

609**Spezialnäähmaschine**

Serviceanleitung

D[Service Instructions](#)**GB**

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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.



Part 3: Service Instructions for the class 609

(Edition 01/2008)

1.	General	
1.1	Gauge Set	4
2.	Position of needle and needle hole	5
3.	Material presser foot	
3.1	Height of the material presser foot	6
3.2	Timing of the movement of the material presser foot.	7
3.3	Stroke of the material presser foot	8
4.	Opening the thread tension	
4.1	Mechanical opening of the thread tension	9
4.2	Electromagnetic opening of the thread tension	10
4.3	Thread Controller Spring	11
5.	Pre-adjustment to the needle bar height	12
6.	Hook settings	
6.1	Loop stroke and clearance of the hook point to the needle	13
7.	Thread trimmer	
7.1	Function sequence	14
7.2	Thread trimmer drive.	15
7.3	Knife carrier and thread-pulling knife	16
7.4	Hook shaft and knife carrier	17
7.5	Timing of the trimming process (control cam)	18
7.6	Position of the counter knife	19
7.7	Cutting pressure of the counter knife	20
7.8	Re-sharpening the counter knife.	21
7.9	Position of the thread guiding sheet.	22
8.	Bobbin winder	
8.1	Function of the bobbin winder	23
8.2	Bobbin fill quantity	24
9.	Oil lubrication	
9.1	General.	25
9.2	Lubrication points.	26
10.	Maintenance	27
11.	Summary of all sewing machine settings	28

1. General

These service instructions describe the adjustments that can be made to the 609-class special sewing machine.

609-100101: The single-needle lockstitch cylinder arm machine with electromagnetic thread trimmer.



ATTENTION!

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



Caution Risk of Injury!

Always switch off main switch before any repair, alteration and maintenance.

Any adjustment work and function testing conducted while the machine is running should follow all safety measures with the greatest possible caution.

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 made in the order described.

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

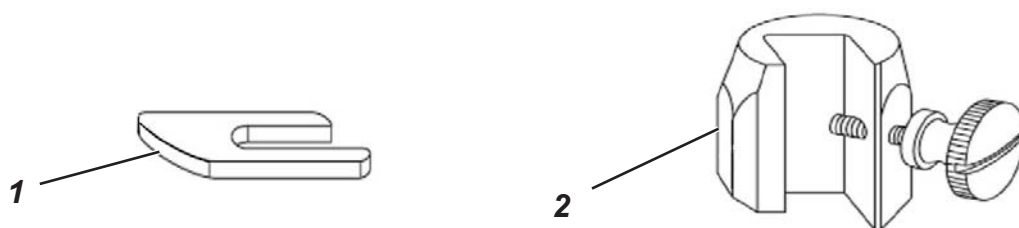
GB



ATTENTION!

All colored parts were set at the factory and should only be loosened by skilled personnel.

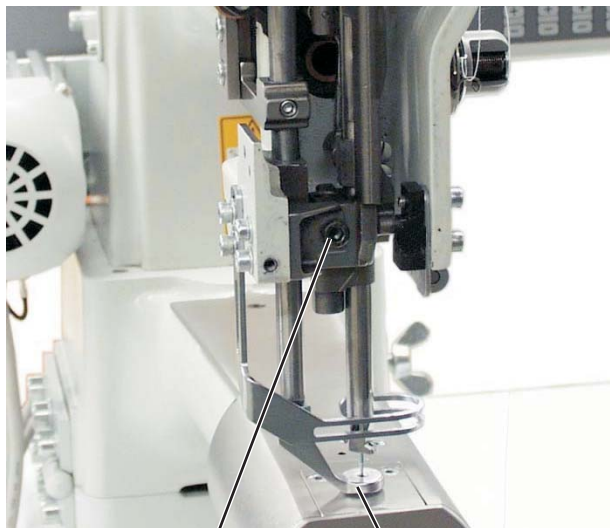
1.1 Gauge set



You can use the setting gauges included in the gauge set to precisely check and adjust the sewing machine.

Pos.	Setting gauge	Order no.	Use
1	Gauge	0981 150003	Loop stroke
2	Block	0981 150002	Loop stroke

2. Position of needle and needle hole



Caution Risk of Injury!

Turn the main switch off.

Check and set the position of the needle and needle hole only when the sewing machine is turned off.

GB

Rule and control

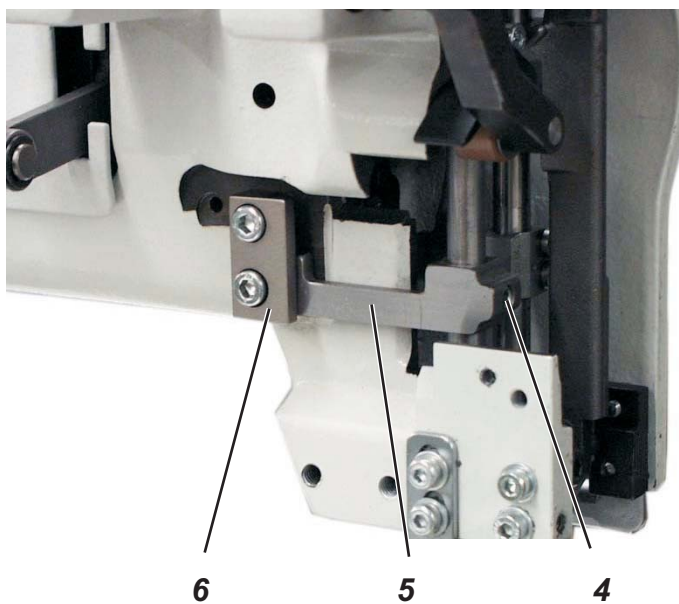
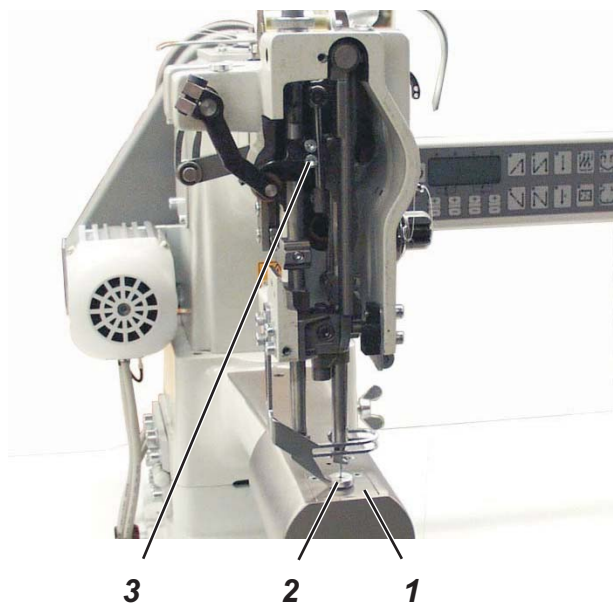
The needle-bar link must be standing over the needle hole, so that the needle penetrates the middle of the hole.

Adjustment

- Take off the material presser foot.
- Turn the handwheel until the needle is positioned directly over the needle hole.
- Loosen screw 2.
- Align the needle-bar link.
- Tighten screw 2 again.
- Mount and align material presser foot 1.

3. Material presser foot

3.1 Height of the material presser foot



Caution Risk of Injury!

Turn the main switch off.

Check and set the height of the material presser foot only with the sewing machine turned off.

Rule and control

The distance between the material presser foot 2 and the needle plate 1 should be 0.3 mm.

The setting can be made with a feeler gauge.

- Turn handwheel until the material presser foot is at its lowest point.
- Use the feeler gauge to check if the height is correct.

The spool must abut the radius of the retainer (the left side).

During the entire course of the needle movement, the guide piece 5 should neither strike the top, nor protrude out from the guide 6.

Adjustment

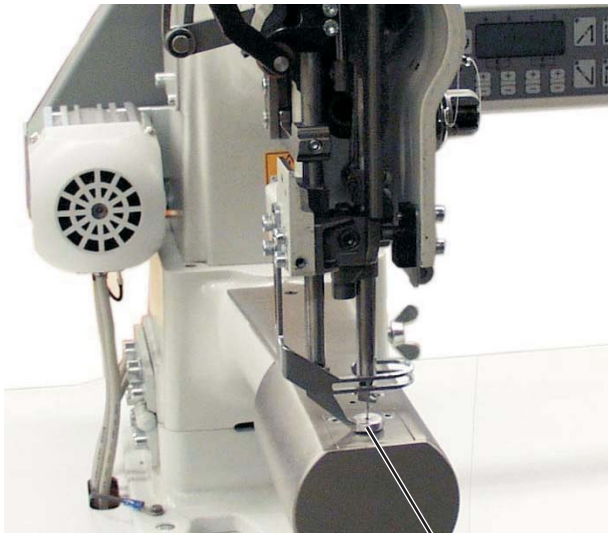
Setting the height of the material presser bar

- Loosen clamping screws 3.
- Set the material presser foot higher or lower (place the feeler gauge under the foot).
- Press the retainer against the spool.
- Tighten screws 3 again.

