

Preface and General Safety Notes

Part 1: Operating Instructions Cl. 558

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The illustrations used in these instructions are of differing sub-classes of the buttonhole machine 558 !

Please note that your buttonhole may deviate from the illustrations !



1. Product Description

1.1 Short Description and Proper Use

The **DÜRKOPP ADLER 558** is a double chain stitch buttonhole machine. Buttonholes with or without eye and with or without taper bar can be sewn.

- The buttonhole form is determined by 2 exchangeable disc cams with corresponding knives. The upper disc cam determines the form of the eye. The disc cam lying thereunder determines for buttonholes with taper bar the taper bar form and the buttonhole length.
- The smallest and largest buttonhole width for each sewing device (E no.) is established by the position of the limit plate.
- Pendulum swing of the needle bar from the rest position one-sided to the right when sewing the right and one-sided to the left when sewing the left buttonhole seam.
- Automatic adaption of the upper cloth clamp pressure to differing material thicknesses through spring-hangered clamp frame.
- The safety devices do not have to be removed when tilting up the machine.
- The combined finger-eye protection device increases safety. It is held in the work position by springs.
- The gas pressure spring aids tilting up and effects a sure, slow lowering. The stop position makes an unhindered threading of the hook thread possible.
- The machine is equipped with a central oil wick lubrication from 2 oil reservoirs (the positions marked in red must also be oiled).

In the next chapter the individual sub-classes are described.



1.2 Sub-classes

558 - 211241

With automatic trimmers.

The upper thread, the underthread and the gimp fed in from the bottom are cut so short that no thread ends are visible. Cleaning is unnecessary.

Cutting open the buttonhole after sewing.

Cutting length 20 mm

558 - 221301

With automatic trimmers.

The upper thread is cut off short. The underthread and the gimp fed in from the bottom are cut off long (about 30 mm).

Cutting open the buttonhole depending on E no. before or after sewing, as desired.

This sub-class has the electromagnetic upper thread catcher as standard equipment.

Cutting length 10...38 mm

558 - 231391

With automatic trimmer.

Only the upper thread is cut short. The sewing piece can be easily removed from the sewing position or, with buttonholes lying in a row, simply pulled a bit to the left. The underthread and the lower gimp are then trimmed by hand.

With this sub-class the sewing piece is positioned 12 mm further forward than with -221301 and -251301.

Cutting open of the buttonhole, depending on the E no., as desired, before or after sewing.

Cutting length 10...38 mm

558 - 241291

The sewing piece is positioned 9.5 mm further forward than with sub-classes -221301 and - 251301. This means a better view and more freedom when positioning the sewing pieces.

With automatic trimmers.

The upper thread, the underthread and the gimp fed in from the bottom are trimmed so short that no thread ends are visible. No cleaning is necessary.

Cutting open the buttonhole after sewing.

Cutting length dependent on the length package 14...32 mm

558 - 251301

With automatic trimmer.

Only the upper thread is cut short. The sewing piece can be easily removed from the sewing position or, with the buttonholes lying in a row, simply pulled a bit to the left. The underthread and the lower gimp are then trimmed by hand.

Cutting open the buttonhole can be switched between cutting before or after sewing.

Cutting length 10...50 mm

1.4.1 Device Summary Table and Function Characteristics 578 E.../....



558	Material	Buttonhole form				Cutting		Short trimmer for	Buttonhole width		Cutting area	Looping stroke
						before	after		min. mm	max. mm		
- 211241	Loose, coarse weave cloth		E2107 / 20				---> N	Upper thread, Under th., Gimp	4,5	5,8	0,4	2,7
- 221301	Buttonholes similar to handworked quality	E209 / 10 - 38					---> N	Upper thread, Under thread, Gimp long	4,1	5,2	0,4	3,0
	High quality clothing of varying thicknesses	E212 / 10 - 38	E213 / 10 - 38			V <---	---> N	"	5,0	7,0	- / 0,4	2,7
	Loose, coarse weave cloth											
	Buttonholes similar to handworked quality in outerwear	E309 / 18 + 24					---> N	Upper thread	4,1	5,2	0,4	3,0
	Small buttonholes in elastic material (e.g. knitwear) with round or flat gimp				E311 / * 6 - 34		---> N	"	4,1	5,2	0,4	3,2
- 231391	Materials of varying quality and thickness	E312 / 10 - 38				V <---	---> N	"	5,0	7,0	- / 0,4	2,7
	Garment leather	E327 / 10 - 38				V <---	---> N	"	5,0	7,0	- / 0,6	3,2
	Waistbands on jeans, graduated cloth clamps				E328 / 16 - 20		---> N	"	4,5	5,8	0,4	3,0
	Fine, tightly woven materials (e.g. poplin)	E334 / 10 - 38				V <---		"	6,0	7,0	-	2,7

* The construction set upper gimp guide 578.5101 must be ordered additionally.



558	Nähgut	Buttonhole form				Cutting		Short trimmer for	Buttonhole width		Cutting area	Looping stroke
						before	after		min. mm	max. mm		
- 241291	Loose, coarse weave cloth		E2407 / L1 - L3				---> N	Upper thread, Under th., Gimp	4,5	5,8	0,4	2,7
	Buttonholes in elastic material (e.g. knitware)											
	Waistbands on jeans and similar		E2417 / L1 - L3				---> N	"	4,5	5,8	0,4	3,0
- 251301	Loose, coarse weave cloth, plastic stitch formation		E2431 / L1 - L4				---> N	"	4,5	5,8	0,4	2,7
	Materials of varying quality and thickness	E512 / 10 - 50	E512 / 12 - 50			V <---	---> N	Upper thread	5,0	7,0	/ 0,4	2,7



1.4.2 Device Summary Table and Function Characteristics 558 E.../...

558	Material	Buttonhole form				Cutting		Short trimmer for	Buttonhole width		Cutting area	Looping stroke
						before	after		min. mm	max. mm		
- 11241	Loose, coarse weave cloth			E107 / 20			---> N	Upper thread, Under th., Gimp	4,5	5,8	0,4	2,7
- 21301	Buttonholes similar to handworked quality	E209 / 10 - 38					---> N	Upper thread, Under thread, Gimp long	4,1	5,2	0,4	3,0
	High quality clothing of varying thicknesses	E212 / 10 - 38	E213 / 10 - 38			V <---	---> N	"	5,0	7,0	- / 0,4	2,7
- 31391	Loose, coarse weave cloth											
	Buttonholes similar to handworked quality in outerwear	E309 / 18 + 24					---> N	Upper thread	4,1	5,2	0,4	3,0
	Small buttonholes in elastic material (e.g. knitwear) with round or flat gimp				E311 / * 6 - 34		---> N	"	4,1	5,2	0,4	3,2
	Materials of varying quality and thickness	E312 / 10 - 38		E312 / 12 - 34		V <---	---> N	"	5,0	7,0	- / 0,4	2,7
	Garment leather	E327 / 10 - 38				V <---	---> N	"	5,0	7,0	- / 0,6	3,2
	Waistbands on jeans, graduated cloth clamps			E328 / 16 - 20			---> N	"	4,5	5,8	0,4	3,0
	Fine, tightly woven materials (e.g. poplin)	E334 / 10 - 38				V <---		"	6,0	7,0	-	2,7

* The construction set upper gimp guide 578 51 01 must be ordered additionally.



558	Nähgut	Buttonhole form				Cutting		Short trimmer for	Buttonhole width		Cutting area	Looping stroke
						before	after		min. mm	max. mm		
- 41291	Loose, coarse weave cloth		E407 / L1 - L3				---> N	Upper thread, Under th., Gimp	4,5	5,8	0,4	2,7
	Buttonholes in elastic material (e.g. knitware)											
	Waistbands on jeans and similar		E417 / L1 - L3				---> N	"	4,5	5,8	0,4	3,0
- 51301	Loose, coarse weave cloth, plastic stitch formation		E431 / L1 - L4				---> N	"	4,5	5,8	0,4	2,7
	Materials of varying quality and thickness	E512 / 10 - 50		E512 / 12 - 50		V <---	---> N	Upper thread	5,0	7,0	/ 0,4	2,7



1.5 Optional Equipment

558 - 10012 Electromagnetically operated upper thread catcher

The electromagnetically operated upper thread catcher immediately after the thread trimming procedure grips the upper thread. It holds this clamped and inserts it in the right seam during sewing of the next buttonhole.

This means:

- Secure seam beginning even with light, loose cloth.
- Beginning stitches pulled tight.
- Neating the underside of the buttonhole is unnecessary because the beginning thread is sewn over.

The sub-class 558 - 221301 has the upper thread catcher as standard equipment. It is available on request for all other sub-classes.

558 1501 Thread oiler

For improving thread glide in extremely thickness material.

557 1103 Gimps roller holder on the table top

For lower Gimps which are stiff and hard to bend.

558 3001 Thread unreeler, complete

For holding thread or wool cones. The attachment is to the middle traverse of the table frame.

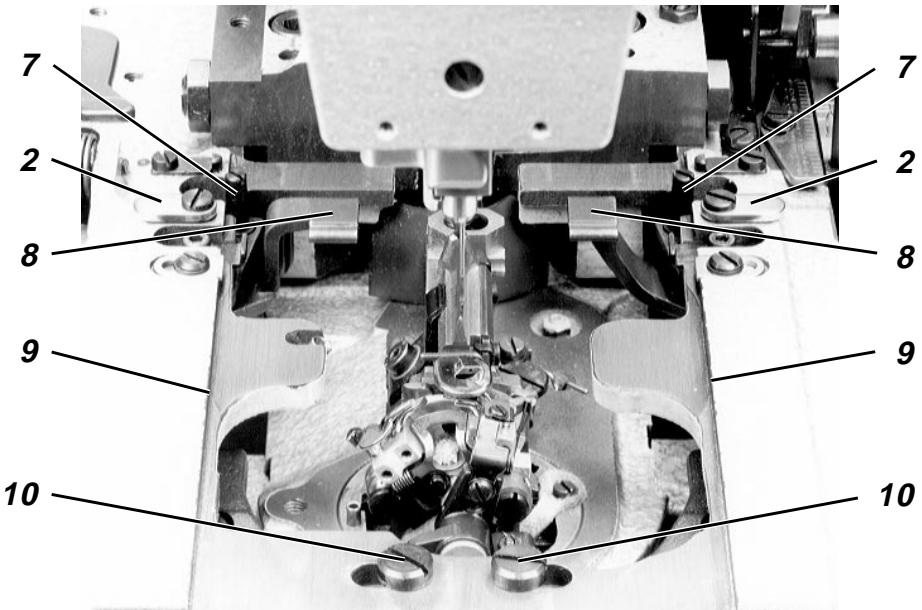
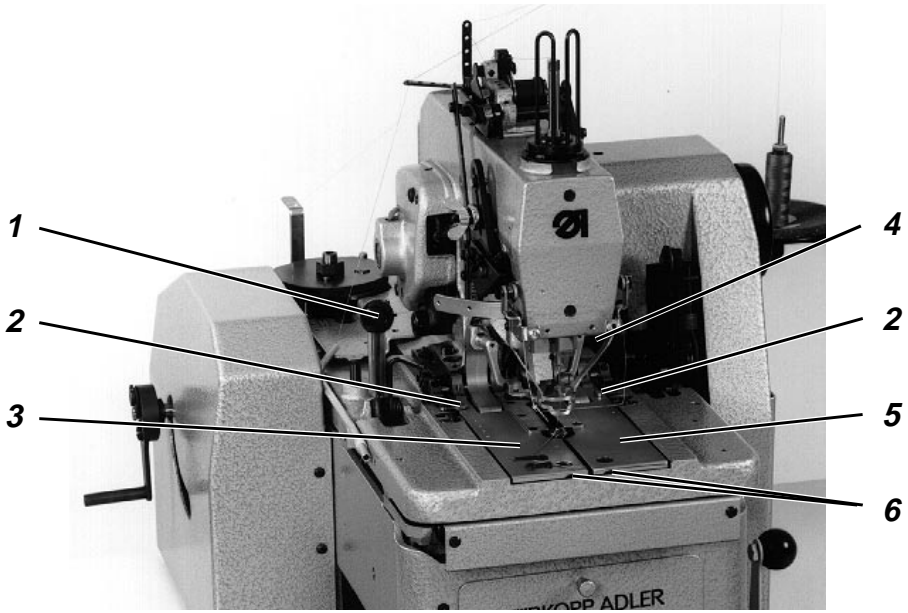
558 1731 Stop for buttonhole interval from 70 - 330 mm

App. 1062 Halogen sewing light

App. 1541 Mounting kit

798 500088 Sewing light transformer

Stops for the clearance between material edge and buttonhole are available in different lengths on request.





2. Operation

2.1 Removal and Placement of the Clamp Plates



Caution Risk of Injury !

Pull the mains plug.
Remove or place the clamp plates only with the machine turned off.

The removal or placement of the clamp plates 3 and 5 occurs in the machine end position (see Chapter 2.3).

The clamp operating lever 1 must be open !

This is the case when it is pushed to the back until it hits.



ATTENTION !

In order to avoid damage to the needle the combined finger-eye protection 4 must remain swung down.

Sub-class -231391 and -251301:

Removing the clamp plates

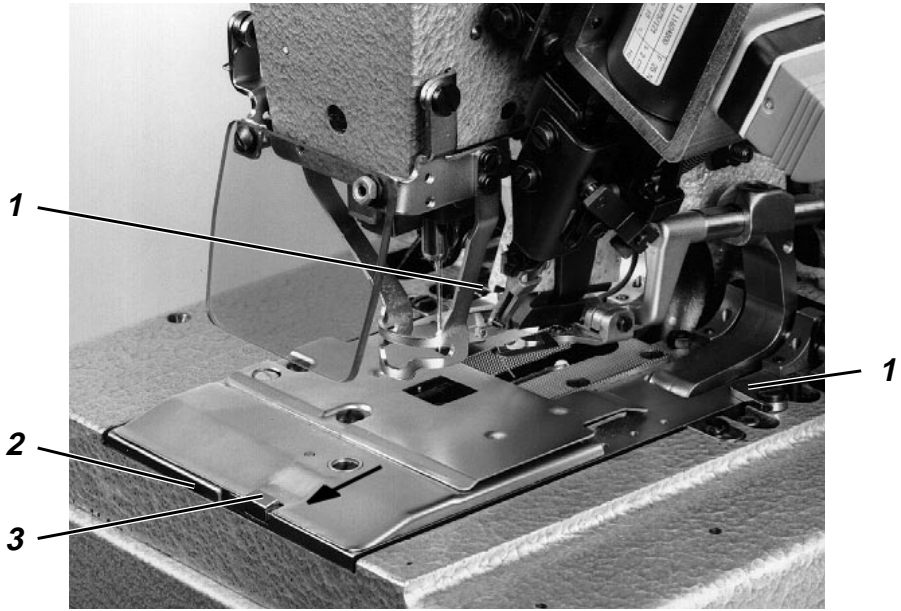
- Swing the clamp plate holder 2 away to the side.
- Reach under each nail slit 6 and lift the clamp plate.
- Remove the clamp plates to the front.

Placing the clamp plates

- The clamp operators 8 must reach into the forks of the clamp arms.
- Push the clamp plates to the right or left against the pressure screws 7 and plate edges 9.
- Place the clamp plates over the setbolt 10 on the material support plate.
- Swing the clamp plates holder 2 back over the clamp plates.
The clamp plates are secured against lifting.
- Check by closing the clamp operating lever 1 if the clamps open and close correctly.



-221301



-211241 und -241291





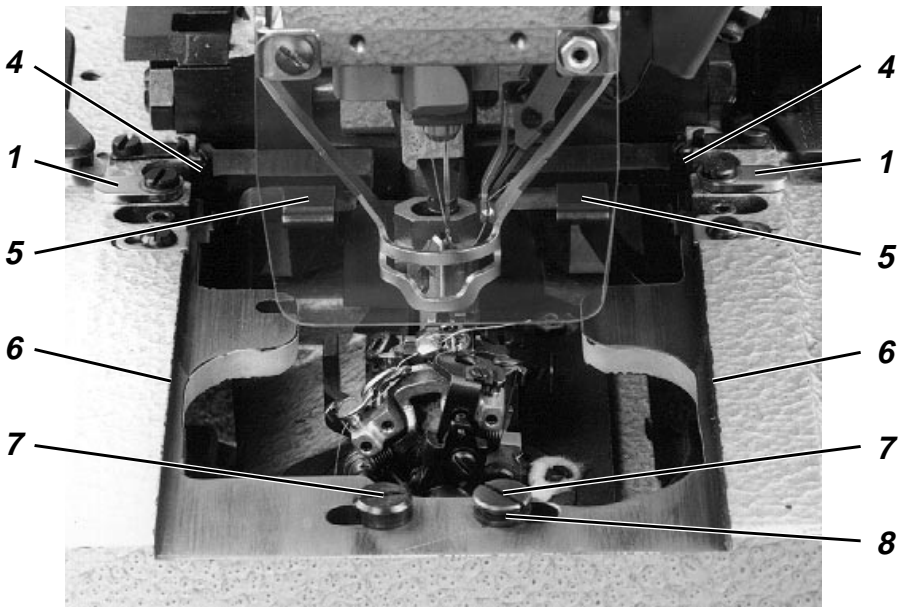
Sub-classes -211241, -221301 and -241291:

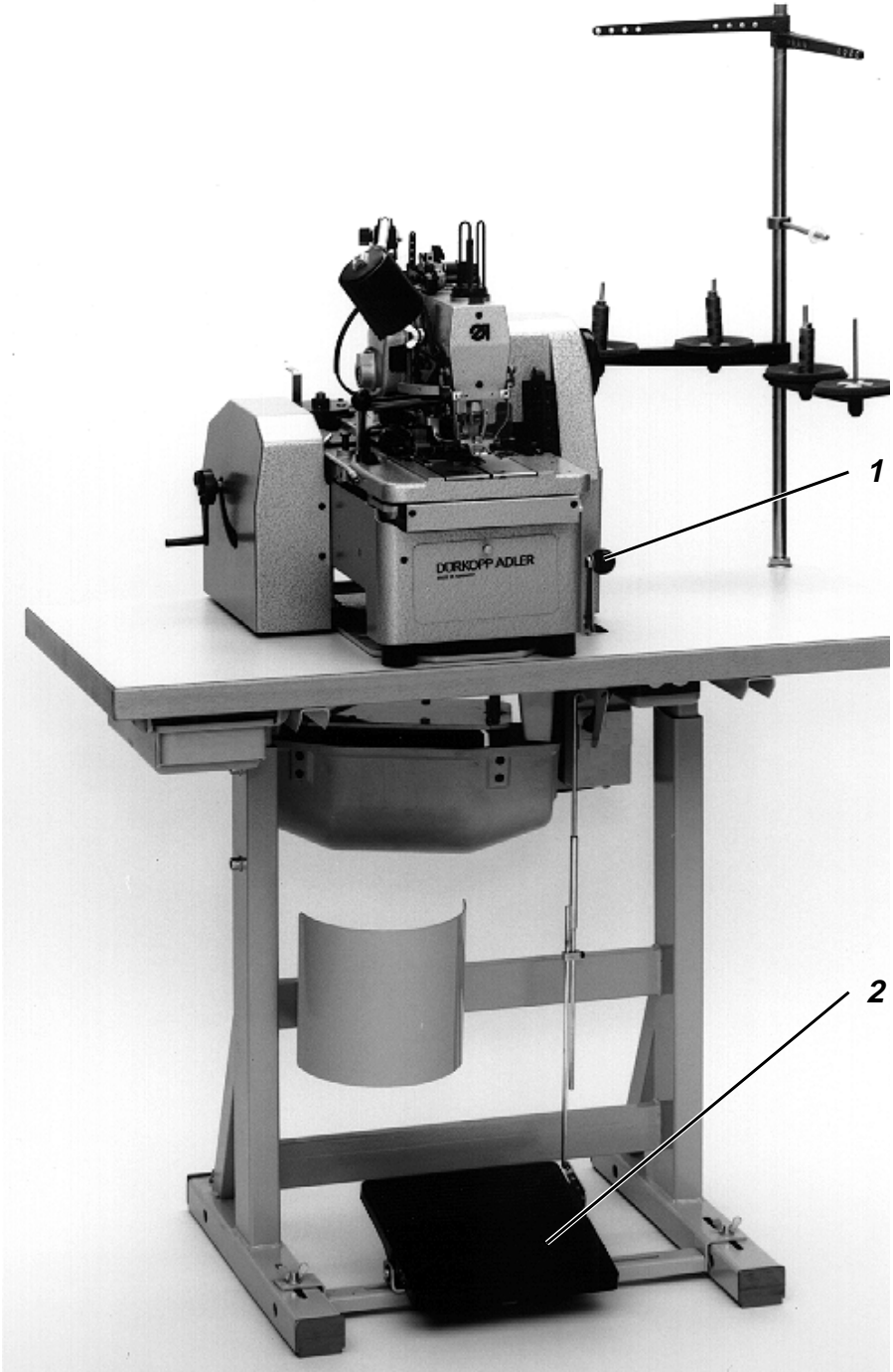
Removing the clamp plates

- Swing the clamp plate holder 1 away to the side.
- Pull the spring mounted slide 3 in the direction of the arrow and remove the right clamp plate.
- Reach under the nail slit 2 and remove the left clamp plate.

Placing the clamp plates

- Place first the left, then the right clamp plate.
- The clamp operators 5 must reach into the forks of the clamp arms.
- Push the clamp plates to the right or left against the pressure screws 4 and plate edges 6.
- Place the clamp plates over the setbolt 7 on the the material support plate. Hereby pull the spring mounted slide 3 in the direction of the arrow and let catch in groove 8.
- Swing the clamp plate holder 1 over the clamp plates again. The clamp plates are secured against lifting.
- Check by closing the clamp operating lever if the clamps open and close correctly.







2.2 Turning On - Quick Stop - Restart



Caution Risk of Injury !

Do not reach into the area of moving machine parts, particularly not under the knife and the cloth clamps.

Turning on

Turn on the drive motor with the hand shift lever 1.

- Loosen the hand shift lever 1 out of its catch by **pulling up** on the ball head and bring into position "1".
The catch prevents an unwanted turning on of the drive motor.

Turning off

Turn off the drive motor, **as desired**, with the hand shift lever 1 or the pedal 2.

- Place the hand shift lever 1 in position "0".
The hand shift lever catches in this position.
- Step forward on pedal 2.



