



887

Service Instructions

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Introduction

This service booklet contains the instructions for setting the sewing machine head mechanisms.

The directions for putting the machine into operation and for setting the positioning drive are contained in another publication.

The service booklet is common for all subclasses of the machine and contains also the instructions for setting optional accessories of the machine, if this is necessary owing to their complexity. Provided the machine supplied does not contain some elements, then the respective chapters may be ignored.

The succession of the setting operations is expressed here by sequencing the paragraphs of this booklet. When setting, check up, if the setting operations related to this setting have already been performed.

General safety instructions

The non-observance of the following safety instructions can cause bodily injuries or damages to the machine.

1. The machine must only be commissioned in full knowledge of the instruction book and operated by persons with appropriate training.
2. Before putting into service also read the safety rules and instructions of the motor supplier.
3. The machine must be used only for the purpose intended. Use of the machine without the safety devices is not permitted. Observe all the relevant safety regulations.
4. When gauge parts are exchanged (e.g. needle, presser foot, needle plate, feed dog and bobbin) when threading, when the workplace is left, and during service work, the machine must be disconnected from the mains by switching off the master switch or disconnecting the mains plug.
5. Daily servicing work must be carried out only by appropriately trained persons.
6. Repairs, conversion and special maintenance work must only be carried out by technicians or persons with appropriate training.
7. For service or repair work on pneumatic systems, disconnect the machine from the compressed air supply system (max. 7-10 bar). Before disconnecting, reduce the pressure of the maintenance unit. Exceptions to this are only adjustments and functions checks made by appropriately trained technicians.
8. Work on the electrical equipment must be carried out only by electricians or appropriately trained persons.
9. Work on parts and systems under electric current is not permitted, except as specified in regulations DIN VDE 0105.
10. Conversion or changes to the machine must be authorized by us and made only in adherence to all safety regulations.
11. For repairs, only replacement parts approved by us must be used.
12. Commissioning of the sewing head is prohibited until such time as the entire sewing unit is found to comply with EC directives.
13. The line cord should be equipped with a country-specific mains plug. This work must be carried out by appropriately trained technicians (see paragraph 8).



It is absolutely necessary to respect the safety instructions marked by these signs.

Danger of bodily injuries !

Please note also the general safety instructions.



Service Instructions for the Class 887

(Edition 09.2015)

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1 General

These service instructions describe the adjustments that can be made to the class **887** special sewing machine.



CAUTION!

The operations described in these service instructions may only be carried out by qualified staff or other appropriately trained persons!



Caution: Risk of injury!

Turn the main switch off for repair, conversion and maintenance work and separate the machine from the pneumatic supply line.

Any adjustment work and functional testing with the machine running should be conducted only under observance of all safety measures and with the greatest possible caution.

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These service instructions describe the adjustment of the sewing machine in a logical order. Please observe that various setting positions are dependent on each other. Thus it is essential that the settings be conducted while keeping to the order described.

For all adjustments of parts involved in the stitch formation, a new undamaged needle must be inserted.

This text does not specifically mention any machine covers or panels which must be removed or re-mounted in order to conduct inspections or adjustments.

Note

Some shafts on the special **887** machine are provided with flat eccentric surfaces. This significantly simplifies machine adjustments.

For all adjustments on flat surfaces, the first screw screwed in the direction of the eccentric surface.

1.1 Setting gauges

The retention pin required for adjusting the machine is included with all units. It is located with the machine accessories and can be attached so that it is easily accessible below the oil tray.

1.2 Adjusting the handwheel

Rule:

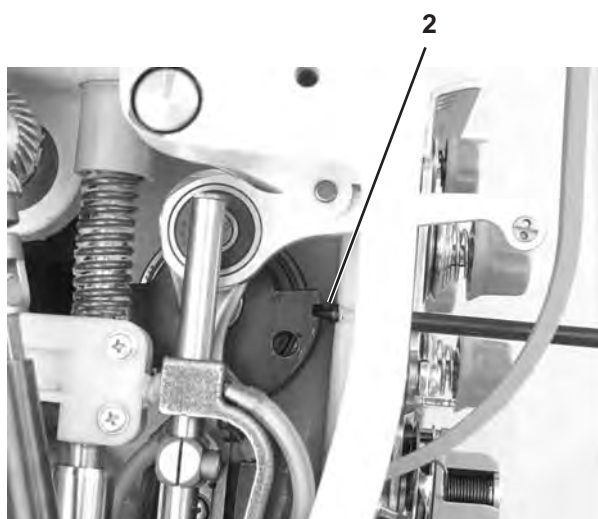
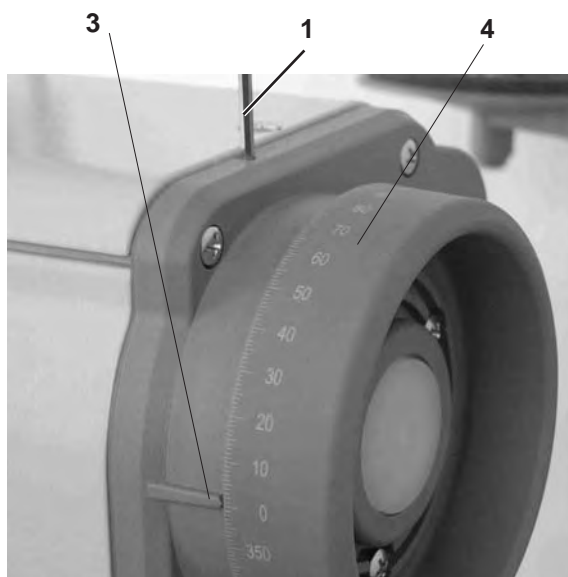
The handwheel (4) is labelled with degree numbers.

Certain adjustments are made with these marked handwheel positions.

- Turn the handwheel until the degree value specified in the instructions is aligned with the pointer (3).
- Proceed with the adjustment described.

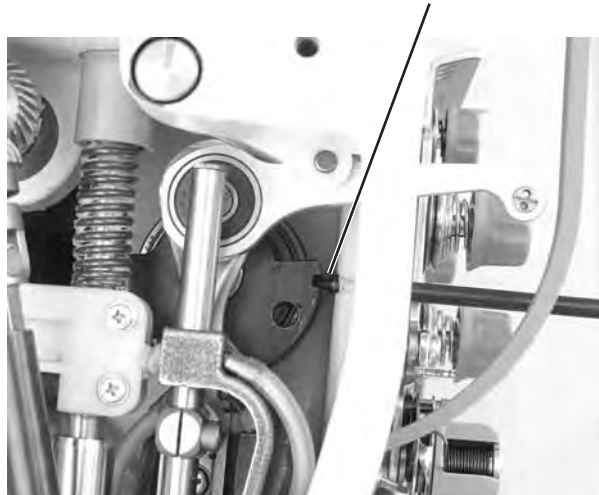
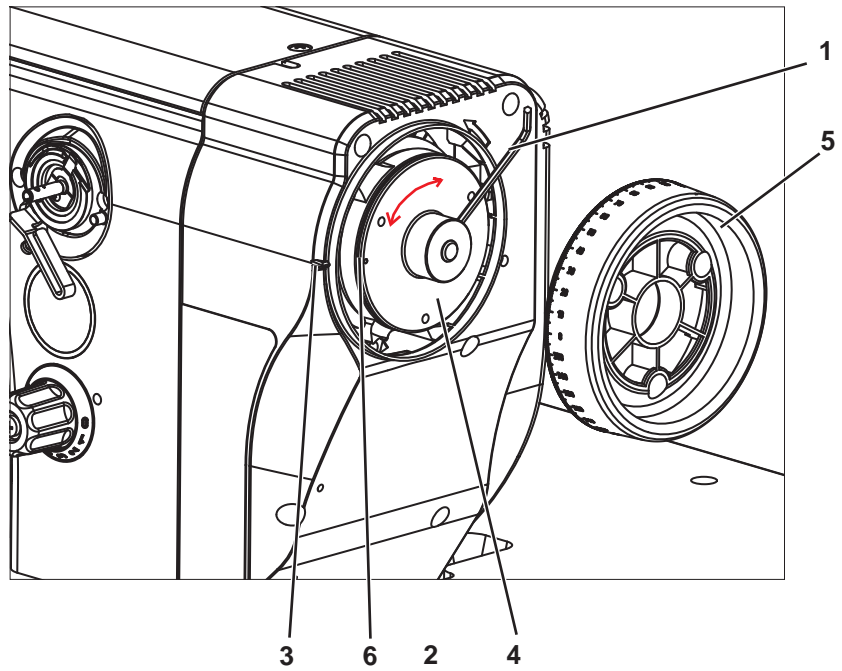
When the needle bar is at top dead centre, the pointer (3) should be aligned with “0” degrees.

1.2.1 Sewing machines with minimotor



- Loosen the handwheel screws with a 3 mm Allen key (1).
- Position the needle bar in the upper dead centre position. Use the retention pin (3 mm diameter) to peg the position (2).
- Turn the handwheel so that the pointer (3) points to 0 degrees on the rotary scale.
- Tighten the first screw with the Allen key (1). Turn the handwheel to 50° and tighten the second screw with the Allen key (1).

1.2.2 Sewing machine with direct drive



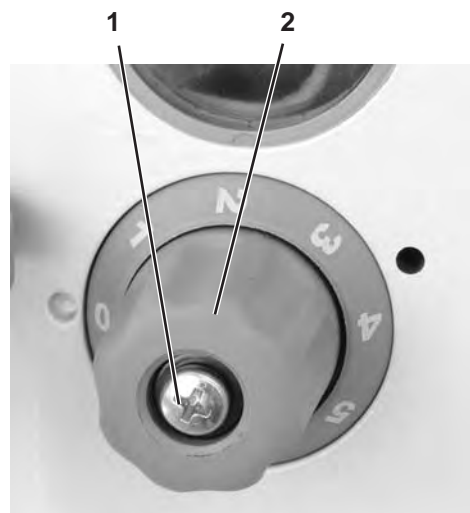
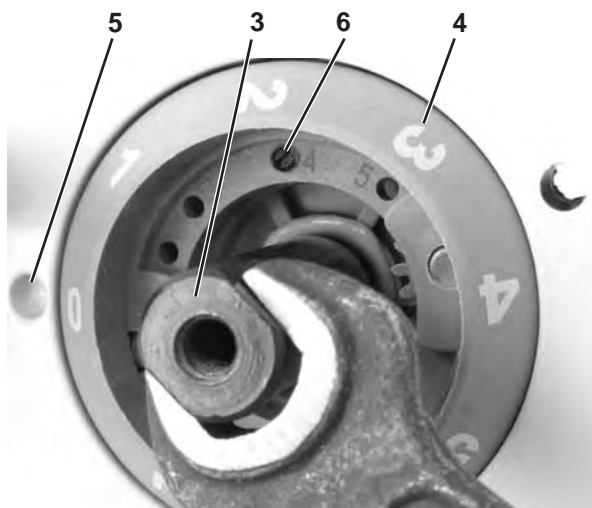
- Unscrew three fixing screws on the hand wheel (5) and remove it.
- Put the needle in the upper dead point and insert the setting pin (2), which is a part of the sewing machine accessories and which is fixed on the oil tray bottom side, into the crank head.
- Loosen two setting screws of the hand wheel flange (4) with the Allen key 3 mm (1).
- Turn the hand wheel flange with the hollow (6) against the sign (3).
- Tighten both setting screws with the key (1) and fix the hand wheel on again.

2 Bottom feed

2.1 Basic setting for stitch adjustment and stitch length limit

Rule:

1. When setting the stitch length at "0", the stitch regulator gear should have as little play (clearance) as possible when you press down on the bartacking lever.
2. The maximum stitch length limit depends on the material to be sewn and the sewing equipment being used (see operating instructions).



- Loosen screw (1) and take off the settings dial (2).
- Turn the screw (3) as far as needed to the right using a 10 mm open-ended wrench. Verify that the stitch regulator gear is without motion by pressing down on the bartacking lever. This fulfils rule 1.
- Set the scaling ring (4) with stitch length "0" to align with the circular mark (5).
- Limit the stitch length according to rule 2. For this, screw the retention pin (6) into the proper hole. The holes are marked with numbers which indicate the maximum stitch length.
- If a maximum stitch length of 7 mm is required, unscrew the screw (6) for 2.5 mm. Another end stop is available for this length.
- Put the settings dial (2) back on and tighten the screw (1).



Caution: Risk of injury!

Turn the main switch off.

Only carry out this basic stitch adjustment when the machine is turned off.



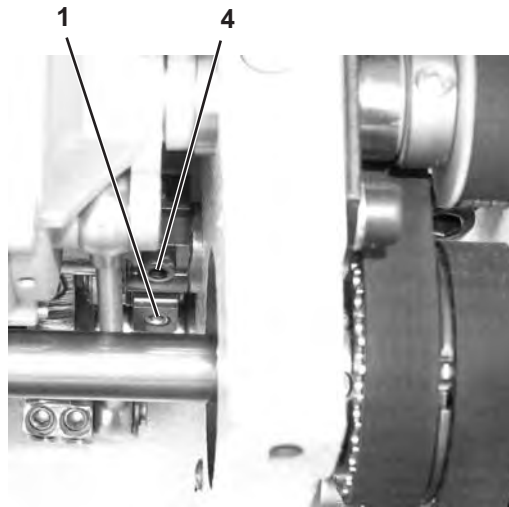
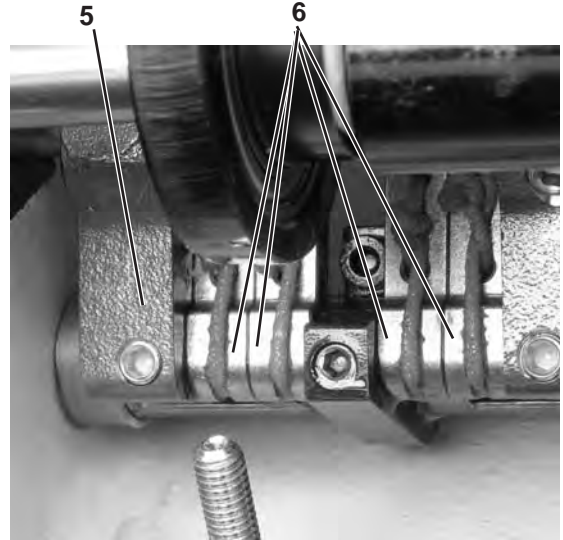
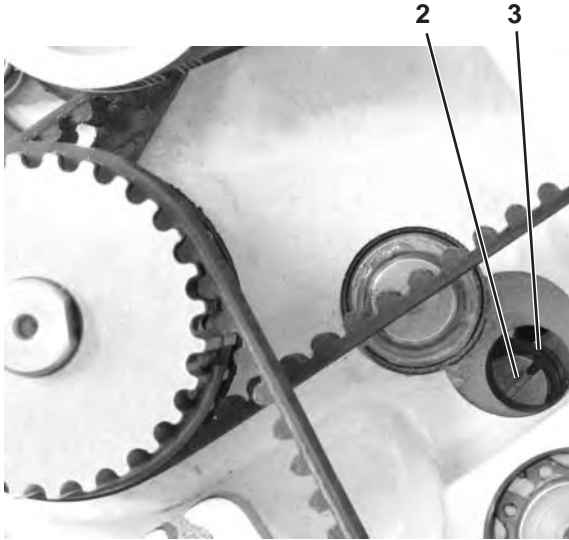
ATTENTION: Danger of breakage!

If the set stitch length is larger than allowed by the sewing equipment in use, then the needle will hit against the throat plate insert.

2.2 Stitch uniformity for forwards and reverse stitching

Rule:

1. When making a rough-scale adjustment to the stitch regulator gear, the machine should not feed when the stitch length is set to "0".
2. When making a fine-scale adjustment to the stitch regulator gear, the forwards and reverse stitch lengths should only deviate in value by a half stitch.

