DÜRKOPP ADLER

540-500-01

Operating Instructions

IMPORTANT

READ CAREFULLY BEFORE USE

KEEP FOR FUTURE REFERENCE

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.

Table of contents

Table of contents

Table of contents

1. Product description

The Dürkopp Adler 540-100-1 is a CNC double lockstitch buttonhole machine with stepping motor technology for the sewing of flat form linen button holes in light to medium weight material. Maximum buttonhole length is 65 mm and maximum buttonhole width is 6 mm (equipment dependent).

Including a knife for all cutting lengths, longitudinal or transversal setting possible, fine adjustment of the buttonhole with the push of a button, integrated direct DC drive.

Additional functions:

- Selectable bartack forms :
  Cross tack (vertical), Cross tack (horizontal), Cross tack (divided), Round tack (to the middle point), Round tack (horizontal), Taper tack, Eye tack, Simple tack, Snaffle-shaped tack
- 50 variable seam makers
- 20 Buttonhole – each sequence can be programmed with a maximum of 20 buttonholes
- Programmable sewing revolution to a max. of 4000 stitches/min
- Soft start
- Bobbin capacity meter
- Daily quantity meter
- Multi test functions
- Voltage rating: 1 x 190 - 240V 50/60Hz

1.1 Designated use

The **DÜRKOPP ADLER 540-100-1** is an automatic sewing machine designed for sewing buttonholes in light to medium-heavy material.

Such material, which is generally made of textile or synthetic fibres, is used in the clothing industry. This sewing machine can also be used to produce so-called technical seams. In this case, however, the operator must assess the possible dangers which may arise (with which DÜRKOPP ADLER would be happy to assist), since such applications are on the one hand relatively unusual and, on the other, they are so varied that no single set of criteria can cover them all. The outcome of this assessment may require appropriate safety measures to be taken. Generally only dry material may be sewn with this machine. The material may be **no thicker than 4 mm** when compressed by the lowered upper material sewing basket.

The material may not contain any hard objects. The machine may only be operated with finger and eye protection. The seam is generally produced with sewing threads of gauge up to 65/2 Nm (synthetic threads with or without cotton covering). Before using any other thread the possible dangers arising must be assessed and appropriate safety measures taken if necessary. This machine may be set up and operated only in dry, well-maintained premises. If it is used in other premises which are not dry and well-maintained it may be necessary to take further precautions (which should be agreed in advance - see EN 60204-31: 1999). As manufacturers of industrial sewing machines we proceed on the assumption that personnel who work on our products will have received training at least sufficient to acquaint them with all normal operations and with any hazards which these may involve.

1.2 Sub classes

540-100-1

For the sewing of raised-form or flat-form linen buttonholes in light to middle weight material, with electronically driven thread tensioner. Buttonhole length max. 70 mm, buttonhole width max. 6 mm. A knife for all cut lengths.

2. Technical data

Machine head:	Class 540-100-1
Needle system:	System 265 with slightly rounded head
Needle thickness:	70 – 100 (dependent on equipment)
Threads:	Synthetic thread and synthetic thread with cotton covering up to 65/2 Nm
Stitch type:	Double lockstitch (304)
Stitch number:	Max. 4000 RPM (adjustable)
Double stitch distance:	0,2 - 3 mm
Sewing foot stroke:	12 mm
Buttonhole length :	6 - 70 mm (dependent on equipment)
Buttonhole width:	3 - 6 mm (dependent on equipment)
Cut length:	6 - 65 mm
Power rating:	1,3 kW
Operating pressure:	6 bar
Air consumption:	approx.4 NL per working cycle
Rated voltage:	1 ~ 230 V, 50/60 Hz 1~ 190 - 240 V, 50/60 Hz
Frame:	1060 x 620 x 1250 mm (L x B x H)
Work height:	780 - 880 mm (Top edge of table top)
Weight:	ca. 100 kg (with frame) ca. 70 Kg (without frame)
Rated noise level :	Lc = 79 dB (A) Emission value per workplace according to DIN 45635-48-B-1 (sewing cycle 3.6 s ON and 1.0 s OFF). Buttonhole width: 4 mm Cutting length: 17 mm Speed: 4.000 min^{-1} Stitch length: 0.6 mm Fabric: G1 DIN 23328 two-ply

3. Operating the machine head

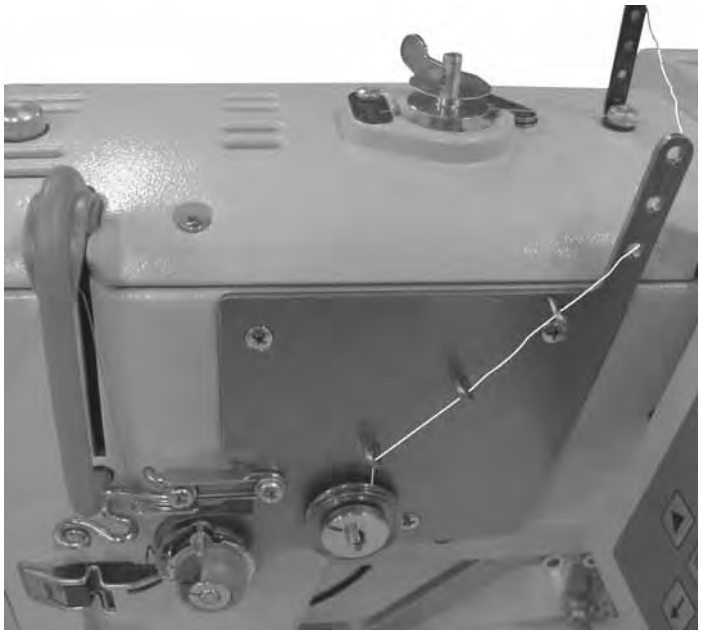
3.1 Needle threading

Caution: Danger of injury !

