

Part 3: Service Instructions Cl. 506

1.	General	3
2.	Removing the Machine Head Cover and Tilting the Machine Head	
2.1	Removing the Machine Head Cover	4
2.2	Tilting the Machine Head	5
3.	Barrel Shuttle, Needle Bar	
3.1	Needle Bar Height	6
3.2	Synchronizing the Hook and Needle Bar Movement	8
3.3	Clearance Hook Point - Needle	9
3.4	Clearance Driver - Needle	10
3.5	Looping Stroke	12
3.6	Worm Wheel Play	13
4.	Clamps and Feed Plate	
4.1	Position of the Feed Plate to the Needle	14
4.2	Position of the Clamps to the Feed Plate	16
5.	Bobbin Ejector	17
6.	Curve Disk	
6.1	Replacing the Drive Train and Worm Wheel	20
6.2	Replacing the Curve Disk	22
6.3	Installing the Gear Reducer	24
7.	Thread Pull	25
8.	Thread Controller Spring	26
9.	Needle Cooling	27
10.	Shut Off Devices	
10.1	Transport Levers for the Length and Crosswise Movement (Switches b09, b16)	28
10.2	Base Position Stop (Switch b10)	30
10.3	Synchronizer	32

11.	Thread Burning Device	
11.1	Thread Deflector	34
11.2	Upper Burning Device	36
11.2.1	Position of the Fully Extended Burner	36
11.2.2	Setting the Height Stop of the Burner	37
11.2.3	Angle Position of the Burner	38
11.3	Lower Burning Device	39
11.3.1	Prerequisite for the Setting	39
11.3.2	Initial Position	39
11.3.3	Clearance between the Thread Puller and the Burner	40
11.3.4	Position of the Swung-forward Burner	40
11.3.5	Height of the Burner	41
11.3.6	Height of the Thread Puller	41
12.	V-belt Tension	42
13.	Setting the Bobbin Winder	43



1. General

These service instructions describe the settings for the sewing unit in a practical order.

Attention !

Various setting positions are interdependent.

It is therefore essential to make the settings while keeping to the order described.



ATTENTION !

The tasks described in these service instructions may only be conducted by skilled personnel or appropriately trained staff !

Danger of Breakage !

After disassembly work first conduct the required setting tasks as per these service instructions before putting the sewing unit into service again.

Never start the sewing unit with an incorrect direction of rotation of the drive motor.

It is only possible to start a sewing sequence with closed head cover and closed cover of the hook area.

If the head cover or the cover of the hook area is open all functions of the controls are blocked.



Caution Risk of Injury !

During repair, conversion and maintenance work turn the main switch off and disconnect the sewing unit from the pneumatic supply.

Adjustment work and function testing with the unit running are to be conducted only observing all safety measures and with the greatest possible caution.

For setting work in the area of the clamps and the needle these must be removed beforehand in order to avoid injuries.

Setting Gauges

Along with the usual parts and tools the following setting gauges are to be found in the accessories pack:

Setting Gauge	Application
Gauge	Setting the needle bar height, synchronizing the hook and needle bar movement
Timing pin	Synchronizing the hook and needle bar movement

On request you can also receive the following setting gauges:

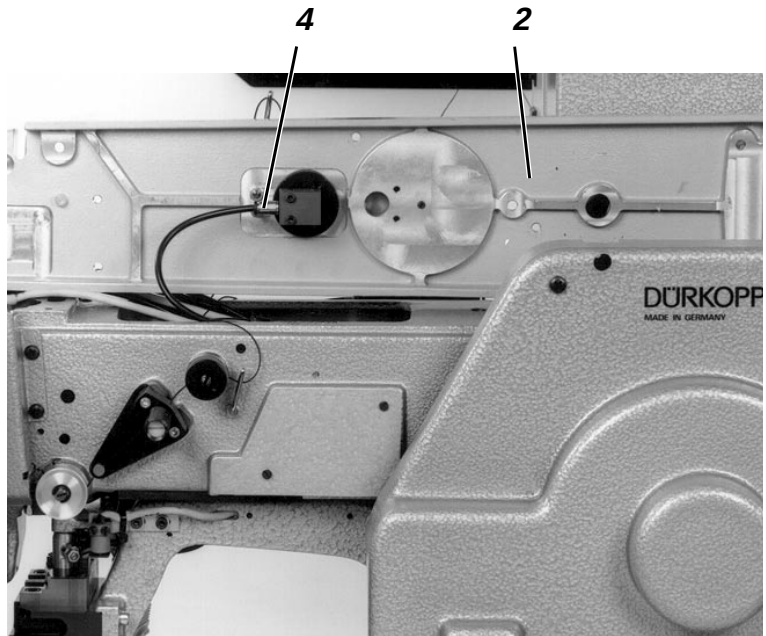
Setting Gauge	Application	Order no.
Gauge	Setting the looping stroke	981 150012
Block	Setting the looping stroke	981 150006



2. Removing the Machine Head Cover and Tilting the Machine Head

2.1 Removing the Machine Head Cover

For service work on the inside of the machine head the machine head cover 2 is to be removed.
For this the Microcontrol control unit must first be swung to the side.



Caution Risk of Injury !

Turn the main switch off.
Remove the machine head cover only with the main switch turned off.

Swing the Microcontrol control unit to the side

- Slightly loosen the Allen screws 1.
The Allen screws are accessible through the holes 3 in the cover.
- Carefully swing the Microcontrol control unit to the side.
- The machine head cover 2 is freely accessible and can be removed.

Remove the bobbin winder

- Loosen the mounting screws of the bobbin winder and remove the bobbin winder.

Remove the machine head cover

- Loosen the mounting screws of the machine head cover 2.
- Carefully lift the machine head cover 2.
- For the complete removal of the machine head cover loosen the screws 4 of the compressed air hose.



ATTENTION !

Removing the machine head cover by force can lead to damage to the compressed air feed.

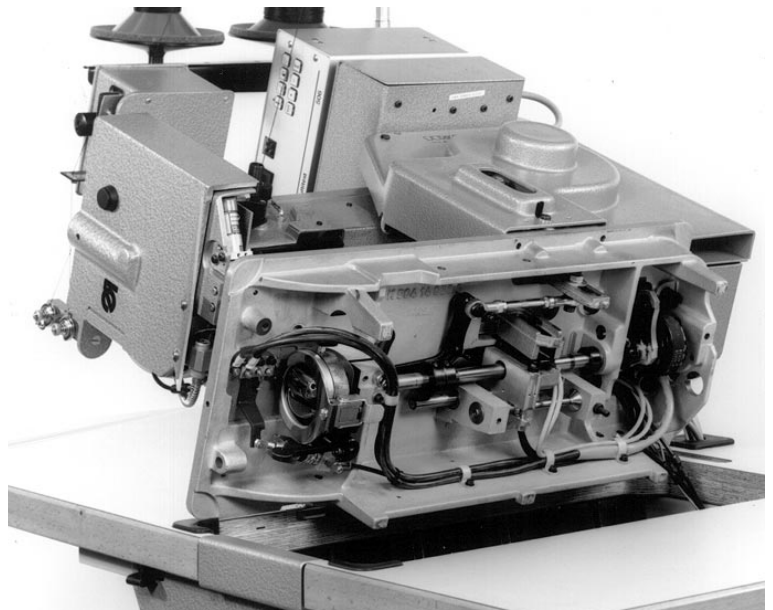


2.2 Tilting the Machine Head

For service work on the underside of the machine head this must be tilted to the back.



1



Caution Risk of Injury !

Turn the main switch off.

Tilt the machine head only with the main switch turned off.

- Swing the V-belt cover 1 to the back.
- Carefully tilt the machine head over and lay onto the support on the table.
The underside of the machine head is accessible for service work.



3. Barrel Shuttle, Needle Bar

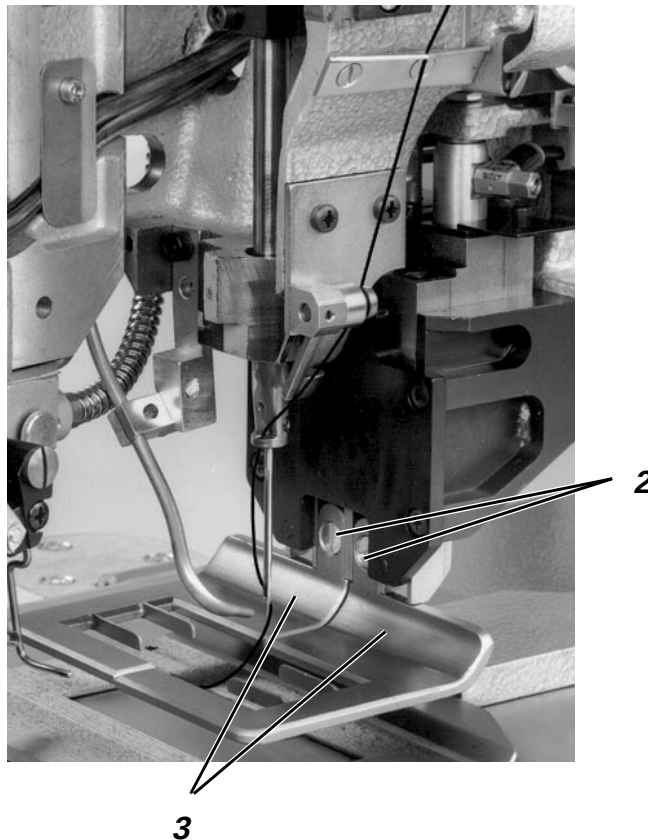


ATTENTION !

The settings described in the Chapters 3.1 to 3.4 are interdependent. It is therefore essential that the individual settings be made in the order listed in the service instructions.

3.1 Needle Bar Height

When the hook point extends 2 mm beyond the right needle side the eye of the needle must be under the hook point.



Caution Risk of Injury !

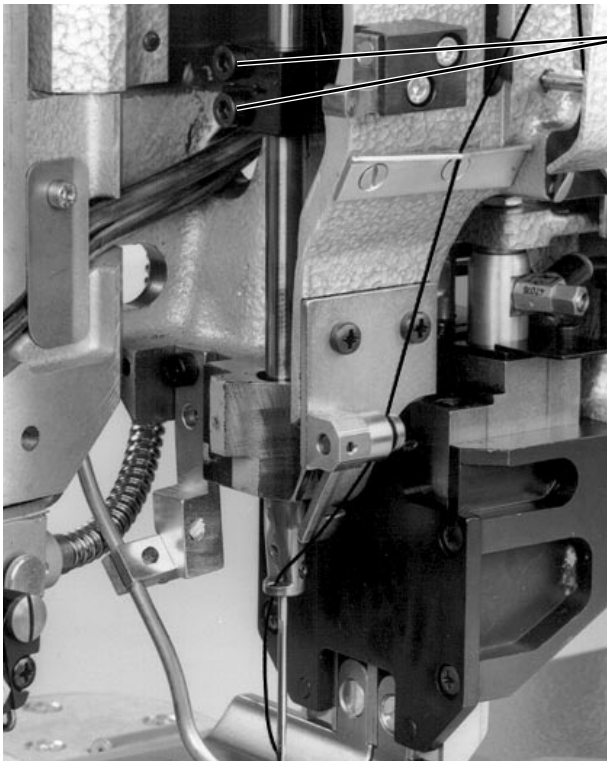
Turn the main switch off.
Adjust the needle bar height only with the main switch turned off.

- Switch off the main switch.
- Loosen screws 2.
- Remove the clamps 3.

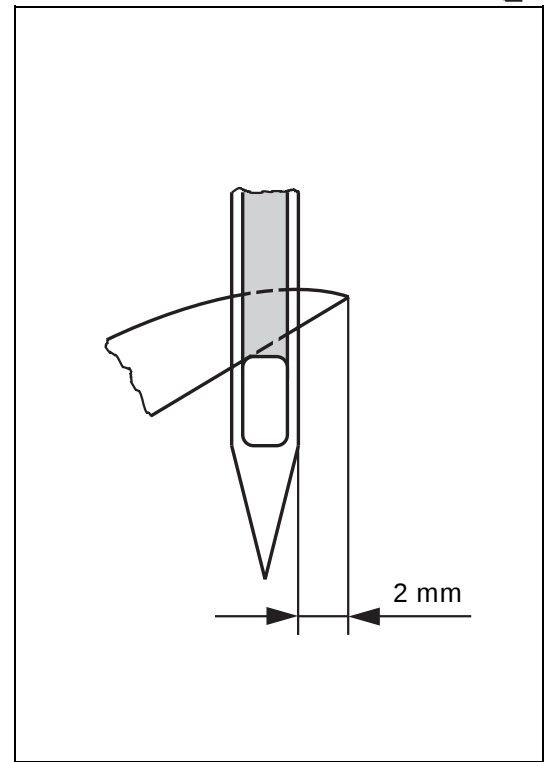


Caution Danger of Breakage !

Before conducting the following settings it is essential to remove the clamps. This avoids the needle hitting against the clamps during the settings following later.



4



- Turn the handwheel in the direction of run until the hook point exceeds the right edge of the needle by 2 mm.

ATTENTION!

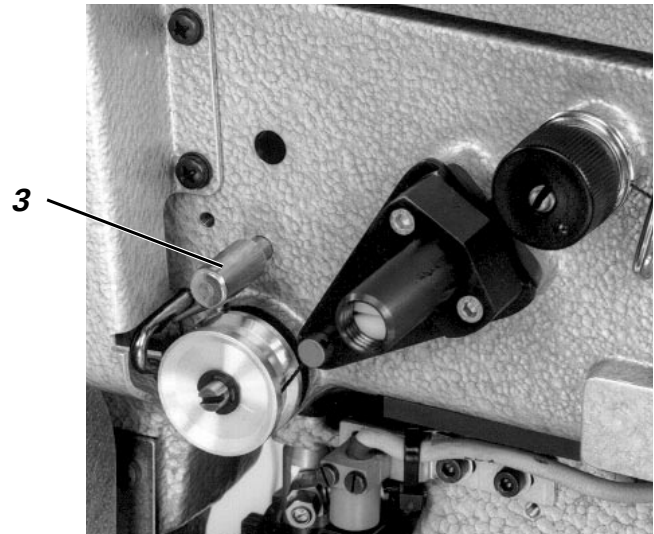
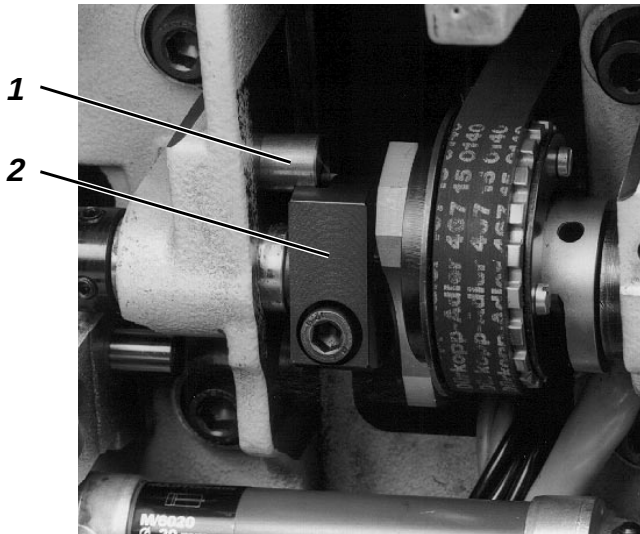
Care of the driver lying on the barrel shuttle in the direction of run.

- Loosen the clamping screws 4.
- Set needle bar height so that the lower edge of the hook just becomes visible in the eye of the needle (see drawing above).
- Tighten the clamping screws 4.
- Attach again clamps 3 with screws 2.