Setting the guide piece

- Loosen screw 4.
- Push the guide piece 5 accordingly.
- Tighten screw 4 again.

3.2 Timing of the movement of the material presser foot



1



3

2



Caution Risk of Injury!

Turn the main switch off.

Check and set the movement of the material presser foot only with the sewing machine turned off.

GB

Rule and control

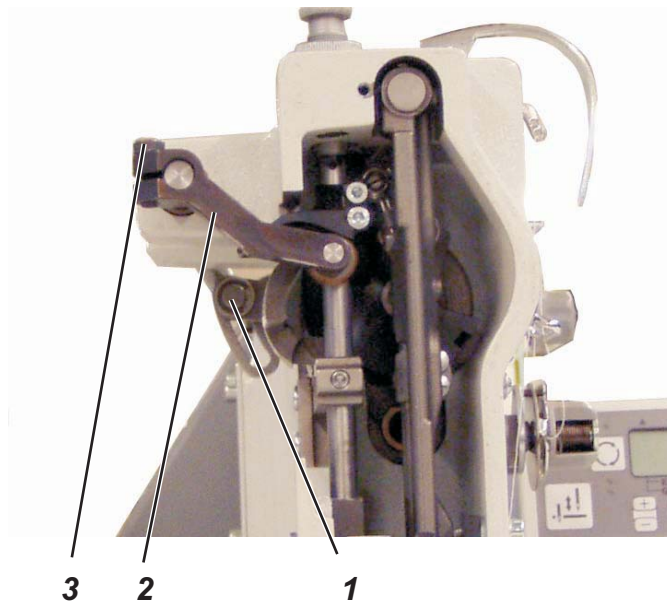
During the needle-insertion cycle, the material presser foot 1 must be at its lowest point when the descending needle penetrates the needle plate.

- Turn handwheel until the material presser foot is at its lowest point.
- Observe the movement of the needle.

Adjustment

- Loosen the set screw 2.
- Adjust the cam 3.
- Tighten set screw 2 again.

3.3 Stroke of the material presser foot



Caution Risk of Injury!

Turn the main switch off.

Check and set the stroke of the material presser foot only with the sewing machine turned off.

Rule and control

When the stroke is set at its highest (lever 1 is at upper stop position), there should be 20 mm clearance between the highest position of the material presser foot and the needle plate.

- Turn handwheel until the material presser foot is at its highest point.
- Measure the clearance.

Adjustment

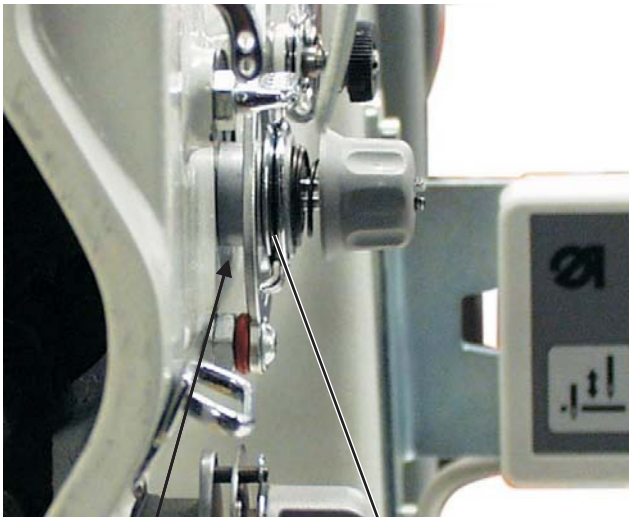
- Loosen screw 3 with needle bar at the bottom dead center.
- Adjust the crank 2.
- Tighten screw 3 again.

4. Opening the thread tension

Functions

1. The needle thread tension is opened **mechanically**,
 - on every stitch, when the thread lever is located 2 mm past the upper dead center.
2. The needle thread tension is opened **electromagnetically**,
 - during the thread trimming.

4.1 Mechanical opening of the thread tension



1

2



4

3



Caution Risk of Injury!

Turn the main switch off.

Check and set the opening of the thread tension only with the sewing machine turned off.

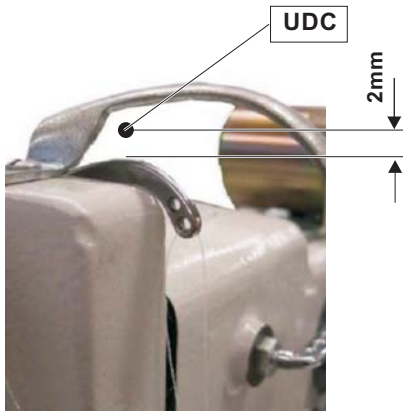


Prerequisite:

The positioning of the control unit is setup as follows: in sewing mode after every stitch, the thread lever is located 2 mm past the upper dead center.

The position is determined by the preset value of the parameters.

GB



Rule and control

When the thread lever is exactly at its UDC, the tension discs should be closed.

As soon as the thread lever is about 2 mm behind the upper dead center (UDC) point, the needle thread tension should be open to allow a pulling of the thread.

This setting will guarantee a sufficient stitch formation despite regular opening of the tension discs.

In the maximally open position, there should be 1.0 mm distance between the tension discs 2.

- Turn the handwheel until the thread lever is in position. Then keep turning slowly and observe the needle thread tension.
- Check the distance between the tension discs.

Adjustment of the distance

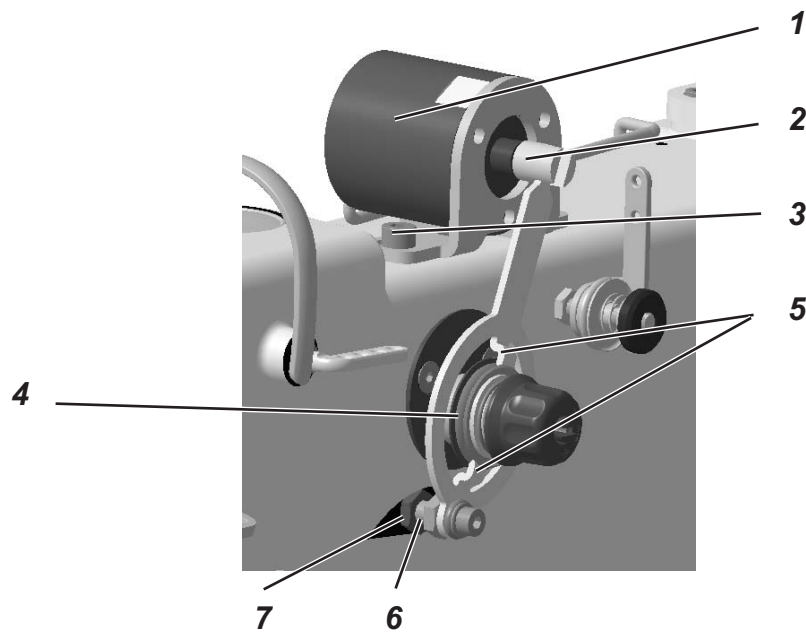
- Loosen the set screw 1, while in the maximally-open position.
- Move the thread tension bolts accordingly.
- Tighten set screw 1 again.

Adjustment of the timing

- Loosen screw 4 at the cam 3.
- Turn the cam.
- Tighten screw 4 again.

Notes:

4.2 Electromagnetic opening of the thread tension



Caution Risk of Injury!

Turn the main switch off.

Check and set the opening of the thread tension only with the sewing machine turned off.

Rule and control

In its unopened state, the lugs 5 of the trigger plate should be positioned so that they do not press the tension discs 4 apart from each other.

The magnet must be positioned so that the trigger plate does not jump out of the guide 2.

- Visual control for unopened state

In the opened state, the needle thread must pass unimpeded through the tension discs 4.

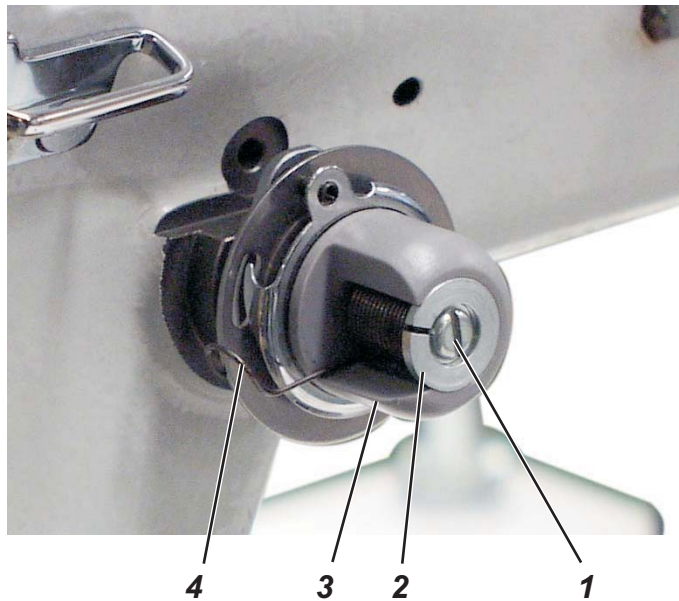
Adjustments for the unopened state

- Loosen locknut 7.
- Turn bolts 6 in or out, according to adjustment.
- Tighten locknut 7.