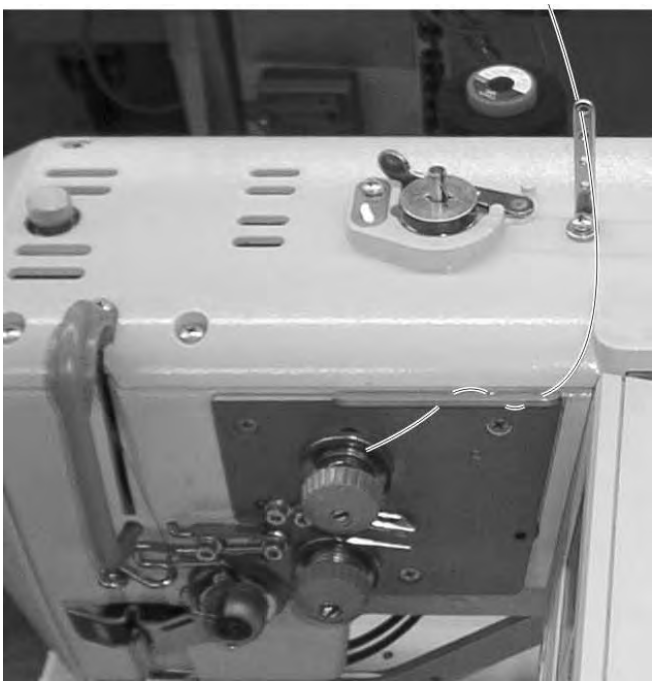
The needle should only be threaded when the sewing automat is switched off.

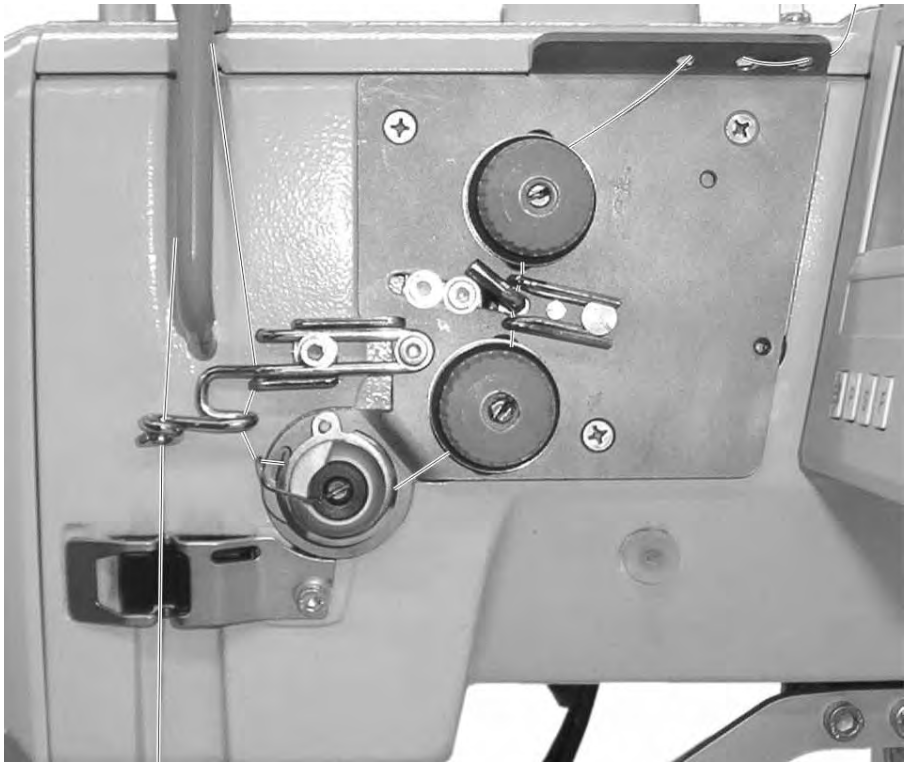
- Thread needle according to diagram

540-500-1

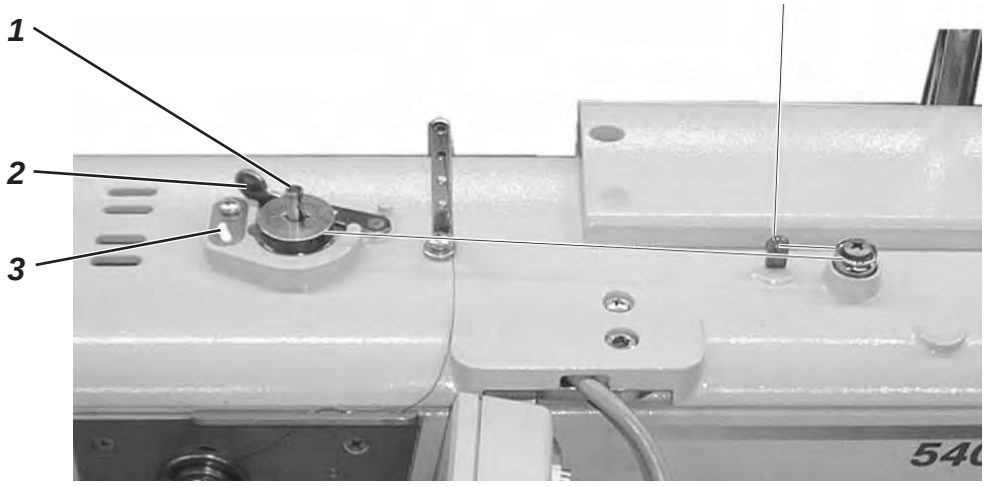


540-500





3.2 Winding the hook thread



Threading the hook thread is independent of sewing operation.

- Put the thread on the thread stand.
- Thread the hook as shown in the picture.
- Put the empty bobbin onto the bobbin winder 1.
- Wind the hook thread clockwise about 5 times around the bobbin core.
- Swing winder lever 2 towards spool and click in.
  The thread will be wound on.
- Winder lever 2 ends the spooling event when the bobbin is full.
- After spooling snap out the bobbin thread from thread clamp 3.

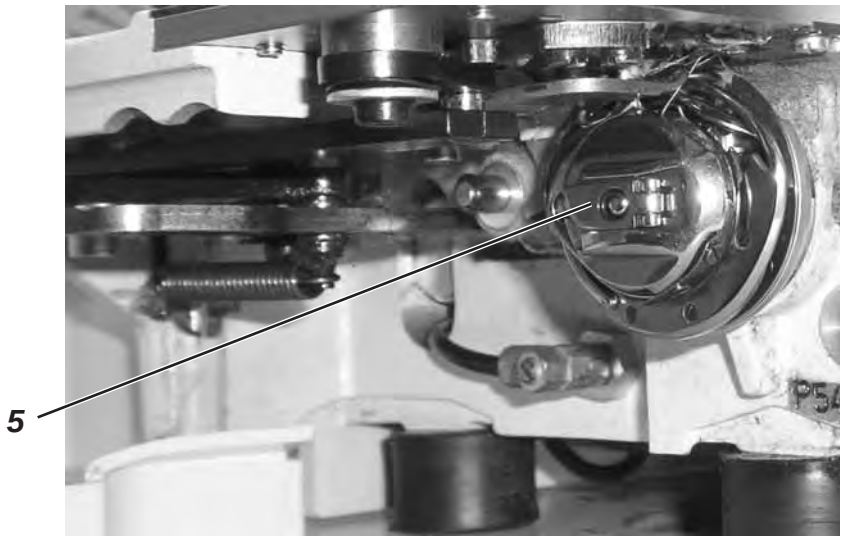
3.3 Changing the bobbin

Caution: Danger of injury !