3.2 Synchronizing the Hook and Needle Bar Movement

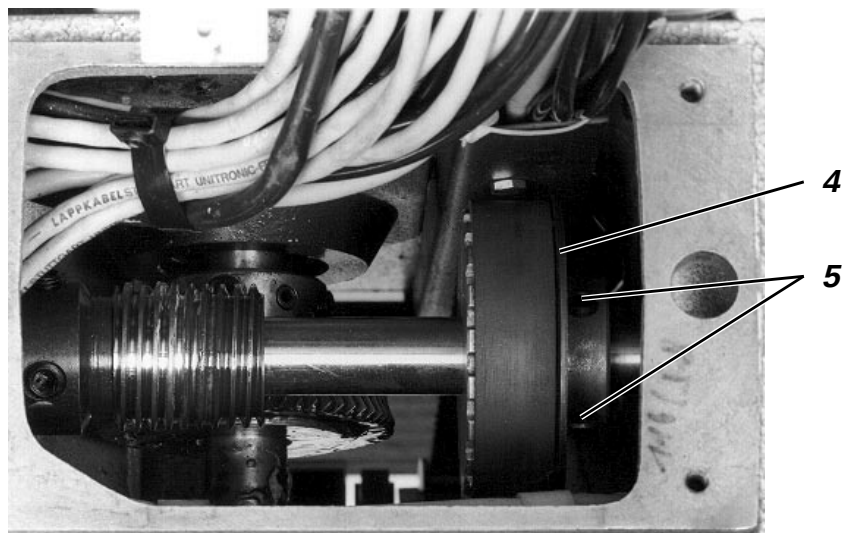
The synchronization of the hook movement to the movement of the needle bar is made with gauge 1 and timing pin 3.



Caution Risk of Injury !

Turn the main switch off.
Synchronize the hook and needle bar movement only with the main switch turned off.

- Insert the timing pin 3 into the hole in the housing on the machine head.
- Turn the handwheel in the direction of run until the timing pin 3 can be felt to have caught in the groove on the arm shaft crank.
- Tilt the machine head to the side.
- Insert gauge 1 through the hole in the housing.
With a correct setting it must be possible to push gauge 1 into the recess on the crank 2.



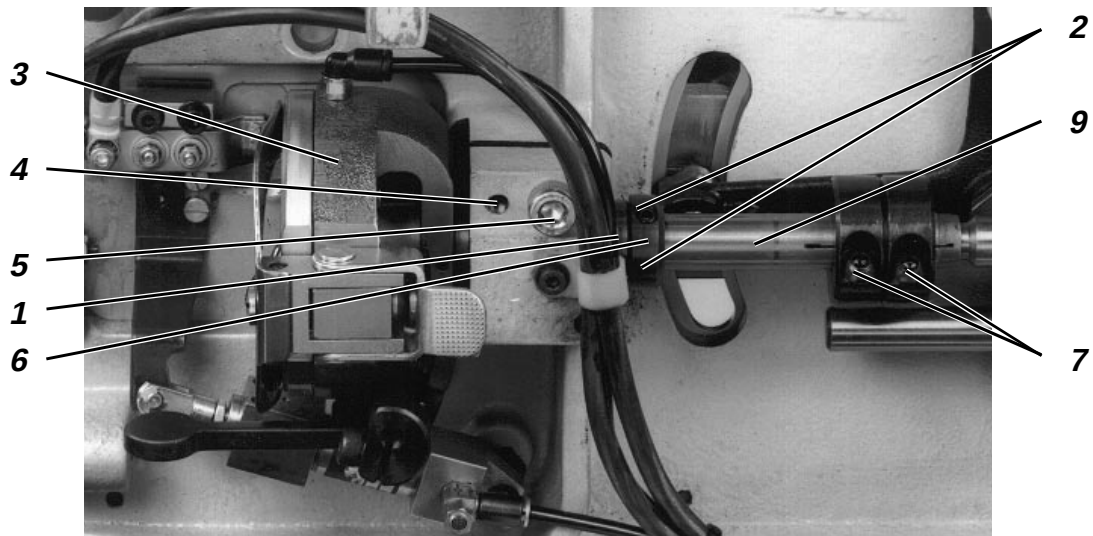
To correct:

- Remove the machine head cover.
- Loosen the clamping screws 5 on the timing belt pulley 4.
- Turn the handwheel in the direction of run until the gauge 1 can be pushed into the recess on the crank 2.
- Tighten the clamping screws 5.
- Replace the machine head cover again.



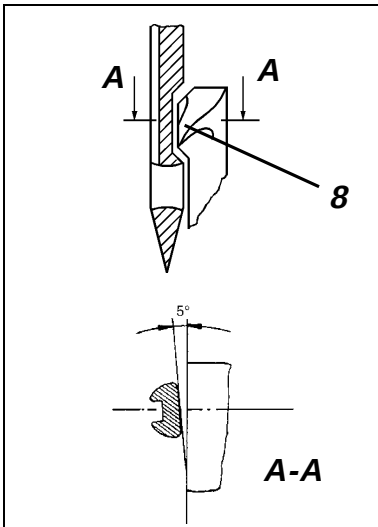
3.3 Clearance Hook Point - Needle

The hook point 8 must lie as close as possible to the furrow of the needle without touching it.



Caution Risk of Injury !

Turn the main switch off.
Set the clearance hook point - needle only with the main switch turned off.



- By turning the handwheel bring the hook point 8 to the the needle and check the position of the hook point to the furrow of the needle.

To correct:

- Tilt the machine head to the side.
- Loosen the clamping screws 7.
- Loosen the clamping screws 2 on the set collar 6.
- Remove driver with driver shaft 9 forward from shuttle run bearing 3.
- Loosen clamping screw 5 on the the base plate.
- Screw in forcing screw 4 slightly.
The jaws on the base plate are spread.
- Move the hook point 8 to the furrow of the needle by axial relocation of the shuttle run bearing 3.
The upper surface of the shuttle run bearing 3 must thereby be parallel to the needle plate.
- Screw the forcing screw 4 back.
- Tighten the clamping screw 5.
- Re-insert driver with driver shaft 9 into shuttle run bearing 3 and push it back.
- Push the set collar 6 up to the stop against bushing 1.
- Tighten clamping screws 2.
- Tighten clamping screws 7.



ATTENTION !

When inserting a thicker needle the clearance of the hook point to the needle also changes automatically.
The clearance hook point-needle is to be corrected.



3.4 Clearance Driver - Needle

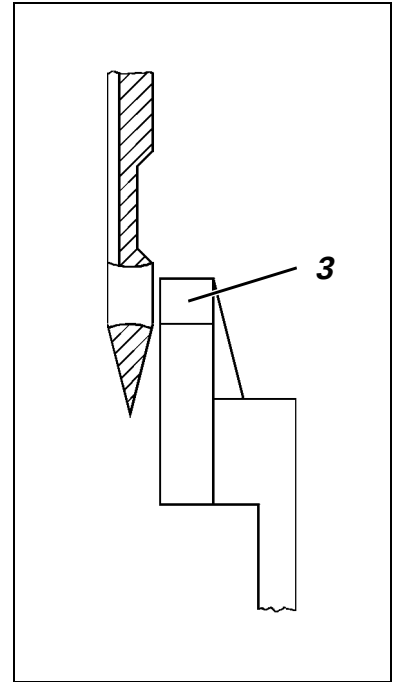
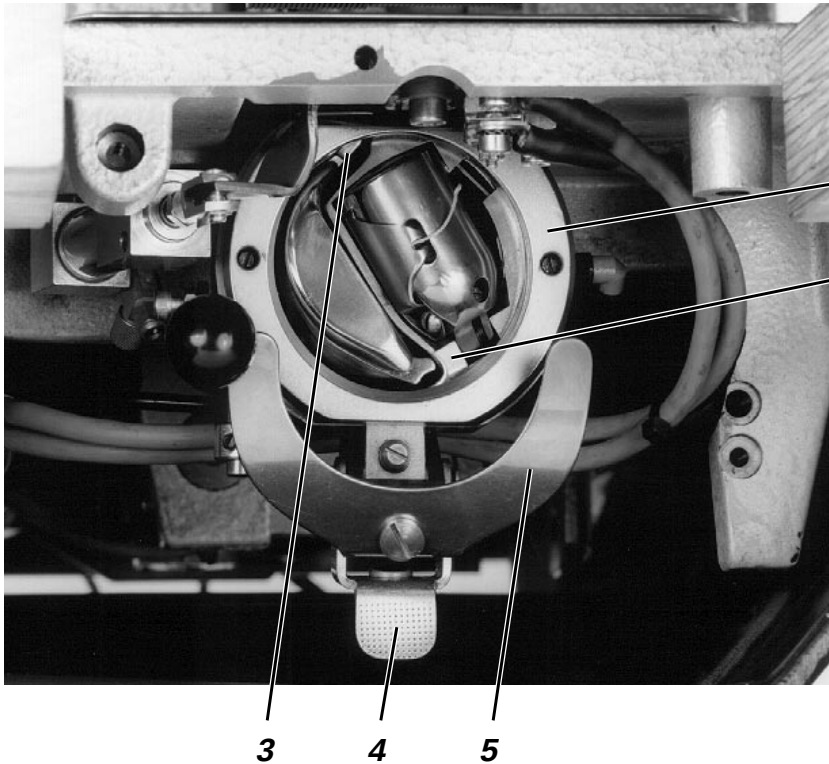
The encompassing driver 3 moves the barrel shuttle 1 in the shuttle run.

With a correct setting of the driver this also serves as a guide for the needle in the vertical direction.

Missing stitches because of "shimmy" of the needle are avoided in this manner.

The right side of the needle must touch the driver 3 without being deflected.

For this the driver 3 must be set close to the the needle.

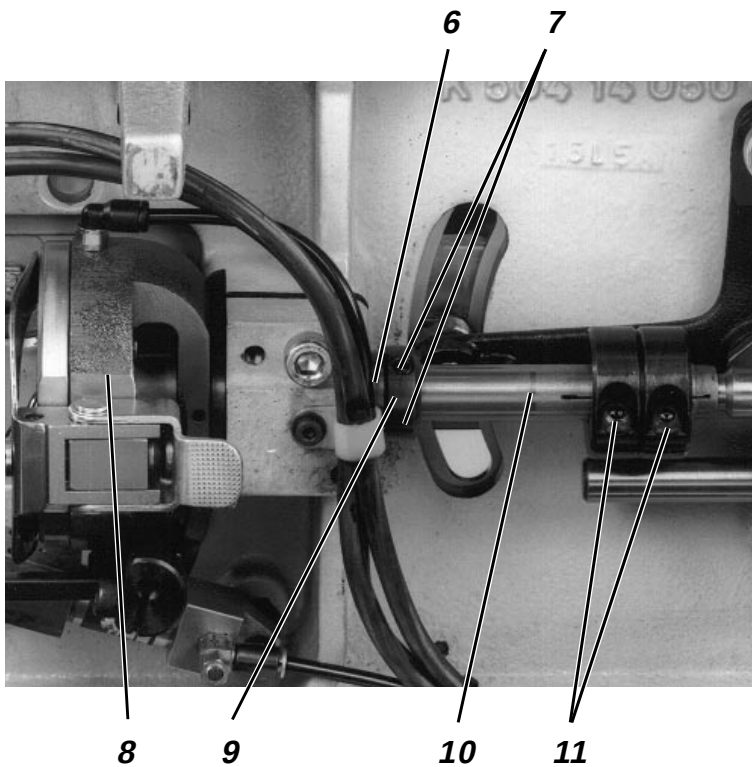


Caution Risk of Injury!

Turn the main switch off.

Set the clearance driver - needle only with the main switch turned off.

- By turning the handwheel bring the needle into the high position (Position 2).
- Pull the spring lock 4 forward for unlocking of the shuttle run spring 5.
- Swing the shuttle run spring 5 to the back.
- Remove the cover ring 2.
- Take out the barrel shuttle 1.
- To check the the setting move the driver 3 to the needle by turning the handwheel.



To correct:

- Tilt the machine head to the side.
- Loosen the clamping screws 11.
- Loosen the clamping screws 7 on the set collar 9.
- Pull the driver 3 with the driver shaft 10 forward out of the shuttle run bearing 8.
- Washers 12 to be added to or removed from the removed driver shaft 10. You may find them in the accessories pack.

Remark

If using a thinner needle, sometimes it may be necessary to add a washer and if using a thicker needle, to remove one.

- Insert the driver 3 with the driver shaft 10 into the shuttle run bearing 8 again and push to the back up to the stop.
- Push the set collar 9 up to the stop against the bushing 6.
- Tighten the clamping screws 7.
The driver 3 is secured against axial displacement.
- Reset the looping stroke (see section 3.5)
- Check the setting by turning the belt pulley on the arm shaft. The right side of the needle must touch the driver without being deflected.

If the setting is not correct, repeat the procedure.



ATTENTION !

After the setting of the clearance driver - needle it is essential to reset the looping stroke per Chapter 3.5.

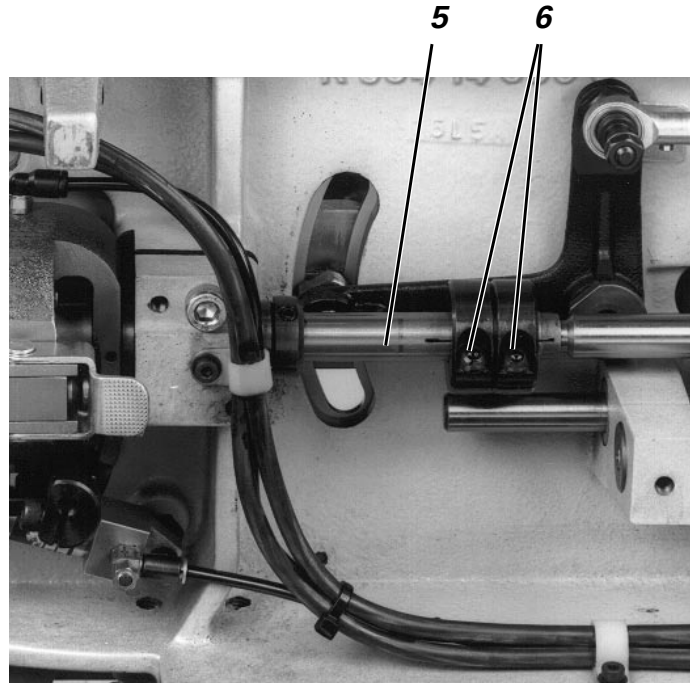
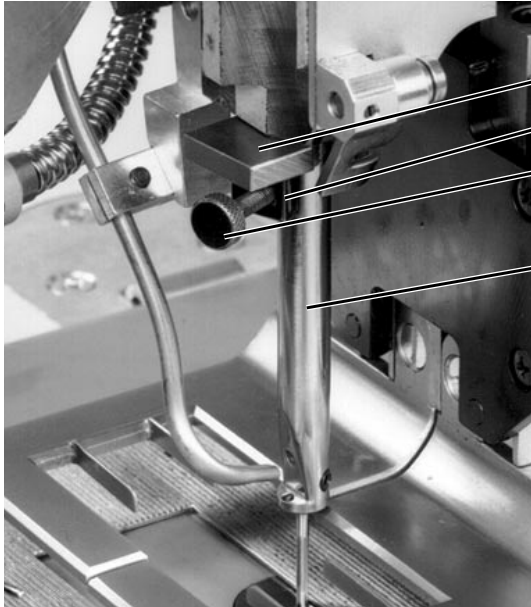


3.5 Looping Stroke

The looping stroke is the path of the needle bar from its lower dead center up to the point where the hook point 7 ends with the right needle side.

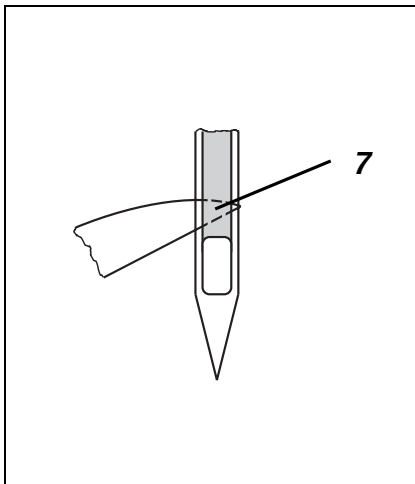
The looping stroke must be 5 mm.

It is set with gauge 1 (Order no. 981 150012) and block 2 (Order no. 981 150006).



Caution Risk of Injury !

Turn the main switch off.
Set the looping stroke only with the main switch turned off.