Adjustments for the opened state

- Loosen screws 3 at the mounting sheet.
- Move the magnets 1 according to adjustment.
- Tighten screws 3 at the mounting sheet.

4.3 Thread controller spring



Caution Risk of Injury!

Turn the main switch off.

Set the thread controller spring only with the sewing machine turned off.

GB

Rule and control

The thread controller spring 4 must hold the needle thread under minor tension from the highest position of the thread lever to the moment the needle's eye penetrates the fabric.

The spring tension should be lower than the needle thread tension.

The thread controller spring 4 may only touch on the stop 3 when the needle has entered the sewing material up to the eye.

Adjustment of the spring travel

- Loosen screw 1.
- Turn stop sleeve 3.
- Tighten screw 1 again.

Adjustment of the spring tension

- Loosen screw 1.
- Adjust spring washer 2, without changing the position of the stop sleeve 3.

Turning the washer clockwise equates to less spring tension.

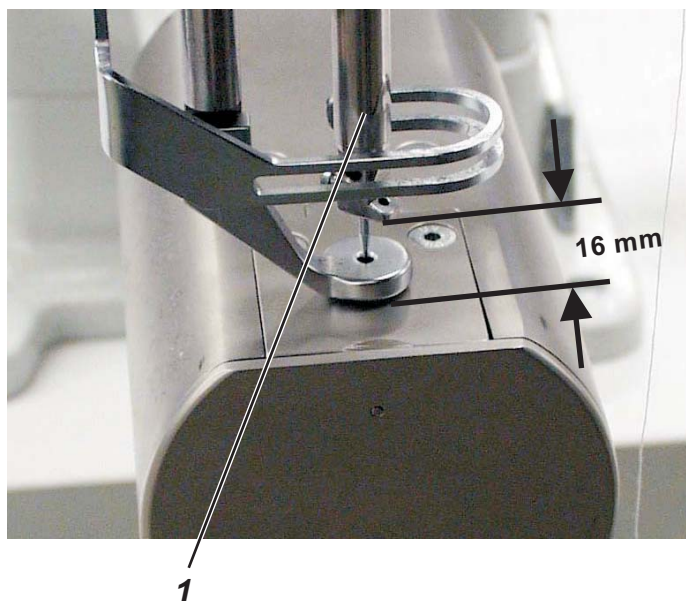
Turning the washer counter-clockwise equates to more spring tension.

- Tighten screw 1, without changing the position of stop sleeve 3 or spring washer 2.

Note

The settings for the spring path and spring tension apply only for normal thread thicknesses. With extremely thick or thin needle threads or sewing materials other settings may be required.

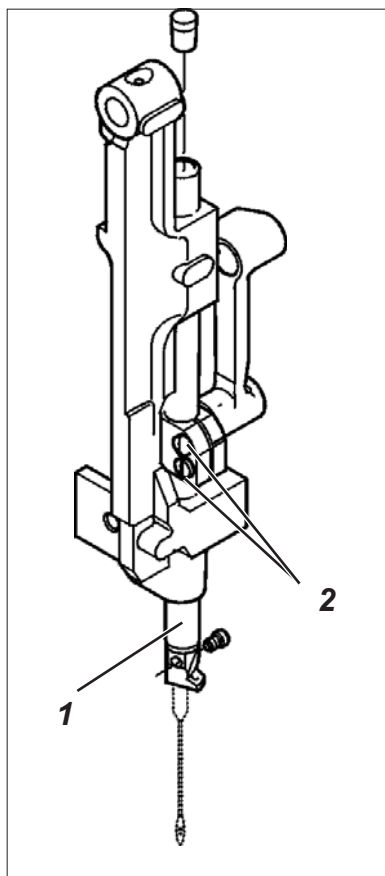
5. Pre-adjustment to the needle bar height



Caution Risk of Injury!

Turn the main switch off.

Set the needle bar height only with the sewing machine turned off.



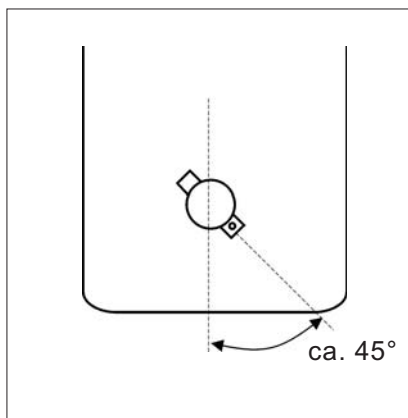
Rule and control

There must be 16 mm between the lower edge of the needle bar and the needle plate, when the needle bar 1 is located at its bottom dead center.

- Turn the handwheel until the needle bar is located in the bottom dead center.
- Check the distance.

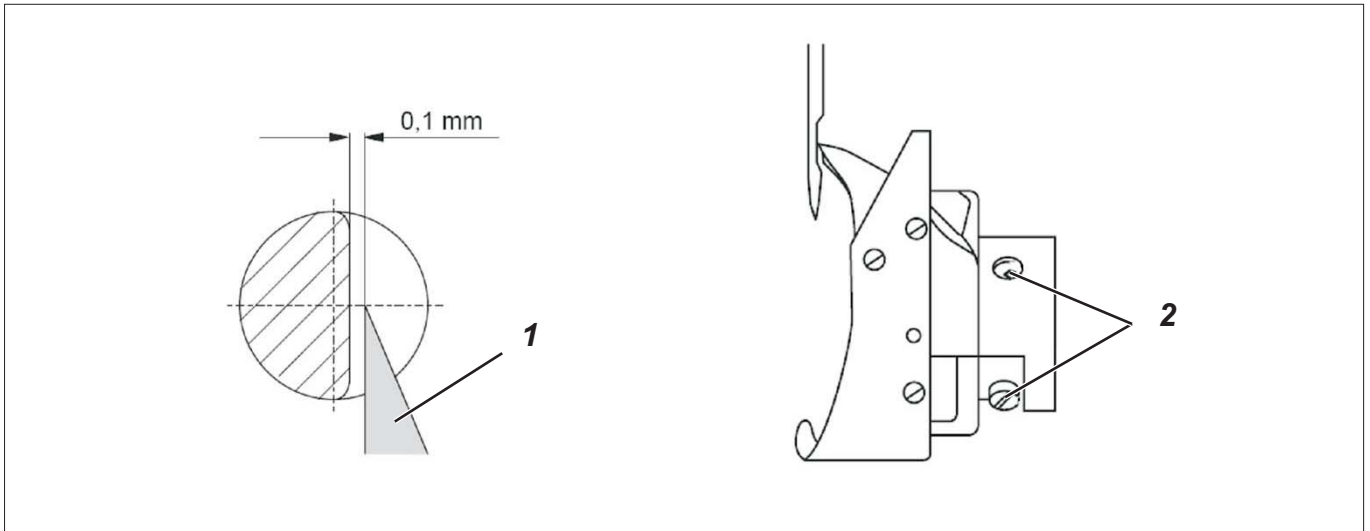
Adjustment

- Loosen screws 2.
- Move the needle bar 1.
- Re-tighten screws 2. Make sure that the thread guide is at an angle of 45° to the machine axis (see diagram). approx. 45°



6. Hook settings

6.1 Loop stroke and clearance of the hook point to the needle



Caution Risk of Injury!

Turn the main switch off.

Check and set the loop stroke only with the sewing machine turned off.

GB



Rule and control

The loop stroke (2 mm) is the run of the needle bar from the bottom dead center up to the point where the hook point 1 lies at the middle of the needle.

- Insert a needle with size of Nm 80 (E1) or Nm 100 (E2).
- Using the handwheel, turn the machine so that the needle bar is located at its bottom dead center.
- Fix the loop stroke gauge and the block (see chapter 1.1 Gauge set) according to the opposite picture. Tighten the screw of the block.
- Pull out the loop stroke gauge and turn the handwheel until the block hits the needle bar rocker. The needle is now in loop stroke position.
- In this position the hook point 1 must lie at the middle of the needle.

In the loop stroke position, the hook point should be located in the lower half or lower third of the needle furrow.

