

52Xi**Industrial sewing machine**[Service Instructions](#)**GB**

Serviceanleitung

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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 regulations

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 treading, 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 the machine must be disconnected from the compressed air supply system.
Exceptions to this are only adjustments and function 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. Conversions 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 connecting cable must be provided with a permissible local specific network socket. This work requires trained and qualified professionals (see point 8 too).



It is absolutely necessary to respect the safety instructions marked by these signs.
Danger of bodily injuries !
Please note also the general safety instructions.



Introduction and safety regulations

Instructions for the machine setting - class 52X

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1. Zigzag stitch mechanism of machines 523, 524, 527

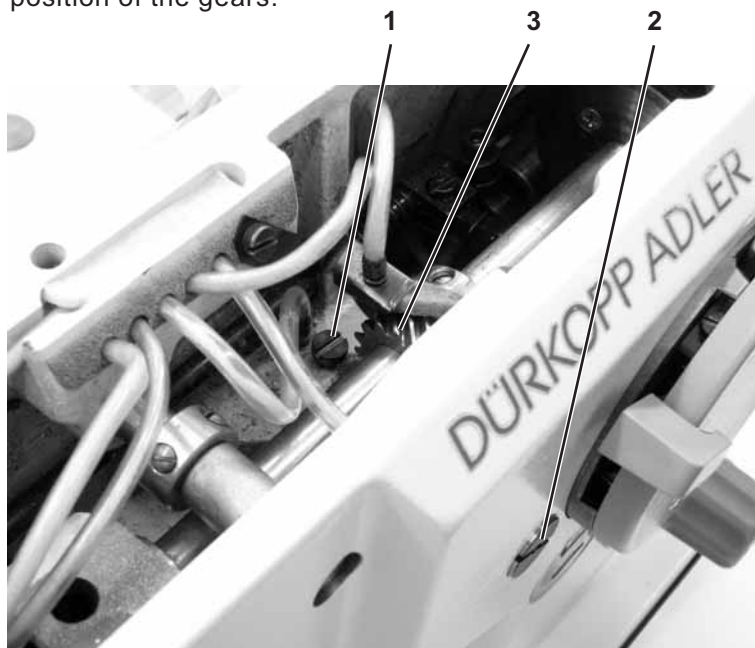
1.1 Introduction

The machine setting must be carried out in the sequence as described herein.

1.2 Tooth clearance setting of zigzag stitch gear

Regulation

The tooth clearance of zigzag stitch should be as small as possible. No overlap instead of clearance, however, may arise in any mutual position of the gears.

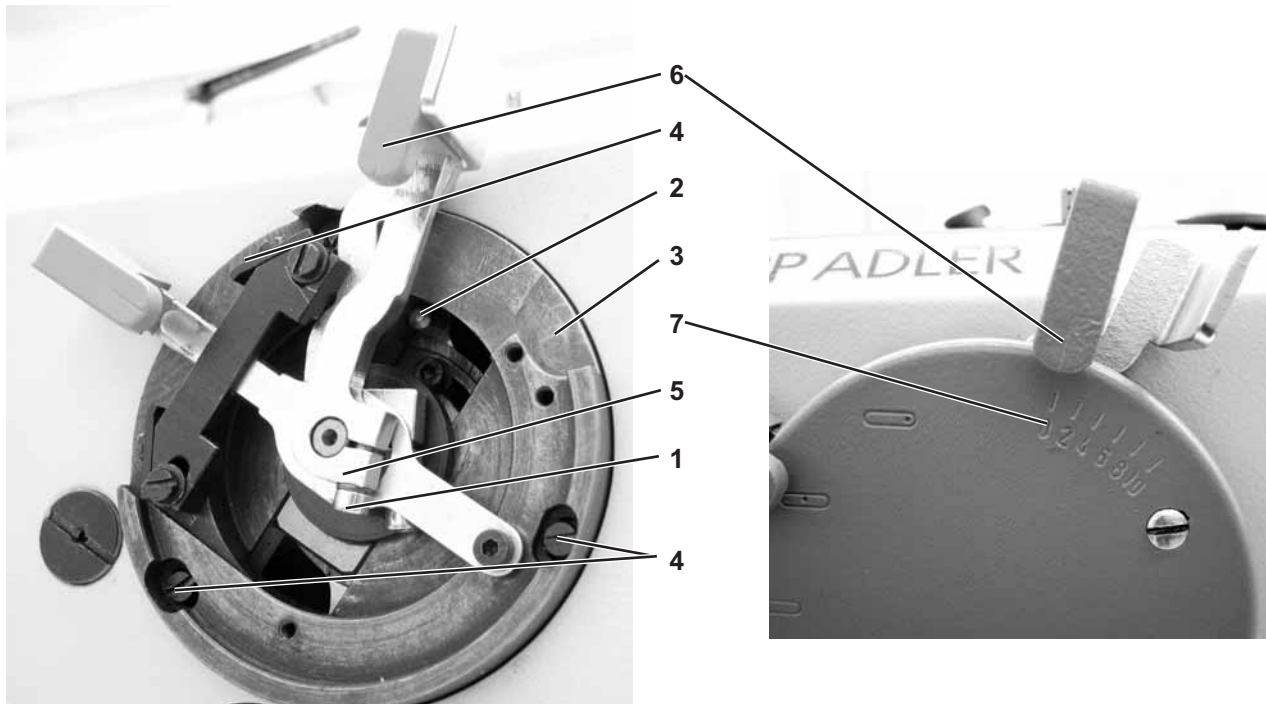


- Dismantle the machine top cover.
- Loosen the screw (1) and turn the eccentric bolt (2) until the gear fitted on it strikes the gear (3). With regard of the gear runout, caused by manufacturing inaccuracy, turn the hand wheel by 1/4 revolution, and set the clearance again. Repeat this 8 times (2 revolutions of the main shaft), until the eccentric bolt (2) position with the smallest tooth clearance is found. Locate the bolt (2) in this position and fix it with a screw (1).

1.3 Straight stitch alignment

Regulation

The centrally positioned straight stitch must be fully aligned, i. e. the needle must not have any lateral motion.

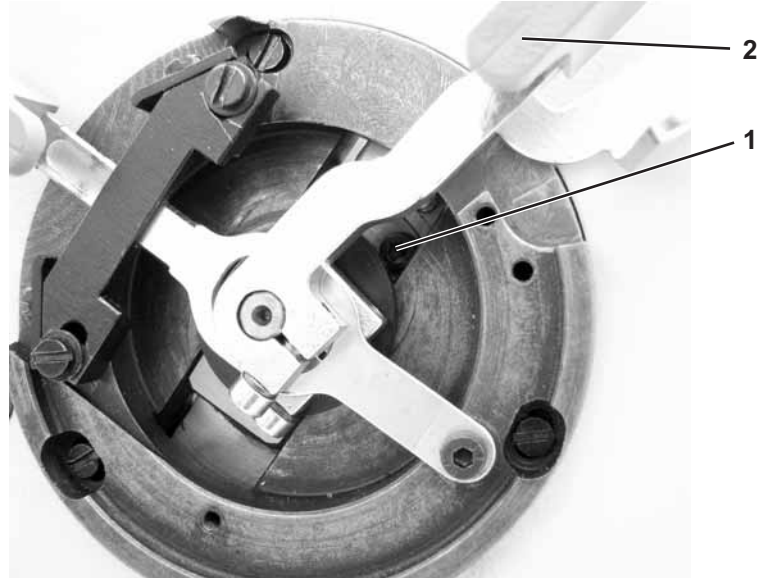


- Set the zero stitch length.
- Loosen the screw (1).
- Place the stop pin (2) to the stop onto the casing (3).
- Place a piece of paper onto the throat plate and turn the hand wheel there and back until the needle point makes 2 holes in the paper.
- Loosen 3 screws (4) and try to set the casing (3) angle position until the needle, when being turned, stabs there and back in the same hole in the paper.
- Tighten the screws (3).
- Fix the lever (5) so that the mark (6) is located opposite the zero on the zigzag stitch scale (7).

1.4 Zigzag stitch width

Regulation

The zigzag stitch width setting must be limited to the value prescribed for the applied sewing equipment with the setting tolerance -5% of the prescribed value.



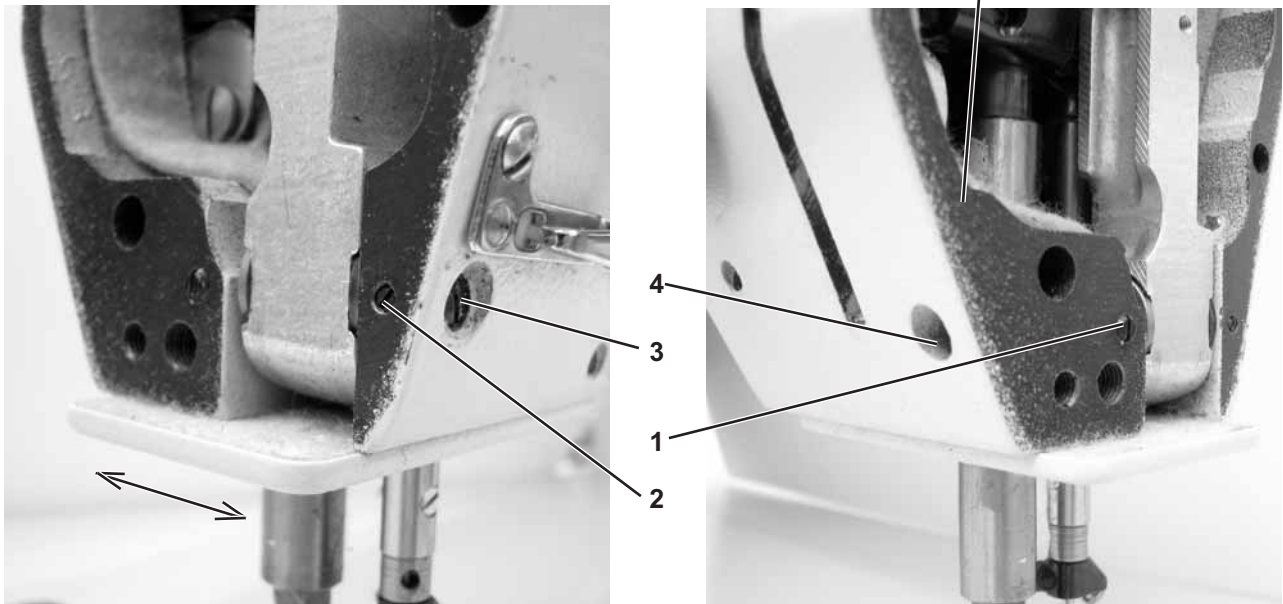
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- Set the zero stitch length.
- Place a piece of paper onto the throat plate.
- Loosen the screw (1).
- Try to set the lever (2) in the position corresponding with the required zigzag stitch width. Turn the hand wheel there and back until the needle makes 2 holes in the paper. Measure their distance. Change the lever position (2) until the distance of the holes complies with the regulation.
- Shift the screw (1) to the stop and tighten it.