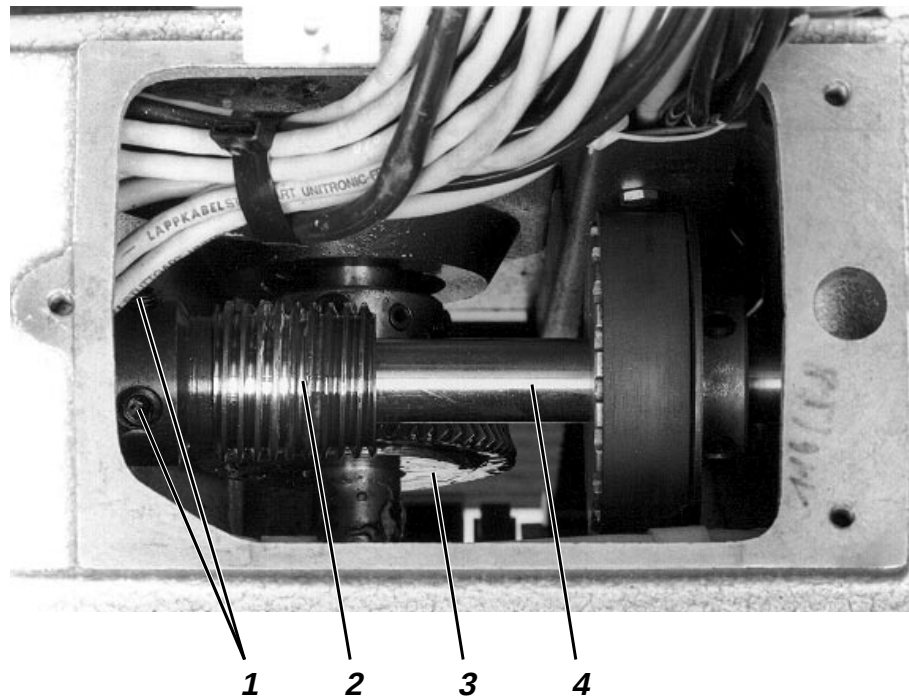
- By turning the handwheel bring the needle bar 4 into its lowest position.
- Open the head cover.
- Press gauge 1 with block 2 upward against the housing.
- Set the clamping screw 3 tight to the block 2.
- Pull out gauge 1.
- Turn the handwheel in the direction of run until the block 2 touches on the housing.
- Check if the hook point 7 ends at the right needle side.

To correct:

- Tilt the machine head to the side.
- Loosen the clamping screws 6.
- Turn the driver shaft 5 appropriately.
- Tighten the clamping screws 6.
- Check the clearance driver - needle again and, if necessary, correct (see Chapter 3.4).

3.6 Worm Wheel Play

The tooth play between worm 2 and worm wheel 3 must as little as possible.



Caution Risk of Injury !

Turn the main switch off.

Set the worm wheel play only with the main switch turned off.

To check:

- Turn the curve disk to the right and left.
A little play must be felt.

To correct:

- Remove the machine head cover.
- Loosen the clamping screws 1.
- Set the tooth play by axial relocation of the conical worm 2 on the arm shaft 4.

Attention !

The first screw - seen in the direction of rotation - must lie on the surface of the arm shaft.

- Tighten the clamping screws 1.
- Replace the machine head cover again.



4. Clamps and Feed Plate

4.1 Position of the Feed Plate to the Needle

The transmission of the movement from the curve disk to the clamps and the feed plate occurs via lever systems. By changing the lever multiplication the seam formation sizes can be changed within certain limits.

The size of the safety clearance between the feed plate 1 and the needle is determined by the width of the movement of the feed plate in the crosswise and lengthwise directions.

For safety reasons the feed plate 1 must keep a uniform minimum clearance to the penetrating needle over the whole course of the bartack.

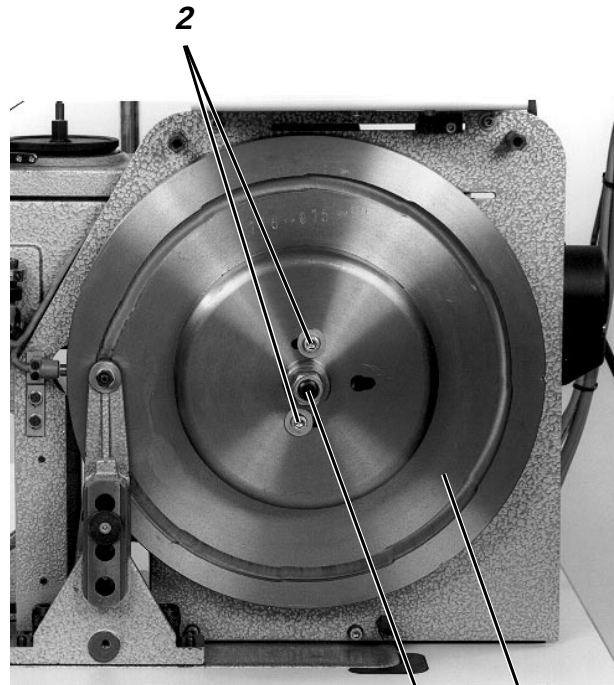


Attention Danger of Breakage !

Through not keeping the safety clearance the penetrating needle strikes the feed plate 1.



1



2

3

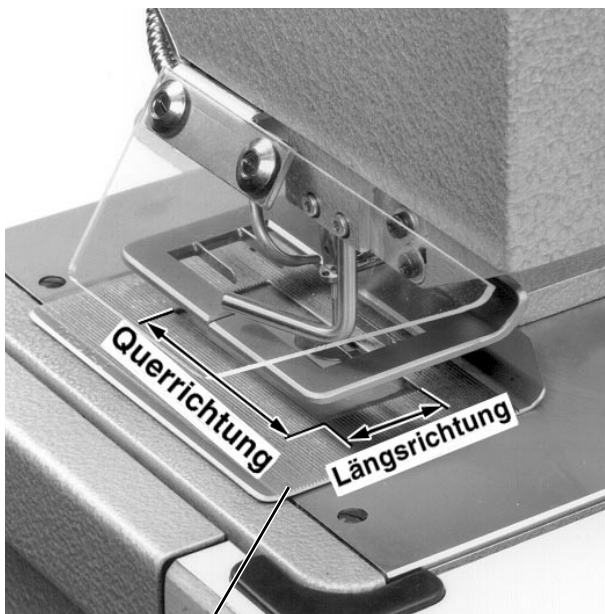
4



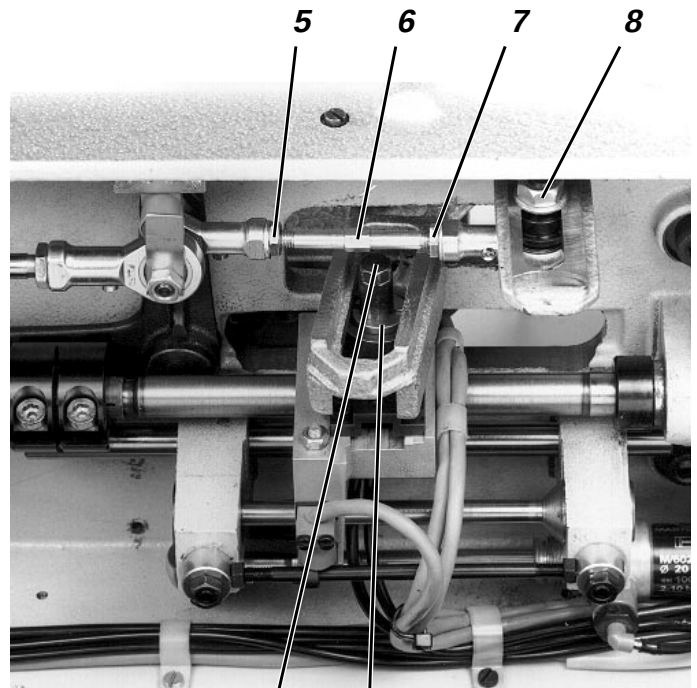
Caution Risk of Injury!

Turn the main switch off.
Set the safety clearance of the feed plate 1 to the penetrating needle only with the main switch turned off.

- Loosen nut 3 and screws 2.
- Pull off the curve disk 4.
- Remove the claw from the curve disk.
- Place the curve disk without the claw on the shaft again.
- Turn the curve disk in the direction of run and run through the complete bartack course.
Thereby check for a uniform safety clearance of the feed plate 1 to the penetrating needle.
- For correction tilt the machine head to the side.



1



9 10

Align the feed plate 1 centered to the needle:

In the crosswise direction (Querrichtung):

- Loosen the nuts 5 and 7.
- By turning the threaded rod 6 align the feed plate 1 in the crosswise direction centered to the needle.
- Tighten the nuts 5 and 7.

In the lengthwise direction (Längsrichtung):

- Loosen screw 9 slightly.
- By turning the eccentric 10 align the feed plate 1 in the lengthwise direction centered to the needle.
- Tighten screw 9.

Setting the width of the movement of the feed plate 1:

In the crosswise direction (Längsrichtung):

- Loosen the nut 8 slightly.
- Set the width of the movement in the crosswise direction by sliding the link in the slot.
- Tighten nut 8.

In the lengthwise direction (Querrichtung):

- Loosen screw 9.
- Set the width of the movement in the lengthwise direction by sliding the link in the slot.

Attention !

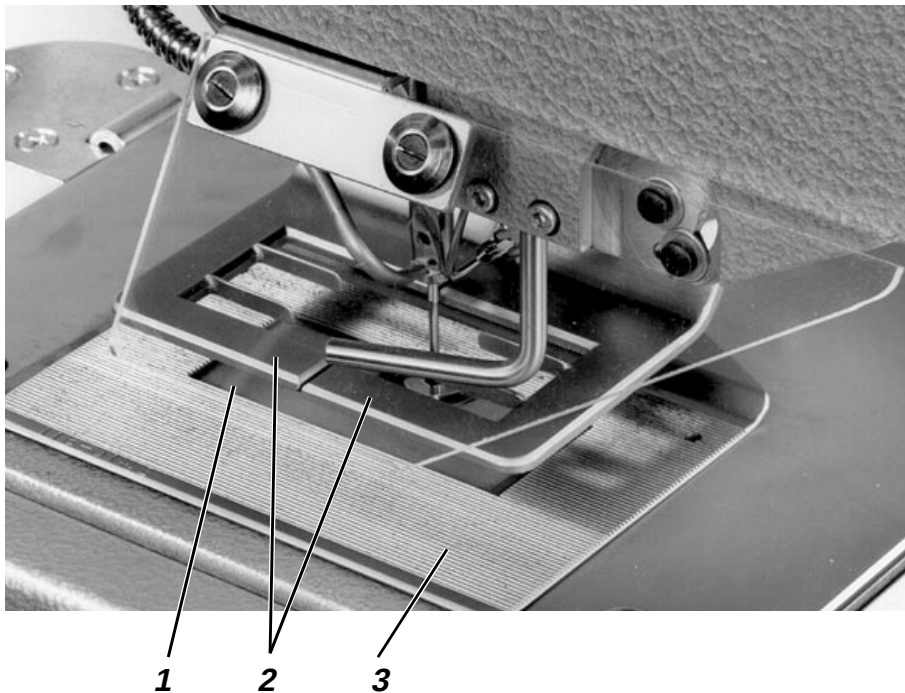
Thereby do not change the setting of the eccentric 10.

- Tighten screw 9.



4.2 Position of the Clamps to the Feed Plate

The clamps 2 must be aligned congruent to the recess 1 in the feed plate 3.

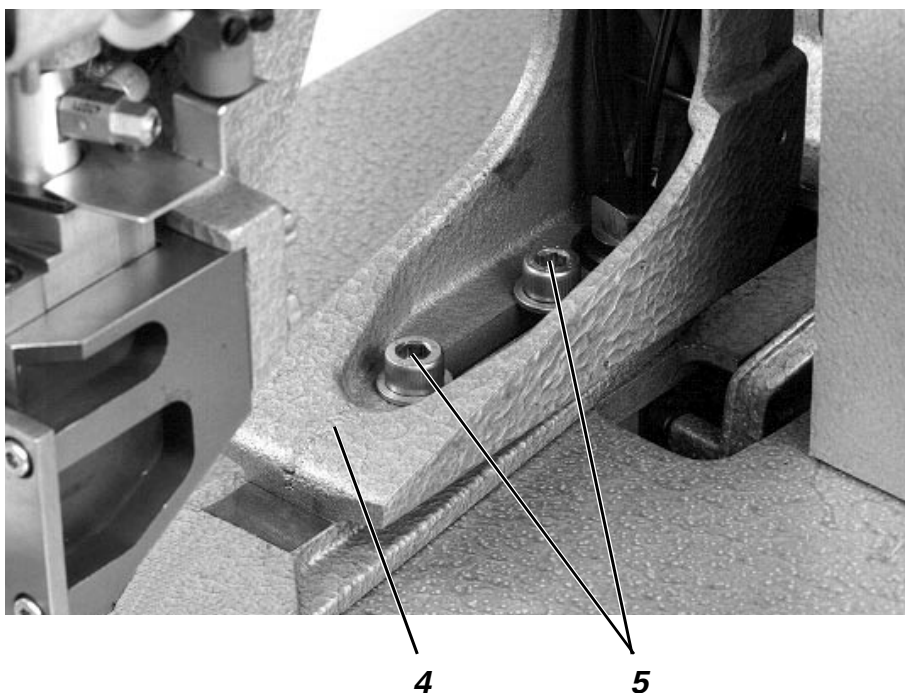


Caution Risk of Injury !

Turn the main switch off.

Align the clamps only with the main switch turned off.

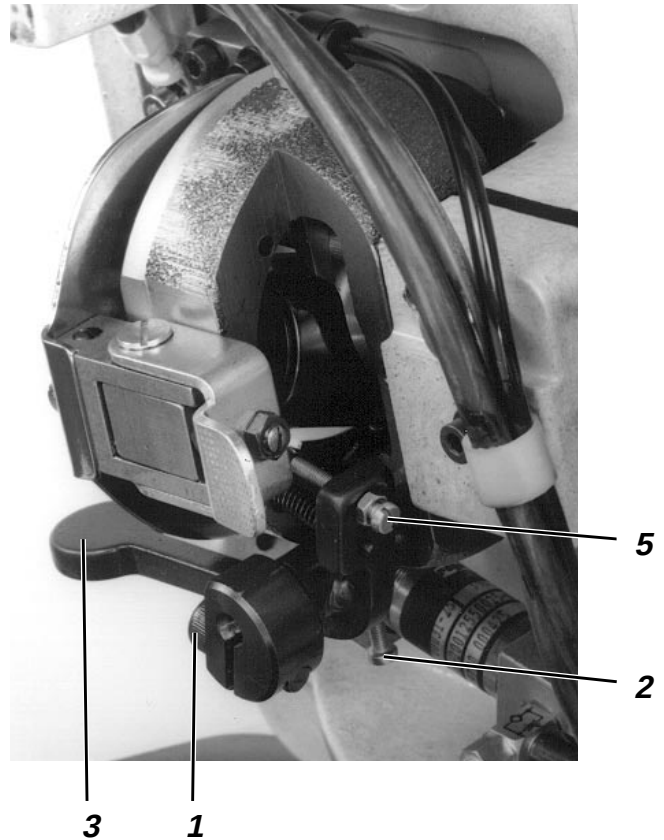
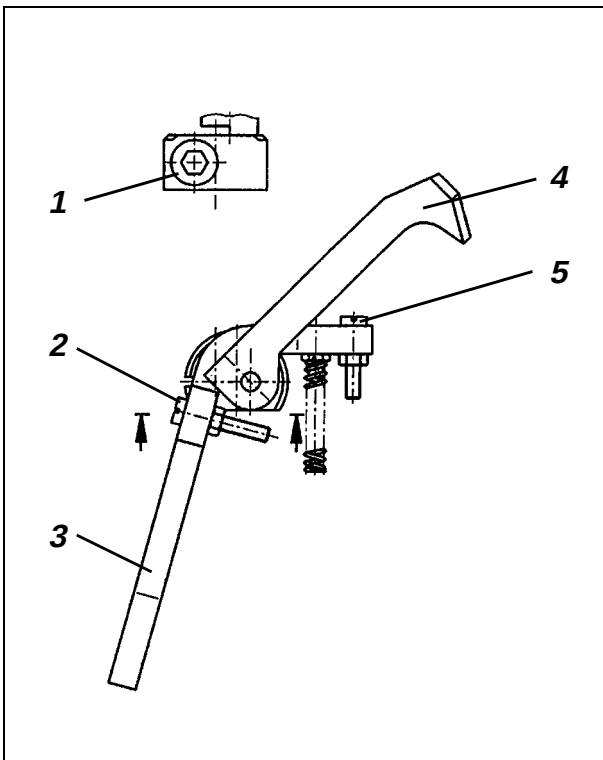
- Loosen the screws 5 on the clamp bracket 4 slightly.
- By sliding the clamp bracket 4 align the clamps 1 and 2 congruent to the recess in the feed plate 3.
- Tighten screws 5.