Adjustment

- Loosen screws 2 at the hook.
- Turn the hook on the hook shaft.
- The hook point 1 must lie at the middle of the needle.
- Thereby the clearance between hook point 1 and the furrow of the needle must be 0.1 mm.
- Tighten screws 2 again.
- Re-adjust the needle bar height if necessary (see Chapter 5).



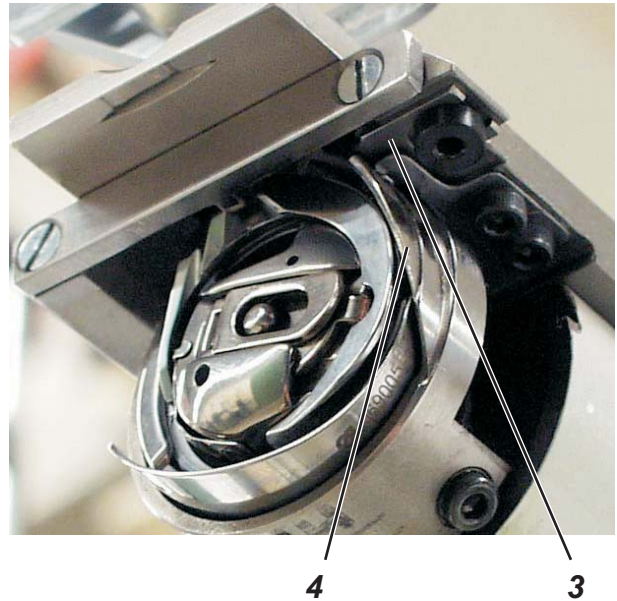
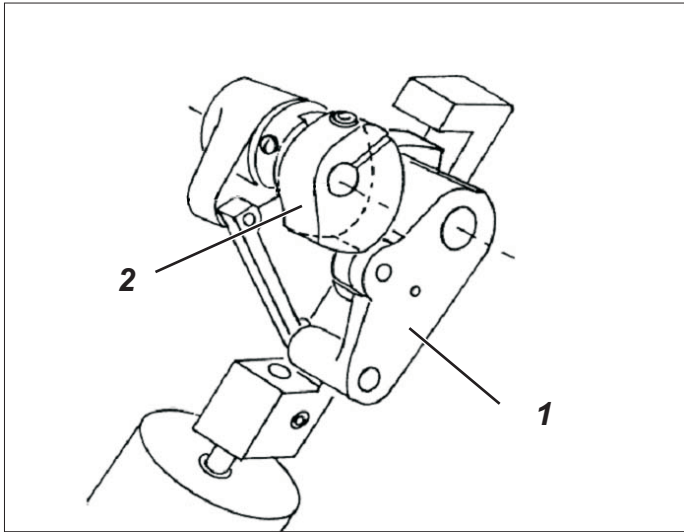
ATTENTION!

When a needle with a different size is inserted:

- Check the clearance of the hook to the needle and adjust if necessary.

7. Thread trimmer

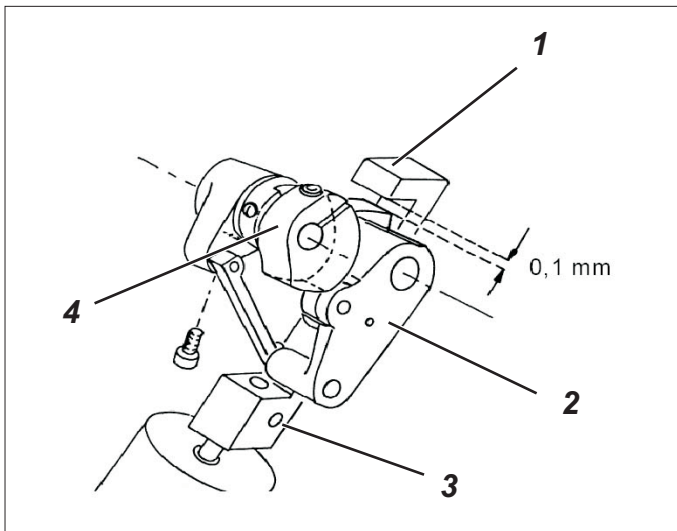
7.1 Function sequence



The thread trimmer is switched on electromagnetically.

- To trigger the trimming sequence, step back completely on the pedal during sewing.
- The sewing machine runs at trimming speed (150 min^{-1}).
- When the 1st position is reached, the solenoid for the thread trimmer is switched on.
- The cutout arm presses the crank 1 against the control cam 2.
- The thread-pulling knife 4 is thereby swung completely away from the counter knife 3.
- Thus, the thread-pulling knife catches first the hook thread and then the needle thread.
- The control cam 2 swings the thread-pulling knife 10.16 cm the direction of the counter knife 3.
- The needle thread tension opens.
- The thread-pulling knife pulls needle thread from the spool and bobbin thread from the bobbin.
- The threads are cut shortly before the high position of the thread lever.
- The sewing drive stops after turning backward.
- The solenoids for the thread tension opening and the thread trimmer are switched off.

7.2 Thread trimmer drive



Caution Risk of Injury!

Turn the main switch off.

Work only with the sewing machine turned off.

GB

Rule and control

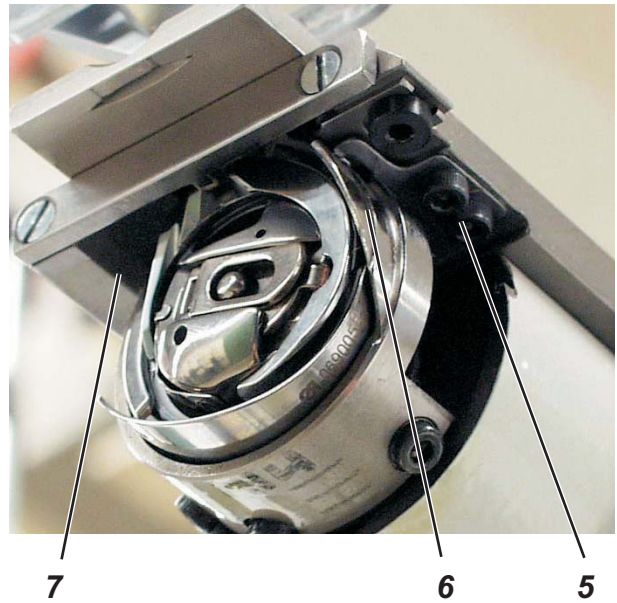
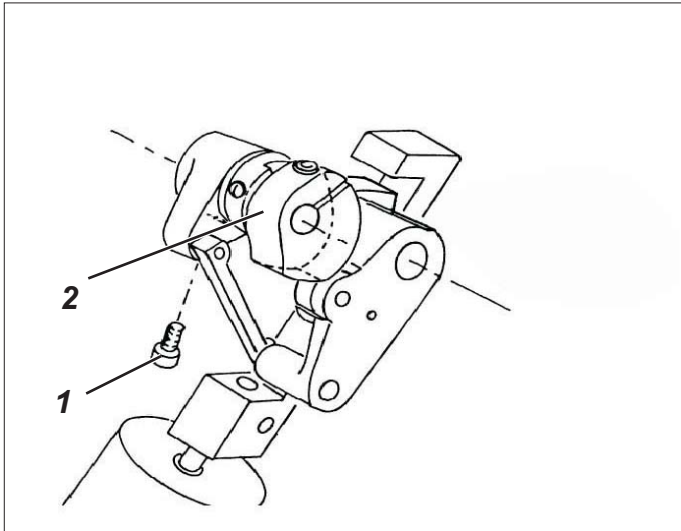
The play or slack between tie rod 1 and crank 2 must be 0.1 mm.

- Turn the handwheel in the direction which it runs, until the greatest elevation of the control cam 4 lies opposite the crank 2.
- Turn the knife carrier counter-clockwise.
- Check the play between tie rod 1 and crank 2 with a feeler gauge.

Adjustment

- Loosen screw 3.
- Turn the cutout arm of the solenoid in or out.
- There must be a play or clearance of 0.1 mm between tie rod 1 and the crank 2.
- Tighten screw 3 again.

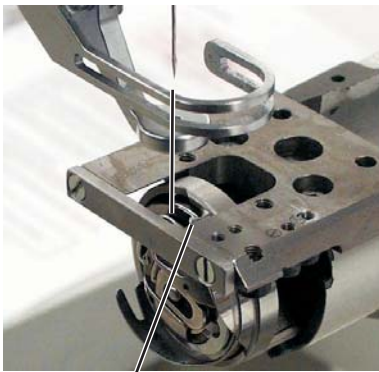
7.3 Knife carrier and thread-pulling knife



Caution Risk of Injury!

Turn the main switch off.

Check and set the position of the knife carrier only with the sewing machine turned off.