1.5 Needle stab position setting in feeding direction

Regulation

If the needle is in the bottom dead center, it should be positioned in the throat plate needle hole center in feeding direction and its lost motion in the feeding direction should be as small as possible.

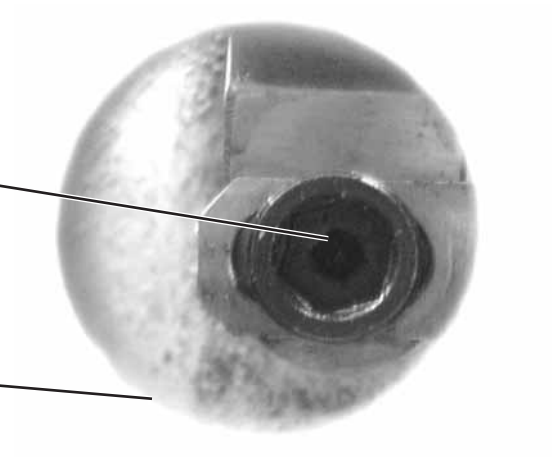


- Place the needle in the bottom dead center.
- Loosen the arresting screws (1), (2), and the regulating screw (3).
- Adjust the screw (4) so that the regulation is complied with and arrest it with the screw (1).
- Adjust the regulating screw (3) so that the lost motion (play) of the needle bar holder in the arrow direction is the smallest achievable one; rubbing must not occur.
- Tighten the screw (2).

1.6 Lateral setting of needle stab position

Regulation

Both dead centers of the needle lateral motion at the zigzag stitch sewing should be at the same distance from the throat plate needle hole edges.

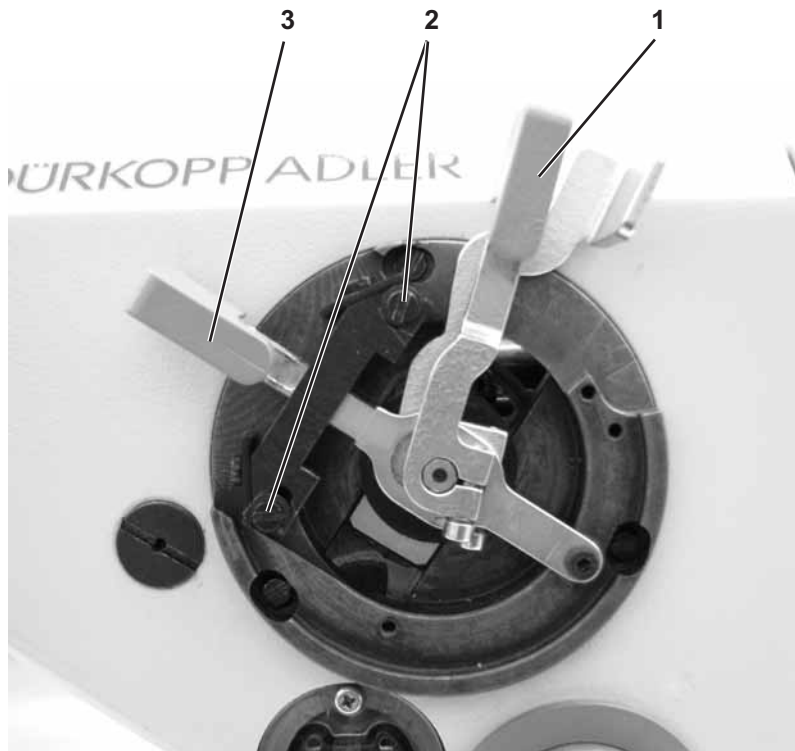


- Dismantle the cover (1) and the hole stop (2) from the rear side.
- Loosen both screws (3).
- Set the maximum zigzag stitch width and adjust the positions of the needle lateral motion dead centers as per regulation.
- Tighten both screws properly (3).

1.7 Lateral setting of central straight stitch position

Regulation

If the central straight stitch is set, the needle position should be approximately in the center of the presser foot or in the middle of the throat plate needle hole center.

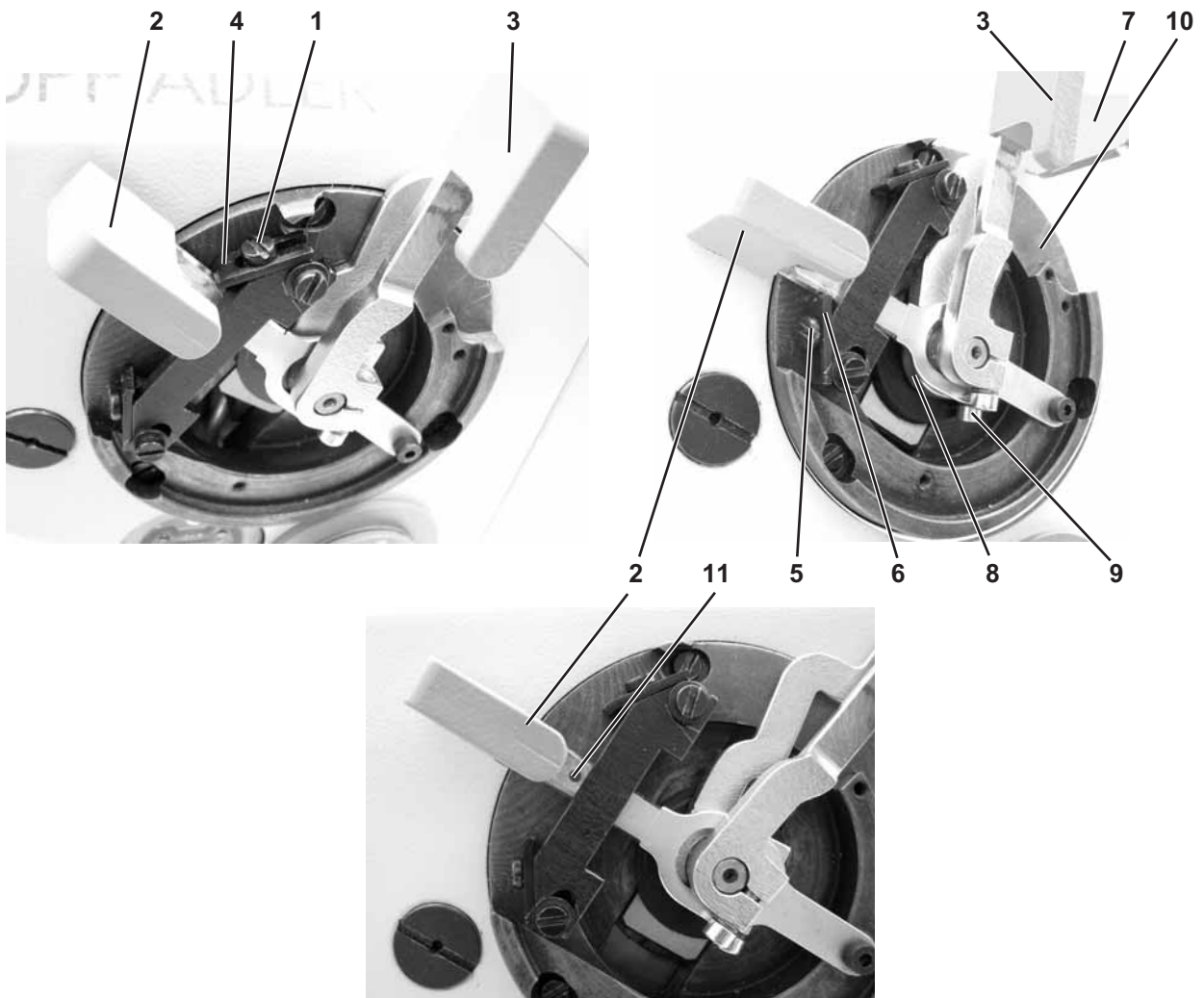


- Set the zero width of the zigzag stitch with the lever (1).
- Loosen the screws (2).
- Shift the lever (3) until the needle shifts in the lateral direction to the throat plate needle hole center.
- Tighten the screws (2).

1.8 Lateral setting of straight stitches on throat plate needle hole edges, arresting of zigzag stitch setting mechanism

Regulation

If the sewing equipment allows using the maximum zigzag stitch width, which is characteristic of the particular machine type, the position of the border straight stitches should be adjusted so that it aligns with the zigzag stitch border. If the throat plate needle hole is narrower than the maximum zigzag stitch width of the particular sewing machine type, the lever for the position setting of the border stitch must be fixed in the central position.



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- Loosen the screw (1) and turn the lever (2) in the position, in which the needle will perform no lateral motion when turning the lever (3).
- Locate the stop (4) to the lever (2) and fix it with the screw (1).
- Loosen the screw (5) and turn the lever (2) to the position, in which the needle performs no side motion when moving the lever (3).
- Locate the stop (6) to the lever (2) and fix it with the screw (5).
- Adjust the arresting lever (7) in this position. Tighten the arresting nut (8-invisible), loosen the screw (9), turn the lever (7) to 1 mm space from the casing (10) and tighten the screw (9).
- If the sewing equipment does not allow using the maximum zigzag stitch width, screw the regulating screw (11) into the lever (2) and fix it in the central position.