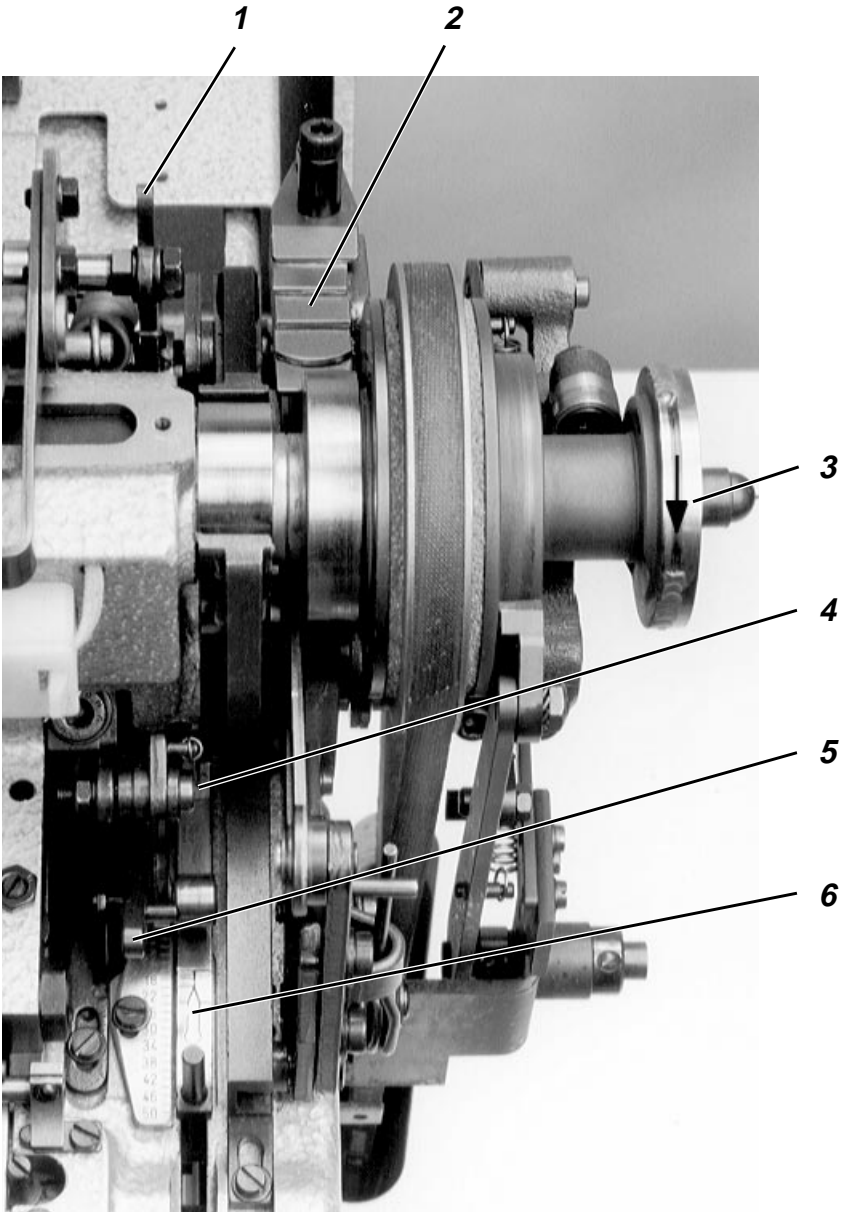
Caution Risk of Injury !

As long as the operator is not yet familiar with the machine, she should turn off the motor with the pedal or hand shift lever after sewing each buttonhole.
restarting should occur only after the cloth has been repositioned and the clamp are closed.

Quick stop

The safety system of the 558 has two possibilities for an **immediate stop during the sewing process** by operating errors or malfunctions (e.g. needle or thread breakage):

- Put the hand shift lever 1 in position "0".
- Step pedal 2 forward.





Restart

In order to avoid damage to the machine, when restarting after a quick stop it is essential to proceed as follows:

- Lift the idle lever 5 until it jumps off of the nose 4 of the length setting slide 6.
Attention !
This point is only to be carried out if the machine was turned off immediately after the first sewing stitches.
- Pull the turn-off lever 1 forward.



ATTENTION !

Before turning on the machine always bring the needle into the high position by catching in the handwheel 3. A bending of the needle or damage to the material is thus avoided.

Exception:

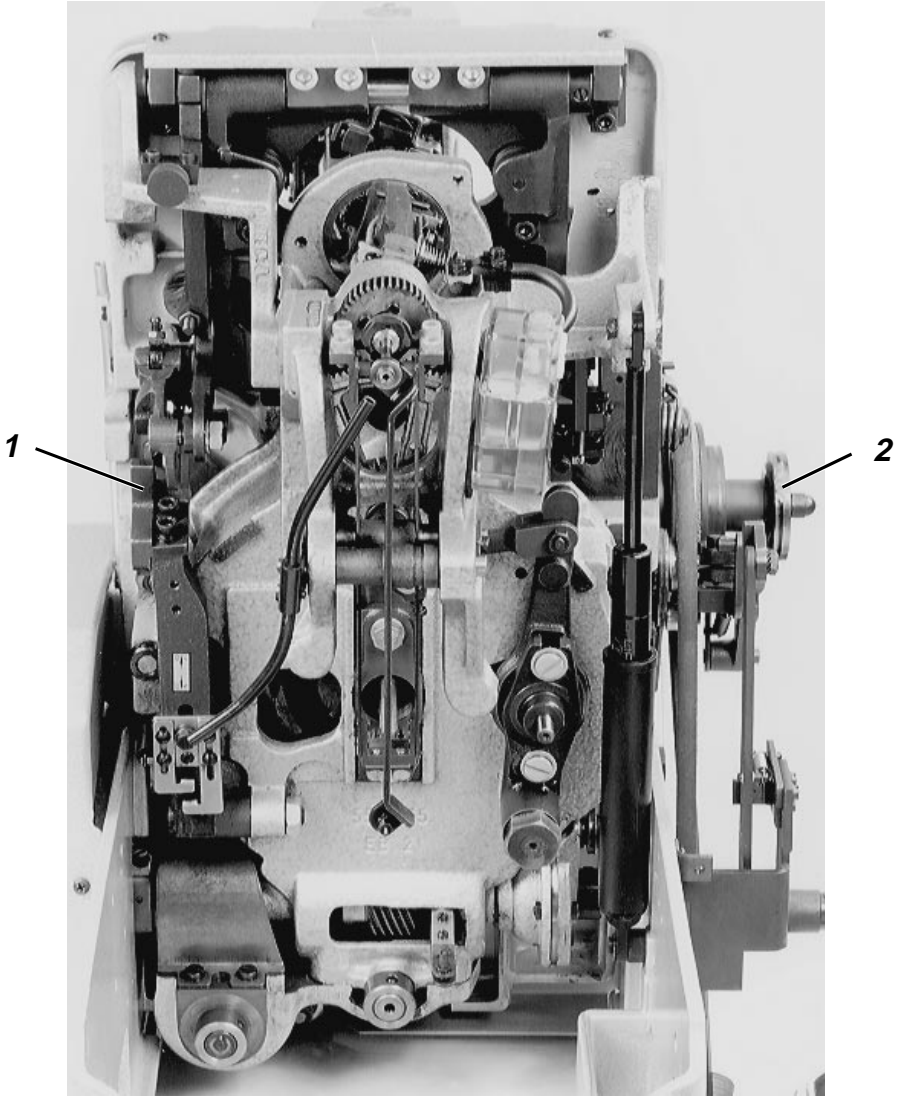
The handwheel may not, however, be turned at that moment in which, after the end of the sewing sequence, the cutting movement of the upper thread knife begins and this lies under the needle hole of the needle plate.

- Turn the handwheel 3 in the direction of the arrow until it catches. The handwheel is arrested in this position by brake lever 2. The needle is in its highest position.
- Open the clamp plates and remove material.
- Close the clamp plates again.
- Turn on the machine with the hand shift lever. The material support plate moves to its end position. The needle remains in its highest position.



ATTENTION !

Only turn the hand crank of the high-speed wheel when the handwheel has caught in the direction of turn.





2.3 End Position of the Sewing Machine

- Turn handwheel 2 until it catches.
The needle is in its highest position.



ATTENTION !

Before turning the hand crank it is essential that the needle be brought into its high position by moving the handwheel into its catch.

A bending of the needle or damage to the material is thus avoided.

Exception:

The handwheel may not, however, be turned at that moment in which, after the end of the sewing sequence, the cutting movement of the upper thread knife begins and this lies under the needle hole of the needle plate.

- Turn the hand crank until the clamp closing lever 1 automatically opens the clamp arms.
Depending on the setting of the machine to cutting **before** or **after** sewing opening occurs before or after operation of the cutter bar 3.
- The machine is in the end position.



3



2.4 Needles, Threads and Gimps

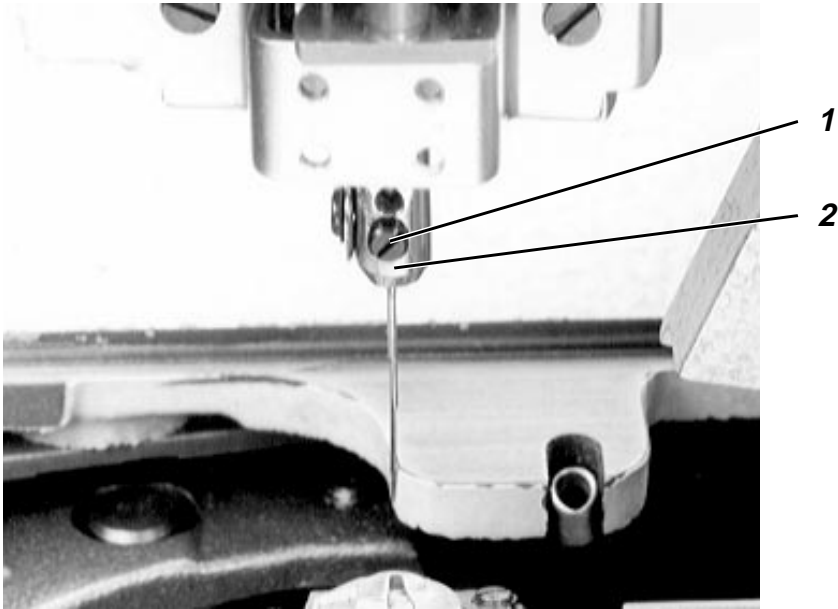


Table: Threads and Gimps

	Sub-class	
	558-221301 558-231391 558-251301	558-211241 558-241291
Needle thread type and thickness	Polyester fiber thread, schappe-spun 70/3	Polyester fiber thread, schappe-spun 70/3
Hook thread type and thickness	Polyester fiber thread, schappe-spun 70/3	Polyester fiber thread, schappe-spun 30/3
Lower gimp type and thickness	Tube or wire gimp	not required
Upper gimp type and thickness	not required	Twist gimp 15/3



Needles

Needle system: 558

Needle thickness: Nm 90 - 110
Dependent on type of sewing thread and material.

Replacing the needle



Caution Risk of Injury !

Pull the mains plug.
Replace the needle only with the machine turned off.

- Swing up the combined finger-eye protection.
The needle is accessible without hinderance.
- Loosen screw 1 and remove the needle.
- Push the new needle as far as possible into the hole in the needle bar 2.
- **Attention !**
The furrow of the needle must show to the front with the machine in its end position.
- Tighten screw 1 again.
- Swing the combined finger-eye protection back again.

Threads

As needle and hook thread, spun, synthetic fiber thread or silk thread can be used.
The appearance of the buttonhole is considerably influenced by

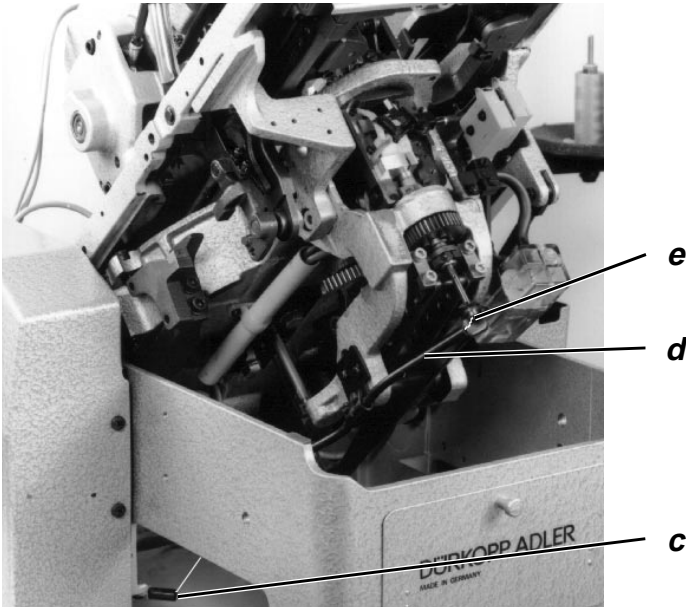
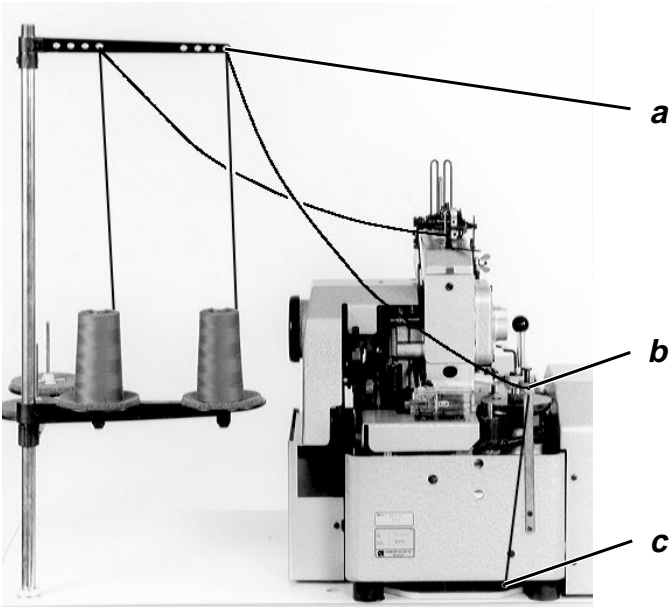
- the thread used.
- the use of different strengths for needle and hook thread.

Gimps

The gimp should stabilize the buttonhole and at the same time by it form.
It should have the following characteristics:

- not too thick, but pliable and firm
- uniform diameter

The recommended threads and gimps in the table alongside are only guide lines.
Dependent on sewing device (E no.) and material other threads and thread thicknesses may also be required.





2.5 Threading of the Underthread (Hook Thread)



Caution Risk of Injury !

Pull the mains plug.
Thread the underthread only with the machine turned off.

The threading of the underthreads 1 (Page 28) is conducted as shown in the illustrations on pages 26 and 28 **in alphabetical order of the letters:**

- Bring the machine in its end position (see Chapter 2.3).
In the end position the hook bracket with the underthread tension must point to the front (to the seamstress).
- Remove the clamp plates (see Chapter 2.1).
- Tilt up the machine head.
The gas pressure spring aids the tilting and holds the machine head in its position.
- Place the thread spool on the thread stand and guide the thread through hole **a**.
- Guide the thread through the thread guide **b** in the thread guide tube **c** on the back of the housing.
- Guide the thread through the thread guide tube **d**.
- Guide the thread with the aid of the threading wire from the accessories pack into the spreader drive spindle **e**.
For this insert the threading wire into the spreader drive spindle from above.
- Lead the thread over the guide pin **f** and past behind the tension plate **g**.
- Lead the thread between the two tension discs of the underthread tension **h** up over the guide pin **i**.
- Guide the thread through the eye of the torsion spring **k**.
- With sub-classes **-211241**, **-221301** and **-241291** additionally guide the thread through the hole of the bring-forward lever **l**.
- Lead the thread up through the thread guide tube **m**.
- Lead the thread through the spreader stop **n**.
- Guide the thread from below through hole **o** in the hook and needle hole **p** of the needle plate. Hereby let an approx. 25 mm long underthread end hang out of the needle hole.

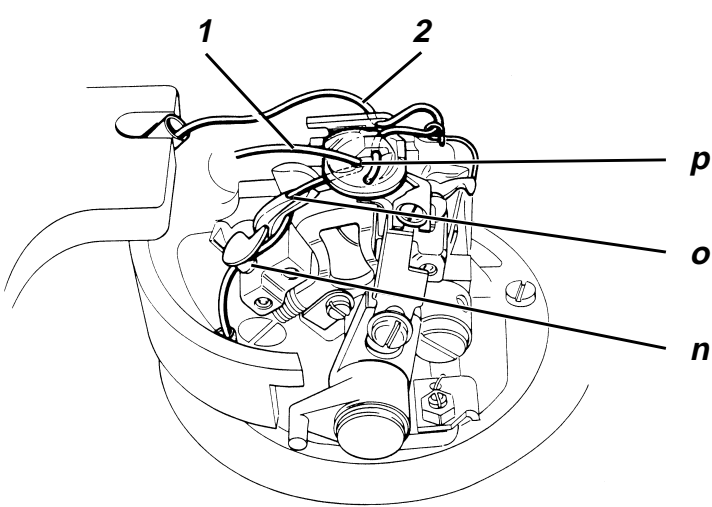
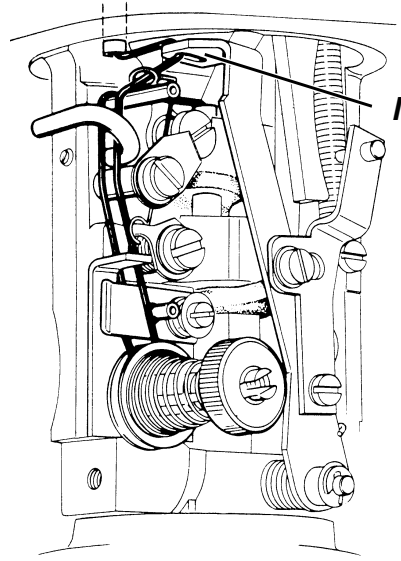
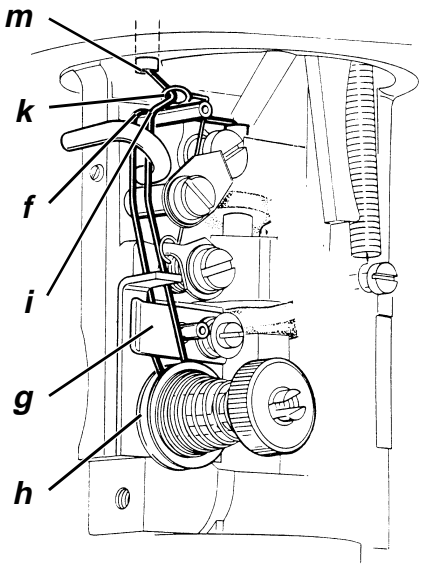
2 = Gimp thread

(Page 28)



-231391
-251301

-211241
-221301
-241291

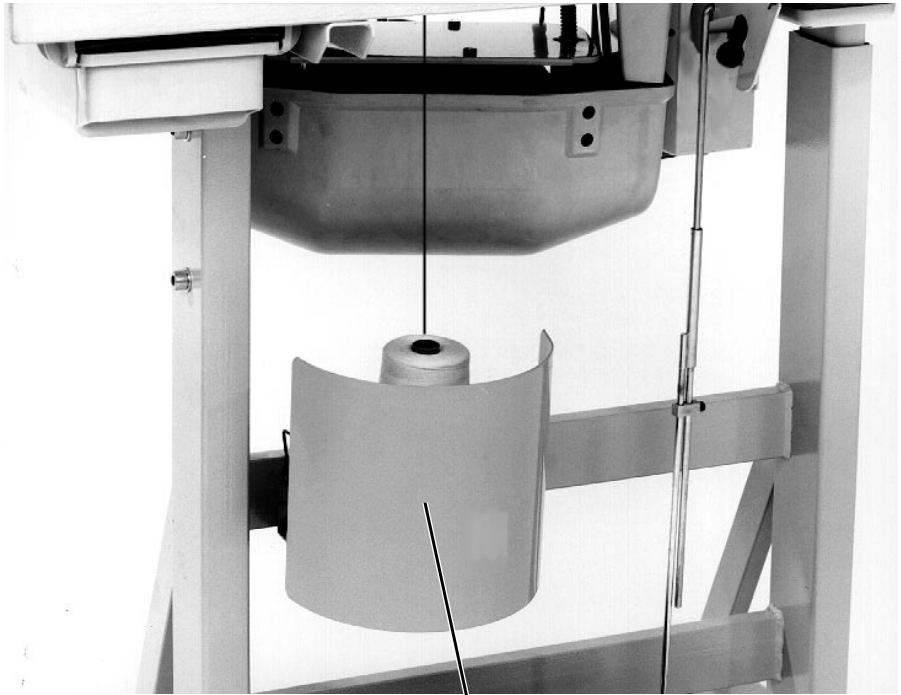




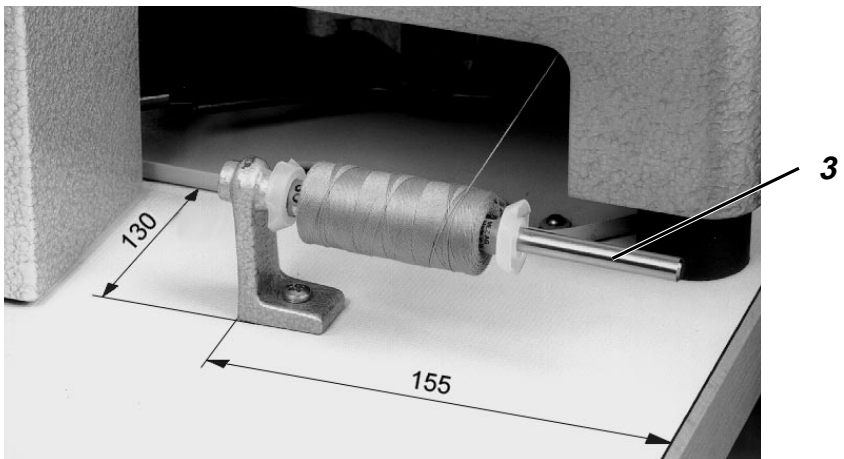
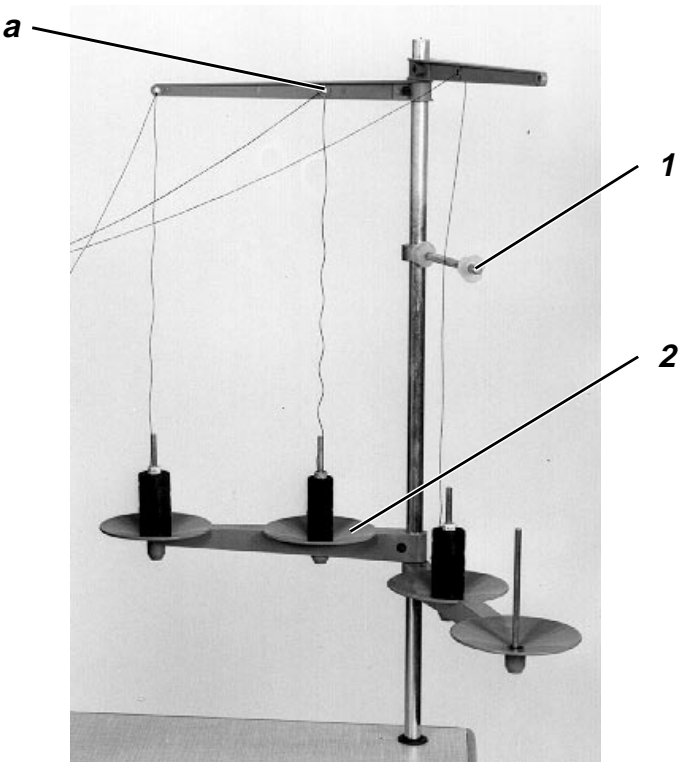
Path of the underthread when using yarn or wool cones:

If yarn or wool cones are used as hook thread then these are to be set on the as optional equipment available thread unreeler 1 (Order no. 558 3001) underneath the table.

- Lead the thread through the thread guides under the table.
- Lead the thread up through the thread tube.
- The threading of the machine above the table is conducted as described above.



1





2.6 Threading the Gimp



Caution Risk of Injury !

Pull the mains plug.
Thread the lower and upper gimp only with the machine turned off.

- Place tube and wire gimp rolls on the gimp roll holder 1. Place the gimp rolls with crosswinding vertically on the yarn plate 2 for an easy pull off of the gimp or thread.
- For stiff and difficult to bend lower gimps choose the short feed over the as optional equipment available gimp roll holder 3 (Order no. 557 1103).