The bobbin should only be changed when the sewing automat is switched off.

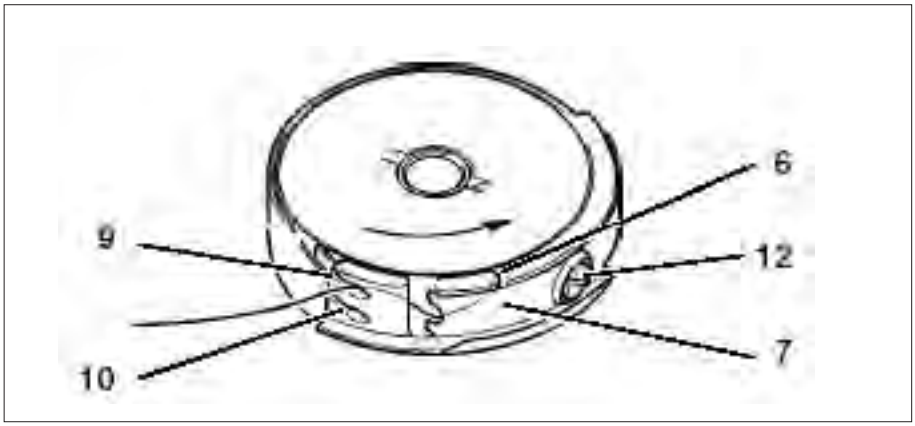
Remove empty bobbin.

- Open bobbin case lid.
- Flip up the clip 5 and remove the top of the bobbin housing with bobbin.
- Remove the bobbin from the top of the bobbin housing.



Threading the bobbin

- Place the full bobbin in the bobbin housing top, whereby the bobbin has to turn in anti-clockwise direction when the hook threader is pulled.
- Pass the hook thread through the slit 6 and under the spring.
- Dependent on chosen buttonhole the hook thread has to go through slit 9 for raised-form buttonholes and slit 10 for flat-form buttonholes.



Setting the hook thread tension

- Set the hook thread tension by turning screw 12 so that the bobbin housing slowly sinks with its own weight when the hook thread is held tight.
- Flat-form buttonholes will require a higher tension.

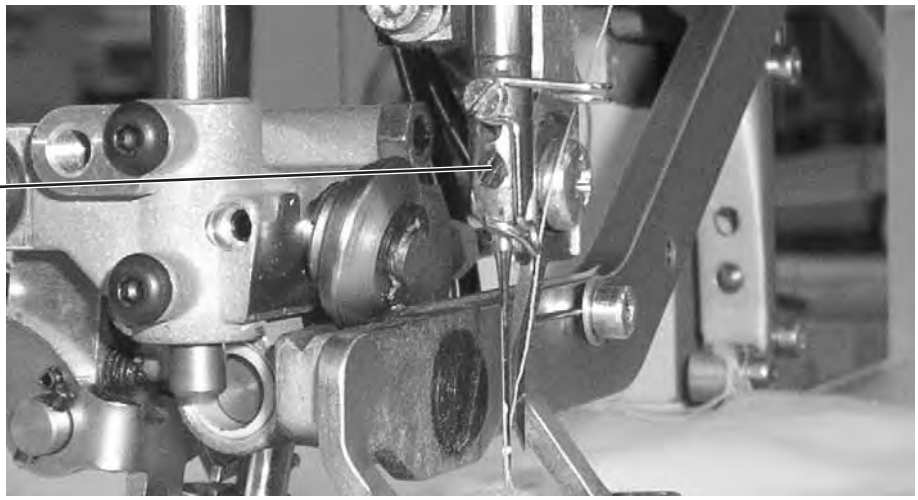
Fitting of bobbin housing

- Put the bobbin housing top along with the bobbin on the bobbin housing bottom, make sure that the clip 5 audibly snaps into place.
- Close bobbin case lid.

3.4 Changing the needle

Caution: Danger of injury !

Switch off at main power switch ! Only change the needle when the sewing automat is switched off !



- Loosen screw 1.
- Pull needle form the needle bar.
- Insert the new needle to the stop in the bore of the needle bar.
- Set the needle so that the needle scarf lies on the backward facing side of the knife.
- Tighten screw 1.

CAUTION !

If the needle thickness is changed, the distance between the hook and the needle may need to be changed.

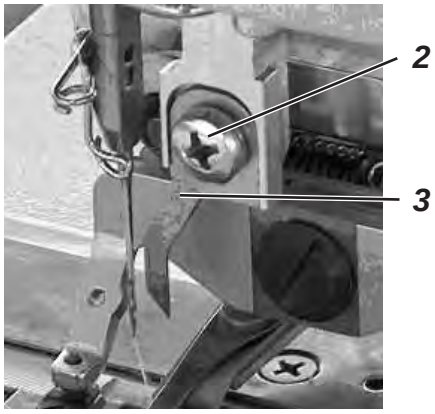
3.5 Changing the knife

Caution: Danger of injury !

Switch off at main power switch ! Only change the knife when the sewing automat is switched off !

CAUTION !

Ensure that the lifted basket has a minimum distance of 1mm between the upper thread scissors and the bottom knife edge.



Knife removal

- Loosen screw 2.
- Remove knife 3.

Knife insertion

- Insert new knife and set it right at the top.
- Tighten screw 1.

Note!

If the cut does not occur in the middle of the buttonhole or not parallel to the buttonhole seam, the knife needs to be readjusted.

Instructions for service 540-100-1, Chapter: Knife adjustment.

3.6 Checking the knife height

Rule:

The knife point is needed only when diving into the material. The knife point should not leave the throat plate during the cutting procedure.