2. Form stitch mechanism of machine 525

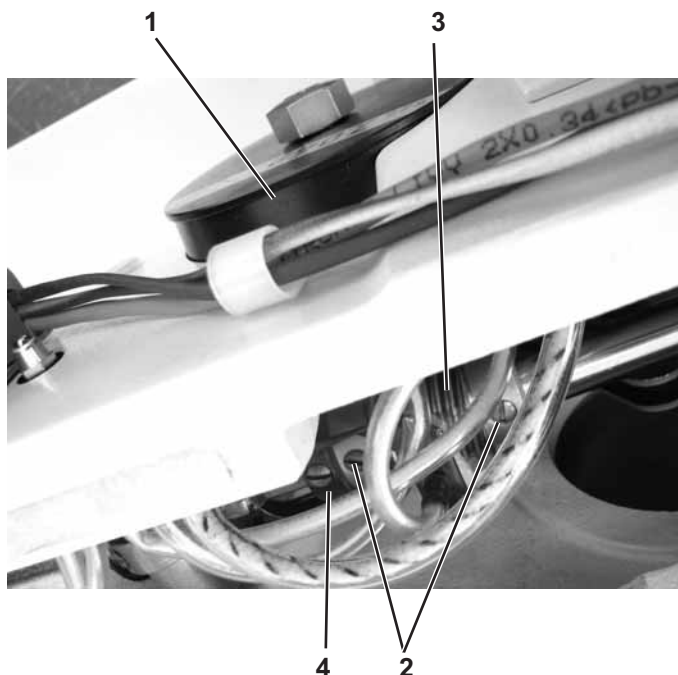
2.1 Introduction

The setting should be carried out in the sequence as described herein.

2.2 Tooth clearance setting of form stitch gear

Regulation

The tooth clearance of the form stitch gear should be as small as possible. No overlap instead of clearance, however, may arise in any mutual position of the gears.

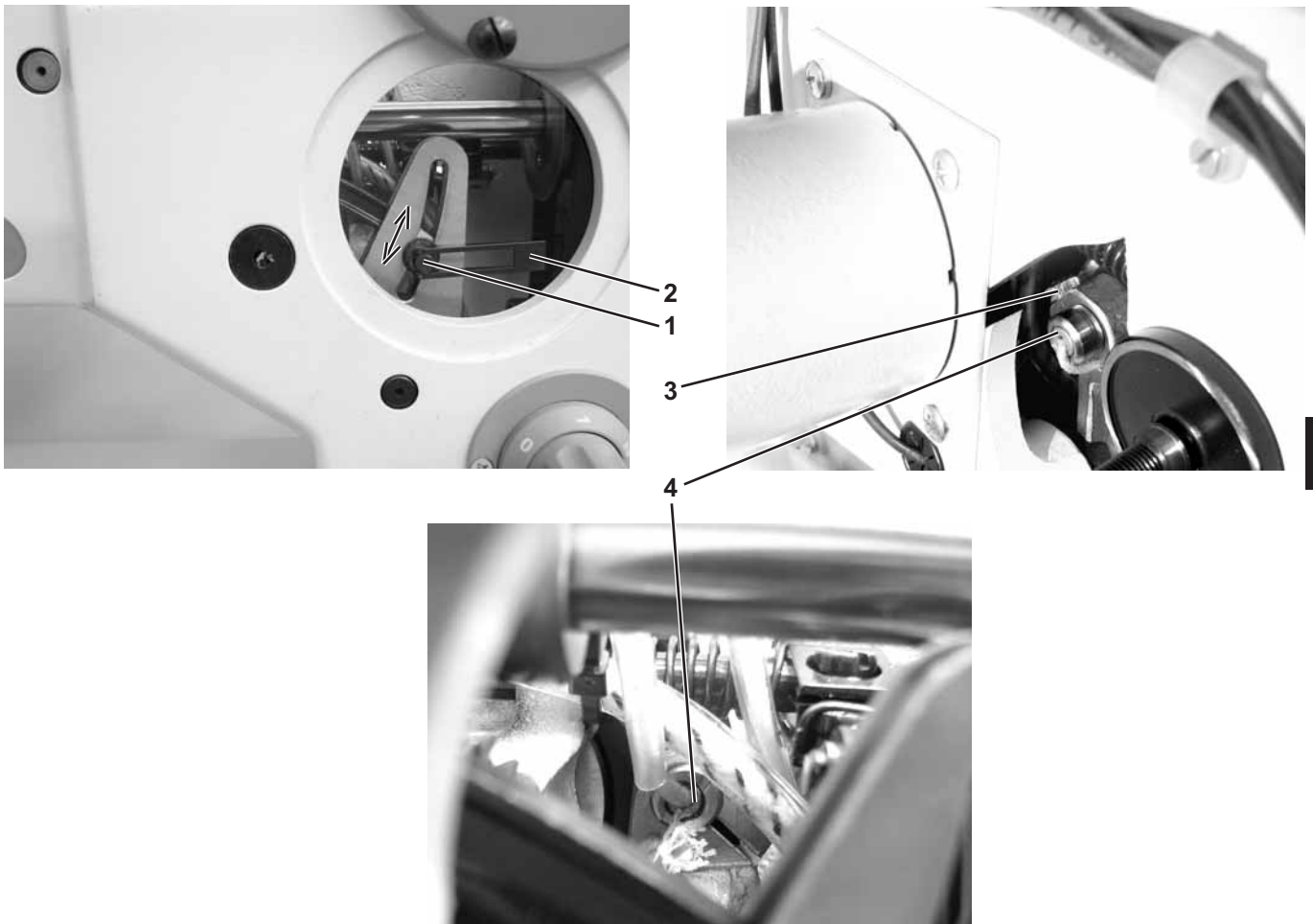


- Dismantle the top cover.
- Turn the hand wheel 12 times in intervals of approximately 1/3 revolution and ascertain the tooth clearance, turning the steering cam (1) manually until the position with the smallest tooth clearance is found.
- Loosen the screws (2), turn the gear in the smallest tooth clearance position, shift the cone scroll (3) to the right and set the tooth clearance as small as possible. Tighten the screws (2).
- Mount the regulating ring (4) on touch with the scroll (3).
- Check the tooth clearance.

2.3 Roller bolt position of form stitch steering cam

Regulation

When changing the form stitch width, the stitch central axis should remain in its place. It should not shift laterally.



- Mount the wheel steering cam of the straight stitch (from the machine rear side).
- Dismantle the cover of the form stitch width setting mechanism.
- Release the bolt (1) position by tilting the lever (2) in yourself direction.
- Move the bolt (1) in the arrow direction and watch whether the needle is moving laterally. If yes, dismantle the steering cam, loosen the screw (3) and try to turn the eccentric bolt (4) to a different position and test whether the needle is changing its position. Repeat this until the eccentric bolt (4) position is found where the needle position does not change.
- Tighten the screw (3).

2.4 Setting of needle stab position

Regulation

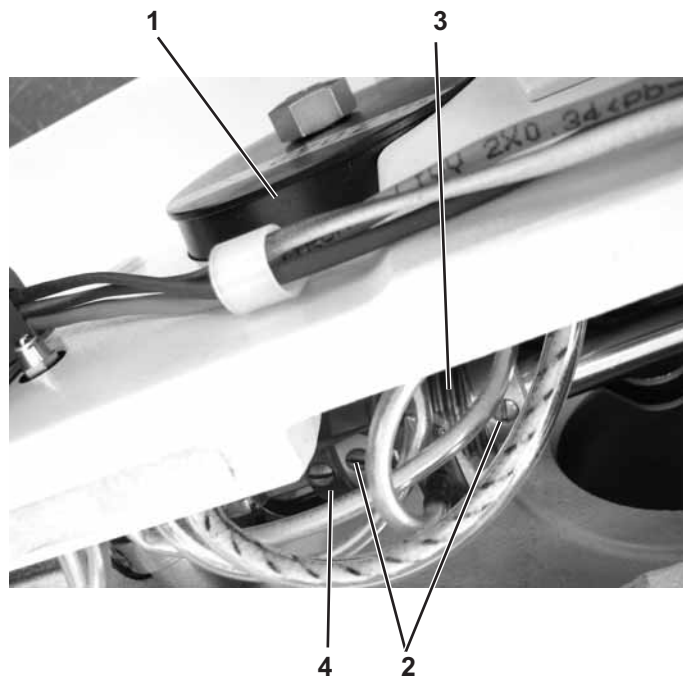
If the wheel steering cam of the straight stitch is mounted, the needle should be located in both directions in the center of the throat plate needle hole.

- Adjust the needle position in feeding direction as per section 1.5.
- Adjust the needle lateral position similarly as in section 1.6 so that the needle is located in the needle hole center.

2.5 Timing of form stitch steering cam to needle motion

Regulation

When sewing the form stitch, the needle should shift in the lateral direction at the time when it is over the sewn material.



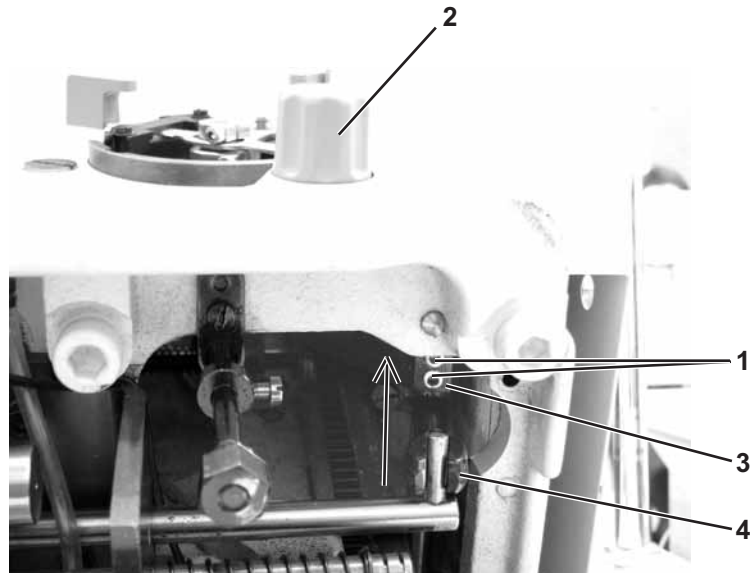
- Dismantle the top cover.
- Mount any form stitch cam (1).
- Loosen 4 screws (2) and turn the scroll (3) to the position where the regulation is complied with. Put the scroll (3) on touch with the regulating ring (4) and fix it.
- Check whether the needle is without any motion at the time when it is stabbed in the sewn material and adjust the setting, if needed.

3. Feeding and presser foot

3.1 Stitch length setting mechanism

Regulation

If the zero stitch length is set, the hand lever should perform no lost motion.