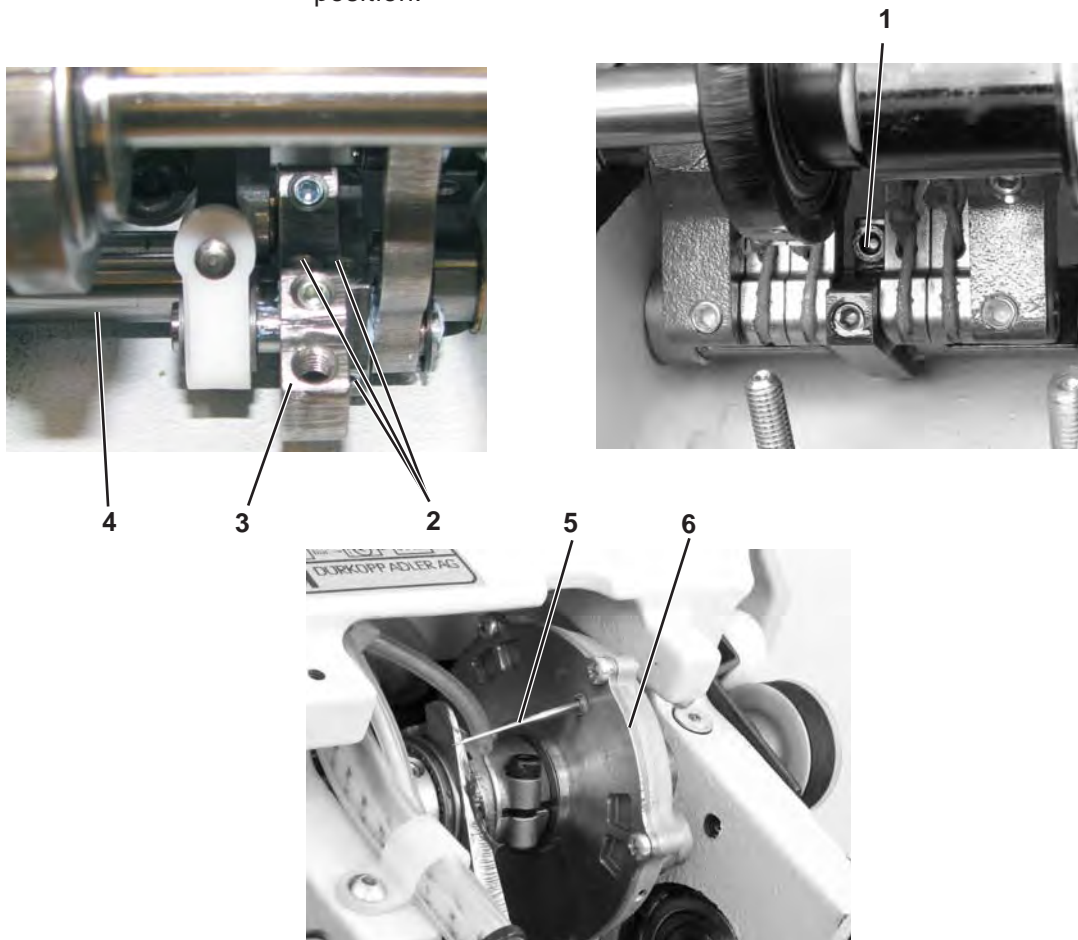


- Set the stitch length to "0".
- Loosen screw (1) and turn the grooved (3) eccentric tappet (2) according to the illustration. Fasten with screw (1).
- Loosen screw (4) on the clamping lever. Turn the settings frame (5) so that the shackles (6) are parallel. Tighten screw (4). This then fulfils rule 1.
- The next step is to match up the forwards and reverse stitch lengths. Sew ten stitches forwards. Press the bartacking lever and then sew ten stitches backwards. Rotate the eccentric tappet (2) so that rule 2 is fulfilled.
- Clockwise = increase forward stitch, decrease reverse stitch.
- Counter-clockwise = decrease forward stitch, increase reverse stitch.

2.3 Adjusting of feed shaft position and clutch lever position

Rule:

When setting the stitch length to "0" the groove on the feed shaft front side is in the vertical position. The feed clutch should be in the central position.



- Set the stitch length to "0".
- Loosen the screw (1).
- Loosen four screws (2) on the lever (3).
- Turn the shaft (4) so that the groove on its front side is in the vertical position.
- Tighten the screw (1).
- Unscrew the screw on the feed clutch (6) and insert the needle (5) into the hole left after it. Turn the clutch (6) with hand until the needle (5) fits 5 mm inwards. This fulfils the rule.
- Tighten the four screws (2).
- Remove the needle (5) and screw the screw back again.



Caution: Risk of injury!

Turn the main switch off.
Only carry out this adjustment when the machine is turned off.



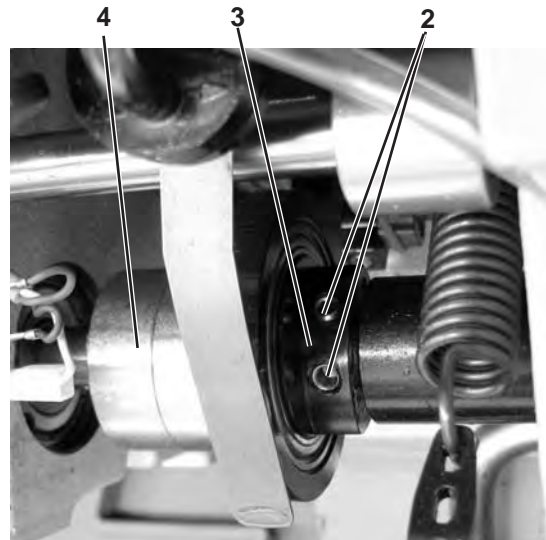
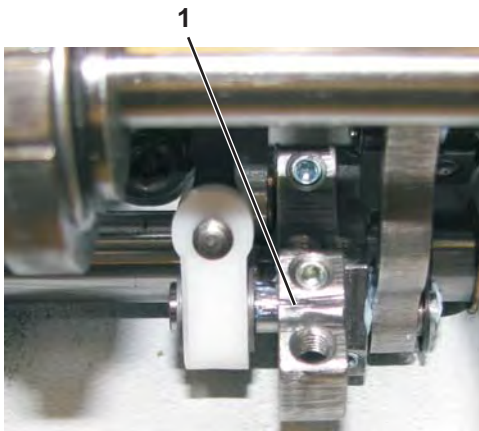
ATTENTION: Danger of breakage!

With large stitch lengths, it is possible that parts within the clutch will collide if the middle working range of the clutch is not maintained.

2.4 Position of the eccentric tappet for the feed movement

Rule:

When the handwheel pointer indicates “0” degrees, the feed lever (1) should not move when the bartacking lever is pressed down.



- Turn the handwheel so that the pointer indicates “0”.
- Loosen screws (2). To make the rough-scale adjustment, turn the eccentric tappet (3) so that it is approximately in the position shown in the illustration. Now make the fine-scale adjustment to the eccentric tappet. Continue until you have found the position where the feed lever (1) no longer moves when the bartacking lever is pressed down.
- Tighten screws at eccentric tappet (3).
- Fasten the weight (4) in the opposite position to the eccentric (3).



Caution: Risk of injury!

Turn the main switch off.

Only carry out this eccentric adjustment when the machine is turned off.



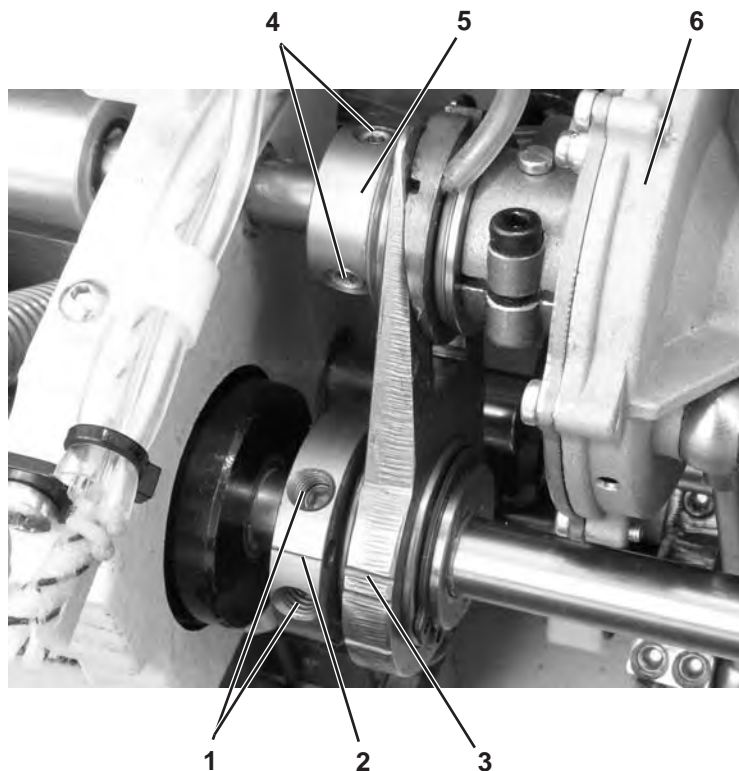
ATTENTION: Danger of breakage!

Imprecise settings can shorten the lifespan of the machine.

2.5 Switching over the feed clutch

Rule:

The clutch should be switched over when it is motionless (i.e., when it is in the dead centre point of its pendulum motion).



- Loosen the screws (1) on the eccentric tappet (2).
- Turn the eccentric tappet (2) so that the dash is aligned with the other dash (3).
- Loosen the three screws (4). Loosen the adjusting nut (5).
- Tighten the adjusting nut (5) until you feel it strike (the tightening increases in jumps). Push the clutch (6) to the right until the end stop is reached. Tighten the screws (4).
- Verify the adjustment. Turn the eccentric tappet with your hand in the other direction. The resistance during the rotation of the eccentric tappet should increase significantly when the two dashes are lined up.



Caution: Risk of injury!

Turn the main switch off.

Only carry out this adjustment when the machine is turned off.



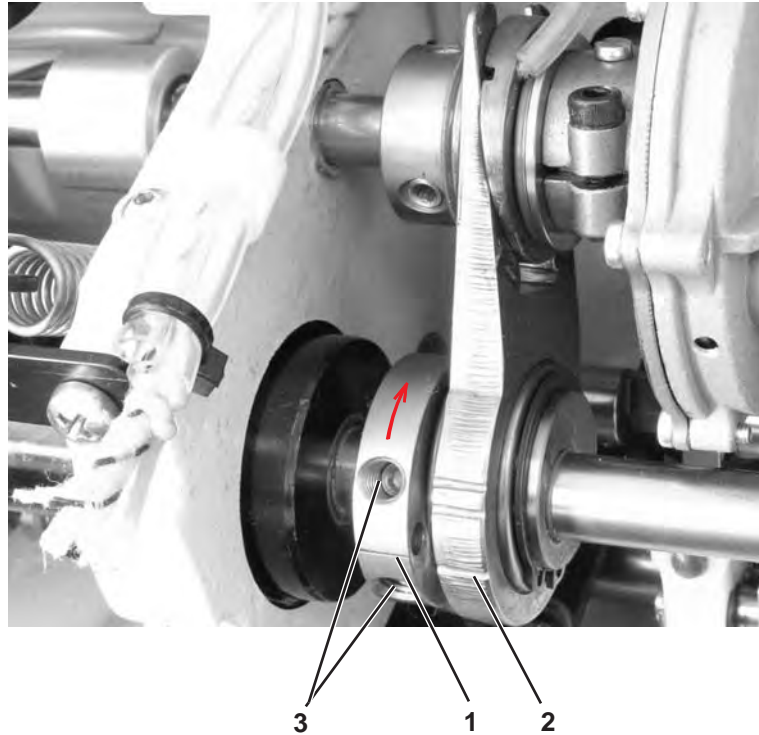
ATTENTION: Danger of breakage!

Imprecise settings can shorten the lifespan of the machine.

2.6 Position of the eccentric tappet for the switch over of the feed clutch

Rule:

When the handwheel pointer indicates “313” on the scale, the dash (1) on the eccentric tappet should be lined up with the lower dash (2) on the V-shaped push rod.



- Loosen screws (3).
- Turn the handwheel to position “313”.
- Turn the eccentric tappet in the direction of arrow so that dash (1) is lined up with dash (2).
- Turn back the eccentric tappet about 2° and move axially on the shaft until the middle is between the limit settings.
- Align the two dashes (1) and (2) again. Tighten the screws (3).



Caution: Risk of injury!

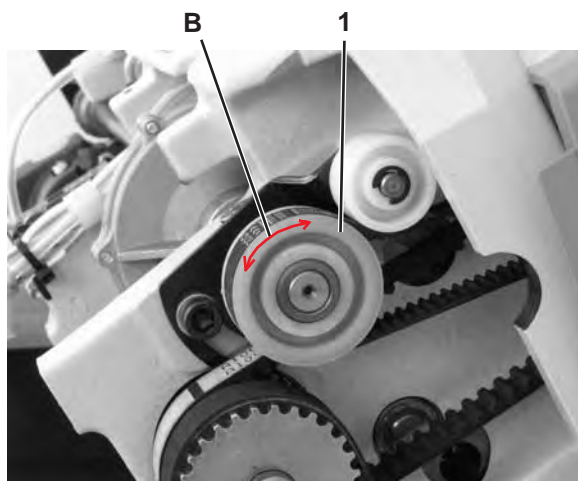
Turn the main switch off.

Only carry out this adjustment when the machine is turned off.

2.7 Checking the switch over of the feed clutch

Rule:

The feed clutch should be switched over when it is motionless (i.e., when it is in the dead centre point of its pendulum motion). This can be detected from the rotational direction of the belt pulley (1) in front of and behind the dead centre point.



	1	2	3	4
A	274°	281°	94°	101°
B	←	→	←	→

- Set the maximum stitch length.
- Turn the handwheel (A) so that it is positioned at “274” degrees (refer to Table / A). Push the bartacking lever down. Check if the rotational direction (B) of the belt pulley (1) corresponds to the direction specified in the table. Do the same for “281” degrees.
- If the rotational directions do not correspond to those specified in the table, correct the necessary settings. If the clutch switches over too soon (on a smaller angle), tentatively loosen the adjusting nut (5) (see chapter 2.5) and repeat the check. Continue loosening until you locate the correct position for the nut. If the clutch switches over too late, tighten the controlling nut (5).



Caution: Risk of injury!

Turn the main switch off.

Only carry out this adjustment when the machine is turned off.



CAUTION!

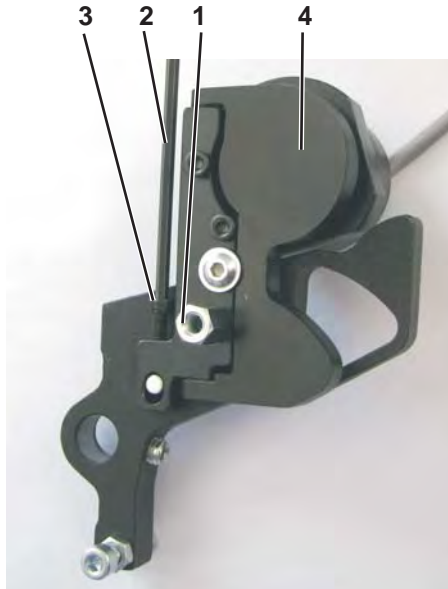
Imprecise settings can shorten the lifespan of the machine.

2.8 Adjusting the reduced stitch length

Note: It is an optional equipment.

Rule:

If a reduced stitch is selected via a switch button, it should then be effectively 50% with 7 mm stitch length and between 60% and 70% with 2 mm stitch length.



- Loosen nut (1).
- Shift the piece (4) through changing the position of the screw (3) with a 2.5 mm Allen key (2) until the stitch length corresponds to the value given in the above rule.
- Fasten nut (1).



Caution: Risk of injury!