CAUTION !

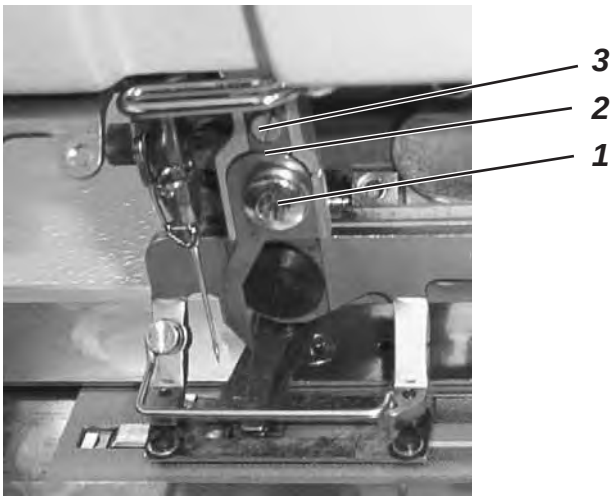
Ensure that the lifted basket has a minimum distance of 1mm between the upper thread scissors and the bottom knife edge.

Note !

When a knife is sharpened, its length will be shorter.
With the insertion of the sharpened knife the knife height may need to be corrected.

Adjusting:

- Position the material under the clamp and start the sewing process.
- Stop the sewing process during the cutting process on the reverse buttonhole seam stitch by pushing the pedal backwards.
- Make the slit on the throat plate visible by pulling the material a little away from the clamp.
- Turn the hand wheel in the direction of rotation until the knife has reached its highest position to the throat plate.
- In this position 0.2 mm of the knife point should remain dipped in the throat plate slit.
- Knife height adjustment: Loosen screw 1.
  Push the knife as far as needed until the correct knife position has been reached.
  Re-tighten screw 1.
- Loosen screw 3.
- Push stop 2 right up to the knife
- Re-tighten screw 3.
- End the sewing process by pushing the pedal backwards.



3.7 Thread tension

Thread tension 1

The tension serves the purpose of sewing flat-form tacks and buttonhole seams.

The tension is always effective and opens only with thread cutting.

Thread tension 2

The thread tension can be switched on and off. The complete tension of thread tension 1 and thread tension 2 generate raised-form tacks and buttonhole seams. The selection can be freely programmed for each buttonhole section of a buttonhole.

The tension is only effective if programmed and opens during thread cutting.

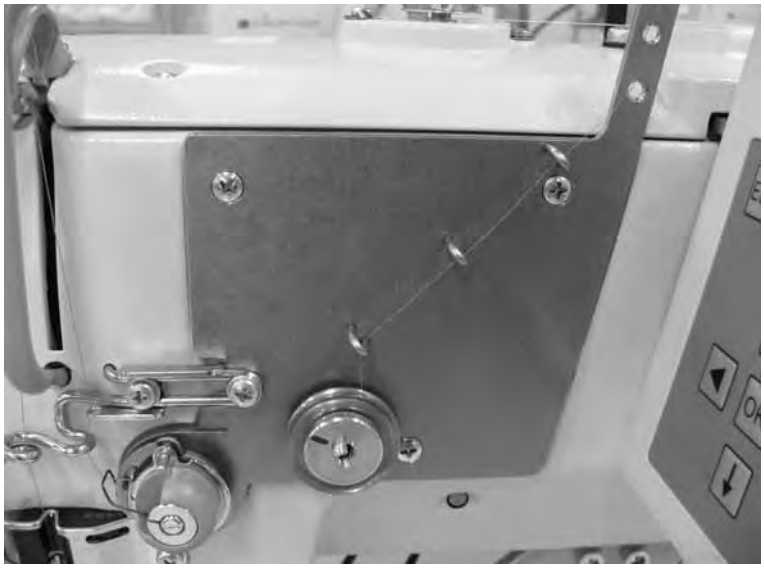
Check:

- Thread the needle and hook thread with different coloured yarn.
- Make a trial seam.
- For the flat parts of the buttonhole the cross-over point of the thread should be in the middle of the material.
  Setting: Change the thread tension 1
- For the raised parts of the buttonhole the cross-over point of the thread should be on the top side of the material.
  Setting: Change the thread tension 2 until the seam pattern is regular.

With the correct setting, in the flat buttonhole parts the upper thread and in the raised buttonhole parts only the looper thread will be visible on the material top side.

Increase tension	Turn knurled nut clockwise.
Reduce tension	Turn knurled nut anti-clockwise.

3.8 Electronic thread tension



Setting or altering the thread tension values

- Switch on the machine.
- Display the main menu.
- Select the menu item “Thread tension” using the ▲ and ▼ keys and confirm by pressing “**OK**”.

			Explanation
	Seam	[%] : value (e.g. 35)	*Changes the forward/backward seam*
	Bartack	[%] : value (e.g. 20)	*Changes the upper/lower bartack*
(2) (1) (3) (4)	Seam (fwd.) (1)	[%] : value (e.g. 35)	*Changes values for forward seam (leading)*
	Upper bartack (2)	[%] : value (e.g. 20)	*Changes values for upper bartack*
	Seam (bw.) (3)	[%] : value (e.g. 35)	*Changes values for backward seam (trailing)*
	Lower bartack (4)	[%] : value (e.g. 20)	*Changes values for lower bartack*
Knitwear mode invoked	1st stitch	[%] : value (e.g. 10)	
	Start	[%] : value (e.g. 15)	*Seam beginning area*
	End	[%] : value (e.g. 15)	*Knotting area of the stitch*
	Basting stitch	[%] : value (e.g. 15)	*Tension of the straight securing stitches*
	1 ZZ ↑	[%] : value (e.g. 20)	*Forward seam of the knitted fabric Backward*
	1 ZZ ↓	[%] : value (e.g. 20)	*seam of the knitted fabric*
	Copying No.:		