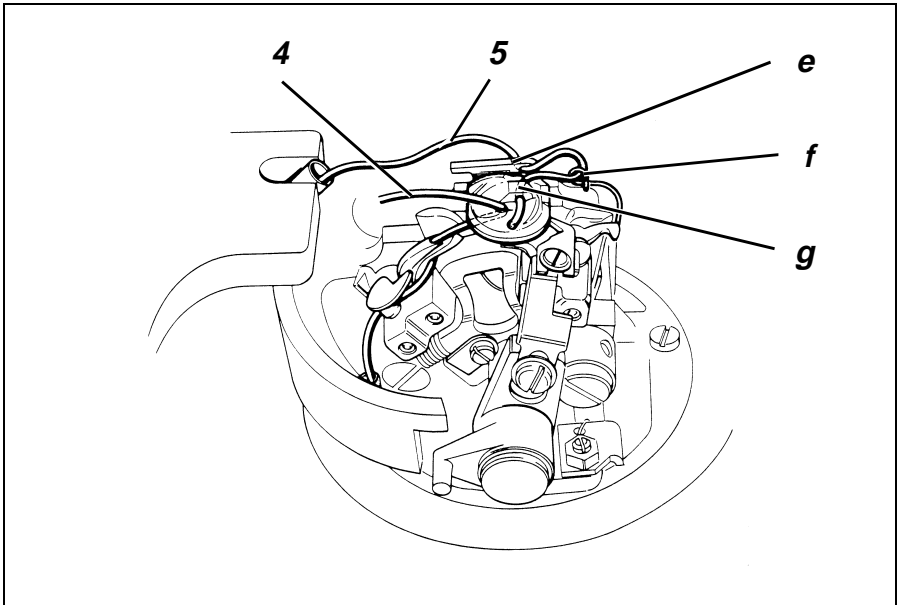
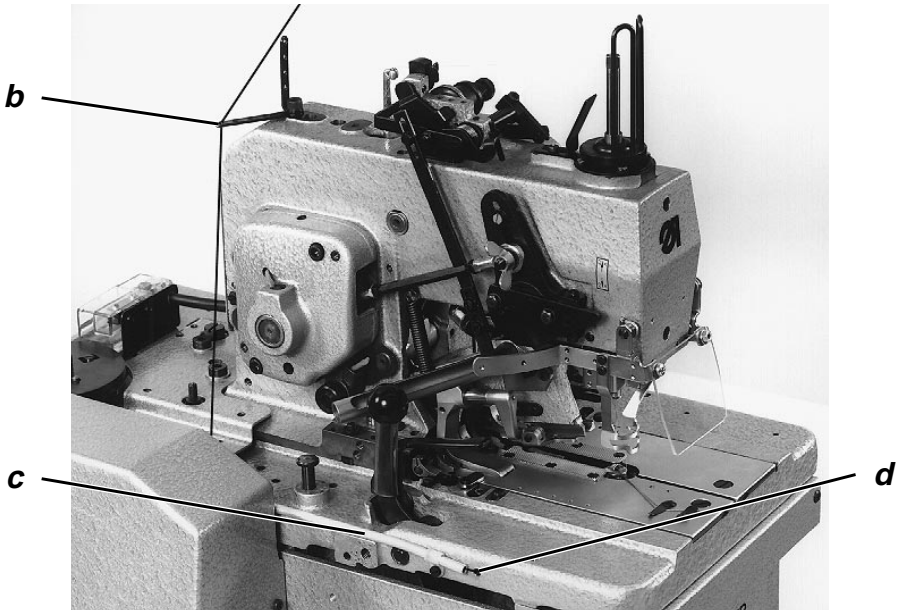
Lower gimp threading

The threading of the lower gimp is conducted as shown in the Illustrations on pages 30, 32 and 33 **in the alphabetical order of the letters:**

Sub-classes -211241, -221301, -231391 and -251301:

- Remove the clamp plates (see Chapter 2.1).
- Thread the gimp from the gimp roll holder 1 or the yarn plate 2 through hole **a** in the thread stand.
- Lead the gimp in order through the gimp guide **b** and the gimp guide tubes **c** and **d**.
- Thread the gimp through gimp guide **e**.
- With sub-class **-221301** the gimp must also be threaded through the draw spring **f**. Through the draw spring the loosening gimp thread is held taut during simultaneous turning movement of the hook bracket and operation of the gripper knife.
- Thread the gimp through the gimp hole **g** of the needle plate. Allow an approx. 25 mm long gimp end to hang out of the gimp hole.

4 = Hook thread (Page 32)
5 = Gimp thread (Page 32)
- Replace the clamp plates again (see Chapter 2.1).

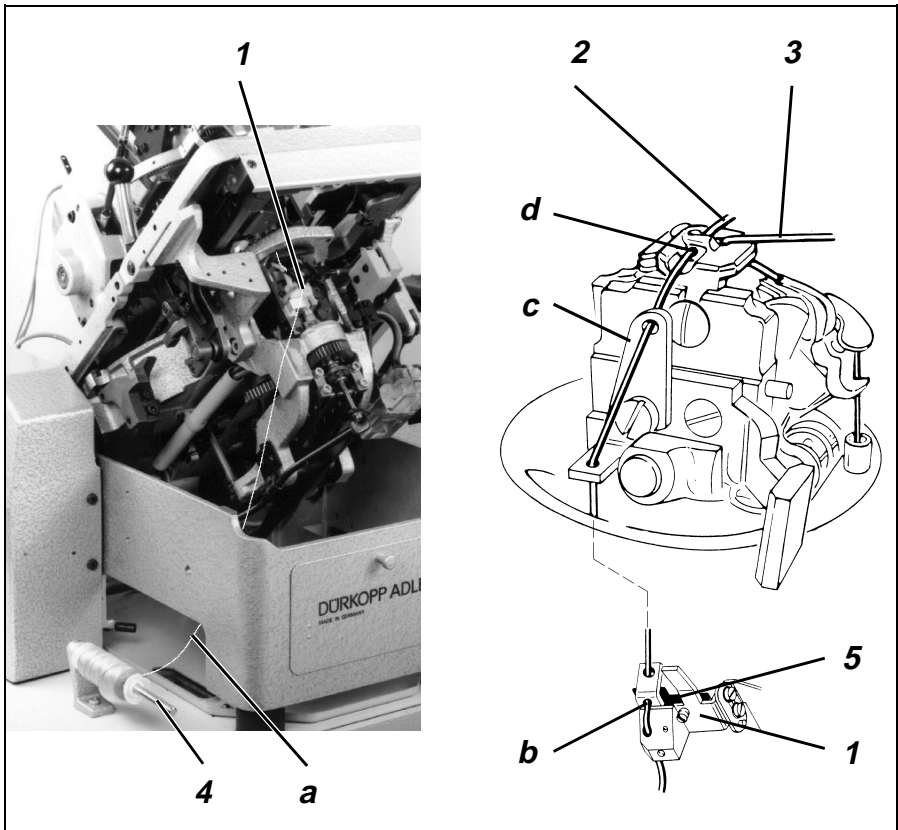


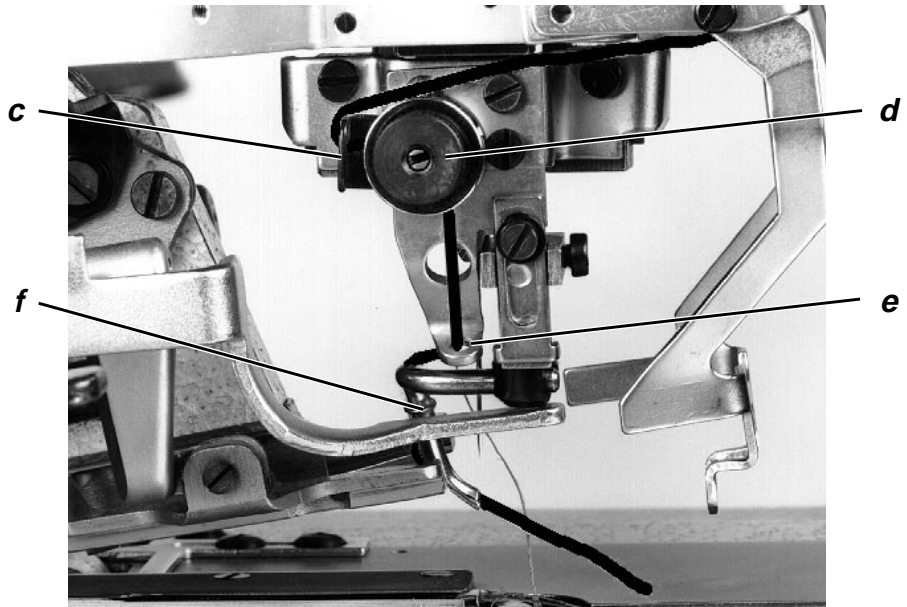
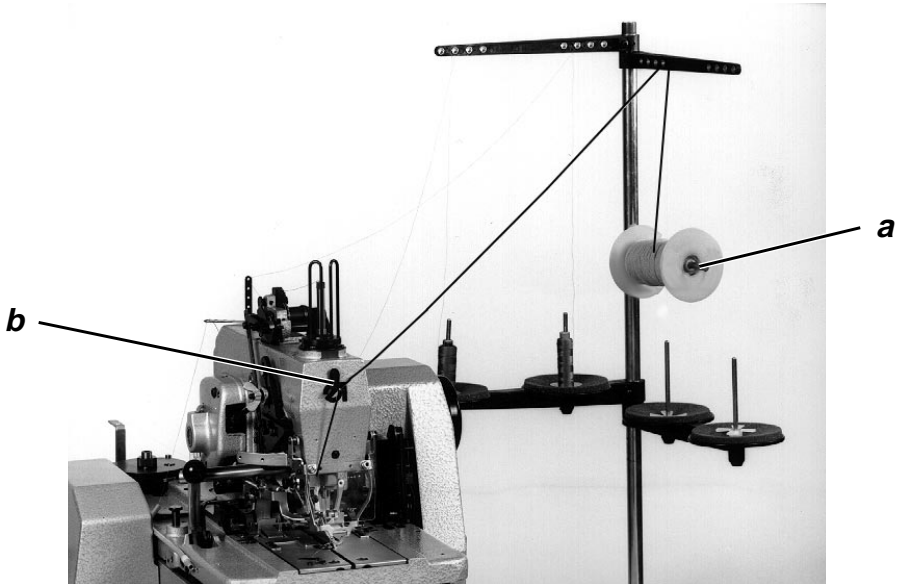


Sub-class -241291:

This sub-class is equipped with gimp pulling device.
Before the start of sewing it pulls the gimp back to the correct starting length.
For correct positioning see the Service Instructions.

- Remove the clamp plates (see Chapter 2.1).
 - Turn the hand crank *drehen* until the hook bracket reaches the position shown.
The gimp pulling device 1 faces forward (to the seamstress).
 - Lead the gimp 2 from the lower gimp roll holder 4 through the side recess **a** in the machine housing.
- 3 = Hook thread
- Thread the gimp through the holes of the gimp pulling device 1.
For threading through the hole **b** press the brake flap 5 lying behind a little to the back.
 - Thread the gimp 2 through the holes of the gimp guide **c** and gimp hole **d** of the needle plate.
- With the gimp pulling device in low position let an approx. 4 mm long gimp end look out of the gimp hole of the needle plate.
- Replace the clamp plates again (see Chapter 2.1).





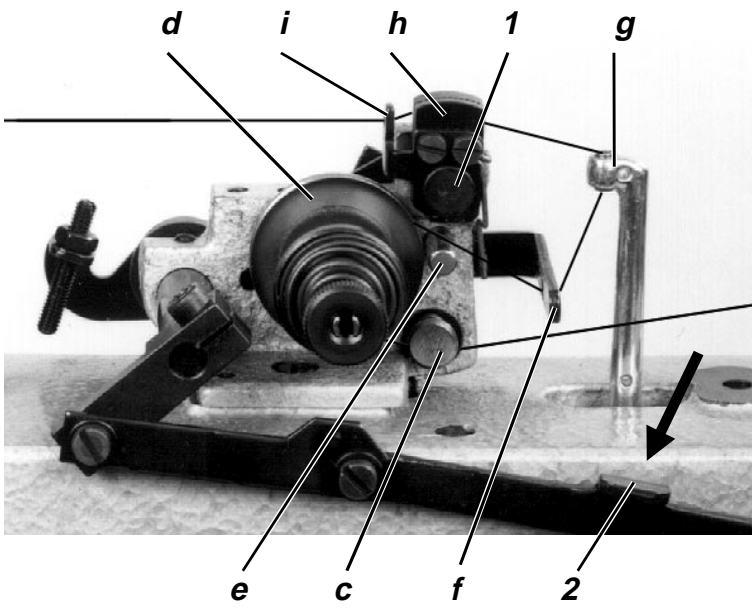
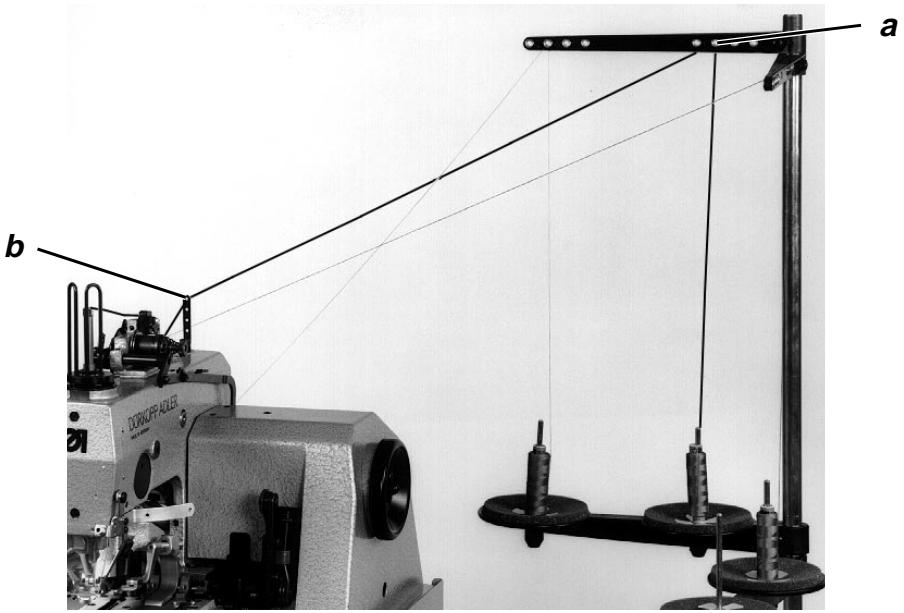


Upper gimp threading

The feed of the upper gimp is possible with a gimp guider placed in front of the needle. The threading of the upper gimp is conducted as shown in the illustrations alongside **in the alphabetical order of the letters:**

- Thread the gimp from the gimp roll holder **a** through gimp guide **b**.
- Lead the gimp through the gimp guide angle **c** and between the tension discs of the gimp pre-tensioning **d**.
- Thread the gimp through the gimp guide **e** and the gimp guider **f**.

The assembly for round and flat gimps is available under the Order no.: 578 5101.





2.7 Threading of the Upper Thread (Needle Thread)



Caution Risk of Injury !

Pull the mains plug.
Thread the upper thread only with the machine turned off.

The threading of the upper thread is conducted as shown in the illustrations on pages 36 and 38 **in the alphabetical order of the letters:**

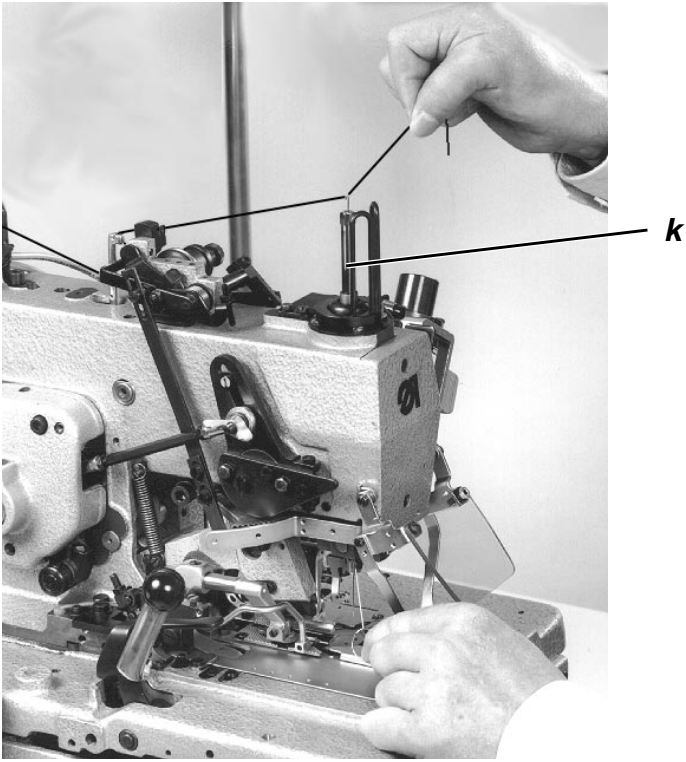
- Bring the machine into its end position (see Chapter 2.3).
In the end position the hook bracket with the underthread tension must face forward (to the seamstress).
- Close the clamps with the aid of the clamp operating lever and swing up the combined finger-eye protection.
The needle bar and needle are accessible unhindered.
- Place the thread spool on the thread stand and guide the thread through hole **a**.
- Guide the thread in order through the thread guide **b** and under thread guide **c**.
- Lead the thread between the tension discs **d** of the upper thread tension and over guide pin **e**.
- Guide the thread through the hole of the lever **f** and the thread lever **g**.
- Lead the thread through the thread gripper **h** and thread guide **i**.
- Guide the thread with the aid of the threading wire from the accessories pack through needle bar **k**.
- Lead the thread past behind the tension disc of the pre-tensioning **l** and through the eye of the needle.

Subsequent pulling of the upper thread by hand

The upper thread is trimmed after the last stitch automatically.

For subsequent pulling of the upper thread:

- Operate the release lever 2 or push button 1 and subsequently pull the upper thread by hand.

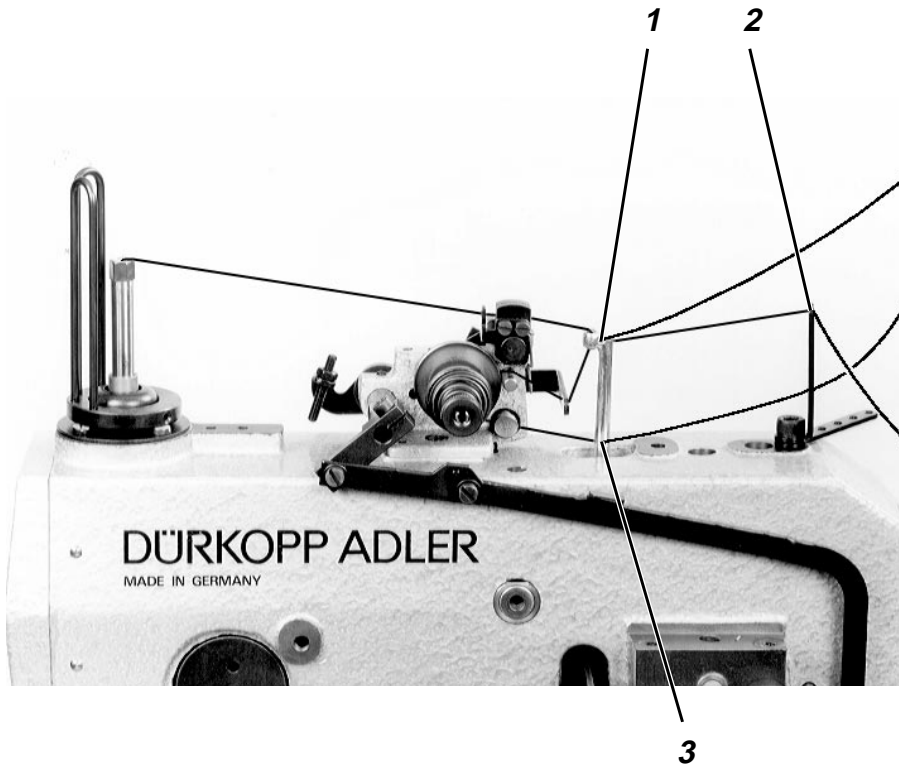


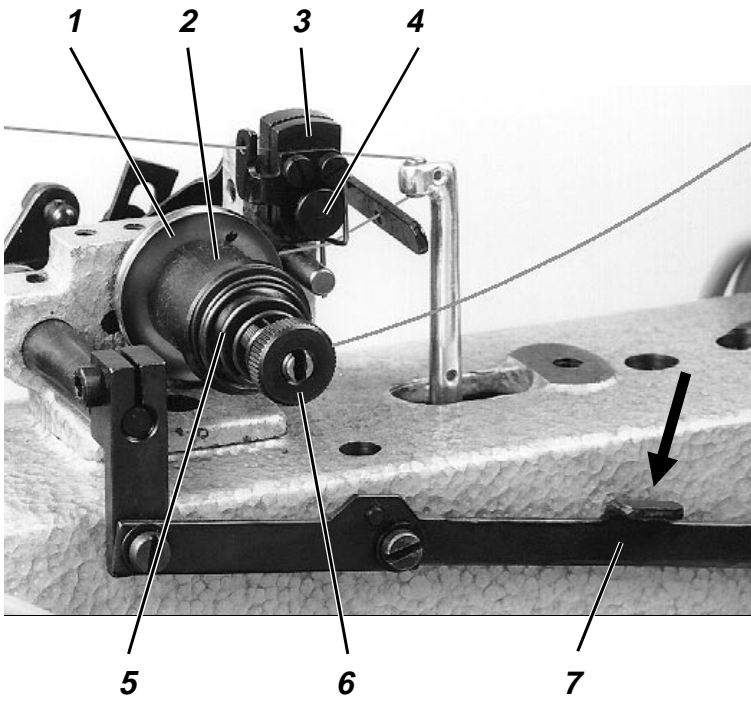


Threading by difficult to unreel thread rolls

To achieve an easy pull off of the upper and underthread from the thread plate:

- Additionally guide the underthread through the holes 1 and 2.
- Additionally guide the upper thread through hole 3







2.8 Thread Tension

Upper thread tension

The upper thread tension on the machine arm must generally be set tighter than the underthread tension.

It is set by turning the knurled nut 6.

Tension increase = **turn to the right**
Tension decrease = **turn to the left**

The upper thread tension is executed as a dual tension:

– **Remaining rest tension 1**

It serves to tauten the upper thread during the cutting procedure under the needle plate as well as to achieve the desired length of upper thread end. The rest tension must, depending on the elasticity of the upper thread used, be so set that upper thread end hanging out of the needle is long enough to assure a secure sewing start.

The setting occurs by turning the sleeve 2.

Longer thread end = **turn to the left**
Shorter thread end = **turn to the right**



ATTENTION !

Do not heighten the cutting effect of the upper thread knife by further increasing the rest tension.
To heighten the cutting effect sharpen the knife.

If the upper thread end remains too long then work must be conducted without tension release. This can, for example, be the case with firm and hardly flexible upper thread.

For the appropriate settings see Service Instruction 558.

– **Main tension 5**

This should be appropriately corrected after changing the rest tension.

The thread gripper 3 remains closed in the end position.

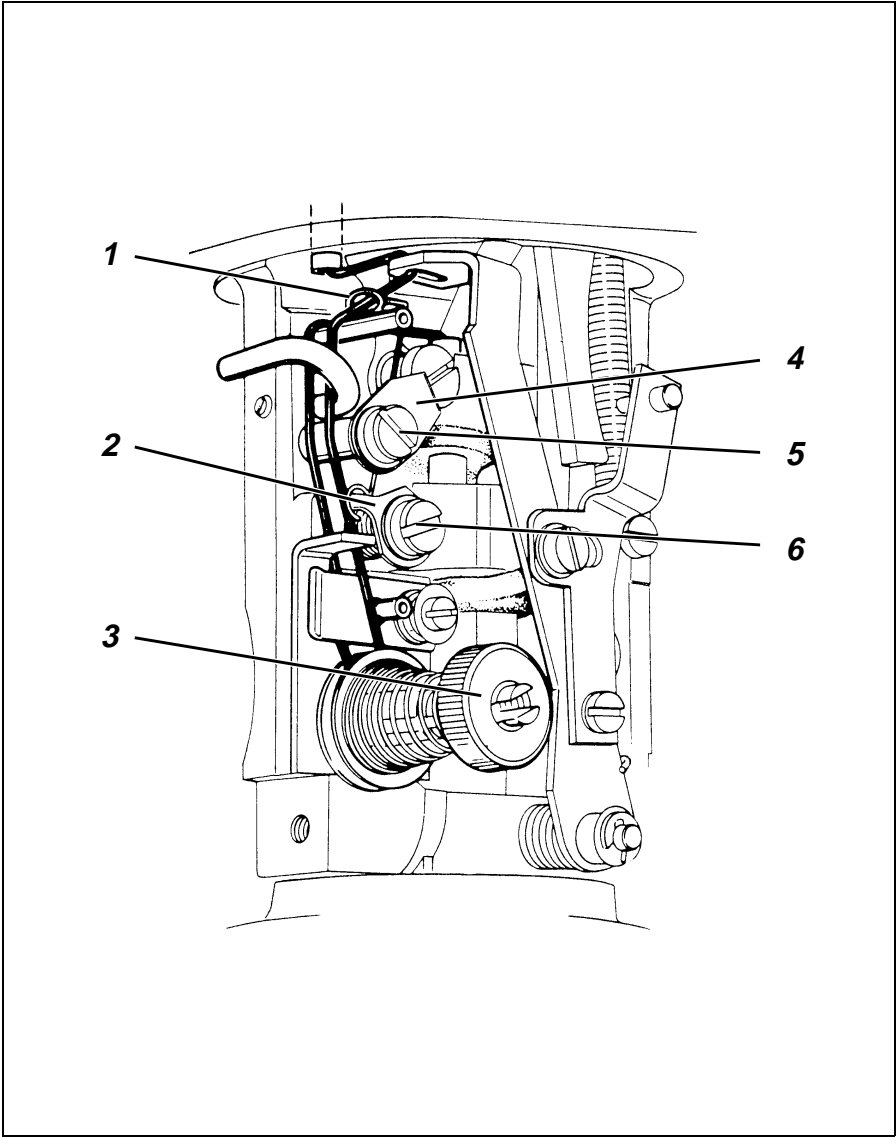
During removal of the sewing pieces this avoids a subsequent pulling of the upper thread out of the thread tension.