6

Rule and control

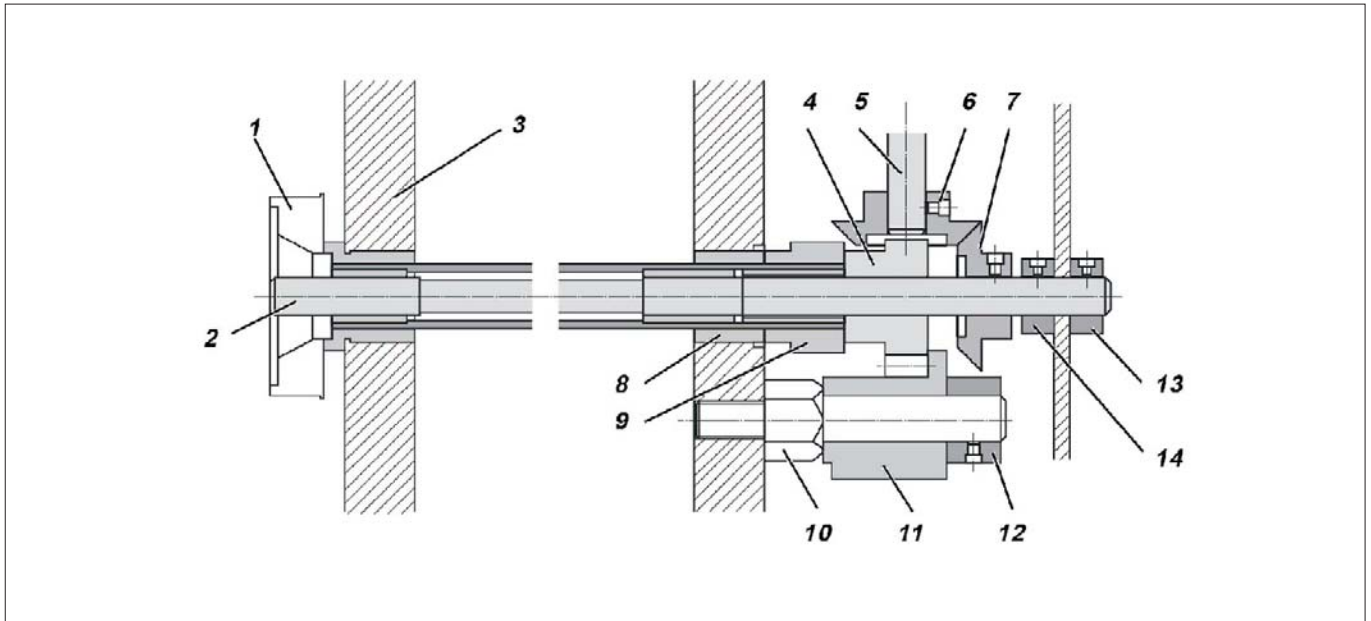
During the cutting process, the knife carrier with the pulling knife 6 should not strike against the areas 5 or 6.

The knife carrier must be aligned axially, so that the tip of the thread-pulling knife 6 is aligned with the middle of the needle.

Adjustment

- Loosen screw 3 on control cam 2.
 - Loosen screw 1.
 - Adjust the knife carrier axially.
 - Tighten screw 3 on control cam 2.
 - Turn the knife carrier to bring it in the correct position.
 - Tighten screw 1.
- During tightening, the lever must set the knife carrier tight.

7.4 Hook shaft and knife carrier

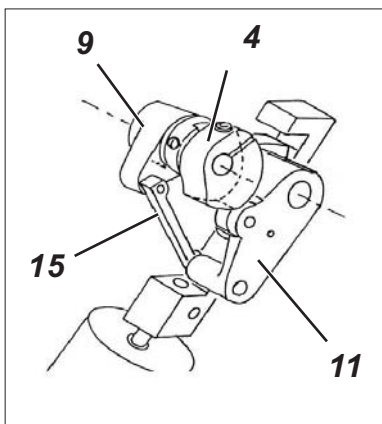


Caution Risk of Injury!

Turn the main switch off.

Check and set the hook shaft and knife carrier only with the sewing machine turned off.

GB



Rule and control

The hook shaft 2 and the knife carrier 1 should have only slight axial play but must still run easily.

- Check the play (tightness) of the hook shaft.
- Turn the handwheel in the direction which it runs, until the thread-pulling knife can be swung in.
- Check for the smooth operation of both the knife carrier and the transmission elements.

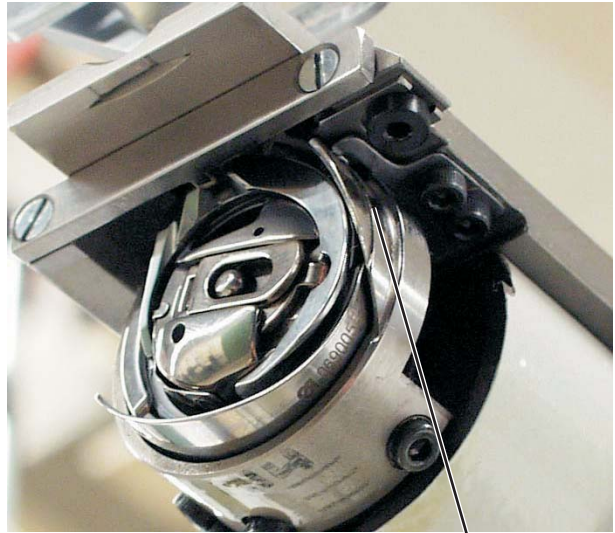
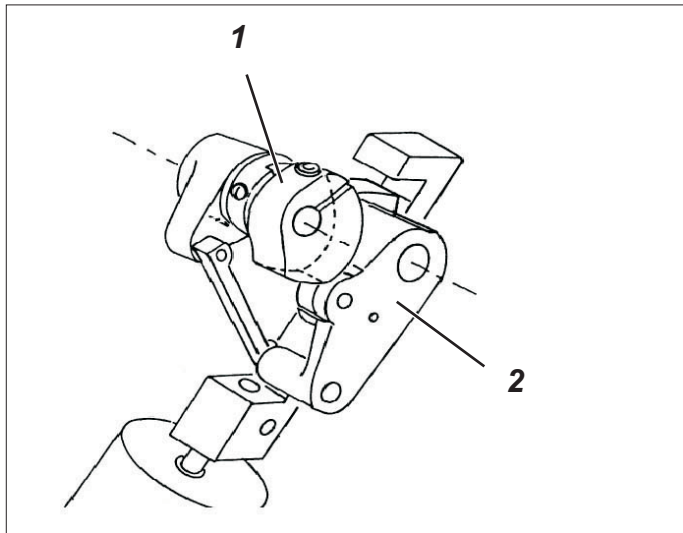
Adjustment to the hook shaft

- Set the setting collars 13 and 14 tight.
- Check the hook settings and correct if necessary (see Chapter 6).

Adjustment to the knife carrier

- Set the knife carrier 1 with the tip of the thread-pulling knife, axially to the needle.
- Set lever 9 tight on bush 8.
- Set control cam 4 tight on lever 9.
The knife carrier is fixed axially.
- Set bevel wheel 7 tight on bevel wheel 6.
- The tie rod 15 must move the lever 9 easily without tilting. The control cam 4 must run on the spool in crank 11.
- Check the function of the thread trimmer and correct, if necessary.

7.5 Timing of the trimming process (control cam)



Caution Risk of Injury!

Turn the main switch off.

Check and set the position the control cam only with the sewing machine turned off.

Rule and control

The control cam 1 determines the time at which the thread-pulling knife 3 is swung in.

At the high position of the thread lever, the thread-pulling knife should have reached its rear stop position.

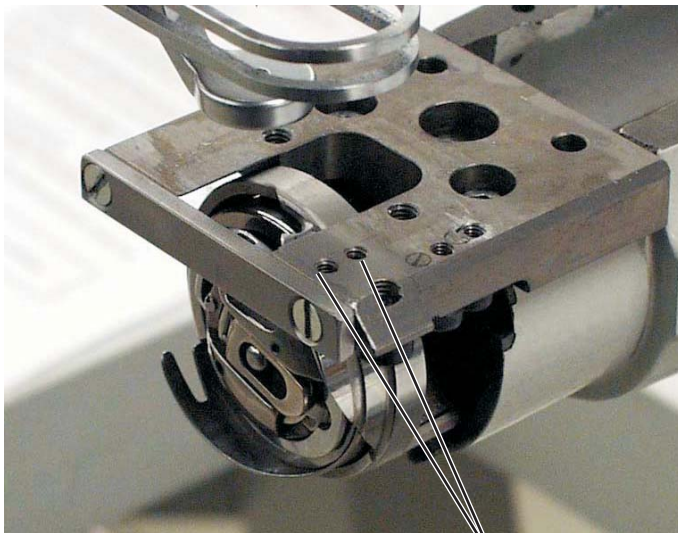
During sewing (with no operation of the thread trimmer), the control cam 1 should not touch the crank 2.