5. Bobbin Ejector

The ejector 4 must reliably eject the bobbin. The tip of the ejector must not protrude into the bobbin's range of movement.



Caution Risk of Injury !

Turn the main switch off.
Setting of the ejector only with the main switch turned off.

- Tilt the machine head to the side.
- Undo screw 1.
- Rotate the ejector 4 on its axle in such a way as to ensure that the bobbin is reliably ejected when the lever 3 is operated.
- Tighten screw 1.
- Operate the ejector lever 3 to ensure that it is working properly. The bobbin capsule must swivel out automatically.
- Undo the lock nut on screw 2.
- Turn screw 2 to adjust the limit position. The tip of the ejector must not protrude into the bobbin's range of movement.
- Securely tighten the lock nut on screw 2.
- Undo the lock nut on screw 5.
- Turn screw 5 to adjust the limit position. The ejector must reliably eject the bobbin.
- Securely tighten the lock nut on screw 2.



6. Curve Disk

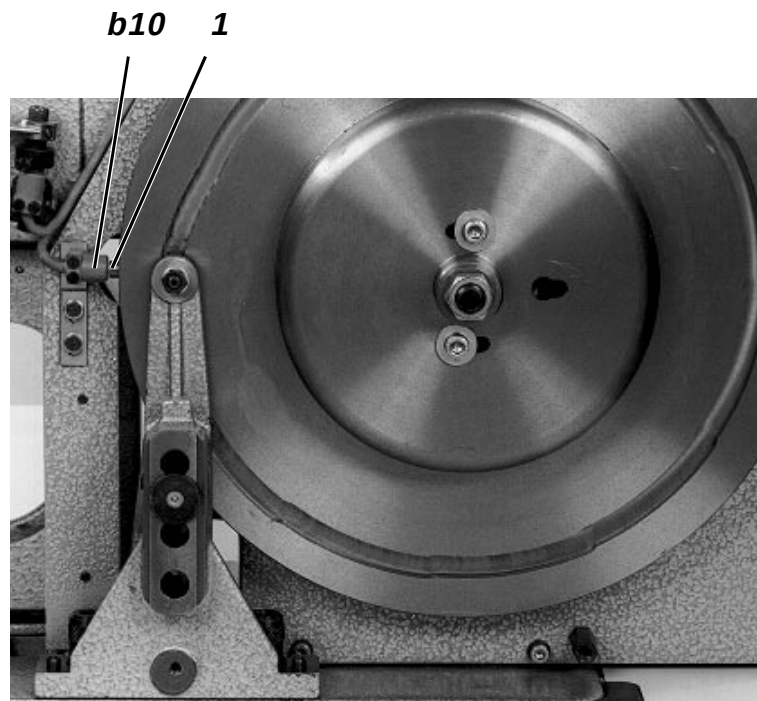
The curve runs on the in- and outside of the curve disk determine the transport movement of the clamps.

The outer curve run controls the movement of the clamps in the crosswise direction, the inner transports the clamps in the lengthwise direction.

The position of the curve disk on the shaft determines the timing of the clamp transport.

The curve disk is in its base position when cam 1 is exactly in front of switch **b10**.

In the base position of the curve disk the valve for the needle cooling is not triggered. The needle cooling is only activated during sewing.



Curve disk

The different seam formations (stitch patterns) are determined by easily exchangeable curve disks.

All curve disks belonging to a stitch number range are interchangeable with each other.

The curve disks are numbered.

The number engraved on the curve disk has the following meaning:

Example: **116 - 072 .- 1**

116 = Number of stitches per curve disk revolution

072 = Stitch pattern

1 = Calculation operation



Caution

The correct stitch number must be set with the DIP switches of the micro-control (see chapter 2.2 in part 4: Programming Instructions).

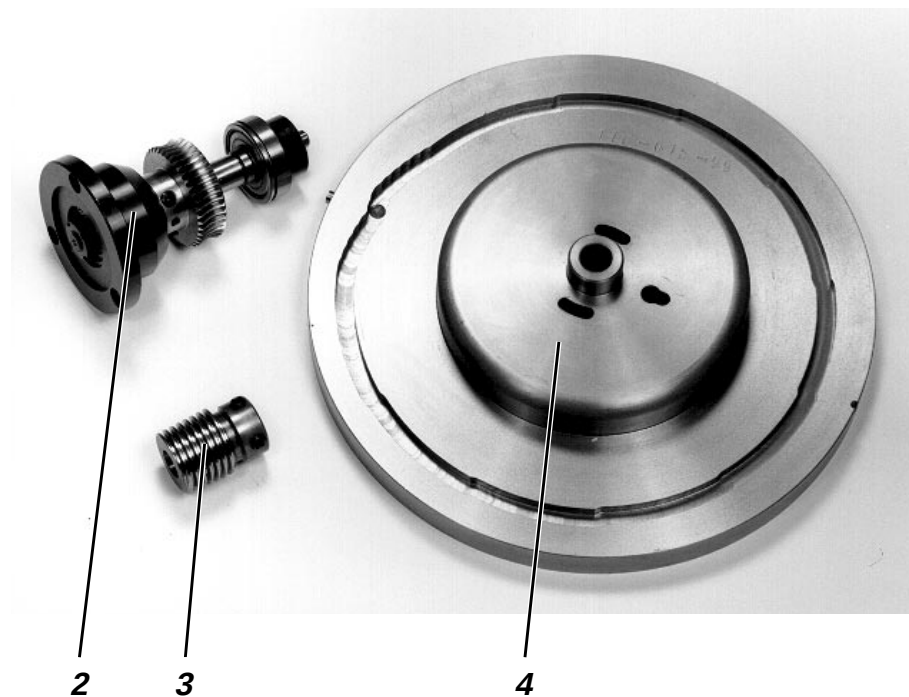
Otherwise an incorrect seam pattern may result, or damage may be caused to the needle or needle plate.

When converting to a different seam formation attach the clamps belonging to the mounted curve disk.



Worm wheel set

For conversion to a curve disk 4 of a different stitch number range the appropriate **worm wheel set** must also be mounted. A worm wheel set consists of a worm driver 2 and a worm 3.

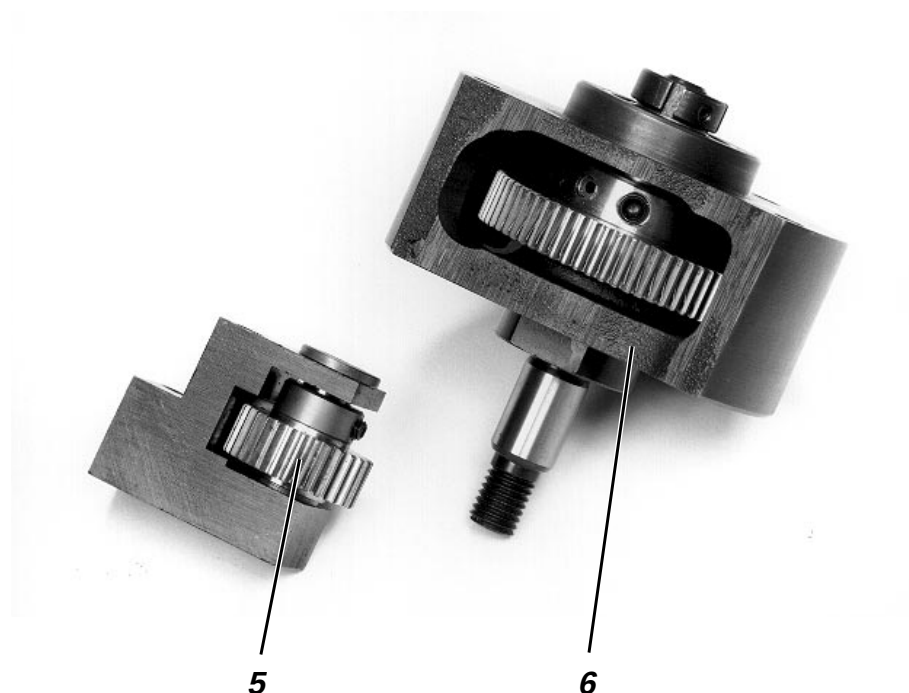


Gear reducer

Through installation of the gear reducer 6 with the intermediate gear 5 the number of stitches per curve disk revolution is doubled (multiplication ratio 1:2).

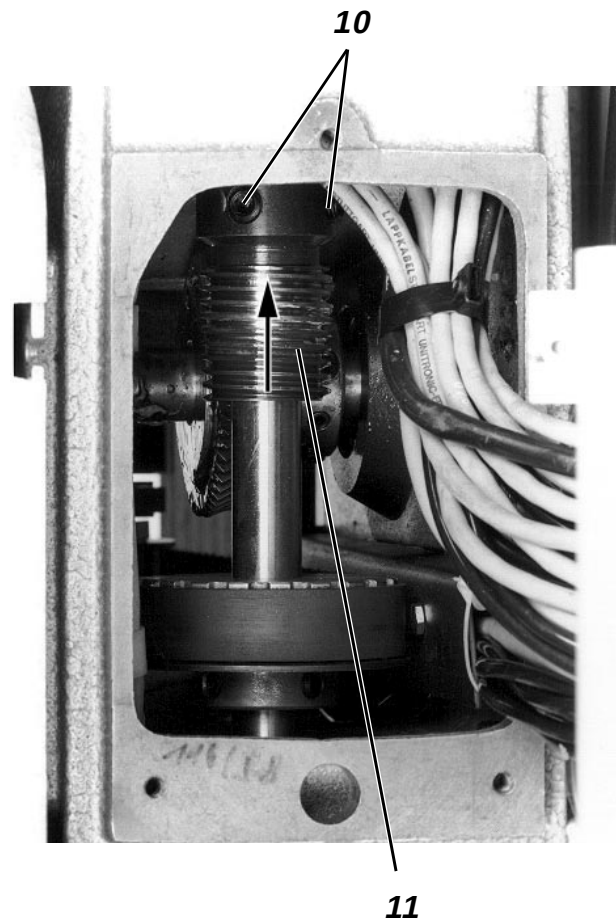
Without gear reducer: 42, 58 and 72 stitches per curve disk revolution (depending on the worm wheel set)

With gear reducer: 84, 116 and 144 stitches per curve disk revolution (depending on the worm wheel set)





6.1 Replacing the Drive Train and Worm Wheel



Caution Risk of Injury !

Turn the main switch off.
Replace the drive train and worm wheel only with the main switch turned off.



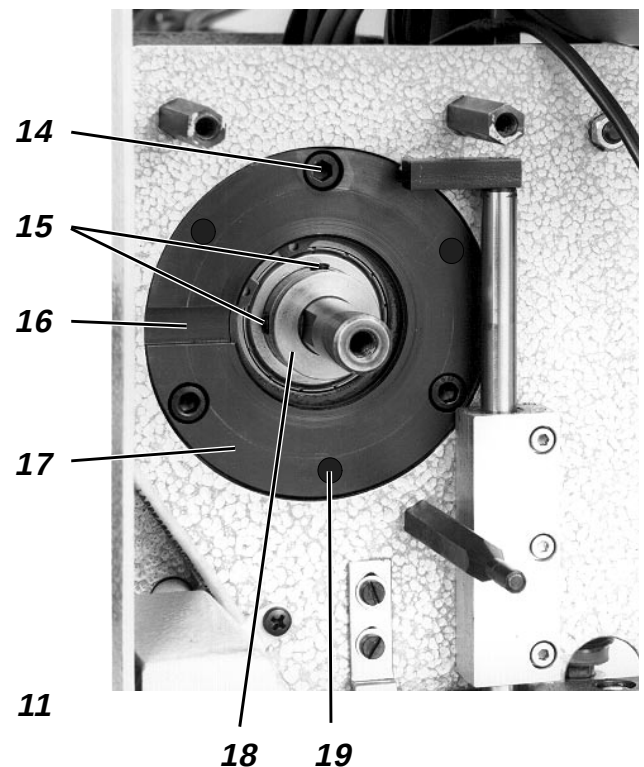
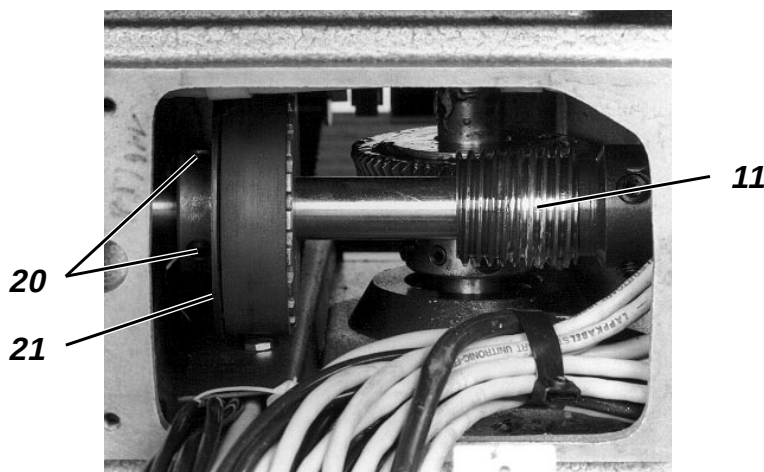
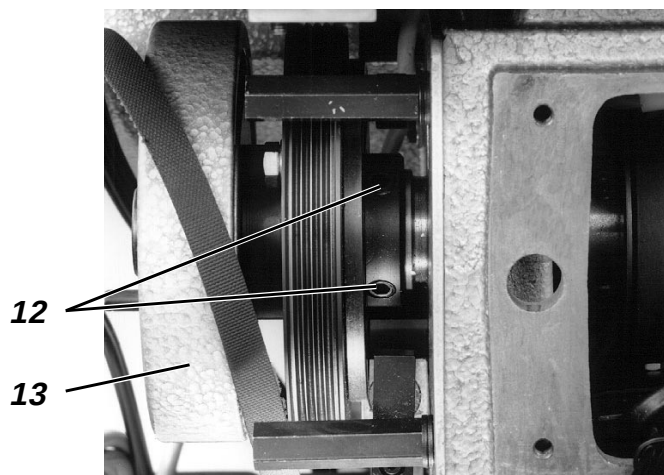
Attention Danger of Breakage !

Before replacing the drive train and worm wheel it is essential to remove the clamps and needle.

- Remove the clamps and needle.
- Swing the V-belt cover 8 to the back.
- Loosen the clamping screws 2 on the synchronizer ring.
- Pull off the synchronizer 1.
- Flip up the securing clip 5 and pull off the plug 6.
- Remove the cover 3 after loosening the mounting screws.
- Pull the V-belt 7 off of the belt pulley.
Thereby slightly tilt the machine head in order to relieve the V-belt 7.
- Swing the Microcontrol control unit over to the side and remove the machine head cover (see Chapter 2).
- Loosen the clamping screws 10 on the worm 11.
- To pull out the drive train, first push the worm 11 to the back in the direction of the arrow.