For the next sewing sequence there is then always an uniformly long starting thread available.

Subsequent pulling of the upper thread by hand

Open the thread gripper 3 by hand and subsequently pull the thread.

For this either hold the button 4 down or swing the release lever 7 down.





Underthread tension

The underthread tension is set by turning the knurled nut 3 on the hook bracket.

Tension increase = **turn to the right**
Tension decrease = **turn to the left**

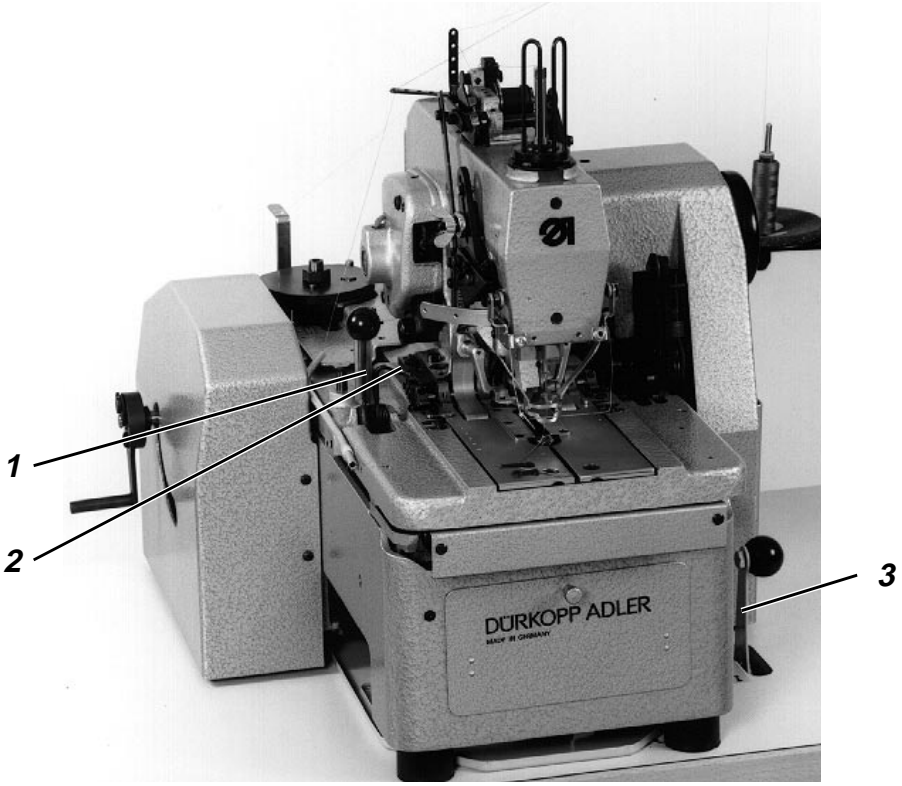
Thread pull-on spring for the underthread

The thread pull-on spring 1 influences the pull-on of the underthread through its stopper width and pre-tension and thus the form and beading of the buttonhole.

Setting the stopper width: **Loosen screw 5 and turn the angle 4.**
Setting the pre-tension: **Loosen screw 6 and turn angle 2.**

Gimps

The upper and lower gimp should be pulled easily and uniformly from the guide hole in the needle plate and the gimp guider.
For a faultless appearance of the buttonhole a braking or clamping of the gimp on its way to the sewing station is to be avoided.





2.9 Sewing

- Place a work piece under the clamps and align precisely.
The alignment can be made with markings or the stops available as optional equipment (see Chapter 1.5).



Caution Risk of Injury !

Keep hands out from under the lowering cloth clamps !

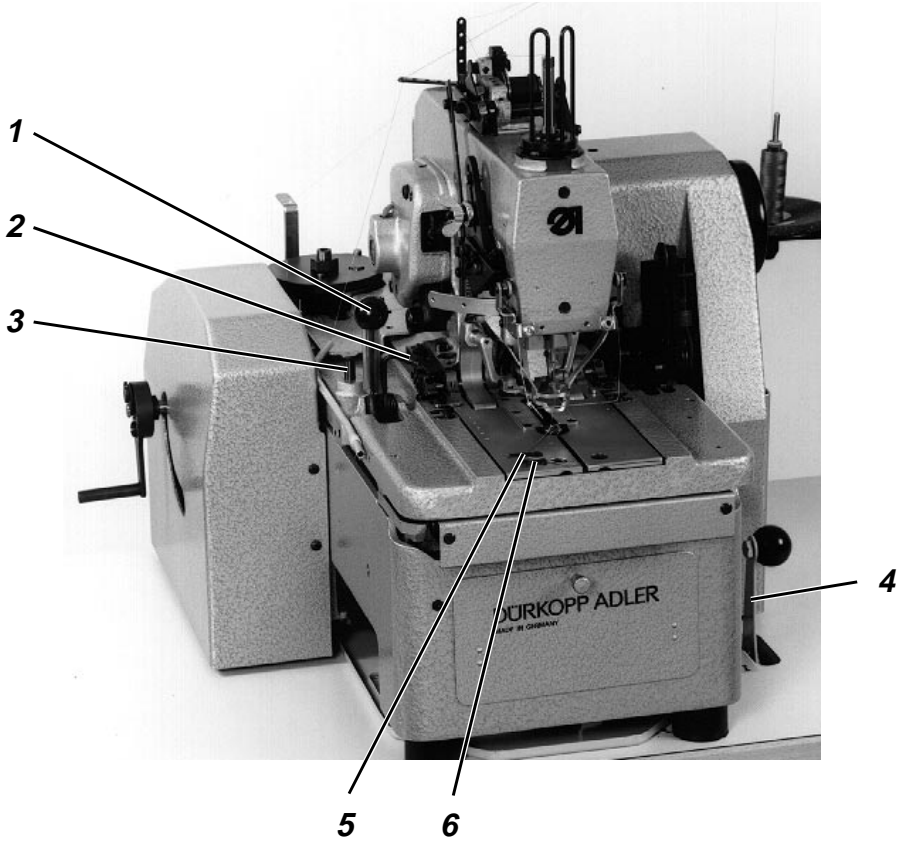
- Pull the clamp operating lever 1 to the front until it touches.
The work piece is fixed by the clamps.
- Turn on the motor with hand shift lever 3.
For this loosen the hand shift lever out of its catch by **pulling up** on the ball head and bring into position "I".
- Press start lever 2 down.
The machine, depending on setting, automatically conducts the following work steps in order:

With the setting "cutting before sewing":

- The cutting knife cuts the buttonhole slit.
- The material support plate moves quickly with the clamped in work piece so far forward until the beginning of the buttonhole slit is exactly under the needle.
- At the same time the clamp plates are drawn apart.
The buttonhole slit is opened a little.
- The sewing unit is turned on and the buttonhole sewn.
- After the left seam row is completed the needle stops outside the cloth.
- The material support plate moves quickly to its end position, thereby opening the clamps.

With the setting "cutting after sewing":

- The material support plate moves quickly with the clamped in work piece so far forward until the position where the buttonhole is to start is exactly under the needle.
- At the same time the clamp plates are drawn apart.
The cloth lies taut for the sewing of the buttonhole.
- The sewing unit is turned on and the buttonhole sewn.
- After the left seam row is completed the material support plate moves quickly in the cutting position. The buttonhole slit is cut.
- The material support plate moves quickly to its end position, thereby opening the clamps.





Caution Risk of Injury !

As long as the seamstress is not yet familiar with the operation of the machine she should turn off the motor with the hand shift lever 3 or the pedal after sewing each buttonhole.

Work procedure for the experienced seamstress

After a suitable learning period the closing of the clamp operating lever 1 and the turning on and off of the motor with every buttonhole through the seamstress can be eliminated.

Instead the experienced seamstress proceeds as follows:

- Place the work piece exactly under the clamps by eye or with stops and hold the cloth fixed in this position.



Caution Risk of Injury !

Keep hands out from under the lowering cloth clamps !

- With the left index finger press the start lever 2 down.
The machine closes the clamps by itself and runs through all described work procedure automatically.

Taking out the finished work piece

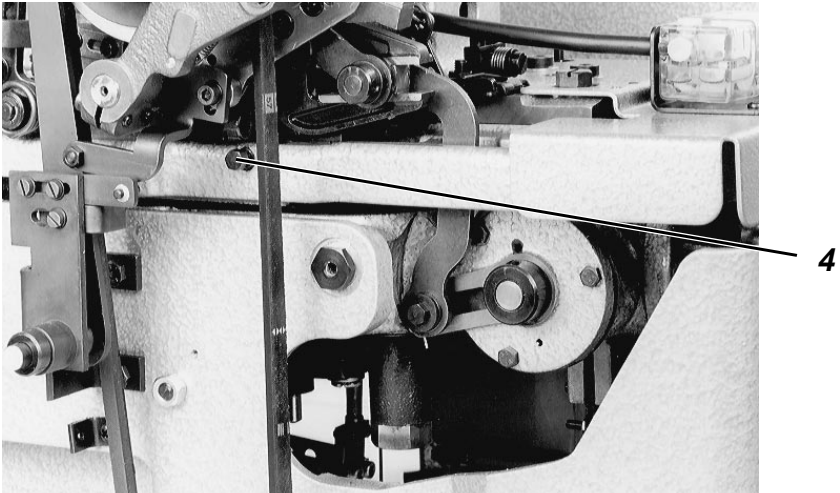
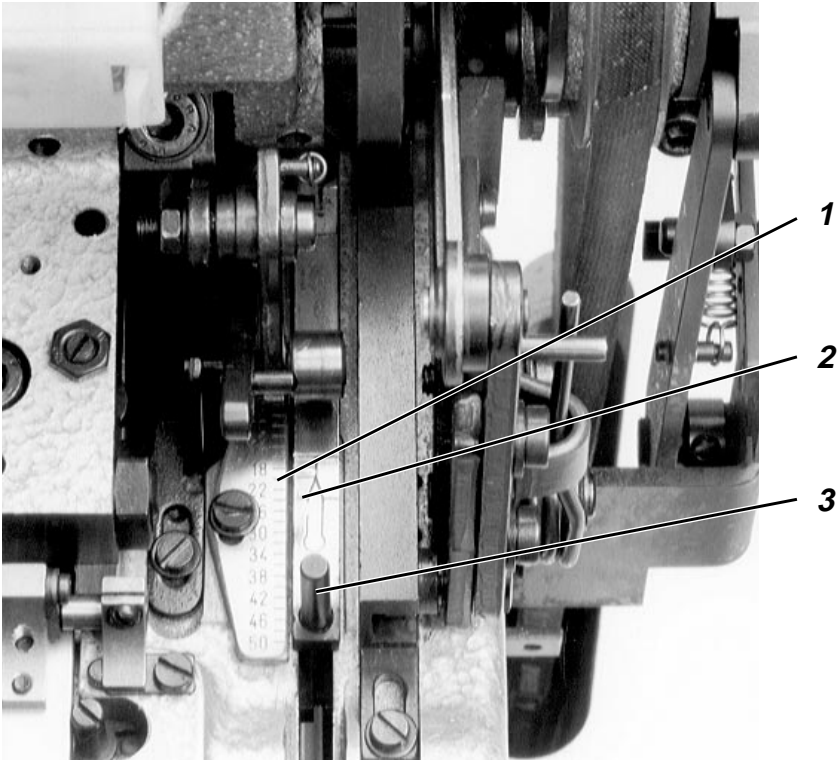
- If necessary a little subsequent pulling of the upper gimp and then trimming. The work piece can be pushed further or removed.
- For removal of work pieces with sub-classes -231391 and -251301 Guide the underthread (hook thread) and lower gimp under the thread gripper 5. Pull both threads from right to left along the knife 6. The threads are trimmed.

2.10 Blocking the Clamp Lift

Normally, after the ending of the sewing process the clamps are automatically lifted (opened).



If they should not be lifted, proceed as follows:

- Push button 3 immediately and hold pressed until the machine shuts off.






2.11 Buttonhole length

	Caution Risk of Injury ! Pull the mains plug. Set the buttonhole length only with the machine turned off.
	ATTENTION ! The changing of the buttonhole length requires a simultaneous change of the cutting length and thus the mounting of a different cutting block (see Chapter 2.12) !

Buttonholes without Taper Bar

By buttonholes without taper bar the buttonhole length is determined through the position of the length setting slide 3:


- Loosen clamp screw 4.
- Set the desired buttonhole length.
Longer buttonhole length = Pull the length setting slide 3 forward
Shorter buttonhole length = Push the length setting slide 3 to the rear
- The scale 1 and marking lines 2 serve for setting a specific buttonhole length.
- Tighten clamp screw 4 again.

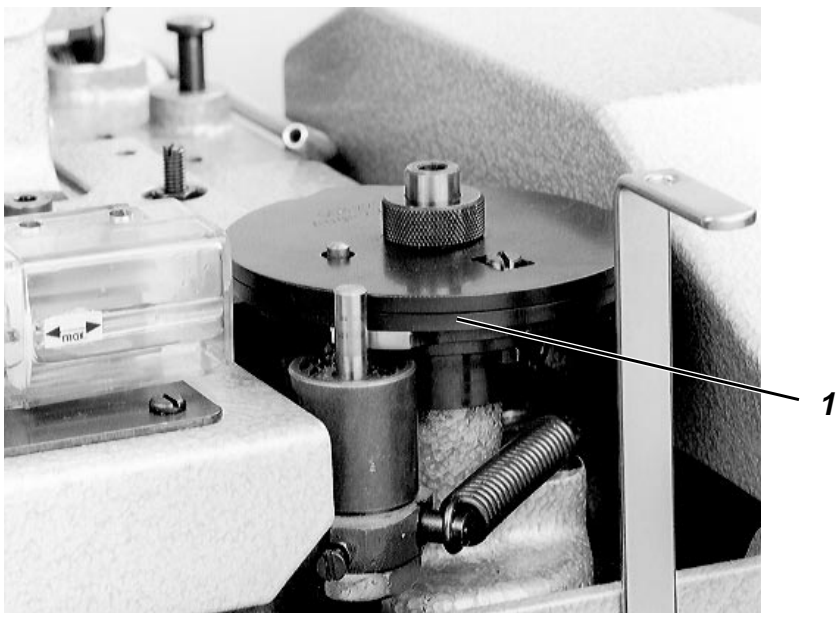
	ATTENTION ! Set only the through the sewing device (E no.) allowable minimum and maximum buttonhole lengths.
--	--

Sub-classes -221301 and -241291:

With these sub-classes an exceeding of the maximum sewing length is prevented by a stop.

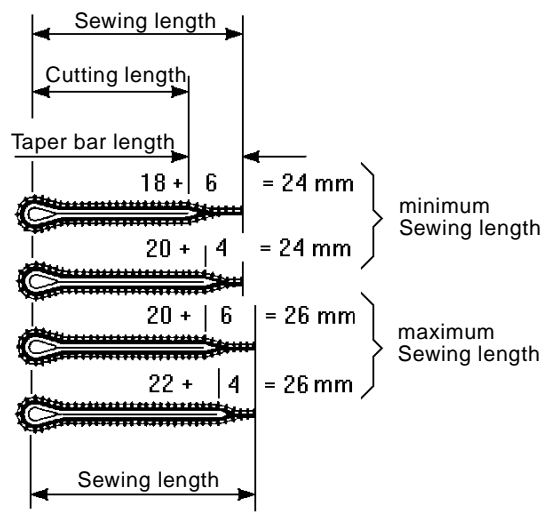
With the setting of the length setting slide at max. sewing length the stop piece must lay in at the guide slit at the front.

	ATTENTION ! Scale plate, length setting slide and stop piece have been correctly set at the factory. They may not be altered.
---	--



Example:

E407/L2
resp.
E2407/L2





Buttonholes with Taper Bar

By buttonholes with taper bar the different buttonhole lengths are achieved through insertion of the appropriate lower disc cam 1. It determines taper bar form and length.

For exchanging the lower disc cam see Chapter 2.18.

The order numbers for the different lower disc cams can be found on the device sheets for the 558 and 578.

The shortening, lengthening or complete shutting off of the taper bars occurs as described above through adjusting the length setting slide and mounting of the corresponding cutting block.



ATTENTION !

Do not set the taper bar length below the minimum or beyond the maximum buttonhole length.

When setting the length of buttonholes with taper bar along with the cutting length the taper bar length must also be added in.

Example: 18 mm cutting length + 4 mm taper bar length = 22 mm sewing length

Special characteristic by sub-class 558-241291:

With this sub-class buttonhole length, cutting length and taper bar length can be changed.

For this four different **cutting length packages** (L1...L4) can be requested:

- L1 for cutting lengths of 14 - 20 mm
- L2 for cutting lengths of 18 - 24 mm
- L3 for cutting lengths of 22 - 28 mm
- L4 for cutting lengths of 26 - 32 mm

Each cutting length package includes:

- 3 lower disc cams and cutting blocks for sewing buttonholes with 3 different cutting lengths
- a corresponding clamp plate set

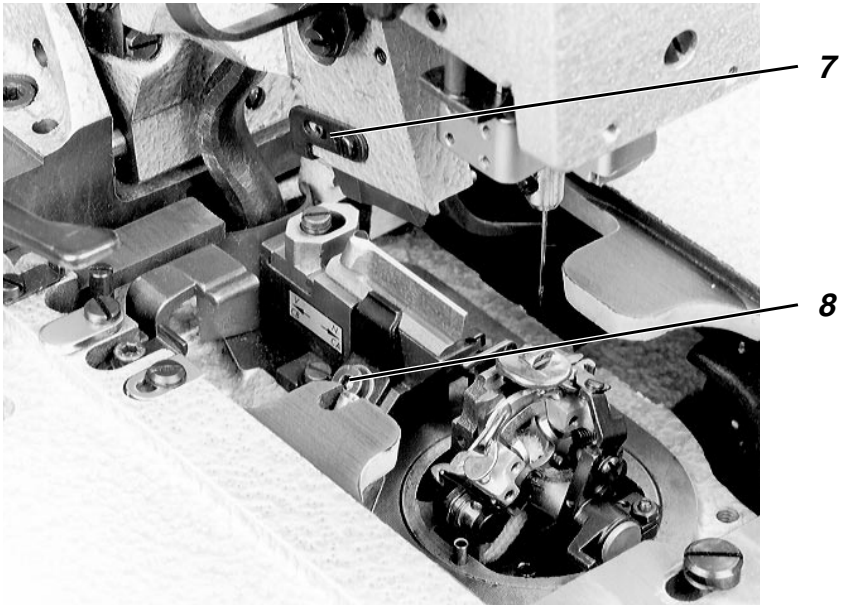
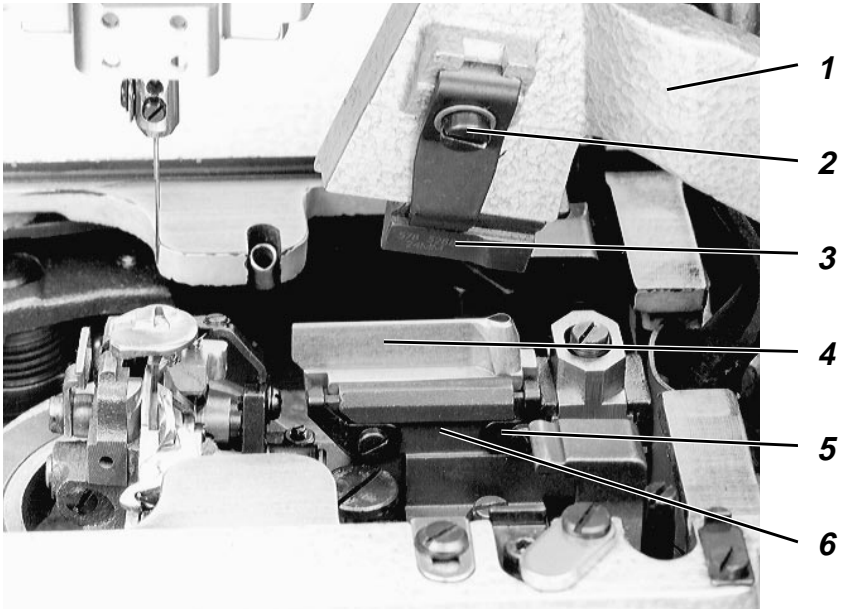
The clamp plate sets are differentiated by differing lengths for cloth clamps and thread scissors with operating element for the short trimming of thread.

In order to assure a secure gripping and short trimming of thread and gimp the difference in the buttonhole lengths which can be sewn with one cutting length package cannot exceed 2 mm.

Example:

578 E 2407/L2 (Sewing device E2407 combined with cutting length package L2)

Allowable sewing lengths: minimum 24 mm
 maximum 26 mm.





2.12 Cutting Length

The cutting length is determined by the length of the cutting block. It can be altered by changing the cutting block.

The order numbers for the different cutting blocks are, taking into account the sewing device used (E no.), to be found on the device sheets for the 558 or 578.

Changing the cutting block



Caution Risk of Injury !

Pull the mains plug.
Change the cutting block and cutting knife only with the machine turned off.

Cutting block 3 and cutting knife 4 are designed so that two configurations are possible:

- Configuration **top** (on cutter bar 1)
- Configuration **bottom** (below the clamp plates on the anvil body 6)

To change the cutting block:

- Loosen screw 2 or 8 and remove the cutting block or cutting knife entfernen.
- Insert the new cutting block and cutting knife and tighten screws 2 and 8 again.

Attention !

When inserting push the new cutting block to the back until touching on the stop 5 or 7.