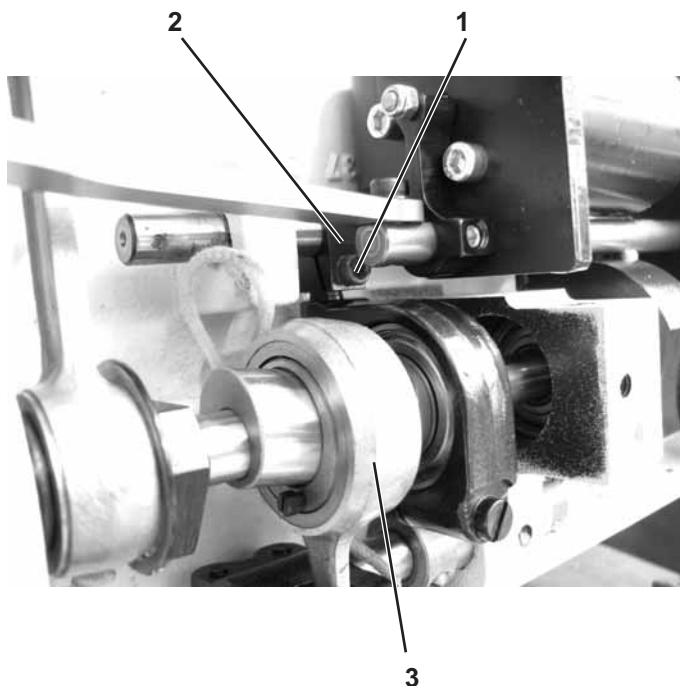
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- Loosen the screws (1).
- Set the setting knob (2) on the zero stitch length.
- Shift the lever (3) in the arrow direction until its fork is in bilateral contact with the screw spherical end on the knob (2) axis.
- Tighten the screws (1).
- Check whether the backtacking lever (4) performs any lost motion in this position.

3.2 Zero stitch length

Regulation

If the zero stitch length is set, the connecting rod (3) should perform no motion.

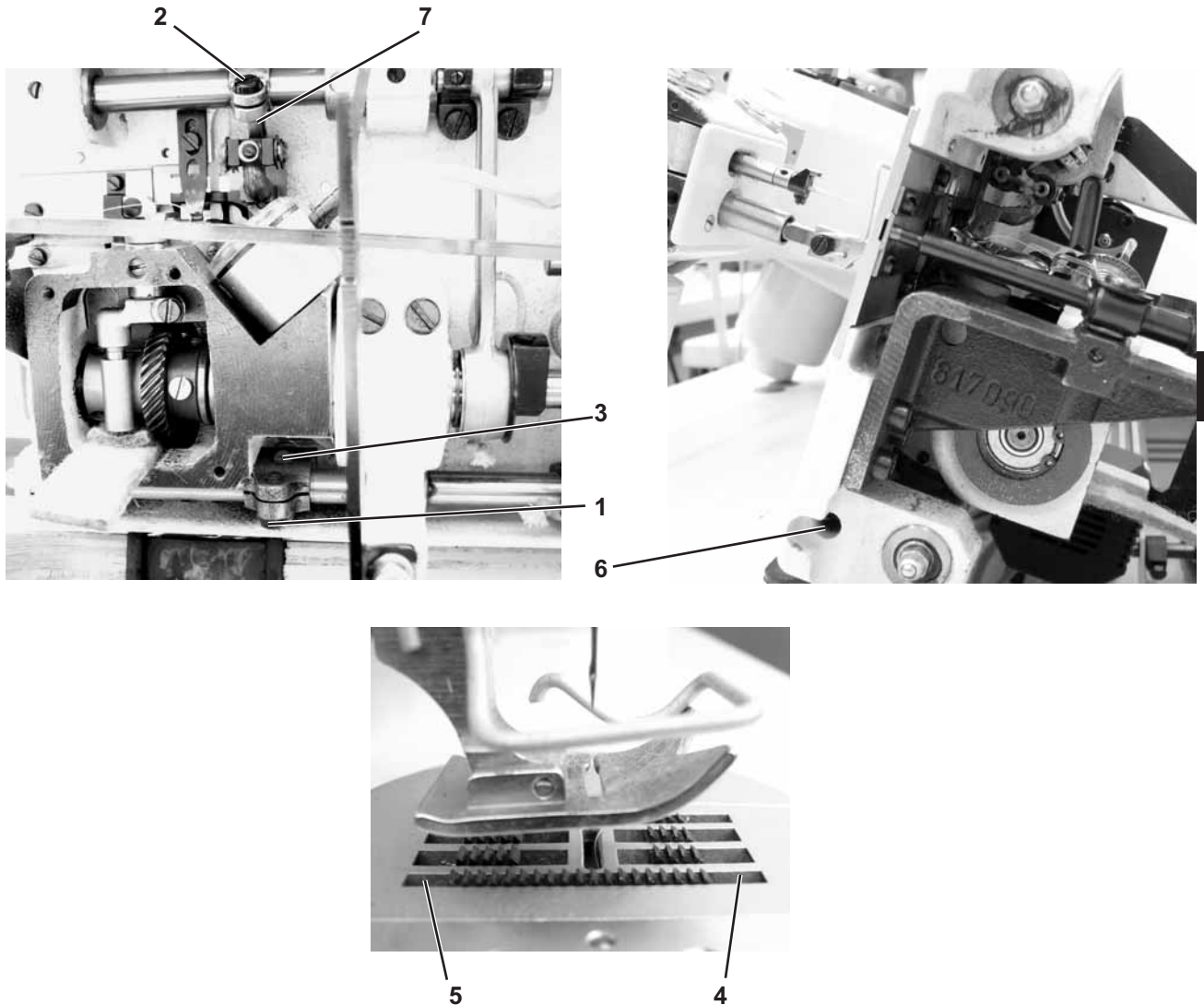


- Set the stitch length knob on the zero cipher.
- Tilt the machine and loosen the screw (1).
- Shift the sleeve (2) until the position is found where the connecting rod (3) stops moving.
- Tighten the screw (1).

3.3 Feed dog position in throat plate recess and its height

Regulation

The feed dog should not touch the throat plate laterally. At the zero stitch length the teeth should be located in the throat plate recess center. If the feed dog is positioned in the top dead center, it should be located 1 mm over the throat plate and its top surface should be parallel with the throat plate.

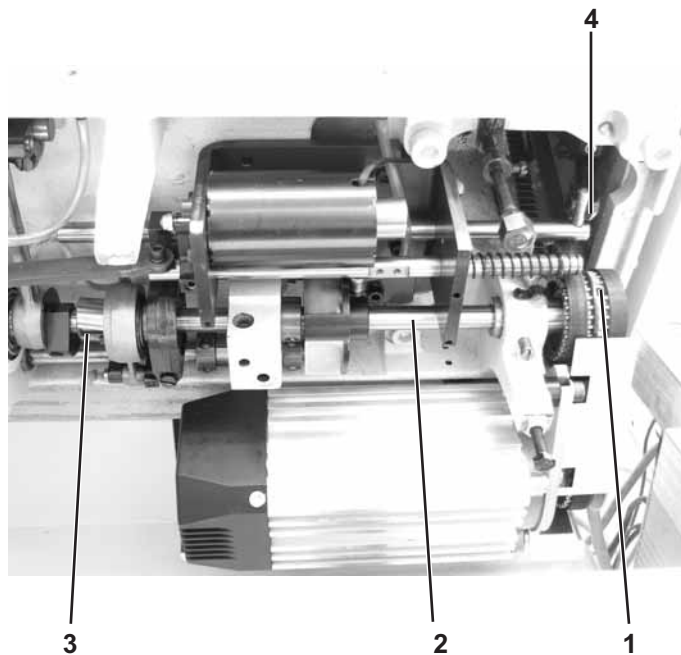


- Set the zero stitch length.
- Loosen the screws (1) and (2). Shift the whole mechanism laterally so that the feed dog does not touch the throat plate.
- Shift the feed dog so that the spaces (4) and (5) are the same and tighten the screw (1).
- Loosen the screws (3), turn the eccentric bolt (6) and the lever (7) until the feed dog protrudes from the throat plate by 1 mm in front and at the back.
- Tighten the screws (3) and (2).
- Set the maximum stitch length and check whether the spaces (4) and (5) are the same in the dead centers of the feed dog motion.

3.4 Timing of feed dog motion eccentric in sewing direction

Regulation

If the needle is lifted by 1 mm from the bottom dead center, the feed dog should not move when the backtacking lever is pressed down.

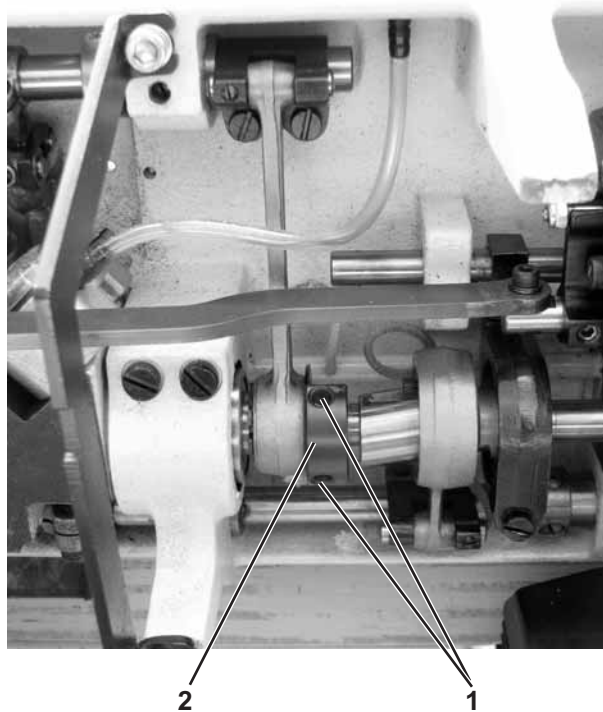


- Set the maximum stitch length.
- Turn the hand wheel in yourself direction until the needle is in the bottom dead center and then turn until the needle lifts by 1 mm.
- Take care that the needle position remains unaffected and loosen two screws (1).
- Turn the shaft (2) manually and find its position where the feed dog does not move at the backtacking lever (4) shifting. At the same time, the longitudinal groove in the roller (3) should be turned close (visible).