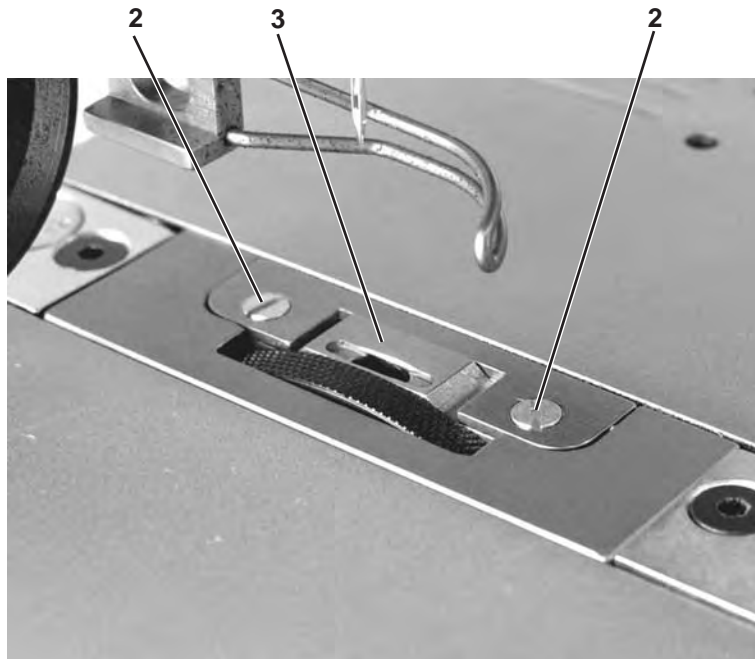
Turn the main switch off.

Only carry out this adjustment when the machine is turned off.

2.9 Throat plate

Rule:

With the standard setting of single needle machine the throat plate insert should be adjusted to the center of the throat plate.



- Remove the throat plate.
- Loosen the screws (2) and adjust the throat plate insert (3) to be in the centre of the throat plate cutout.
- Fasten the screws (2) again.
- Fit the throat plate again.



Caution: Risk of injury!

Turn the main switch off.

Only carry out this adjustment when the machine is turned off.



ATTENTION: Danger of breakage!

An incorrectly fixed throat plate causes the destruction of the parts when the machine is started.

2.10 Slide wheel feeder

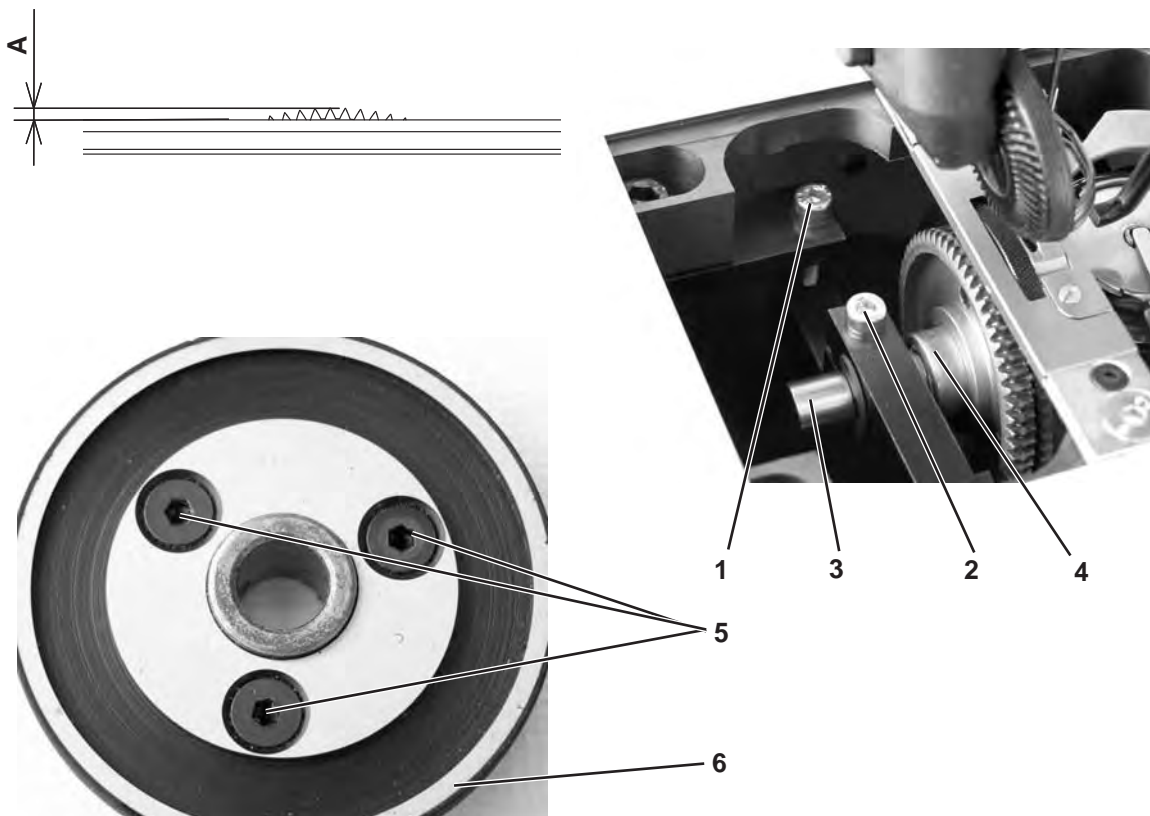
Rule:

1. The height **(A)** that the feed dog (1) is above the throat plate must be appropriate for the thickness and toughness of the material.
2. Standard height of teeth above the throat plate:

Needle thickness Nm	Feed dog height in mm (A)
70 - 80	0.4 - 0.5
90 - 110	0.4 - 0.5
120 - 200	0.6 - 0.8

3. Also the tooth pitch must be adapted according to the material that is to be sewn:
thin material – fine teeth in order to avoid marks in the leather
soft, thick material – thick teeth for sufficient feed traction

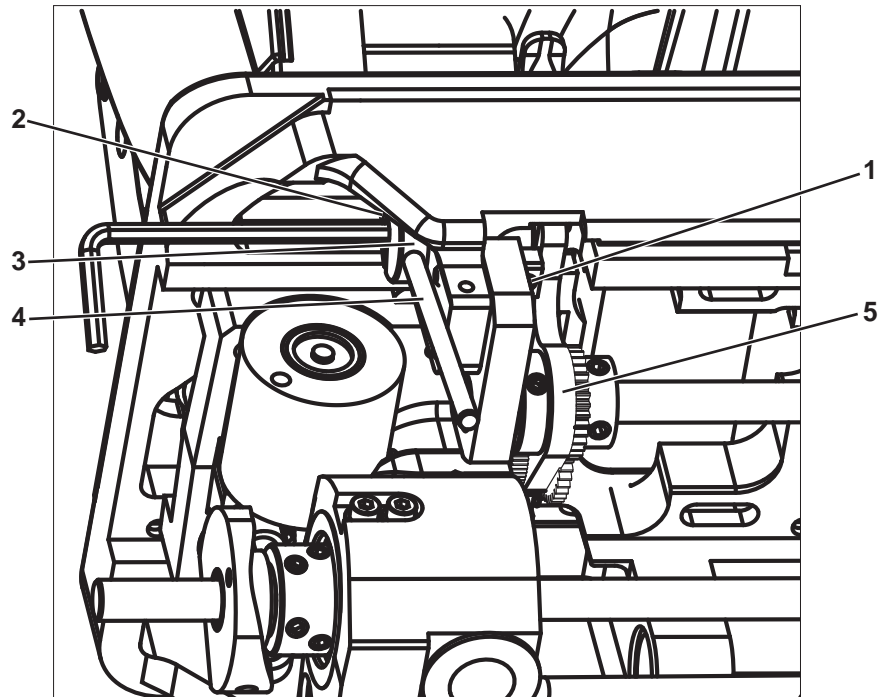
2.10.1 Adjusting the wheel feeder height for single needle sewing machines



- Set the height of the wheel feeder according to rule 2. In order to elevate the wheel feeder, turn the screw (1) clockwise.
- In order to lower the wheel feeder, turn the screw (1) counter-clockwise.
- When exchanging the wheel take out the throat plate. Loosen the screw (2) and slide the pin (3). Remove the feeder (4) with the cogwheel. Loosen the screws (5), exchange the wheel feeder against another one and remount the parts in inversed sequence again.

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2.10.2 Adjusting the wheel feeder height for double needle sewing machines and sewing machines with edge trimmer



- With the tipped and locked sewing machine loosen the safety screw (1) with an Allen key as well as the blocking screw (2).
- By means of the setting pin (4) inserted into the hole of the rotational part (3) set the correct position of the whole wheel feeder holder (5) according to rule 2. Tighten the screws (2) and (1).



Caution: Risk of injury!

Turn the main switch off.

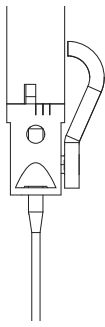


Only carry out this adjustment when the machine is turned off.

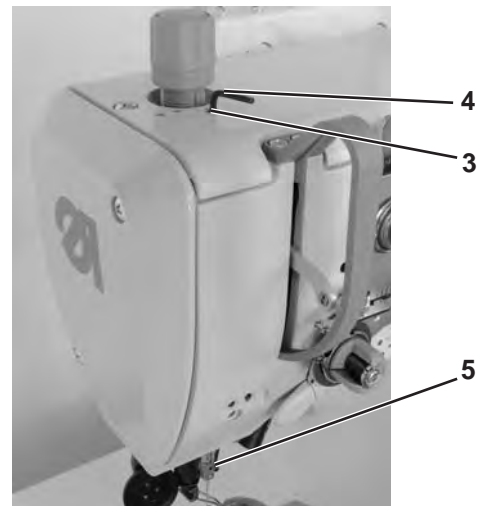
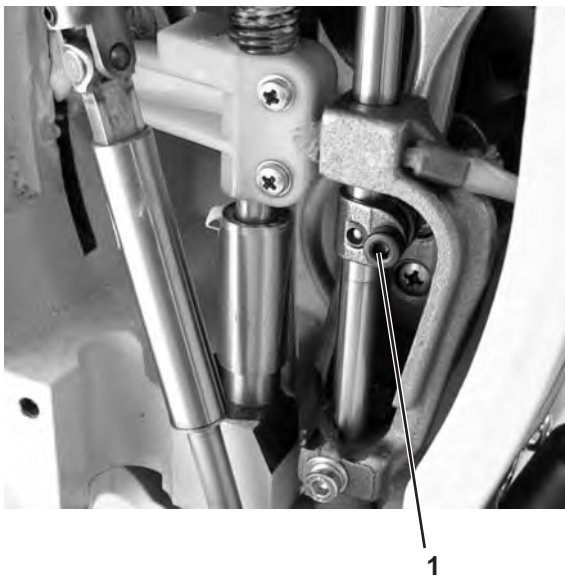
3 Top feed

3.1 Position of the needle holder with single needle sewing machines

Rule:

The position of the needle holder is to be set in dependence to the needle thickness according to the following chart.

Angular position of the needle holder			
Needle thickness Nm	70 - 110	120 - 160	180 - 200

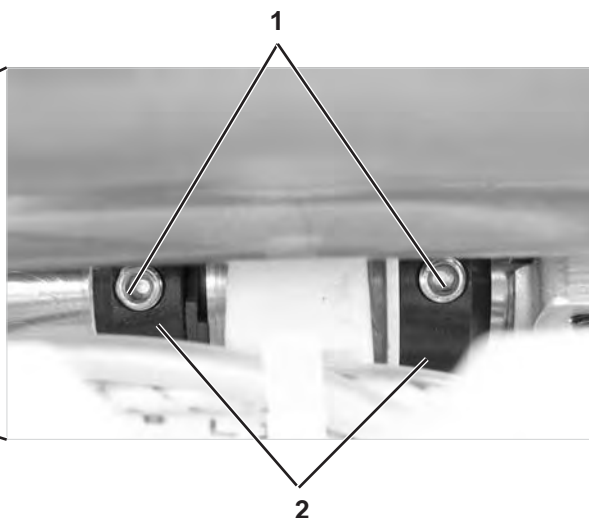
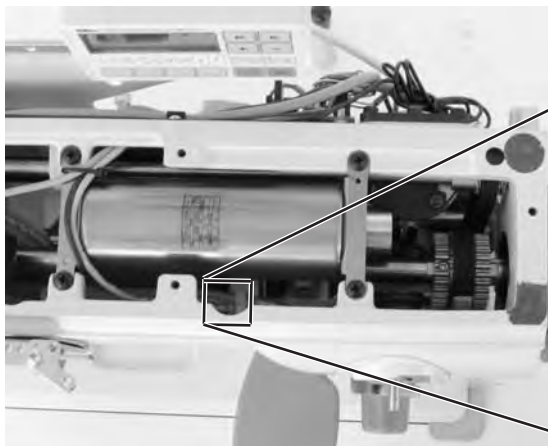
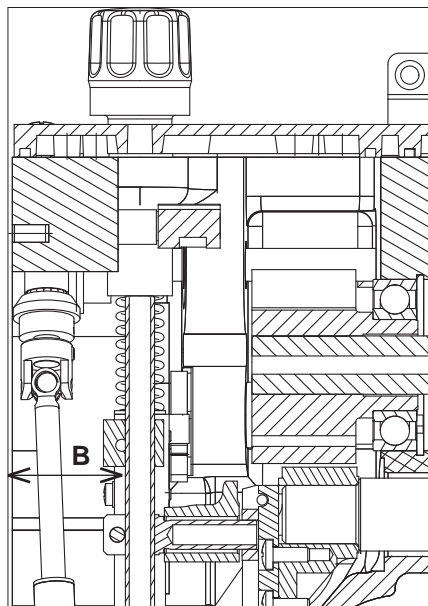
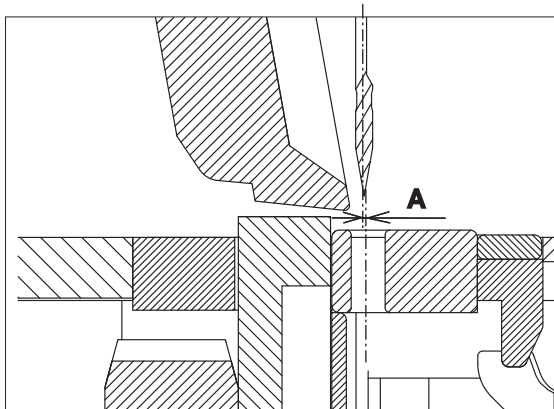


- Remove the thread guide.
- Loosen screw (1) and turn the needle bar with the right groove edge (2) to the needle bar axis (in sewing direction) and tighten screw (1).
- Bring the needle bar to the upper dead center and loosen the screw of the needle holder through the bore (3) by using an Allen key of 2.5 mm (4).
- Turn the needle holder (5) according to the rule and tighten the screw (1).

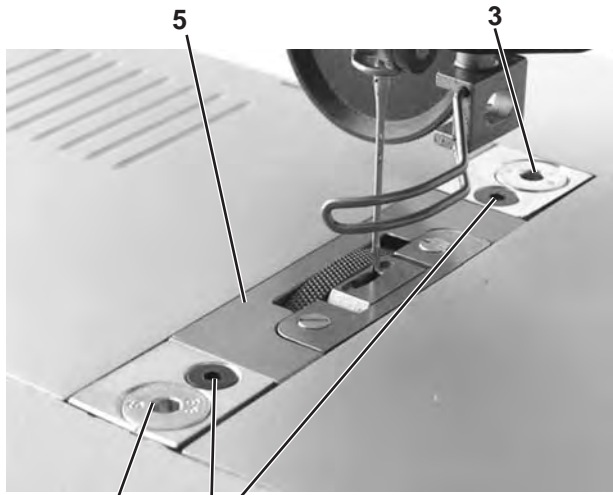
3.2 Needle feed

Rule:

1. The needle bar should be adjusted so that it is flush with the presser foot bar.
2. The throat plate is to be set
 - 2.1 with single needle machines, so that the axis of the needle is displaced about **A = 0,1 mm** to the left of the stitch hole center.
 - 2.2 with twin needle machines, so that the needles are symmetrical to the stitch hole centers.
3. The transport motion of the needle should be set as follows: at the maximum stitch length the needle leaves the throat plate very near the back edge of the stitch hole.



- Loosen screws (1) and adjust the needle bar to the dimension **(B) = 31mm** as shown in the illustration. Rule 1 has been fulfilled.
- Set the adjustment rings (2) and tighten the screws (1).