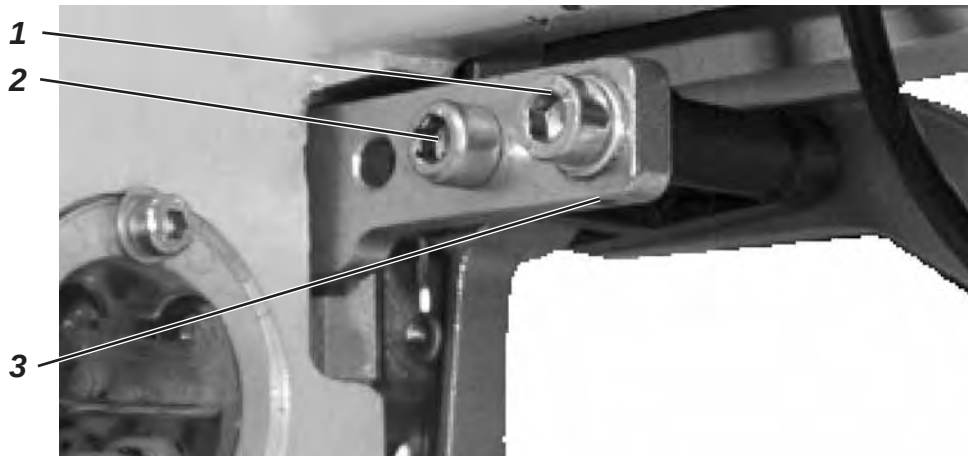
Calibrating the electronic thread tension

- Check the mechanical basic setting at the magnet and adjust it if necessary**.**
- The distance between the mobile cone and the solid base must me 0,3 mm.
  The distance is set with the flat nut on the tension pin.
  The nut is locked by a small set screw which is located in the tension pin.

- Switch on the machine.
- Press button F and enter code 25483.
- Display the Technician menu.
- Select the menu item “machine” using the ▲ and ▼ keys and confirm by pressing “**OK**".
- Select the menu item "cal. tension" and press "**OK**".
- Select the menu item "100 gr" and press "**OK**".
- Enter the value for 100 gr an press "**OK**".
- Select the menu item "200 gr" and press "**OK**"
- Enter the value for 200 gr an press "**OK**".

- If no measuring instrument for the thread tension is available, enter the values which are notated on the rear side of the tension plate.

3.9 Regulating the sewing basket lifting height



CAUTION !

Ensure that,

- a distance of at least 1 mm lies between top thread cutter and the knife bottom edge of the lifted basket
- the knife point does not protrude out of the basket bottom.

Factory setting for the basket lifting height is 12 mm. Adjust the basket lifting height in the following way:

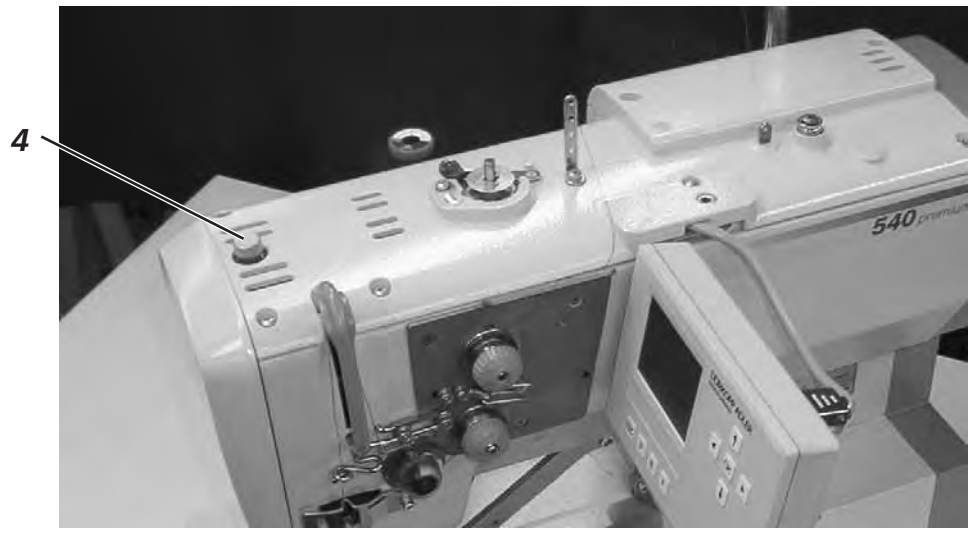
- Switch off the machine.
- Loosen screws 1 and 2.
- **Increase the basket lifting height:** Turn set screw 3 clockwise.

  Reduce basket lifting height: Turn set screw 3 anti-clockwise.
- Tighten screws 1 and 2.
- Switch on the machine and check settings.

3.10 Regulating the sewing basket pressure

- The sewing basket pressure is adjusted using screw 4.

  Increase pressure: Turn screw 4 clockwise.
  Reduce pressure: Turn screw 4 anti-clockwise.



4. Control panel and control unit

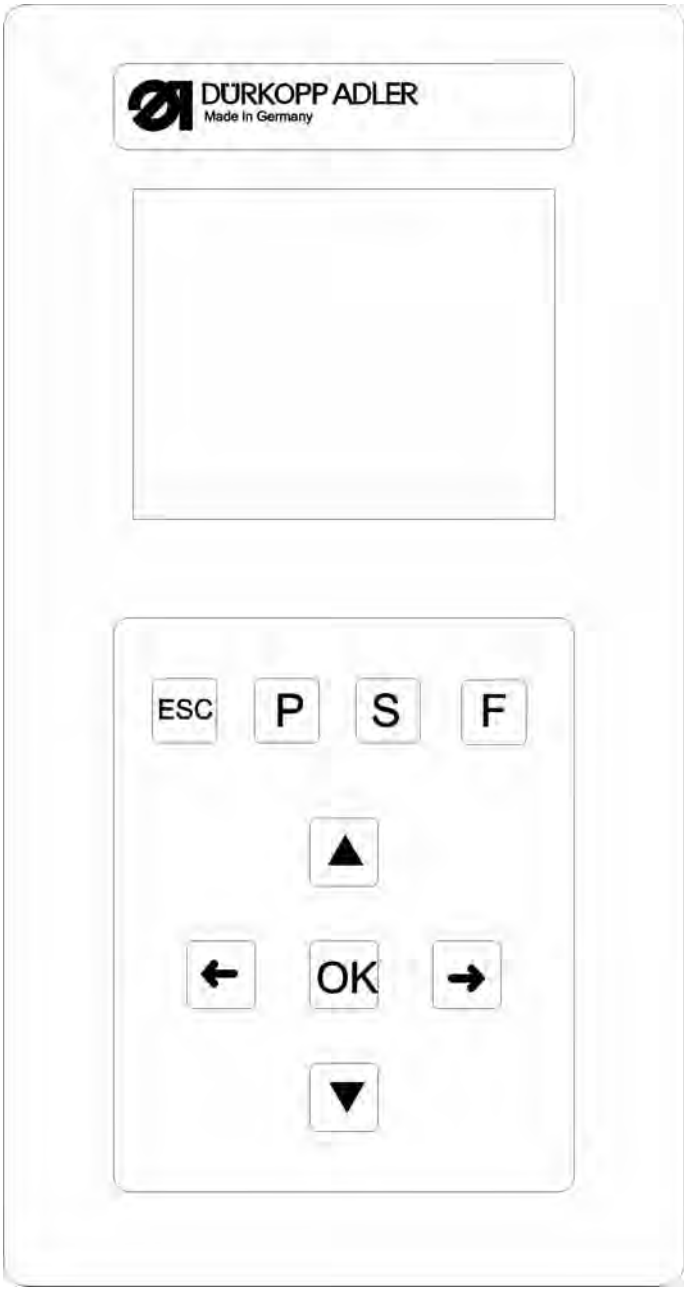
In this operating manual only the functions of the keys and the parameter changes that the operator can make are listed.