- Turn the handwheel.
- Swivel the thread-pulling knife during the upward movement of the needle.
- Turn the handwheel further, until the thread lever is at its upper dead center.
- Check if the thread-pulling knife has reached its stop position.

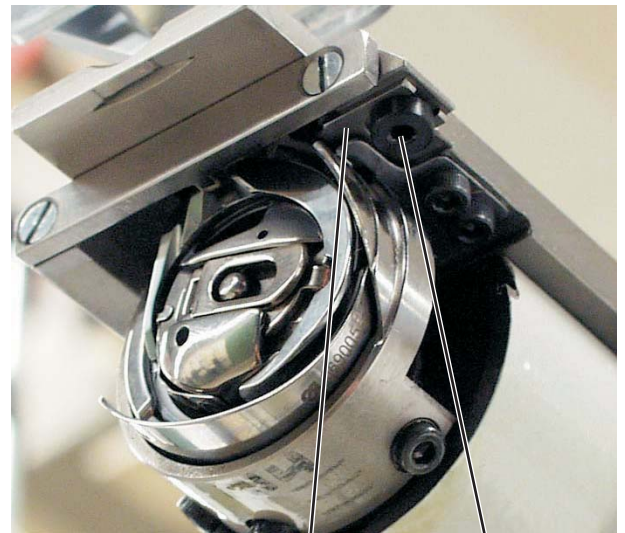
Adjustment

- Using the handwheel, turn the machine into the high position of the thread lever.
- Loosen screw on control cam 1.
- Turn control cam 1 on the hook shaft.
- Re-tighten screw on control cam 1.
- If necessary, check stop position and reset the control cam again.

7.6 Position of the counter knife



1



3

2



Caution Risk of Injury!

Turn the main switch off.

Check and set the counter knife only with the sewing machine turned off.

GB

Rule and control

The stationary knife (counter knife) 3 must be positioned so that the entire length of its blade abuts the thread-pulling knife.

In the stop position of the thread-pulling knife, the cutting edge of the counter knife must overlap the cutting edge of the thread-pulling knife by about 0.5 mm. The threads must be securely cut.

Adjustment

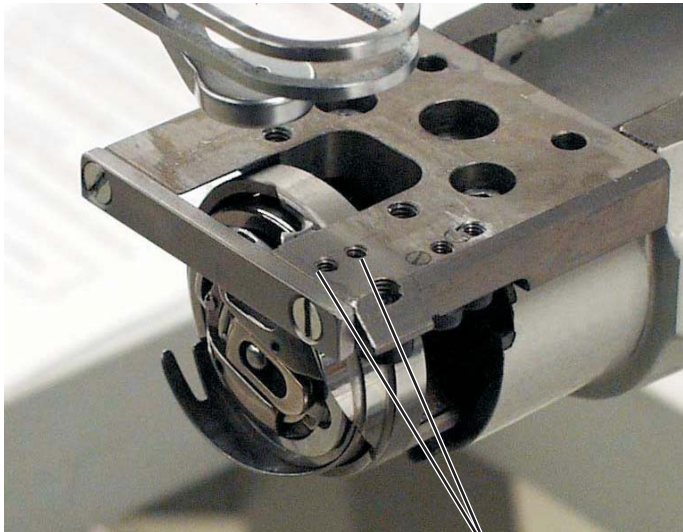
- Screw out the cutting-pressure screws 1.
- Loosen screw 2 from below.
- Align knife 3 (keep cutting pressure low).
- Re-adjust the swivel angle of the knife carrier if necessary (see Chapter 7.3).
- Tighten screw 2.
- Set the cutting pressure with screws 1 (see Chapter 7.7).



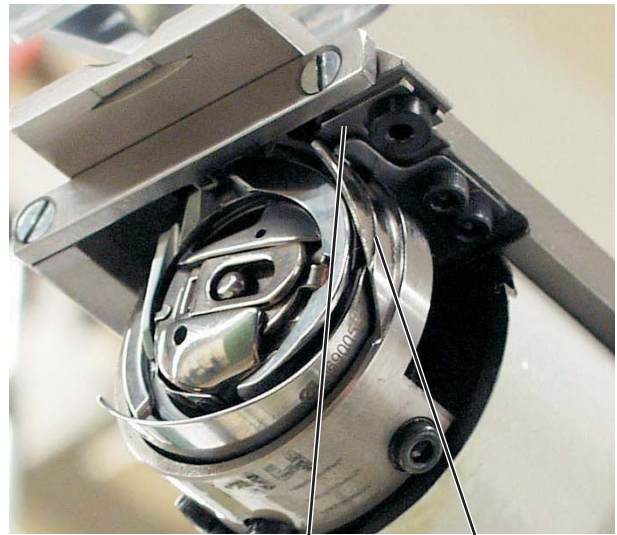
ATTENTION!

If the pressure of the counter knife is set too high, this can result in increased wear on the knife.

7.7 Cutting pressure of the counter knife



1



3

2



Caution Risk of Injury!

Turn the main switch off.

Check and set the counter knife only with the sewing machine turned off.

Rule and control

The thread must be securely cut with the least possible pressure. A low cutting pressure results in less wear on the knives!

- Turn the handwheel in which it runs, until the thread-pulling knife 2 can be swung in.
- Manually swing the thread-pulling knife 2 under counter knife 3. Check the cut of the knives.

Adjustment

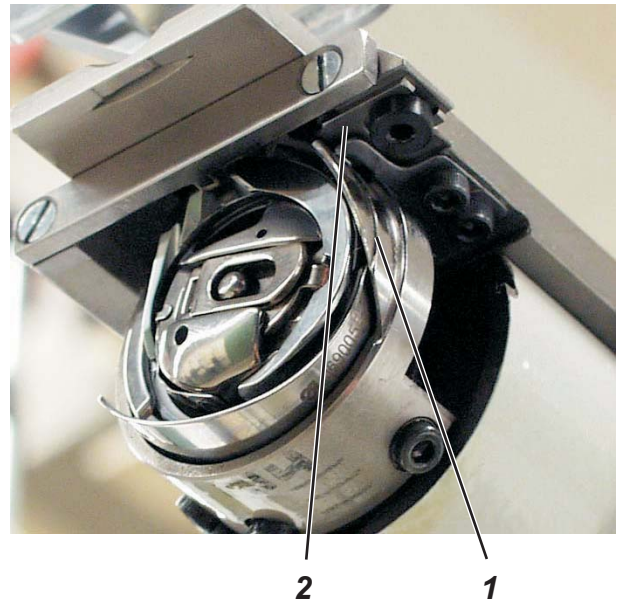
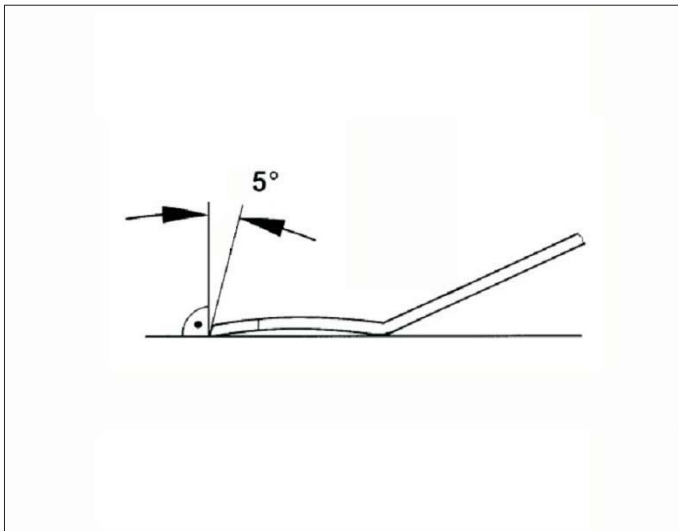
- Screw out the cutting-pressure screws 1.
- Manually swing thread-pulling knife 2 under counter knife 3. The knife-edge of the thread-pulling knife 2 must lie under the knife-edge of the counter knife 3.
- Set counter knife 3 against the thread-pulling knife by screwing in the cutting-pressure screw 1.



ATTENTION!

If the pressure of the counter knife is set too high, this can result in increased wear on the knife.

7.8 Re-sharpening the counter knife



Caution Risk of Injury!

Turn the main switch off.

Install a re-sharpened knife only with the sewing machine turned off.



ATTENTION!

When a re-sharpened knife has lost more than 0.5 mm of its original length, it should be replaced by a new knife.