3 4 Fig. 2

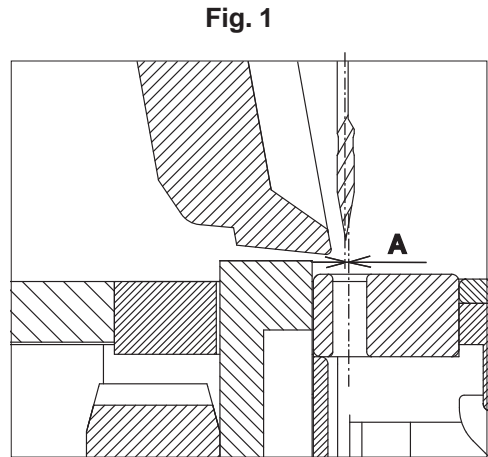
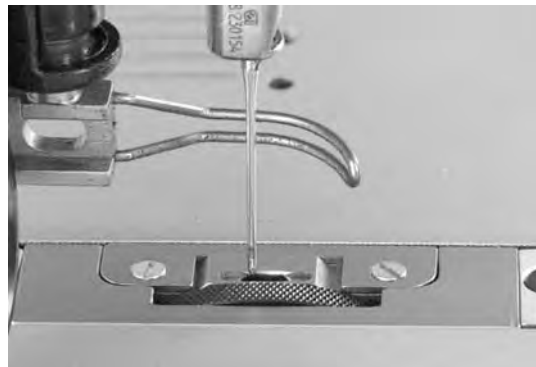
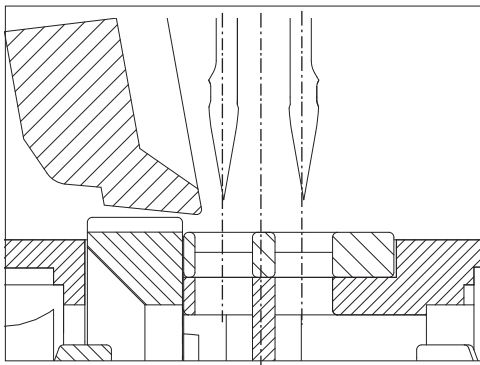
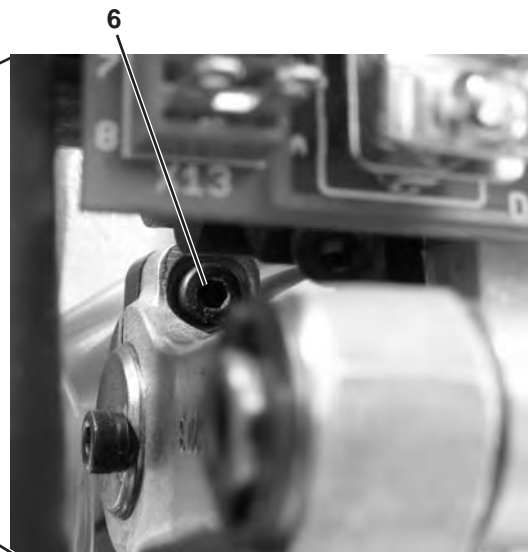
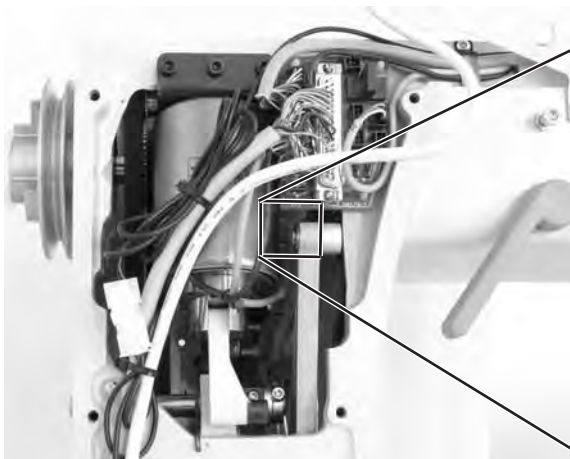


Fig. 1

Fig. 3



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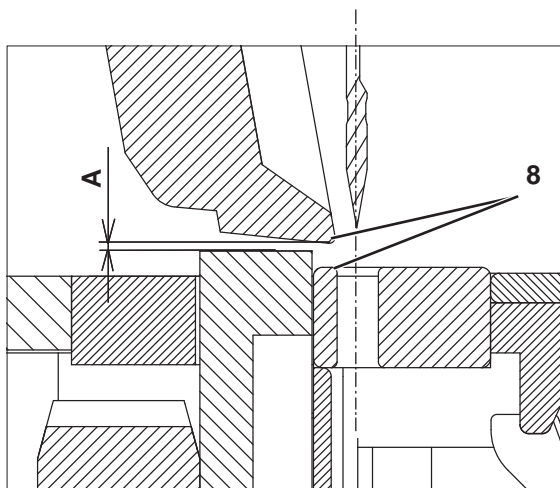
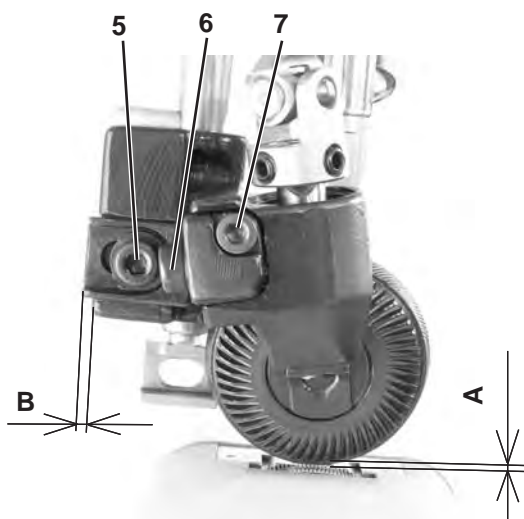
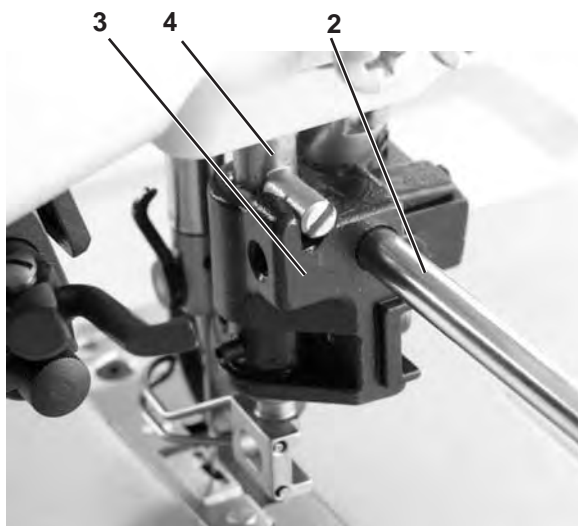
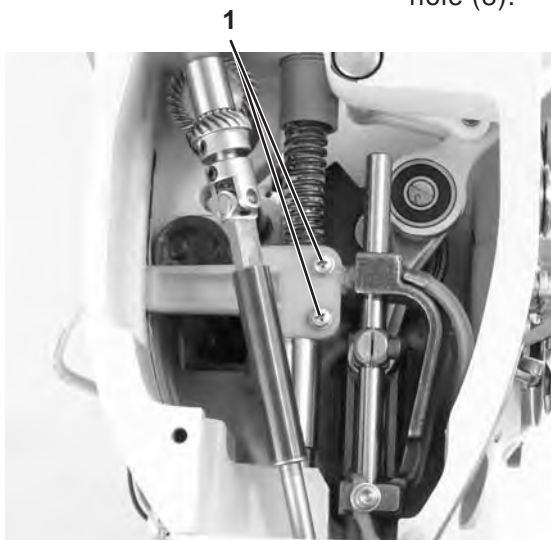


- Loosen screws (3) and (4). Move the throat plate so that the rule 2.1 (A) = 0,1 mm according to fig. 1 or rule 2.2 according to fig. 2 is accomplished. Tighten the screws.
- Center the throat plate insert (see chapter 2.9).
- Set the maximum stitch length (see chapter 2).
- Set the needle to the position in which it leaves the throat plate insert. Dismantle the rear cover and loosen screw (6). Set the needle manually to the position shown in fig. 3 and tighten screw (6).

3.3 Roller foot

Rule:

1. The location surface on the roller foot holder should be aligned in the right angle to the longitudinal axis of the machine.
Between the roller foot and the wheel feeder should be a distance of **(A) = 0.03 to 0.16 mm**.
2. The position of the roller foot in sewing direction should be set as follows:
- for single needle machines **(B) = 1,3 to 2,3 mm**
- for twin needle machines **(B) = 0 to 2,3 mm**
3. The lateral position of the roller foot should be set so that the lower edge of the roller foot ends with the left-hand edge of the stitch hole (8).

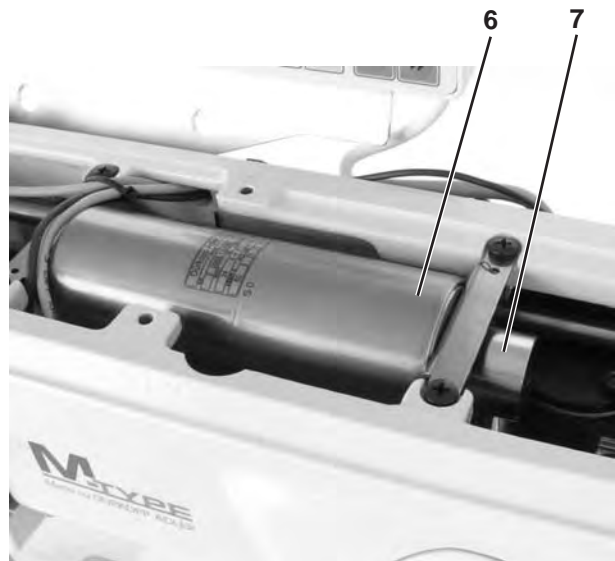
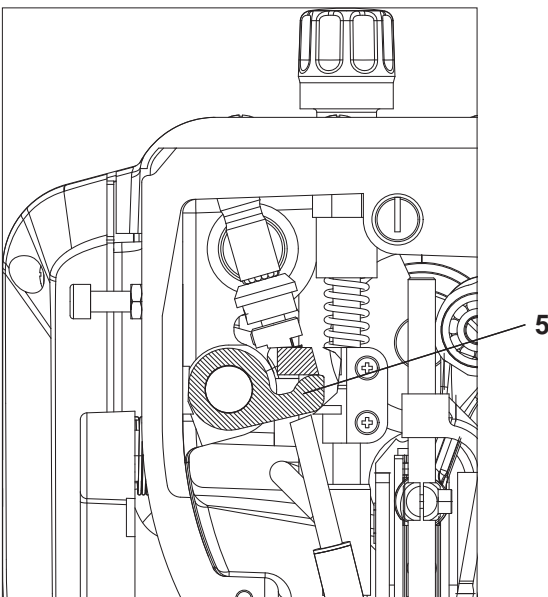
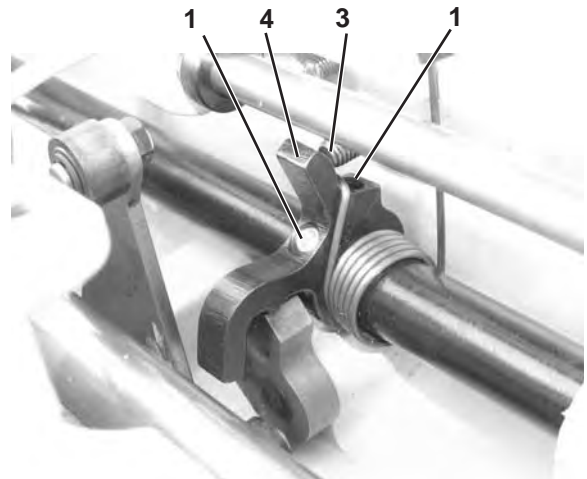
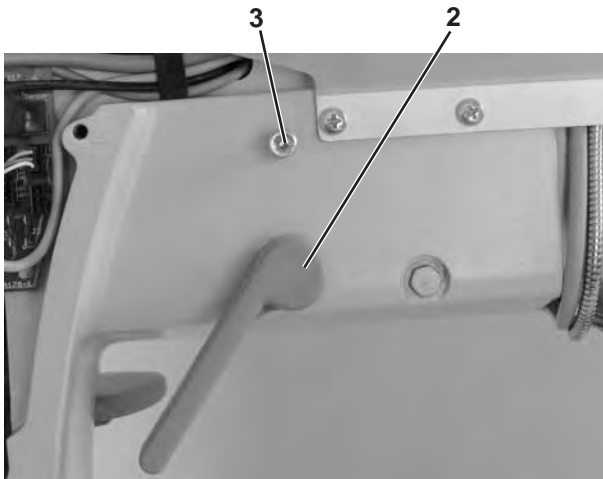


- Loosen screw (1). Displace the presser foot bar vertically according to rule 1. Insert the Philips screw-driver (2) that is part of the accessories into the hole of the roller foot holder (3) and turn the presser foot bar (4) together with the roller foot holder (3) until the Philips screw-driver comes to a right angle with the longitudinal axis of the machine. Tighten screw (1).
- Loosen screw (5). Displace the roller foot according to rule 2 and tighten screw (5).
- Loosen screw (6). Displace the roller foot according to rule 3 with the adjusting screw (7) and tighten screw (6).

3.4 Roller foot lifting

Rule:

1. The lifting of the roller foot via hand lever should be of **5.4 to 5.6 mm**.
2. The lifting of the roller foot via electromagnet should be of **11.5 to 12.5 mm**.
3. The lifting of the roller foot via knee lever should be of about **0.2 to 0.4 mm** higher than the electromagnetic lifting (if existing).

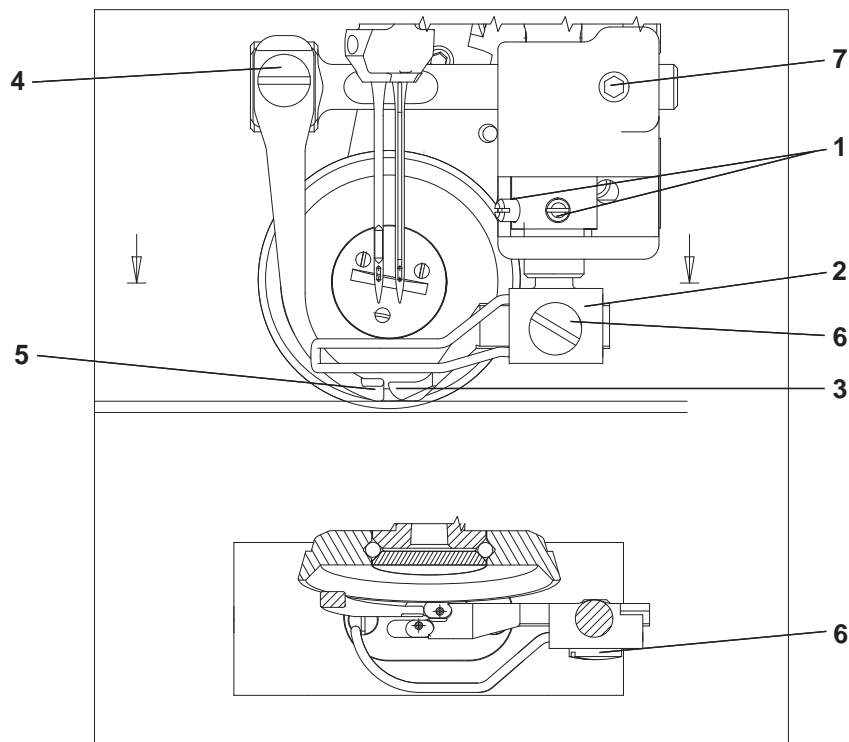


- Remove the solenoid of the presser foot lifting.
- Loosen screw (1). Bring the hand lever (2) into the depicted position and simultaneously screw in screw (3) until it butts against the lever (4). The lever (2) remains in the depicted position.
- Put a spacer of **5.6 mm** underneath the roller foot and push the lever (5) manually according to the figure above until it stops. Tighten screw (1). This procedure accomplishes rule 1.
- Remove screw (3) and mount the electromagnet of the presser foot lifting (6). In order to check whether rule 2 is accomplished, engage the magnetic core. If the values are not correct, effectuate an adjustment.
- Set the lifting of the knee lever according to rule 3 by adjusting screw (3).

3.5 Fabric holder for double needle sewing machines

Standard checking

1. The fabric holder should touch the sewing material without exerting any pressure on it.
2. The fabric holder should be positioned in sewing direction and laterally on the edges of the stitch holes.



- Insert two pieces of material of about 1.5 mm thickness underneath the roller foot and set a medium fabric pressure.
- Loosen screw (1) and displace the holder (2) with the rear fabric holder (3) vertically until it comes to rest without any pressure on the leather. Tighten screw (1), but not too hard. Loosen screw (4) and effectuate the same setting for the front fabric holder (5). Remove the leather, rule 1 is now accomplished.
- Set the fabric holder according to rule 2: Set the rear fabric holder (3) to the sewing direction by using screw (6) and laterally by turning the holder (2). Set the front fabric holder to the sewing direction and laterally by using screw (7).
- Tighten all screws.



Caution: Danger of injury !

Turn the main switch off.

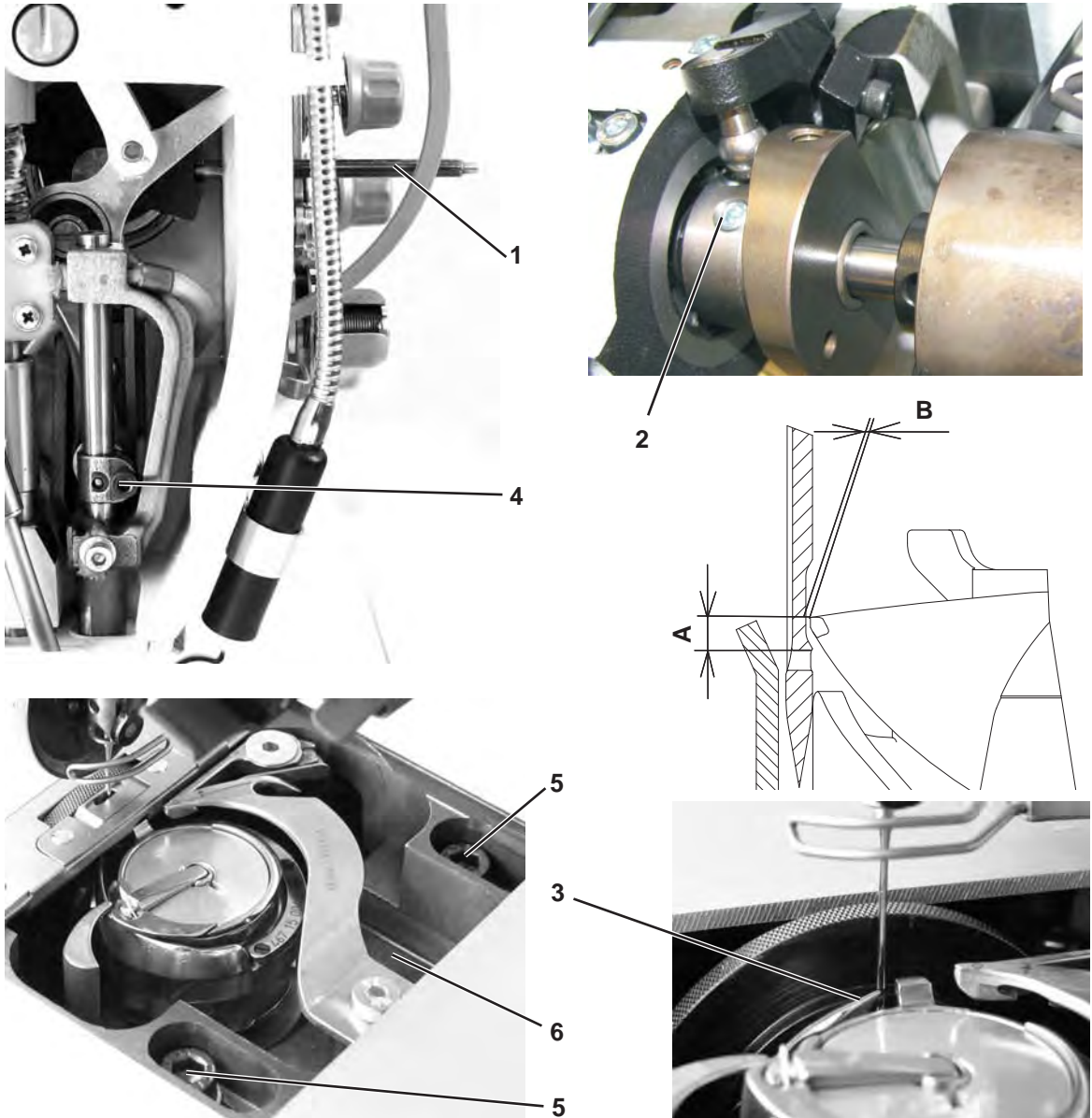
Proceed with the setting only with the sewing machine switched off.

4 Adjusting the needle bar and the hook

4.1 Needle bar height, play of needle to hook tip, loop stroke

Rule:

When the handwheel pointer indicates “205” degrees (2.3 mm loop stroke), the hook tip should stand at the needle axis at the stitch length “0”. Length (A) = 1.5 mm, distance (B) = 0.02 to 0.1 mm.



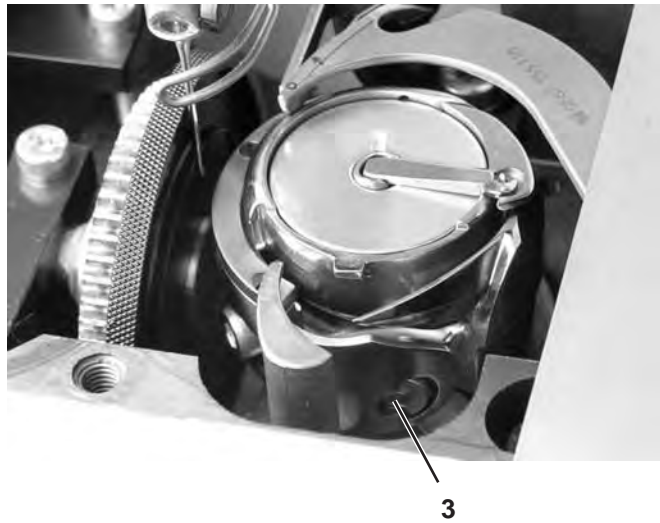
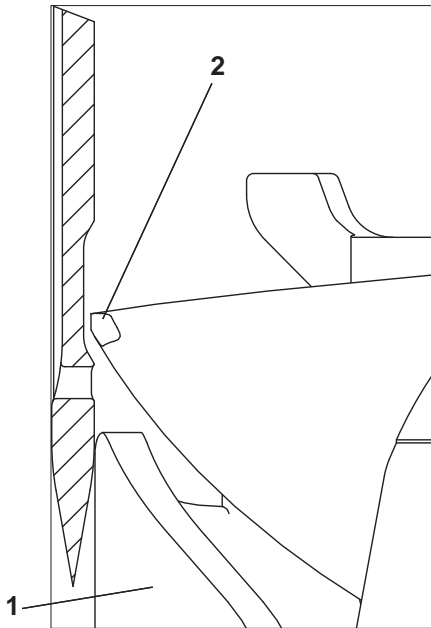
- Lock the handwheel in loop stroke position (2.3 mm) by using the locking pin (1) 5 mm, degree “205”.
- Loosen four screws (2) and turn the hook tip (3) to the needle axis.
- Loosen screw (4), position the needle bar and needle to the distance measure (A) and tighten screw (4).
- Loosen the two screws (5) and displace the hook case (6) to the distance measure (B).
- Check whether the hook tip (3) is positioned in the range of the needle axis, tighten screws (2).

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4.2 Hook tip guard

Rule:

The guard plate (1) for the hook should prevent the needle from touching the hook tip (2).



- Adjust the maximum stitch length according to the machine configuration.
- Remove the throat plate.
- Position the hook tip (2) on the needle and adjust the setting screw (3) of the guard plate (1) by using an Allen key of 3 mm, so that the needle does not touch the hook tip.
- The setting is not incorrect if the guard plate (1) slightly deflects the needle.



Caution: Risk of injury!

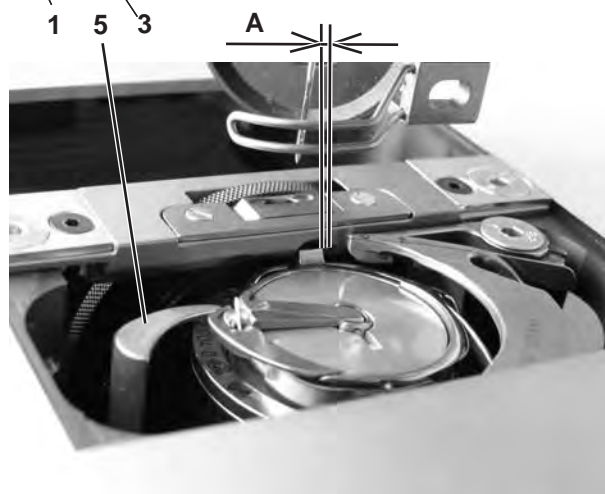
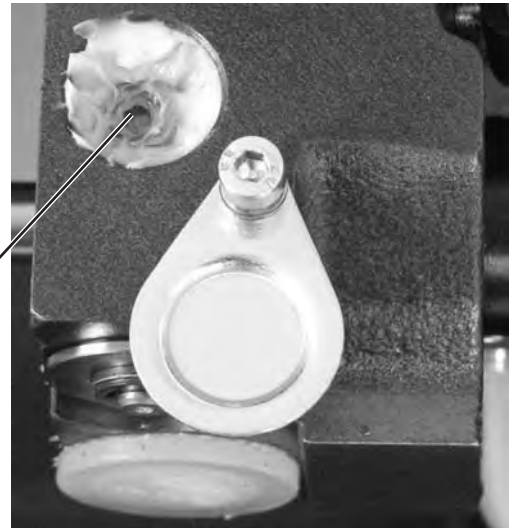
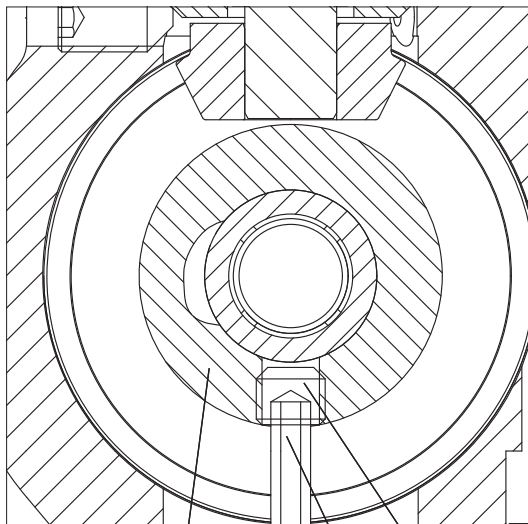
Turn the main switch off.

Proceed with the setting of the hook guard only with the sewing machine switched off.

4.3 Bobbin housing release

Rule:

1. When the Allen key (1) is inserted in the threaded pin (3), the index should point to the degree on the graduation scale of the handwheel:
 - for the right hook case **112°**
 - for the left hook case **302°**
2. The distance measure (**A**) = **0.8 mm** with max. release.



- Remove the plug on the bottom, loosen screw (3), adjust the handwheel according to rule 1. Tighten screw (3).
- Turn the handwheel so the indicator points to "310". Remove the plug. Loosen screw (4). Turn the bobbin housing lift (5) so that the available clearance distance (**A**) complies with rule 2. Tighten screw (4). Re-seal the openings.

4.4 Hook lubrication

Rule:

The lubricator's regulator screw (1) should project approx. **1 mm** out of the lubricator.



1

- The oil quantity necessary for a safe lubrication of the hook is set at the factory. A modification may only be needed in exceptional cases.
The required oil quantity depends on the material to be sewn and the thread used.
Hold a piece of paper (blotting paper) next to the hook, sew a material for approx. 1 m and check if oil is spun off onto the paper.
- Increase the oil quantity = turn the screw counter-clockwise, but not any further than **1.0 mm** above the surface of the lubricating fitting.
- Reduce the oil quantity = turn the screw clockwise, but not any further than **0.3 mm** below the surface of the lubricating fitting.



Caution: Risk of injury!

Turn the main switch off.

Proceed with the setting of the hook lubrication only with the sewing machine switched off.

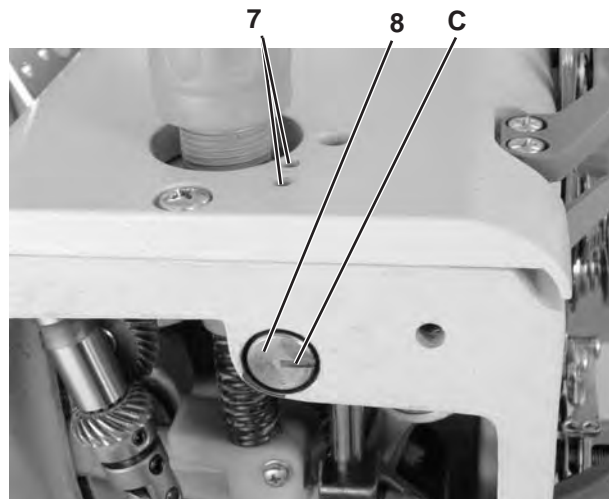
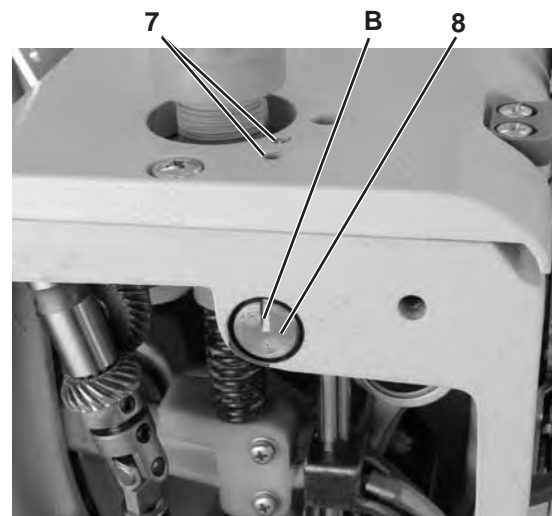
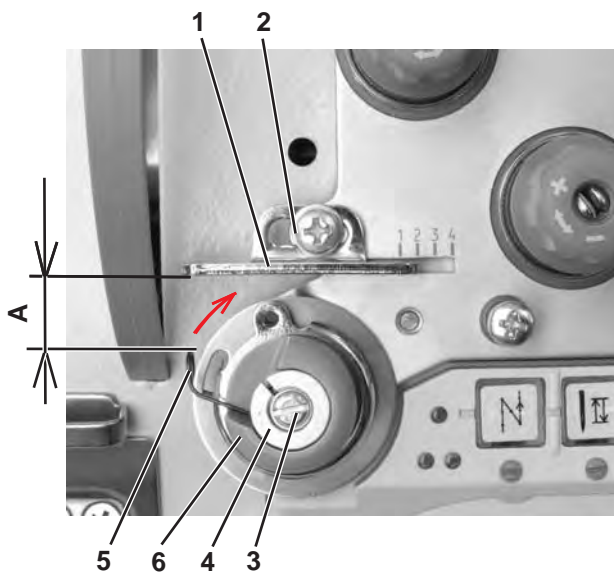
5 Thread setting

5.1 Thread regulator, check spring, bolt for the thread lever mechanism

Rule:

1. The right edge of the thread regulator (1) should end at figure 2 on the scale.
2. The check spring (5) should be set to the distance measure of **(A) = 10 to 12 mm**. The spring travel consists of about **30°**.
3. The position of the bolt (8) should be set as follows, depending on the needle in use:

Needle thickness Nm	Bolt position
70 - 80	B
90 - 200	C

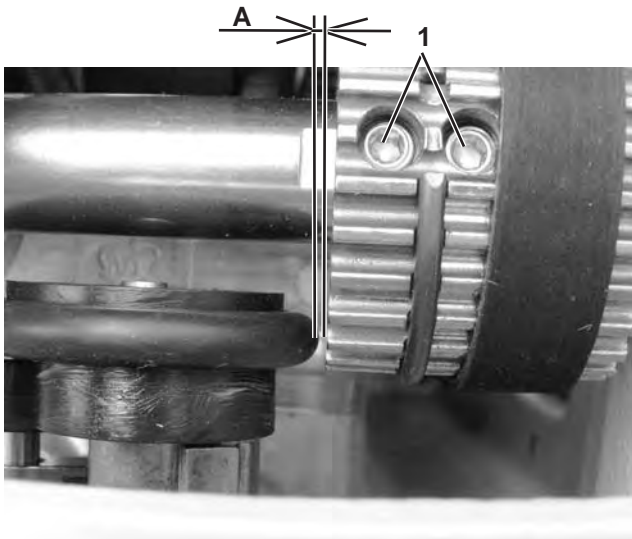


- Loosen screw (2), push the thread regulator (1) according to rule 1 to end at figure 2, tighten screw (2).
- Loosen screw (3). Turn the stop sleeve (4) in the direction of the arrow until the check spring (5) comes off the body (6). Turn the stop sleeve (4) against the direction of the arrow until the check spring (5) touches the body (6). Turn both parts (4) and (6) together to reach the distance measure **(A)**. Detain the body (6) and turn the stop sleeve (4) for another **30°** against the arrow. Detain the parts (4) and (6), tighten screw (3).
- Insert a 3 mm Allen key in the holes (7) and loosen the screws. Bring the bolt (8) into the correct position according to rule 3 and tighten screws (7).