3.5 Timing of feed dog vertical motion eccentric

Regulation

If the needle eye is in the same height as the sewn material of the maximum thickness 1 mm, the feeding of the material should start (the feed dog teeth approximately at the throat plate level).



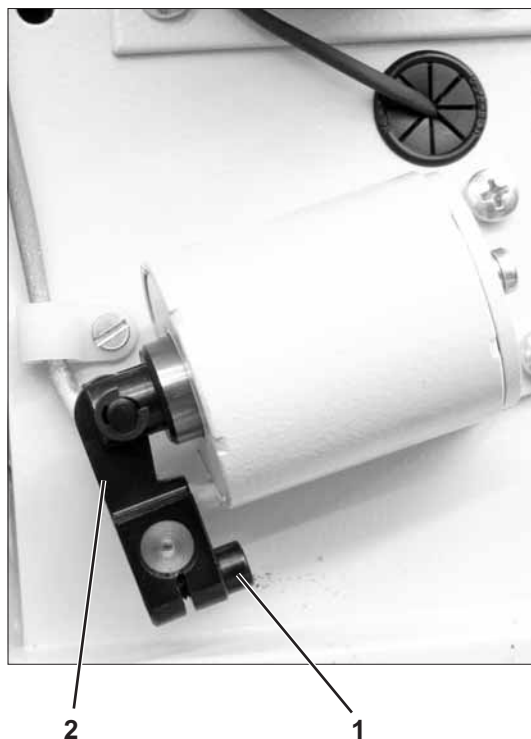
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- Set the maximum stitch length.
- Place the sewn material under the presser foot.
- Turn the hand wheel until the needle stabs in the material as deep as its eye.
- Tilt the machine and loosen the screws (1).
- Turn the eccentric bolt (2) in the machine turning direction until the feed dog strikes the sewn material - resistance against the eccentric turning will be increased by leap. Tighten the screws (1).
- Test whether the regulation is complied with: set the needle eye slightly over the material - the material should not move when the backtacking lever is pressed down. Set the needle eye slightly under the material - the sewn material should shift when the feeding lever is pressed down.

3.6 Backtacking with solenoid

Regulation

At the maximum stitch length, at the backtacking mechanism dislocation with the solenoid, its movable core should not strike the fixed one.

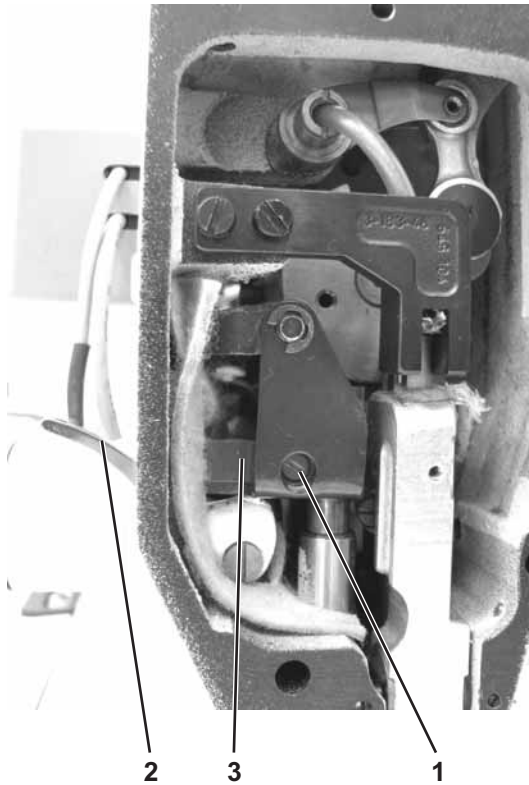


- Set the maximum stitch length.
- Press the backtacking lever down to the stop and hold it in this position.
- Loosen the screw (1), press the lever (2) down to the stop, and put it back by approximately 1 mm.
- Tighten the screw (1).
- Test whether its movable core does not strike the fixed one when the solenoid is switched on.

3.7 Manual foot lifting

Regulation

The foot stroke with the hand lever should be 5,5 mm.

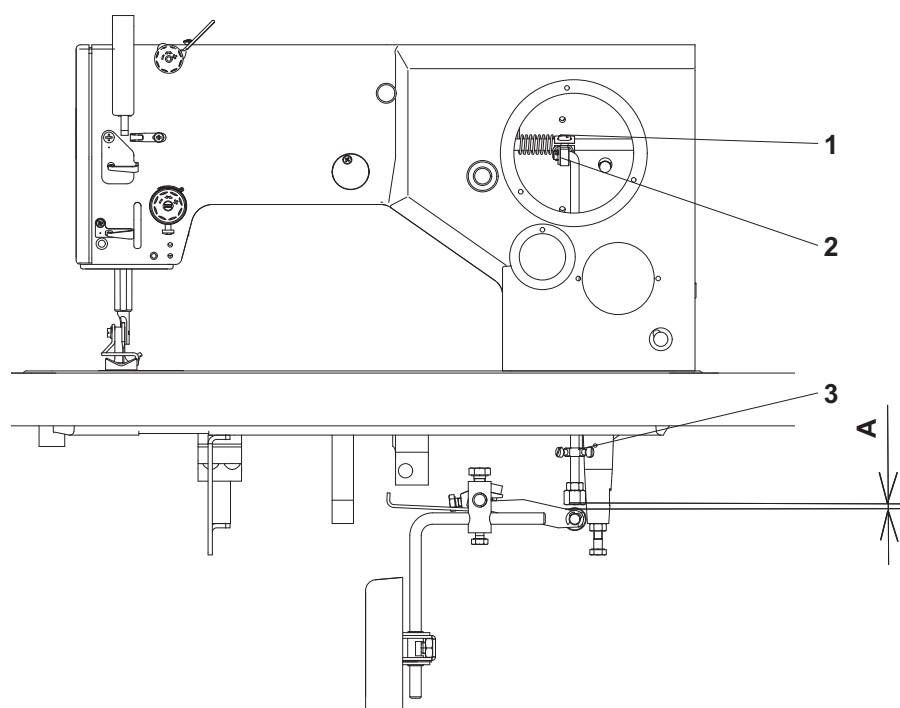


- Place the bottom feed dog under the level of the throat plate top surface.
- Place an object of thickness 5,5 mm under the foot.
- Loosen the screw (1), lift the hand lever (2), press the driver (3) down to the lever (2) and tighten the screw (1).

3.8 Foot lifting with knee lever

Regulation

The foot stroke with the knee lever should be 12,5 mm, the space (A) = approximately 2 mm if the knee lever is in the initial position.



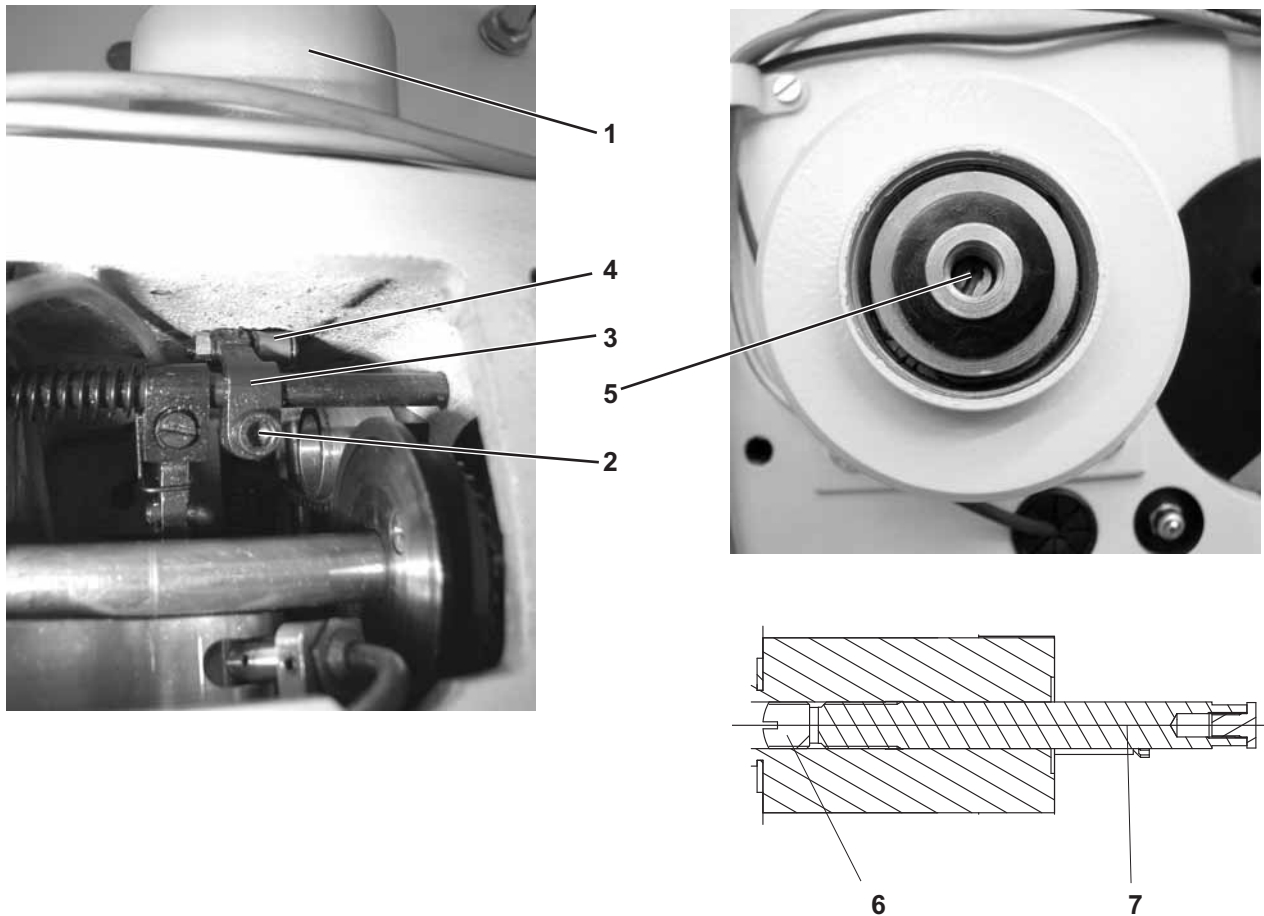
- Lower the presser foot on the throat plate.
- Loosen the screw (1) and turn the lever (2) so that there is no space (A).
- Tighten the screw (1).
- Try to adjust the ring (3) position and test how big the foot stroke with the knee lever is. Repeat this until the prescribed foot lifting is achieved.

3.9 Foot lifting with solenoid

Regulation

The foot stroke with the solenoid is 12 mm.

If the foot is lifted, the solenoid movable core should be at the stop onto the fixed core.



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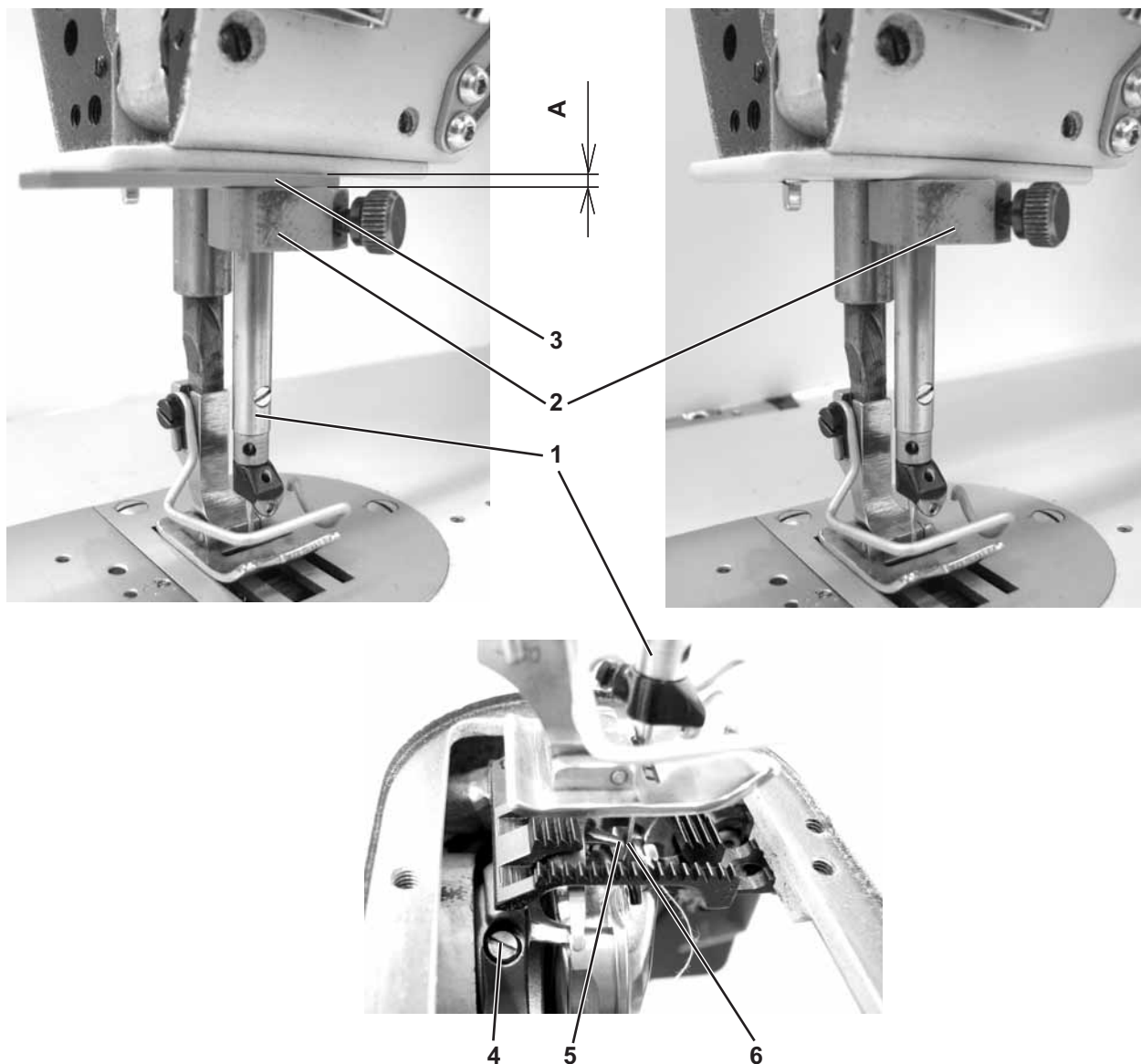
- Place the foot onto the throat plate.
- Unscrew the solenoid (1) nut.
- Loosen the screw (2).
- Turn the lever (3) with the roller (4) almost on touch with the side, and tighten the screw (2).
- Remove the solenoid core (5).
- Loosen the screw (6) and try to turn the screw (7) to any position.
- Insert the core (5) back in the solenoid, press it down and find out how big the solenoid stroke is. Repeat the procedure until the prescribed value is achieved.
- Lock the screw (7) position with the screw (6).

4. Needle bar and hook

4.1 Timing of hook

Regulation

When sewing the straight stitch in the foot center, if the needle bar performs the stroke (A) = 2,2 mm (2,5 mm of machine 527) from its bottom dead center (hook timing, loop stroke), the hook point should be on the needle axis. A special fixture is necessary for the setting to make the setting sufficiently accurate.

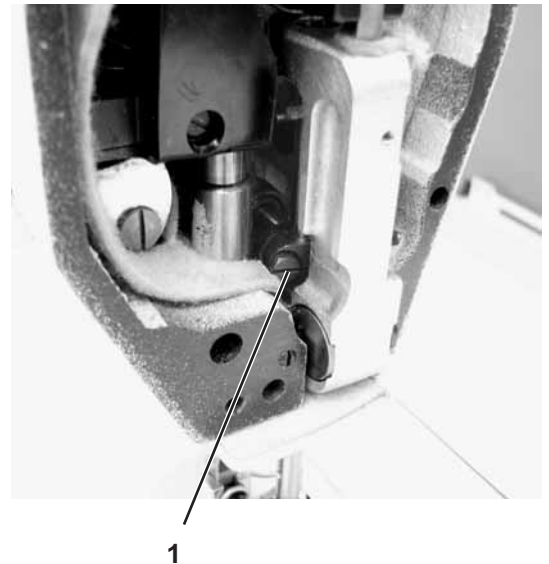
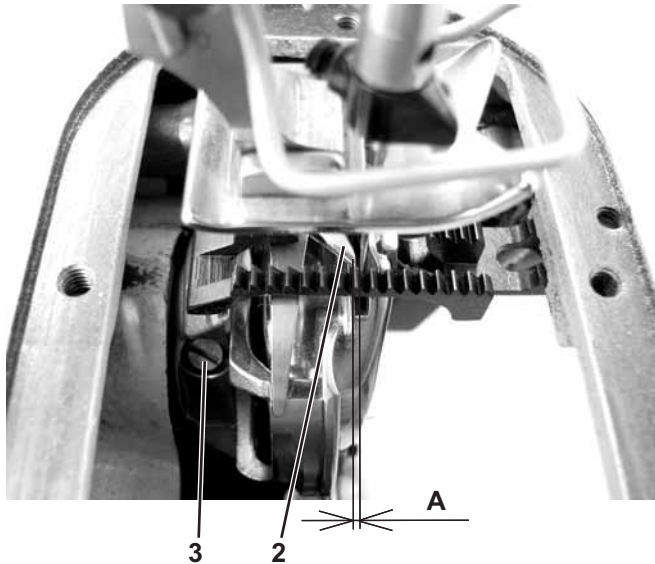


- Dismantle the throat plate.
- Set the needle bar (1) onto the bottom dead center.
- Fix the sleeve (2) onto the needle bar after having inserted the gauge (3).
- Remove the gauge (3). Turn the hand wheel until the sleeve (2) shifts to the stop.
- Loosen the hook screws (4) and set its point (5) on the needle axis (6).

4.2 Needle bar height, needle and hook point clearance

Regulation

When sewing on the left, if the hook point is positioned on the needle axis, the hook point bottom edge should be located on the needle eye top edge. The hook should be positioned so that the distance between the needle scarf bottom and the hook point is (A) = 0,2 mm.



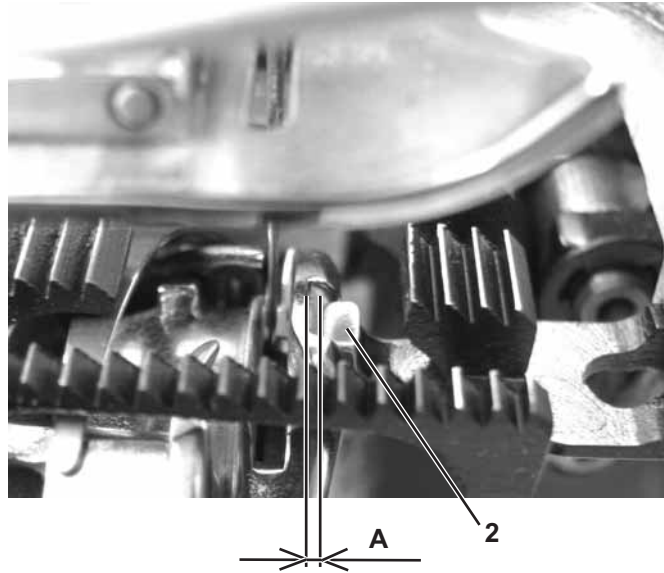
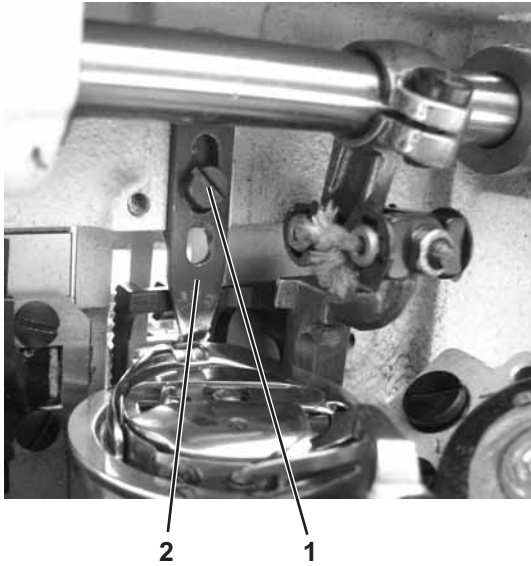
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- Dismount the throat plate.
- Set the needle stab to the left and the hook point onto the needle axis.
- Loosen the needle bar driver screw (1) and shift the needle bar vertically so that the hook point bottom edge (2) is at the level of the needle eye top edge. Tighten the screw (1).
- Loosen two screws (3) and shift the hook to the distance (A). Take care that the hook point does not change the angle position set as per section 4.1. Tighten the two screws (4).