Rule and control

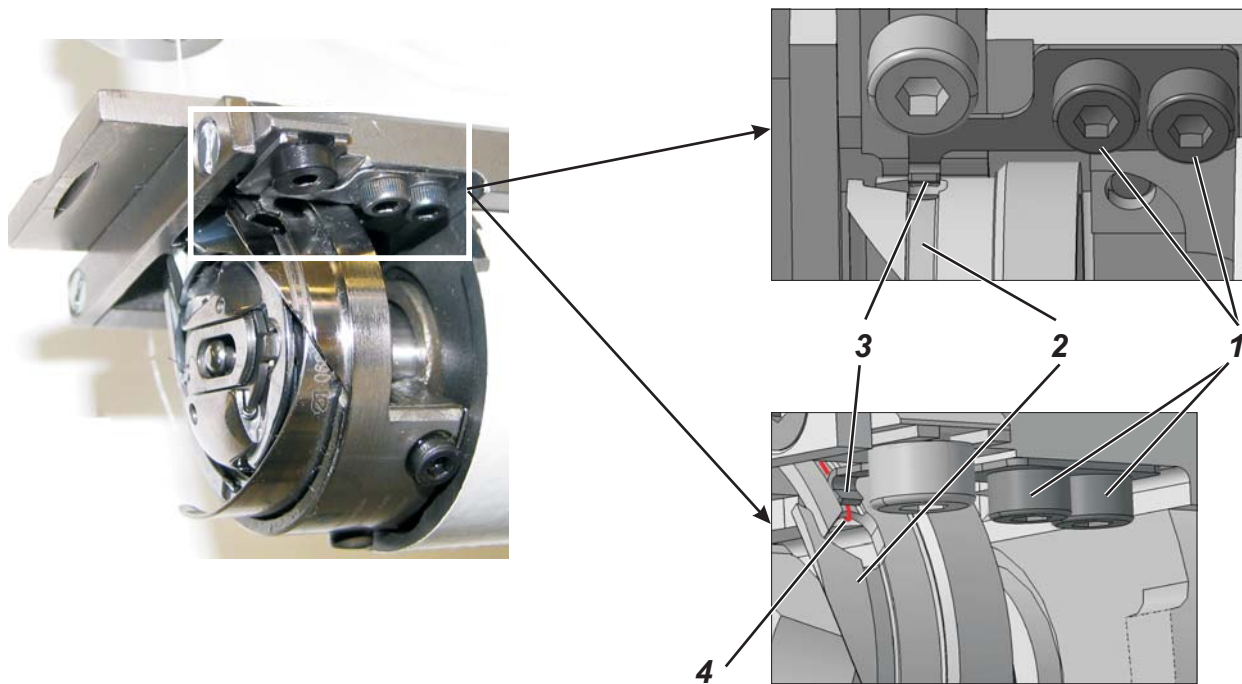
The cutting angle of a stationary knife should be about 5° (see diagram). A fine-grit stone must be used to re-sharpen the knives.

Adjustment

- Loosen cutting-pressure screws 5.
The pre-tension of the stationary knife 2 is reduced.
- Take out knife 2.
- Re-sharpen the knife.
The cutting angle of a stationary knife should be about 5°.
- Install knife 2.
- Align the knife so that the threads are securely cut (see Chapt. 7.6).
- Tighten the counter knife screw tightly.
- Re-adjust the cutting pressure (see chapter 7.7).

GB

7.9 Position of the thread guiding sheet



Caution Risk of Injury!

Turn the main switch off.

Check and set the thread guiding sheet only with the sewing machine turned off.

Rule and control

The lug of the thread guiding sheet 3 should lie within the grooves of the thread-pulling knife 2.

The clearance between the thread guiding sheet and the base of the groove should be approx. the same as the thickness of the upper thread (same size or slightly bigger), so that the upper thread does not become jammed in the groove, but also that the lower thread 4 can be guided in the grooves and cannot slide out.

- Run through a cutting sequence. Pull the upper thread behind the guiding sheeting from the groove.

You should be able to easily pull out the upper thread.

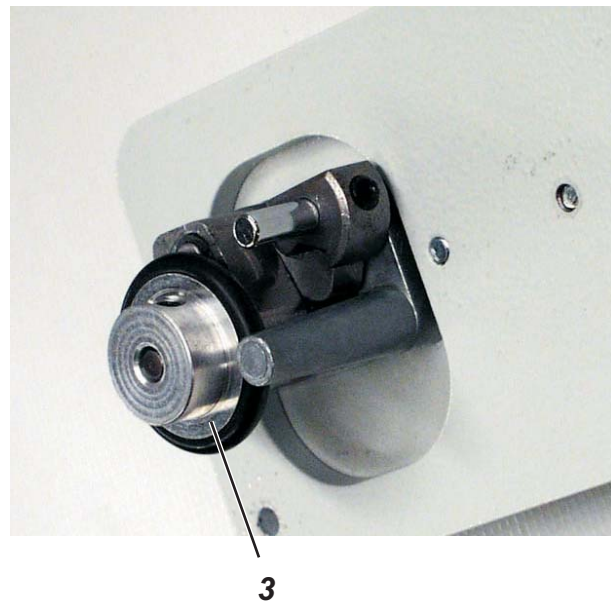
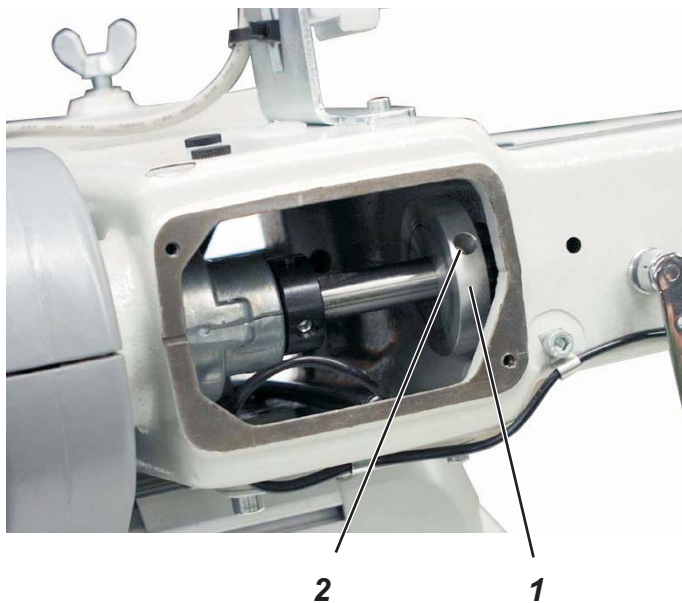
The lower thread should remain in the groove.

Adjustment

- Loosen screws 1.
- Move the thread guiding sheet 3 accordingly.
- Tighten screws 1.
- Check the functioning again.

8. Bobbin winder

8.1 Function of the bobbin winder



Caution Risk of Injury!

Turn the main switch off.

Check and adjust bobbin winder only when the sewing machine is switched off.

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Rule and control

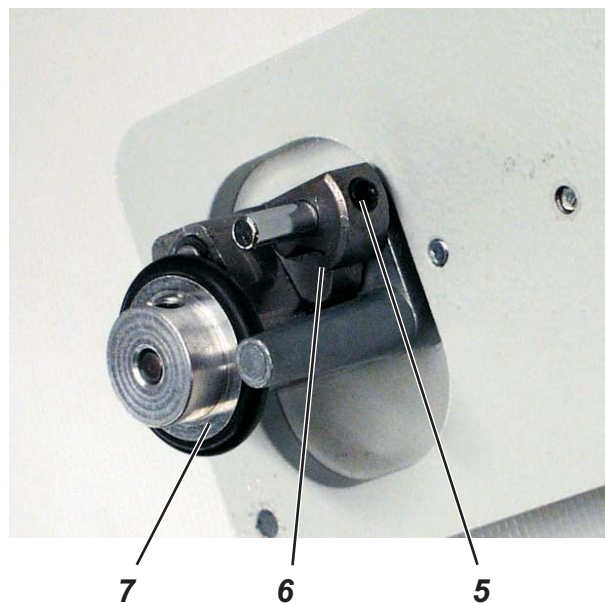
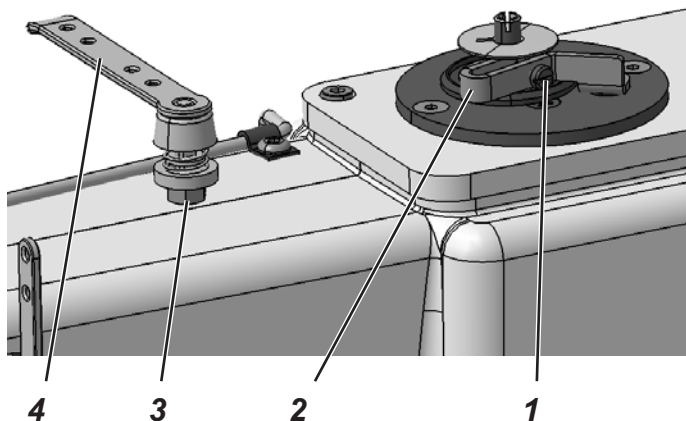
When the trigger lever is swivelled in, the bobbin winder wheel 3 must abut (press lightly against) the driver wheel 1. It must also be driven by the drive wheel.

