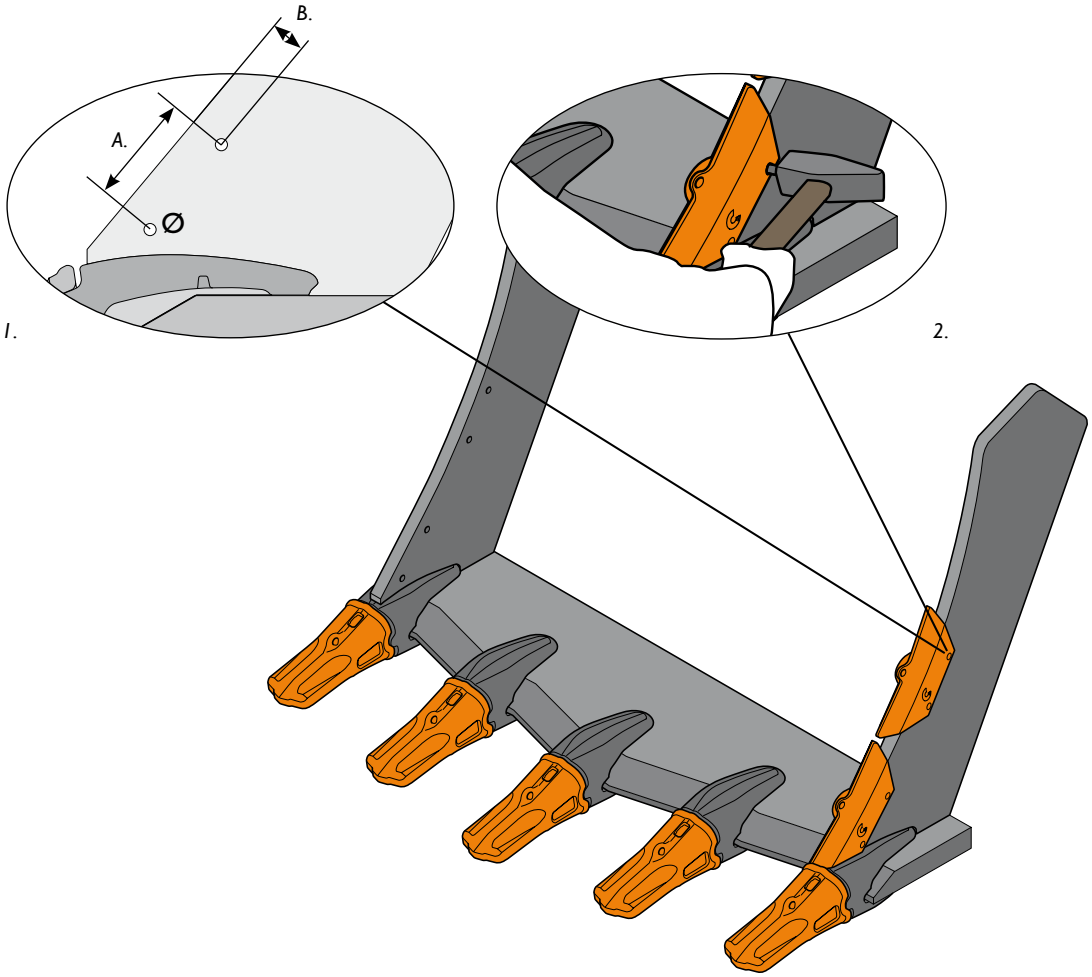
Tack weld the heel shrouds in position, preheat them to 150 °C (334 °F) before adding the welding beams.



Mounting side shrouds

1. Cut the side wall and drill holes accordidng to table H.

2. Use pin and ring to fasten the side shroud. The ring is placed in the pocket inside the shroud. Use a hammer to drive the pin into locked position in the ring. Make sure that the ring is securely locked in the groove on the pin.



Pattern for drilling				
Shroud	**Side wall**	**A**	**B**	**Ø**
700602	50 mm / 1.97 in	190 mm / 7.49 in	64 mm / 2.52 in	23 mm / 0.91 in
700603	60 mm / 2.37 in	220 mm / 8.68 in	75 mm / 2.96 in	27 mm / 1.06 in
700601	65 mm / 2.56 in	220 mm / 8.68 in	75 mm / 2.96 in	27 mm / 1.06 in

Table H

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combi wear parts

move the earth

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