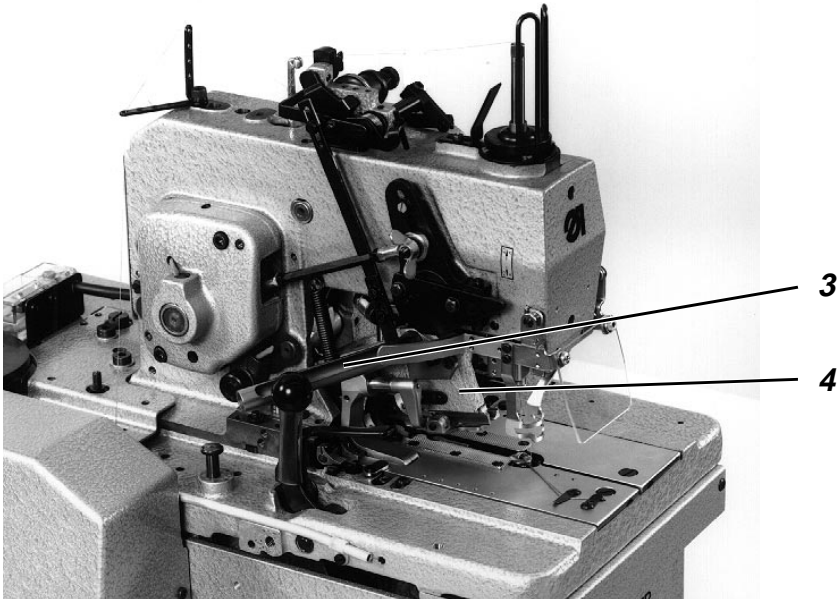
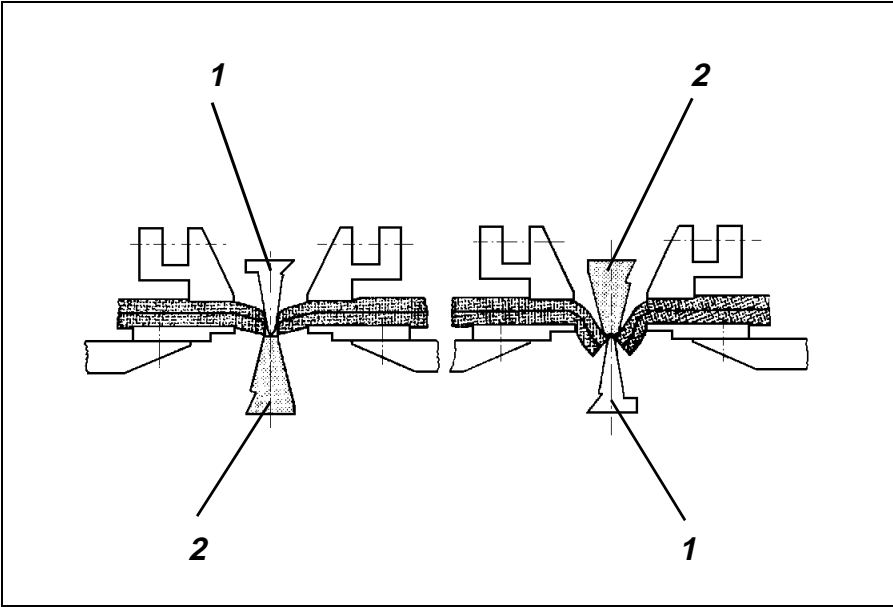
ATTENTION !

Insert only the cutting blocks corresponding to each cutting knife.

Cutting knife for "cutting before sewing" have a larger eye form than a cutting knife for "cutting after sewing".

In order to avoid having two different knife impressions on one cutting block the cutting block corresponding to the cutting knives must always be inserted.

Cutting knives with two different knife impressions cause buttonholes to not be cleanly cut and must be trued again (see Chapter 2.13).





Mounting the cutting block at the top or bottom ?

The mounting of the cutting block **2** and the cutting knife **1** is dependent on the sub-class with its sewing device (E no.) for cutting "before" or "after sewing":

A. Sewing device for "cutting before sewing":

- **Cutting block at bottom and cutting knife at top**
- The material is supported by the cutting block during the cutting procedure. In this way an unwanted pressing down of the edges of the buttonhole slit by thick material (as in configuration b) is avoided.



Attention !

With the cutting knife mounted at the top the waste pipe 3 for collection of cutting waste must be mounted on the cutter bar 4.

B. Sewing device for "cutting after sewing":

- **Cutting block at the top and cutting knife below**
- The sewn buttonhole seam glides down the slim sides of the cutting knife without resistance during the cutting procedure. In this way an unwanted deformation through pressure exerted on the buttonhole seam (as with configuration a) is avoided.

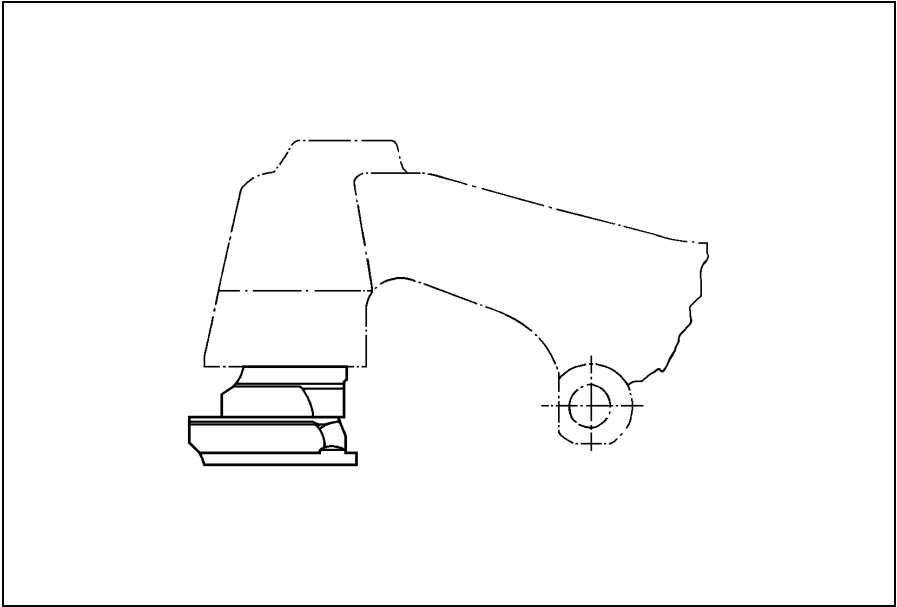
C. Sewing device for "cutting before and after sewing":

- **Cutting block at the top and cutting knife below**
- **Exception:**
With the setting "cutting before sewing" and at the same time processing of thick material the reverse configuration (cutting block at the bottom and cutting knife above) is to be chosen.
In this way an unwanted pressing down of the edges of the buttonhole slit (as with configuration b) is avoided.

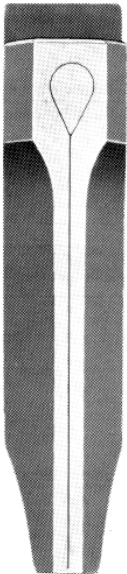


ATTENTION !

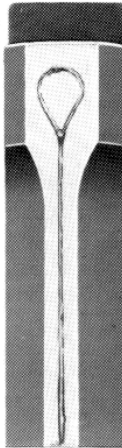
For the change-over from "cutting before sewing" to "cutting after sewing" it is essential to observe Chapter 2.19.



1



2



3





2.13 Cutting Blocks



Caution Risk of Injury !

Pull the mains plug.
Remove the cutting block only with the machine turned off.

A trueing (filing) of the cutting block becomes necessary,

- when the cutting block has been too strongly cut into by the cutting knife.
- when two different cutting knife forms have worked on the cutting block (Illus. 2).

When trueing the cutting block care is to be taken:

- **The cutting block must be so filed that the impression of the knife blade is to be seen everywhere very fine and exactly uniform (Illus. 1).**



ATTENTION !

The trueing of the cutting block must be conducted very precisely.
Use only flawless, straight bastard files !

- The height of the cutting blocks may only be reduced by a **maximum 1.5 mm** through filing.
- To achieve a uniform distribution of the cutting pressure the cutting block must hit parallel onto the cutting knife (see sketch).
One-sided cutting pressure, particularly in the area of the eye, can cause the cutting knife to break off.
Illustration 1 shows a correctly filed, illustration 3 a badly filed cutting block.
- After trueing one cutting block, all other cutting block used must also be reworked to the **same height dimension**. Only in this way can, after a cutting block change, work continue with the same cutting pressure. Otherwise there is a danger of breaking the cutting knife by a change of the cutting block !

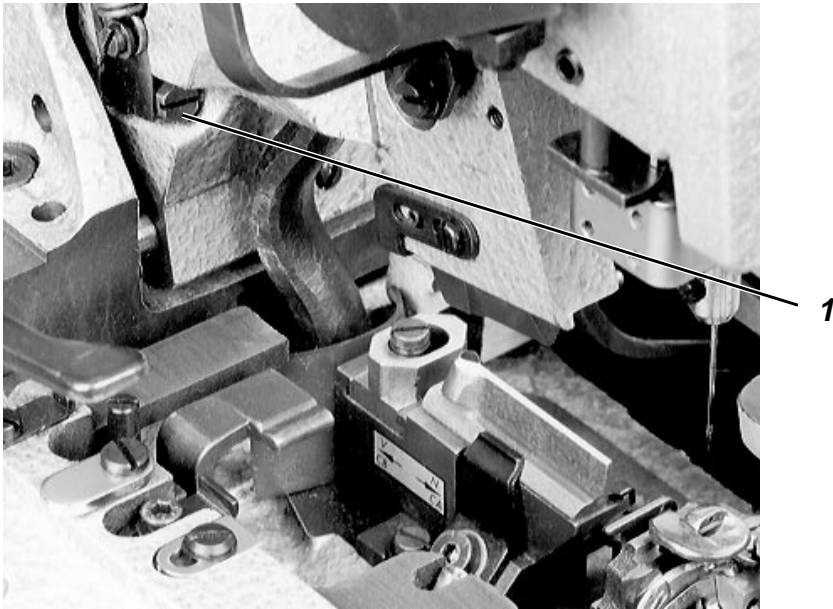
Malfunctions during cutting

After a longer period of operation the sharpness of the cutting knife is reduced. The blade is blunt and the knife no longer cuts precisely in spite of a correctly trued cutting block.

- Send the knife to one of the **DÜRKOPP ADLER AG** for reworking.



2.14 Cutting Pressure



The cutting pressure is set with screw 1:

Increase cutting pressure = turn to the right
Decrease cutting pressure = turn to the left

After each adjustment of screw 1 the cutting pressure must be checked.

Checking the cutting pressure

- Turn the machine with the hand crank.
The cutting pressure may only be set so high that the hand crank can be turned at the moment of cutting without exerting too much energy !



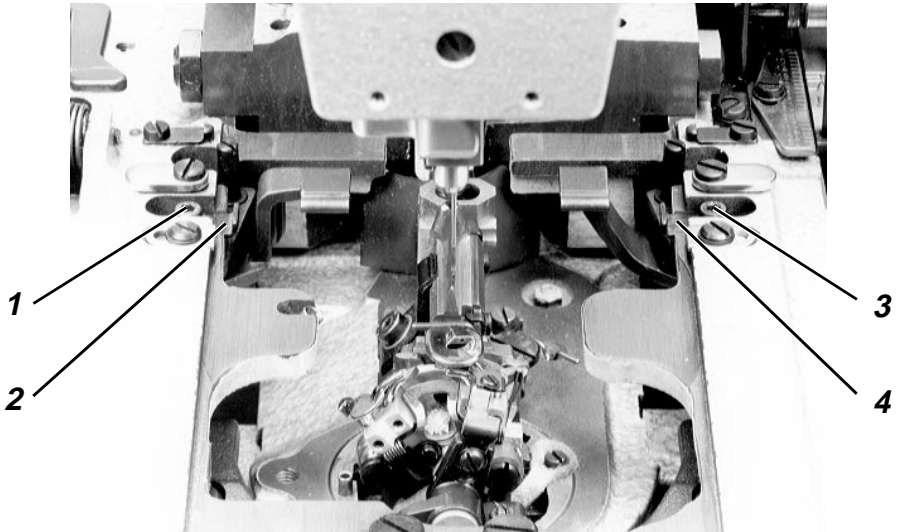
ATTENTION !

Excessive cutting pressure leads to unnecessary wear of the cutting tools !

- If even with this setting of the cutting pressure the cloth can still not be cleanly cut: True the cutting block or check the sharpness of the knife blade (see Chapter 2.13).



2.15 Spreading of the Material



Caution Risk of Injury !

Pull the mains plug.
Set the spreading only with the machine turned off.

At the setting **"cutting after sewing"** the clamp plates are drawn apart after the run start of the material support plate. The material is drawn taut.

At the setting **"cutting before sewing"** the clamp plates are drawn apart only after the cutting. The buttonhole slit is opened a little. The stitching needle can cleanly sew both seam rows without stitching into the cut edge of the material.

Normally a spreading of **1.5 mm is sufficient**.

- Remove the clamp plates (see Chapter 2.1).
- Loosen screws 1 and 3 and move the stops 2 and 4.

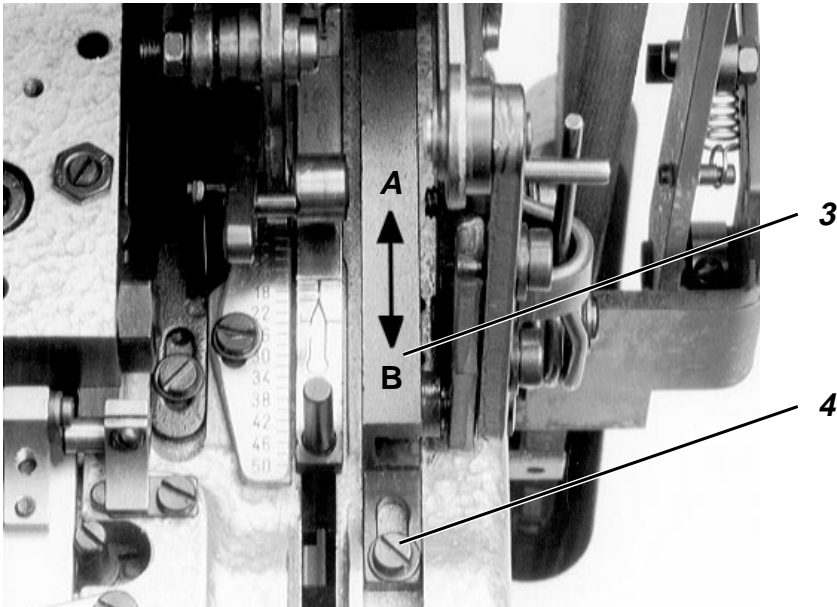
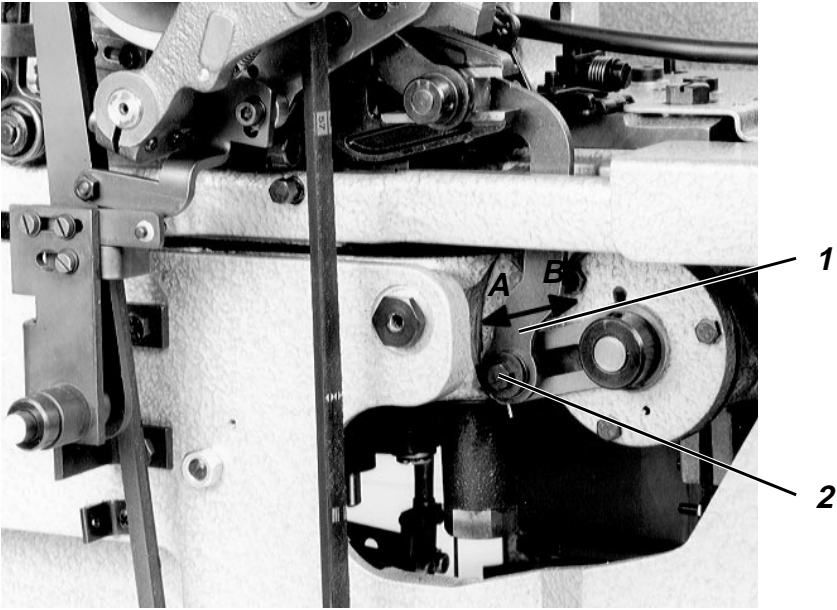
Increase spreading = **move the stops inward**
Decrease spreading = **move the stops outward**



ATTENTION !

So that both seam rows are equally wide the left and right stops must be moved equal distances.

- Tighten screws 1 and 3 again.
- With unequal seam widths correct the spreading accordingly





2.16 Stitch Density



Caution Risk of Injury !

Pull the mains plug.
Set the stitch density only with the machine turned off.

For the whole buttonhole length

The stitch density is adjustable between 0.9 and 2 mm.
It is determined by the required strength and the appearance of the buttonhole, as well as the thread size used.

- Loosen screw 2.
- Move the transport lever 1.
 - Movement in direction A = stitches become denser**
 - Movement in direction B = stitches are farther apart**
- Tighten screw 2 again.

In the eye of the buttonhole

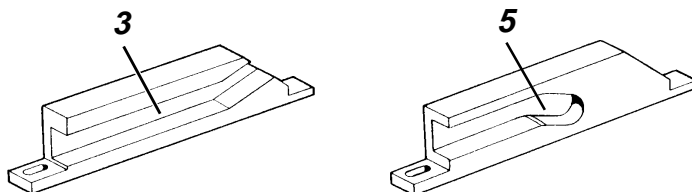
This setting has no influence on the stitch density in both seam rows.

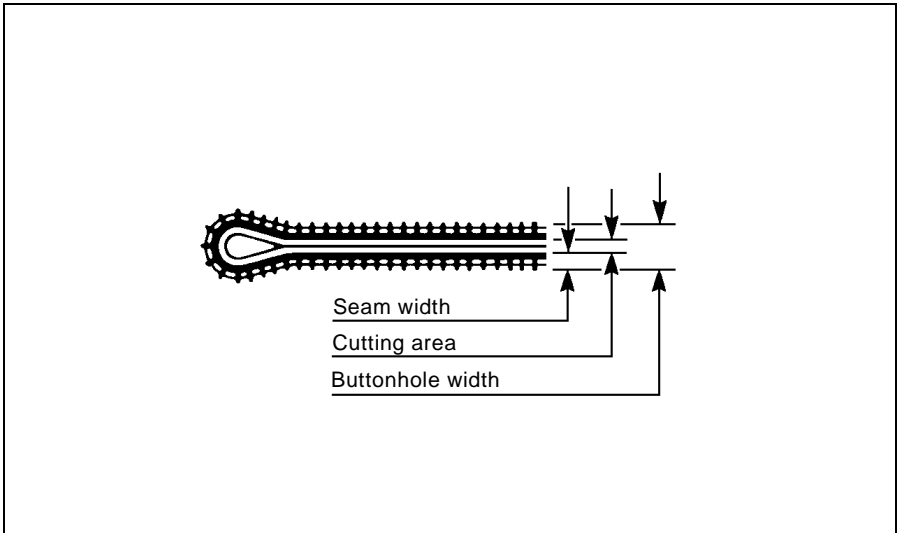
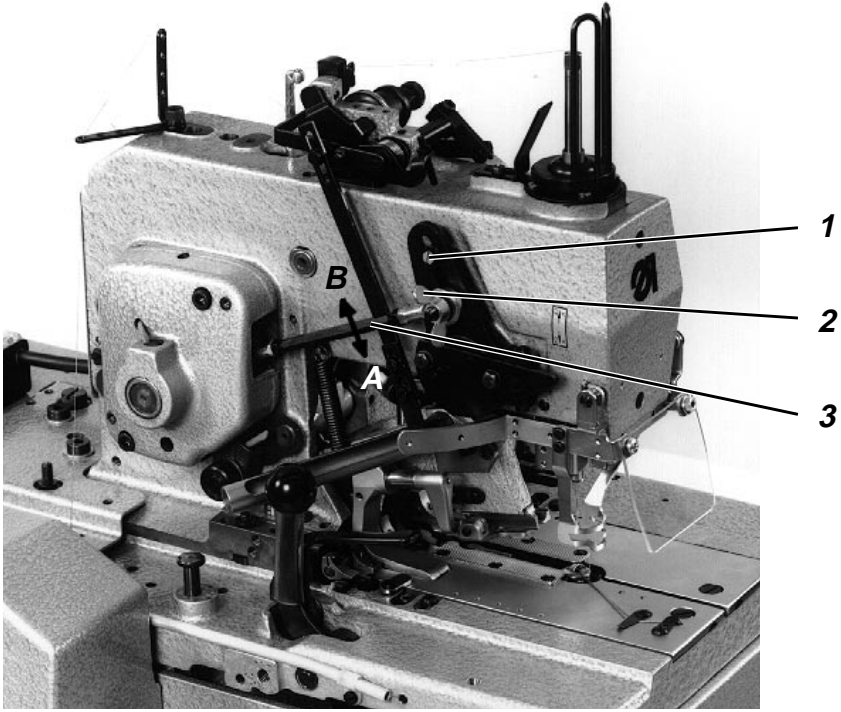
Stitch density in the buttonhole eye to be **smaller**:

- Loosen screw 4.
- Move the stitch length regulator rail 5 in the direction of the arrow.
- Tighten screw 4 again.

Stitch density in the buttonhole eye to be **greater**:

- Loosen screw 4.
- Replace the old stitch length regulator rail 5 with the stitch length regulator rail 3 found in the accessories pack.
- Tighten screw 4 again.







2.17 Seam Width (Buttonhole Width)



Caution Risk of Injury !

Pull the mains plug.
Set the seam width only with the machine turned off.

At the setting "cutting after sewing" the buttonhole width is arrived at as follows:

Buttonhole width = Cutting area + 2 x seam width

Setting the seam width

- Loosen the wing nut 2.
- Move the connecting rod 3.
 - Movement in direction A = wider seam**
 - Movement in direction B = narrower seam**
- Tighten the wing nut 2 again.

Setting for sewing with gimp thread

- Select the seam width so that the gimp thread is not pierced by the needle tip but rather just still overcast.

Smallest and greatest allowable seam width

The smallest and greatest allowable seam width for the sewing device used (E no.) is determined by the limit plate attached with screw 1.

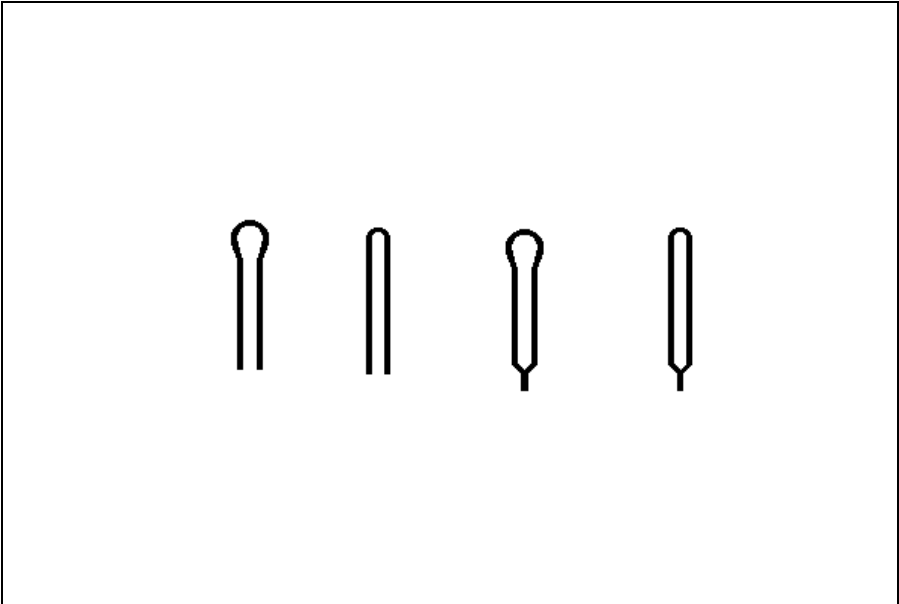
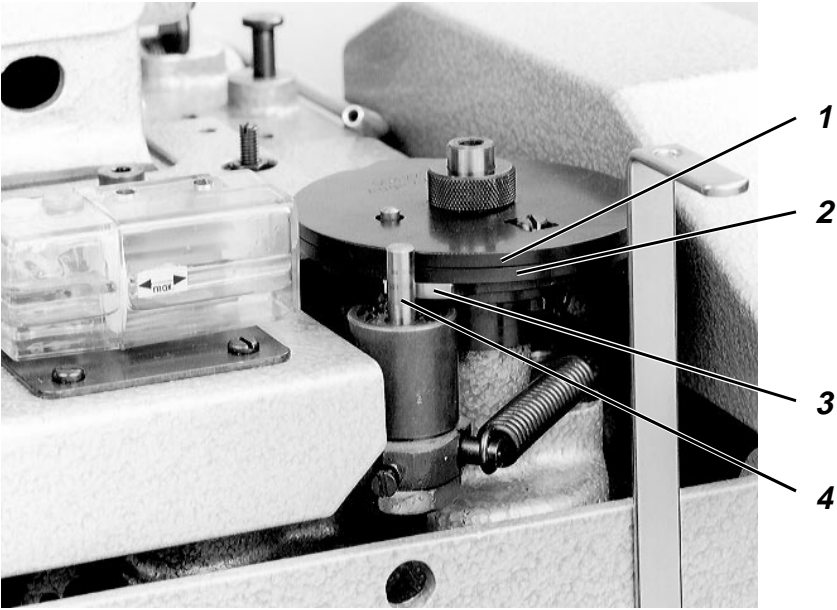


ATTENTION !