4.1 Control panel

Through the operating panel the control is programmed and the functions for the respective seams are set. This occurs partly through direct pressing of the corresponding key or through parameter adjustment. The input of parameters occurs in programming mode “P”. The parameter and the corresponding values are shown on the display. In order to avoid inadvertent changes of parameters, the operation of the control panel is sub-divided into several levels (operator, technician, manufacturer)

The operator (seamstress) can directly access his/her level.

Access to other levels is only possible after the input of a code number.



4.1.1 Control panel elements

Key	Function
	**When no input panel is activated:** – Change to the higher level menu.
	– In the main menu, change between the buttonhole programs within a sequence. **When an input panel is activated:** – Change between the digits tenths, units and tens.
	– Change lines within the menu. The active line appears white on black. **When an input panel is activated:** – Increase or decrease the value of the corresponding digit by 1 or with functions having several options change between the options, e.g. “Buttonhole seam tension on” and “Buttonhole seam tension off”.
	– Activate the input panel. The value can be changed by using “⇧” and “⇩” keys . **When an input panel is activated:** – The set value will be accepted
	– Change from a submenu back to sewing mode. – Resolve a thread breakage – repair mode, the basket drives to the end position, raises and releases the material – After stopping the sewing procedure the basket drives to the end position, raises and releases the material **When an input panel is activated:** – An input is discontinued. The previous value remains valid.
	– The control changes from sewing mode to programming mode. The buttonhole parameters can be changed in this mode.
	– The control changes from either the sewing mode or programming mode to the sequence programming mode.
	– The control changes from the sewing mode to the technician mode. This mode can only be activated by entering a code. In this operating condition basic machine parameters can be set, diagnosis and calibration programs can be started

4.2 Changing parameter values

4.2.1 Numerical values

Numerical values can be altered in the following ways:

- With the arrow keys ⇧ and ⇩ choose the line in which the value needs to be changed.
- Press the **OK** key.
  The curser blinks under the position of the value to be changed.
- With the arrow keys ⇦ and ⇨ change between the values.
- With the arrow keys ⇧ and ⇩ increase or decrease the chosen value.
  With parameters that can not be arbitrarily changed, by pressing of the arrow keys ⇧ and ⇩ another possible parameter is shown on the display.
- Press the **OK** key.
  The set value will be accepted.
- If the set value is not to be accepted, press the **ESC**-key.
  The original value or setting will be reestablished.

4.2.2 Parameter selection

With some parameters several choices are available.

The parameter can be changed in the following way:

- With the arrow keys ⇧ and ⇩ choose the line with the parameter to is be changed.
- Press the **OK** key.
- With the arrow keys ⇧ and ⇩ change between the possibilities. The respective parameter is shown.
- Press the **OK** key. The set value or parameter will be accepted.
- If the set value or parameter is not to be accepted, press the **ESC**-key.
  The original value or parameter setting will be reestablished.

4.3 Main menu

Symbol	Parameter	Meaning
	Buttonhole number N1	Selection of the buttonhole to be sewn - Program number 1 to 50 contains buttonhole programs. Program number 51 and 52 contain free contour sewing programs. - The preprogrammed form of the chosen buttonhole is shown in the left half of the display. - Additionally an info window is shown with some buttonhole specific values: - Cut length - Intermediate fabric - Buttonhole seam stitch length - Buttonhole width
	Thread tension N2	Selection of the submenu for changing the thread tension values. Only visible when the electric thread tension control is activated
	Cut length N3	- Selection of buttonhole cut length from 6 – 65 mm - The setting is dependent of the buttonhole number.
	Speed N4	- Selection of sewing speed for the buttonhole to be sewn from von 200 - 4000 RPM. The setting is dependent of the buttonhole number. - If the set sewing speed is less than the soft start speed a cautionary warning is displayed and the soft start is switched off. - The high speed that is here selectable can be set in the technician level.
	Soft start N5	Soft start switch on and off - Number of soft start stitches and their sewing speed can be preset in the technician level.
	Daily quantity counter N6	The daily quantity counter counts the number of sewn buttonholes. - By pressing the “OK”- key twice, the daily quantity counter will be reset to zero.
	Hook thread counter N7	Display of the current hook thread counter state (when active) and selection of the submenu for the changing of the initial value and for the switching on and off of the hook thread counter.
	Repair mode N8	Repair mode.

4.4 Hook thread monitoring

Hook thread monitoring mode of operation:

Hook thread monitoring is carried out by counting the buttonholes. With the insertion of a full bobbin the hook thread counter is set to a predetermined value. This value is subtracted by one with each complete cycle. When the value 0 is reached the operator receives an information message.

There should be some remaining thread on the bobbin.

Note

This principle only functions when the same amount of bobbin thread is used per buttonhole or sequence. Changing frequently the cut length, buttonhole form or buttonhole parameter changes the amount of bobbin thread used per buttonhole.

4.4.1 Hook thread counter adjustment

Select the submenu “Hook thread counter”

– With the ⇧ and ⇩ keys choose in the main menu the line “**Hook thread counter**”.

– Press **OK**- key.
The submenu “**Hook thread counter**“ is displayed.

Submenu “Hook thread counter” displayed parameters:

Current hook thread counter value
N7.1

7000
↑
8500

Sets the display in the main menu to the initial value indicated in N7.2 below.