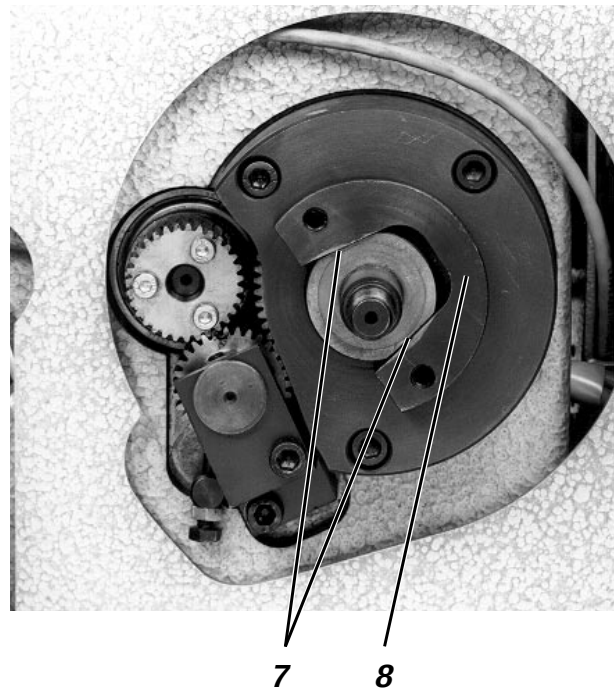
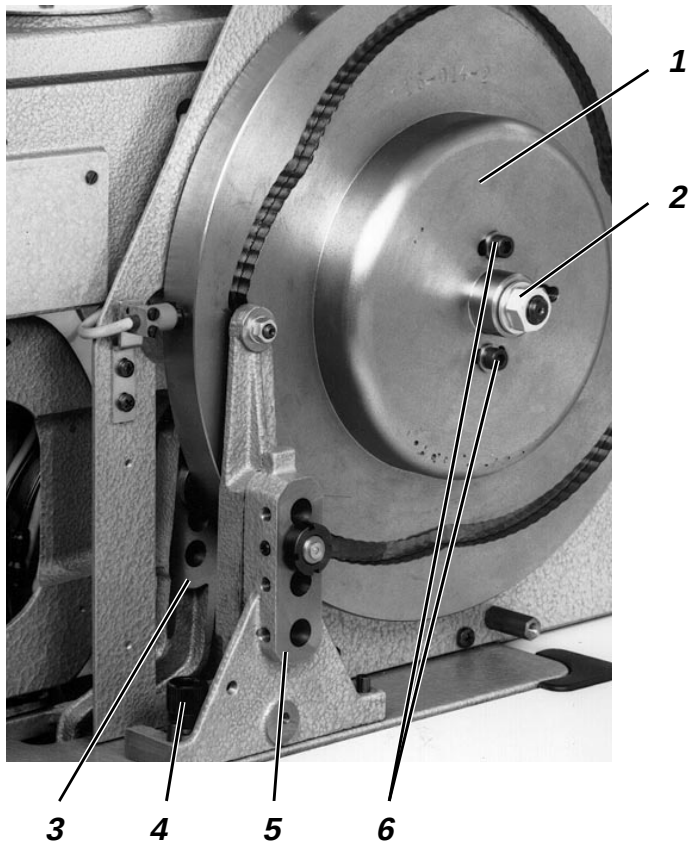


- Loosen the screws 4 on the bearing 9 and screw out. The mounting screws 4 serve at the same time as pull-off screws for the drive train.
- Insert the screws 4 in the threaded holes of the bearing 9.
- Carefully pull the drive train out of the housing by uniformly screwing in the pull-off screws.
- Loosen the clamping screws 12.
- Pull the handwheel 13 with the belt pulley off of the arm shaft.
- Loosen the clamping screws 15 on the bearing sleeve 18. The clamping screws 15 are accessible through the slot 16.
- Loosen the screws 14 on the bearing 17 and screw out. The mounting screws 4 serve at the same time as pull-off screws for the bearing.
- Insert the screws 14 into the threaded holes 18.
- Carefully pull the complete bearing 17 out of the housing through a uniform screwing in of the pull-off screws.
- Loosen the clamping screws 20 on the timing belt pulley 21.
- Pull the timing belt pulley 21 off of the arm shaft.
- Pull the worm 11 off of the arm shaft.
- Push a new worm on to the arm shaft.
- Successively mount and fasten the timing belt pulley 21, bearing 17 and handwheel 13 again.
- Mount the new drive train and fasten with the screws 4.
- Push the worm 11 over the worm wheel and set the worm wheel play (see Chapter 3.6).
- Attach all parts removed (V-belt 7, cover 3, plug 6, synchronizer 1 and V-belt cover 8) again.





6.2 Replacing the Curve Disk



Caution Risk of Injury !

Turn the main switch off.
Replace the curve disk only with the main switch turned off.

- Loosen the screws 4.
- Lift the drive lever 5 for the clamp crosswise movement and push to the side.
- Loosen nut 2 and screws 6.
- Carefully pull off the curve disk 1.



ATTENTION !

If for the conversion to a different seam formation the attaching of the gear reducer is necessary this must occur before the installation of the new curve disk. For the attaching of the gear reducer see Chapter 6.3.

- Installing a new curve disk.

Attention!

Take care that drive lever 3 for the clamp lengthwise movement catches in the inner curve run of the curve disk.

The claw 8 must encompass the surfaces 7 of the shaft.

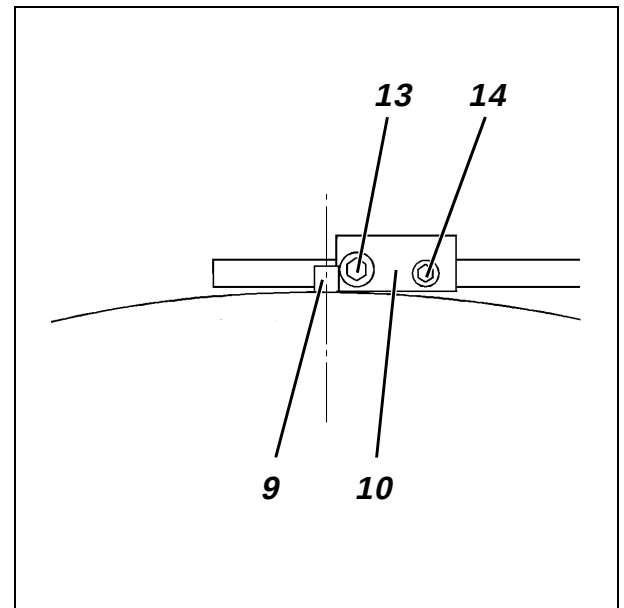
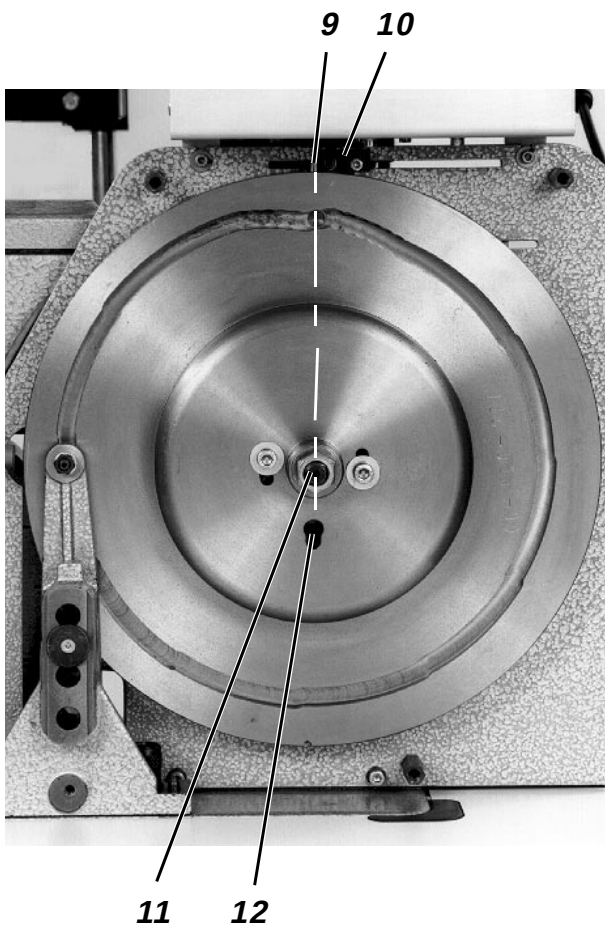
Note:

The illustration shows a unit with attached gear reducer.

- Turn the curve disk in the direction of run until the claw 8 is felt to encompass the surfaces 7.
- Tighten nut 2.
- Insert the clamps and needle.
- Turn the curve disk farther in the direction of run until the cam 9 lies vertically above the shaft 11.



- Turn the handwheel in the direction of run until the clamps not longer move.
With a correct setting the needle is at this moment just short of penetrating into the material.



To correct:

- Turn the curve disk farther in the direction of rotation until the cam 9 lies vertically above the shaft 11.
- Loosen screw 14 on the rider 10 slightly.
- Push the rider 10 with screw 13 until it touches on the cam 9 of the curve disk.
- Tighten screw 14.
The position of the curve disk is fixed.
- Loosen nut 2.
- Turn the handwheel in the direction of rotation until the needle is just short of entering into the material.
- In this position press claw 8 with a screwdriver through the slot 12 onto the surfaces 7 of the shaft.
- Tighten screws 6 and nut 2.
- Push the rider 10 back all the way to the right.



Attention Danger of Breakage !

After replacing the curve disk it is essential to check the following settings:

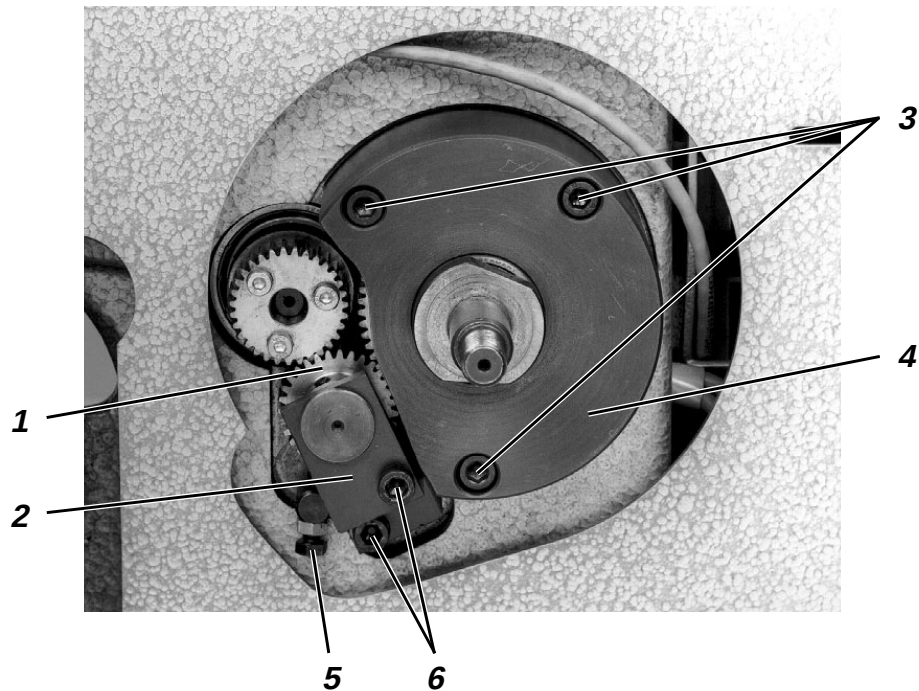
- Position of the feed plate to the needle (see Chapter 4.1)
- Position of the clamps to the feed plate (see Chapter 4.2)



6.3 Attaching the Gear Reducer

By attaching the gear reducer 4 with intermediate gear 1 the number of stitches per curve disk revolution is doubled (multiplication ratio 1:2).

The attaching of the gear reducer must occur before the installation of the new curve disk.



Caution Risk of Injury !

Turn the main switch off.

Attach the gear reducer only with the main switch turned off.

- Remove the curve disk as described in Chapter 6.2.
- From the outside fasten the gear reducer 4 with screws 3 on the machine arm.
- Insert the bearing bracket 2 and set the intermediate gear 1 close.
- First tighten screws 5 just a little.
- Set the intermediate gear 1 completely tight by tightening screw 4.



ATTENTION !

Possibly existing tooth play will be increased by the multiplication of the gear reducer. Therefore set the intermediate gear 1 completely tight.

- Tighten screws 5.
- Mount the curve disk as described in Chapter 6.2.



7. Thread Pull

For a secure sewing on at the seam beginning a certain quantity of drawn-forward needle thread is required.

The drawing-forward occurs after completion of the seam with the clamps still lowered.

Function sequence

- The needle thread tension opens.
- The burner lowers.
- The thread pull 1 pulls the required thread quantity forward.
- The thread pull 1 moves back into its base position.
- The needle thread tension closes again.
- The thread deflector pulls the drawn-forward needle thread into the burning position.
- The thread is burned off.
- A new sewing sequence can be started.

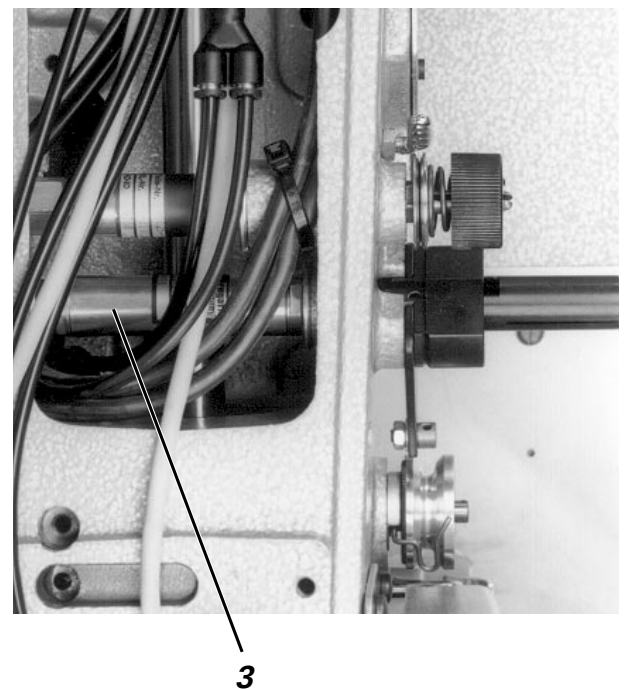
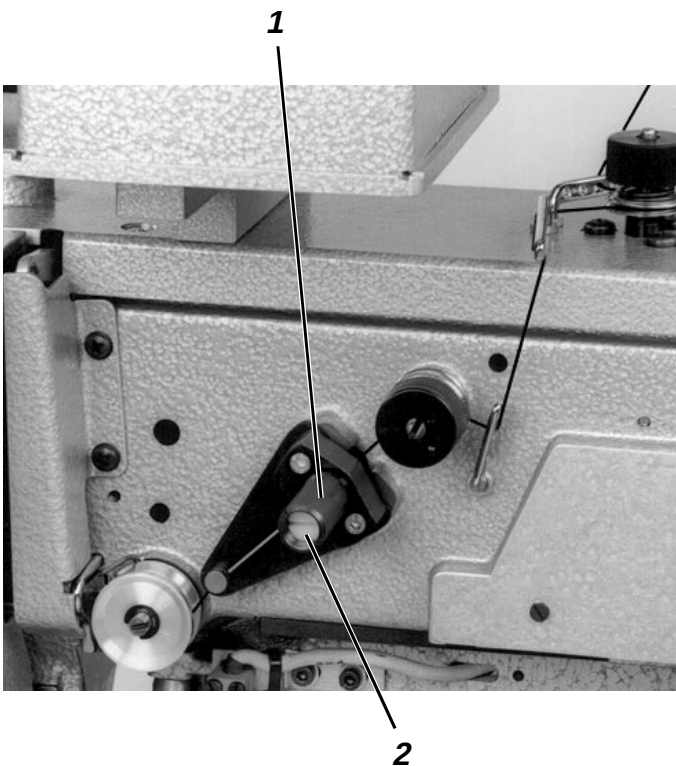
Setting

The thread pull 1 must be set so that, depending on the material to be worked, a secure seam beginning is assured.



ATTENTION !

If the drawn-forward thread quantity is too small the thread is too taut during burning. The thread end doesn't "melt together".