Do not loosen screw 1 under any circumstances.
There is a **danger of breakage** for the needle, cloth clamps, hook, spreader and needle plate !

Should the machine be converted to another sewing device (E no.) umgerüstet werden, then the allowable buttonhole widths for it are to be found in the table in Chapter 1.4.

The conversion is to be made per the Service Instructions.





2.18 Buttonhole Form

The buttonhole form is determined by the two exchangeable disc cams 1 and 2:

- The upper disc cam 1 determines the eye form.
- The lower disc cam 2 determines, by taper bar buttonholes, the taper bar form and buttonhole length.

Disc cams, cutting blocks and cutting knife for the different buttonhole forms and buttonhole lengths are to be found in the device sheet for the 558 and 578.

Exchanging the disc cams

- Bring the machine into the end position (see Chapter 2.3).
In the end position the roller bolt 4 is held in position by the underlying cam plate 3.
The disc cams can be removed unhindered.
- Remove and exchange the disc cams.

After the exchange of the disc cams it is essential that the following points be checked:

1. Are the corresponding cutting knife and the appropriately long cutting block mounted ?
If necessary exchange the cutting knife and cutting block (see Chapter 2.12)
2. Is the correct buttonhole length set as per Chapter 2.11 ?
If necessary set the correct buttonhole length at the length setting slide (see Chapter 2.11).
3. During the exchange of the knives was the corresponding cutting block also mounted ?



ATTENTION !

When changing to a different cutting knife form it is essential to also install the corresponding cutting block !

When using the wrong cutting block two differing cutting knife impressions appear in it. This leads to a bad cutting of the buttonhole slit. In this case true the cutting block again (see Chapter 2.13).





2.19 Change-over to Cutting Before or After Sewing



Caution Risk of Injury !

Pull the mains plug.
Conduct the change-over to "cutting before" or "cutting after sewing" only with the machine turned off vornehmen.

The change-over from "cutting before" to "cutting after sewing" is only possible with sub-classes with the appropriate sewing device (E no.) (see Device Table in Chapter 1.4).

All machine elements which must be adjusted are marked by the following bi-lingual sticker with the following meaning:

N	V
←	→
CA	CB

Adjustment in direction of arrow $\begin{matrix} V \\ \rightarrow \\ CB \end{matrix}$ = cutting before sewing

Adjustment in direction of arrow $\begin{matrix} N \\ \leftarrow \\ CA \end{matrix}$ = cutting after sewing

Note:

CA and CB are the English language abbreviations.

CA = Cut after CB = Cut before

Change-over to "cutting before" or "cutting after sewing"

The settings for cutting before and cutting after sewing are each limited by two stops.

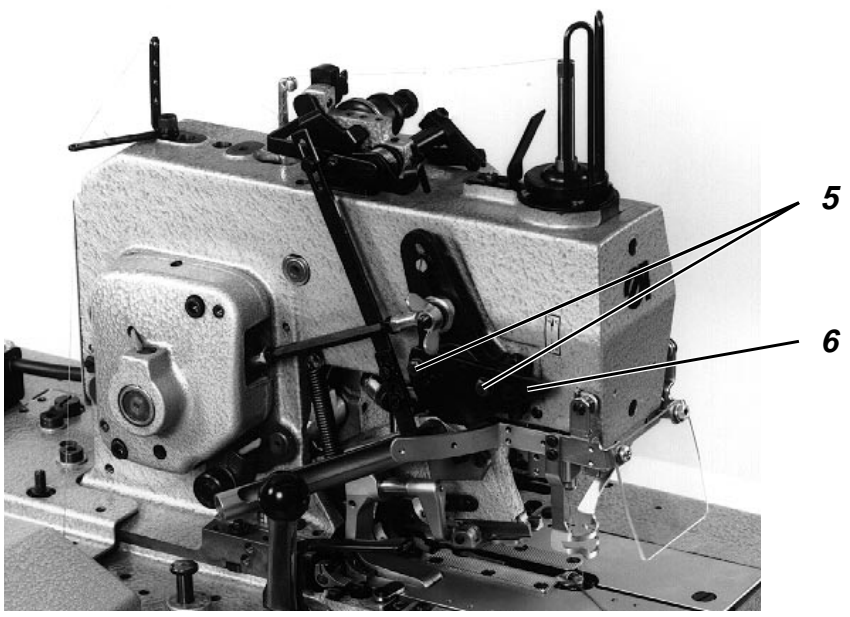
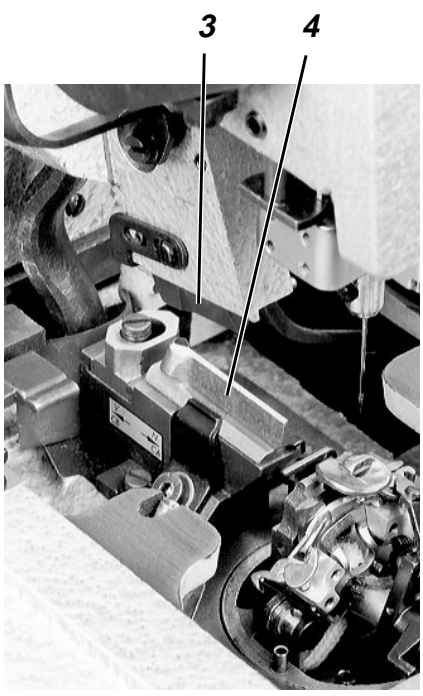
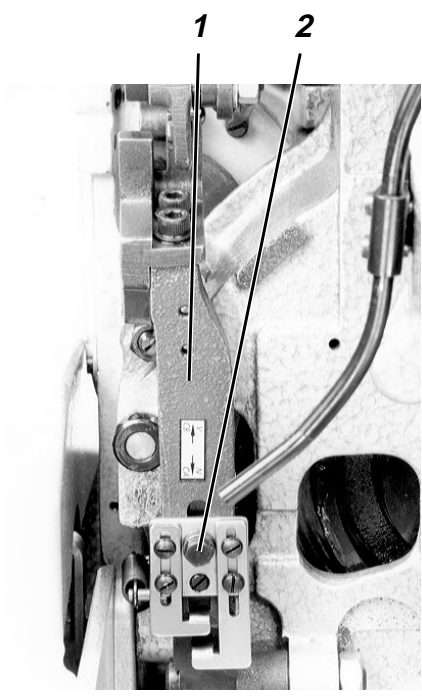


ATTENTION !

The stops have been set.
They may not be altered !

1. Timing of the cut

- Loosen screw 2.
- Slide the turn-off bolt 1 in the appropriate arrow direction.
Press the high-speed wheel inward for easier setting of the turn-off bolt.
- Tighten screw 2 again.





2. Timing of the closing and opening of the clamps

- Tilt the machine head up.
- Loosen screw 2.
- Push the clamp closing lever 1 in the appropriate arrow direction up to the stop.
- Tighten screw 2 again.

3. With or without cutting room between the seam rows

- Loosen screws 5.
- Slide the lever 4 in the appropriate arrow direction up or down up to the stop.
Attention !
The amount that the lever has to be moved is very small.
- Tighten screws 5 again.

4. Cutting knife and cutting block

- Slide the cutting knife 4 in the appropriate arrow direction up to the stop.
The configuration of the cutting at the top or below occurs hereby as per the instructions in Chapter 2.12.
- Insert the cutting block 3 corresponding to the cutting knife used and slide to the back up to the stop (see Chapter 2.12).



ATTENTION !

Only mount the cutting block corresponding the cutting knife used !

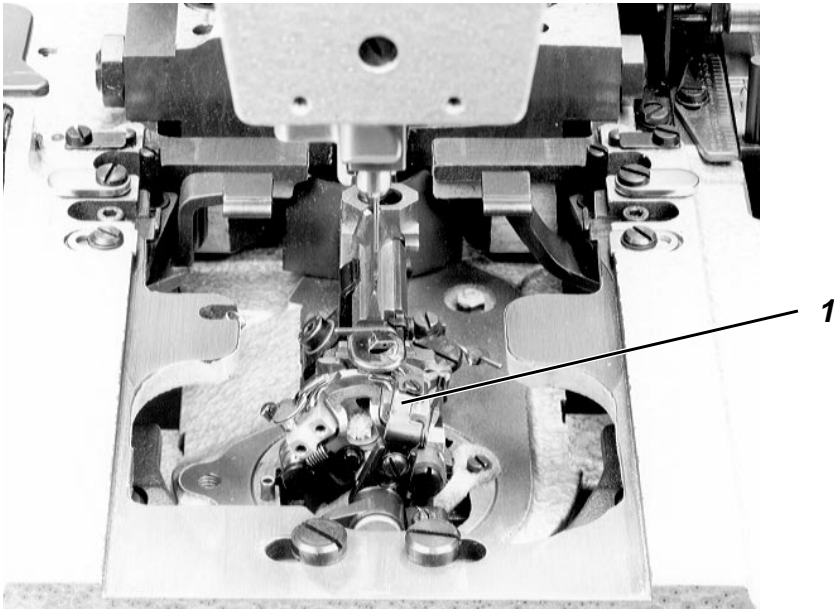
When using the wrong cutting block two different cutting knife impressions are made.
This leads to a bad cut of the buttonhole slit.

5. Exchanging the upper disc cam (see Chapter 2.19)

- Bring the machine in its end position bringen (see Chapter 2.3).
In end position the roller bolt is held in its position by the underlying cam plate.
The upper disc cam can be removed unhindered.
- Remove and exchange the upper disc cam.



3. Maintenance



Caution Risk of Injury !

Pull the mains plug.
Maintain the machine only when it is turned off.

3.1 Cleaning

A clean machine protects against malfunctions !

Daily cleaning:

Clean the area under the clamp plates, particularly around the hook bracket 1, of sewing dust, thread rests and cutting refuse.



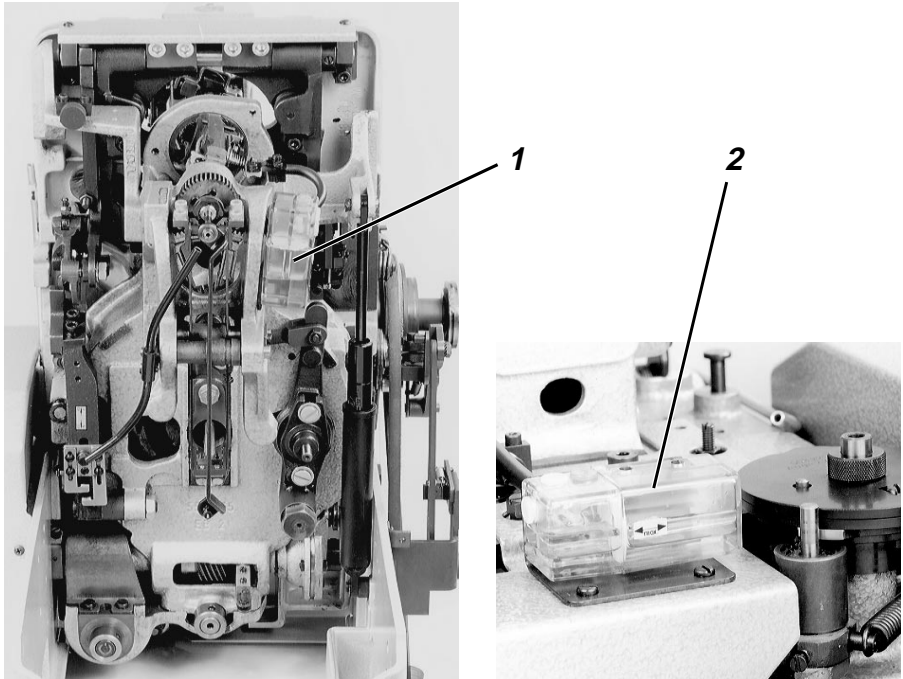
ATTENTION !

It is to be avoided that cutting refuse enters into the housing of the main disc cam at the back. If a vacuum is available this is recommended.

- Take off the clamp plates (see Chapter 2.1) and remove cutting waste.
- Tilt up the machine head and remove cutting waste from the base.



3.2 Lubrication



For lubrication of the machine only **ESSO SP-NK 10** lubricating oil is to be used. SP-NK 10 is available at the **DÜRKOPP ADLER AG** sales offices.

Check the oil level in the oil reservoirs

- The lubrication of all moving parts the machine on the machine arm and hook bracket is through a central oil wick lubrication out of the oil reservoirs 1 and 2. If necessary fill oil through the filling plug up to the "max." marking.

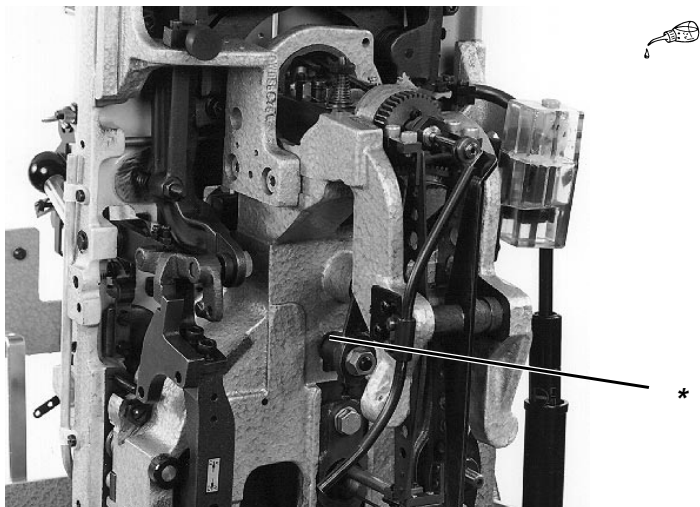
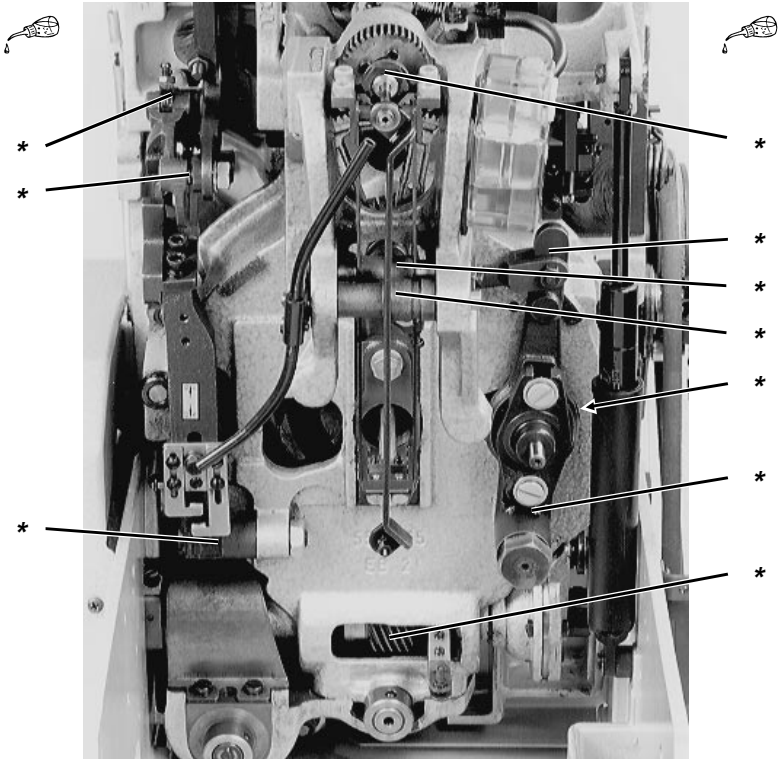
Weekly lubrication of the buttonhole machine

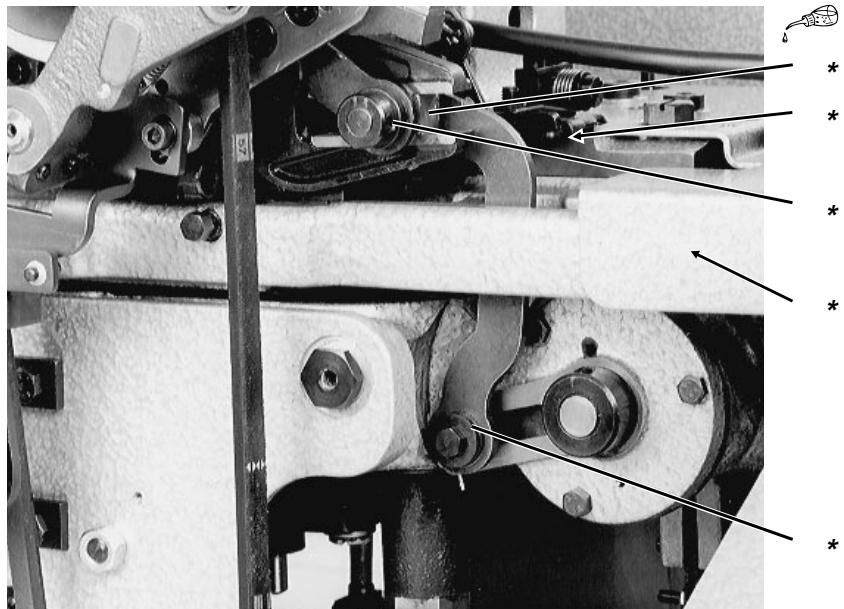
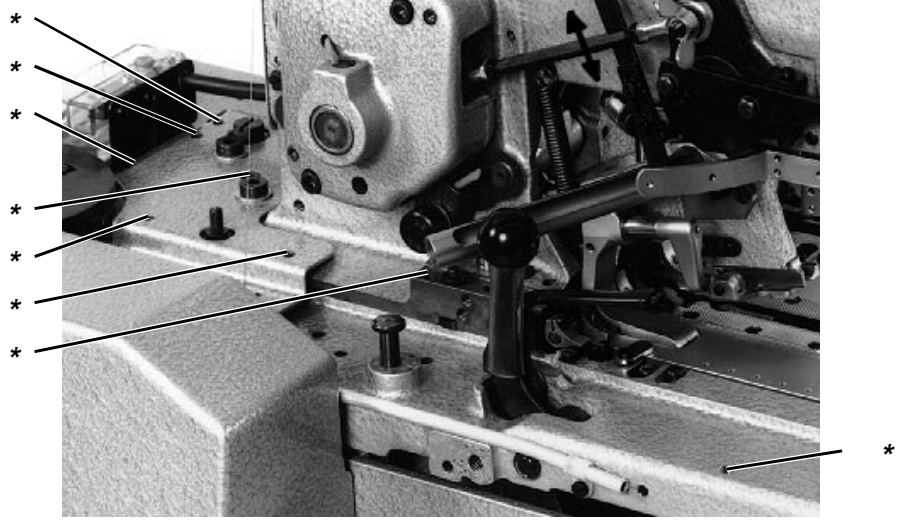
- The marked positions on the material support plate and the control curve housings are to be given a few drop of oil weekly.

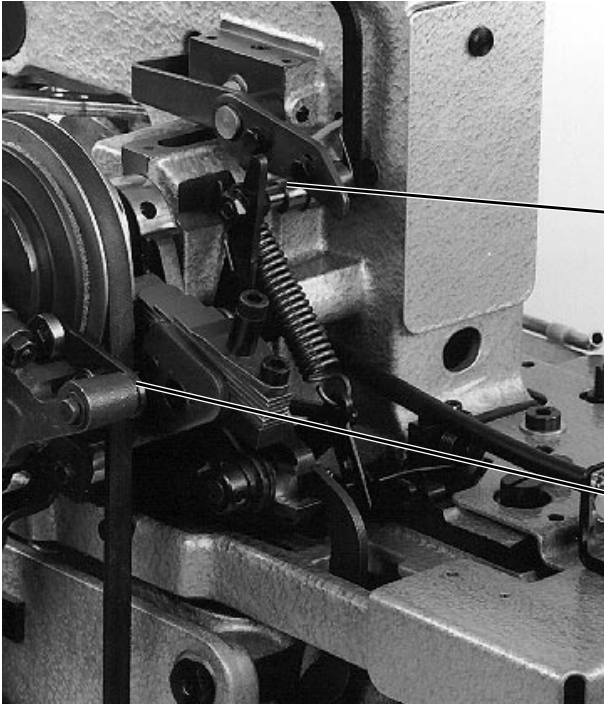
The positions are shown in the pictures on the following page.