4.3 Bobbin case driver

Regulation

The distance between the bobbin case driver and the bobbin case groove bottom should be (A) = 0,7 mm.

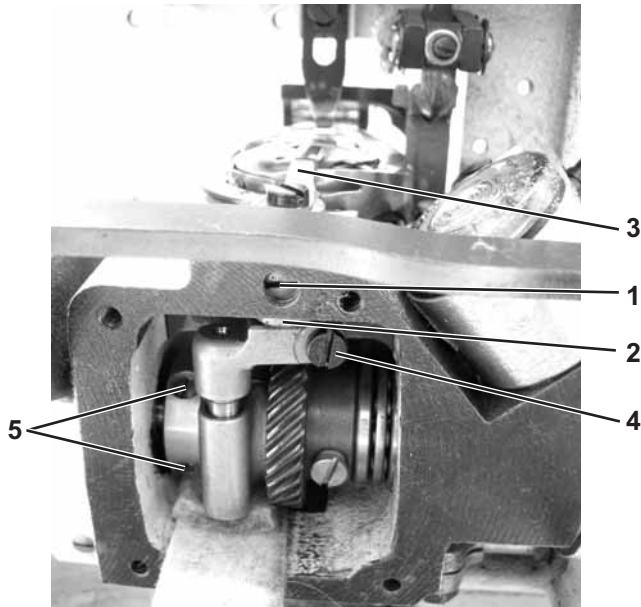


- Dismantle the throat plate and tilt the machine.
- Loosen the screw (1).
- Shift the driver (2) to the distance (A) = 0,7 mm.
- Tighten the screw (1).

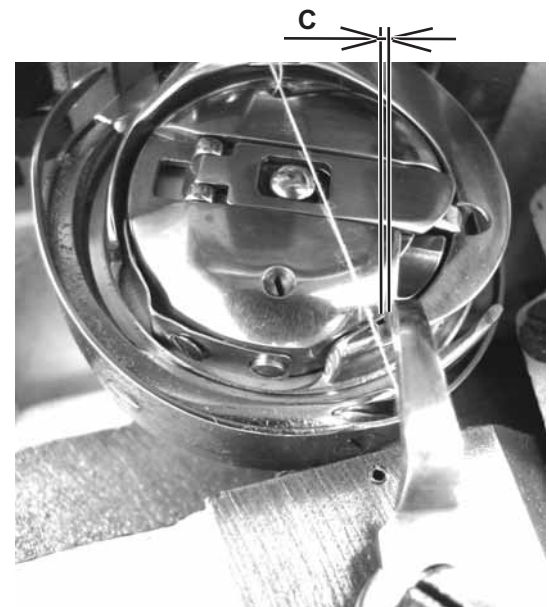
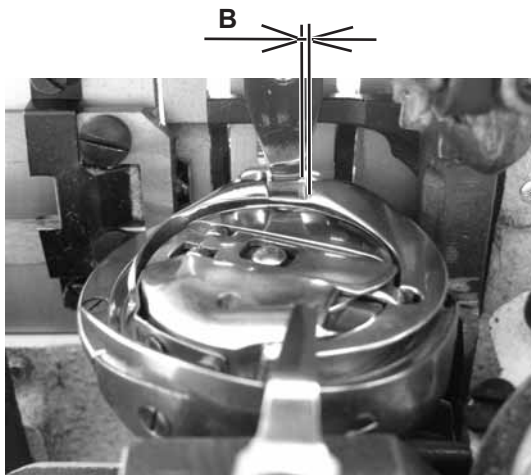
4.4 Hook lifting

Regulation

In the direction of the hook axis there should be the space (A) = 0,8 mm between the bobbin case lifter and the hook. The maximum hook lifting should be (B) = 0,4 to 0,8 mm according to the thread thickness. The timing of the lifting eccentric should enable a smooth passage of the thread between the bobbin case and the bobbin case lifter (C) = 1 mm.



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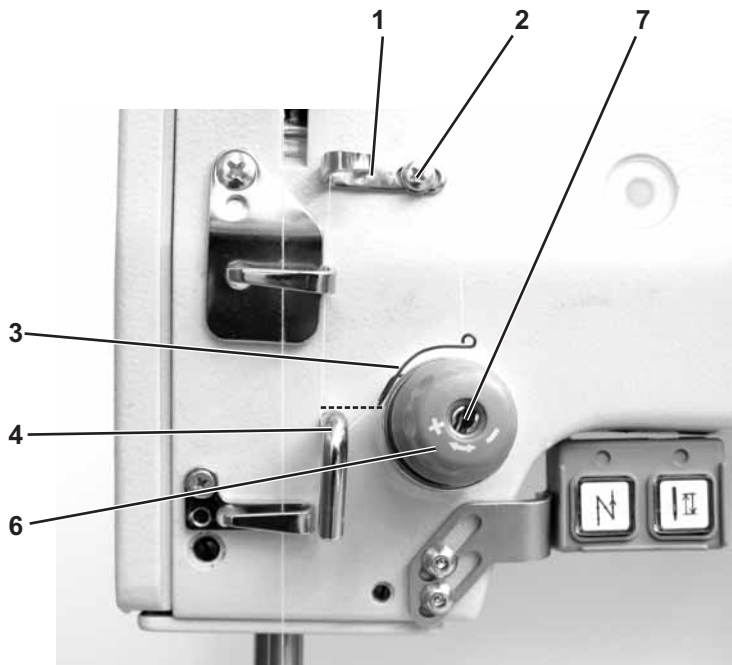
- Dismantle the throat plate and tilt the machine.
- Loosen the screw (1) and shift the casing (2) to obtain the space (A) = 0,8 mm and tighten the screw (1).
- Turn the hand wheel until the bobbin case lifter (3) is in the maximum lifting position (left position). Loosen the screw (4) and turn the bobbin case lifter so that the space (B) = 0,4 to 0,8 mm is achieved according to the thread thickness.
- Loosen two screws (5), try to set the timing of the feeding eccentric and tighten the screws (5). Sew and watch the size of the space (C) at the moment when the thread is passing through the space. Correct the timing so that (C) = 1 mm.

5. Thread mechanism

5.1 Thread limiter and check spring

Regulation

The thread limiter (1) should be positioned horizontally. The screw (2) should be located in the center of its groove. The spring (3) stop should be located in such position so that the spring end (3) is in the same height as the thread guide top edge (4). In the initial position the spring (3) should be pre-tensioned by 90°.



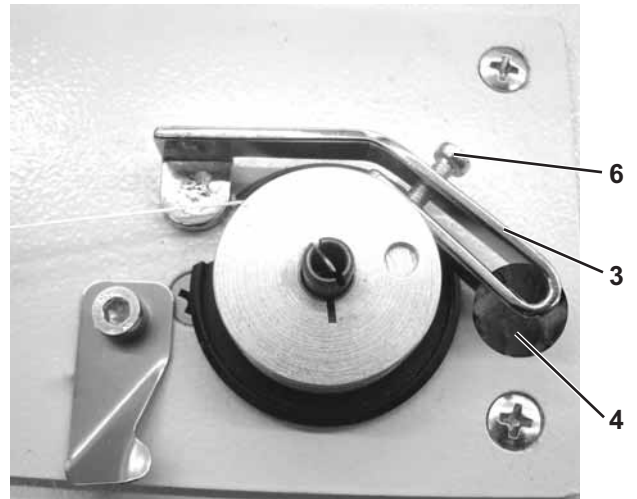
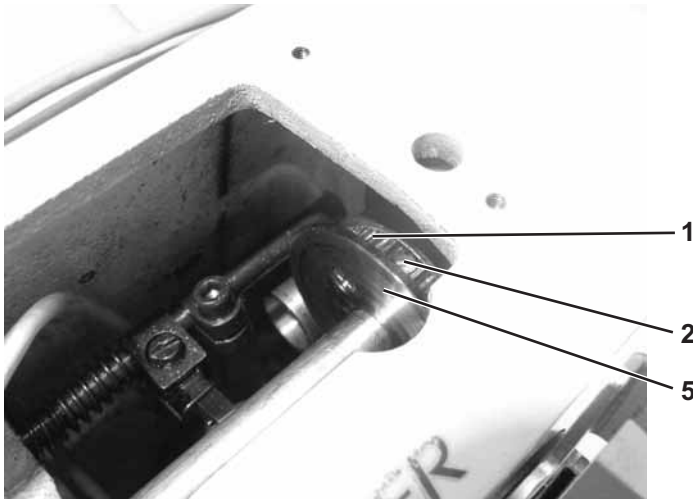
- Set the thread limiter position (1) as shown in the picture and in compliance with the regulation.
- Loosen the screw (5) and turn the whole tensioner (6) so that the spring end (3) is in the same height as the guide top edge (4). Tighten (5) the screw.
- Insert a screwdriver into the groove (7) and turn the shaft (thread tensioner bolt) anticlockwise until the spring (3) starts turning. Then turn clockwise until the spring (3) strikes the stop. Then turn by approximately another 90° to achieve the prescribed pre-tension.

5.2 Bobbin winder

Regulation

If the bobbin winder is switched off, the space between the driving and driven wheels of the bobbin winder should be as small as possible, but they must not touch each other.

When winding the thread, the bobbin winder should automatically switch off when the thread is wound up to 0,5 mm under the bobbin outer diameter.