5.2 Bobbin winder

Rule:

1. When the bobbin winder is switched off, the distance between bobbin winder wheel and belt pulley should be **(A) = 0.8 mm**.
2. The winding procedure should stop automatically, when the bobbin is filled up to **0.5 mm** underneath the the bobbin edge.



- Turn the belt pulley to the top using the screws (1). Push the toothed belt to the right so that both screws (1) are accessible. Loosen screws (1) and set the distance measure **(A)** according to rule 1, tighten screws (1).
- Determine the bobbin filling by adjusting screw (2). Screw in screw (2) for 1 to 2 mm, but a bobbin on the bobbin winder shaft and wind on thread. Check the filling level as soon as the bobbin winder turns off. If necessary, change the position of the screw (2) until rule 2 is fulfilled.

6 Thread cutter

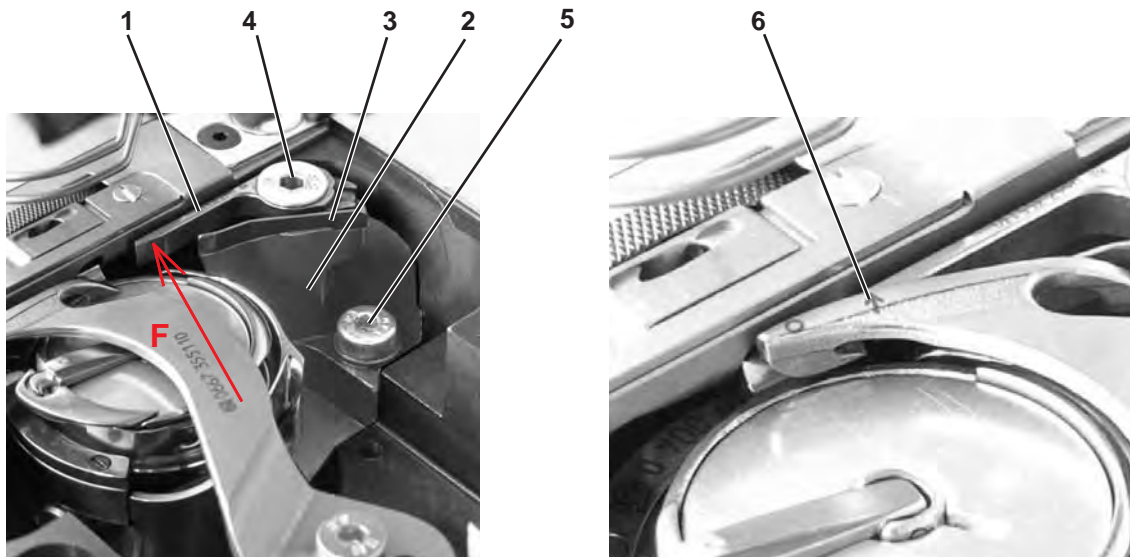
6.1 General

The large and the oversized hook could be used with the present machine. In both cases the parts used are identical. The knife carrier should only be mounted in a different position.

6.2 Position of the thread-pulling knife, position of the counter knife

Rule:

1. The counter knife (1) is to be screwed to the holder (2) with a 50 to 100 N force on the knife in the arrow direction (F). This will avoid a change of the cutting pressure when loosening and tightening the screw (4) of the clamp spring (3).
2. The holder (2) should be fixed with screw (5) to the hook bearing so that the knives touch mutually at arrow point (6) during the knife trimming motion. This guarantees an optimal cutting pressure.



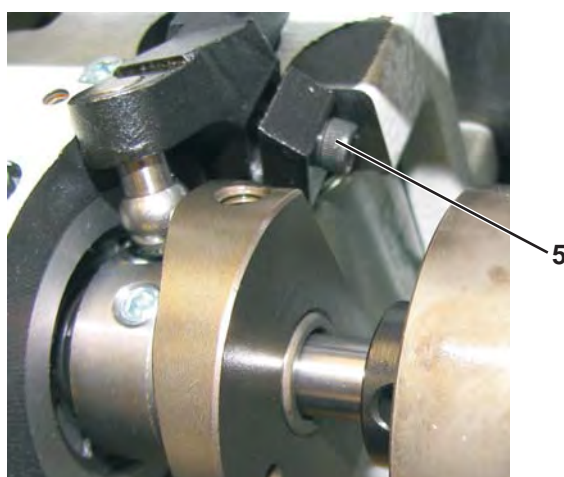
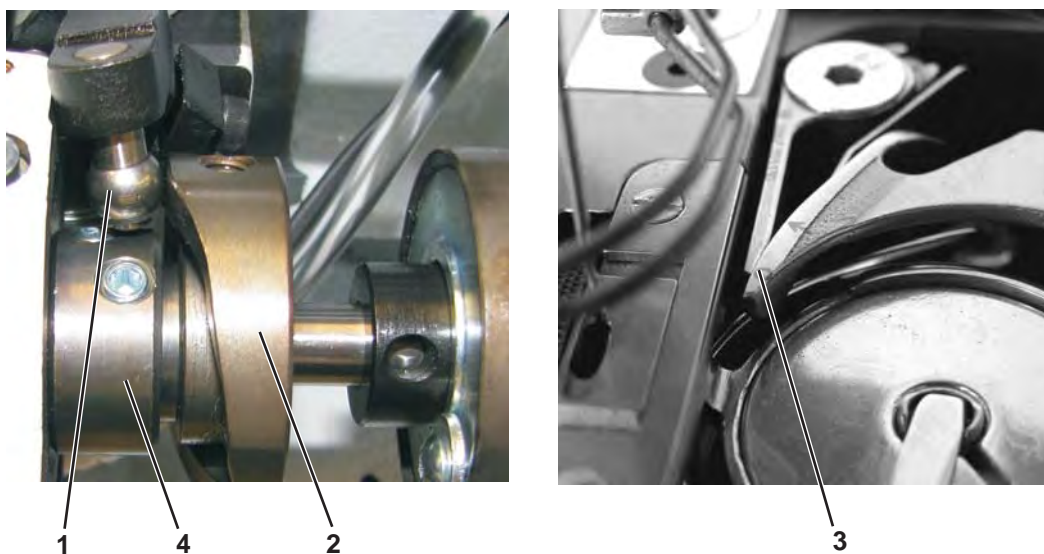
ATTENTION !

If the pressure of the counter-knife is set too high this leads to an excessive knife wear.

6.3 Starting position for the thread pulling knife

Rule:

When the roller (1) is at the highest point of the control cam (2), the marking "O" (3) of the thread pulling knife should stand close to blade of the counter-knife.



- Check if the control cam (2) is stopped at the ring (4).
- Turn the cam according to the rule.
- Loosen screw (5).
- Turn the thread pulling knife in a way that the marking "O" (3) stands close to the blade of the counter-knife.
- Tighten screw (5) and check the initial position of the knife.



Caution: Risk of injury!

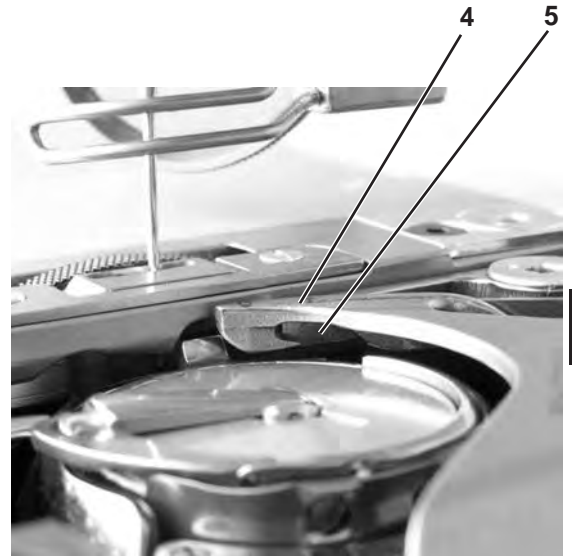
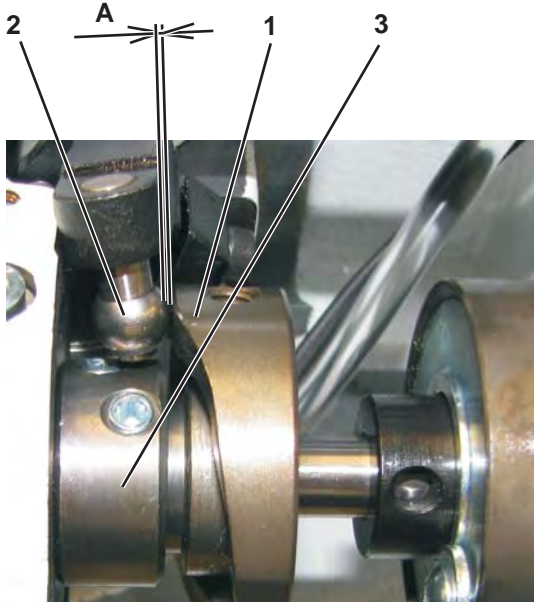
Turn the main switch off.

Proceed with the setting of the thread cutter only with the sewing machine switched off.

6.4 Control cam

Rule:

1. There should be a clearance distance **(A) = 0.05 to 0.1 mm** between the highest point on the control cam (1) and the roller (2).
2. The threads should be separate when the pointer on the handwheel points from "40" to "45" on the scale.



- Loosen the screws of the ring (3).
- Loosen the screws of the cam (1).
- Turn the cam (1) with its top against the roller (2). Shift the cam laterally so that the distance between the cam and the roller is **(A) = 0.05 – 0.1 mm**.
- Shift the ring (3) to the right towards the cam (1) until it stops. Take care that the hook timing (par. 4.1) is not destroyed.
- Tighten the ring (3) screws.
- Tighten the cam (1) screws so that the trimming knife (4) edge and the fixed knife (5) edge flush at 40° - 45° on the hand wheel.
- Check the setting of the distance according to rule 1, cam angle according to rule 2, and hook timing according to par. 4.1.



Caution: Risk of injury!

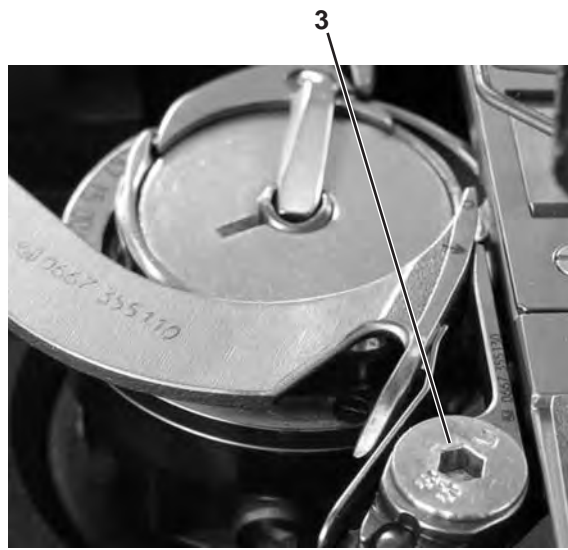
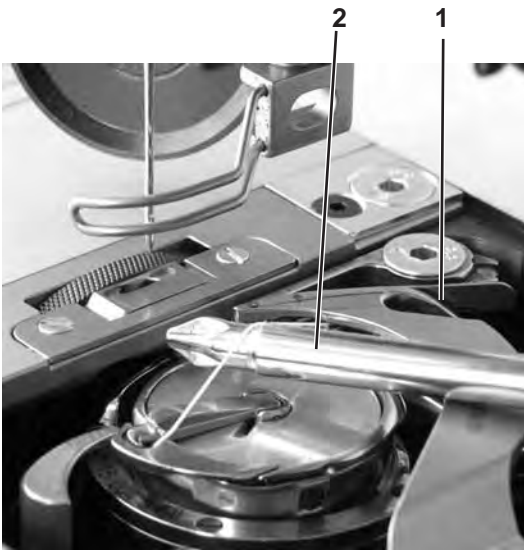
Turn the main switch off.

Proceed with the setting of the control cam only with the sewing machine switched off.

6.5 Bobbin thread clamp

Rule:

The clamping force of the spring (1) should not be set higher than needed. It should just be able to pull out the lower thread from the hook.



- Sew and cut the threads.
- Using a screwdriver (2), inspect the thread according the illustration. Check if the thread is being pulled out of the bobbin winder or from the clamping (1).
- Using screw (3), control and adjust the spring pressure (1) until the rule is fulfilled.



Caution: Risk of injury!

Turn the main switch off.

Only adjust the clamping spring when the machine is turned off.



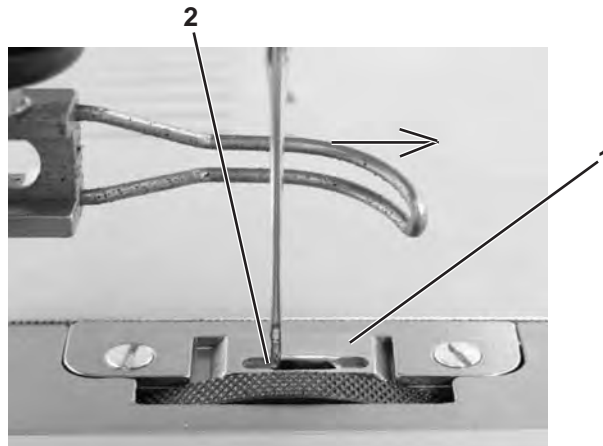
CAUTION!

Sewing problems can result when the clamping spring is improperly adjusted.

6.6 Position of the throat plate insert

Rule:

When sewing with short stitch length, the throat plate insert should be shifted against the operator to avoid stitch skipping at the beginning of sewing.



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- Depending on the thread thickness, set the stitch length from **1.5 to 2.5 mm**
- At seam beginning check if skipped stitch occurs. In such a case, shift the throat plate insert (1) in the arrow direction, until the rear edge of the needle hole (2) will be **0.2 up to 0.3 mm** from the needle. Fasten the insert.
- Limit the stitch length to **2.5 mm**. The explanation on how to limit the stitch length is described in chapter 2.1.



Caution: Risk of injury!

If the position of the throat plate insert is changed without limiting the stitch length to 2.5 mm, the needle may then strike against the throat plate insert if the stitch length is increased. This will damage the machine and may even injure the operator.