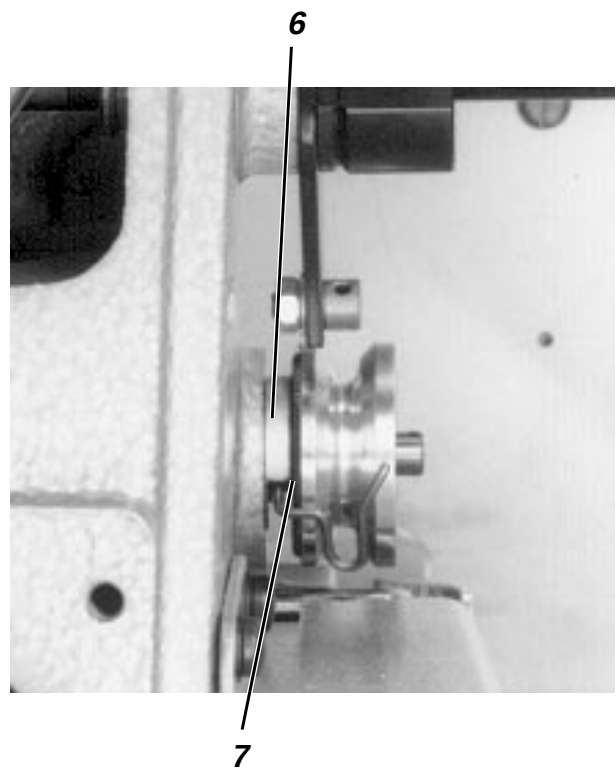
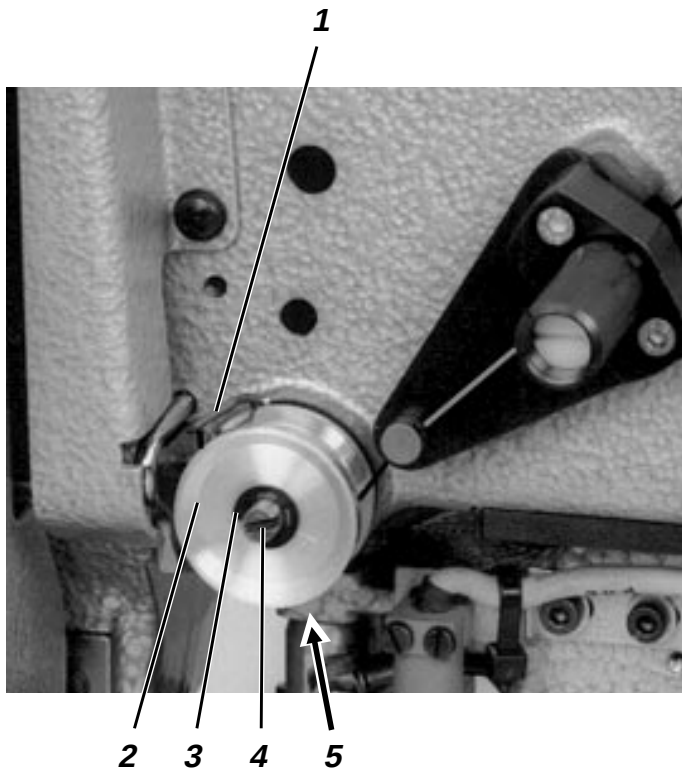


To correct:

- Set the drawn-forward thread quantity by turning the stopper screw 2.
The stopper screw 2 limits the stroke of the cylinder 3.



8. Thread Controller Spring



Spring path

When the needle enters into the material the thread controller spring 1 must lay onto the thread tension carrier 6. When the eye of the needle enters into the material the spring is just then relaxed.

To correct:

- Loosen clamping screw 5.
The clamping screw 5 is behind the thread return roller 2 under the machine arm.
- Turn the thread tension carrier 6.
- Tighten clamping screw 5.

Spring tension

The spring must hold the drawn-forward thread taut until the eye of the needle enters into the material. The necessary spring tension is dependent on the material to be sewn.

To correct:

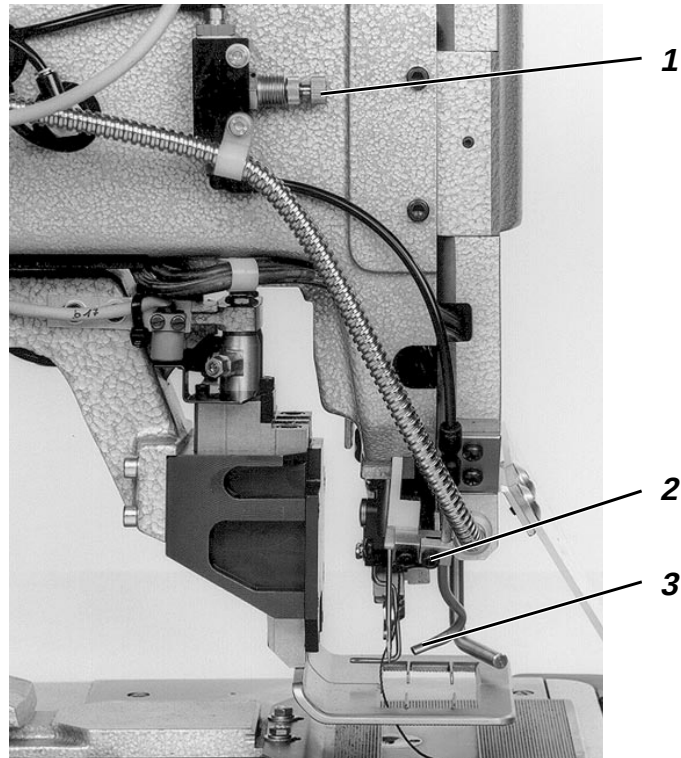
- Remove the securing collar 3 and washer.
- Pull off the thread return roller 2.
- Loosen screw 4 slightly.
- Secure screw 4 against turning with a screwdriver.
- Set the spring tension by turning the knurled nut 7.
Turning clockwise = Increase spring tension
Turning counterclockwise = Decrease spring tension
- Hold the knurled nut 7 and tighten screw 4.
- Attach the thread return roller 2 again.
- Attach the washer and securing collar 3.



9. Needle Cooling

The needle cooling can be switched from normal to continuous operation. The desired mode of operation is set at the DIP switch b500.6 on the control unit (see part 4: Short Description Microcontrol). In normal operation needle cooling is only activated during sewing.

The air current coming from nozzle 3 must be directed at the needle in sufficient strength.



To test the needle cooling in normal operation select program P45:

- Set the "**Program**" switch to "**45**".
- Press the "**STOP**" key.
The program is activated.
- In the right half of the second display line "**B-TEST->Σ**" appears.
- Press the "**Σ**" key.
- The unit slowly sews to the seam end.
The needle cooling is in operation.
- Check the strength and direction of the air current.

To correct:

- Loosen clamping screw 2 slightly.
- Align the nozzle 3 to the needle.



ATTENTION !

The air current coming from nozzle 3 should in no case blow out the burner.

- Tighten clamping screw 2.
- Regulate the strength of the air current with the adjustment screw 1 of the throttle valve.



10. Shut Off Devices

10.1 Transport Levers for Lengthwise and Crosswise Movement (Switches b09, b16)

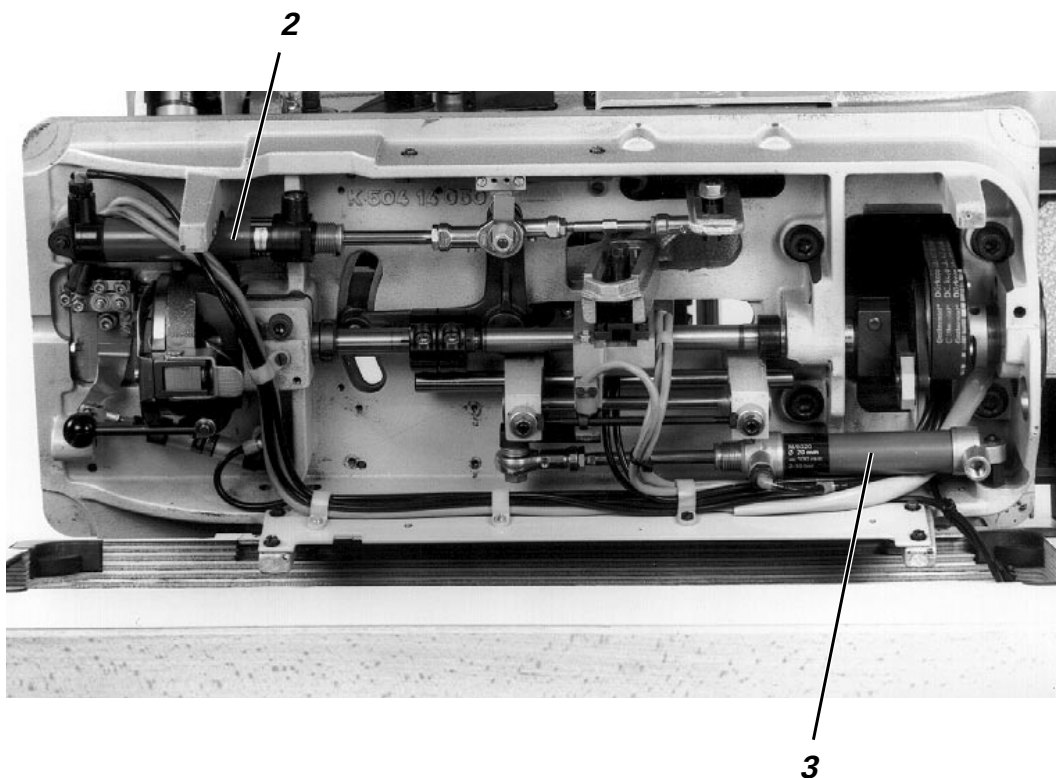
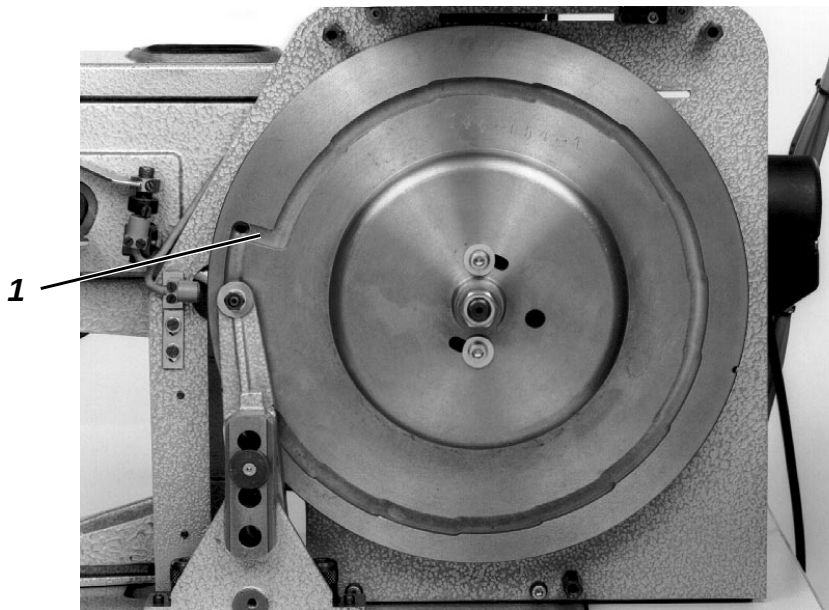
The setting of the switches **b09** and **b16** is only necessary by units with an **"open guide curve"**.

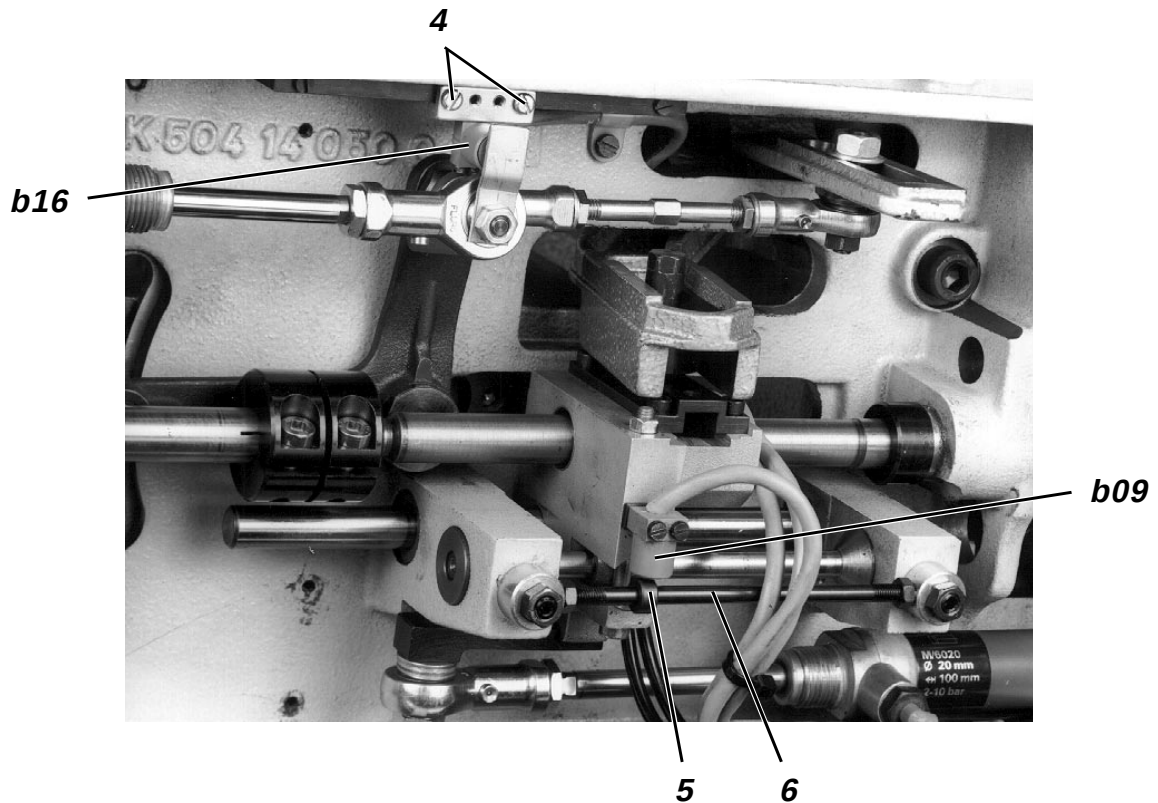
"Open guide curves" are used for seam formations where the seam end and seam beginning are at different positions.

Through the straight section 1 of the curve runs the transport levers for the lengthwise and crosswise movement are moved back into the initial position after completion of the seam.

The movement occurs in the base position of the curve disk via the pneumatic cylinders 2 and 3.

The base position (seam beginning position) of both transport levers is scanned via switches **b09** and **b16**.





For setting bring the curve disk into the base position (seam beginning position) and tilt the machine head back.

The setting of the switches b09 and b16 occurs in program **P63**:

- Set the "**Program**" switch to "**63**".
- Press the "**STOP**" key.
The program is activated.
The display shows "**B?**".

Setting switch b09:

- Set the "**Program**" switch to "**09**".
The display shows the switching status (e.g. "**-B09**").
- Loosen the clamping screw on the set collar 5 slightly.
- Slide the set collar 5 on axle 6 until the display shows the switching status "**+B09**".
- Tighten the clamping screw on the set collar 5.

Setting switch b16:

- Set the "**Program**" switch to "**16**".
The display shows the switching status (e.g. "**-B16**").
- Loosen the clamping screws 4 slightly.
- Slide switch **b16** sideways until the display shows the switching status "**+B16**".
- Tighten the clamping screws 4.



10.2 Base Position Stop (Switch b10)

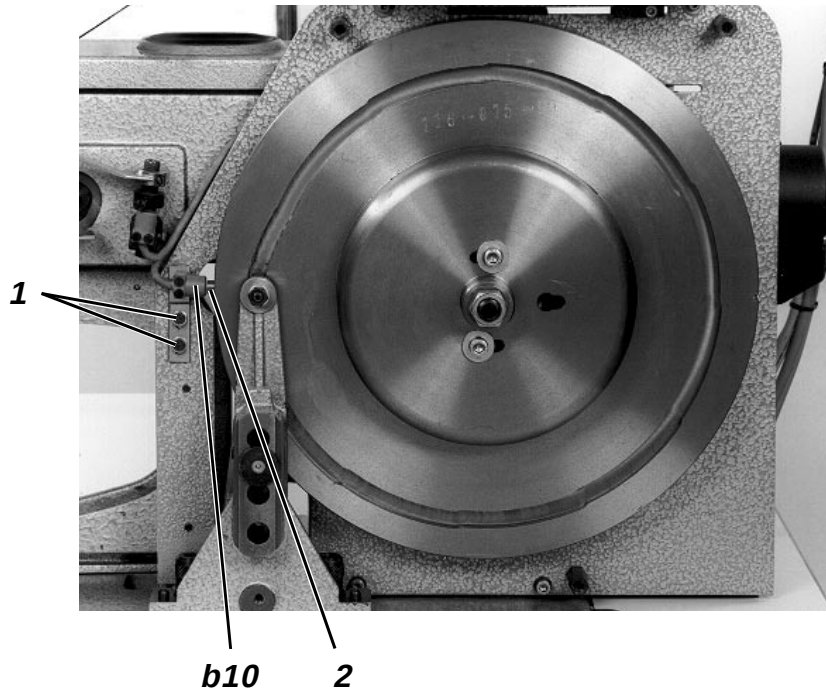
To every curve disk (number of stitches) belongs a cam 2 with a certain diameter.

The diameter is sized so that the switch **b10** is no longer operated by the cam a stitch before or after the base position.

If the cam is replaced by a larger diameter cam (e.g. because it was lost or damaged) the following problem can arise:

When turning the unit on switch **b10** is operated, the curve disk, however, lies a stitch before or behind the base position.

Hereby the controls do not show an error message!



ATTENTION !

Only the cam 2 belonging to the curve disk or a cam of the same diameter may be used.

The cam may only be so wide that switch **b10** is no longer operated a stitch before or after the base position.

Before setting the switch **b10** the setting of the synchronizer must first be checked (see Chapter 12).

During the reference run the following conditions apply for the positioning in the base position:

- The sewing drive runs until cam 2 triggers switch **b10**.
- After reaching the 1st position the sewing drive stops in position 2.

If the display shows the error message "**GRUNDST**" the curve disk lies a stitch too far.

The switch **b10** must be reset.



Setting switch **b10**

- Loosen screws 1 slightly.
- Slide switch **b10** upward so that cam 2 reaches the switch sooner.
- Tighten screws 1.

The outgoing flank of the 1st position may not lie together with the incoming flank of switch **b10**.

- Set switch **b10** to cam 2 as described above.
- Check position 1 (thread lever low position) of the synchronizer (see Chapter 10.5).
- If necessary re-adjust switch **b10**.



10.3 Synchronizer

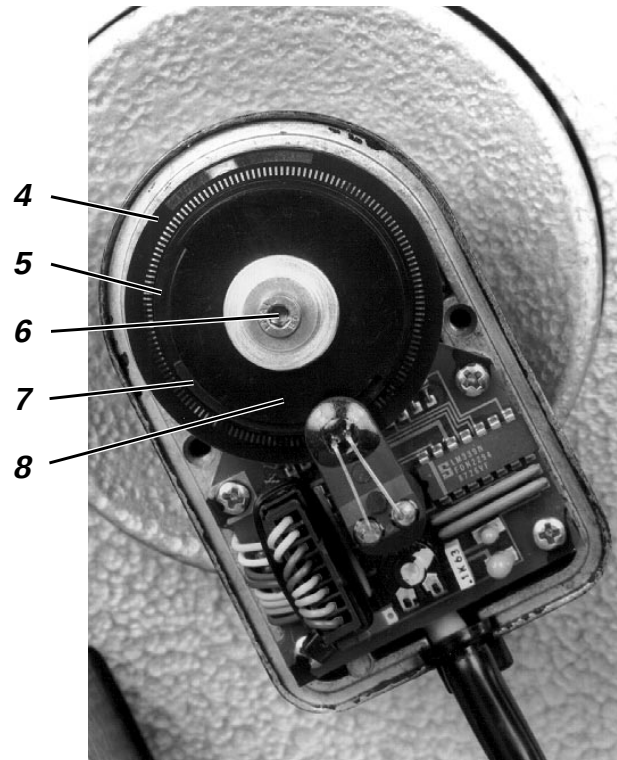
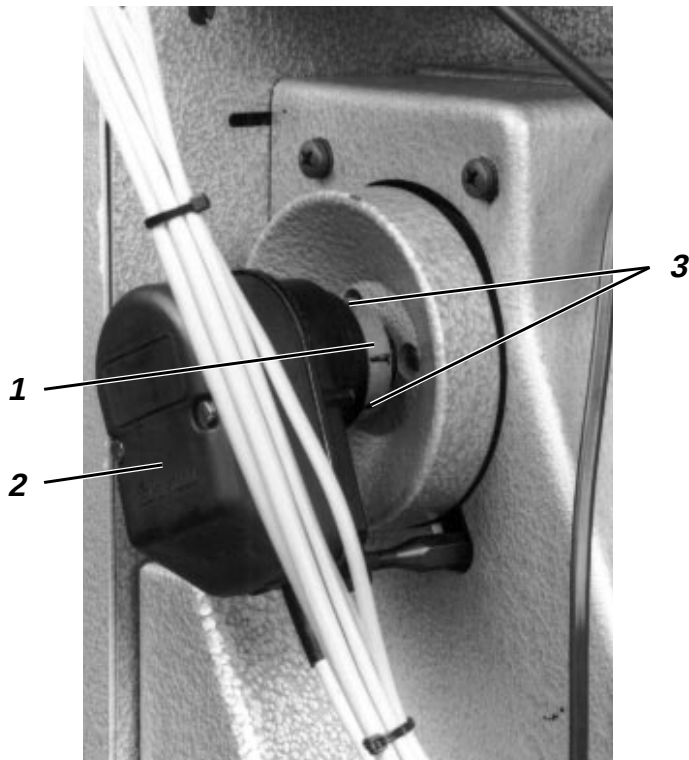
The sewing unit positions in two different positions:

Position 1: Thread lever low position

Position 2: Thread lever high position

The individual positions are determined by the position of corresponding light stops in the synchronizer.

Positioning is normally adjusted at the factory.



Caution Risk of Injury !

Before correcting each of the positions 1 through 2 turn the main switch off.

Position 2 (thread lever high position):

- Turn the main switch off.
- Turn the handwheel to bring the thread lever into a central position.
- Turn the main switch on.
The unit assumes position 2 (thread lever high position).
- Check the position of the thread lever, correcting it, if necessary.

To correct:

- Loosen the clamping screws 3 on the synchronizer ring 1.
- Hold the synchronizer ring 1 in position.
- Turn the handwheel to bring the thread lever to top dead center.
- Tighten the clamping screws 3.



Position 1 (thread lever low position)

- Set the "**Program**" switch to "**67**".
- Press the "**STOP**" key.
The program is activated.
The display shows "**N-TEST->Σ**".
- Press the "Σ" key.
- Select the rpm of the sewing drive with the "**Program**" switch.
- Press the "Σ" key.
The sewing drive runs at the selected rpm.
- Release the "Σ" key.
The sewing unit positions in position 1 (thread lever low position).
- Check the position of the thread lever.
If necessary, correct the positioning.

To correct:

- Remove the cover 2 of the synchronizer.
- Loosen clamping screw 6.
- Turn the light stops 4 and 5 so that their light slits are offset 180°, that is, lie across from each other.
- Tighten clamping screw 6.



11. Thread Burning Device

The electric thread burning device separates the needle and underthread by burning.

The needle thread is melted at the end.

The resulting small hardening hinders an unravelling of the seam.

To achieve a flawless melting of the thread ends only **synthetic** threads may be used.

The length of the burnt-off underthread on the material corresponds to the needle plate thickness of approx. 5 mm.

11.1 Thread Deflector

The thread deflector 3 pulls the thread quantity drawn-forward by the thread pull into the correct position for the burning procedure.

Swing movement

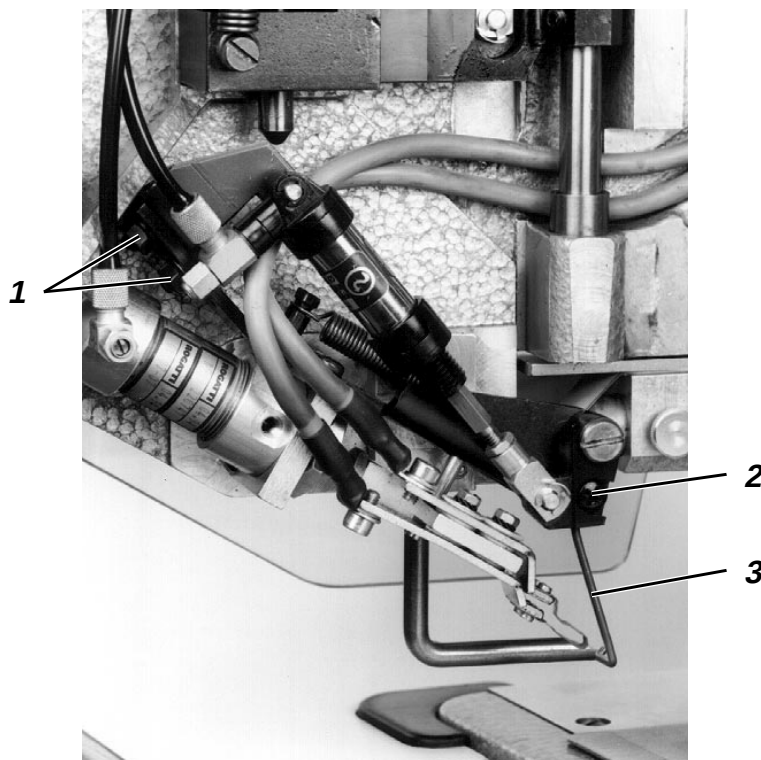
The thread deflector 3 must pull forward as much thread as possible.

The drawn-forward thread quantity may, however, only be so great that the thread is not under tension.



ATTENTION !

Too high a tension leads to a fraying of the thread during burning. The thread end does not melt together.

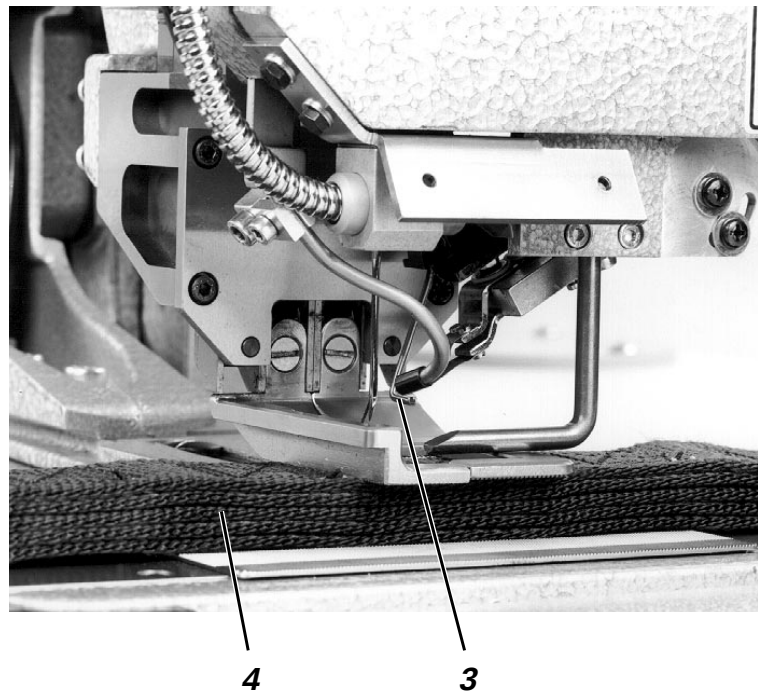


- Open the head cover.
All functions of the controls are blocked.
- Loosen the nuts 1.
- Set the swing movement of the thread deflector 3 by sliding the cylinder suspension up or down.
- Tighten the nuts 1.



Height of the thread deflector

In the thread lever high position of the unit the thread deflector 3 should move freely past under the needle.



- Place material 4 of the maximum allowable thickness ($t = 16 \text{ mm}$) or a spacer under the clamps.
- Lower the clamps.
- Turn the main switch off.



Caution Risk of Injury !

Turn the main switch off.
Check the height of the thread deflector 3 only with the main switch turned off.

- Swing the thread deflector 3 manually past under the needle.
The thread deflector 3 should not thereby strike against the needle.

To correct:

- Loosen clamping screw 2.
- Adjust the height of the thread deflector 3.
- Tighten clamping screw 2.



11.2 Upper Burning Device

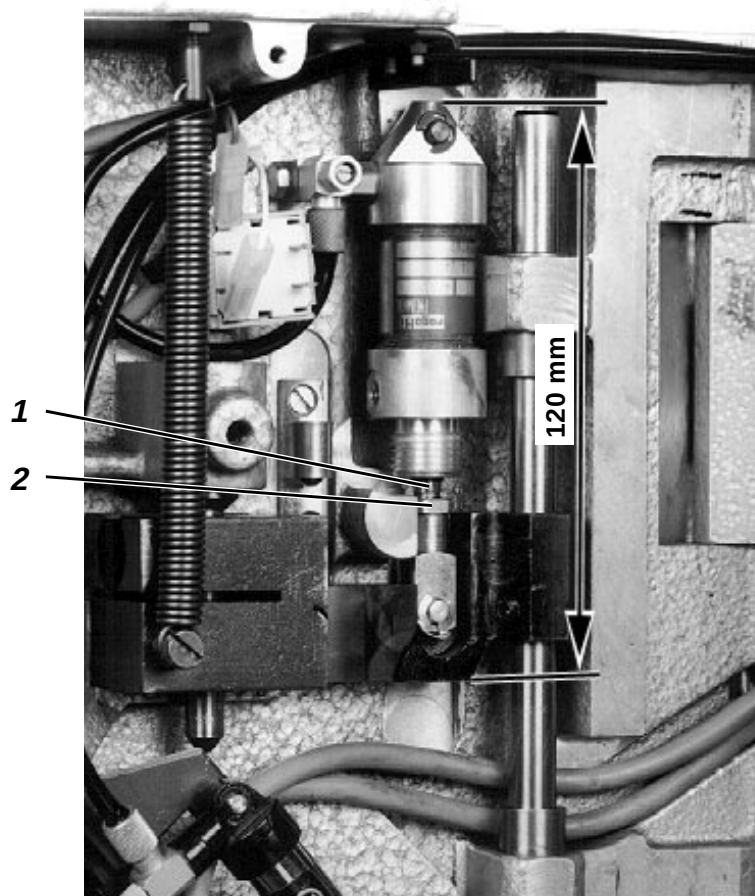
The correct sideways positioning of the burner to the thread is automatically made through the attachment of the burning device.

11.2.1 Position of the Fully Extended Burner

With a correct setting the following positions must be present:

- The fully extended burner must have a clearance of approx. 1 mm to the clamped material.
- The fully extended burner must touch on the thread positioned by the thread deflector with a slight pressure.

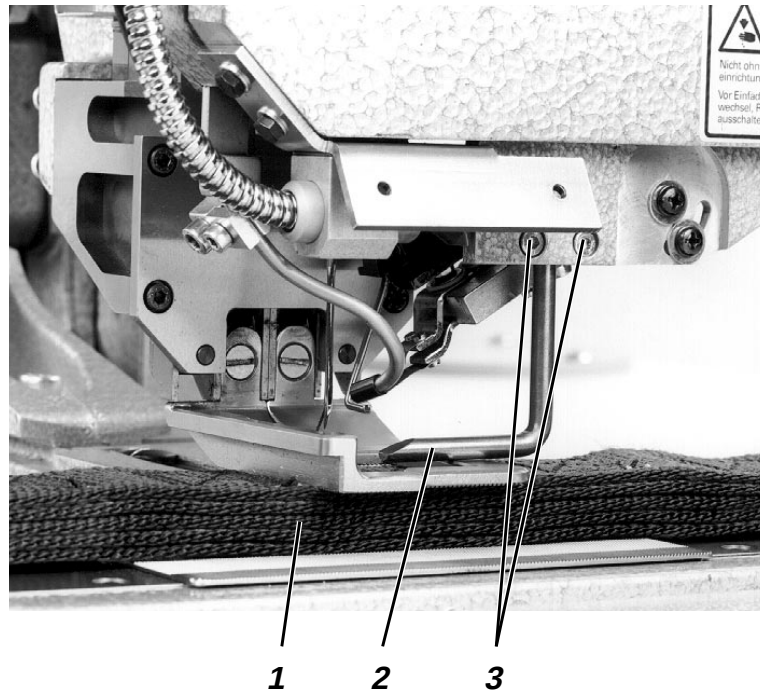
Both requirements are met when the clearance between the upper edge of the cylinder suspension and the lower edge of the mounting bracket is 120 mm.



- Open the head cover.
All functions of the controls are blocked.
- Loosen the lock nut 2 on the piston rod 1.
- Set the clearance between the upper edge of the cylinder suspension and the lower edge of the mounting bracket by turning the piston rod 1.
- Tighten the lock nut 2.



11.2.2 Setting the Height Stop of the Burner



- Place material 1 of the maximum allowable thickness ($t = 16 \text{ mm}$) or a spacer under the clamps.
- Lower the clamps.
- Turn the main switch off.



Caution Risk of Injury !

Turn the main switch off.
Set the height stop of the burner only with the main switch turned off.

- Remove the finger guard after loosening the mounting screws. The clamping screws 3 are readily accessible.
- Loose the clamping screws 3 slightly.
- Pull the height stop 2 downward until it touches the lowered clamps.
- Tighten the clamping screws 3.
- Reattach the finger guard again.



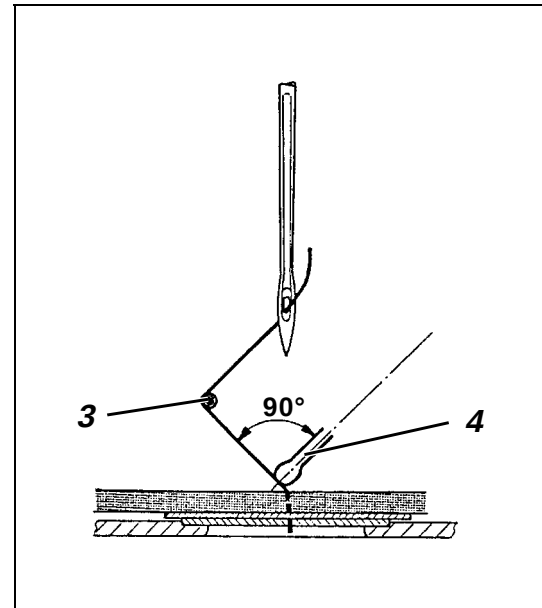
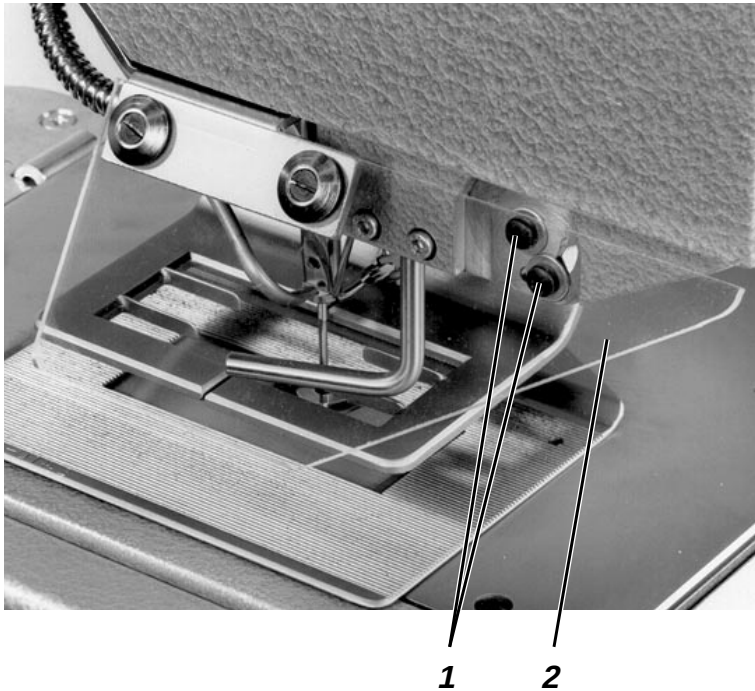
Caution Risk of Injury !

After completing the setting work it is essential that the finger guard be attached again.



11.2.3 Angle Position of the Burner

The burner 4 must be at an angle of approx. 90° to the thread positioned by the thread deflector 3.



Caution Risk of Injury !

Turn the main switch off.
Set the angle position of the burner only with the main switch turned off.

- Remove the finger guard 2 after loosening the mounting screws. The clamping screws 1 are readily accessible.
- Loosen the clamping screws 1 slightly.
- Set the correct angle position by swinging the burner.
- Tighten clamping screws 1.
- Attach the finger guard 2 again.



Caution Risk of Injury !

After completing the setting work it is essential that the finger guard be attached again.

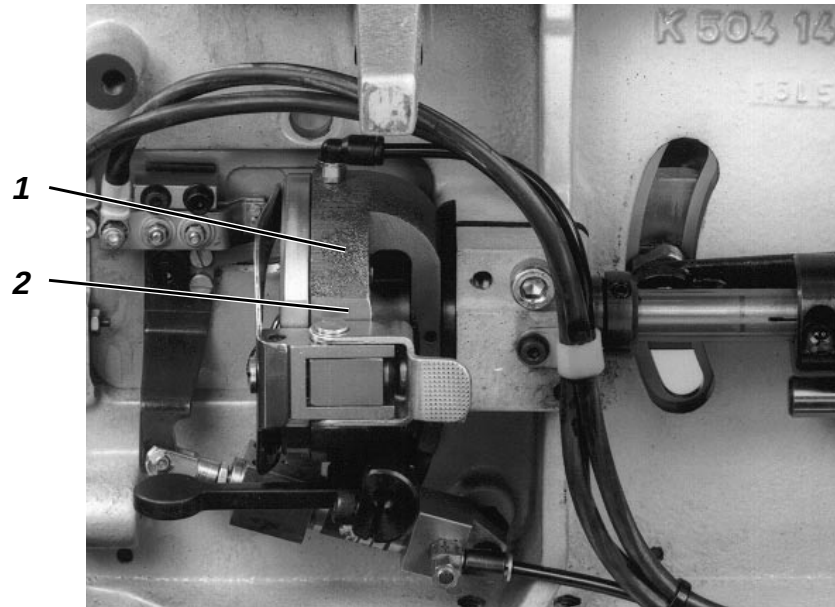


11.3 Lower Burning Device

11.3.1 Prerequisite for the Setting

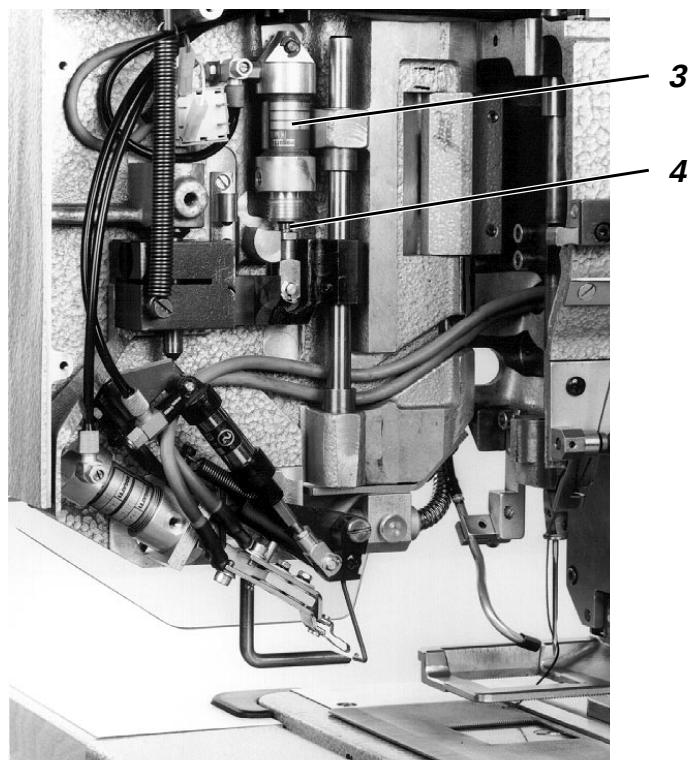
The following prerequisite applies for the setting of the lower burning device:

- The surface 2 on the shuttle run bearing 1 must lie parallel to the needle plate.



11.3.2 Initial Position

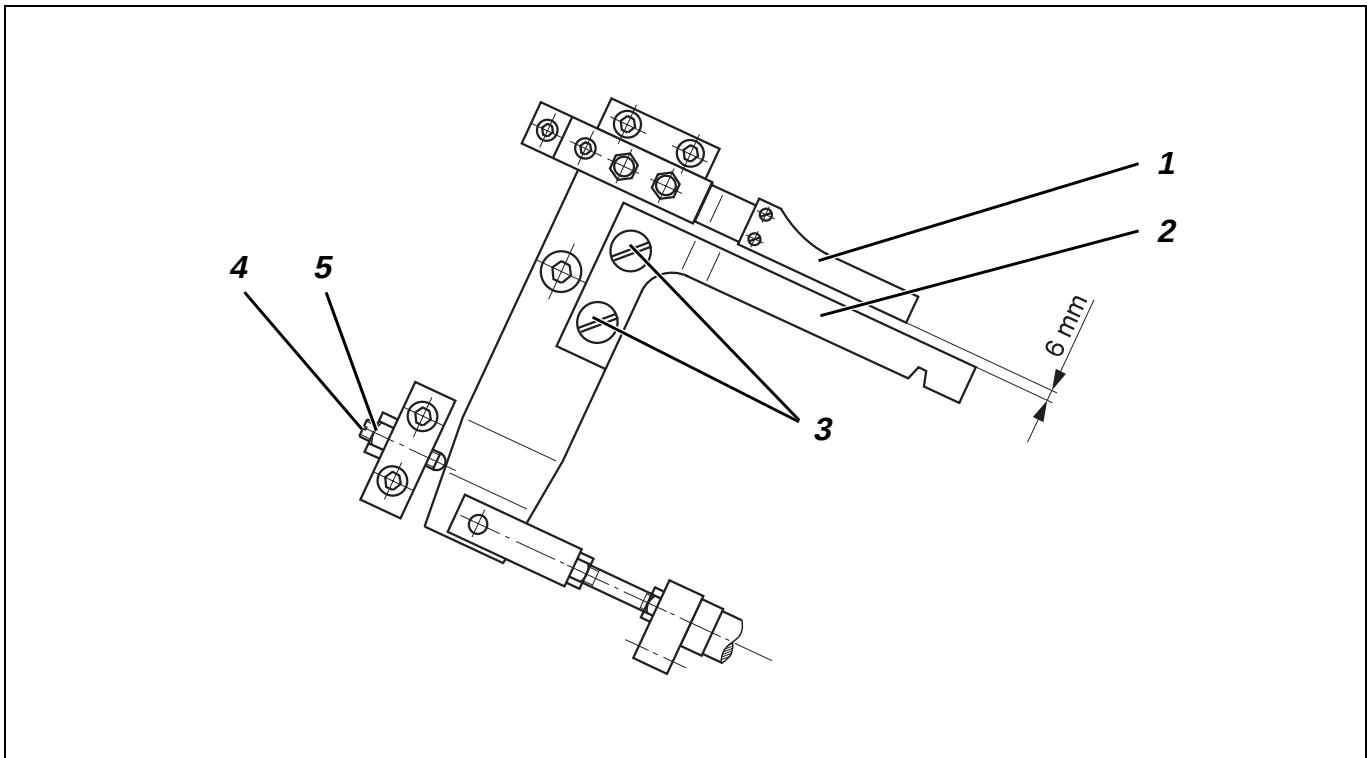
The burner is in its initial position when the piston rod 4 of the cylinder 3 is fully retracted. In this position the thread puller is outside the area of the needle hole.





11.3.3 Clearance between the Thread Puller and Burner

The clearance between the thread puller 2 and the burner 1 must be approx. 6 mm in the forward area.



Caution Risk of Injury !

Turn the main switch off.
Set the clearance between the thread puller 2 and burner 1 only with the main switch turned off.

- Tilt the machine head to the side.
- Loosen screws 3 slightly.
- Set the correct clearance by relocating the thread puller 2.
- Tighten screws 3.

11.3.4 Position of the Swung-forward Burner

The left side of the burner 1 must end in line with the outer edge of the needle hole bushing 6.



Caution Risk of Injury !

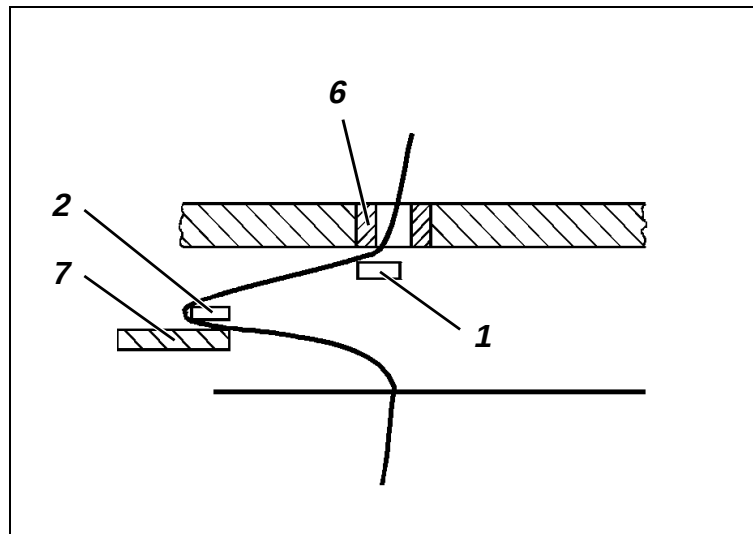
Turn the main switch off.
Set the position of the burner 1 only with the main switch turned off.

- Loosen the lock nut 5.
- Set the position of the burner by turning the stopper screw 4.
- Tighten the lock nut 5.



11.3.5 Height of the Burner

**The swung-forward burner 1 must touch the needle hole bushing 6 with light pressure.
In the initial position the burner 1 may touch no other part.**



Caution Risk of Injury !

Turn the main switch off.
Set the height of the burner 1 only with the main switch turned off.

To correct:

- Bend the burner 1 appropriately.

11.3.6 Height of the Thread Puller

The clearance between the thread puller 2 and the thread guide plate 7 must as small as possible.

The inclined position of the thread resulting therefrom aids in the burning process.

The underthread should, however, not be clamped in between the thread puller 2 and the thread guide plate 7.



Caution Risk of Injury !

Turn the main switch off.
Set the height of the thread puller 2 only with the main switch turned off.

To correct:

- Bend the thread puller 2 downward appropriately.



12. V-belt Tension

The notched V-belt must be under sufficient tension for the unit to run softly into the end position.

Tension the notched V-belt so that it can be pushed in at the center approx. 10 mm by finger pressure.



Caution Risk of Injury !

Turn the main switch off.

Set the V-belt tension only with the main switch turned off.

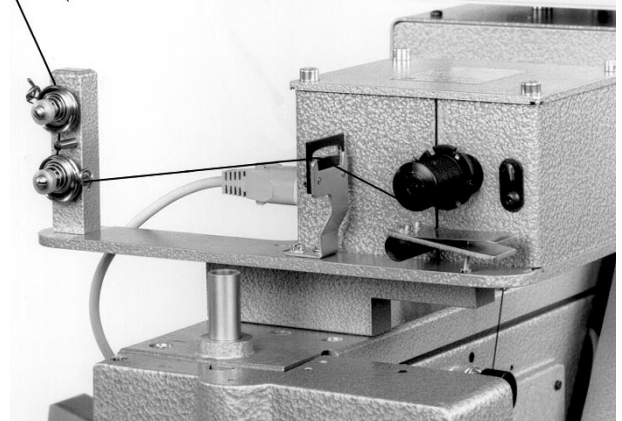
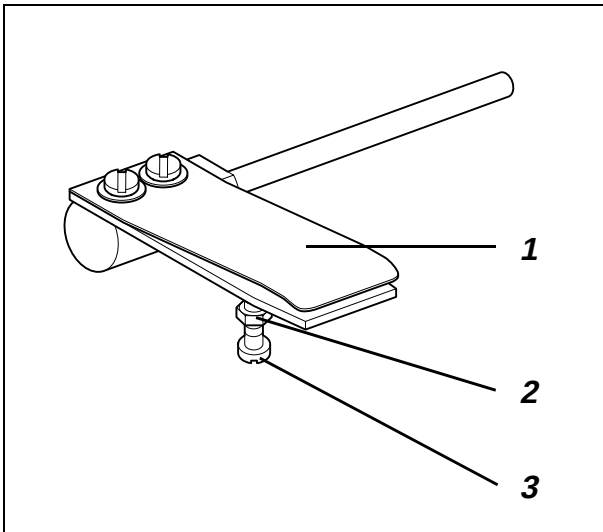
To correct:

- Loosen nut 1.
- Swing the sewing drive 2 until the correct V-belt tension is achieved.
- Tighten nut 1.



13. Setting the bobbin winder

The setting of spring 1 of the thread layer must be such that the thread layer switches off when the bobbin is full.



Caution Risk of Injury !

Turn the main switch off.
Set the bobbin winder only with the main switch turned off.

To correct:

- Loosen lock nut 2.
- Adjust the spring of the thread layer 1 by turning screw 3.
- Tighten lock nut 2.