3.3 Oiling Positions

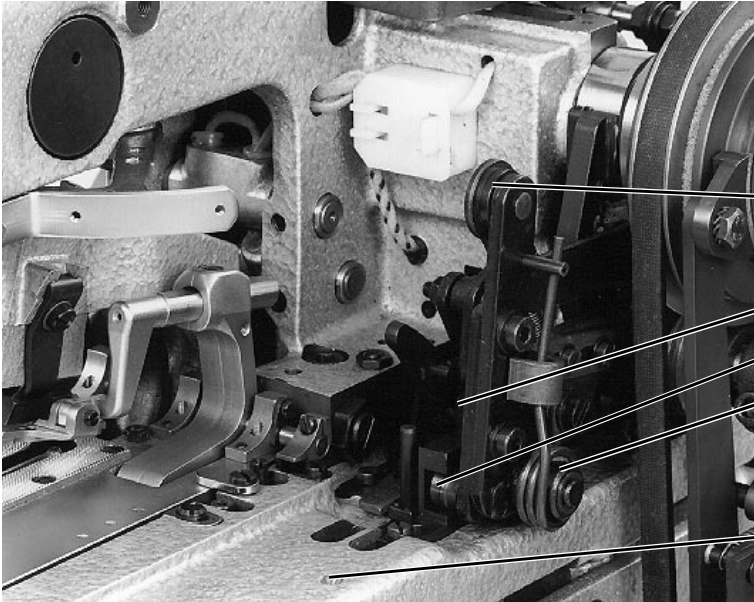






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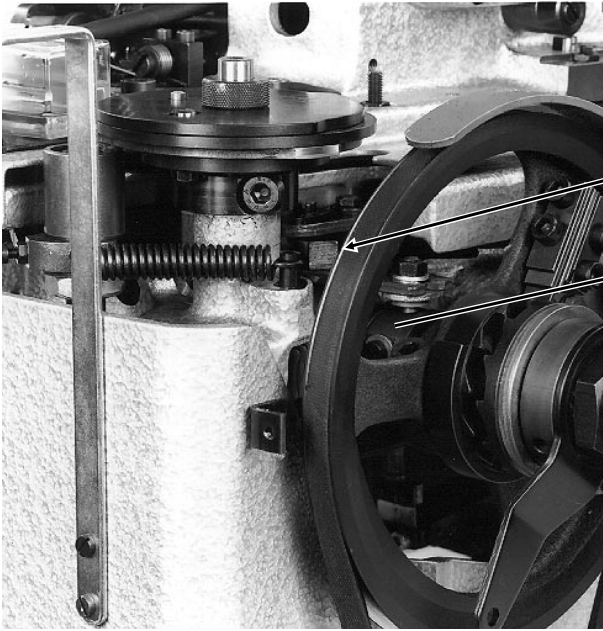
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4. Malfunction Remedies

Malfunction	Remedy
<p>1. Machine does not start or runs unevenly.</p> <p>a) V-belt from the motor to the high-speed wheel or to the handwheel is too loose.</p> <p>b) Machine is in front of the cutting position at the time of starting.</p>	<p>Tension V-belt as per Installation Instructions for the 558.</p> <p>With the main witch turned off and the needle high bring the machine into its end position with the hand crank.</p> <p>Reduce cutting pressure as per Chapter 2.14.</p>
<p>2. Clamp closing lever cannot be closed or opened.</p> <p>Material support plate is not in the end position.</p>	<p>With the hand crank bring the material support plate into the end position. With a repeat of this malfunction have a specialist reset the turn-off timing (see Service Instructions for the 558).</p> <p>When changing over to cutting before or cutting after sewing always slide the turn-off bolt up to the stop.</p>
<p>3. Cloth clamp pressure is too high or too low.</p>	<p>Reset the cloth clamp pressure (see Chapter 2.17).</p>
<p>4. Buttonhole is not cleanly cut open.</p> <p>a) Cutting block has been cut into too deeply by the knife.</p> <p>b) Knife blade is blunt or broken.</p> <p>c) Exit opening in the knife is blocked by cloth waste.</p> <p>d) Cutting pressure is not correctly set.</p> <p>e) The cutting block corresponding to the cutting knife is not mounted.</p>	<p>True the cutting block (see Chapter 2.13) and reset the cutting pressure (see Chapter 2.14).</p> <p>Insert a new knife or send the old knife to one of the DÜRKOPP ADLER AG business offices for reworking.</p> <p>Remove the knife and clean the exit opening in the knife and knife holder or cutter bar.</p> <p>Reset the cutting pressure (see Chapter 2.14).</p> <p>Always mount the cutting block corresponding to the cutting knife used !</p>



Malfunction	Remedy
5. Unequal stitch lengths or stitch positions. a) V-belt is too loose. b) Gimp is too taut, jams or does not pass easily through the gimp hole of the needle plate .	Tension V-belt as per Installation Instructions for the 558. Use thinner gimp or insert a needle plate with larger gimp hole. For stiff and inflexible gimps use gimp roller holder on the table (Order no. 557 1103).
6. Missing stitches a) Needle is blunt, bent or not correctly inserted. b) Upper or underthread is not correctly threaded. c) Thread tension is set too taut. d) Thread unwinds badly from the thread rolls. e) Hook or spreader have become misadjusted. f) Material is not held or spread correctly.	Insert a new, flawless needle (see Chapter 2.4). Check the threading path of the upper or underthread (see Chapter 2.5 and 2.7). Reset thread tension (see Chapter 2.8). See Chapter 2.7. Readjustment only through a specialist ! Check the spreading of the material (see Chapter 2.17) and pressure of the upper cloth clamps.
7. Loose stitches. a) Thread tensions are not set correctly. b) Upper or underthread is not threaded correctly.	Reset thread tensions (see Chapter 2.8). Check the threading path of the upper or underthread (see Chapter 2.5 and 2.7).
8. Thread breakage. a) Upper or underthread is not threaded correctly. b) Needle is incorrectly inserted, bent or sharp-edged. c) Thread used is unsuitable (knotted, hard or too thick). d) Thread tensions are set too taut. e) Needle plate, hook or spreader are damaged.	Check the threading path of the upper or underthread (see Chapter 2.5 and 2.7). Insert a new, flawless needle (see Chapter 2.4). Use a different thread. See recommendations in Chapter 2.6. Reset thread tensions. (see Chapter 2.8) Replace damaged parts through new ones or have reworked by a specialist.



Malfunction	Remedy
9. Needle breakage. a) Needle thickness is unsuitable for the material or the thread. b) Needle is hitting the cloth clamps.	Use a needle thickness as per Chapter 2.6 or as per sewing device (E no.). The max. buttonhole width listed in the table on page 8 for each sewing device (E no.) may not be exceeded. Resetting by service personnel as per Service Instructions for the 558.
10. No clean seam beginning or unthreading of the upper thread. a) Rest tension for the upper thread is set too taut. Start thread for the next sewing beginning is thus too short. b) Thread gripper on the upper thread tension does not clamp the upper thread in the machine end position.	Reset the rest tension for the upper thread (see Chapter 2.8). Reset the thread gripper as per Service Instructions for the 558.



5. Optional Equipment

Electromagnetically Operated Upper Thread Catcher

5.1 General

The sub-class 558-221301 has the the electro-magnetically operated upper thread catcher as standard equipment.

All other sub-classes can, on request, be outfitted with it at the factory or have it retrofitted.

Function

The electromagnetically operated upper thread catcher grabs the upper thread immediately after the thread cutting procedure and hold it clamped. When sewing the next buttonhole it places it in the right seam.

The means:

- Secure seam beginning even in light, loose weaves.
- Beginning stitches drawn fast.
- Trimming of the underside of the buttonhole is unnecessary because the starting thread is overcast.

Parts set required for the retrofitting

Retrofitting attachment: Order no. 558 10002

Factory attachment: Order no. 558 10012

ATTENTION !

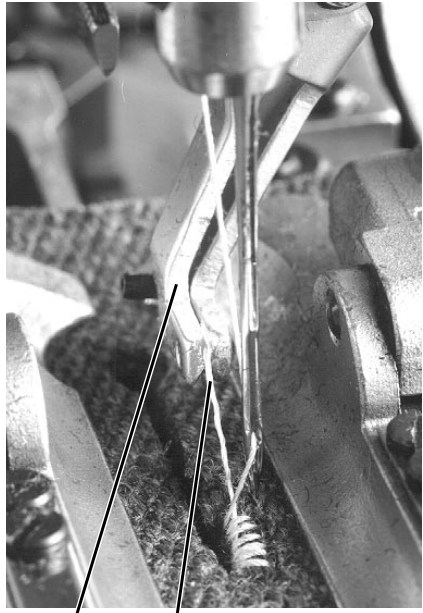
By equipment with the upper thread catcher in the individual sub-classes the following points are to be observed:

558-231391 The maximum sewing length with thread catcher function is 32 mm.
For sewing lengths above 32 mm the upper thread catcher must be deactivated (see chapter 2.2).

558-251301 The max. sewing length with thread catcher function is 42 mm.
For sewing lengths above 42 mm the thread catcher must be deactivated.



b3



1

2



3

4

5



5.2 Electrical Connection



ATTENTION

All work on the electrical components of the upper thread catcher may only be conducted by electricians or appropriately trained personnel. The mains plug must be pulled.

The transformer in the controls of the upper thread catchers is equipped with connections for following mains voltages:

- 1 ~ 200 V
- 1 ~ 220 V
- 1 ~ 380 V
- 1 ~ 415 V

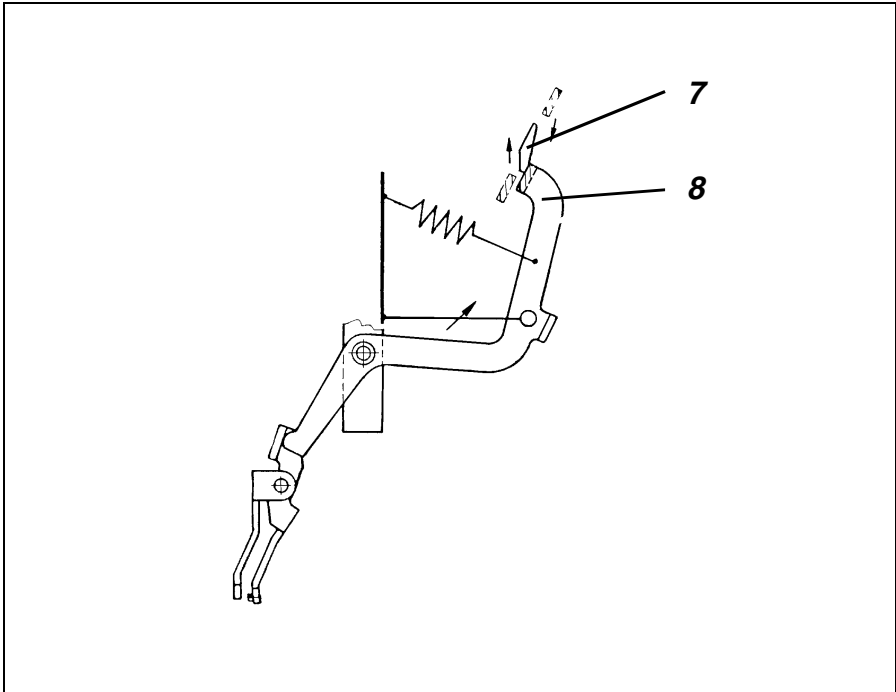
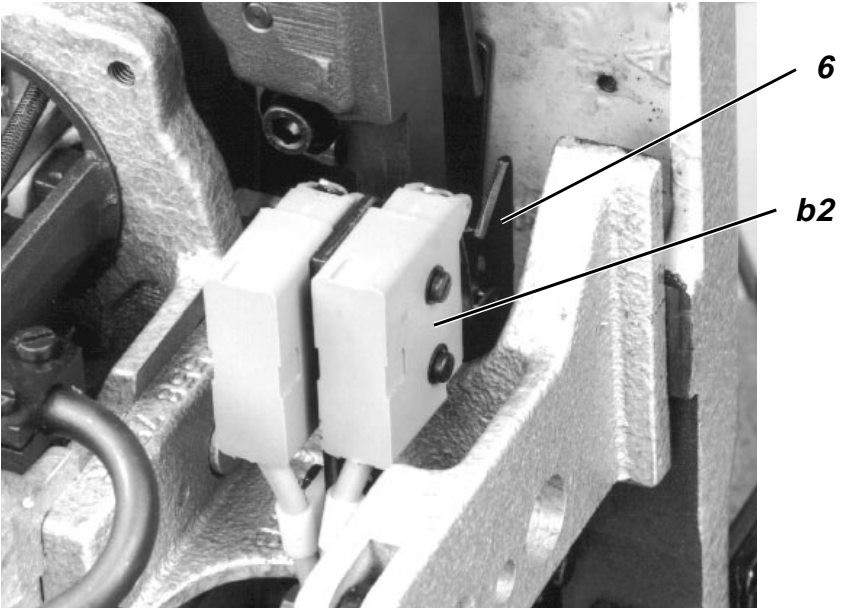
At the factory the transformer is connected to 1 ~ 380 V.

- With other mains voltages change the connection on the primary side of the transformer accordingly before commissioning.

5.3 Function Sequence

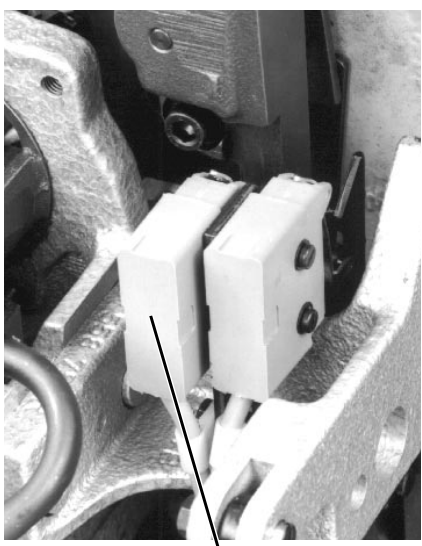
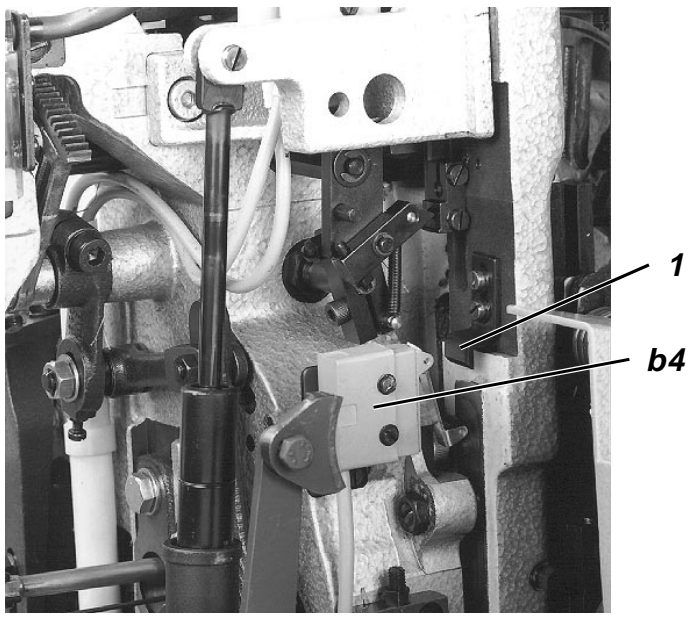
- After the machine is turned on the switching piece mounted on the material support plate operates switch b3.
Thread catcher 1 lowers with the clamped upper thread 2 to the material.
- Appropriate to the set buttonhole length the sewing drive turns on and begins with the right seam.
The upper thread end placed by the thread catcher is thereby overcast and sewn in.
- Shortly before reaching the buttonhole eye switch b3 falls off of the switching piece.
Thread catcher 1 moves back into its upper position.
- During sewing of the buttonhole eye the upper toothed segment 5 with stopper angle 4 leaves its extreme right position.
The slewably bearinged thread catcher changes from the insertion to the catch position, e.g. from the right to the left buttonhole seam.
- After finishing the left buttonhole seam the sewing drive turns off in the needle high position.
The upper thread is trimmed.

(Continuation see the following page)

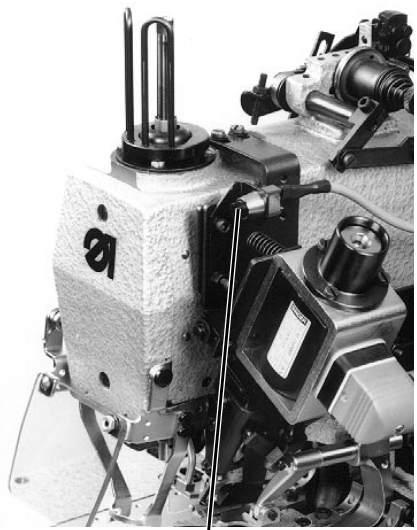




- The cam 6 connected with the length setting slide operates the switch b2. The thread catcher lowers.
Through the slide of the opener lever 8 onto the opener 7 the thread catcher is opened.
Via the curve plate 3 it is swung in front of the needle to grip the upper thread.
- During further lowering the opener lever 8 falls off the opener 7.
The thread catcher closes.
- After cam 6 has run over the switch b2 the thread catcher with the clamped thread moves back into the upper position.
Opener lever 8 thereby slides past **behind** opener 7 without being operated.



b1



b5



5.4 Turn-on Interlocks

Switch b4

With the cloth clamps opened the machine can only be turned on in its end position. For this cams 1 operates the switch b4.

Switch b1

In all other machine positions with the cloth clamps opened a turning on and thus also the thread catcher function are blocked by switch b1.

The safety switch b1 is bypassed by the activated switch b4.

The machine, with **opened cloth clamps**, can only be started in its end position.

Example:

The sewing sequence is interrupted with the hand shift lever.

During the subsequent release of the cloth clamps switch b1 opens.

The switch interlock in the thread catcher controls switches the motor off.

To restart:

- Pull the turn-off lever forward (see chapter 2.2).
- Turn the handwheel until it catches.
The needle is in its highest position.
- Remove material.
- Close the cloth clamps.
- Bring the hand shift lever into position "I".
- Turn on the motor by operating the push button b5.
The machine moves back into its end position.

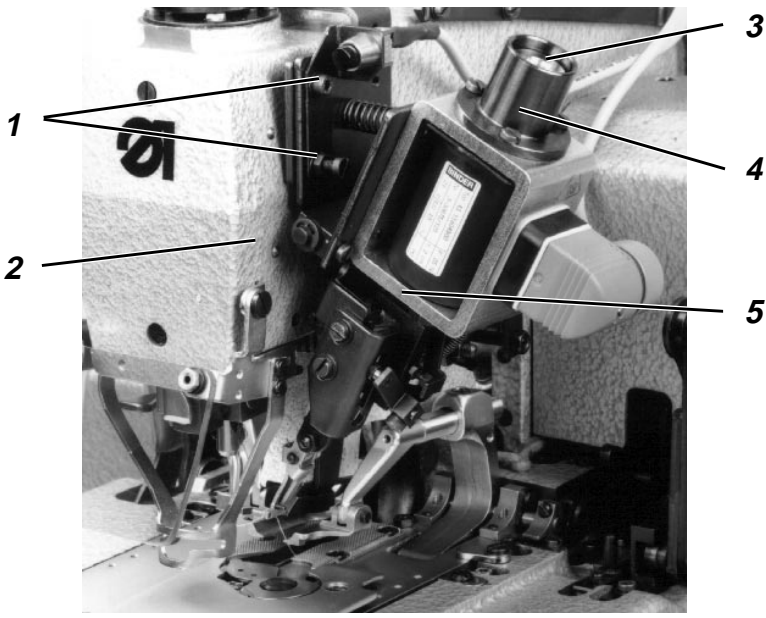
Deactivating the upper thread catcher

By pulling the plug from the electromagnet the upper thread catcher is deactivated.



ATTENTION !

Do not block the thread catcher by pulling the plug from the thread catcher controls. The power supply for the sewing drive is interrupted otherwise.





5.5 Setting



Caution Risk of Injury !

Pull the mains plug.
Make setting only with the machine turned off.

5.5.1 Lift of the Electromagnet

The lift of the electromagnet should be 20 mm. Measured is the distance between the upper edge of the protective sleeve 4 and the upper edge of the anchor 3 in both positions (ON and OFF). The difference must be 20 mm.

- Loosen lock nut 6.
- Screw anchor 3 further in or out.
- Tighten lock nut 6 again.

5.5.2 Base Position of the Upper Thread Catchers

The forward edge 5 of the magnet must be in line with the face 2 of the machine arm.

- Loosen screws 1 and 12.
- Align the magnet.
- Tighten screws 1 and 12 again.

Opener lever 13 and guide piece 11 must lie parallel to one another.

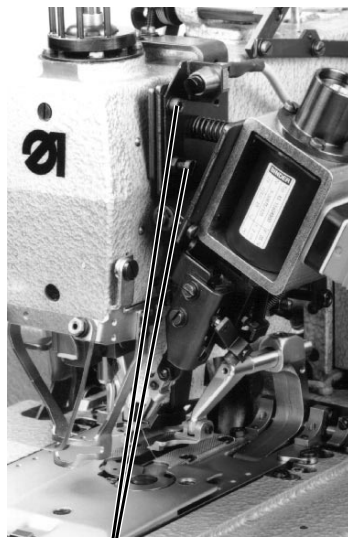
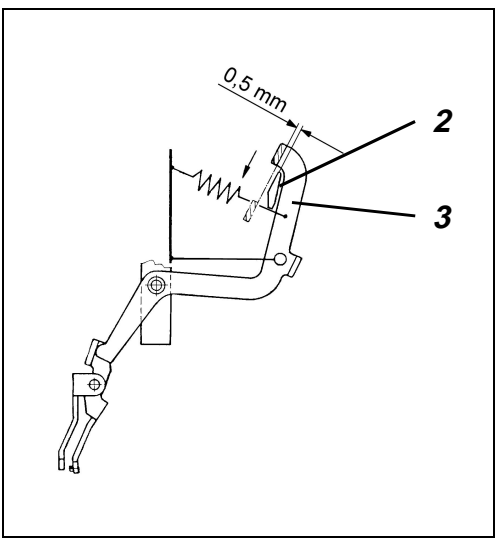
- Loosen clamp screw 9.
- Turn the opener lever 13 with thread catcher 10 and set parallel to the guide piece 11.
- Tighten clamp screw 9 again.

So that the thread catcher 10 can close securely there must be a little play between the lower part 14 of the opener lever and the movable leg 15.

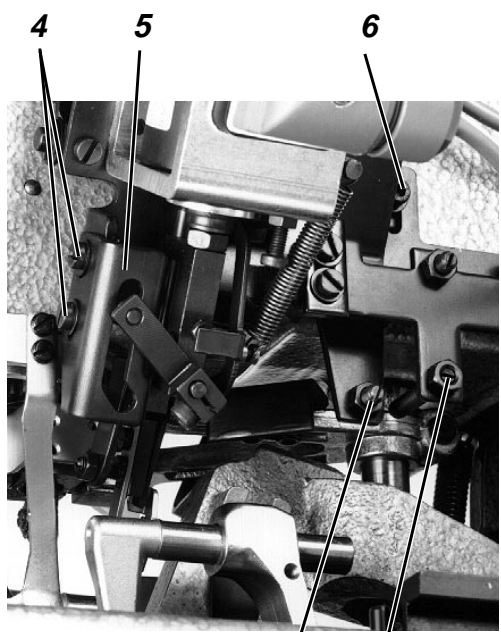
- Bring the machine into the end position (see chapter 2.2.3).
- Screw out the stop screw 7 so far that during retreat of the opener lever before operation of the movable leg 15 a clearance of approx. 0.3 mm is still felt between bracket 8 and stop screw 7.



1



7





5.5.3 Lowering Movement

Opener setting

After the closing of the thread gripper 1 the opener lever 3 must move past behind the opener 2 unhindered.

Thread gripper 1 must thereby remain closed.

- Check the unhindered movement of the opener lever 1.
- If necessary, set opener 2 accordingly with screw 9.

Insertion position

When sewing the right buttonhole seam and simultaneous manual operation of the magnet the inserted upper thread end should be overcast.

- Set the insertion position accordingly with setting screw 8.

Thread catcher height

The clearance between **lowered thread gripper** and material should be 3 - 4 mm. This setting applies for medium-weight material. With thicker or thinner materials a correction may be necessary.

- Loosen screws 6 and 7.
- Set the thread catcher height.
- Tighten screws 6 and 7 again.
- Check the insertion position again and correct, if necessary.

Opener

The clearance between the back of the opener 2 and the opener lever 3 must be about 0.5 mm.

- Set the distance accordingly by turning the setting screw 8.

Slewing movement

Shortly before reaching its lowest position wurd thread gripper 1, through the curve plate 5, is swung close in front of the needle.

In this position the distance between thread gripper 1 and needle must be about 3 mm.

- Loosen screws 4.
- Set the curve plate 5 higher or lower.
- Tighten screws 4 again.

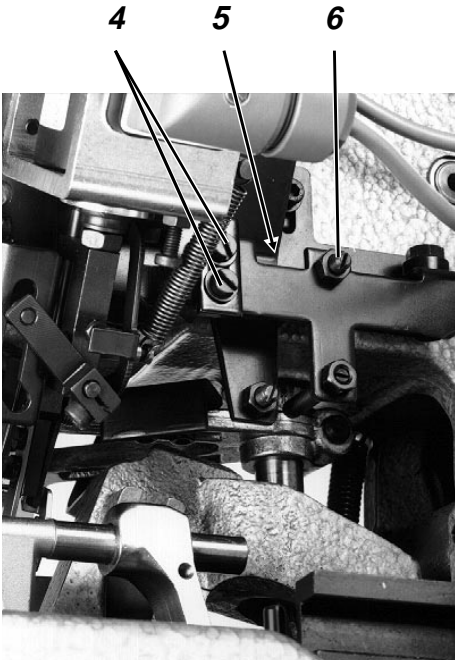


1

2



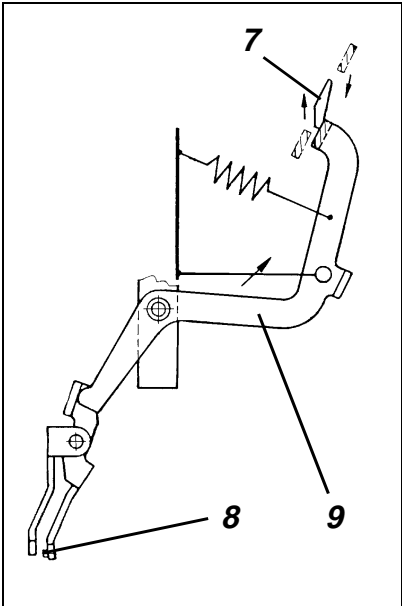
3



4

5

6



7

8

9



5.5.4 Gripping Movement

Bringing the thread gripper in gripping position

After sewing the left buttonhole seam the thread gripper 3 must be set in the precise gripping position for the upper thread.