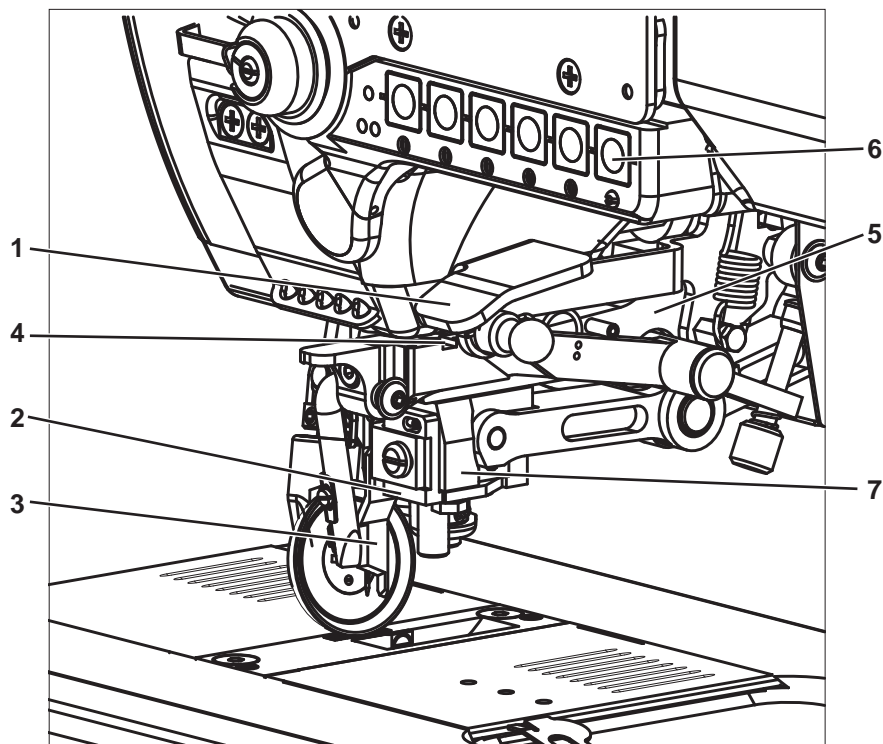
7 Sewn material edge trimmer control

7.1 Switching on/off edge trimmer



Caution! Risk of injury!

Adjust the trimming mechanism only with the main switch switched off.



Switch on

- Push the lever (1) down.
- By this action the upper knife holder (2) together with the cutting knife (3) is shifted to the bottom cutting position. According to the standard parameter setting, the knife driven by an electric motor vibrates only at the pedal treading down to set the sewing machine in operation (can be change).
- In the pneumatic version, the edge trimmer is switched on by means of a push button (6).

Switch off

- Return the lever (1) to top position.
- In the pneumatic version, the edge trimmer is switched off by means of a push button (6).

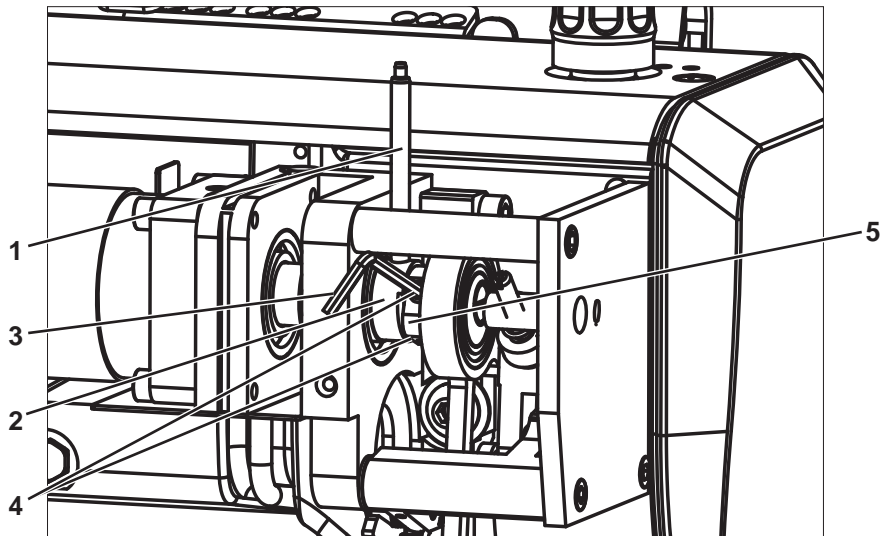


To for a faultless function, it is needed to fill in several drops of lubrication oil in the felt lubrication spot (4), or in the lubrication spot on the knife holder (7) once a week.

7.2 Upper knife height adjustment

Rule:

The standard height value of the cutting knife is 5 mm for the vertical edge trimmer. This value can be changed as needed as follow:



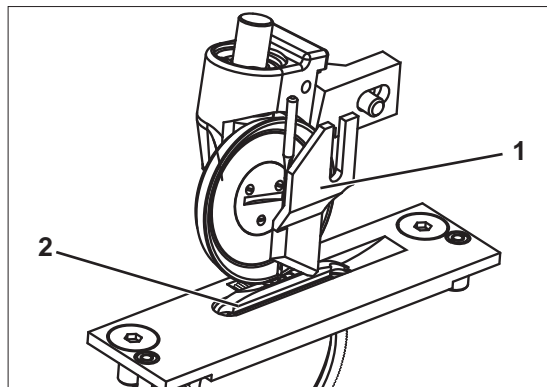
- Insert the setting pin (1) in the hole in eccentric (2) and set in the vertical position.
- With Allen key (3) inserted in one of the two screws (4) of the eccentric (5) loosened beforehand, turn in a limited reach to achieve the needed change of the knife height.
- Tighten the screws (4) in the set up position / for the 5mm lift is set up the pin on the eccentric (5) opposite the sign on the opposite part (2)/, remove the setting pin (1).



Attention!

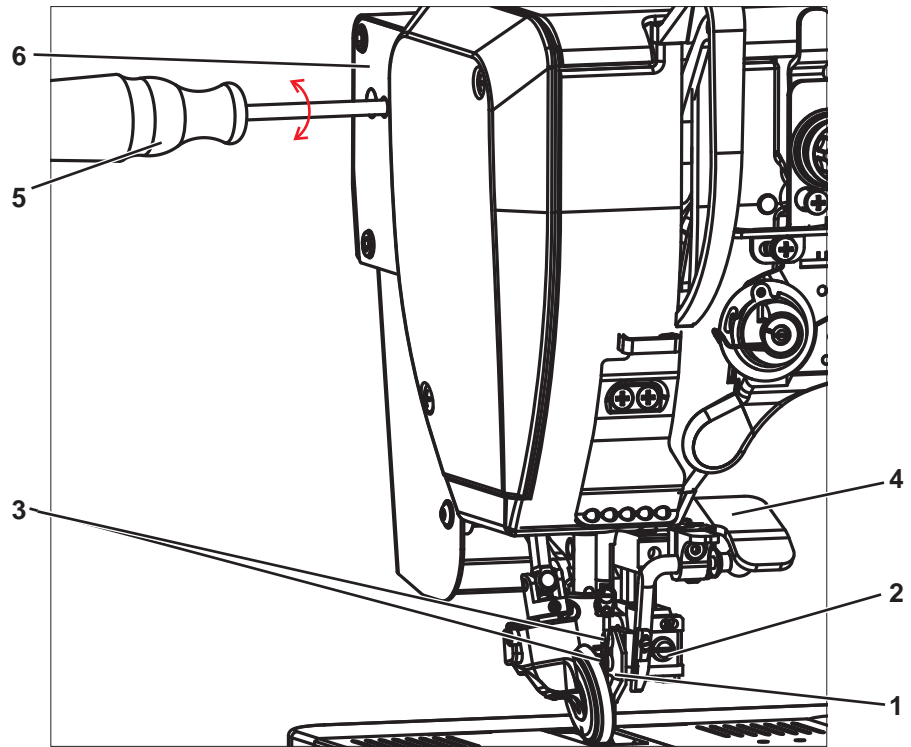
The cutting knife must not strike the bottom of the throat plate recess in its bottom dead center.

Using the special sewing set (see schedule II) with the cutting knife 0887 330100 (1) and different insert of the throat plate (2) acc. the picture, set up the cutting knife lift value through the above mentioned way to 2,4 mm.



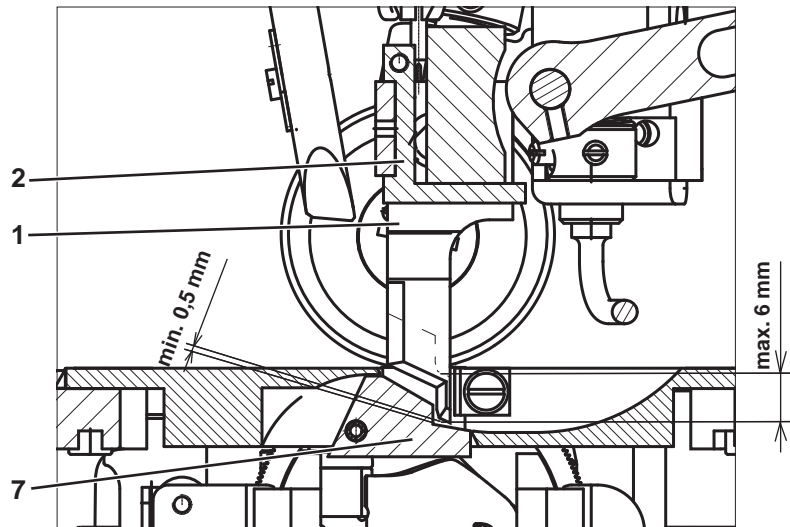
7.3 Height adjustment of cutting knife

The cutting knife (1) is clamped in the knife holder (2) with two bolts (3) and by means of a groove.



- Lower the knife holder (2) to the bottom position by means of a lever (4).
- Set the knife (1) bottom position with a flat screwdriver (5) inserted in the lifting eccentric groove through the side cover hole (6).
- Lower the loosened cutting knife (1) entirely so that its lower part touches the retaining part (7). Then lift it by about 0,5-1mm upwards and tighten the bolts (3).
- Check its correct movement by rotating the screwdriver manually when the knife is lowered.

- To provide for the correct setting in the sewing direction, the cutting knife (1) should be in a correct position against the cutting edge of the bottom replaceable knife so that any contact is avoided of the cutting edge of the upper knife with the retaining part (7) in front of the knife.



EN

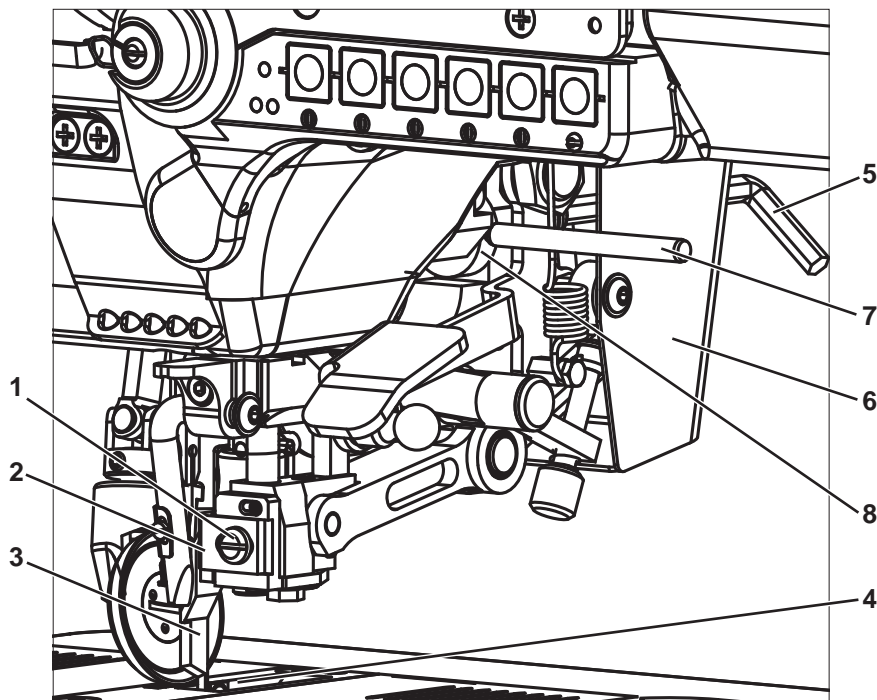


Attention!

The cutting knife must not run out over the throat plate with its tip, or strike the bottom of the recess in the throat plate.

7.4 Setting of side (lateral) position of knife

The lateral position of the cutting knife depends on the sewn material distance from the needle. To provide for the correct function of the edge trimmer, there must not be any gap between the bottom and upper cutting edge.



- With the lowered edge trimmer loosen the fixing bolt (1) on the cutting knife holder (2).
- The cutting knife (3) will be pressed, by means of a spring, onto the cutting edge of the throat plate insert (4).
- Tighten the bolt (1) strongly and check the pressure and correct cutting function.

If the setting range of cutting knife holder is not sufficient applied as above described, make a modification of the trimming mechanism position as follows:

- Put the Allen key (5) sized 5mm through the cover rear hole (6) in the respective screw and loosen it.
- Move the inserted setting pin (7) in the hole in the part (8) in the direction up and down, by which we roughly adjust, by means of the movement of the whole drive mechanism, the lateral position of the knife holder (2).
- In the position set with the key (5) tighten the rear fixing bolt and finely adjust the lateral position of the cutting knife in the way described in the previous paragraph.

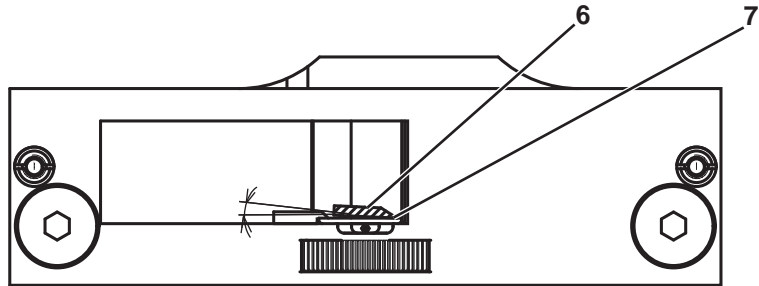


Attention!

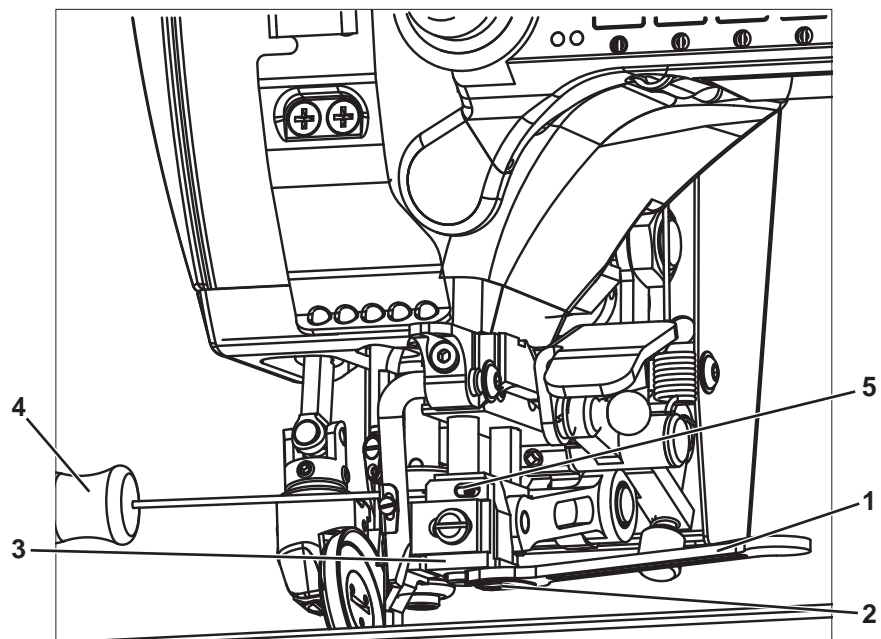
The cutting knife must not strike the throat plate insert from above with its tip, when it is lowered into the switch-on position, or it must not be bent as a result of a strong pressure on the fixed knife.