– With the ⇧ and ⇩ keys select the relevant line.

– By pressing the **OK**-key the indicated value in the main menu will be set to the initial value.

– The display changes automatically back to the main menu.

Initial value
N7.2

Total number of possible buttonholes with the remaining thread on the bobbin.

Σ=

– Select the relevant line with the ⇧ and ⇩ keys.

– Press the **OK**-key.
The curser blinks under the position of a numerical value.

– Move between the digits with the keys ⇦ and ⇨.

– Increase or decrease the digit value with the keys ⇧ and ⇩.

– Confirm with the **OK**-key.

– Choose line N7.1 with the arrow keys ⇧ and ⇩

– By pressing the **OK**-key the indicated value in the main menu will be set to the initial value.

– The display changes automatically back to the main menu.

Hook thread counter on and off
N7.3

The function of the hook thread counter is either switched on or off.

– Select the relevant line with the ⇧ and ⇩ keys.
– Press the **OK**-key.
– Select the parameter **On** or **Off** by using the arrow keys ⇧ and ⇩. The main menu will indicate no parameter with the hook thread counter switched off.

4.5 Soft start on /off

– Select the "**Soft start**" in the main menu with the arrow keys ⇧ and ⇩.
– Press the **OK**-key.
– Select the parameter **On** or **Off** by using the arrow keys ⇧ and ⇩.
– Press the **OK**-key.

Note !

The number and sewing speed of the soft start stitch can be preset in the technician level.

If a main sewing speed is less than the soft start sewing speed, the soft start will be automatically switched off.

4.6 Sequences

4.6.1 General

Single buttonhole mode

One buttonhole can be selected from a total of 50 preprogrammed buttonhole programs. Memory locations 51 and 52 can be used for free sewing contours.

This buttonhole will be sewn until another buttonhole is selected.

Sequence mode

The seamstress will be in a position to sew a sequence of different buttonholes without having to push a key on the control panel.

- 20 different sequences can be created and saved in the memory.
- Each sequence can contain up to 20 buttonholes.
- In principle all buttonholes can be selected in one sequence.

Note

A plausibility check of the individual buttonhole parameters is first made when the sequence is selected in the sewing mode!

4.6.2 Switching sequence mode on/off or selecting Multiple

- Press the **S** key.

- The control switches to the menu used for programming buttonhole sequences.

- Use the arrow keys ⇧ and ⇩ to select the relevant line.

- Press the **OK** key.

- Use the arrow keys ⇧ and ⇩ between *On* (sequence mode), *Off* (buttonhole mode) or *Multiple* (all selected buttonholes are sewn one on top the other).

- Press the **OK** key to save the setting.

- Press the **ESC** key to return to the main menu.

4.6.3 Selecting a sequence in sequence mode (main menu)

After power-on, the topmost line of the display is highlighted with a dark background. The display shows the sequence that was sewn last.

Selecting a different sequence

- Press the **OK** key

- You can use the arrow keys ⇧ and ⇩ to switch between sequences.

- Press the **OK** key to save the setting.

4.6.4 Automatic and manual operation

02 ⇨ 05 ⇨ 07 **Automatic operation**

In the sequence shown on the display, arrows are displayed between the buttonhole shapes.

- After sewing a buttonhole, the control changes automatically to the next buttonhole shape.

- After sewing the last buttonhole, the control changes back to the first buttonhole shape within the sequence.

- The current buttonhole is marked with a bar.

- The shape of the currently selected buttonhole is shown in the left half of the display.

02 - 05 - 07 **Manual operation**

In the sequence shown on the display, no arrows are displayed between the buttonhole shapes.

- The control does not change automatically between the buttonhole shapes.

- The current buttonhole is marked with a bar.

- The shape of the currently selected buttonhole is shown in the left half of the display.

Switching between automatic and manual operation

- Use the arrow keys ⇧ and ⇩ to select the line which shows the current sequence.

- Press the **OK** key.

- You can use the arrow keys ⇧ and ⇩ to switch between the two operating modes.

- Press the **OK** key to save the setting.

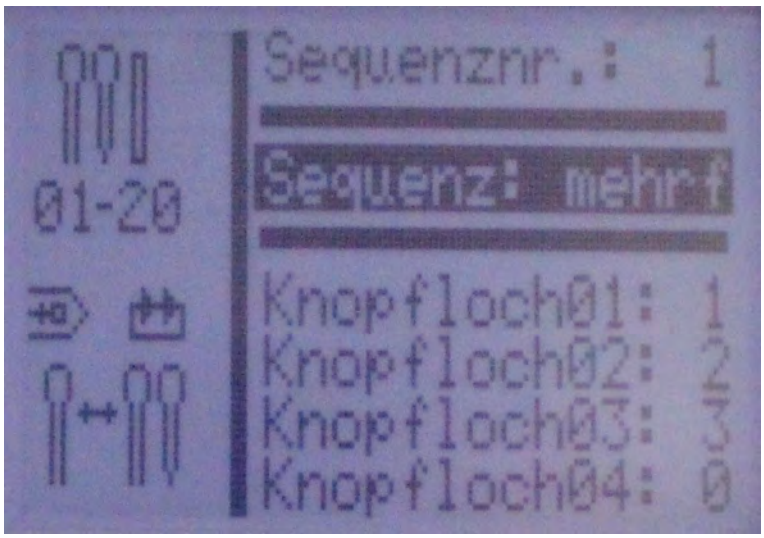
Selecting another buttonhole to be sewn within the sequence

You can switch between the programmed buttonholes at any time when the sewing menu is shown on the display.

- Press arrow key ⇦ or ⇨ .

The next / previous buttonhole shape is selected in the sequence shown.

Sequence: select multiple



If *Sequence: multiple* is selected, you can select up to 20 buttonhole programs in the bottom half of the display. The display shows 4 buttonhole programs at a time.

The buttonholes can be programmed freely (chapter 5).

All selected buttonholes are sewn on top of one another without a machine stop.

You mark the end of the sequence by selecting the **0** buttonhole program in one of the lines. The machine stops the sewing process, allowing you to remove the sewing material.

4.7 Programming sequences

Up to 20 buttonhole sequences can be programmed.

Each sequence can contain up to 20 buttonholes.

4.7.1 Programming a single sequence

Selecting the program menu sequence

- Press the **S** key.