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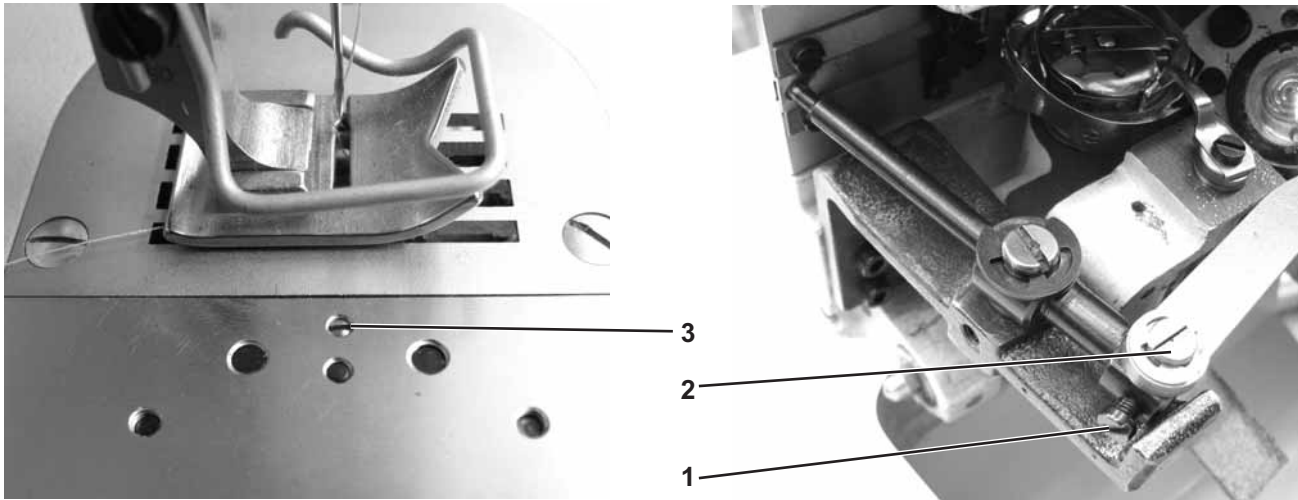
- Dismantle the machine arm top cover.
- Shift the indented belt (1) with a screwdriver so that two regulating screws are (2) accessible and loosen them.
- Mount the machine arm top cover and switch off the bobbin winder with the lever (3).
- Insert a hexagonal key through the hole (4) into the regulating screw (2) and shift the indented belt pulley (5) to the left up to the stop. Afterwards shift it by 0,5 mm to the right and tighten the screw. Then tighten also the other belt pulley fixing screw.
- Adjust the switch lever (3) with the screw (6) and test whether the adjustment complies with the regulation.

6. Thread trimming

6.1 Trimming pressure between knives

Regulation

The trimming pressure should be as large as possible, however, the knives should be on touch within the last part of the trimming knife path only.

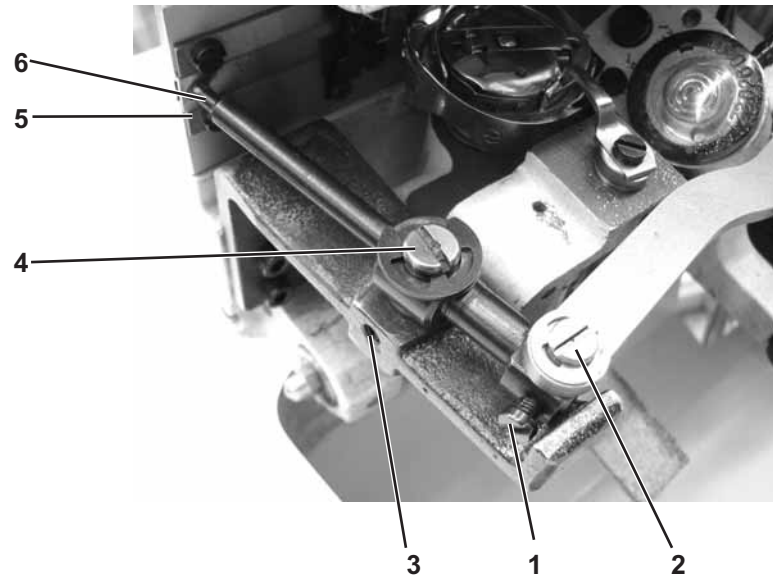


- Tilt the machine, loosen the screw (1), and remove the bolt (2).
- Set a high pressure between the trimming knives with the screw (3) so that the resistance against the knife motion is high within the whole motion path.
- Gradually reduce the knife pressure with the screw (3) until compliance with the regulation is achieved.
- Mount the bolt (2) back again.

6.2 Trimming lever

Regulation

The trimming lever (6) should be located as high as possible, but it should not rub the plate (5). The eccentric bolt (2) groove should be in horizontal position.



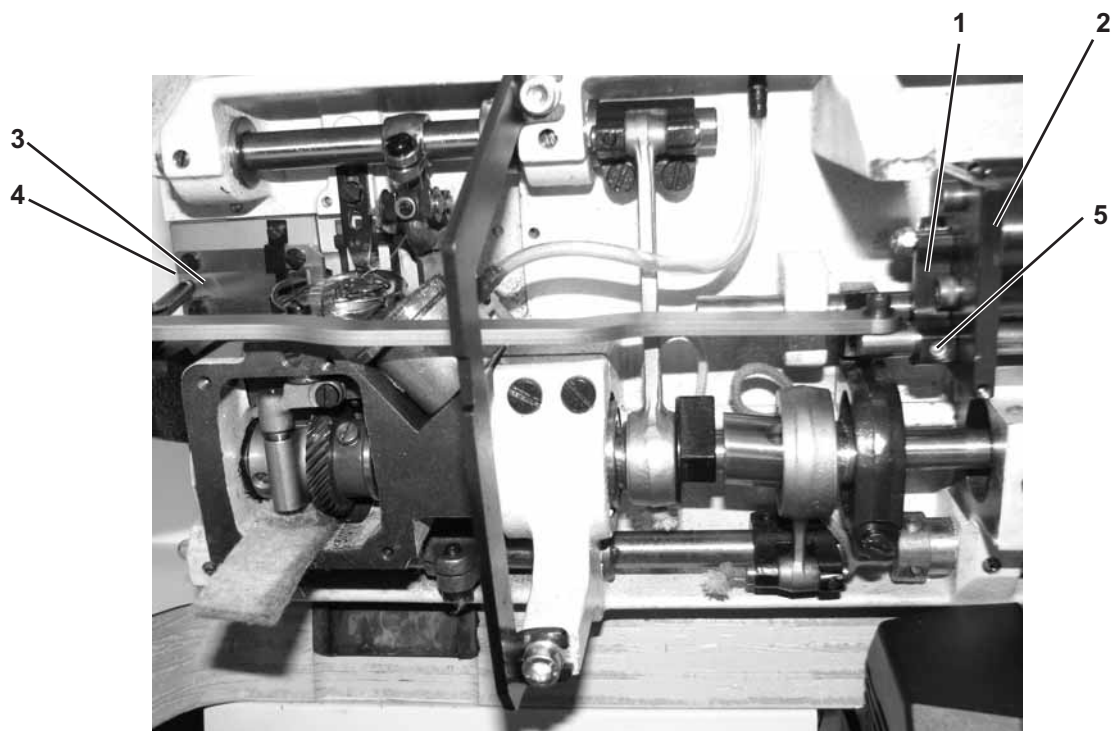
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- Tilt the machine.
- Loosen the screw (3) and turn the eccentric bolt (4) so that the lever does not rub (6) the plate (5), however, it should be positioned as high as possible. Tighten the screw (3).
- Loosen the screw (1). Turn the eccentric bolt (2) so that its groove is almost horizontally positioned. Tighten the screw (1).

6.3 Driver

Regulation

If the driver (1) touches the casing (2), the knife (3) should be on the plate edge (4).



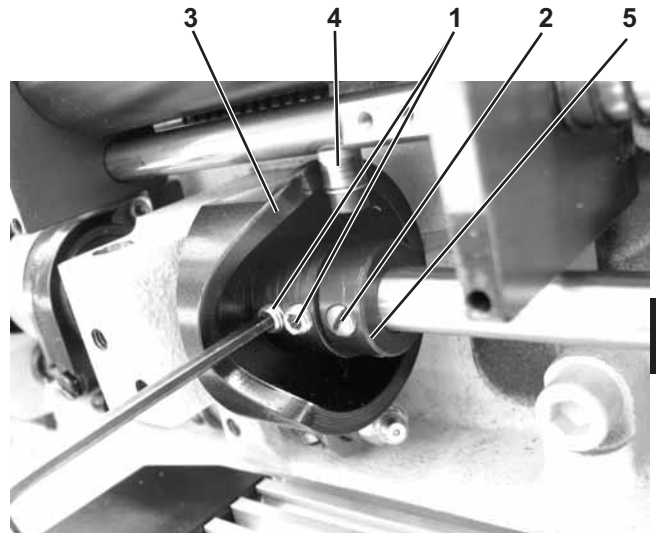
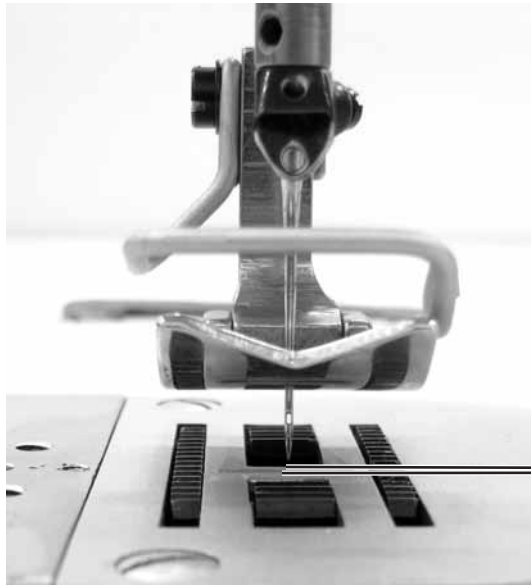
- Tilt the machine.
- Loosen the screw (5).
- Shift the knife (3) as per regulation.
- Place the driver (1) on touch with the casing (2) and tighten the screw (5).

6.4 Trimming cam

Regulation

If the trimmer is not active, then the shortest distance between the cam (3) and roller (4) should be 0,1 mm.

Timing of the cam: if the needle point is approximately (A) = 1 mm over the throat plate, the cam screws should be turned downwards and their axes perpendicularly to the machine base plate.



- Tilt the machine.
- Loosen the screws (1) and (2), set the distance 0,1 mm by shifting the cam (3) and tighten the screws (1).
- Put the ring (5) on touch with the cam (3) and tighten the screws (2).
- Loosen the screws (1).
- Set the needle point to the distance (A) = 1 mm.
- Set the cam (3) with the screws (1) downwards as per regulation and tighten them.

7. Electronic control and machine drive

Detailed instructions for the positioning motor operation are attached to the machine (see also **www.efka.net**).

Selected instructions for the drive setting at the machine installation are included in the second part of the Instruction manual.