- Turn the handwheel until the sewing sequence for the left buttonhole seam is completed and the handwheel catches.
- Turn the material support plate with the hand crank about 14 mm farther. For this measure the distance between bearing block 2 and machine arm 1. If the measured distance is e.g. 21.5 mm, then we get a distance to be set of 7.5 mm by subtracting 14 mm.
- Move the bearing block 2, by turning the hand crank, toward the machine arm 1.

Opening width

If, in gripping position, the magnet is operated manually, then the opener lever 9 must glide onto the front of the opener 7 and open the thread gripper 3.

The opening width of the thread gripper should thereby be 3 - 3,5 mm.

- Set the opener 7 more or less in the path of the opener lever 9 by turning the setting screw 6.

Position the thread gripper

The upper thread to be caught must, with lowered and opened thread gripper 3, lie in the center of its opening.

- Set the thread gripper by turning the setting screw 5. The screw 5 is hidden in the illustration by the lever.

Timing of the closing

The closing of the thread gripper 3 should only occur shortly before reaching the lowest position of the thread catcher.

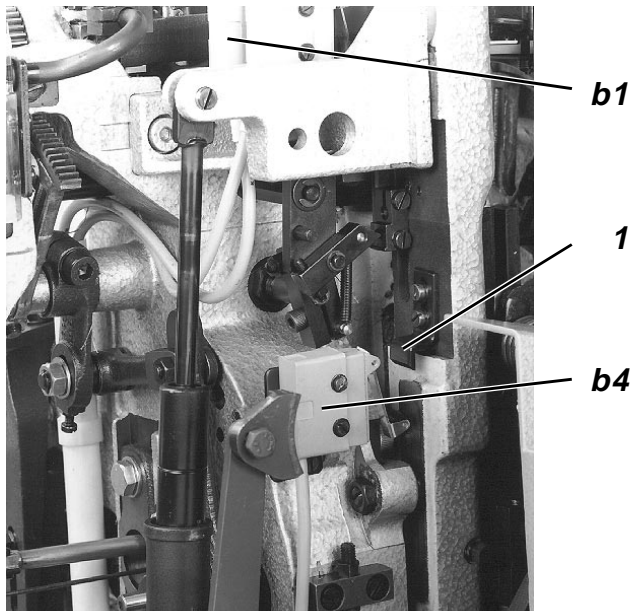
At the end of the slewing movement of the thread catcher in the direction of the needle the pin 8 should have moved past the upper thread approx. 2 mm.

The timing of the closing is determined by the opener 7.

- Loosen screws 4.
- Set the opener 7.
 - Opener higher = earlier closing**
 - Opener lower = later closing**
- Tighten screws 4 again.
- Check the timing of closing by slow manual lowering of the magnet.



5.5.5 Switches for the Upper Thread Catcher Controls



ATTENTION !

Before commissioning the machine all switches must be set as described below.

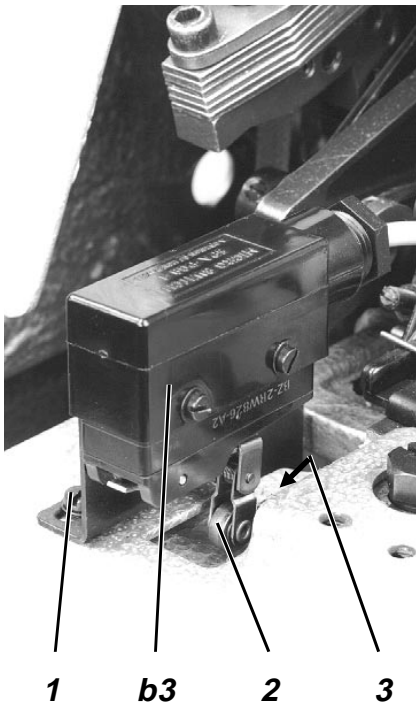
Switch b4

Safety switch b1 is bypassed by the operation of switch b4.

The machine, with **open cloth clamps**, can only be started in its end position.

In the end position the switching piece 1 must turn on the switch b4 and hold it operative.

- Bring the machine in its end position (see chapter 2.3).
The end position is reached when the cloth clamps are automatically opened.
- Set the switching piece 1 under the material support plate and switch b4 on the control curve housing accordingly.



Switch b3

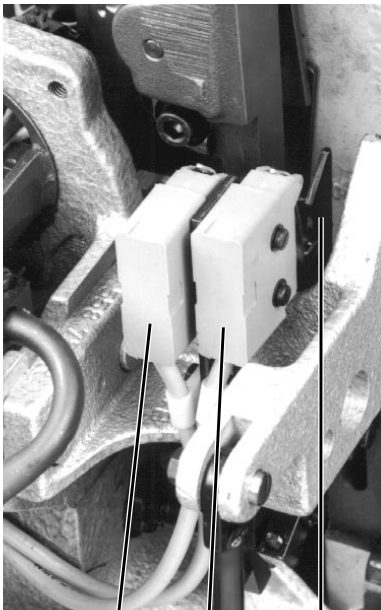
After the sewing in of the upper thread end in the right buttonhole seam switch b3 determines the timing of the raising of the thread catcher.

The upper thread end should be held as long as possible.

Thereby the switching roller 2 must have fallen from the switching piece 3 before the clamping piece 4 of the thread catcher can run onto the clamp shackle 5.

This corresponds to a machine position shortly before entering in the buttonhole eye.

- Loosen screws 1.
- Set switch b3.
- Tighten screws 1 again.



b1 **b2** **1**



2

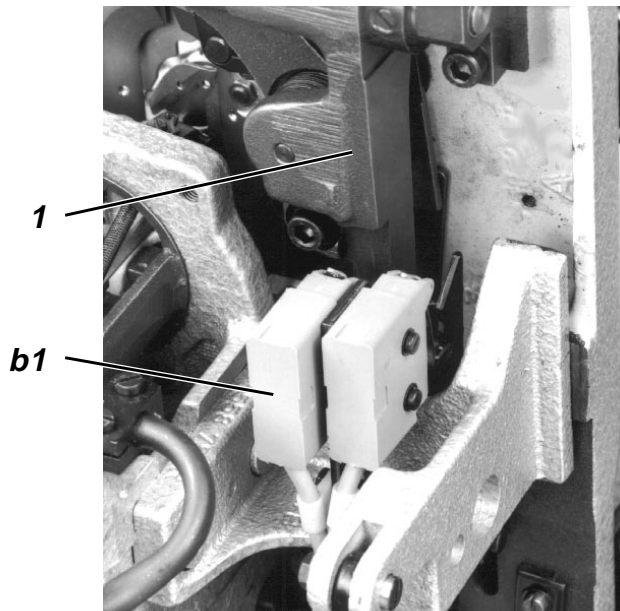
Switch b2

After the trimming of the upper thread switch b2 operated by cam 1 determines the timing for lowering the thread catcher.

Cam 1 is connected to the length setting slide.

With the setting of a different buttonhole length the correct switch timing is thus set automatically.

- Just before ending the left buttonhole seam turn the handwheel until it catches. The sewing drive turns off.
- Turn the material support plate with the hand crank about 6 mm farther. At this time switch b2 should be operated by cam 1. The thread catcher lowers.
- Adjust switch b2.
- Correct the switch timing after a trial run, if necessary. The upper thread must be caught about 2 mm behind pin 2.

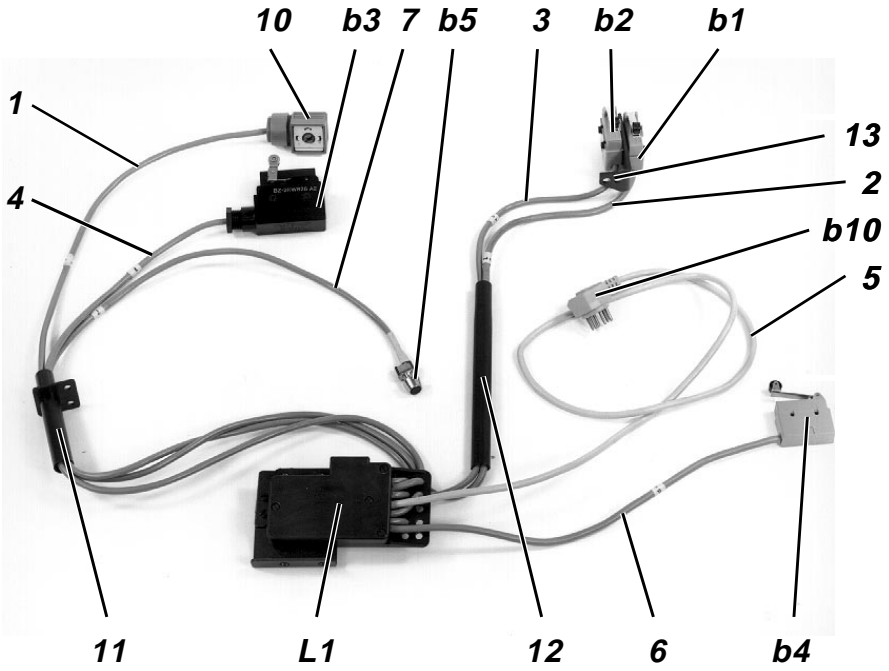


Switch b1

Safety switch b1 is directly under the clamp frame 1.

It is to prevent the machine being turned on with the cloth clamps open.

- Switch b1 must, with open cloth clamps, be open.
With the cloth clamps closed it must be closed.
- Align switch b1 to the clamp frame 1 so that the above mentioned switching functions are assured during the whole advancing movement of the material support plate (with material in place).





5.6 Attachment



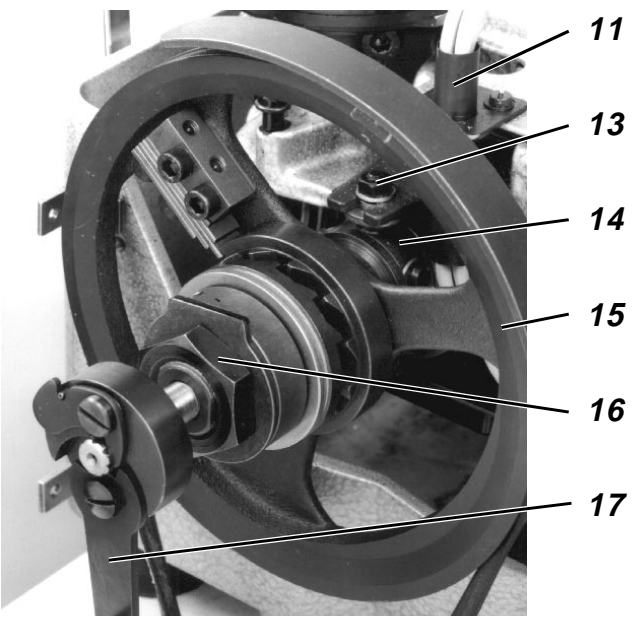
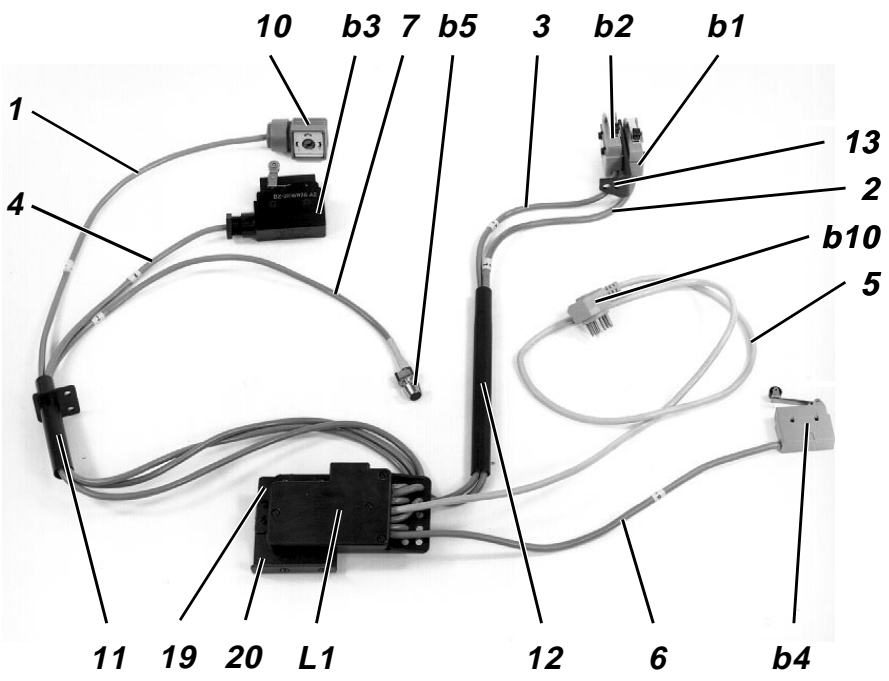
Caution Risk of Injury !

Pull the mains plug.
The attachment of the upper thread catcher may only be conducted with the machine turned off and only by trained skilled personnel.

5.6.1 Pre-assembling the Wiring Distributor

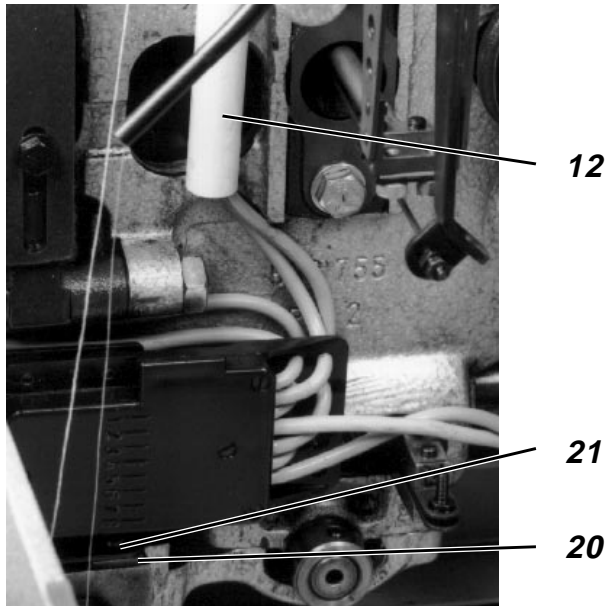
The designation numbers affixed to the cables and position numbers in these instructions are identical with the cable numbers in the enclosed hook-up diagram 558 10296 and in the circuit diagram 558 10295.

- Lay the cables 2 and 3 through the holder tube 12.
- Connect the cores of the cables to the two outside terminals (1 and 4) of the switches b1 and b2.
- Fasten the switches b1 and b2 to angle 13.
- Lay the cables 1 and 4 through the holder tube 11.
- Connect the cores of cable 1 to magnet plug 10.
The terminal with the ground symbol remains free.
- Connect the cores of the cable 4 at switch b3 to the terminals "Normally open" (3) and "Common" (1).
- Pull the cable brackets of cable 7 off of the connects in the wiring distributor L1.
Since the button b5 is already soldered on the freed cable end must be fed through the holder tube 11 from above.
Push the cable brackets back onto the contacts (1 and 5).
- Connect the cores of cable 6 to the two outside terminals (1 and 4) of the switch b4.



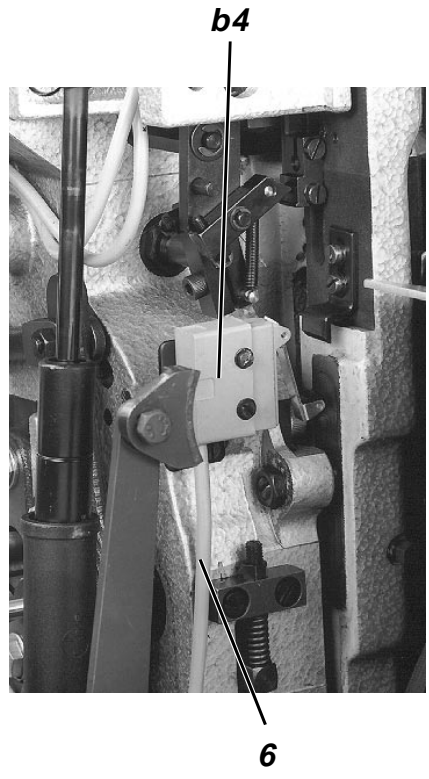
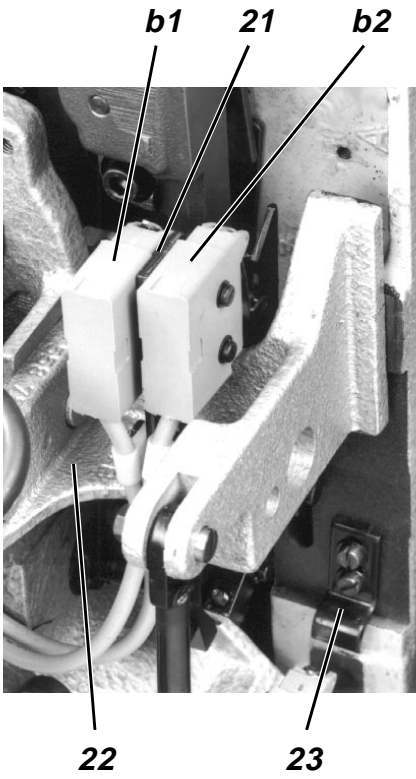


5.6.2 Laying the Wiring



- Pull the hand crank 17 from the shaft end.
- Loosen nut 16 (**ATTENTION:** lefthand thread)
- Loosen nut 13.
- Pull off the high-speed wheel 15 with the drive bush 14.
- Attach the holder tube 11 with cables 1, 4 and 7 to the cover plate.
- Reattach the high-speed wheel 15 again and tighten nuts 13 and 16. Set a clearance of 1 mm between the latches (see Service Instructions 558).
- Replace hand crank 17 again and let catch.
- Mount angle 20 on the machine housing under the screws 21. Thereby do not remove the baffle.
- Mount the triangle plate 19 with distributor L1 on angle 20.
- Fasten holder tube 1 with a hose clamp to the machine housing.
- Lay the cables 2 and 3 to the right.

(Continuation see next page)



- Fasten angle 21 with switches b1 and b2 to the support 22.
- Attach the cable clips.
- Mount switch b4 to the outside of the control curve housing.
- Secure the cable 6 with a clamp.
- Mount operator 23 for switch b4 centered in its slot under the material support plate.



5.6.3 Control Unit



- Mount the control unit 2 under the table.
- Lay the cable 1 from the wiring distributor to the control unit 2 (plug b10) and attach to the table with a clamp.
The laying of the cable must be conducted with the machine head tilted up.
- Connect the mains lead and connector lead to the motor as per the hook-up diagram.



ATTENTION

After connecting the sewing procedure may only be turned on if all setting have previously been made according to Chapter 5.5.



5.6.4 Mounting Switch b3



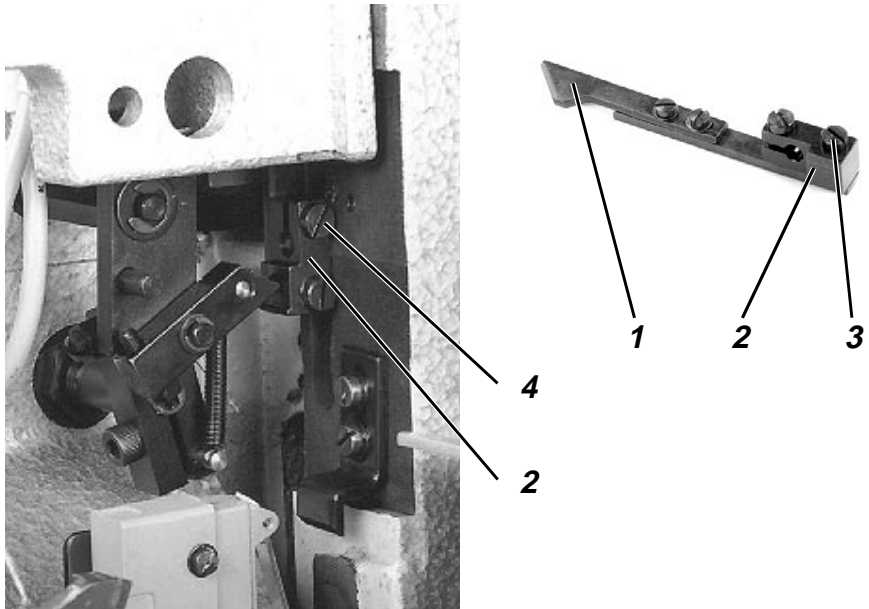
In the parts set there are 2 switching cams for the different sub-classes:

Sub-class	Switching cam
-221301 , -251301	straight switching cam
-231391 , -241291	milled switching cam
-211241	milled switching cam The milling must be deepened

- Loosen and remove cover plate 2.
- Mount the appropriate switching cam 1 to the machine plate.
- Mount switch b3 with angle 3 to the cover plate 2.
- Reattach cover plate 2.
- Set switch b3 (see chapter 5.3.5).



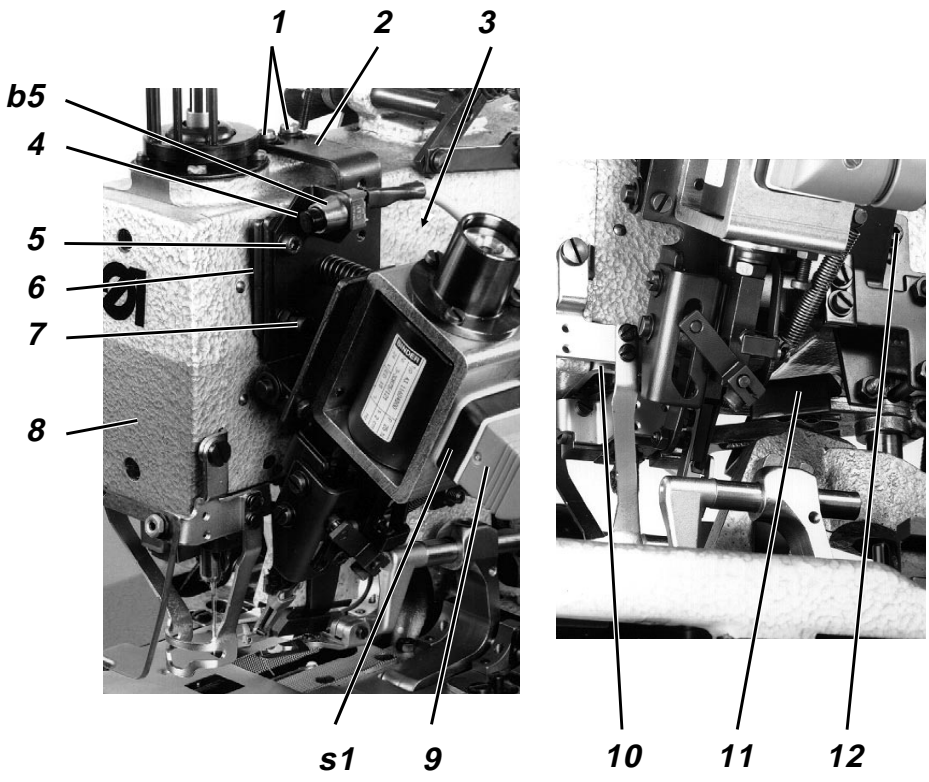
5.6.5 Mounting the Switching Rail for Switch b2



- Loosen screw 4.
- Remove the block 2 from the length setting slide.
- Screw on the switching rail 1 with the extension to the block 2
- Tighten screw 3.
- Reattach the complete switching rail with block 2 again.
- Tighten screw 4.



5.6.6 Mounting the Upper Thread Catcher on the Machine Arm



- Remove the head cover 8.
- Replace the protecting bar 10 for the upper toothed segment with the at the right side shortened protecting bar found in the parts set.
- Reattach head cover 8 again.
- Fasten the mounting angle 2 for the thread catcher with screws 1 and 3 to the machine arm.
- Fasten stopper angle 11 to the toothed segment.
- Attach the thread catcher base plate 6 with screws 5, 7 and 12 to the mounting angle 2.
Thereby place holder 4 for switch b5 under the screws 5 and 7.
- Mount switch b5 on holder 4.
- Place plug 9 onto magnet s1 and secure with a screw.
- Fasten the cables with clamps and cable bindings.