7.5 Setting of upper knife angle with regard to bottom cutting edge

Setting of the crossing of the cutting knife (6) and bottom cutting edge (7) is important for the correct function of the edge trimming and look of the cut edge of the sewn material. For thinner materials, both cutting edges should be parallel, with thicker materials, a demand may arise to slightly turn the front part of the upper knife in the direction of the bottom knife cutting edge.



- With a flat Allen key sized 7mm (1) slightly loosen the bolt (2) located on the bottom of the upper knife holder (3).
- With a small flat screw (4) turn the setting bolt (5) to achieve the required holder turning (3).
- After setting the needed crossing of the cutting edges, tighten the bolt (2) again.
- Check the function of the edge trimmer carefully by repeated lowering of the upper knife, and set the lateral position of the knife again as needed in accordance with 7.4.



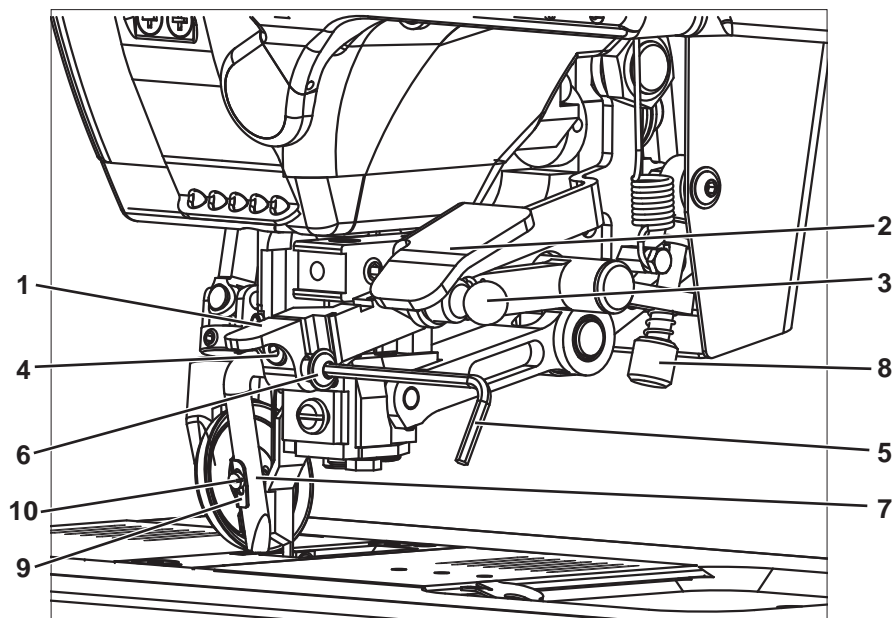
Attention!

By setting of a too large angle of the upper knife in the sewing direction an increased wear of the cutting edges occurs as well as an increased load of the edge trimmer electric drive.

7.6 Material guide adjustment

For a correct guiding of the sewn material against the cutting knife a tipping guide can be used.

The guide can be lowered in the bottom position independent of the cutting knife holder by pushing down of the control lever (1). Another possibility is to switch the guide on and off simultaneously with the switching on the edge trimmer main lever (2), which is ensured by pushing down of the pin (3) in the upper (switched off) position of both levers.



- With the lowered control lever (1), slightly loosen the bolt (4) and with an Allen key (5) turn the bolt (6) to achieve the required lateral position towards the cutting knife.
- At the same time it is necessary to set the position of the guide (7) in the sewing direction by its turning in the lever (1).
- Set the suitable height of the guide over the throat plate by turning of the setting bolt (8).
- After adjusting the guide, tighten the fixing bolt (4).

For better guiding of the sewn material it is possible to use a retaining part (9) attached to the guide (7), the height of which can be set up after the fixing bolt (10) loosening.

Another possibility is using the sewn material tipping guide (can be ordered as an optional equipment) fixed on the bed plate.

7.7 Replacing the lower knife

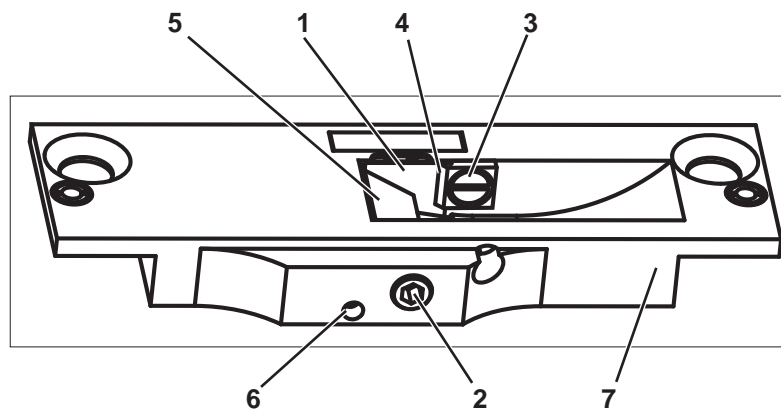
At the change of sewing category it is necessary to replace the throat plate (can be purchased additionally). Dependent on the width of the trimmed edge and selected sewing category it is necessary to choose a suitable bottom knife (1) and the gib (4) for its fixing (see Operating manual, par. 3.3, tab. 1), and at the same time, it is necessary to change the cutting knife lateral setting (paragraph 7.4).



Caution!

Danger of injury with knife edge when handling.

In total, every bottom knife has 4 cutting edges, and the edge can be chosen by turning the knife before it is clamped in the throat plate.



- Loosen the setting bolt (2) with the Allen key and screw the screw (3) out.
- Tip the fixed knife holder (5) around the pin (6) and remove the fixed knife (1).
- Insert a new fixed knife in the holder (5), and by means of the suitable gib (4) held with the screw (3) and by the tightening screw (2) attach the fixed knife so that its cutting edge is horizontal and stands out slightly over the throat plate (7).
- Check the position of the fixed knife (1) and its faultless clamping.

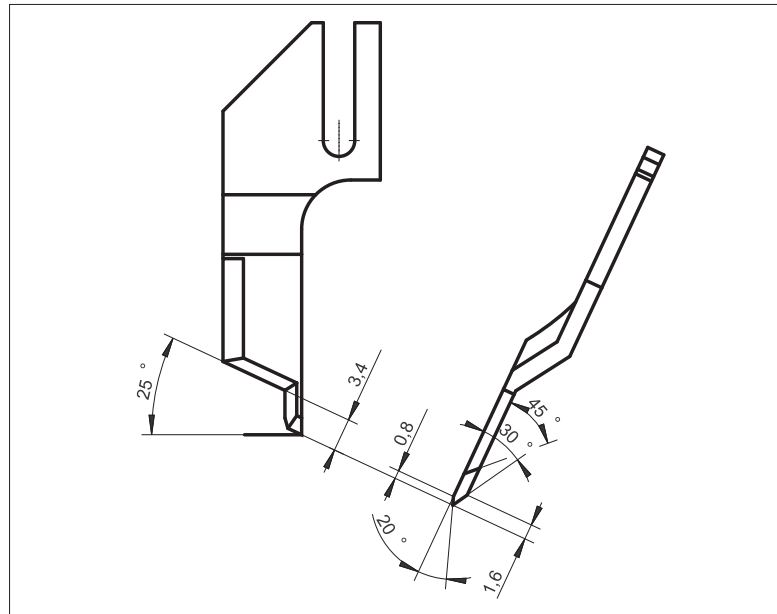
7.8 Sharpening the upper knife

The upper cutting knives supplied as standard, which are made of tool steel, can be sharpened again after they get blunt, best of all by means of a special claming fixture (can be ordered additionally) either manually, or on a special machine grinder at observing its prescribed geometry (see the picture).



Caution!

Danger of injury with knife edge when handling or sharpening.



8 Electronic control and sewing machine drive - positioning motor

All operating instructions and parameter sheets are available at the manufacturers' websites (see www.efka.net, www.duerkopp-adler.com, www.hohsing.com, etc.).

Selected instructions concerning the control and drive setting needed for the operators are included in the Operating instructions.

Selected instructions needed for the technician to set the drive are included in the Operating instructions.

Important notes concerning electrostatic discharges (ESD)



Caution!

Before effectuating any works on electronic components: Turn off the main switch. Remove the plug from the socket.

EN

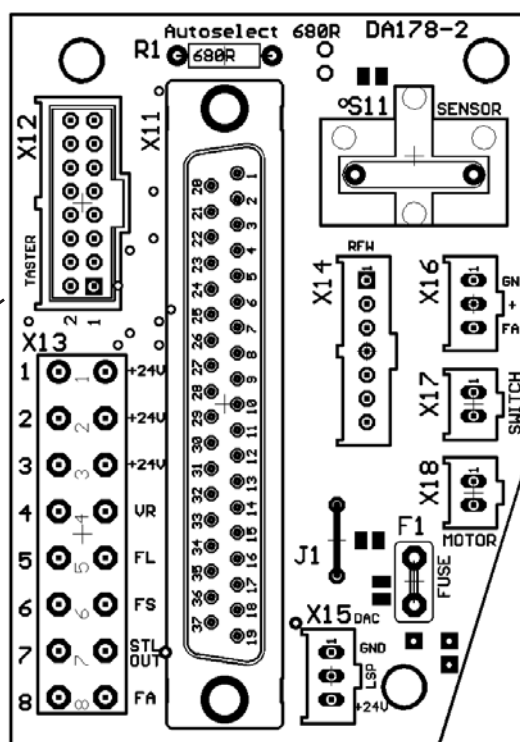
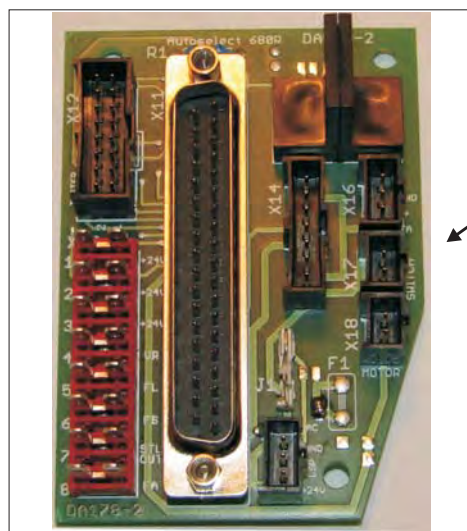
Electrostatic discharges can cause damage to PCBs and other components. You can obtain a certain protection by wearing anti-static gloves or wrist-wraps that you can connect for grounding on the mass of any unpainted metal piece of the machine head or on the switch cabinet.

Handle the PCBs with utmost caution. They are very sensitive towards electrostatic discharges. Hold the PCBs only at their edges.

Put the PCBs after unwrapping or after dismantling with their components upside onto a grounded statically discharged surface. We recommend to use a conductive foam underlay but not as the protective cover of the PCB.

Pay attention not to pull the PCBs over any surface.

8.1 Terminals to PCB connections - electromagnetic variant



Description of DA178-2 (9850 688001) switchboard connection

X11 - main connection cable to control unit

X12 - keypad (Taster)

X13 - terminals for solenoid connection

1,2,3 – supply voltage +24V

4 - VR (backtacking)

5 - FL (foot lifting)

6 - FS (thread tensioner)

7 - STL OUT (half stitch)

8 - FA (thread trimmer)

X14 - bobbin thread monitor

X15 - connection of side switchboard when using DAC control
(with cable 9870 867018)

X16* - connection of connecting cable 9870 688002 for connector on base plate
(thread trimmer solenoids, sewn material edge horizontal trimmer)

X17 - microswitch of sewn material edge trimmer (vertical, oblique)

X18 - sewn material edge trimmer motor

F1 - sewn material edge trimmer resettable fuse

R1 - Autoselect resistor (sewing machine class selection)

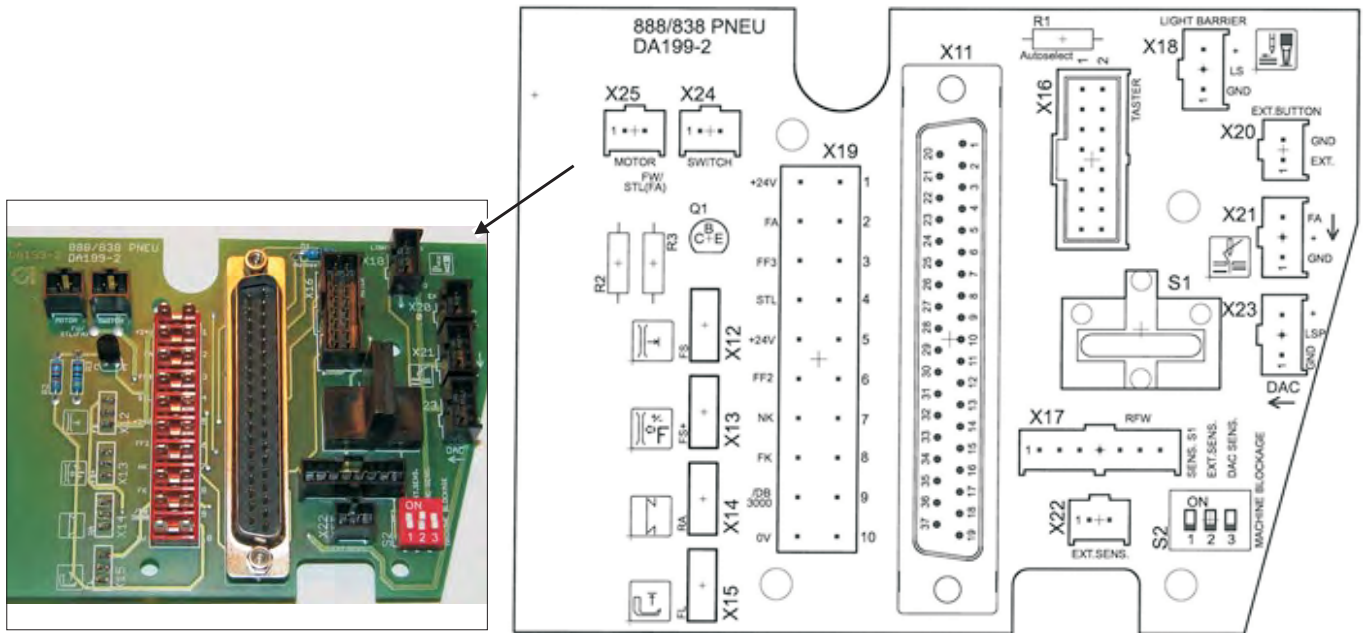
S11 - tilt sensor

J1 - switch; if the sewing machine has a direct drive (DAC control, side switchboard), switch J1 off, otherwise switch J1 on.

* Connection of the trimmer solenoids to the grey connector on the base plate is to be made between FA and + (white and brown).

Connection of the horizontal edge trimmer is to be made between + and GND (brown and green).

8.2 Terminals to PCB connections - pneumatic variant



Description of DA199_2 (9850 838000) switchboard

- X11 - 37-pole connector (to control box)
- X12 - thread tensioner valve
- X13 - secondary thread tensioner valve
- X14 - bartacking valve
- X15 - sewing foot valve
- X16 - keypad
- X17 - bobbin thread monitor
- X18 - light barrier
- X19 - 1. +24V
2. FA (thread trimming)
3. FF3 (functional outlet 3, e. g. puller, pneumatic material edge trimmer)
4. STL (stitch length valve)
5. +24V
6. FF2 (functional outlet 2)
7. NK (needle cooling)
8. FK (thread clamp)
9. /DB3000 (needle switch off)
10. 0V
- FW/STL(FA) – auxiliary outlet (thread wiper/zero stitch length at thread trimming)
- X20 - external outlet controlled with auxiliary pushbutton on keypad ($I_{max}=50mA$)
- X21 - connection of auxiliary cable for bottom distribution (FA, +24V, GND)
- X22 - external blocking of operation (e. g. thread lever guard switch, etc.)
- X23 - connection of a side DAC switchboard (direct drive)
- X24 - material edge trimmer microswitch
- X25 - material edge trimmer mini motor
- S1 - tilt sensor
- S2 - sewing machine operation blocking mode; switch in ON position means that the sensor is without function
- SENS. S1 = tilt sensor on switchboard; EXT.SENS. = sensor in connector X22
- DAC SENS. = sensor on DAC side switchboard (direct drive)



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