When the trigger lever is swivelled out, the bobbin winder wheel should not be driven by the drive wheel.

Adjustment

- Loosen set screw 2 at the driver wheel 1.
- Move the driver wheel on the shaft according to the adjustment.
- Tighten set screw 2.

8.2 Bobbin fill quantity



Caution Risk of Injury!

Turn the main switch off.

Check and adjust the bobbin winder only when the sewing machine is switched off.

Rule and control

The bobbin should be filled uniformly (cylindrically), the thread guide 4 must be perpendicular to the arm axis with its height corresponding to the middle of the bobbin.

The bobbin winding operation must stop automatically when the bobbin is filled up to approx. 0.5 mm below the edge of the bobbin.

The bobbin edge 7 should have no axial backlash, but it must not move too heavy or sluggishly.

Adjustment

Uniformity:

- Loosen the locknut 3, turn the thread guide 4 accordingly to have the correct angle. Tighten the locknut again.

Small changes in the bobbin fill quantity:

- Tighten or loosen the threaded adjustment screw 1 on the trigger lever 2.

Large changes in the bobbin fill quantity:

- Loosen the threaded pin 5. Turn cam 6 so that the trigger lever 2 triggers when the bobbin winder is full.

9. Oil lubrication

9.1 General



Caution Risk of Injury!

Oil can cause skin rashes.

Avoid longer skin contact.

After contact wash yourself thoroughly.



ATTENTION!

The handling and disposal of mineral oils is subject to legal constraints.

Deliver used oil to an authorized reception point.

Protect your environment.

Take care not to spill any oil.

Oil the sewing machine exclusively with the lubricating oil **DA-68** or equivalent oil with the following specifications:

- Viscosity at 40°C: 68 mm^{2/s}
- Flash point: 212 °C

DA-68 can be purchased at sales branches of **DÜRKOPP ADLER AG**, under the following part number:

1 liter container: 9047 000041

5 liter container: 9047 000042

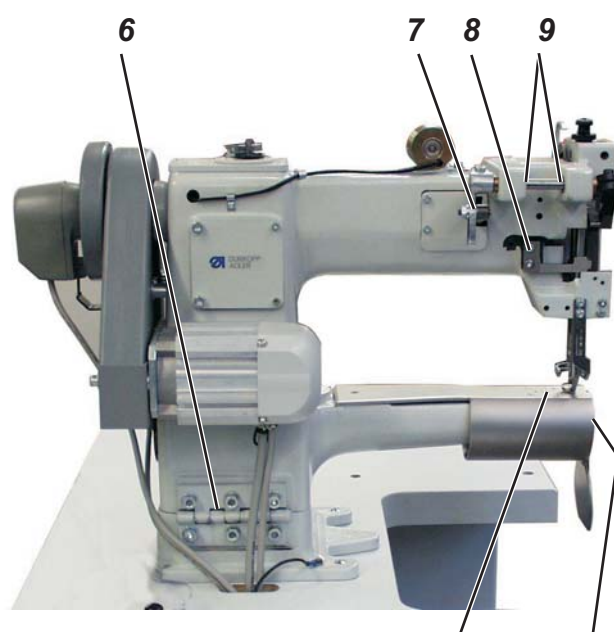
Rule and control

The lubrication of the sewing machine head occurs via oil filling points in the cast body. Additionally, the listed lubricating points are to be supplied with oil.

At the latest after 40 hours of operation all lubricating points shown in the following illustrations are to be lubricated.

- Remove the head cover.
- Supply all lubricating points with few drops of oil.
- Attach the head cover again.

9.2 Lubrication points



11

10



- 1 Thread lever
- 2 Arm shaft bearing - front
- 3 Tie rod bearing, presser feet drive
- 4 Arm shaft bearing - center
- 5 Hook shaft bearing, rear. Vertical shaft bearing, bottom and top.
- 6 Hinge
- 7 Tie rod stroke drive
- 8 Guide for material presser bar
- 9 Stroke drive bearing
- 10 Hook
- 11 Hook shaft bearing, front
- 12 Guide for thread lever
- 13 Joint on needle bar crank
- 14 Needle bar
- 15 Material presser bar

10. Maintenance



Caution Risk of Injury!

Turn the main switch off.

You must turn off the special sewing machine before performing maintenance!

The maintenance tasks to be conducted by the operating personnel of the special sewing machine daily or weekly (cleaning and oiling) are described in the Operating Instructions. They are in the following table only for the sake of completeness.

Necessary maintenance work	Operating hours			
	8	40	160	500
Sewing machine head				
Remove sewing dust, left-over thread and cutting residue.....	X			
Points to be particularly cleaned:				
- The area under the needle plate				
- The area around the hook				
- The area under the bobbin brake spring				
- Needle thread tension				
- Thread trimmer				
Lubricate the sewing machine head.....		X		
Sewing drive				
- Check the condition and tension of the timing belt.....			X	

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11. Summary of all sewing machine settings



ATTENTION!

The complete adjustment of the special sewing machine should be conducted in the order given.

No.	Subject	Chap.	Correct setting	Adjustment
1.	Position of needle and needle hole	2.	The needle penetrates the middle of the hole.	
2.	Material presser foot			
3.	Height of the material presser foot	3.1	At the bottom dead center, there should be a distance of 0.3 mm between the material presser foot and the needle plate.	Adjust the material presser bar.
4.	Timing of the material presser foot movement	3.2	The needle penetrates the needle plate when the material presser foot is in the bottom dead center position.	Adjust the cam.
5.	Stroke of the material presser foot	3.3	The maximum stroke is 20 mm.	Rotate the crank.
6.	Thread tension	4.		
7.	Mechanical opening of the thread tension	4.1	The thread tension begins after the thread lever is located 2 mm after the UDC. The tension discs should be closed at UDC.	Adjust the cam.
			With open thread tension the clearance between trigger plate and trigger pin is 1 mm.	Move the thread tension bolts accordingly.
8.	Electromagnetic opening of the thread tension	4.2	In its unopened state, the trigger plate should be positioned so that they do not press the tension discs apart from each other.	Turn bolts in or out.
			In its opened state, the trigger plate should neither jump out of the magnet guide nor of the tension discs.	Adjust the magnet position.
9.	Needle bar height	5.	In the loop stroke position, the hook point is located in the lower half or lower third of the needle furrow.	Adjust the height of the needle bar.
10.	Hook settings	6.		
11.	Loop stroke	6.1	The loop stroke is 2 mm. In loop stroke position the hook point lies at the middle of the needle.	Check with gauge and block.
12.	Clearance distance between hook tip and needle		In loop stroke position the clearance of the hook point to the needle furrow is a maximum of 0.1 mm.	Slide the hook sideways.

No.	Subject	Chap.	Correct setting	Adjustment
13.	Thread trimmer	7.		Set the play/slack.
14.	Drive	7.2	Play (clearance) for the tie-rod crank = 0.1 mm.	Rotate the knife carrier.
15.	Knife-carrier drive and thread-pulling knife	7.3	The edge of the counter knife overlaps the cutting edge of the thread-pulling knife by about 1 mm, at the end of the cutting process. The tip of the thread-pulling knife is located axially at the middle of the needle.	Move the knife carrier axially.
16.	Hook shaft and knife carrier	7.4	There is smooth operation with minimal axial backlash.	Set the setting collars and the drive elements tightly together.
17.	Thread trimmer	7.		
18.	Control cam	7.5	When the thread lever is at its highest position, the thread must be cut. The control cam should not touch the crank during the sewing process.	Turn the control cam.
19.	Counter knife	7.6 - 7.8	The cutting edge of the counter knife must overlap the cutting edge of the thread-pulling knife by about 0.5 mm The thread must be securely cut with the least possible pressure.	Align the counter knife. Adjust the cutting pressure with the set screws. Re-sharpen if necessary.
20.	Thread guiding sheet	7.9	Lower thread light, upper thread does not become jammed.	Move the thread guiding sheet.
21.	Bobbin winder	8.		
22.	Bobbin winder function	8.1	When the trigger level is swivelled in, the driver wheel drives the bobbin winder wheel.	Move the driver wheel on the shaft.
23.	Bobbin fill quantity	8.2	The bobbin winder switches off automatically when the bobbin is filled up to approx. 0.5 mm below the edge of the bobbin.	Small adjustments: Adjust the trigger lever using the adjusting screw. Large adjustments: Adjust (turn) the cam.

Notes: