DÜRKOPP ADLER

506-3

Manual

DÜRKOPP ADLER AG

Instructions, complete

506-3

Overview
Operating table Operating Instructions Installation Instructions Service Instructions   Pneumatic circuit plan 9770 506002 Interconnection-diagram 9890 506003 B

Foreword

This instruction manual is intended to help the user to become familiar with the machine and take advantage of its application possibilities in accordance with the recommendations.

The instruction manual contains important information on how to operate the machine securely, properly and economically. Observation of the instructions eliminates danger, reduces costs for repair and down-times, and increases the reliability and life of the machine.

The instruction manual is intended to complement existing national accident prevention and environment protection regulations.

The instruction manual must always be available at the machine/sewing unit.

The instruction manual must be read and applied by any person that is authorized to work on the machine/sewing unit. This means:

– Operation, including equipping, troubleshooting during the work cycle, removing of fabric waste,
– Service (maintenance, inspection, repair) and/or
– Transport.

The user also has to assure that only authorized personnel work on the machine.

The user is obliged to check the machine at least once per shift for apparent damages and to immediatly report any changes (including the performance in service), which impair the safety.

The user company must ensure that the machine is only operated in perfect working order.

Never remove or disable any safety devices.

If safety devices need to be removed for equipping, repairing or maintaining, the safety devices must be remounted directly after completion of the maintenance and repair work.

Unauthorized modification of the machine rules out liability of the manufacturer for damage resulting from this.

Observe all safety and danger recommendations on the machine/unit! The yellow-and-black striped surfaces designate permanend danger areas, eg danger of squashing, cutting, shearing or collision.

Besides the recommendations in this instruction manual also observe the general safety and accident prevention regulations!

General safety instructions

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

1. The machine must only be commissioned in full knowledge of the instruction book and operated by persons with appropriate training.

2. Before putting into service also read the safety rules and instructions of the motor supplier.

3. The machine must be used only for the purpose intended. Use of the machine without the safety devices is not permitted. Observe all the relevant safety regulations.

4. When gauge parts are exchanged (e.g. needle, presser foot, needle plate, feed dog and bobbin) when threading, when the workplace is left, and during service work, the machine must be disconnected from the mains by switching off the master switch or disconnecting the mains plug.

5. Daily servicing work must be carried out only by appropriately trained persons.

6. Repairs, conversion and special maintenance work must only be carried out by technicians or persons with appropriate training.

7. For service or repair work on pneumatic systems, disconnect the machine from the compressed air supply system (max. 7-10 bar). Before disconnecting, reduce the pressure of the maintenance unit. Exceptions to this are only adjustments and functions checks made by appropriately trained technicians.

8. Work on the electrical equipment must be carried out only by electricians or appropriately trained persons.

9. Work on parts and systems under electric current is not permitted, except as specified in regulations DIN VDE 0105.

10. Conversion or changes to the machine must be authorized by us and made only in adherence to all safety regulations.

11. For repairs, only replacement parts approved by us must be used.

12. Commissioning of the sewing head is prohibited until such time as the entire sewing unit is found to comply with EC directives.

13. The line cord should be equipped with a country-specific mains plug. This work must be carried out by appropriately trained technicians (see paragraph 8).

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

Danger of bodily injuries !

Please note also the general safety instructions.

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Preface and General Safety Information

Part 1: Operating Instructions Cl. 506-3

(Edition 10/2008)

1. Product Description

1.1 Description of the Proper Use and Proper Application

The 506-3 is a robust, heavy-duty, curve-guided single needle lockstitch short seam unit for seams of stitch type 301.
This short seam unit is designed for use in sewing heavy-weight fabric, as well as thick and hard leather.
Thick and hard leathers find use in the sewing on of trim pieces, in the sewing of buckle caps, tabs, suitcases, tarpaulins, knapsacks and backpacks.
Heavy-weight fabrics are used in the sewing of heavy-duty carrying belts, car belts, as well as belts for aviation.

Generally only dry sewing material may be worked with this machine. The material may be no thicker than 16 mm when pressed together by the lowered clamping feet.
The machine must be operated with eye protection. The information to be found printed on the yellow sign on the head cover is to be strictly adhered to.

The seam is generally made with synthetic sewing yarns with a dimension of 30/3 to 8/3. Those wishing to use other threads must first evaluate the dangers arising therefrom and, if necessary, take safety measures.

This heavy short seam unit may only be installed and operated in dry and clean areas. If the unit is used in other areas, which are not dry and clean, further, to be agreed upon, measures may become necessary (see EN 60204-31: 1999).

We, as manufacturer of industrial sewing machines, presume that the operating personnel working on our products have been given instruction so that all normal operations and the dangers possibly arising therefrom can be assumed to be known.

1.2 Short Description

Uniform Quality

The unit always produces a uniform seam formation.
The high thread tension necessary for the working of heavy materials is achieved through a hinged thread lever.

Direct Power Transmission

The power transmission from the motor to the arm shaft occurs via a special V-belt. This results in a particularly strong perforating power for the sewing of thick materials or multiple layers.

Interchangeable Curve Disks and Material Clamps

The different seam formations are determined by easily interchangeable curve disks.
The material guidance occurs via a pattern curve with two guide curves. The difficult and time-consuming turning of heavy pieces of material by the seamstress is thus unnecessary.
The transmission of the movement to the material clamps occurs via lever systems.
By changing the lever multiplication the seam formation sizes can be varied within certain limits.
All curve disks belonging to a stitch number range are interchangeable among each other.

Large Put-through Area and Large Placement Surface

The large put-through area allows the making of short seams far from the edge of the material. A rolling-in of flexible sewing material is possible. The closed width base plate offers a large placement surface and simplifies the feed.

Pneumatic Clamp Opening

The stroke of the holder clamp is a maximum 20 mm. This stroke allows the working of almost all sewable materials and leather thicknesses.

Electric Thread Burning Device

The thread separator device separates the needle and underthread by burning immediately at the top edge of the material. The synthetic threads are melted together at the ends. The thus created hardening hinders a loosening of the seam and a unthreading of the needle thread.

Control Unit Quick DA104ED

The complete control of the sewing unit occurs via a Quick control unit. It assumes the control tasks, monitors the sewing process and indicates operator errors and malfunctions.

ATTENTION!

These operating instructions give the key functions and describe how operator-level parameter values are changed by the operator.

For a detailed description of the control unit, please consult the enclosed current issue of the operating manual of the motor manufacturer.

1.3 Technical Data

Sewing area:	maximum 60 x 100 mm
Needle system:	428; 428 Serv Nm 250; 794 (for thick sewing material only)
Needle thickness:	Nm 120 - Nm 280 depending on the type of sewing thread and the sewing material.
Yarns:	Synthetic yarns Nm 30/3 - 8/3
Bobbin capacity:	23 m with 18/3 yarn
Stitch type:	Lockstitch type 301
Number of stitches:	1100 / min
Number of stitches per guide curve revolution:	42, 58, 72 (without gear reducer) 84, 116, 144 (with gear reducer)
Seam formation	72 stitches in 3.5 sec. or 144 stitches in 7 sec.
Looping stroke:	4 mm
Clamp stroke:	max. 20 mm
Sewing material thickness:	max. 16 mm (sewing material pressed together by the clamp)
Power:	0.55 kW
Motor rpm:	max. 2800 rpm
Operating pressure:	6 bar
Air consumption:	approx. 1,2 NL per work cycle
Motor specifications:	
Voltage:	1 x 230V, 50/60Hz
Power:	0,55 kW
Speed:	4000 rpm
Torque:	1.2 Nm
Dimensions:	(H x W x D) 1720 x 1100 x 736 mm The listed height dimension applies to the work height of the frame set at the factory.
Put-through area:	210 x 140 mm
Work height:	760...1060 mm (upper edge of the table top)
Weight:	160 kg

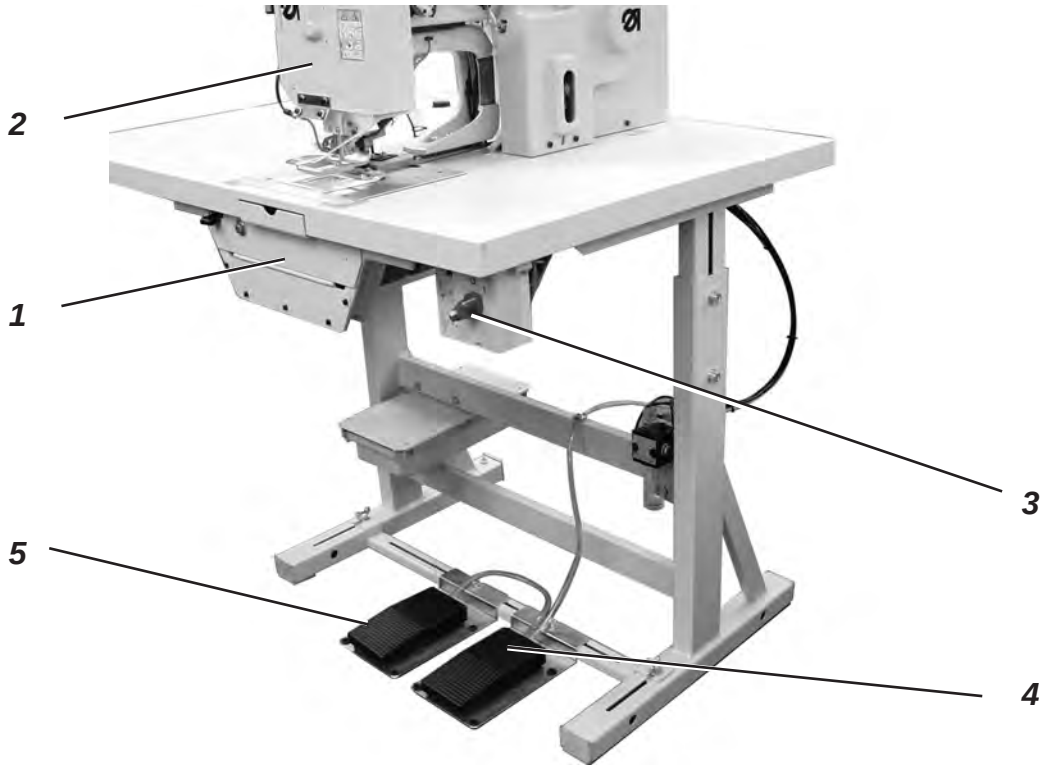
Noise emission

Workspace-specific emission value as per DIN EN ISO 10821:
L_{pA} = 79,4 dB(A), K_{pA} = 0,40 dB(A)

Notes:

2. Operation

2.1 Automatic Sewing Sequence



ATTENTION !

The starting of a sewing sequence is only possible with the head cover 1 and cover 2 for the hook area closed.
If the head cover or cover for the hook area is open all functions of the controls are blocked.

Work procedure (in foot switch mode 1)

- Turn the main switch 3 on.
  The clamps are in their upper position.
- Select sewing program.
- Align the sewing material under the clamps.
  Depending on the type of work sequence this can occur according to the markings or the stops mounted specifically for the customer.

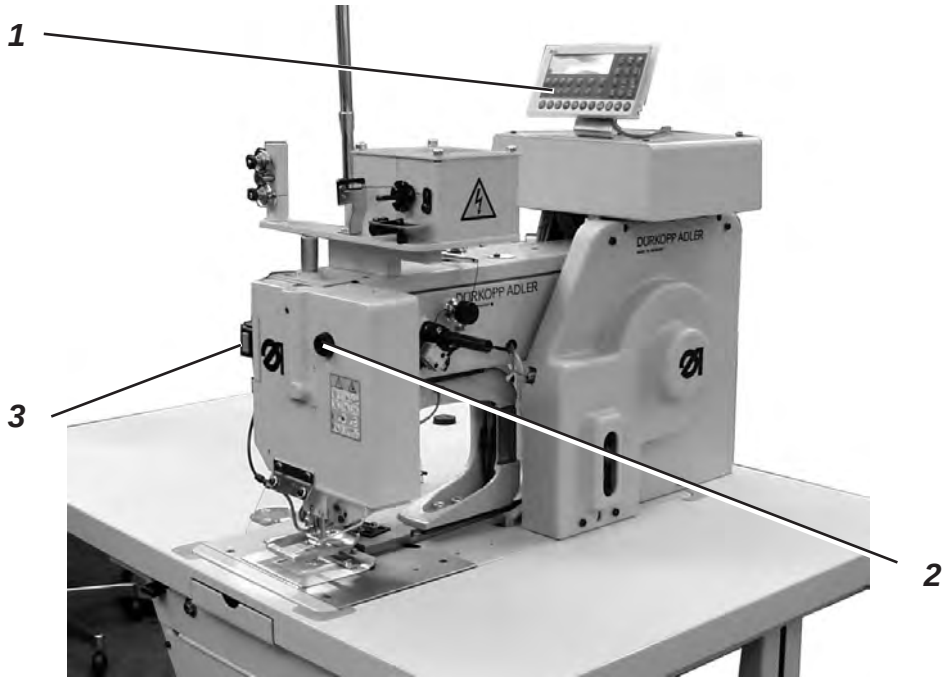
Caution Risk of Injury !

Keep hands free of the lowering clamps.

- Operate the right foot switch 4.
  Both clamps lower simultaneously.
- Check the correct alignment of the sewing material.
  To correct the sewing material alignment operate the right foot switch again.
  Both clamps rise.
- Operate the left foot switch 5.
  The automatic sewing sequence starts.

– For a secure sewing-on pull the thread end hanging out of the needle to the side when starting the **first** sewing sequence and hold it tight.
After the first stitches the thread can be released again.
– The automatic sewing sequence runs through according to the selected sewing program.
For an exact description of the different sewing programs see “Quick User’s manual”.
– After the sewing sequence ends the clamps are raised automatically.
– Remove the sewing material.

Quick stop



The safety system of the 506-3 has two different options for the immediate shut-off of the unit by operator error, needle breakage, thread breakage etc.:

– Pressing the **Stop** key 1 on the front panel of the controls.
The sewing sequence is interrupted.
– Pressing the **Stop** key 2 on the head cover.
The sewing sequence is interrupted.

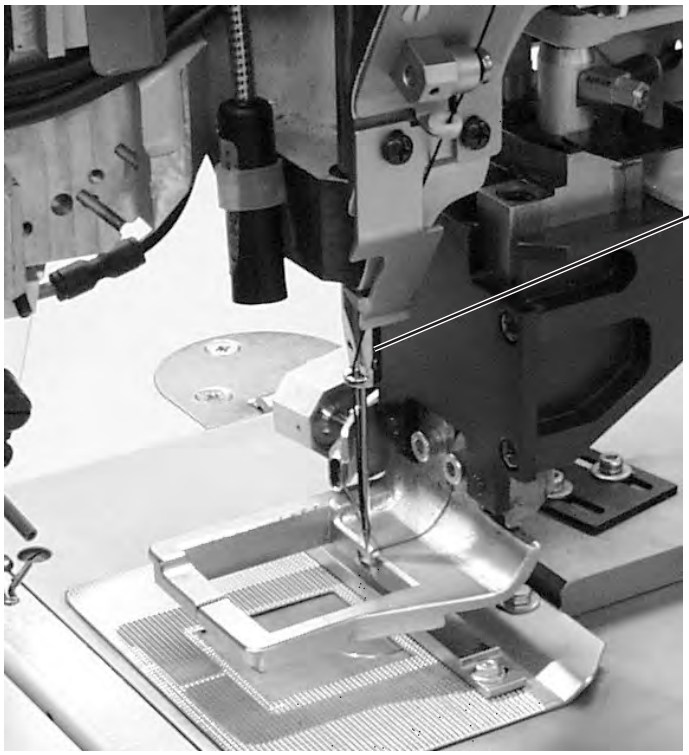
Bring the sewing machine to its starting position:

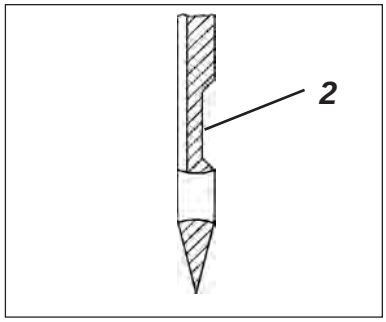
– Press button 3 on the sewing head.
The needle moves to its uppermost position.
– Press button 3 on the sewing head again.
The automatic sewing machine slowly returns to its starting position.

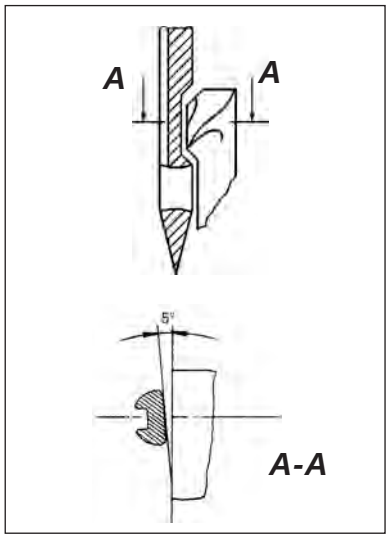
2.2 Needles and Yarns

Needle system: 428; 428 Serv Nm 250; 794
(depending on the type of sewing thread and sewing material used)
Needle thickness: Nm 120 - Nm 280
(depending on the type of sewing thread and sewing material used)
Yarns: Synthetic sewing yarns (30/3 to 8/3)

Changing the needle:







Caution Risk of Injury !

Turn the main switch off.
Change the needle only with the unit turned off.

- Open the head cover.
- Loosen screw 1.
- Remove the needle.
- Push the new needle into the hole in the needle bar up to the stop. Hereby align the needle with the furrow 3 to the hook. The furrow 2 must show to the front (to the seamstress).
- Tighten screw 1.

Attention Danger of Breakage!

After a change to a needle with a different needle thickness it is essential to check the clearances **hook point-needle** and **driver-needle**.
If necessary reset the clearances (see Part 3: Service Instructions).

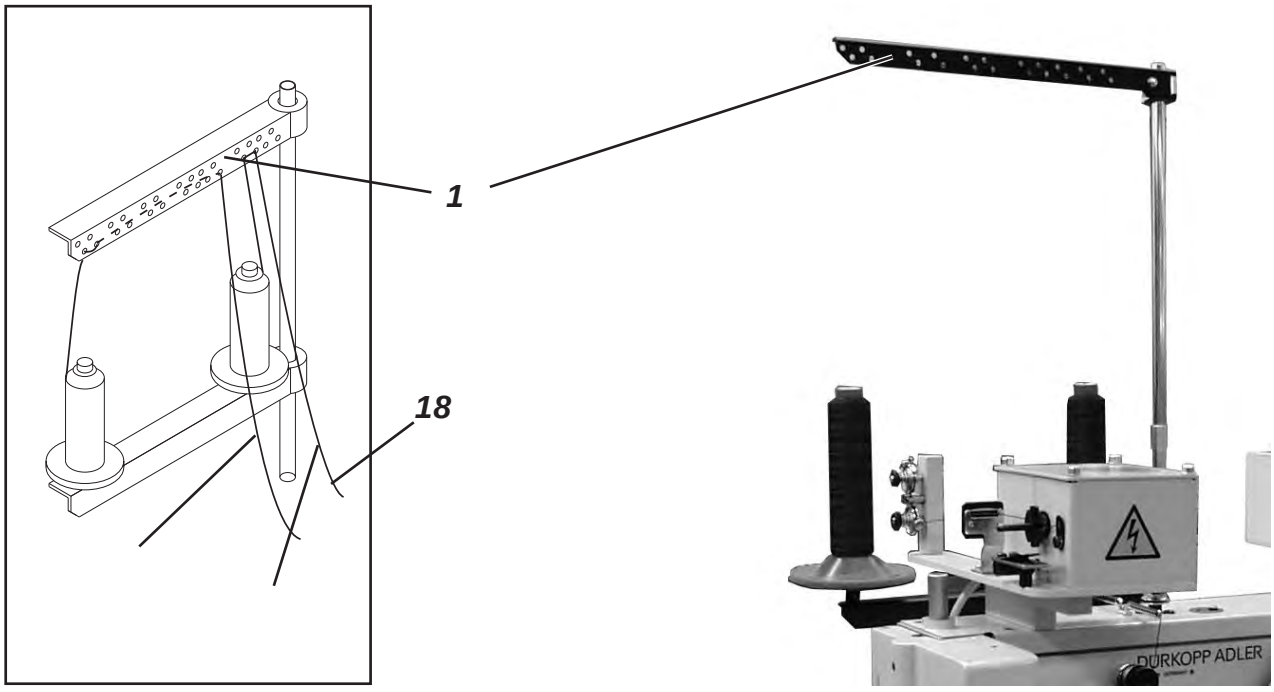
2.3 Threading the Needle Thread

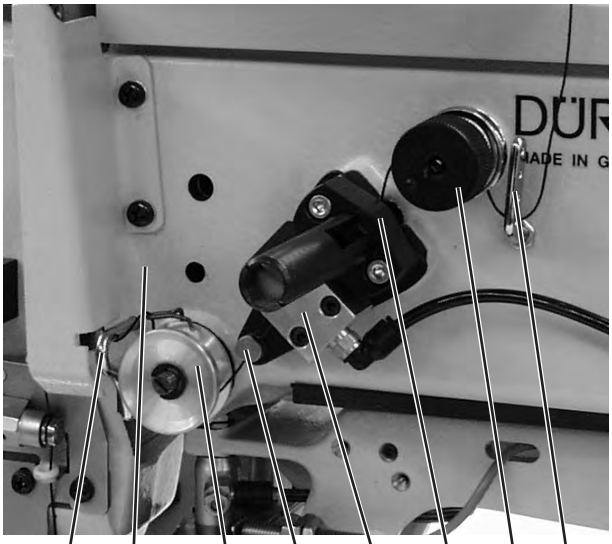
Caution Risk of Injury !

Turn the main switch off.
Thread the needle thread only with the unit turned off.

The threading of the needle thread 18 occurs as shown in the pictures alongside in increasing numerical order:

- Place the yarn roll on the yarn stand.
- Thread the thread through the holes 1 of the yarn stand.
- Thread the thread through thread guide 2.
- Lead the thread through between the tension disks of the first needle thread tension 3.
- Thread the thread consecutively through thread guides 4 and 5.
- Guide the thread through between the tension disks of the second needle thread tension 6.
- Thread the thread consecutively through the hole in the thread pull 7 and thread guide 8.
- Wind the thread from the bottom approx. two times around the thread roller 9.
- Guide the thread through the thread controller spring 10.
- Guide the thread under the thread guide 12.
- Open the head cover.
- Thread the thread through the hole in the thread lever 13.
- Guide the thread through the hole in the thread control plate 14.
- Insert the thread from the side into the thread gripper 15.
- Thread the thread through the thread guide 17 on the needle bar.
- Thread the thread from the front to the back through the eye of the needle.

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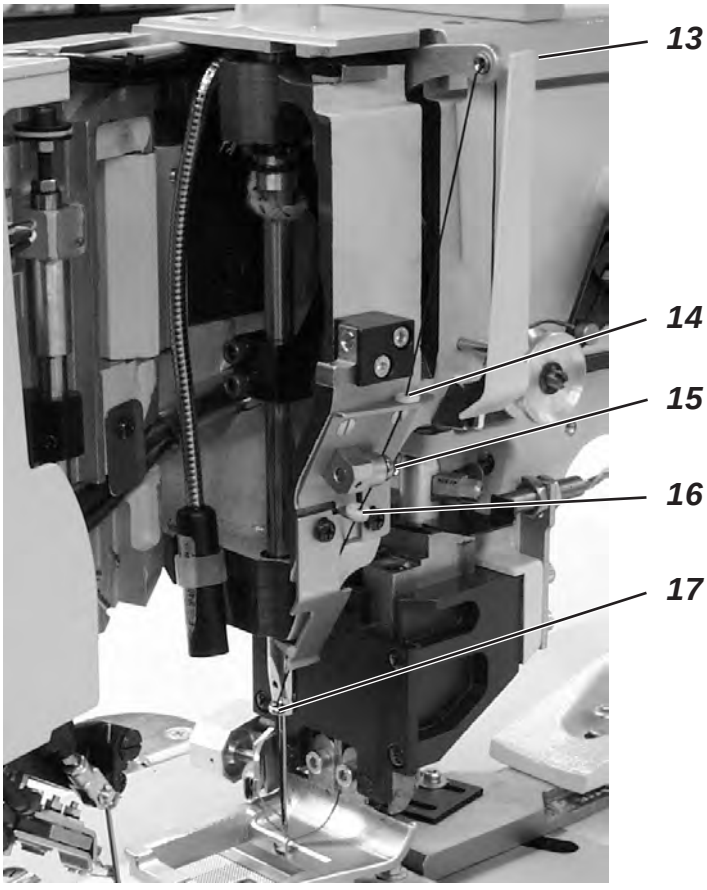
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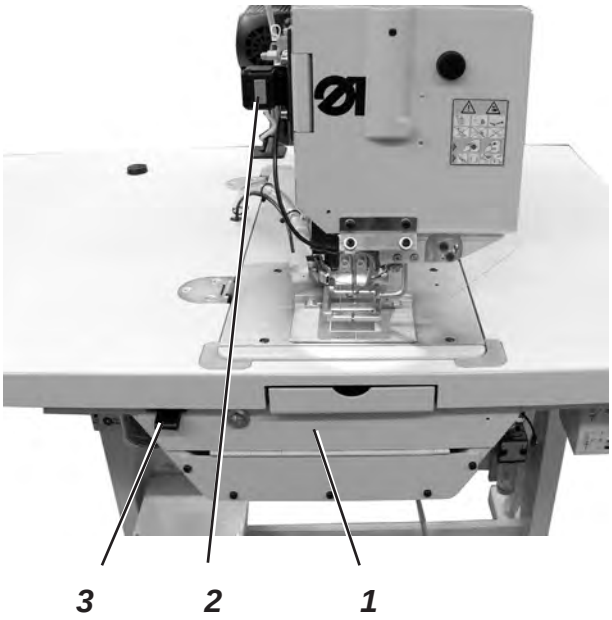
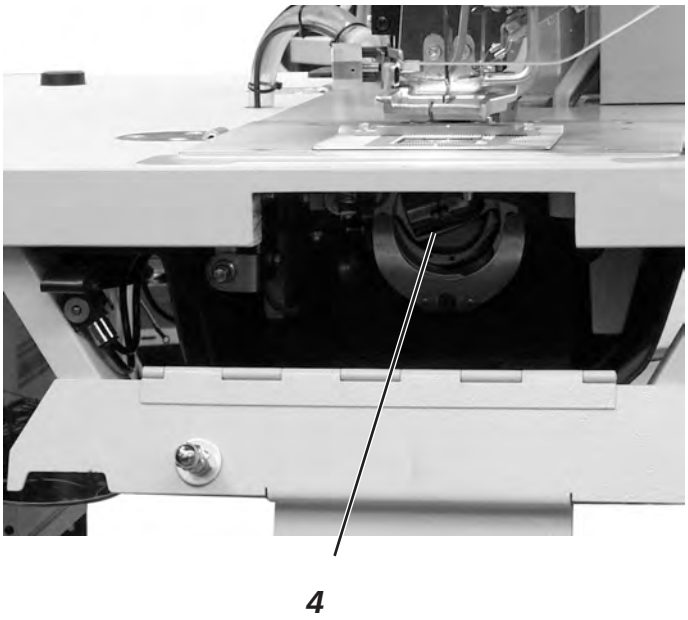
2.4 Changing the Bobbin





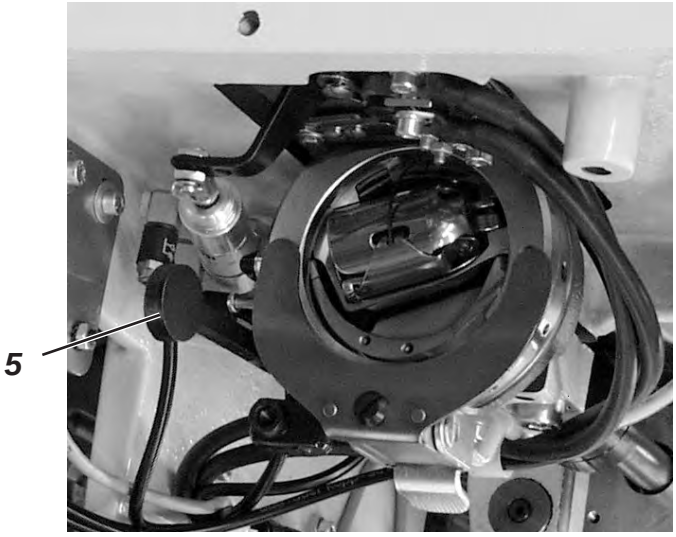
Remove the bobbin

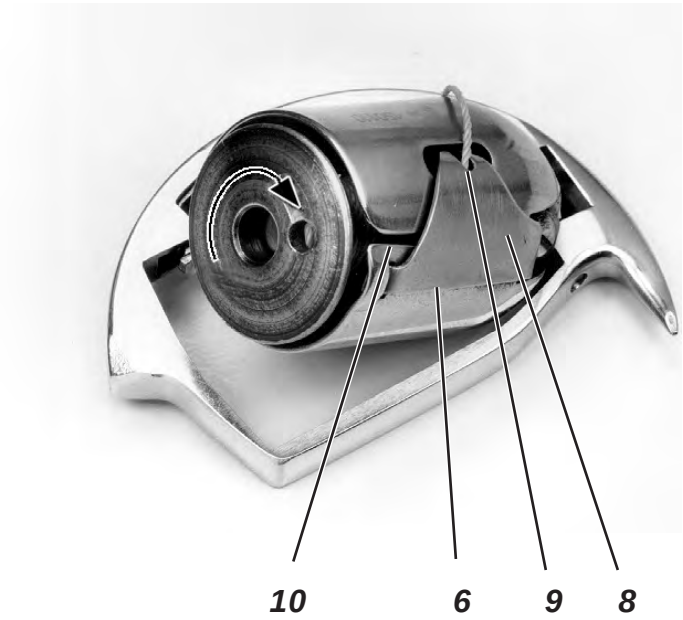
- Press button 2 on the sewing head or button “ ” on the control unit.
- Hold on to cover 1 and push the locking lever 3 upwards to unbolt the cover.
- Fold cover 1 forward and down.

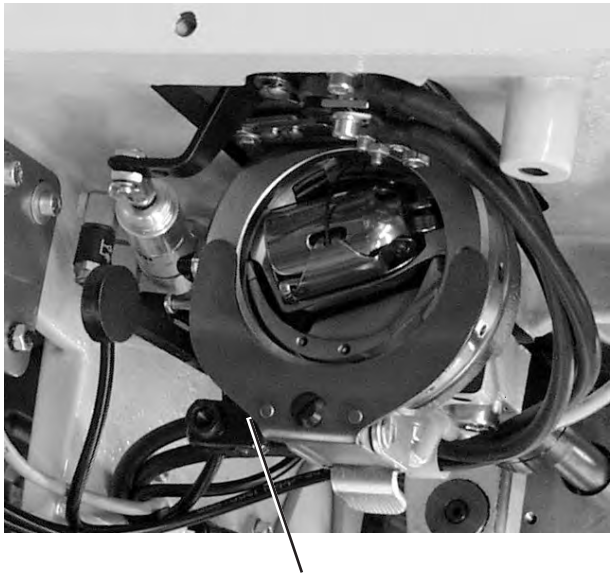
ATTENTION !

Cover 1 is monitored by a safety switch.
With the cover open, all functions of the controls are blocked.
Starting the sewing sequence after a change of bobbin is only possible with the cover closed.

- To swing the bobbin case 4 out press the ejector lever 5 to the left.
- Remove the bobbin from the bobbin case 4.







Inserting a full bobbin

– Place the full bobbin in the bobbin case 6.
  Here take care that when thread is being pulled off the bobbin must turn **clockwise** (see the arrow direction)!
– Swing in the bobbin case 6.
– Pull the thread through the slit 10 into the opening 9 on the spring 8.

ATTENTION !

A thread sliding out of slit 10 can lead to missing stitches and needle breakage.
Therefore pull the thread so far through slit 10 until it lies secure in the opening 9 on the spring 8.

– Insert the bobbin case.
– Pull the thread out of the bobbin case.
– Close cover 1.
– Press “Σ” button.

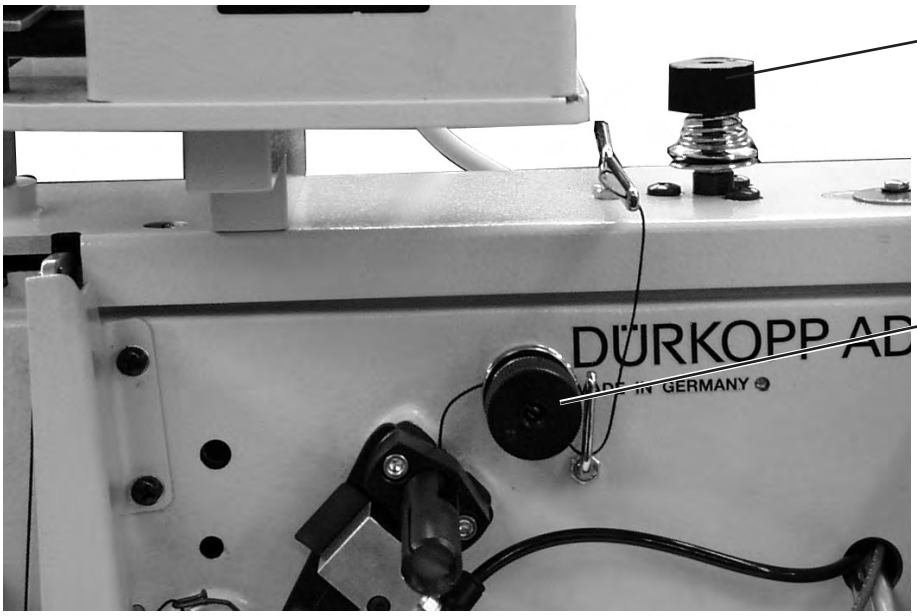
  The item counter is reset.
– Start new sewing run.

2.5 Thread Tension

Set the thread tensions appropriate to the yarn types and thicknesses used so that a clean seam formation results.

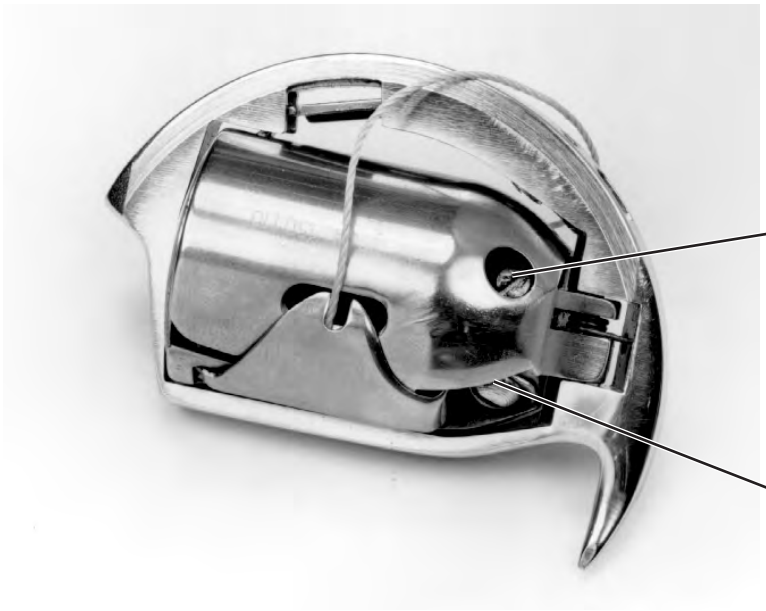
Too high thread tensions cause a crimping of the sewing material. Too low a bobbin thread tension can lead to missing stitches.

Setting the needle thread tension



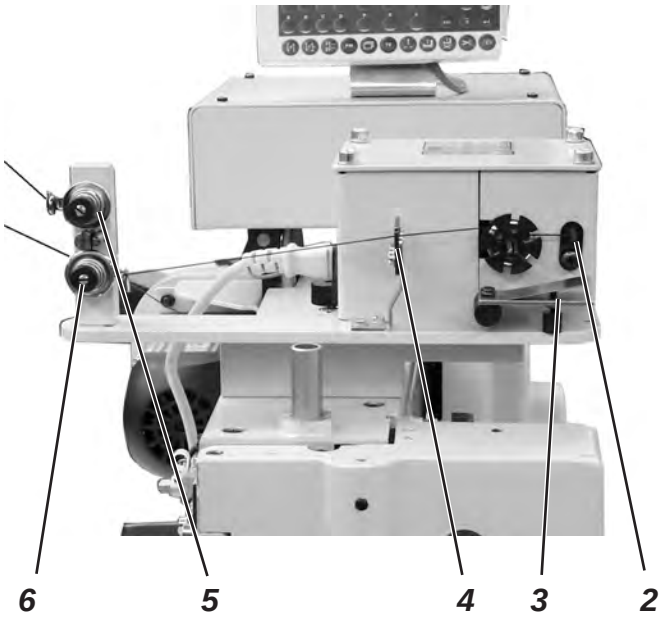
– Set the upper needle thread tension by turning the knurled screw 1 and the lower needle thread tension by turning the knurled screw 2.

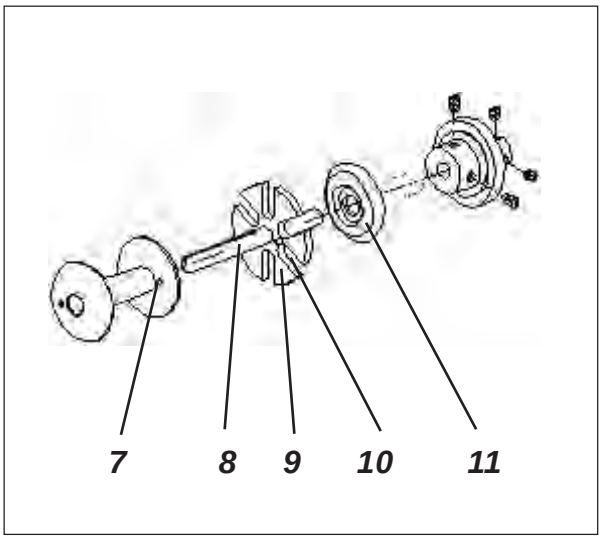
Setting the bobbin thread tension

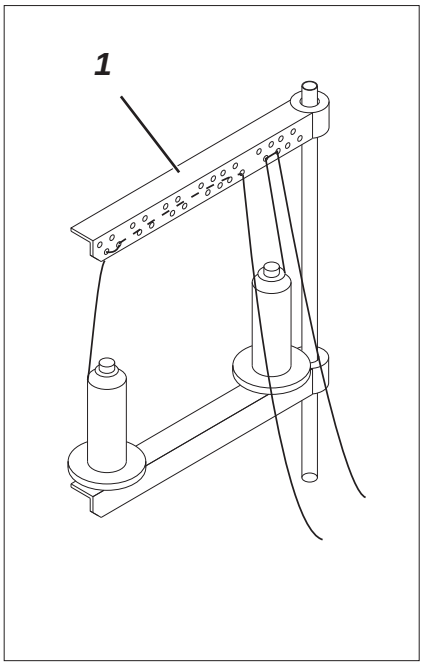


– Loosen the fastening screw 3.
– Set the bobbin thread tension by turning the setting screw 4.
– Tighten the fastening screw 3.

3. Bobbin winder







Reeling on the spool thread

- Place yarn reel on reel stand.
- Thread the thread through the holes 1 in the reel stand.
- Pass the thread through the tension discs of tensioner 2.
- Pass the thread through the tension discs of tensioner 3 of the reel.
- Pass the thread through the slot in guide 4.
- Pass the thread through the hole 7 in the empty reel.
- Place the empty reel on the bobbin shaft 8.
  The pin 10 of the bobbin shaft must fit into the hole 7.
- Pass the thread through the star 10 and clamp it in the tensioner 11.
- Use the thread clipper 6 to cut off the end of the thread.
- Raise the thread layer 5.
  The bobbin winder is switched on and the winding process begins.
- As soon as the reel is full the thread layer 5 springs back into position and the winding process is terminated.

4. Maintenance

Caution Risk of Injury !

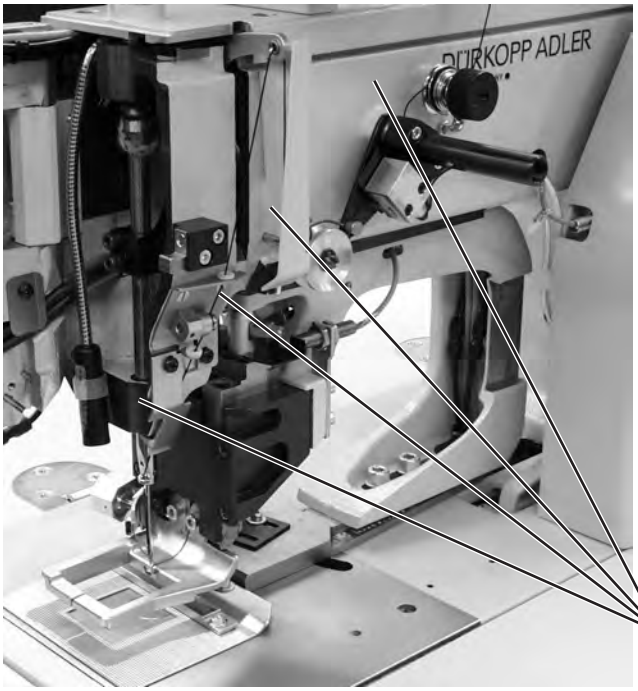
Turn the main switch off.
Maintenance work on the unit may only be conducted with the machine turned off.

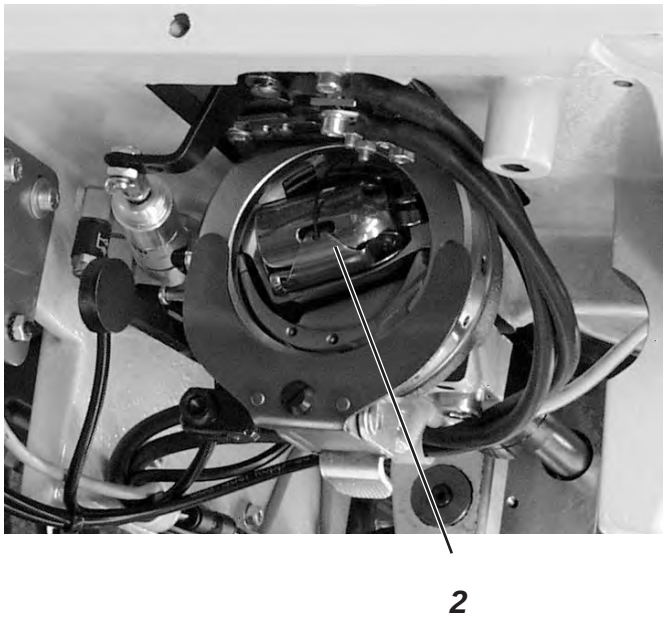
4.1 Cleaning

A clean machine protects against malfunctions !

Daily cleaning:

– Particularly the areas around the needle thread guides 1 and tensions, thread controller spring and hook 2 are to be cleaned of sewing dust and lint accumulations (e.g. with a compressed air gun).
For cleaning the parts attached under the foundation plate tilt the machine head aside.



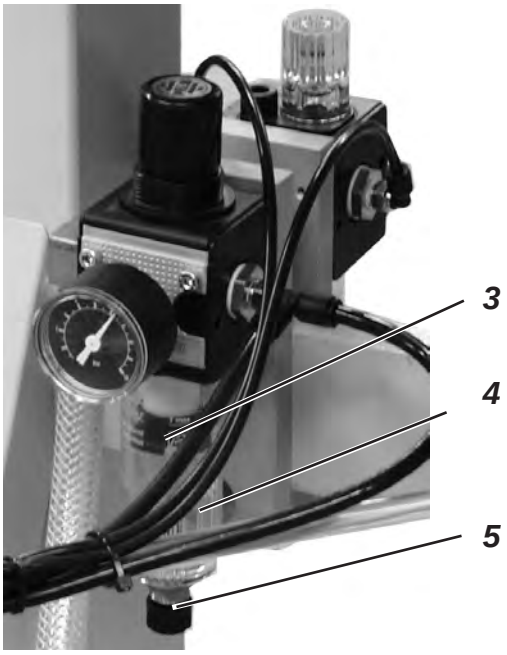


– Check the water level in the pressure regulator.
The water level should not be allowed to rise to the filter insert 3.
After screwing in the drain screw 5 blow the water out of the water separator 4 under pressure.

Dirt and condensation water are eliminated through the filter insert 3.
Wash out the dirty filter bowl and filter insert with naphtha after a certain period of operation and blow clean with compressed air.

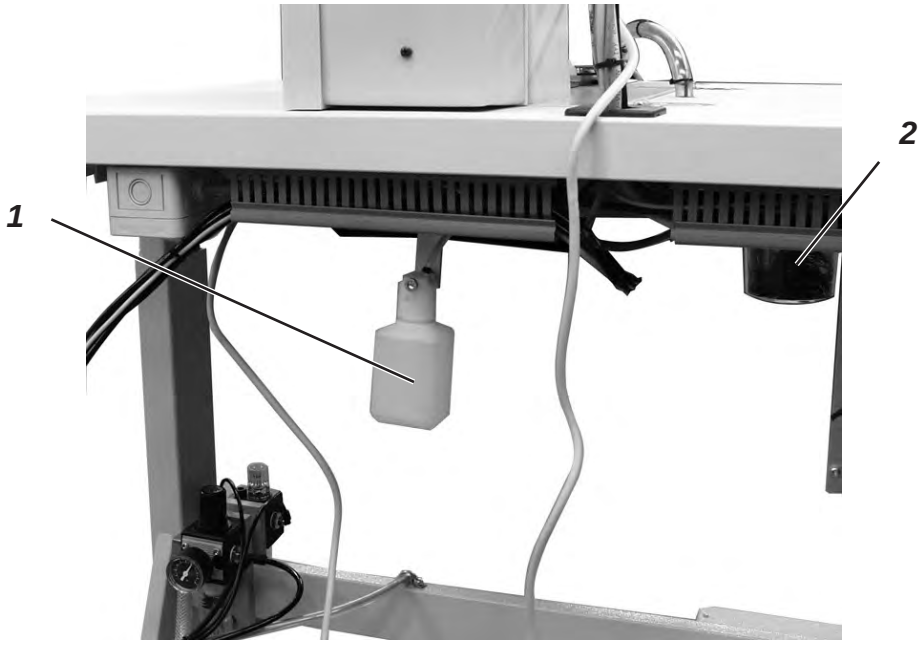
ATTENTION !

Do not use solvents for washing!
They destroy the filter bowl.



Cleaning as required:

– Empty sump pan 1 of the central recirculating-lubrication unit.
– Empty collection bag 2 of the thread-suction device and remove any accumulations of fluff (e.g. with a compressed air gun).



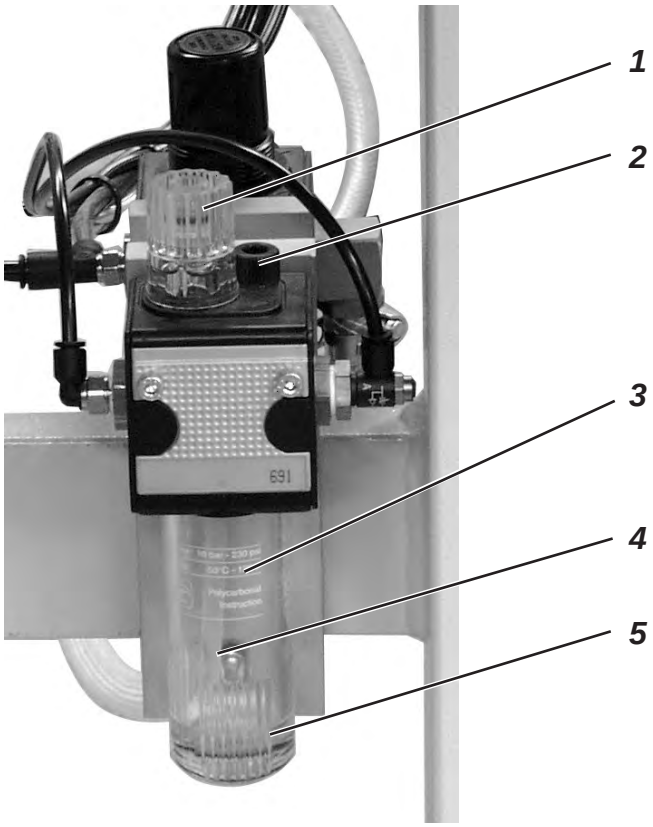
4.2 Lubrication

For lubrication of the machine use only **DA-10** lubricating oil.
DA-10 is available from **DÜRKOPP ADLER AG** retail outlets.

Check the oil level in the oil reservoir of the oil mister

The run of the barrel shuttle is lubricated and cooled by compressed air enhanced with oil from the oil mister.

- The oil level in oil reservoir 5 must not fall below the suction tube 4.
- If necessary, top up with oil to the upper edge of the embossed text 3.
- For topping up screw out the oil filler screw 2.



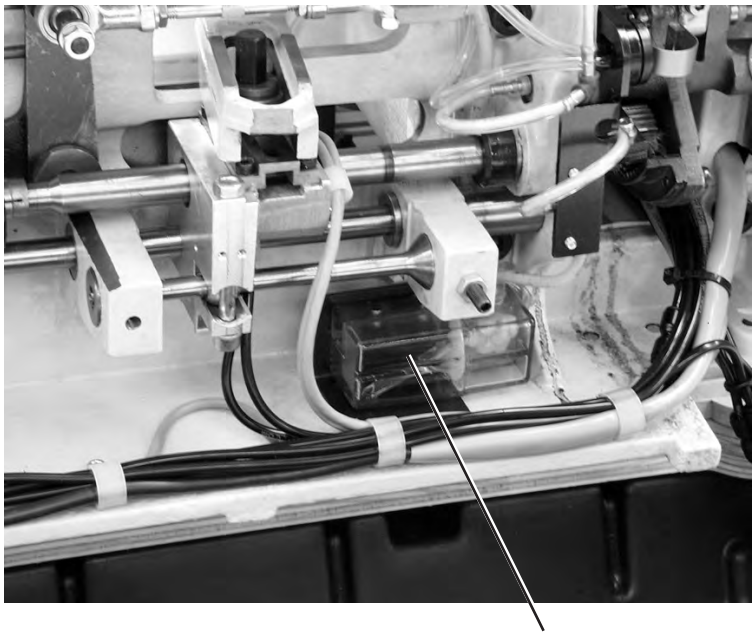
Check the feed quantity of the oil mister weekly

- Under operating pressure a drop of oil should drip out of the pipe under the viewing glass 5 after every 2 to 3 work cycles.
- Regulate the strength of the thus created oil mist at the setting screw 1.

Checking the oil level in the oil reservoir of the central lubrication unit

The central recirculating-lubrication unit automatically supplies all the automatic sewing machine's important lubrication points.

– The oil level in oil reservoir 1 must not fall below the "min" mark.
– If necessary, top up with oil to the "max" mark.



Notes:

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Part 2: Installation Instructions Cl. 506-3

1. Scope of Delivery

- Frame with sewing drive and table 1100 x 736 mm
- Sewing machine with integrated bobbin winder
- Quick control unit
- Compressed air maintenance unit
- Yarn stand
- Foot switches
- Sewing light
- Tools and small parts in the accessories pack

2. Installation of the Unit

ATTENTION !

The unit may only be set up by trained personnel.

Before installing the unit it is essential that all transport fastenings be removed!

2.1 Transport

For in-house transport lift the unit and transport on a suitable wagon (e.g. lift truck).

2.2 Setting the Work Height

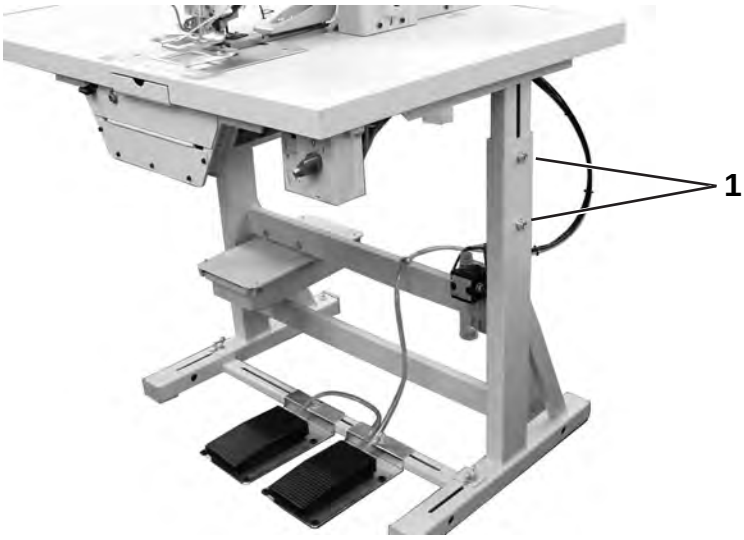
The work height can be set between 76 cm and 106 cm (measured to the upper edge of the table).

The unit is set at a work height of 82 cm at the factory.

Caution: danger of injury

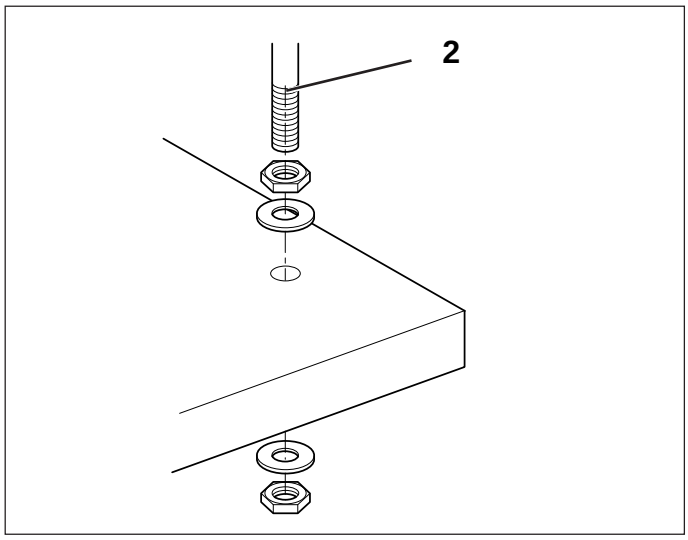
The automatic sewing machine is very heavy. Once the screws have been removed the table top may fall at high speed.

When adjusting the working height it is essential to use auxiliary equipment such as trestles, lifting tackle and the like.



- Loosen the locking screws 1 on both sides of the frame.
- Set the base plate horizontally at the desired work height.
  In order to avoid a tilt pull out or push in the base plate uniformly on both sides.
- Tighten the locking screws 1.

2.3 Attaching the Yarn Stand



- Insert the yarn stand 2 into the appropriate hole in the table and attach with the nuts and washers.

3. Electrical Connection

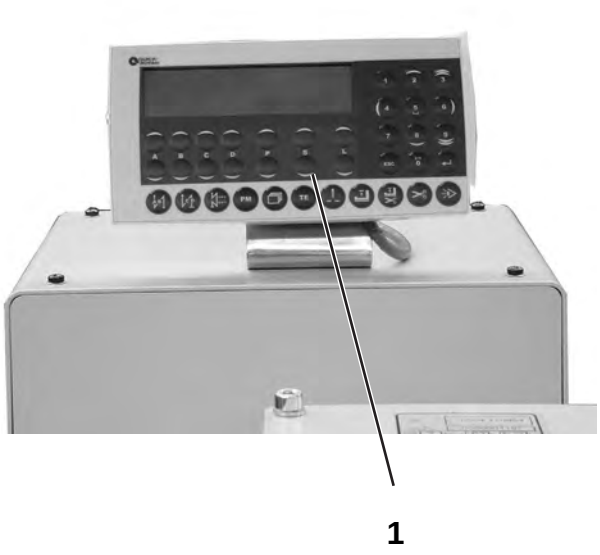
ATTENTION !

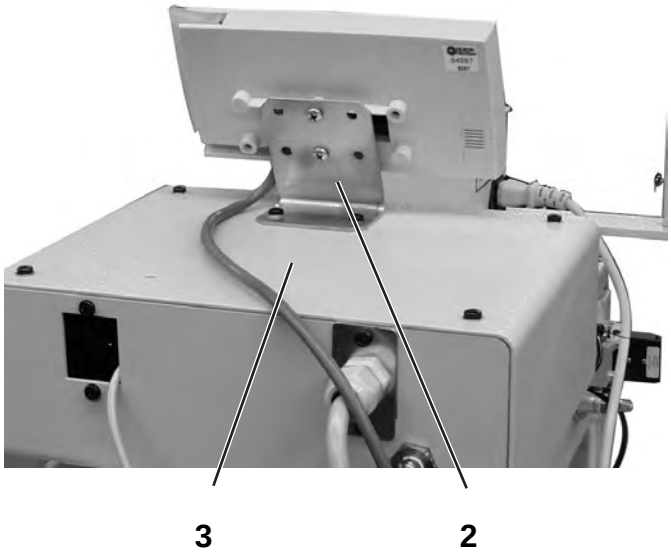
All work on the electrical components of the sewing unit may be carried out only by electricians or appropriately trained personnel.

The mains plug must be pulled.

The instruction manual of the drive's manufacturer must imperatively be respected!

3.1 Connecting the Control Unit





– Screw the operating panel 1 together with its bracket 2 onto the control unit 3.

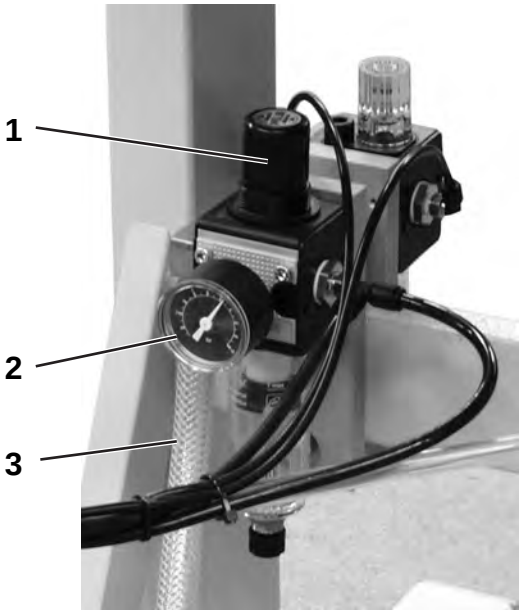
4. Pneumatic Connection

For the operation of the clamp lifting, thread tension opening, needle cooling, etc. the unit must be supplied with water-free compressed air.

ATTENTION !

For a flawless functioning of the pneumatic control processes the compressed air supply must be laid out as follows:

Even at the instant of greatest air consumption the minimum operating pressure may not fall below **5 bar**.



Connecting the compressed air maintenance unit

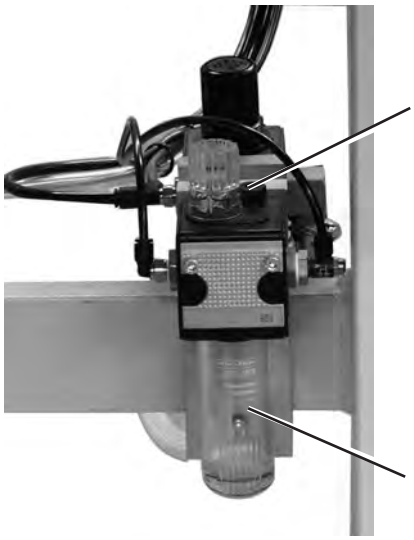
– Connect the connection hose 3 for the maintenance unit to the compressed air supply with the enclosed coupling.

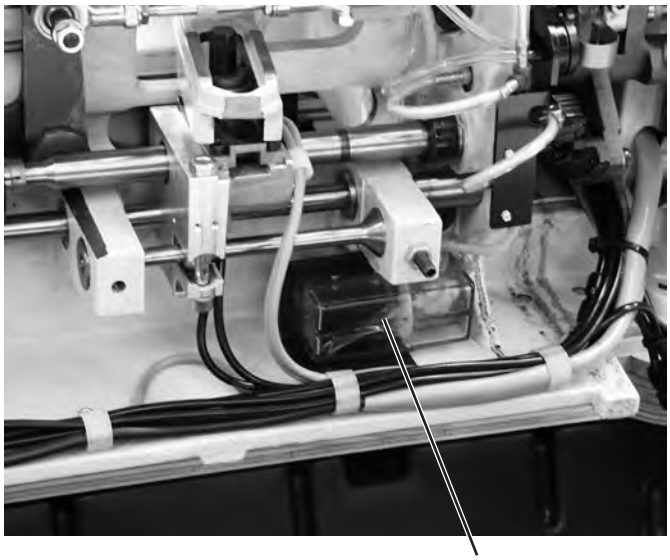
Setting the operating pressure

– The operating pressure is **6 bar**.
  It can be seen on the pressure gauge 2.
– For setting the operating pressure pull knob 1 up and turn.

Turning clockwise	=	Increase pressure
Turning counterclockwise	=	Decrease pressure

5. Oil supply





Filling the oil reservoir for shuttle-track lubrication

Only **DA-10** lubricating oil may be used to fill the oil reservoir.

DA-10 is available from **DÜRKOPP ADLER AG** retail outlets.

– Unscrew oil-filler cap 1.
– Fill the oil reservoir 2 with **DA-10** lubricating oil to the upper edge of the embossed text.

Checking the oil lever in the central recirculating-lubrication unit

Only **DA-10** lubricating oil may be used to fill the oil reservoir.

DA-10 is available from **DÜRKOPP ADLER AG** retail outlets.

– Fill the oil reservoir 3 with **DA-10** lubricating oil to the “max.” mark.

Notes:

Contents **Page:**

Part 3: Service Instructions Cl. 506-3

Contents

Page:

1. General

These service instructions describe the adjustment of the automatic sewing machine in an appropriate order.

CAUTION:
Various adjustments are mutually dependent.
It is therefore essential for adjustments to be carried out in the order described.

CAUTION:

The activities described in these servicing instructions may be carried out only by experts or by persons with the appropriate training.

Danger of breakage

It is essential for the adjustments specified in these servicing instructions to be carried out before the machine is recommissioned following disassembly.

Never start the machine with the drive motor rotating in the wrong direction.

A sewing run may not commence unless the head cover and the shuttle-area cover are closed.
If either of these is open, all control functions are blocked.

CAUTION: danger of injury

Prior to all repair, modification and maintenance work the main switch **must be turned off** and the machine disconnected from the compressed-air supply.

Adjustment work and function testing carried out with the machine running require the utmost care and observance of all safety precautions.

Setting gauges

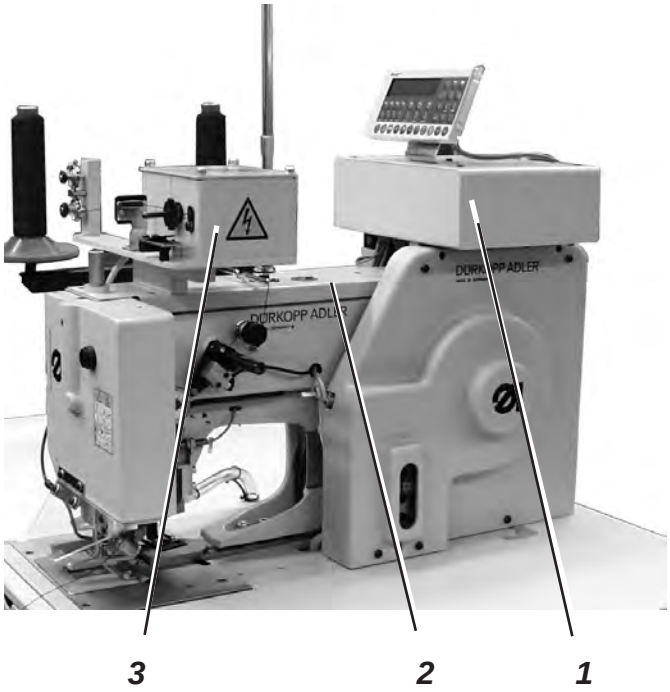
We can supply the following setting gauges on request:

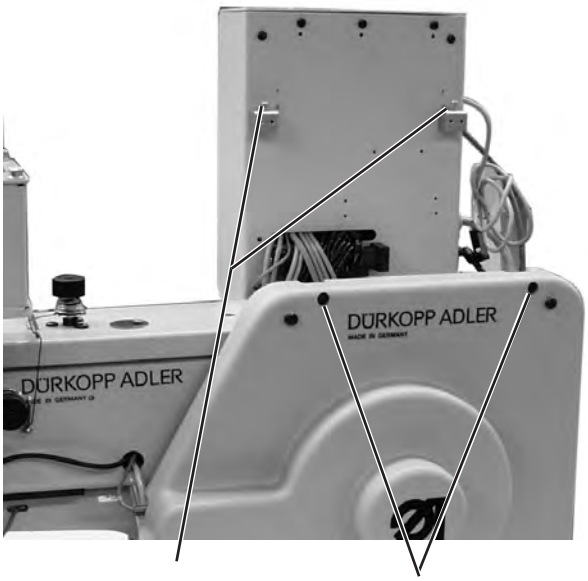
Setting gauge	Use	Order No.
Gauge	Loop-stroke adjustment	0981 150009
Calliper Gauge	Loop-stroke adjustment	0981 150006
	Adjusting the arm-shaft eccentric (optional)	7270 159160

2. Removing the arm cover and Turning over the upper part of the machine

2.1 Removing the arm cover

For service work in the interior of the upper part of the machine the arm cover 3 must be removed.
First the control unit 1 must be swivelled aside and the bobbin-winder cartridge 2 removed.



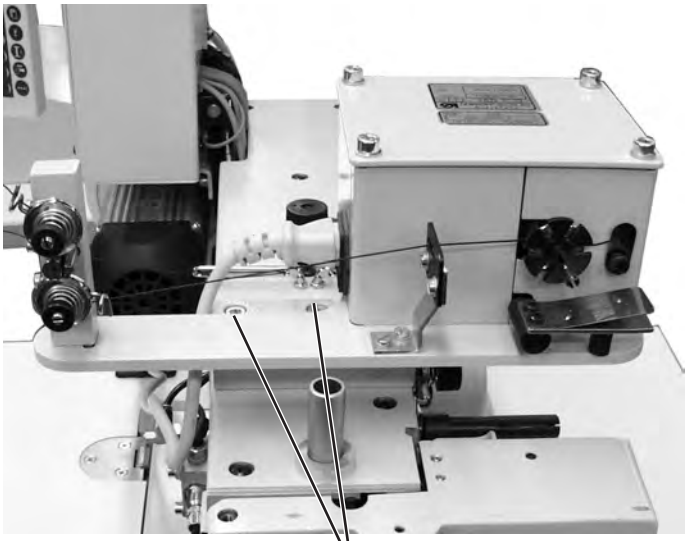


CAUTION: danger of injury

Turn off the main switch and disconnect the machine from the compressed-air supply.
The arm cover must not be removed until both these steps have been taken.

Swivelling the control unit aside

- Slightly undo Allen screws 5.
  These are accessible through the holes 4 in the casing.
- Carefully swivel the control unit aside.



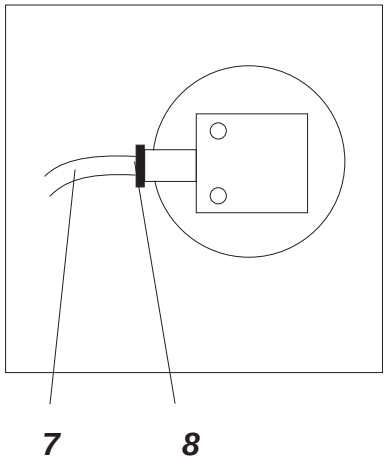
6

2 7

Removing the bobbin-winder cartridge

– Undo fixing screws 6.
– Lift off bobbin-winder cartridge.

3



7 8

Removing the arm cover

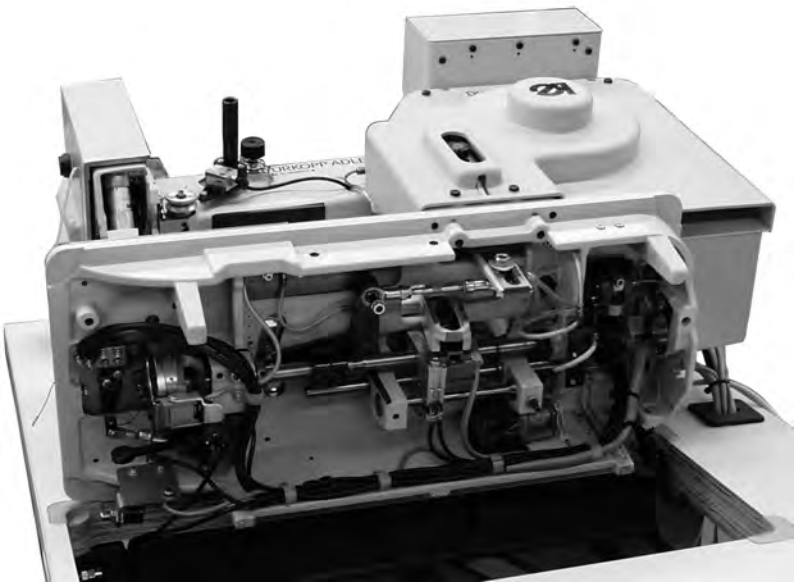
– Undo arm-cover fixing screws 2.
– Carefully raise the arm cover 2 and fold it back.
– Remove compressed-air hose 7 from the quick-release fastening: Push the ring 8 to the right and pull the hose out of the quick-release fastening.

CAUTION :

The use of force to remove the arm cover may cause damage to the compressed-air line.

2.2 Turning over the upper part of the machine

For service work on the underside of the upper part of the machine the upper part must be turned over.



CAUTION: danger of injury

Turn off the main switch.
The upper part of the machine must not be turned over unless the main switch is off.

– Carefully turn over the upper part of the machine until it is supported by the table-plate prop.
The underside of the upper part of the machine is now accessible for service work.

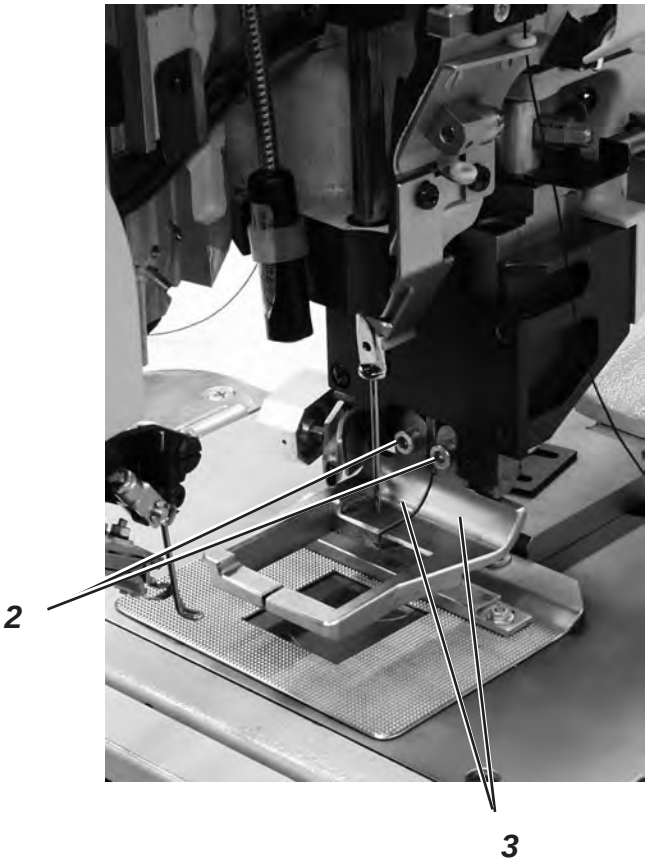
3. Shuttle, needle bar

CAUTION:

The adjustments described in chapters 3.1 to 3.4 are mutually dependent. It is therefore essential for the individual adjustments to be carried out in the order specified in the service instructions.

3.1 Needle bar height

When the shuttle tip extends 2 mm beyond the right-hand side of the needle, the eye of the needle must be directly beneath the shuttle tip.



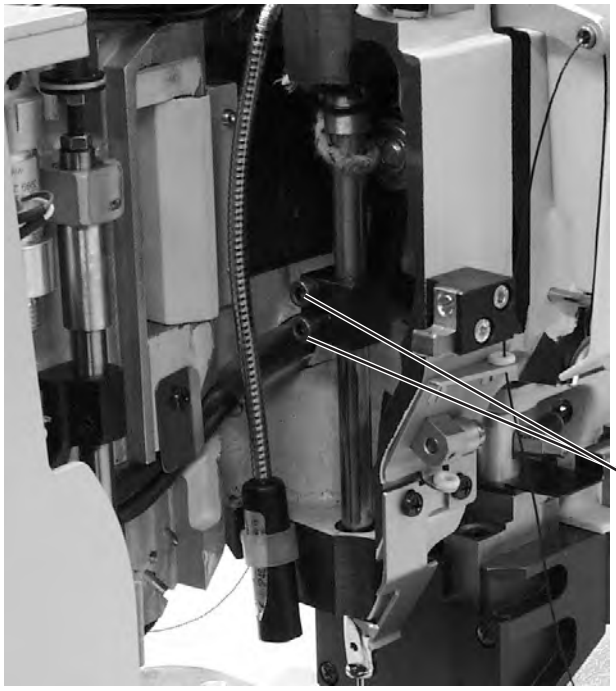
CAUTION: danger of injury

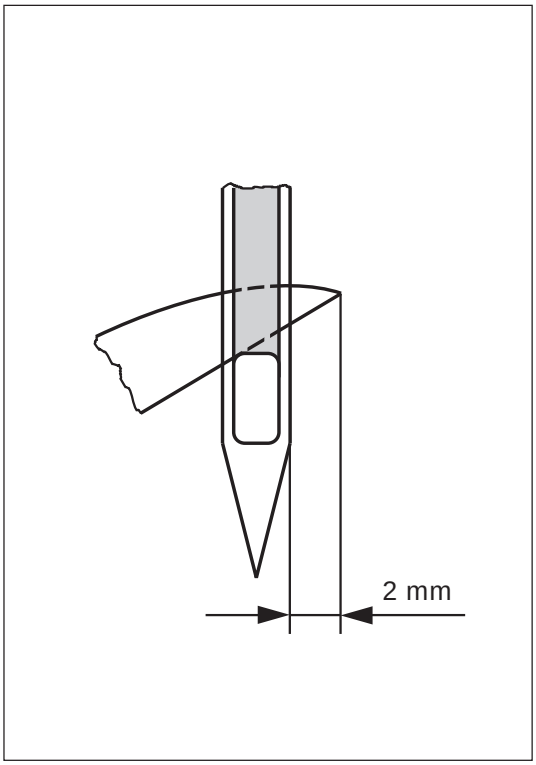
Turn off the main switch.
The needle bar height may only be adjusted with the main switch turned off.

- Turn off the main switch.
- Undo screws 2.
- Remove clamp 3.

CAUTION: Danger of breakage

It is essential for the clamps to be removed prior to the following adjustment work.
This prevents the needle from fouling the clamps in the course of subsequent adjustments.

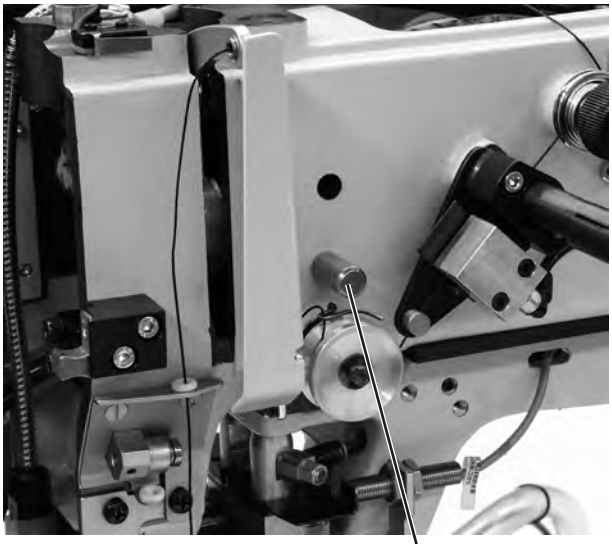


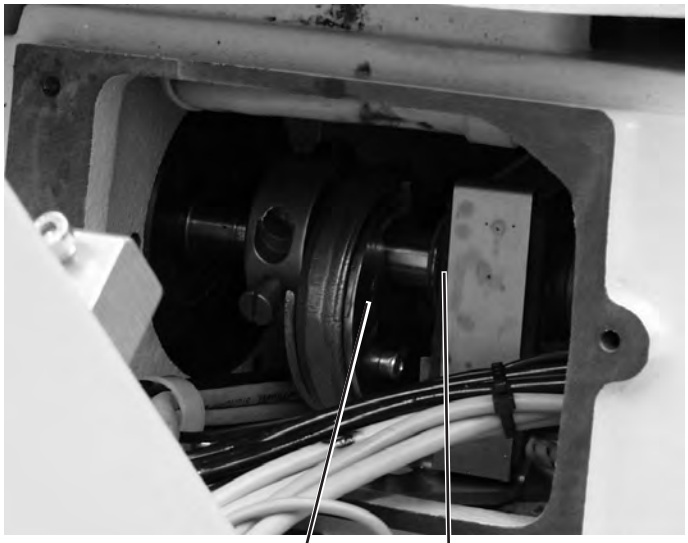


- Turn the handwheel in the direction of rotation until the shuttle tip extends 2 mm beyond the right-hand side of the needle.
  CAUTION:
  Care must be taken that the driver touches the shuttle in the direction of rotation.
- Undo locking screws 4.
- Adjust the height of the needle bar so that the lower edge of the shuttle tip just becomes visible in the eye of the needle.
- Fully tighten locking screws 4.
- Refasten clamp 3 with screws 2.

3.2 Synchronizing the shuttle and needle bar movements

The movement of the shuttle is synchronized with that of the needle bar by means of the locking pin 1 and gauge 2.

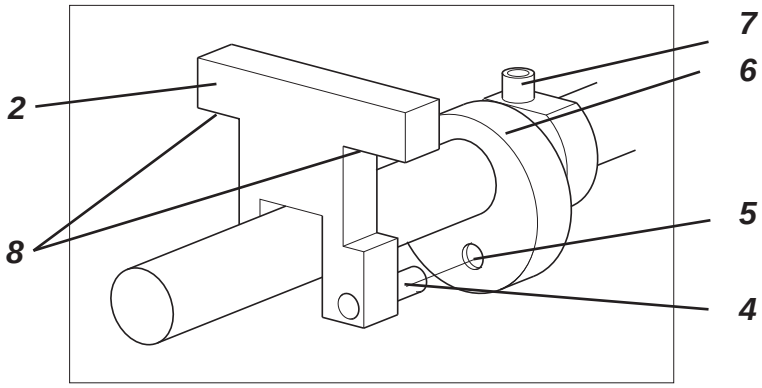




CAUTION: danger of injury

Turn off the main switch.
The shuttle and needle bar movements may only be synchronized with the main switch switched off.

- Insert locking pin 1 in the hole in the housing of the upper part of the machine.
- Turn the handwheel in the direction of rotation until the locking pin 1 perceptibly engages in the groove of the arm-shaft handle.
- Place the gauge 2 on the shaft between the worm-screw wheel 3 and the eccentric 6 in such a way that the pin 4 points to the eccentric 6.
- Push the gauge against the eccentric.
  The pin 4 must fit into the hole 5.
- The legs 8 of the gauge must lie flat on the unpainted surface of the arm.

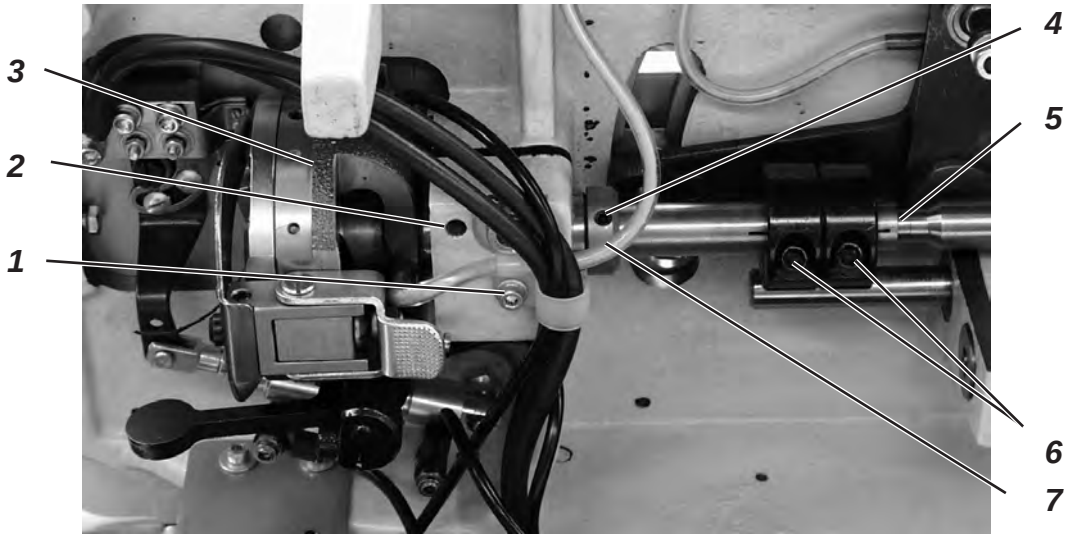


Adjustment:

- Remove the top cover.
- Undo the locking screw 7 on the eccentric.
- Turn the handwheel until the pin 4 of the gauge fits into the hole 5 of the eccentric.
- Fully tighten locking screw 7.
- Replace cover.

3.3 Shuttle-tip/needle distance

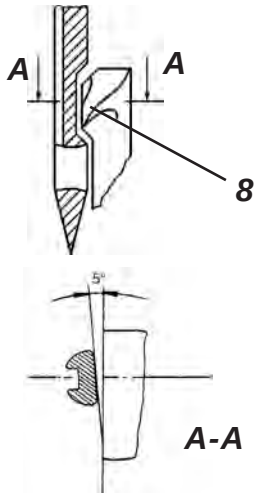
The shuttle tip 9 must be as close as possible to the groove of the needle without touching it.



CAUTION: danger of injury

Turn off the main switch.
The shuttle-tip/needle distance may only be adjusted with the main switch turned off.

– Turn the handwheel to bring the shuttle tip 9 close to the needle and check the position of the shuttle tip with respect to the throat of the needle.



Adjustment:

– Fold the upper part of the machine aside.
– Undo locking screws 6.
– Undo locking screws 4 on adjustment ring 7.
– Extract driver with driver shaft 5 forwards from the shuttle-track support 3.
– Undo locking screw 1 on the base plate.
– Slightly screw in pressure screw 2.
  This opens the base-plate jaws.
– Bring the shuttle tip 8 close to the throat of the needle by axially shifting the shuttle-track support 3.
  The upper surface of the shuttle-track support 3 must be parallel to the needle plate.
– Screw pressure screw 2 out again.
– Fully tighten locking screw 4 (max. 21 Nm).
– Replace driver with driver shaft 5 in the shuttle-track support 3 and push back as far as it will go.
– Push adjustment ring 7 as far as it will go against the end of the shuttle-track support 3.
– Fully tighten locking screws 4.
– Fully tighten locking screws 6.

CAUTION:

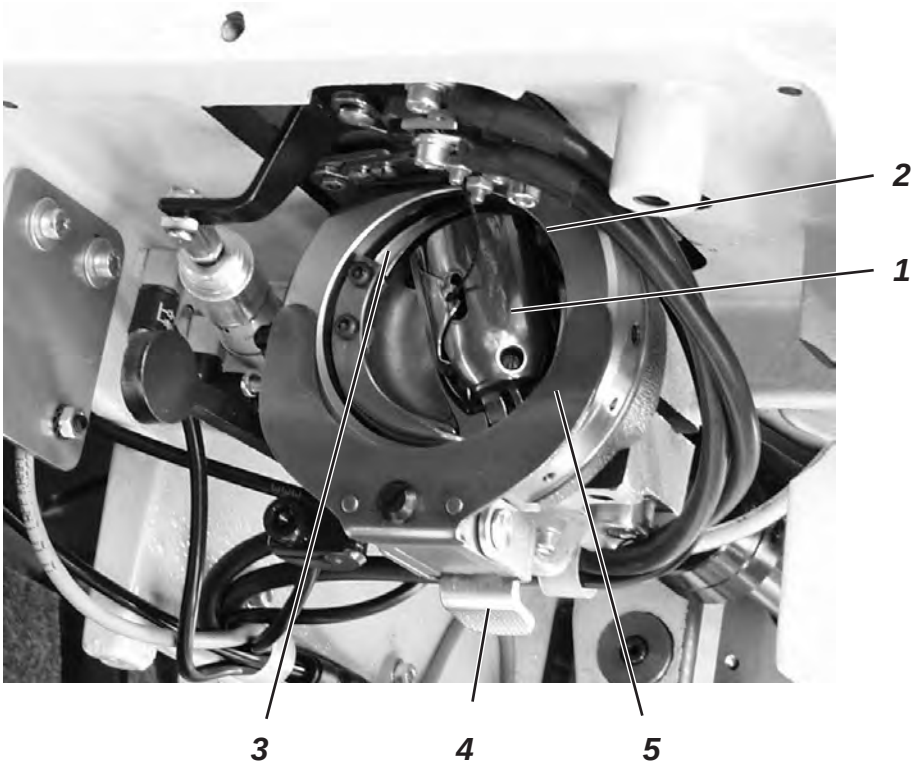
It is essential to check the loop-stroke setting.

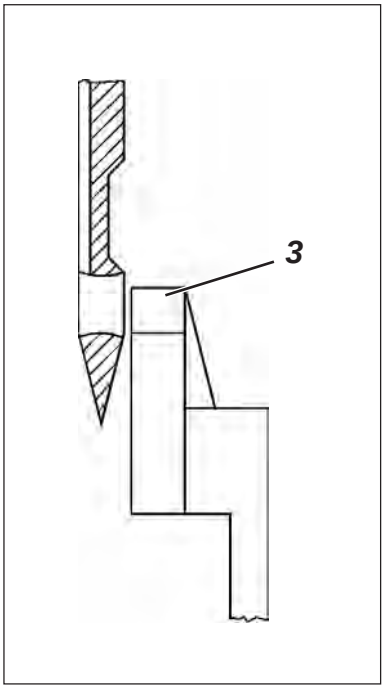
Fitting a stronger needle has the effect of altering the distance between the shuttle tip and the needle.
This shuttle-tip/needle distance must be corrected.

3.4 Driver/needle distance

The oscillating driver 3 moves the shuttle 1 in the shuttle track.
When the setting of the driver is correct it also acts as a needle guide in the vertical dimension.
This avoids needle “flutter”, which causes dropped stitches.

The right-hand side of the needle must be parallel to the driver 3 and at a very small distance from it.
For this purpose the driver 3 must be brought close to the needle.

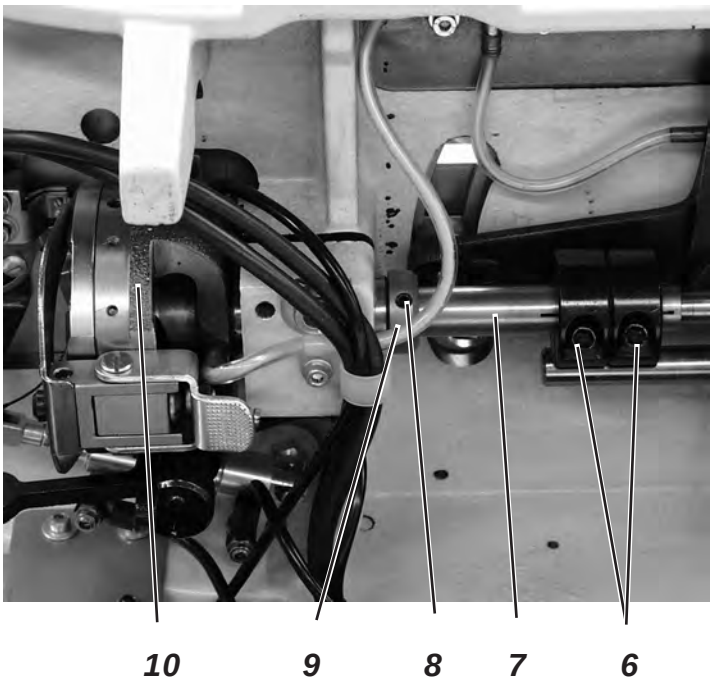




CAUTION: danger of injury

Turn off the main switch.
The driver/needle distance may only be adjusted with the main switch turned off.

- Turn the handwheel to bring the needle to its highest point.
- Pull the sprung bolt 4 forwards to unlock the shuttle-track spring 5.
- Swivel back the shuttle-track spring 5.
- Remove plunger ring 2.
- Extract shuttle 1.
- To check the setting turn the handwheel to bring the driver 3 close to the needle.



Adjustment:

- Fold the upper part of the machine aside.
- Undo locking screws 6.
- Undo locking screws 8 on adjustment ring 9.
- Extract driver with driver shaft 7 forwards from the shuttle-track support 10.
- Once the driver shaft 7 has been dismantled, remove or add shims 12. The shims can be found in the accessory kit.
  Hint
  The use of a smaller needle normally requires a shim to be added and vice versa.
- Replace driver with driver shaft 7 in the shuttle-track support 10 and push it back as far as it will go.
- Push adjustment ring 8 as far as it will go against the end of the shuttle-track support 10.
- Fully tighten locking screws 8.
  This prevents the driver from being axially shifted.
- Reset the loop stroke (see chapter 3.5).
- Check the setting by turning the belt pulley on the arm shaft. The right-hand side of the needle must be parallel to the driver and at a very small distance from it.
  If the setting is not correct the adjustment process must be repeated.

CAUTION:

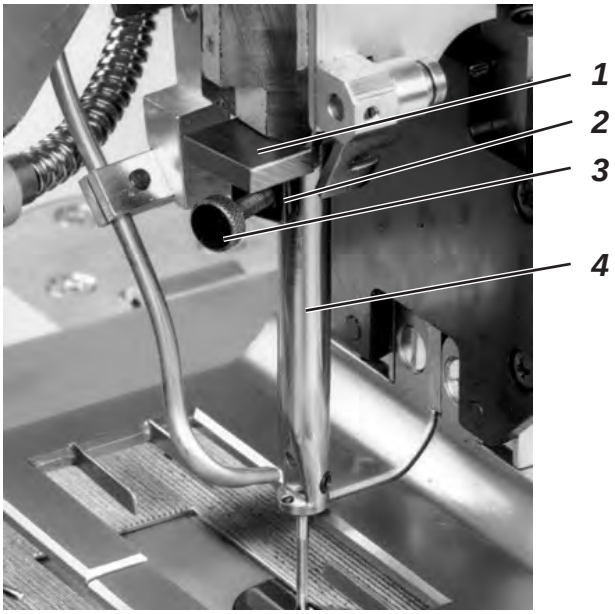
After adjusting the driver/needle distance it is essential to readjust the loop stroke as described in chapter 3.5.

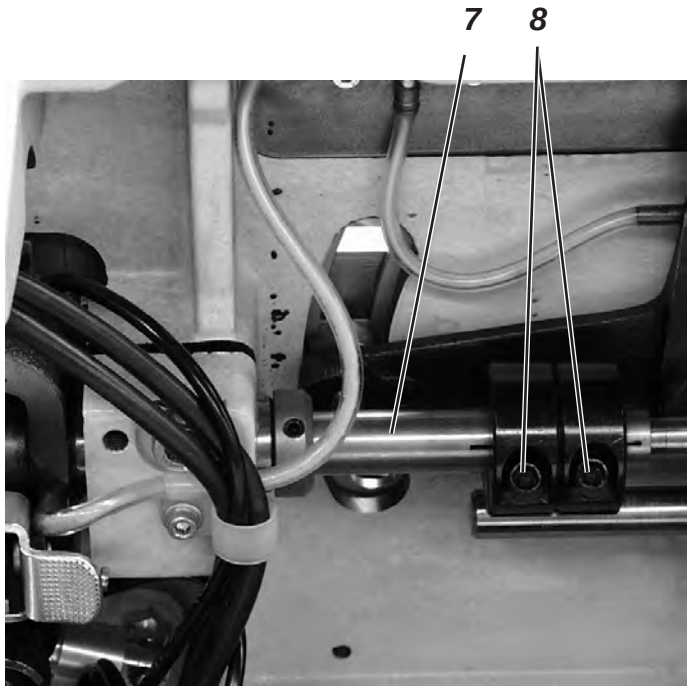
3.5 Loop stroke

The loop stroke is the travel of the needle bar from its BDC point to the point at which the shuttle tip 9 is at the same level as the right-hand side of the needle.

The loop stroke must be 4 mm.

It is set with the gauge 1 (order no. 0981 150012) and block 2 (order no. 0981 150006).

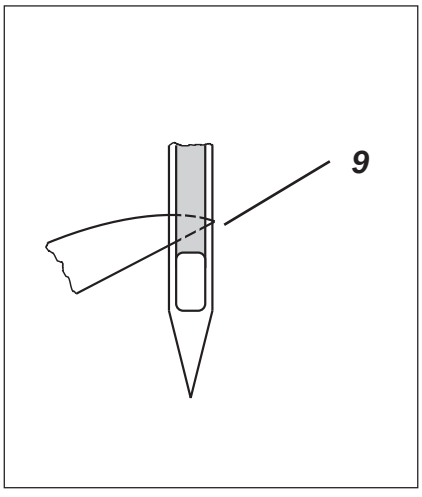




3

CAUTION: danger of injury

Turn off the main switch.
The loop stroke may only be adjusted with the main switch turned off.



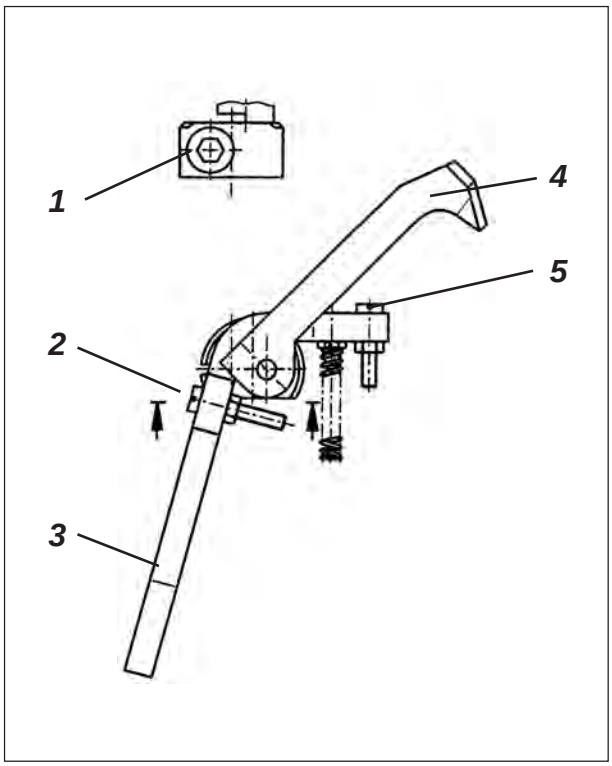
- Turn the handwheel to bring the needle bar 4 to its lowest position.
- Open the cover.
- Press gauge 1 with block 2 upwards against the housing.
- Fully tighten locking screw 3 on block 2.
- Extract gauge 1.
- Turn handwheel in the direction of rotation until the block 2 is in contact with the housing.
- Check whether the shuttle tip 9 is at the same level as the right-hand side of the needle.

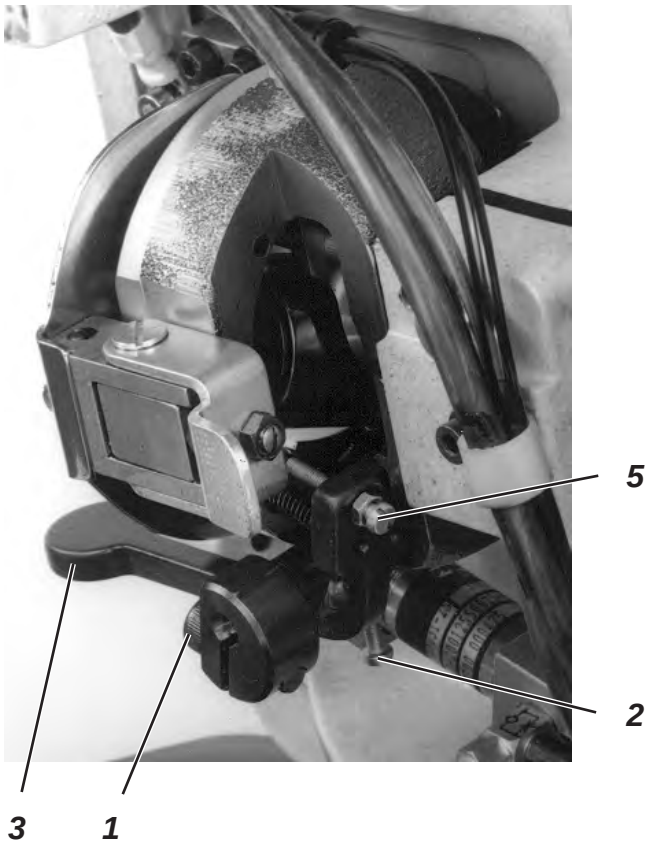
Adjustment:

- Fold the upper part of the machine aside.
- Undo locking screws 8.
- Twist the driver shaft 7 as required.
- Fully tighten locking screws 8.
- Check the driver/needle distance once again and correct it if necessary (see chapter 3.4).

4. Bobbin ejector

The ejector 4 must reliably eject the bobbin. The ejector tip must not enter the bobbin's area of movement.





CAUTION: danger of injury

Turn off the main switch.
The ejector may only be adjusted with the main switch turned off.

- Fold the upper part of the machine aside.

- Undo screw 1.
- Twist the ejector 4 on the axle so that the bobbin is reliably ejected when lever 3 is pressed.
- Fully tighten screw 1.
- Test by pressing the ejector lever 3.
  The bobbin case must automatically swivel out.

- Undo locknut on screw 2.
- Turn screw 2 to set the end position.
  The ejector tip must not enter the bobbin's area of movement.
- Fully tighten locknut on screw 2.

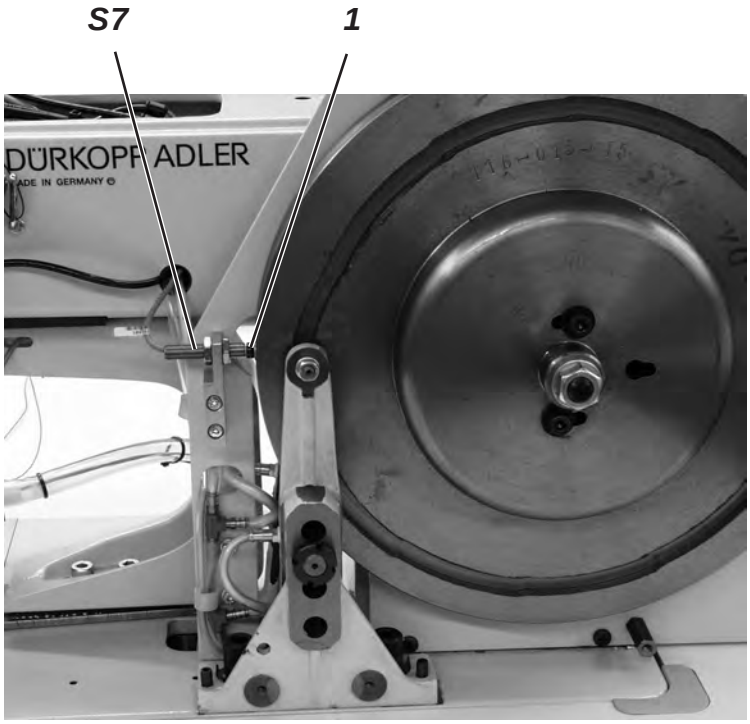
- Undo locknut on screw 5.
- Turn screw 5 to set the end position.
  The ejector must reliably eject the bobbin.
- Fully tighten locknut on screw 5.

5. Disc cam

The cam tracks on the inside and outside of the disc cam determine the transport movement of the clamps.

The inner and outer cam tracks control the longitudinal and transverse movement of the clamps respectively.

The position of disc cam on the shaft determines clamp-transport timing.
The disc cam is in its initial position when cam 1 is located immediately in front of switch **S7**.



Disc cam

The various seam (stitch) types are determined by disc cams, which are easy to replace.
All disc cams with the same stitch number are mutually interchangeable.

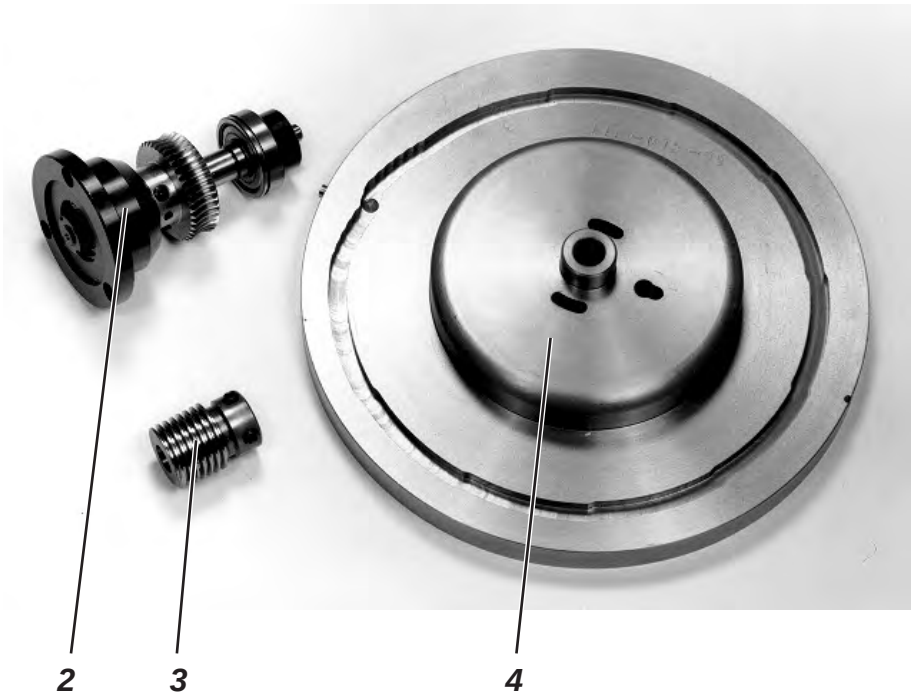
The disc cams are numbered.
The numbers engraved on them have the following meaning:

Example:	**116 - 072 .- 1**	
	116	= number of stitches per disc-cam rotation
	072	= stitch type
	1	= calculation operation

When converting to a different seam type the clamps belonging to the installed disc cam must be fitted.

Worm-gear set

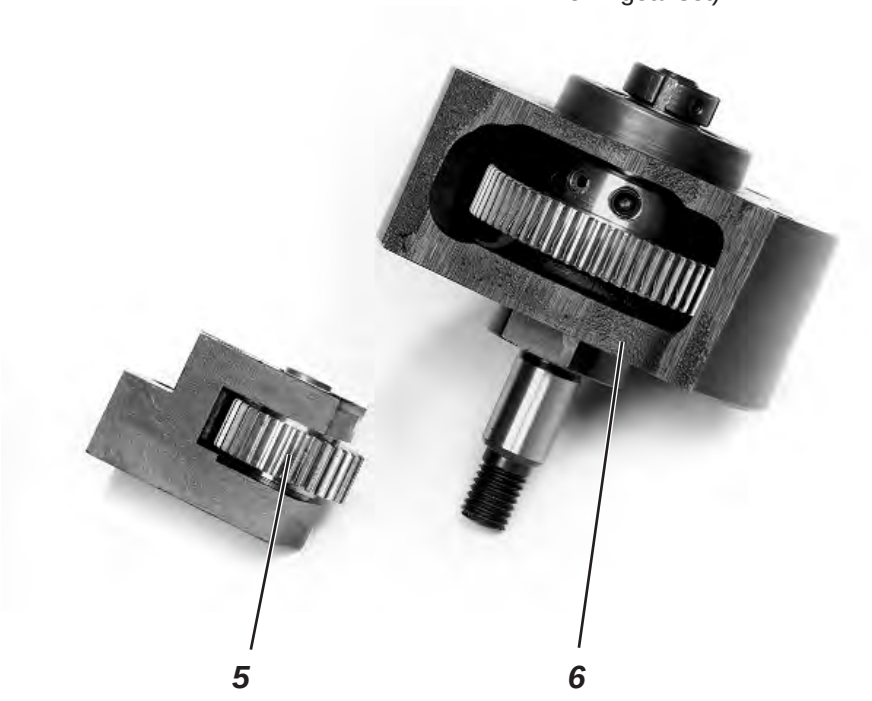
When converting to a disc cam 4 with a different number of stitches the appropriate worm-gear set must also be fitted. A **worm-gear set** consists of worm drive 2 and worm screw 3.



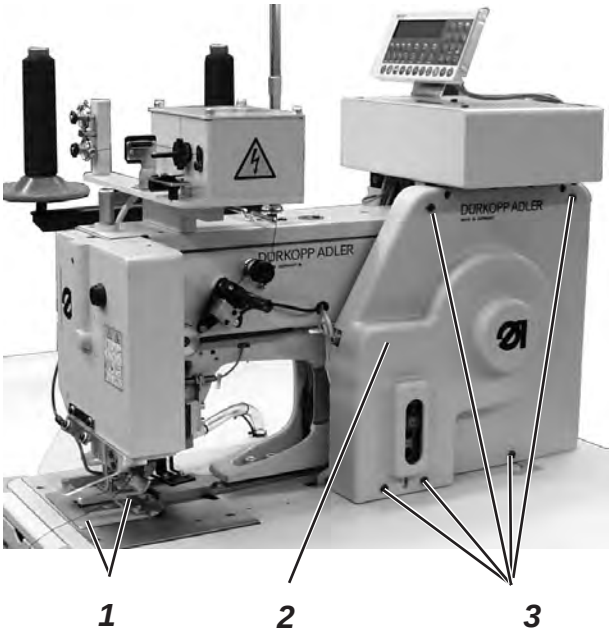
Intermediate transmission

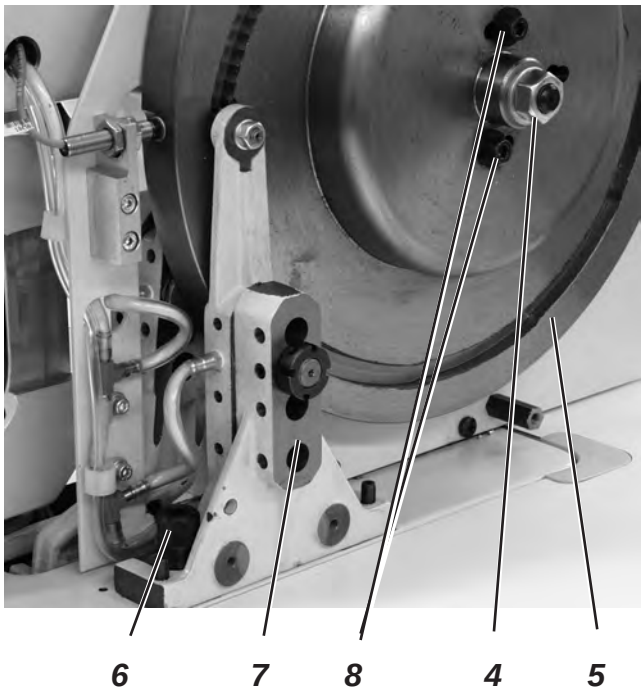
Fitting the intermediate transmission 6 with idler gear 5 doubles the number of stitches per disc-cam rotation (transmission ratio 2:1).

without intermediate transmission:	42, 58 and 72 stitches per disc-cam rotation (depending on the worm-gear set)
with intermediate transmission:	84, 116 and 144 stitches per disc-cam rotation (depending on the worm-gear set)



5.1 Replacing the disc cam





CAUTION: danger of injury

Turn off the main switch.
The disc cam may only be replaced with the main switch turned off.

Removing the material clamps and table plate

– Remove the material clamps and table plate 1.

Removing the disc-cam cover

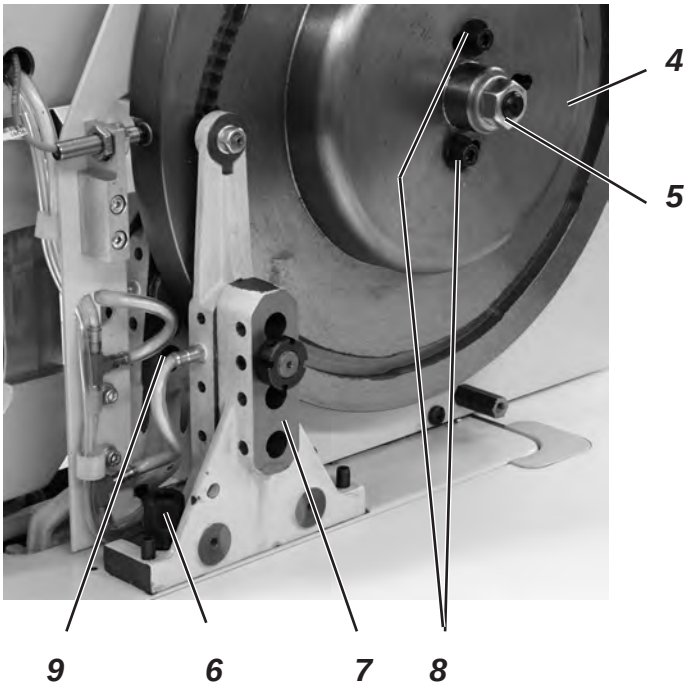
– Remove screws 3.
– Remove disc-cam cover 2.

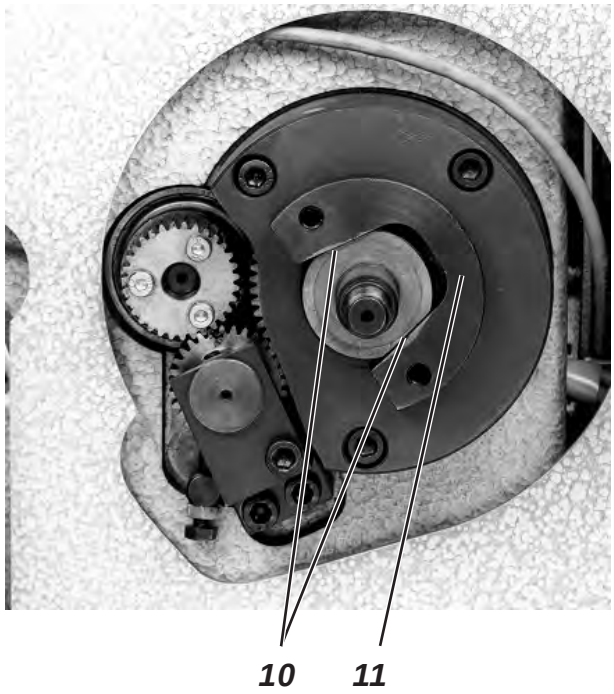
Removing the disc cam

– Undo screws 6.
– Raise the bracket with drive lever 7 for transverse clamp movement and push aside.
– Undo nut 5 and screws 8.
– Carefully remove the disc cam 4.

CAUTION:

If converting to a different seam type requires the intermediate transmission to be installed, this must take place before the new disc cam is fitted. For the installation of the intermediate transmission see chapter 5.2.





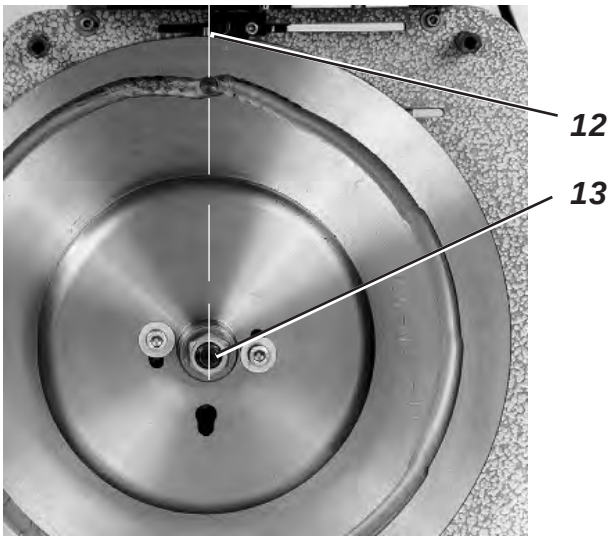
Fitting new disc cam

– Fit the new disc cam.
CAUTION:
Ensure that the drive lever 9 for the longitudinal clamp movement engages in the inner cam track of the disc cam.
The claw 11 must exactly fit the shaft edges 10.
Remark:
The illustration shows a machine with the intermediate transmission fitted.

– Turn the disc cam in the direction of rotation until the claw 11 perceptibly grasps the shaft edges 10.

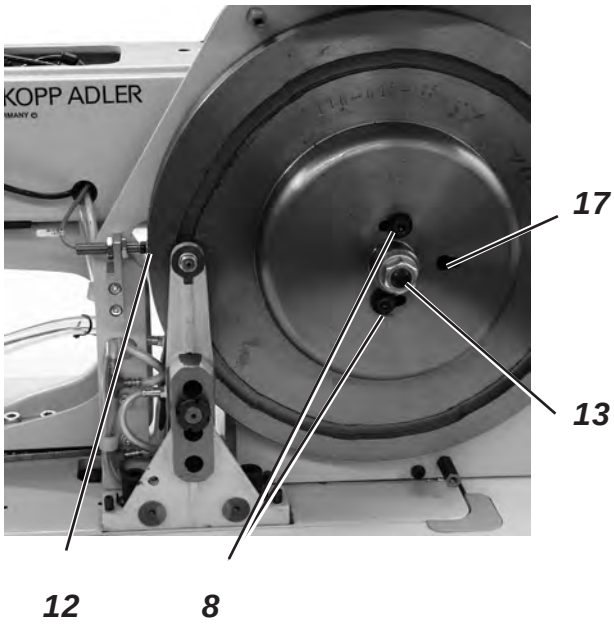
– Fully tighten nut 5.

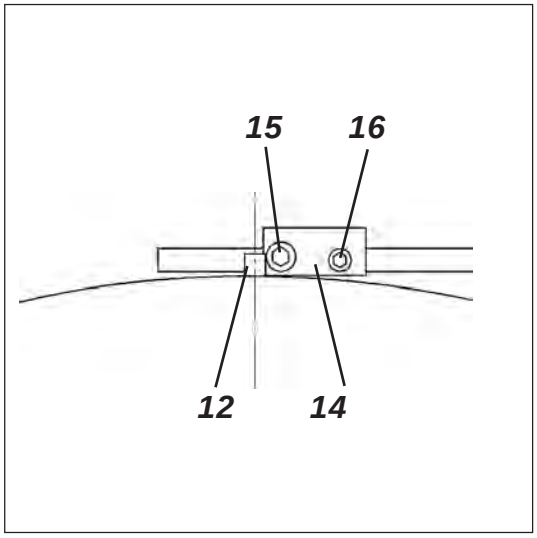
– Fit new clamps and new bearing plate.



– Continue to turn the disc cam in the direction of rotation until the cam 12 is vertically above the shaft 13.

– Turn the handwheel in the direction of rotation until the clamps no longer move.
At this moment, if the setting is correct, the needle is just about to penetrate the material.





Adjustment:

– Continue to turn the disc cam in the direction of rotation until the cam 12 is vertically above the shaft 13.
– Slightly undo the screw 16 on the rider 14.
– Push the rider 14 with screw 15 onto the cam 12 of the disc cam as far as it will go.
– Fully tighten screw 16.
The position of the disc cam is fixed.
– Undo nut 5.
– Turn the handwheel in the direction of rotation until the needle is about to penetrate the material.
– In this position insert a screwdriver into the slot 17 and press the claw 11 onto the shaft edges 8.
– Fully tighten nut 5 and screws 10.
– Push the rider 14 fully to the right and back.

CAUTION: Danger of breakage

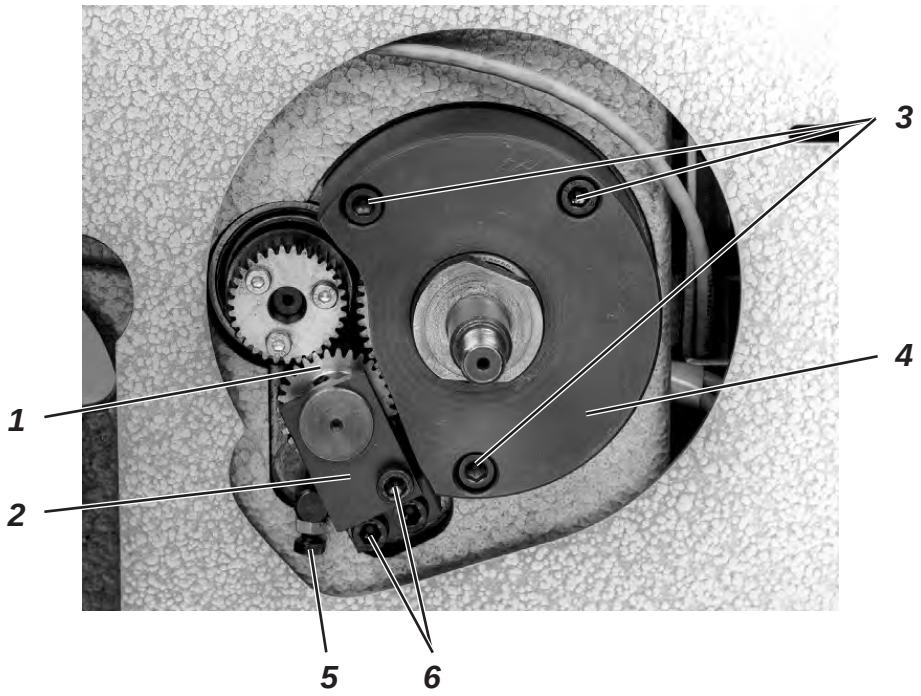
After the disc cam has been replaced it is essential to check the following settings:

– the position of the table plate with respect to the needle (see chapter 7.1)
– the position of the clamps with respect to the table plate (see chapter 7.2)

5.2 Fitting the intermediate transmission

Fitting the intermediate transmission 4 with idler gear 1 doubles the number of stitches per disc-cam rotation (transmission ratio 2:1).

The intermediate transmission must be fitted before the new disc cam is installed.



CAUTION: danger of injury

Turn off the main switch.
The intermediate transmission may only be fitted with the main switch turned off.

- Remove the disc cam as described in chapter 4.1.
- Attach the intermediate transmission 4 from outside with screws 3 on the arm of the machine.
- Fit bracket 2 and position idler gear 1.
- First slightly tighten screws 5.
- Complete positioning of idler gear 1 by tightening screw 6.

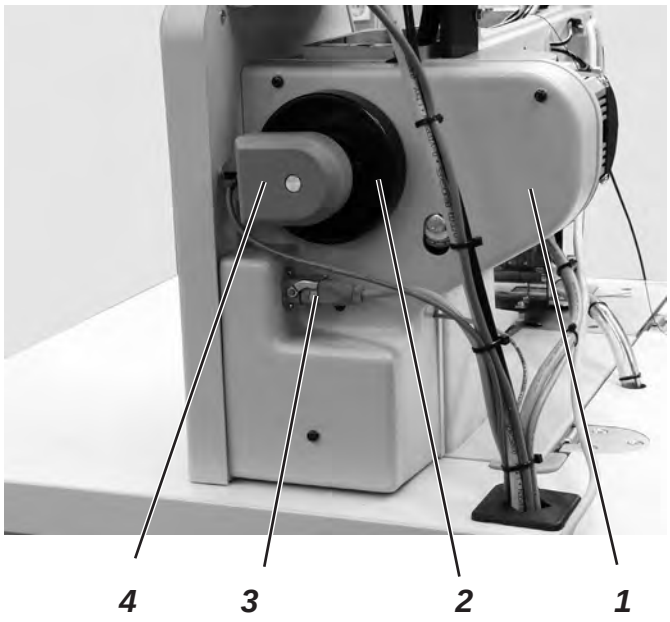
CAUTION:

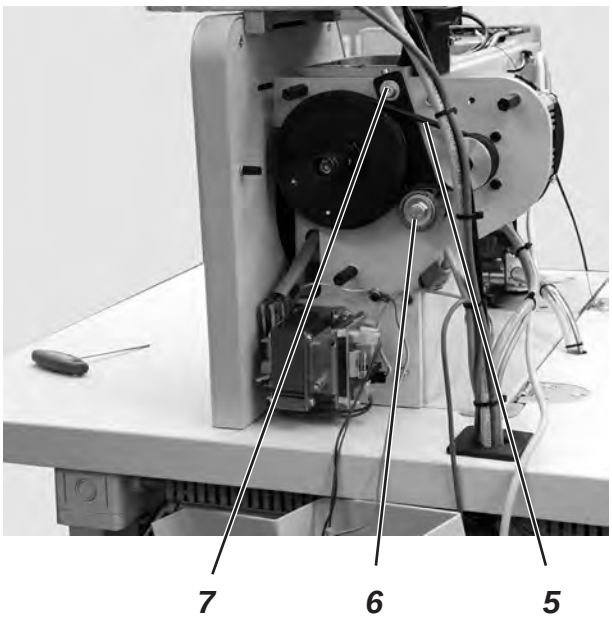
Any gear play present is increased by the intermediate transmission. The idler gear 1 must therefore be exactly in position.

- Fully tighten screws 5 and secure with locknuts.
- Fit the disc cam as described in chapter 4.1.

5.3 Replacing the worm-gear pair and worm screw

5.3.1 Fit/Remove the synchronous motor



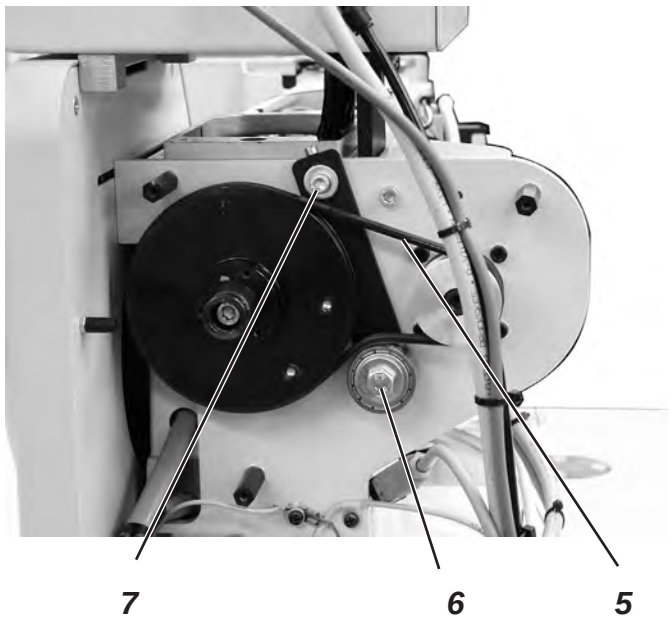


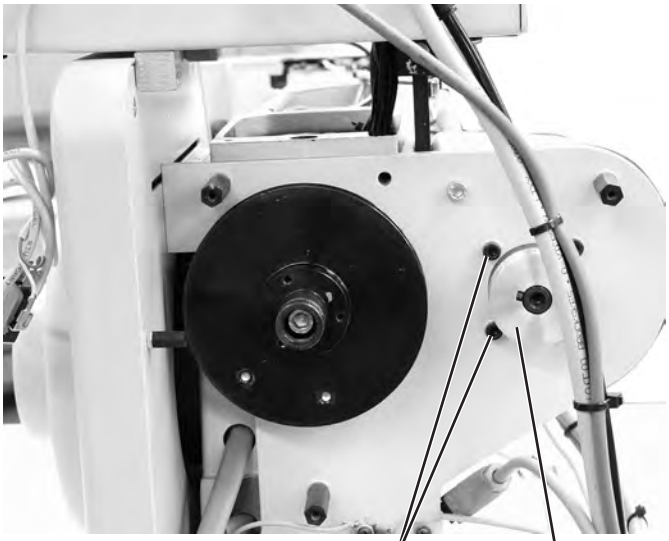
CAUTION: danger of injury

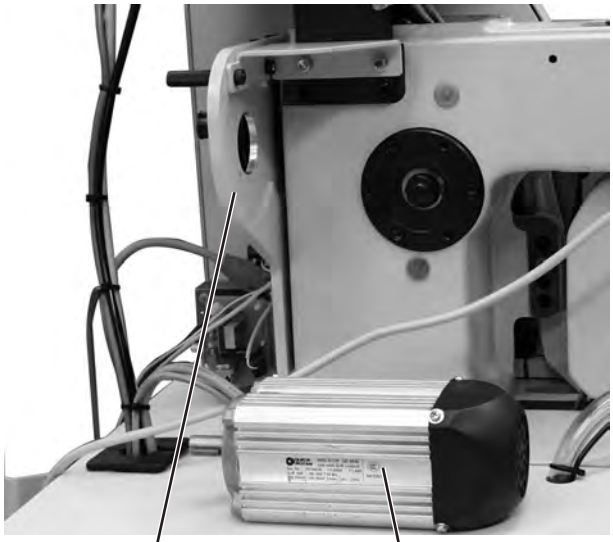
Turn off the main switch.
The synchronous motor may only be replaced with the main switch turned off.

3

- Remove proximity switch 4.
- Remove handwheel 2.
- Unplug connector 3.
- Remove cover 1.
- Dismantle belt tensioner 6.
  Loosen screw 7 and pull out the belt tensioner.
- Remove the belt 5.





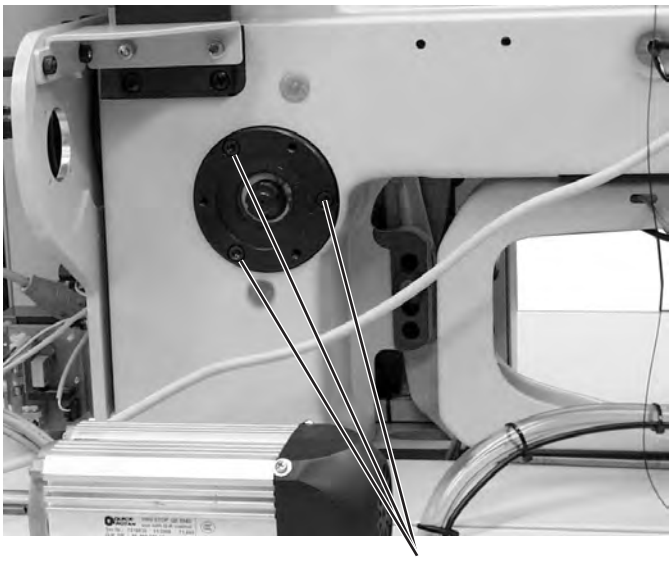


– Loosen the screw of the pulley 8 and separate the pulley from the motor shaft.
– Loosen the mounting screws 9 and remove carefully the motor 10 from the fixing plate 11.

Fitting the synchronous motor

– Fit the synchronous motor 10, pulley 8 and the belt again.

5.3.2 Replacing the worm-gear pair and worm screw



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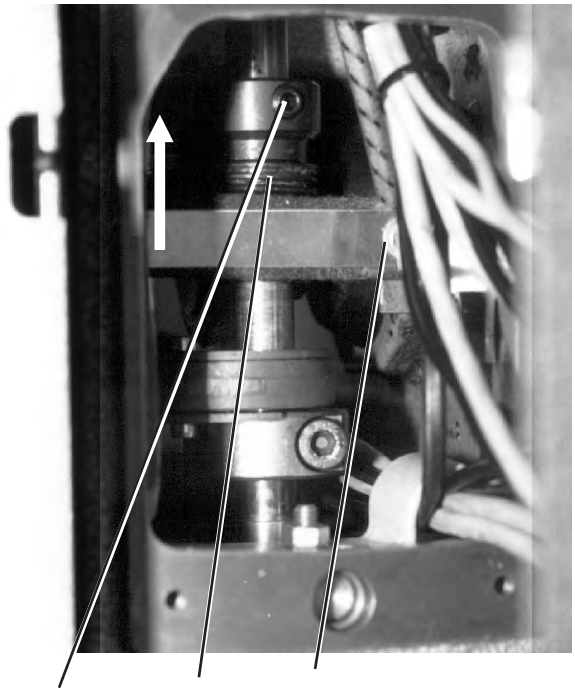


15 *14* *13*

CAUTION: danger of injury

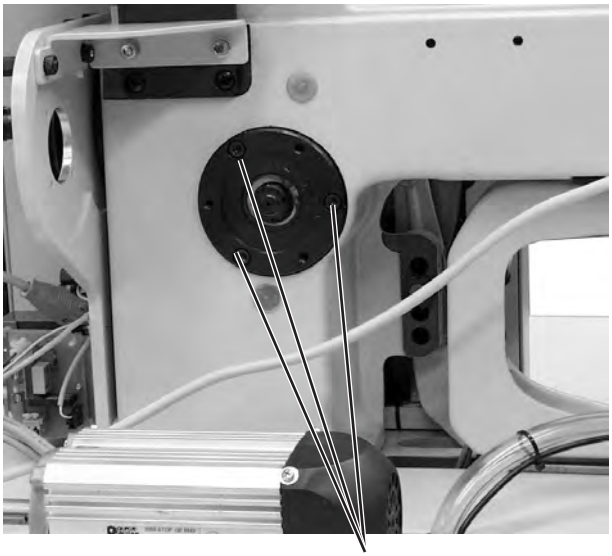
Turn off the main switch.
The worm-gear pair and worm screw may only be replaced with the main switch turned off.

CAUTION: Danger of breakage

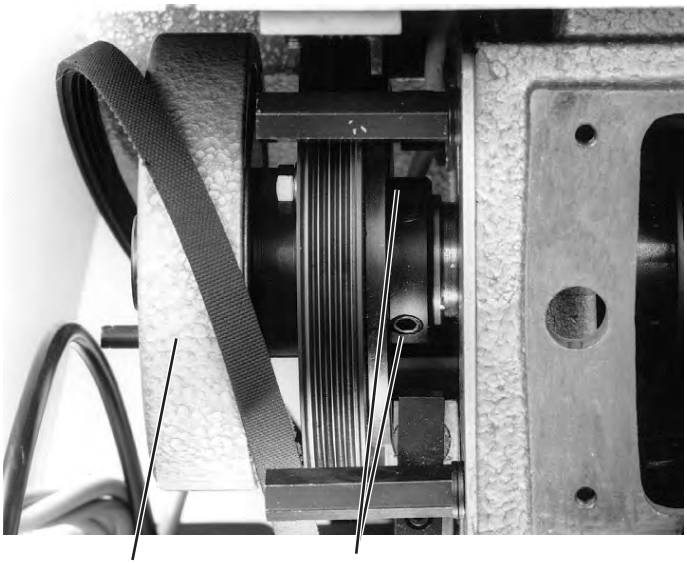
It is essential to remove the clamps and needle before replacing the worm-gear pair and worm screw.

- Remove clamps and needle.
- Swivel the control unit aside and remove the arm cover (see chapter 2).
- Remove screw 13 and oil felt.
- Loosen locking screws 15 on worm screw 14.
- To remove the worm-gear pairs first push worm screw 14 to the rear in the direction of the arrow.
- Undo and remove screws 12 on the bearing.
  The fixing screws 12 also act as extractor screws for the worm-gear pair.
- Insert screws 12 into the threaded holes of the bearing.
- Carefully extract the worm-gear pair from the housing by evenly screwing in the extractor screws.

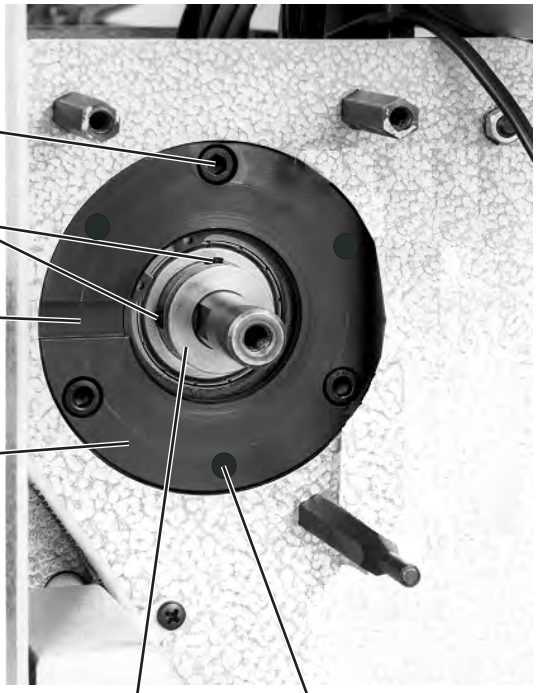
- Undo locking screws 16.
- Pull the handwheel 17 with belt pulley off the arm shaft.
- Undo locking screws 22 on the bearing collar 19.
  The locking screws 22 are accessible through the slot 21.
- Undo and remove screws 23 on bearing 20.
  The fixing screws 23 also act as extractor screws for the bearing.
- Insert screws 23 into the threaded holes 18.
- Carefully extract the entire bearing 20 from the housing by evenly screwing in the extractor screws.
- Unscrew screws 26 on the eccentric and remove cover plates 25.
- Undo cheese-head screw 24 and punch-screw 27.
- Press eccentric bearing to the left out of the eccentric and remove from the arm shaft.
- Remove the worm screw 11 from the arm shaft.
- Fit new worm screw onto the arm shaft.
- Successively replace and secure the eccentric bearing, bearing 20 and handwheel 17.
  CAUTION:
  Care must be taken that the punch screw engages in the mark on the shaft, as this ensures that the eccentrics are exactly positioned.
- Fit new worm-gear pair and secure with screws 12.
- Push worm screw 11 over the worm gear and adjust worm-gear play (see chapter 5.4).
- Replace all the parts which have been removed (motor, belt, etc ...) and put them together again.



12

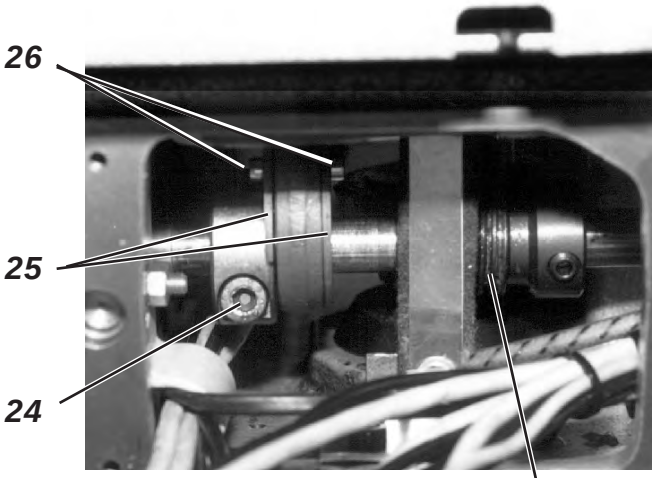


17 16



23
22
21
20

19 18



26
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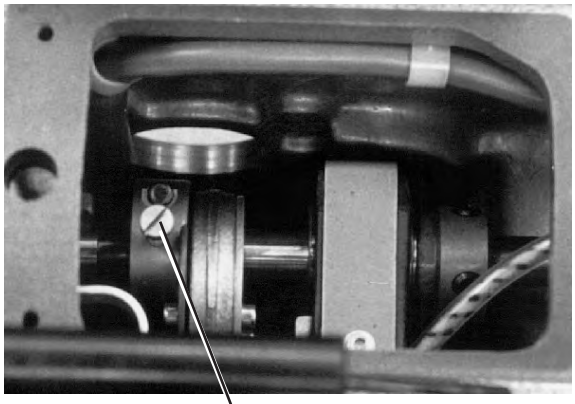
24

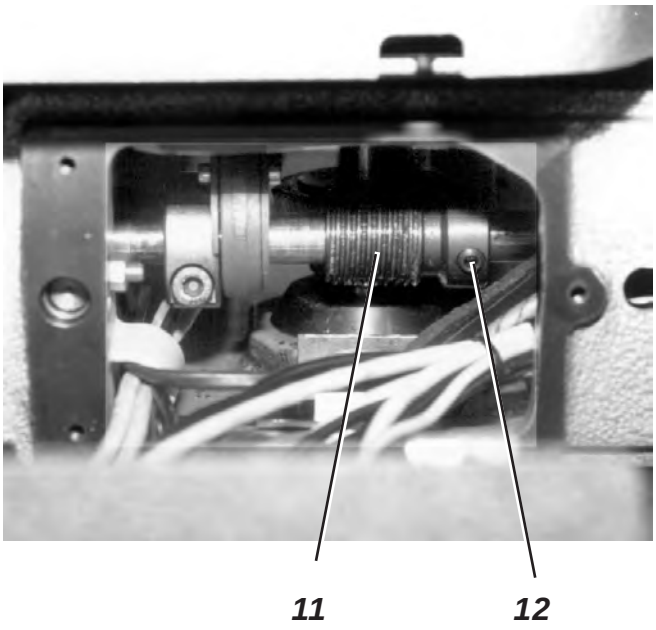
11

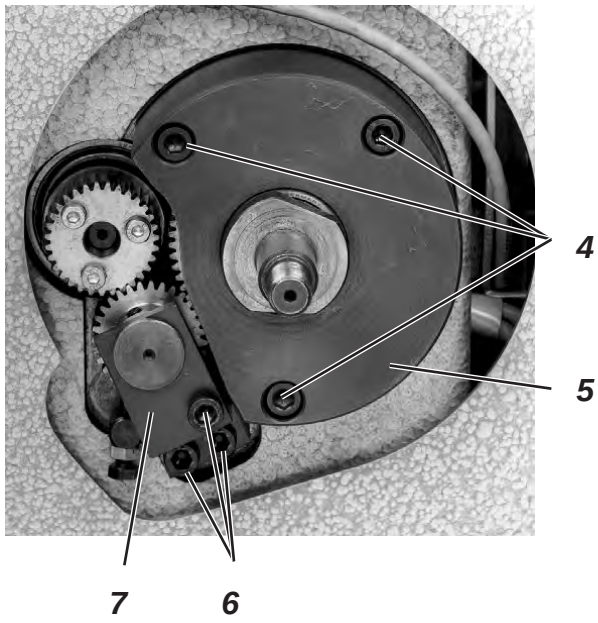


27

5.4 Worm-gear play

There must be as little as possible gear play between the worm screw 11 and worm gear.





CAUTION: danger of injury

Turn off the main switch.
The worm-gear play may only be adjusted with the main switch turned off.

CAUTION:

If an intermediate transmission is fitted it must be removed before this check.

Removing the intermediate transmission

- Remove disc cam as described in chapter 4.1.
- Unscrew screws 4 and remove intermediate transmission 5.
- Unscrew screws 6 and remove bracket 7.

Checking the worm-gear play

- Turn the disc cam to right and left.
  A degree of play must be perceptible.
  There must be play at all points of the worm gear. Continue to turn the disc cam and check at all points.

Adjustment:

- Remove arm cover.
- Loosen bracket with oil felt 10 (see page 21).
- Loosen cheese-head screws 12.
- Adjust the gear play by axially shifting the conical worm screw 11 along the arm shaft.
  CAUTION:
  The first screw 12 of the worm screw - seen in the direction of rotation - must be on the surface of the arm shaft.
- Tighten locking screws 12.
- Adjust bracket with oil felt to exert slight pressure and tighten.
- Replace arm cover.
- Replace intermediate transmission (see chapter 4.2).

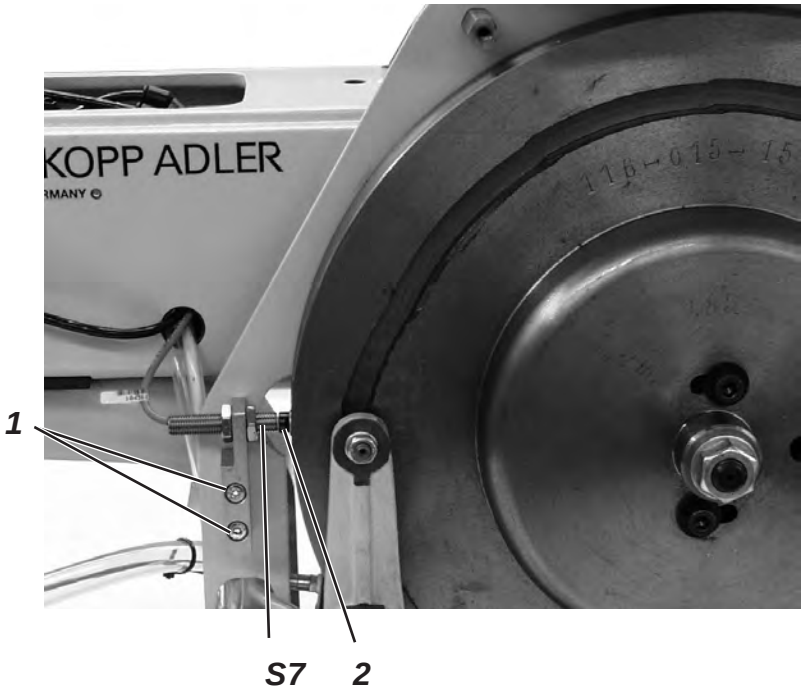
6. Shut-down devices

6.1 Basic stop position (switch S7)

Each disc cam (number of stitches) has its own cam 2 with a particular diameter.
The diameter is such that switch **S7** is not operated by the cam one stitch before or after the initial position.

If the cam is replaced by another with a larger diameter (e.g. in the event of loss or damage), the following problem may occur:

When the machine is switched on switch **S7** is operated, but the disc cam is one stitch before or after the initial position.
If this happens the control unit does not issue an error message.



CAUTION:

Only the cam 2 belonging to the disc cam, or another cam of the same diameter, may be used.
The cam may only be wide enough to ensure that switch **S7** is not operated one stitch before or after the initial position.

Before switch **S7** is set the setting of the proximity switch must first be checked.

The following conditions govern initial positioning for reference travel:

- The sewing drive operates until cam 2 operates the switch.
- Once the 1st position has been reached the sewing drive halts in position 2.

If an error message then appears in the display, the disc cam is positioned one stitch too far.
The switch **S7** must be reset.

Setting switch **S7**

– Loosen screws 1 slightly.
– Push switch **S7** upwards so that cam 2 reaches the switch sooner.
– Tighten screws 1.

The outgoing flank of the 1st position must not coincide with the incoming flank of switch **S7**.

– Adjust switch **S7** as described above for cam 2.
– Check position 1 (thread-lever low point) of the proximity switch (see chapter 10.5).
– Readjust switch **S7** if necessary.

7. Clamps and table plate

7.1 Position of table plate with respect to the needle

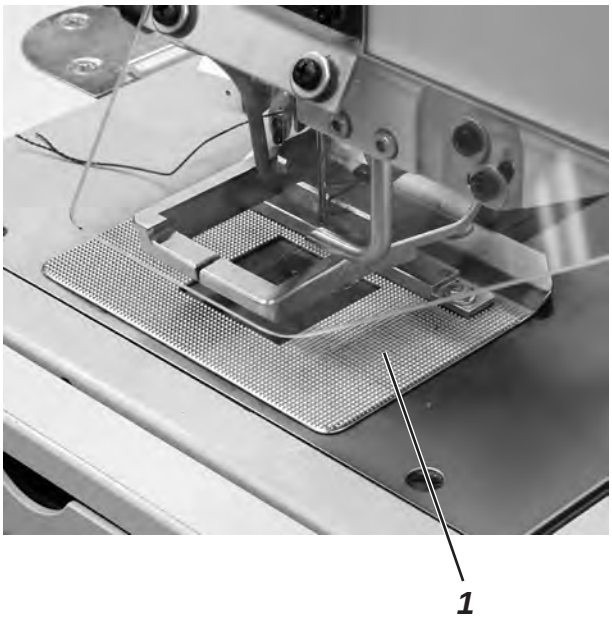
The transmission of the movement from the disc cam to the clamps and the table plate is effected by lever systems.
Within certain limits seam-type sizes can be altered by changing the lever transmission ratios.

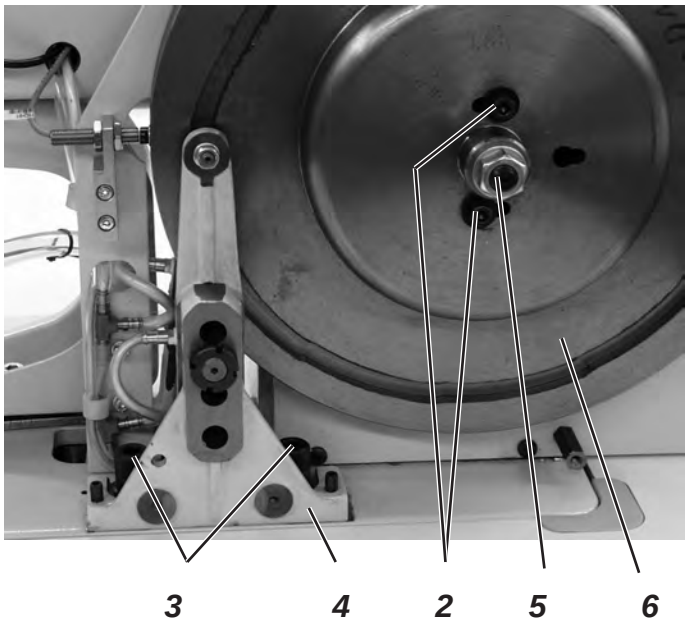
The size of the safety gap between the table plate 1 and the needle is determined by the extent of the transverse and longitudinal movement of the table plate.

For safety reasons the edges of the hole in the table plate 1 must be at a constant minimum distance from the needle when it penetrates the material.

CAUTION: Danger of breakage

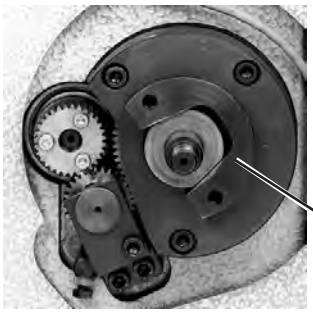
If this safety distance is not observed, the needle will strike the table plate 1.



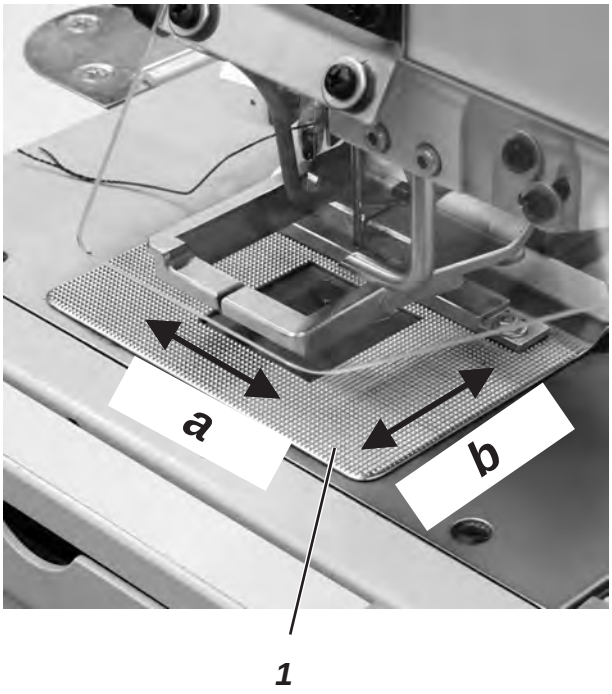


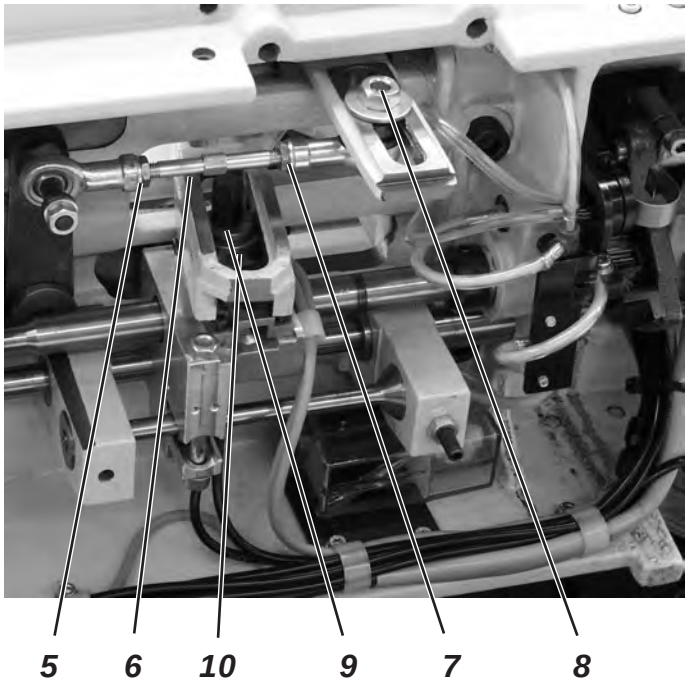
CAUTION: danger of injury

Turn off the main switch.
The safety distance between the table plate 1 and the needle may only be adjusted with the main switch turned off.



- Remove screws 3 and support 4.
- Loosen nut 5 and screws 2.
- Remove disc cam 6.
- Remove claw 7 from disc cam.
- Replace disc cam on the shaft without the claw.
- Turn the handwheel to lower the needle.
- Turn the disc cam in the direction of rotation and follow the outer contour of the seam profile, checking that the safety distance between the table plate 1 and the needle remains constant.





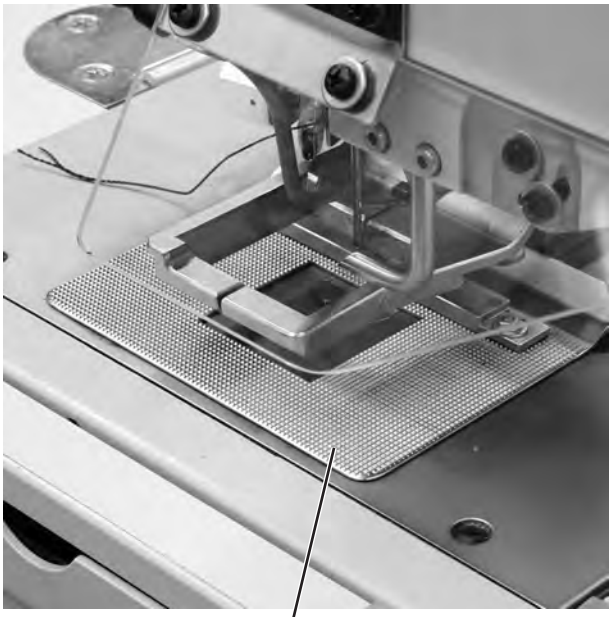
Aligning the table plate

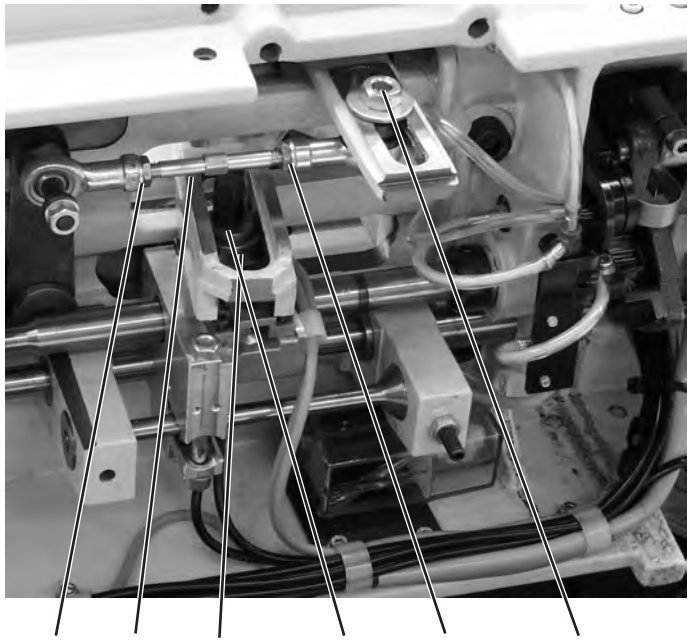
a) Transverse:

- Turn the handwheel to lower the needle.
- Turn the disc cam in the direction of rotation until one side of the table plate (in the transverse direction) reaches the needle.
- Undo nuts 5 and 7.
- Twist the threaded rod 6 to set the distance between the table plate and the needle.
- Continue to turn the disc cam in the direction of rotation until the opposite side of the table plate reaches the needle.
- Twist the threaded rod 6 to set the distance between the table plate and the needle.
- Fully tighten nuts 5 and 7.

b) Longitudinal:

- Turn the disc cam in the direction of rotation until one side of the table plate (in the longitudinal direction) reaches the needle.
- Slightly undo screw 9.
- Twist the eccentric 10 to set the distance between the table plate and the needle.
- Continue to turn the disc cam in the direction of rotation until the opposite side of the table plate reaches the needle.
- Check the distance to the needle.
- Tighten screw 9.





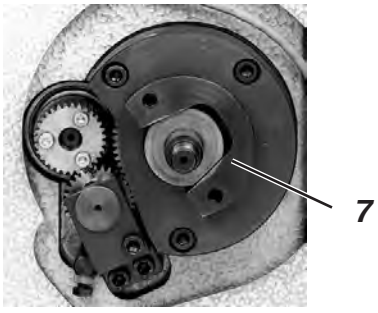
Setting the extent of the movement of the table plate 1:

In the transverse direction:

- Slightly undo nut 8.
- Set the extent of the movement in the transverse direction by moving the crank along the slot.
- Tighten nut 8.

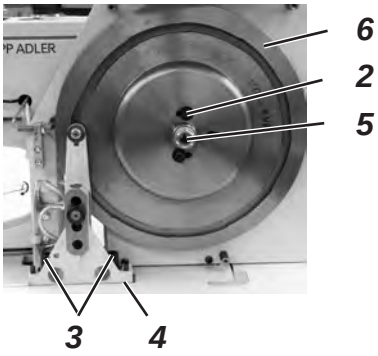
In the longitudinal direction:

- Undo screw 9.
- Set the extent of the movement in the longitudinal direction by moving the crank along the slot.
  CAUTION:
  Do not change the setting of the eccentric 10.
- Tighten screw 9.



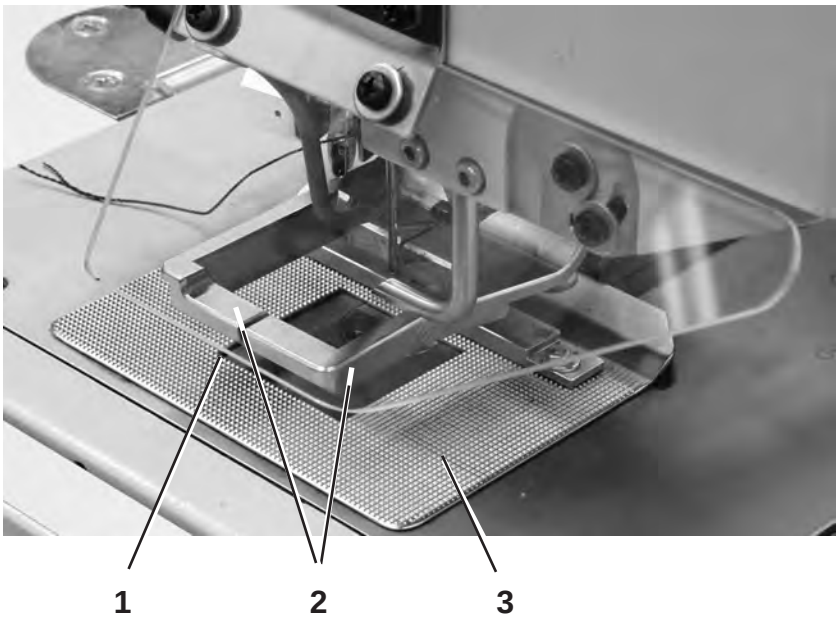
Replacing parts which have been removed

- Remove the disc cam 6.
- Replace the claw 7.
- Replace the disc cam 6 and secure with screws 2 and nut 5.
- Fit support 4 and secure with screws 3.



7.2 Position of clamps with respect to the table plate

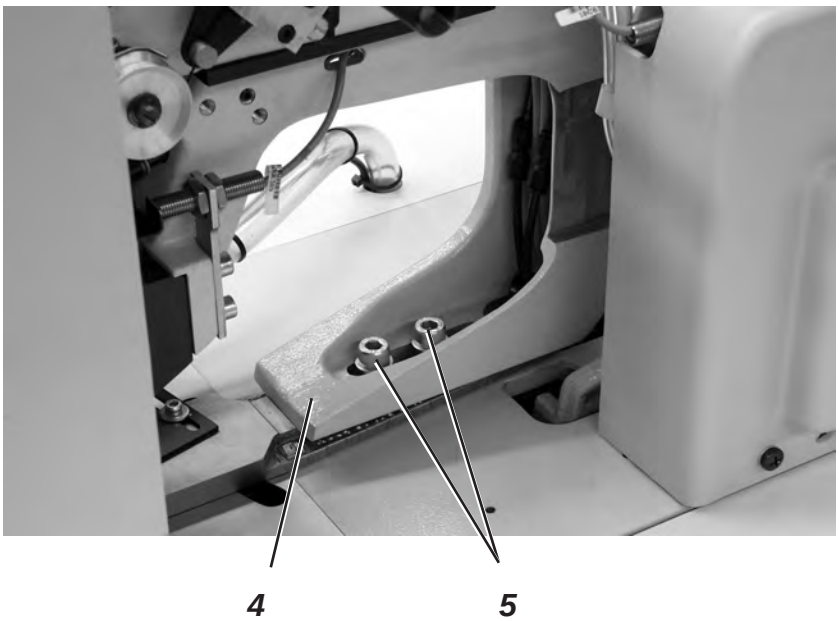
The clamps 2 must be symmetrically aligned with the hole 1 in the table plate 3.



CAUTION: danger of injury

Turn off the main switch.
Clamps may only be aligned with the main switch turned off.

- Operate the pressure regulator to lower the operating pressure to 1 bar.
- Lower the clamps.
- Slightly undo screws 5 on the clamp bracket 4.
- Move the clamp brackets 4 to align clamps 1 and 2 symmetrically with the hole in the table plate 3.
- Fully tighten screws 5.
- Raise the clamps.
- Restore the operating pressure to 6 bar again.



8. Thread advance

To ensure that the seam is properly started a certain length of upper thread must be advanced.

The advance takes place on completion of the previous seam with the clamps still lowered.

Operational sequence

- The upper-thread tensioner opens.
- The burner descends.
- The thread advance 1 advances the required length of thread.
- The thread advance 1 moves back to its initial position.
- The upper-thread tensioner closes.
- The thread extractor draws the upper thread into the burn position.
- The thread is burned through.
- A new sewing run may commence.

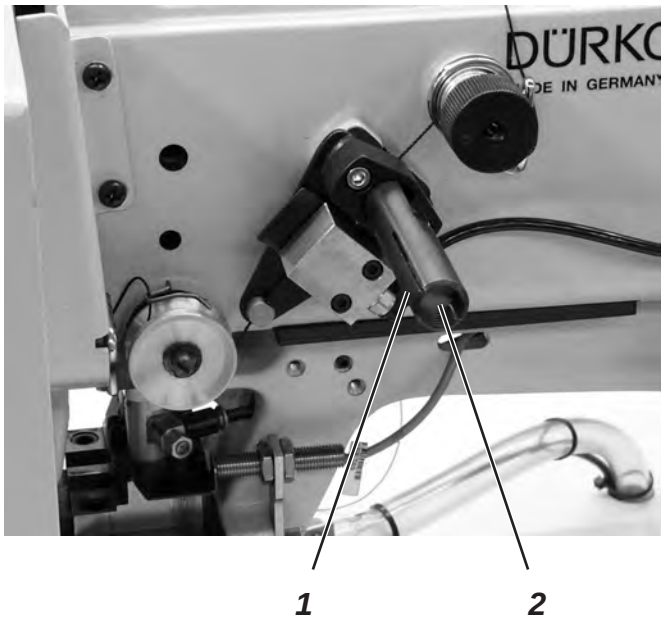
Setting

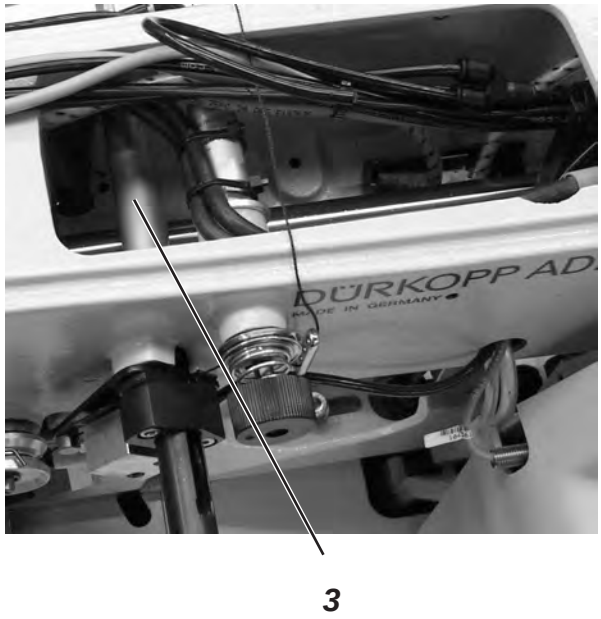
The setting of the thread advance 1 must be such as to ensure that the seam is properly begun. This will depend on the material being sewn.

CAUTION:

If not enough thread is advanced, it will be under too much tension when it is burned through and the end of the thread will not “fuse”.

3

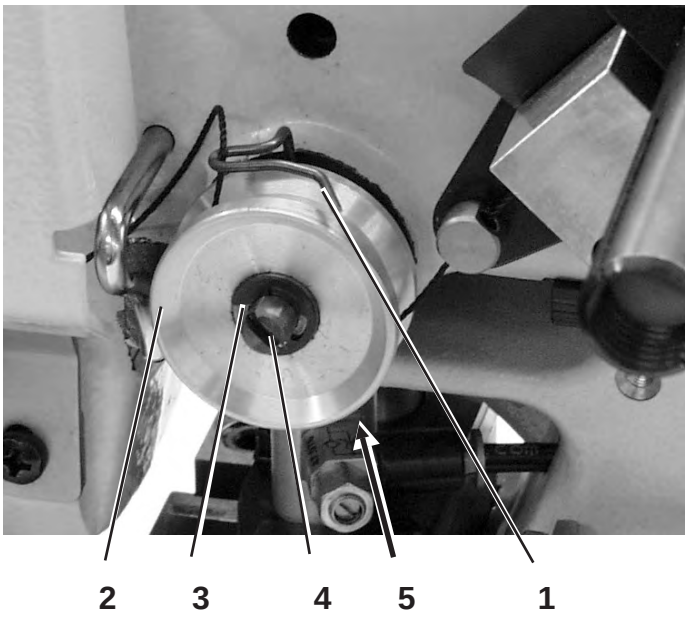


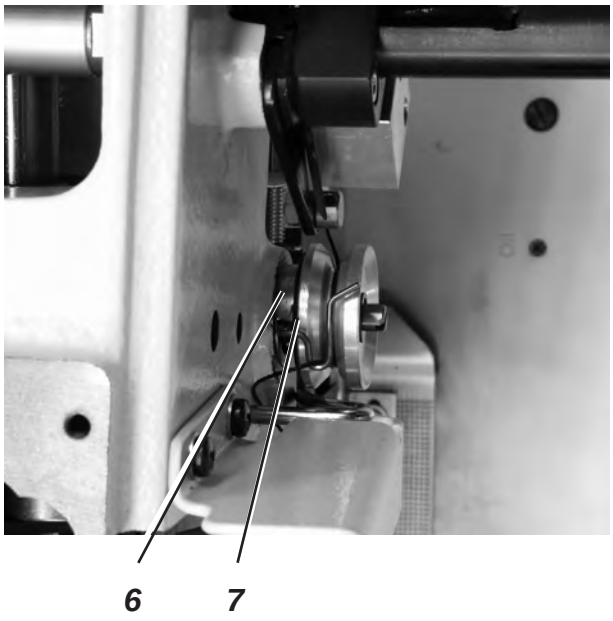


Adjustment:

- Set the length of the thread advance by twisting the stop screw 2. The stop screw 2 limits the stroke of the cylinder 3.

9. Thread-tensioning spring





Spring travel

When the needle penetrates the material the thread-tensioning spring 1 must be in contact with the thread-tensioner support 6.
When the eye of the needle enters the material the spring will then be just free of tension.

Adjustment:

- Undo locking screw 5.
  This locking screw is located behind the thread-guide roller 2 under the arm.
- Twist the thread-tensioner support 6.
- Fully tighten locking screw 5.

Spring tension

The spring must keep the advanced thread under tension until the eye of the needle penetrates the material.
The spring tension necessary for this depends on the material.

Adjustment:

- Remove retaining ring 3 and shim.
- Remove thread-guide roller 2.
- Slightly undo screw 4.
- Hold the screw 4 in position with a screwdriver to stop it twisting.
- Set the spring tension by twisting the knurled nut 7:
  clockwise to increase spring tension
  anticlockwise to reduce spring tension.
- Hold the knurled nut 7 in place and fully tighten screw 4.
- Replace thread-guide roller 2.
- Replace shim and retaining ring 3.

10. Needle cooling

The needle cooling can be switched from normal to continuous operation.

In normal operation needle cooling is only activated during sewing.

The air stream emerging from the nozzle 2 must be pointed at the needle and be of adequate power.

1

2

Adjustment:

– Slightly undo locking screw.
– Point the nozzle 2 at the needle.

CAUTION:

Under no circumstances may the air stream emerging from the nozzle 2 interfere with the burner.

– Tighten locking screw.
– Adjust the strength of the air stream with the setting screw 1 of the throttle valve.

11. Thread-burning device

The electrical thread-burning device severs the upper and lower threads by burning them through.

The end of the upper thread is fused.
The resulting small hardenings prevent the seam from working loose.

To ensure that the thread ends fuse properly it is essential to use only **synthetic** threads.

The length of the burned-off lower thread on the material is equal to the thickness of the needle plate at about 3.5 mm.

11.1 Thread extractor

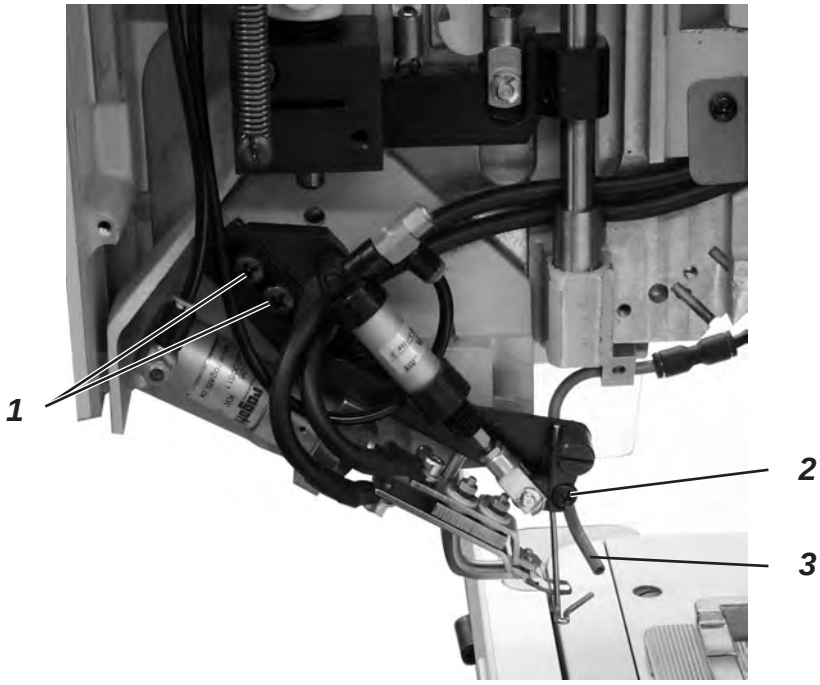
The thread extractor 3 draws the thread advanced by the thread advance into the correct position for the severing process.

Swivelling movement

The thread extractor 3 draw forward as much thread as possible. However, the amount of thread drawn forward must not be so great that it is not under tension.

CAUTION:

Excessive tension causes the thread to fray when it is severed and prevents the thread ends from fusing.

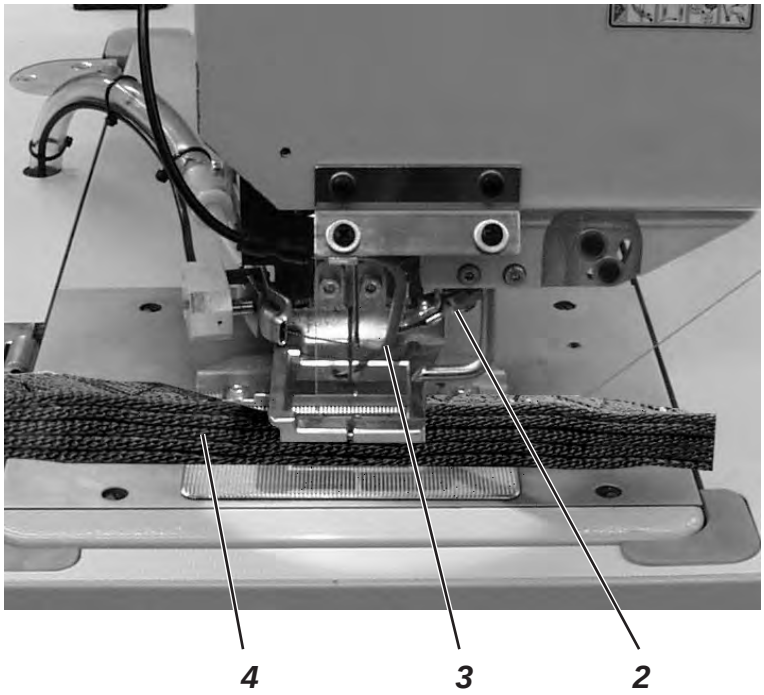


Open the head cover.
All control functions are blocked.

– Undo nuts 1.
– Adjust the swivelling movement of the thread extractor 3 by moving the cylinder suspension up or down.
– Fully tighten nuts 1.

Thread-extractor height

With the thread lever in its highest position the thread extractor 3 should pass freely under the needle.



– Place material 4 of the maximum permissible thickness (t = 16 mm) or a shim under the clamps.
– Lower clamps.
– Turn off the main switch.

CAUTION: danger of injury

Turn off the main switch.
The height of the thread extractor 3 may only be checked with the main switch turned off.

– Manually swivel the thread extractor 3 beneath the needle.
The thread extractor 3 must not touch the needle.

Adjustment:

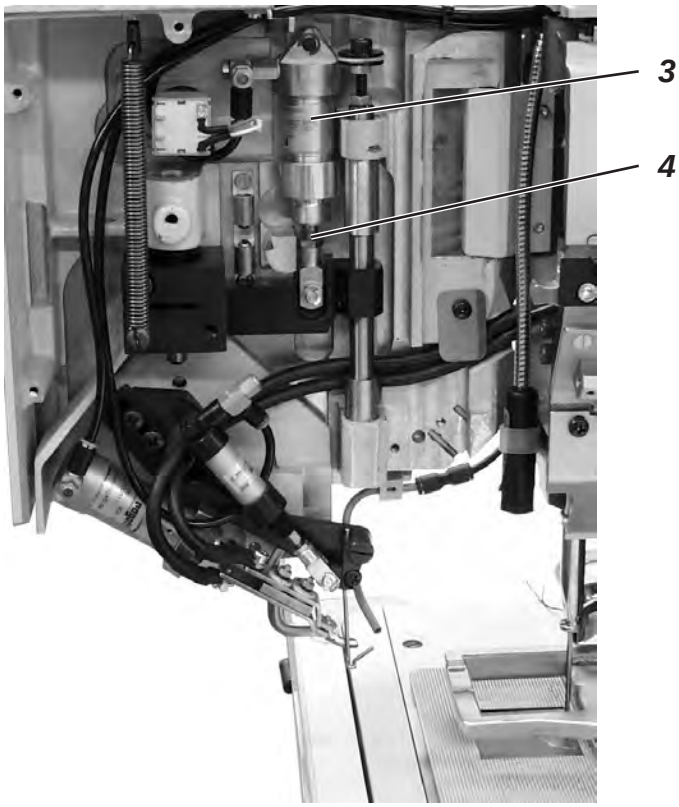
– Undo locking screw 2.
– Adjust height of thread extractor 3.
– Fully tighten locking screw 2.

11.2 Upper burning device

The correct lateral position of the burner with respect to the thread is automatically set when the burning device is secured.

11.2.1 Starting position

The burner is in the starting position when the piston rod 4 of the cylinder 3 is fully retracted.
In this position the thread extractor is located outside the needle-hole area.

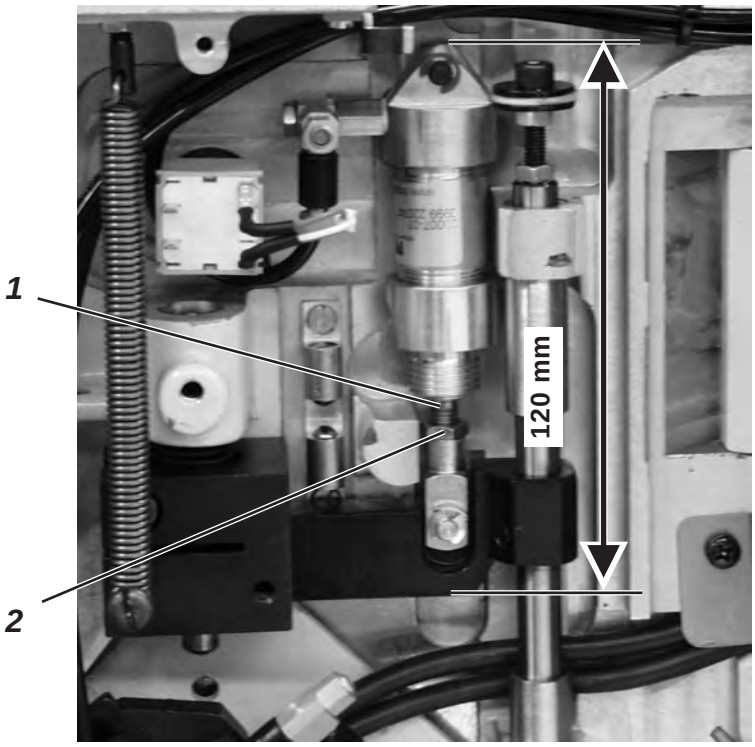


11.2.2 Position of fully-extended burner

When the setting is correct:

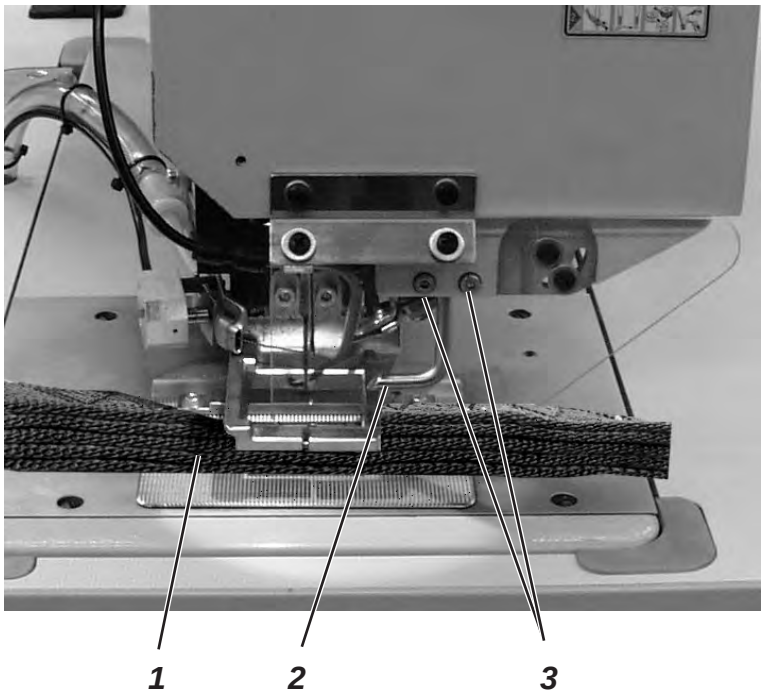
- the fully-extended burner must be at a distance of approx. 1 mm from the clamped material
- the fully-extended burner must be in contact with the thread positioned by the thread extractor and exert slight pressure on it.

Both these requirements are met if the distance between the upper edge of the cylinder suspension and the lower edge of the attachment bracket is 120 mm.



- Open the head cover.
  All control functions are blocked.
- Loosen locknut 2 on piston rod 1.
- Set the distance between the upper edge of the cylinder suspension and the lower edge of the attachment bracket by twisting the piston rod 1.
- Tighten locknut 2.

11.2.3 Adjusting the burner height-stop



- Place material 1 of the maximum permissible thickness (t = 16 mm) or a shim under the clamps.
- Lower clamps.
- Turn off the main switch.

CAUTION: danger of injury

Turn off the main switch.
The burner height-stop may only be adjusted with the main switch turned off.

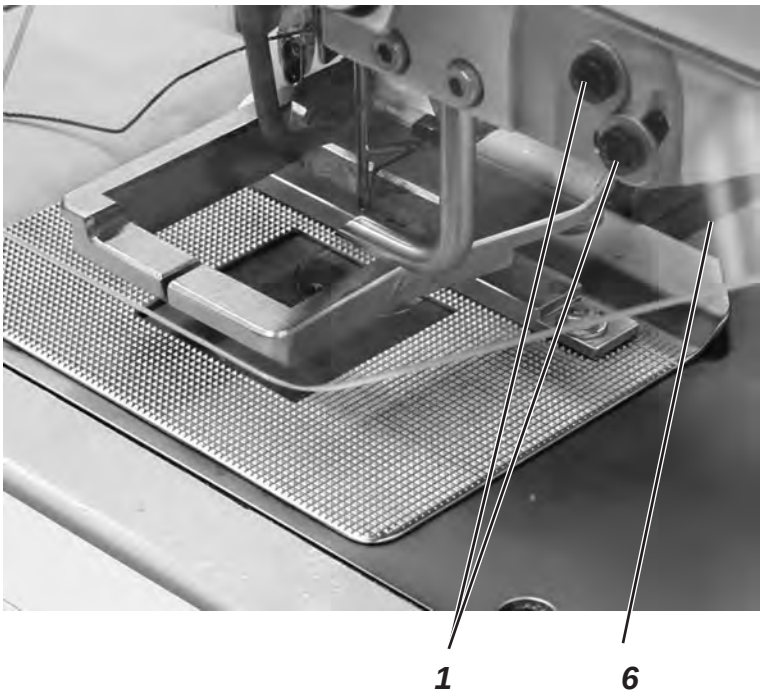
- Remove eye-protection guard after undoing the fixing screws. The locking screws 3 are freely accessible.
- Slightly undo locking screws 3.
- Pull the height-stop 2 down until it makes contact with the lowered clamps.
- Fully tighten locking screws 3.
- Replace eye protection.

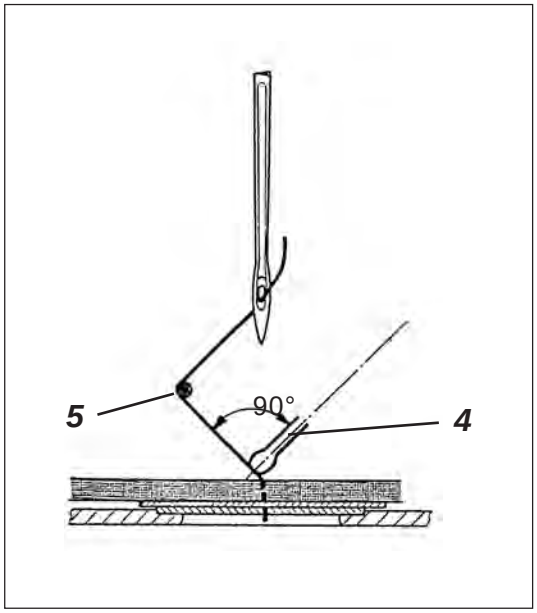
CAUTION: danger of injury

Replace eye-protection guard after completing adjustment work.

11.2.4 Burner angle

The burner 4 must be at an angle of approx. 90° to the thread positioned by the thread extractor 5.





3

CAUTION: danger of injury

Turn off the main switch.
The burner angle may only be adjusted with the main switch turned off.

- Remove eye-protection guard 6 after undoing the fixing screws. The locking screws 1 are freely accessible.
- Slightly undo locking screws 1.
- Swivel the burner to the correct angle.
- Fully tighten locking screws 1.
- Replace eye-protection guard 6.

CAUTION: danger of injury

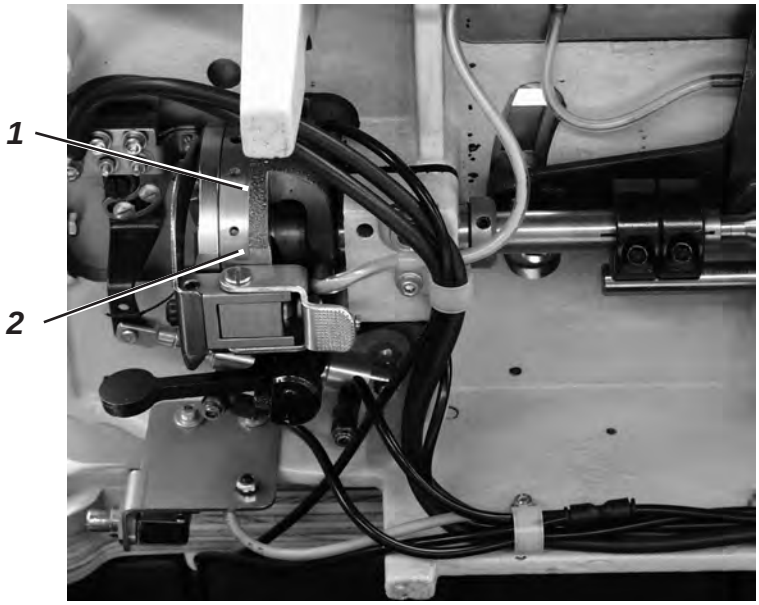
Replace eye-protection guard 6 after completing adjustment work.

11.3 Lower burning device

11.3.1 Adjustment preconditions

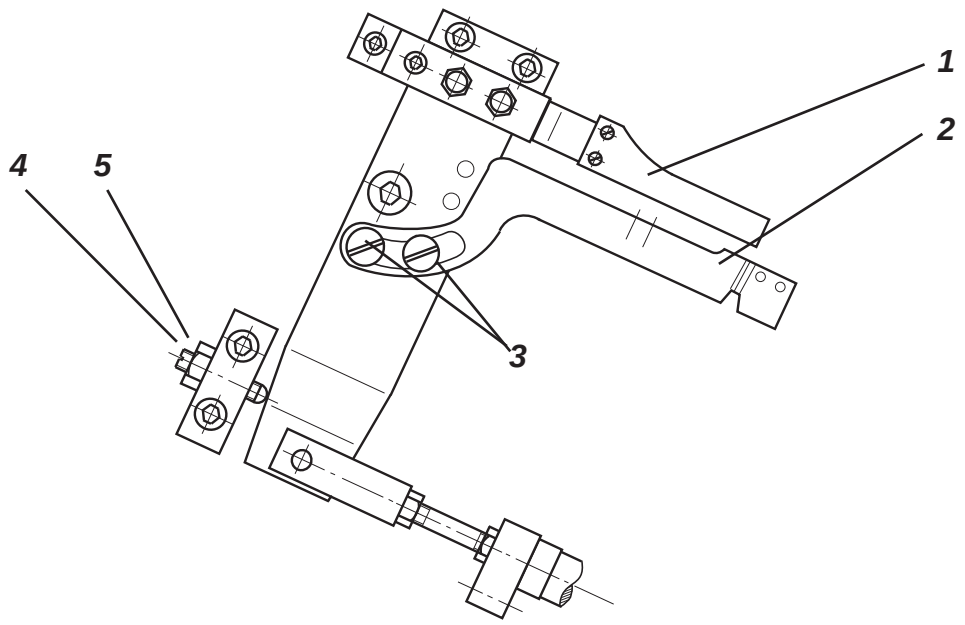
The setting of the lower burning device must be such that:

– the surface 2 on the shuttle-track support 1 must be parallel to the throat plate.



11.3.2 Distance between thread extractor and burner

The distance between the thread extractor 2 and the burner 1 must be as small as possible in the front area.



CAUTION: danger of injury

Turn off the main switch.
The distance between the thread extractor 2 and the burner 1 may only be adjusted with the main switch turned off.

- Fold the upper part of the machine aside.
- Slightly undo screws 3.
- Set the correct distance by moving the thread extractors 2.
- Fully tighten screws 3.

11.3.3 Position of burner when swivelled forwards

The left-hand side of the burner 1 must be on a level with the outer edge of the needle-hole sleeve 6.

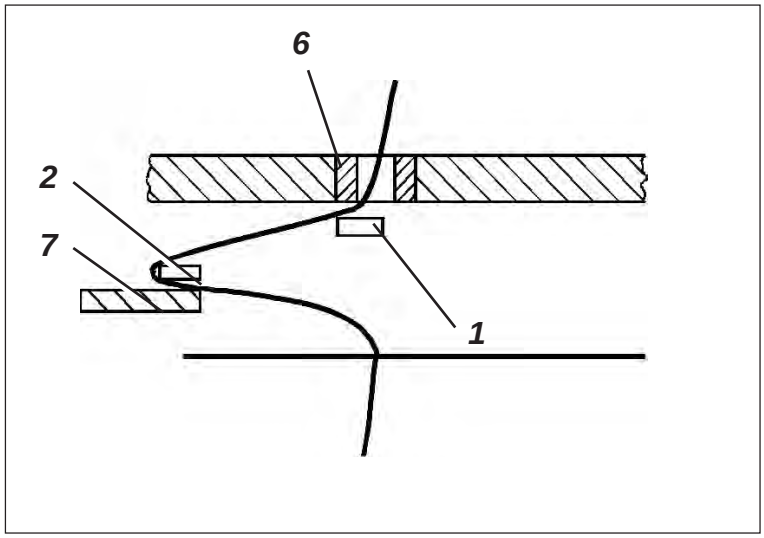
CAUTION: danger of injury

Turn off the main switch.
The position of the burner 1 may only be adjusted with the main switch turned off.

- Undo locknut 5.
- Set the position of the burner by twisting the stop-screw 4.
- Fully tighten locknut 5.

11.3.4 Burner height

When swivelled forwards the burner 1 exert slight pressure on the needle-hole sleeve 6.
In the starting position the burner 1 must not touch any other part.



CAUTION: danger of injury

Turn off the main switch.
The height of the burner 1 may only be adjusted with the main switch turned off.

Adjustment:

– Bend the burner 1 as required.

11.3.5 Thread-extractor height

The distance between the thread extractor 2 and the thread-guide plate 7 must be as small as possible.

The resulting slanting position of the threads favors the severing process.
However, the lower thread must not be jammed between the thread extractor 2 and the thread-guide plate 7.

CAUTION: danger of injury

Turn off the main switch.
The height of the thread extractor 1 may only be adjusted with the main switch turned off.

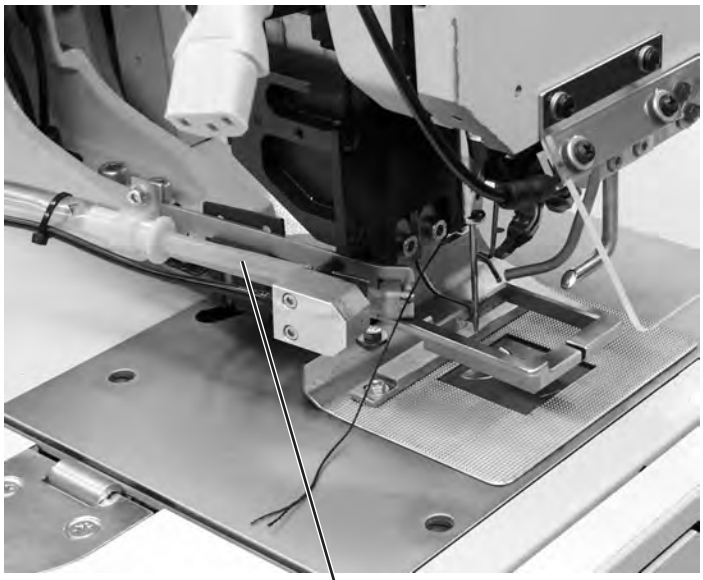
Adjustment:

– Bend the thread extractor 1 downwards as required.

12. Thread-suction device

The thread-suction device 1 picks up the needle thread and holds it fast at the beginning of the seam.

This prevents the needle thread from slipping out of the needle when sewing begins.



1

2 *3*

CAUTION: danger of injury

Turn off the main switch.
The position of the thread-suction device may only be adjusted with the main switch turned off.

CAUTION: Danger of breakage

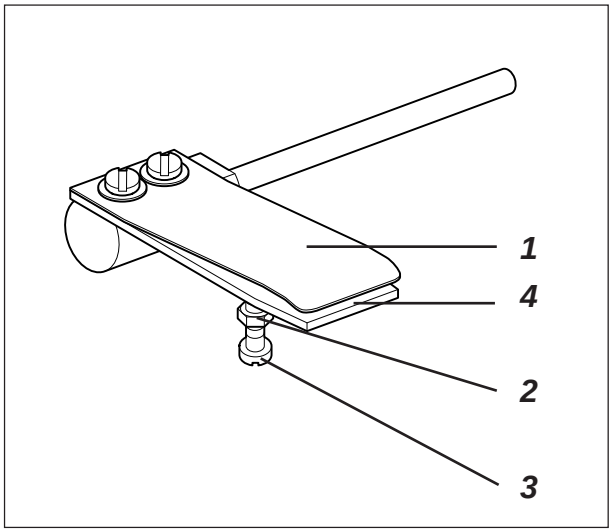
Ensure that the thread-suction device is at the proper distance from the clamp.

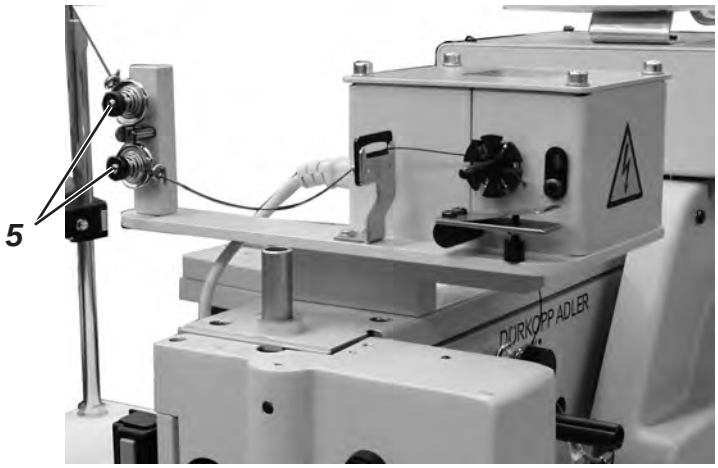
- Undo screws 2 and 3.
- Adjust the thread-suction device so that the starting and needle threads are reliably picked up.
- Retighten screws 2 and 3.

13. Bobbin-winder adjustment

The setting of the spring 1 of the thread layer 4 must be such that the thread layer switches off when the bobbin is full.

The thread to be wound on should be tightly pre-tensioned. Adjust the two tensioners 5 accordingly.





CAUTION: danger of injury

Turn off the main switch.
The bobbin winder may only be adjusted with the main switch turned off.

Adjustment:

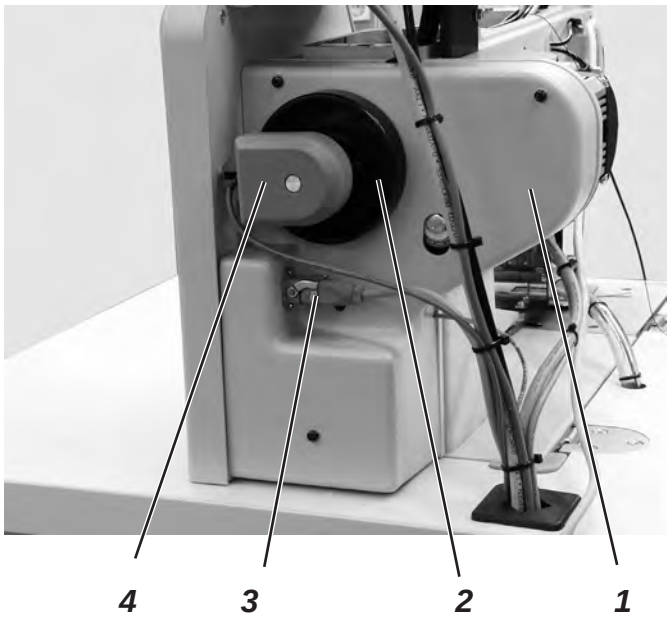
- Undo locknut 2.
- Turn the screw 3 to adjust the spring of the thread layer 4 accordingly.
- Tighten locknut 2.

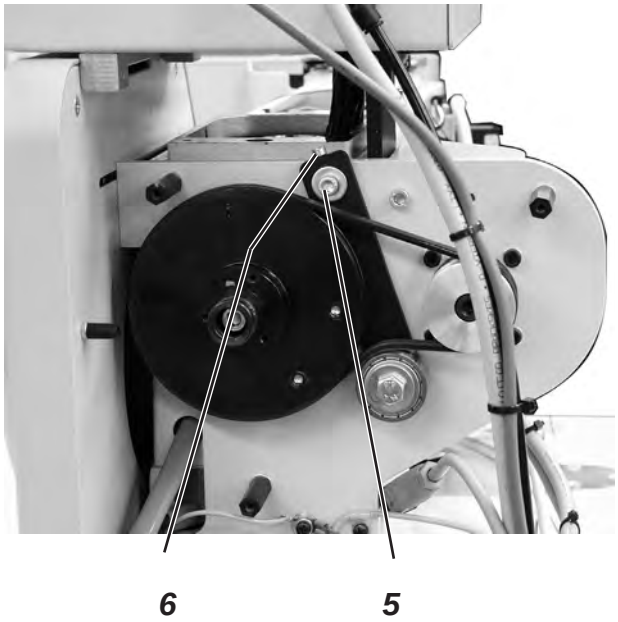
CAUTION:

The bobbin winder is fitted with a thermal switch.

In the event of overheating the power is interrupted. After cooling-off the winding process is automatically resumed.

14. V-belt tension





CAUTION: danger of injury

Turn off the main switch.
The V-belt tension may only be adjusted with the main switch turned off.

3

- Remove proximity switch 4.
- Remove handwheel 2.
- Unplug connector 3.
- Remove cover 1.
- Loosen screw 5 slightly.
- Stretch the belt via screw 6.
- Tighten screw 5 again.
- Fit the cover, connector, handwheel, proximity switch again.

1 2 3 4 5 6 7 8 9 10

H1
LED 3W
Nähleuchte
sewing light

X1
sw 1 gn
gr 2 ge
rt 3 gr
gr 4 rs
LED 2
1 ws
2 bn
LED 1

OUT:
LED1: 24V/70mA
LED2: 400mA
3W
IN:
190-240V
50/60Hz
10VA
T1
F1
M0,63A
9850 001083

Leitung k
9870 001020
230V
+10% -20%
50/60Hz
X0
L1 bn
N bl
PE gnge
Netzstecker
mains plug

Hauptschalter
main switch
Q0
L1 T1
L2 T2
PE

Leitung k
9870 001021

9870 506302 L003

9870 506303 L019

A1

Steuerung Quick DA104ED
controlbox Quick DA104ED

9870 506302 L001

/2.2
X21/Eingänge
X21/Inputs

/3.2
X41-X42/Ausgänge
X41-X42/outputs

9870 506303 L020

/2.7
Verteiler am Oberteil /X2
Junction box at sewing head /X2

Leiterplatte k. 9850 506017
PCB

X8 X3
Opto-elektr.
Relais
K1
R1
100R
C1
F2
F1,6A
+24V
A8
V1
Brennerheizung ein
Burner heating on
X2 X7
L005 L006 L007
X6 X6
9870 506302 L004
9870 506303
X1
A3

X5 X2 37-pol
analog 1
+5V 2
analog 3
0V 4
IN_E2 5 bl
IN_E1 6 bngn
IN_E3 7 gn
IN_E4 8 wsge
IN_E5 9 ws
IN_E6 10 grrs
IN_E7 11 vi
IN_E8 12 rt
IN_E9 13 bn
IN_10 14 rs
+15V 15
+24V 16 wsgn
+24V 17 gebn
+24V 18 rsgn
GND 19
OC 500mA Out_A15 20 gnsw
OC 500mA Out_A10 21 gesw
SYMA Out____ 22
OC 500mA Out_A12 23 bnbl
OC 500mA Out_A13 24 bnrt
OC 500mA Out_A14 25 gert
+24V 26 gers
OD/SE 4A Out_A3 27 bnsw
OD/SE 4A Out_A2 28 rsbn
wssw
grgn
OC 500mA Out_A9 29
OD/FL 4A Out_A5 30 wsrs
OC 500mA Out_A11 31 wsrt
OD/FL 4A Out_A6 32 grbn
+24V 33
OD/ABSE 8A Out_A7 34 wsgr
OD/ABSE 8A Out_A8 35 ge
OD/FL 4A Out_A4 36 wsbl
OD/SE 4A Out_A1 37 gegr
gr
sw
rtbl
gnbl
gebl
gnrt

A4
L010 L010
T2
1V
L011
Brenner für Oberfaden
Burner for needle thread
Brenner für Unterfaden
Burner for bobbin thread
9870 506303 2x L008
9870 506303 2x L009

X3
L N PE

Leitung k
9840 503001

X4
N PE
U V PE
M
1~
M2
Spuler 0504 170854
bobbin winder

X5
Verteiler
junction box
/4.1
Greiferüberwachung /X1
Hook monitoring /X1

M1
M
Motor
M1.2
Extern
M1.1

A2

Z Zusatzeinrichtung
Optional equipment

c				Datum	24.04.08	
b				Bearb.	Cz	
a				Geprüft		
	Änderung	Datum	Name	Norm		

DÜRKOPP ADLER

Teilefamilie
Freigabe 0068/08

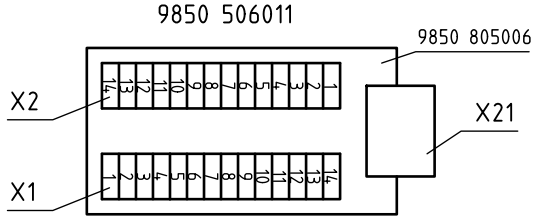
506-3
Netzspannungsteil
Nähantrieb QE5540/DA104ED

Bauschaltplan
9890 506003 B

Blatt 1 / 4

1	2	3	4	5	6	7	8	9	10

Leiterplatte k.
9850 506011



Verteiler am Oberteil
Junction box at sewing head

A5

(16pol.) X21

+24V wsgn 13
E2 bl 7
E1 bngn 14
A8 ge 4
E8 rt 8
E4 wsge 15
gr
5
sw 9
E3 gn 3
E10 rs 6
E9 bn 2
rtbl 12
E5 ws 1
E7 vi 10
+24V gebn 16
E6 grrs 11

J1 J2 J3 J4 J5 J6 J7 J8 J9

X2: 1 2 3 4 5 6 7 8 9 10 11 12 13 14

X1: 1 2 3 4 5 6 7 8

9870 506303 L013 — X23 — Fußschalter k 9880 506301
Foot switch A6

S1 Fußschalter links
Foot switch left
ws +24V — bn E1

S2 Fußschalter rechts
Foot switch right
gn ws +24V — bn E2

9870 506303 L020 — /1.5
X8/Brennerheizung ein
X8/Burner heating on
Ausgang 8
output 8

Steuerung k. 9850 506014
Control box A8

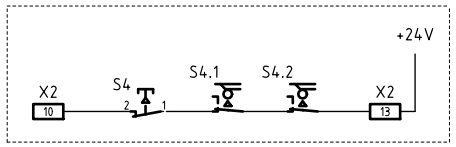
9870 506020 L056 (Z) — X55 — S8 Relais
/4.1
Spulen-Drehüberwachung (Z)
bobbin rotation monitoring

9870 506303 L014 — S4
Stopp
Stop

9870 506303 L015 — S4.1
Oberteil- und Greiferklappenkontrolle
Sewing head- and hook cover controll

9870 506303 L016 — S4.2
Kopfdeckelkontrolle
Head cover control

- Laufsperre -
- Start interlock -



9870 506302 L001
/1.5
X2/Steuerung
X2/controlbox

Taster k
9880 506005 — S3
Spulenwechsel
Bobbin change

9870 506306 L017 — (2pol.) X24 — (*1) — S5
Linke Klammer oben
Left clamp up

9870 506303 L018 — (2pol.) X26 — (*1) — S6
Rechte Klammer oben
Right clamp up

(2pol.) X25 — (*1) — S7
Grundstellung
Basic position

J2 und J4 aufgebohrt
J2 and J4 drilled out

(*1)	Induktivgeber k	9815 710103

(Z) Zusatzeinrichtung
Optional equipment

c				Datum	24.04.08
b				Bearb.	Cz
a				Geprüft	
	Änderung	Datum	Name	Norm	

DÜRKOPP ADLER

Teilefamilie
Freigabe 0068/08

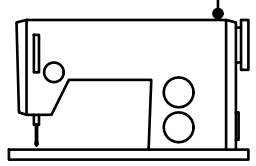
506-3
Eingänge + Ausgang 8
Nähantrieb QE5540/DA104ED

Bauschaltplan
9890 506003 B

Blatt 2 / 4

1	2	3	4	5	6	7	8	9	10

Verteiler am Oberteil
Junction box at sewing head



9870 506303 L012

9870 506302 L001

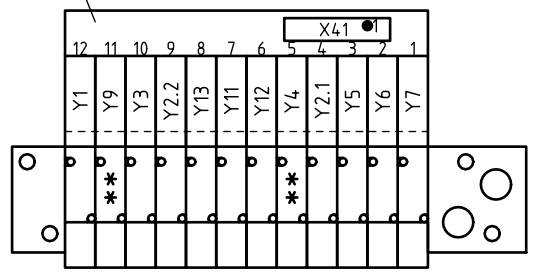
/1.6
X2/Steuerung
X2/control box

(14pol.)
X41

A7	wsgr	1	Y7	1	Klammer links (s1) / Left clamp
+24V	rsgn	13			
A6	grbn	2	Y6	2	Klammer rechts (s2) / Right clamp
A5	wsrs	3	Y5	3	Faden ziehen (s4) / Pull thread
A2	rsbn	4	Y2.1	4	Nadelkühlung (s18) / Needle cooler
A4	wsbl	5	Y4	5	Unterfadenklemme (s19) / Bobbin thread clamp
A12	bnbl	6	Y12	6	Fadenwischer vor (s20) / Thread wiper forward
A11	wsrt	7	Y11	7	Brenner absenken (s22) / Lower burner
A13	bnrt	8	Y13	8	Brenner vor (s26) / Mowe burner forward
A2	wssw	9	Y2.2	9	Greiferschmierung (s28) / Hook lubrication
A3	bnsw	10	Y3	10	Oberfadenklemme (s5) / Needle thread clamp
A9	grgn	11	Y9	11	Fadenspannung lösen (s3) / Releasing thread tension
A1	gegr	12	Y1	12	Faden ansaugen (s6) / Thread suction

A7

Leiterplatte k. 9850 001016



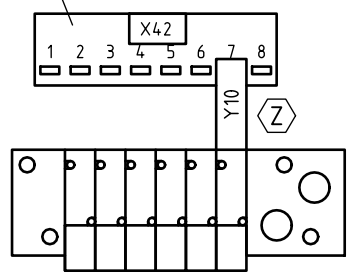
** stromlos offen normally open (NO)

(10pol.)
X42

gnbl		4		2	
+24V	gers	2			
gebl		5		3	
gnrt		6		4	
A14	gert	7	Y14	5	Reserve / Reserve
A15	gnsw	8	Y15	6	Reserve / Reserve
A10	gesw	9	Y10	7	Stempel / die Ⓩ

A9 Ⓩ

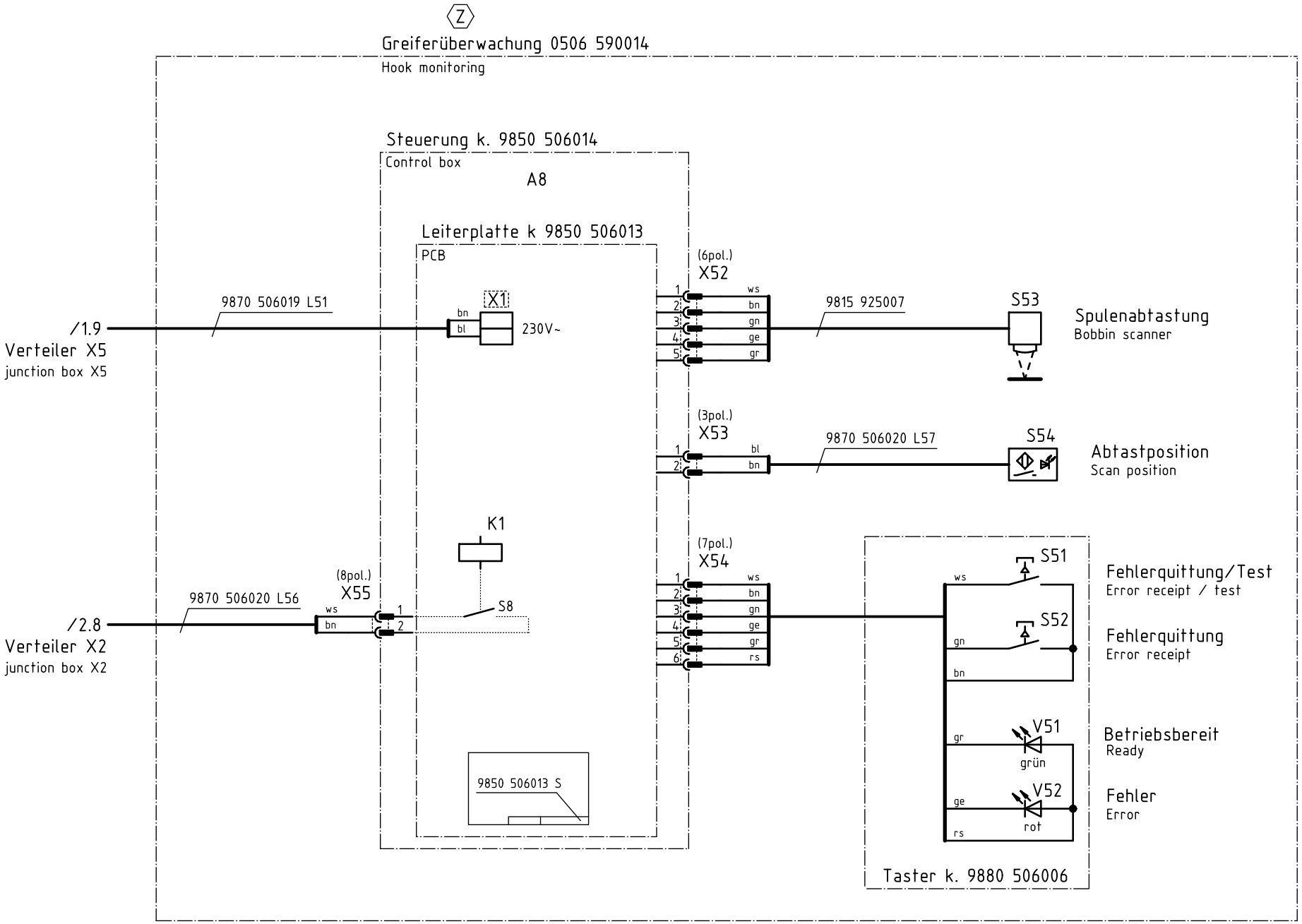
Leiterplatte k. 9850 001038 Ⓩ



Ⓩ Zusatzeinrichtung
Optional equipment

c				Datum	24.04.08	DÜRKOPP ADLER	Teilefamilie	506-3 Ausgänge Nähantrieb QE5540/DA104ED
b				Bearb.	Cz			
a				Geprüft			Freigabe 0068/08	
	Änderung	Datum	Name	Norm				

Bauschaltplan
9890 506003 B
Blatt 3 / 4



Kurz-zeichen	Benennung	Abmessung	Teilenummer	Bemerkung
A1	Steuergerät Sicherung	Quick DA104ED T8,0A/250V 5x20mm	9800 351008 9825 810418	
A2	Bedienfeld	Quick Eco Topp	9800 350003	
A3	Leiterplatte k	Brenner	9850 506017	
A4	Transformator k	Brenner	9870 506304	
A5	Leiterplatte k	Verteiler	9850 506011	
A6	Fußschalter k	2-fach	9880 506301	
A7	Leiterplatte k	Magnetventile	9850 001016	
A8	Steuerung k	Greiferüber-wachung	0506 590014	Z
A9	Leiterplatte k	Magnetventile für Erweiterungen	9850 001038	Z
F1	Sicherung	M0,63/250V 5X20mm	9825 810308	
F2	Sicherung	F1,6A/250V 5x20mm	9825 810213	
H1	Nähleuchte	LED	9822 560000	
M1	Nähmotor	Quick QE5540	9800 150010	
M1.1	Positionsgeber	Quick PD3	9800 347002	
M1.2	Y-Adapter	Quick	9800 350004	
M2	Spuler k Netzleitung	 3x0,75	0504 170854 9840 503001	
Q0	Schalter, Netz		9815 580001	
S3	Taster k.		9880 506005	
S4	Taste Kontaktelement	 1S+1Ö	9815 110025 9815 110026	
S4.1	Drucktaster	MZD1021306	0999 202226	
S4.2	Mikroschalter		9815 510001	
S5	Induktivgeber	M8 Ltg.110mm	9815 710103	
S6	Induktivgeber	M8 Ltg.110mm	9815 710103	
S7	Induktivgeber	M8 Ltg.110mm	9815 710103	
T1	Netzteil	24VDC/5VA	9850 001083	
T2	Transformator		9810 810002	
X0	Stecker, Netz		9825 190104	Z
X5	Gehäuse Klemmleiste		9830 200710 9825 570004	

Z Zusatzeinrichtung
Optional equipment

c				Datum	24.04.08	
b				Bearb.	Cz	
a				Geprüft		
	Änderung	Datum	Name	Norm		

DÜRKOPP ADLER

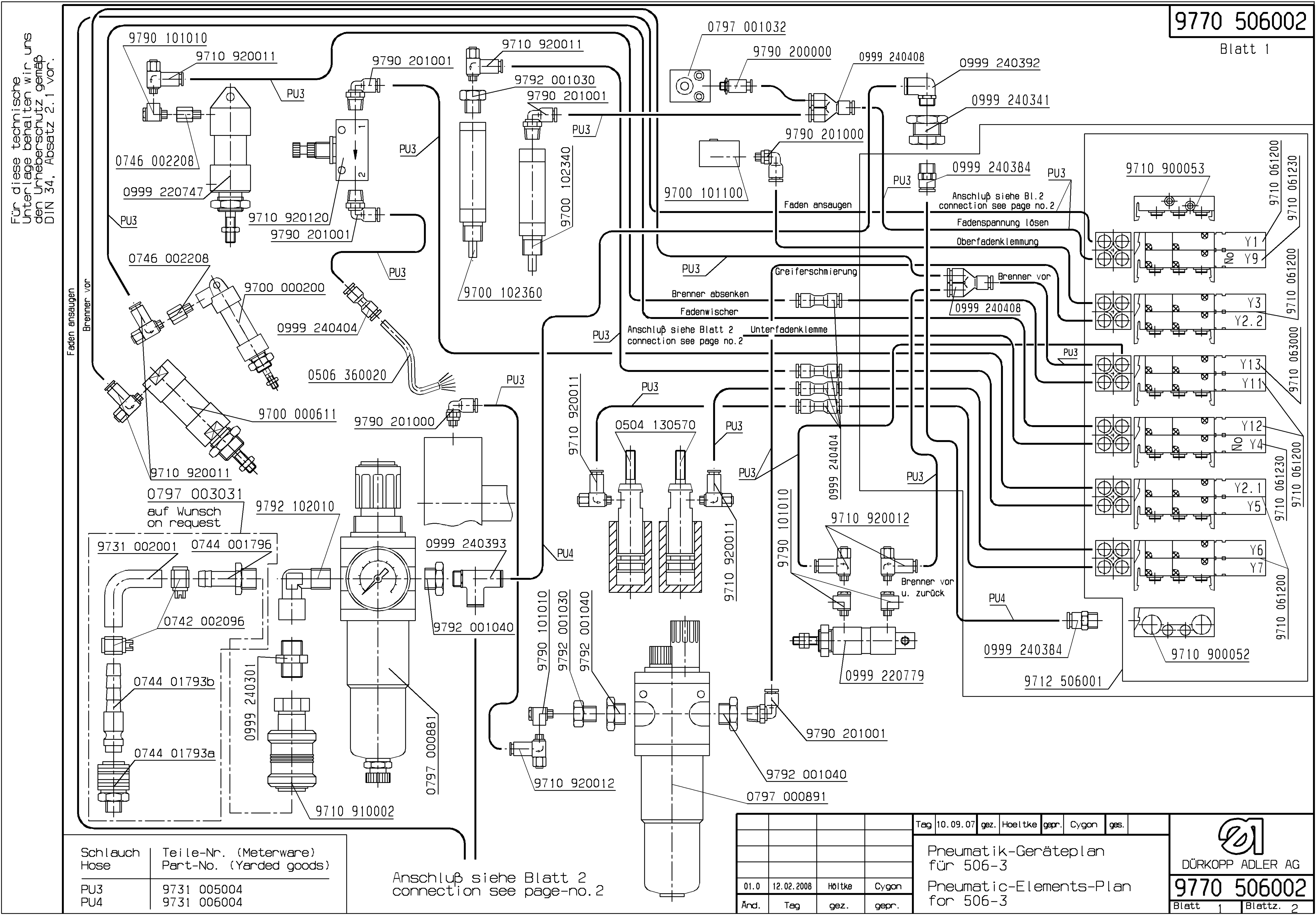
Teilefamilie

Freigabe 0068/08

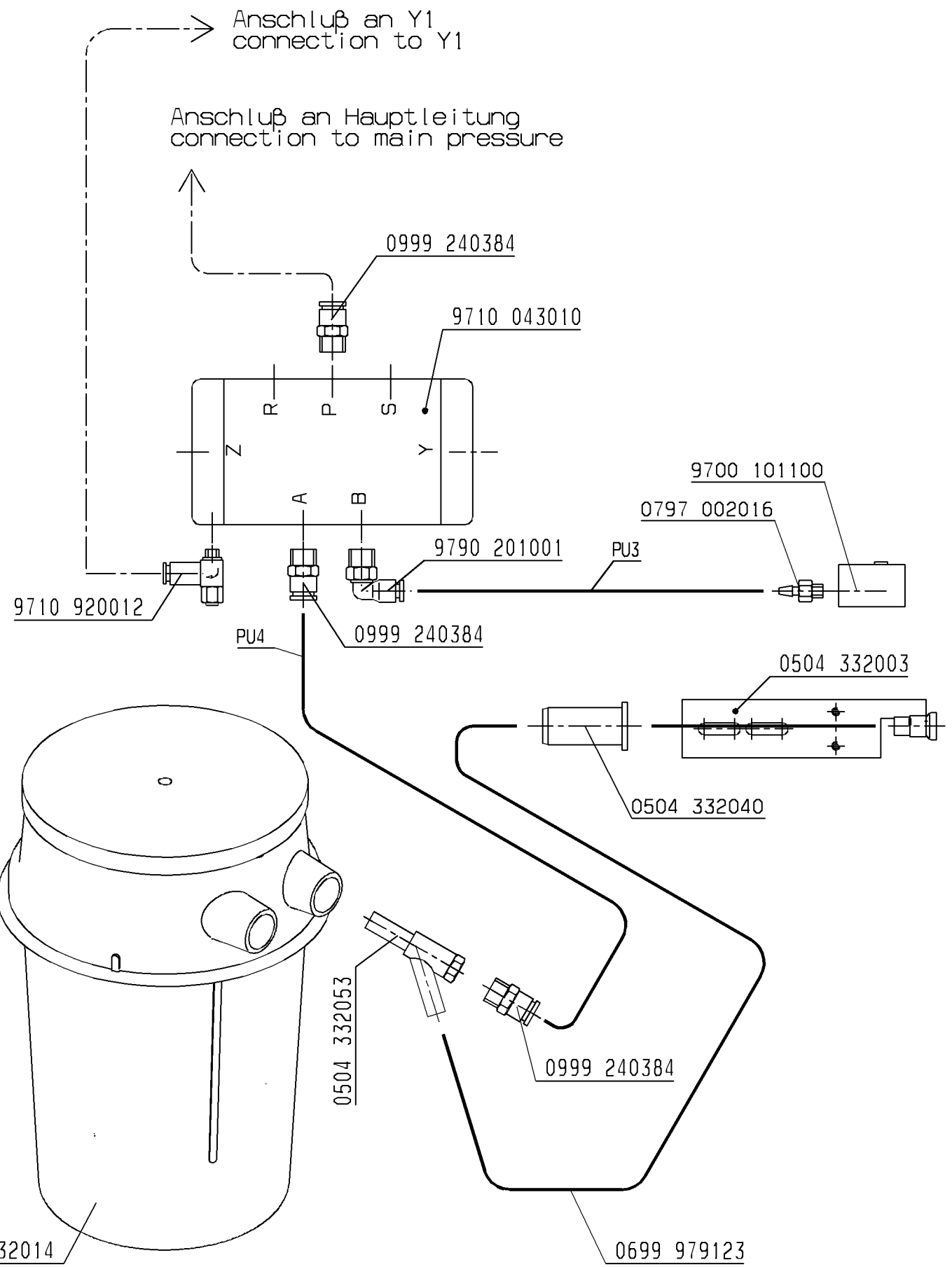
506-3
Zusatzeinrichtung, Teileliste
Nähantrieb QE5540/DA104ED

Bauschaltplan
9890 506003 B

Blatt 4 / 4



9770 506002
Blatt 1
Für diese technische Unterlage behalten wir uns den Urheberschutz gemäß DIN 34, Absatz 2.1 vor.
Faden ansaugen
Brenner vor
9790 101010
9710 920011
0746 002208
0999 220747
PU3
9790 201001
9710 920120
9790 201001
9710 920011
9792 001030
9790 201001
9700 102340
9700 102360
0797 001032
9790 200000
0999 240408
0999 240392
0999 240341
9790 201000
9700 101100
0999 240384
Anschluß siehe Bl.2 connection see page no.2
Fadenspannung lösen
Oberfadenklemmung
Greiferschmierung
Brenner vor
Brenner absenken
Fadenwischer
0999 240408
Anschluß siehe Blatt 2 connection see page no.2
Unterfadenklemme
9710 900053
9710 061200
9710 061230
Y1
Y9
Y3
Y2.2
Y13
Y11
Y12
Y4
Y2.1
Y5
Y6
Y7
9710 063000
9710 900052
0746 002208
9700 000200
0999 240404
0506 360020
9700 000611
9790 201000
9710 920011
0797 003031
auf Wunsch
on request
9731 002001
0744 001796
0742 002096
0744 01793b
0744 01793a
9792 102010
0999 240393
9792 001040
PU4
0999 240301
0797 000881
9710 910002
9710 920011
0504 130570
0999 240404
9790 101010
9710 920012
Brenner vor u. zurück
0999 220779
0999 240384
9712 506001
9790 101010
9792 001030
9792 001040
9710 920012
9790 201001
9792 001040
0797 000891
Schlauch Hose
Teile-Nr. (Meterware) Part-No. (Yarded goods)
PU3 9731 005004
PU4 9731 006004
Anschluß siehe Blatt 2 connection see page-no.2
Tag 10.09.07 gez. Hoeltke gepr. Cygon ges.
01.0 12.02.2008 Höltke Cygon
Änd. Tag gez. gepr.
Pneumatik-Geräteplan für 506-3
Pneumatic-Elements-Plan for 506-3
DÜRKOPP ADLER AG
9770 506002
Blatt 1 Blattz. 2



Schlauch Hose	Teile-Nr. (Meterware) Part-No. (Yarded goods)
PU3	9731 005004
PU4	9731 006004

Änd.	Tag	gez.	gepr.
01.0	12.02.2008	Höltke	Cygon

Tag	10.09.07	gez.	Höltke	gepr.	Cygon	ges.	

Pneumatik-Geräteplan
für 506-3

Pneumatic-Elements-Plan
for 506-3

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Blatt 2 | Blattz. 2

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