- The control switches to the menu used for programming buttonhole sequences.

- Press the **ESC** key to exit the menu.

Selecting the sequence number

- Use the arrow keys ⇧ and ⇩ to activate the line used to select the sequence number.

- Press the OK key.

- Use the arrow keys ⇧ and ⇩ to select the sequence number to be programmed.

- Press the OK key to confirm your selection.

Default example: Buttonhole 1: 1

Buttonhole 2: 0

Programming example: Buttonhole 1: 19

Buttonhole 2: 2

Buttonhole 3: 0

Programming a buttonhole sequence

- Use the arrow keys ⇧ and ⇩ to select the line *Buttonhole 1:*.

- Press the **OK** key.

- Use the arrow keys ⇧ and ⇩ to select the desired buttonhole program (1 to 50).

- Press the **OK** key to confirm your selection.

Following the confirmation of the buttonhole program, a new menu line appears containing the buttonhole to be programmed next.

- The last line of a buttonhole sequence program always shows the buttonhole number *Buttonhole X: 0*, unless all 20 programs are occupied.

- Press the **ESC** key to return to the main menu.

4.7.2 Adding a buttonhole at the end of a sequence

- Use the arrow keys ⇧ and ⇩ to select the last line of the programmed buttonhole sequence *Buttonhole X: 0*.

- Press the **OK** key.

- Use the arrow keys ⇧ and ⇩ to select the desired buttonhole program (1 to 50).

- Press the **OK** key to confirm your selection.

- Following the confirmation of the buttonhole program, a new menu line appears containing the buttonhole to be programmed next.

- Press the **ESC** key to return to the main menu.

4.7.3 Deleting a buttonhole within the buttonhole sequence

- Use the arrow keys ⇧ and ⇩ to select the line to be deleted from the programmed buttonhole sequence.

- Press the **OK** key.

- Use the arrow keys ⇧ and ⇩ to select *Buttonhole program 0:*.

- Press the **OK** key to confirm your selection.

- The selected buttonhole will be deleted following confirmation. Any following buttonholes will move up.

- Press the **ESC** key to return to the main menu.

4.7.4 Inserting a buttonhole within the buttonhole sequence

Information

It is not possible to insert buttonhole programs individually into the buttonhole sequence.

Make a note of the programmed buttonholes that follow.

- Use the arrow keys ⇧ and ⇩ to select the line of the programmed buttonhole sequence.

- Press the **OK** key.

- Use the arrow keys ⇧ and ⇩ to select the desired buttonhole program (1 to 50).

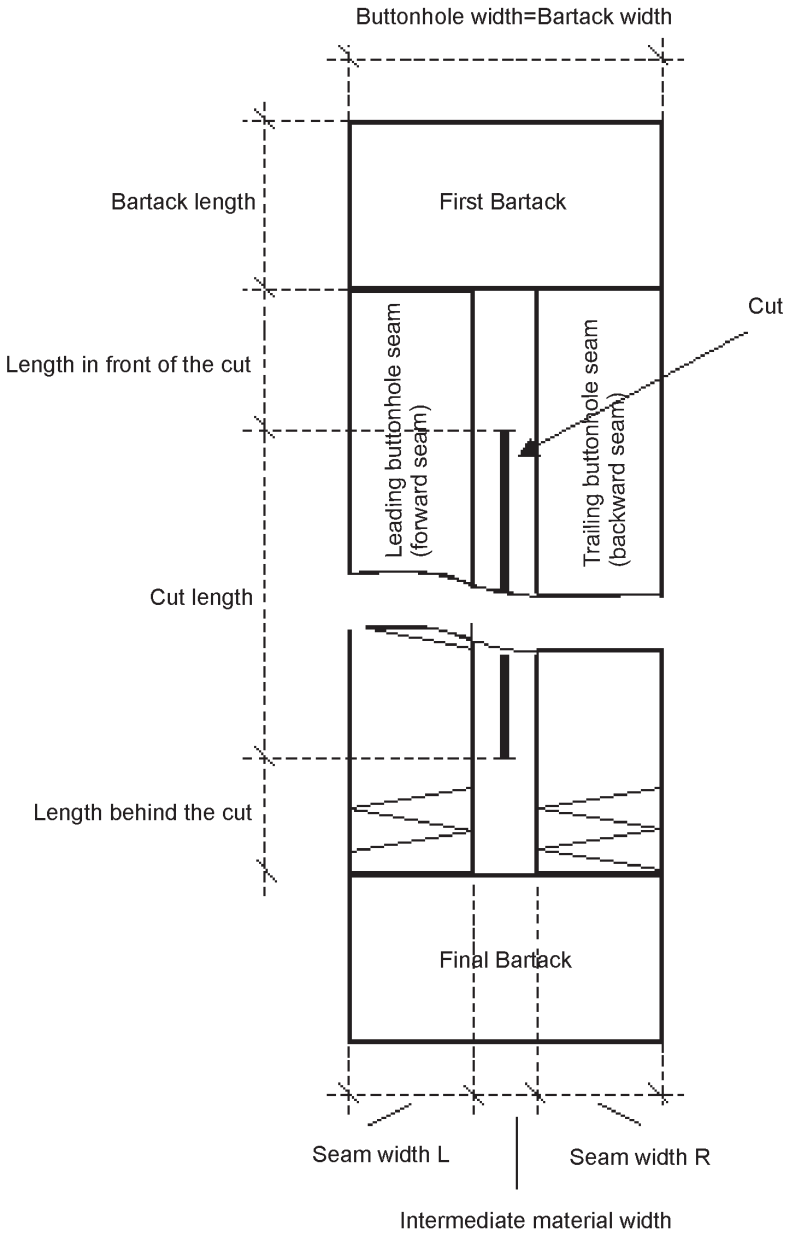
- Press the **OK** key to confirm your selection.

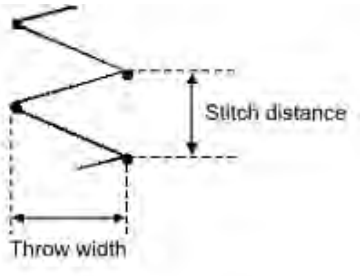
- Next, alter the buttonholes that follow according to your notes.

- Press the **ESC** key to return to the main menu.

5. Buttonhole programming

5.1 Composition of a buttonhole



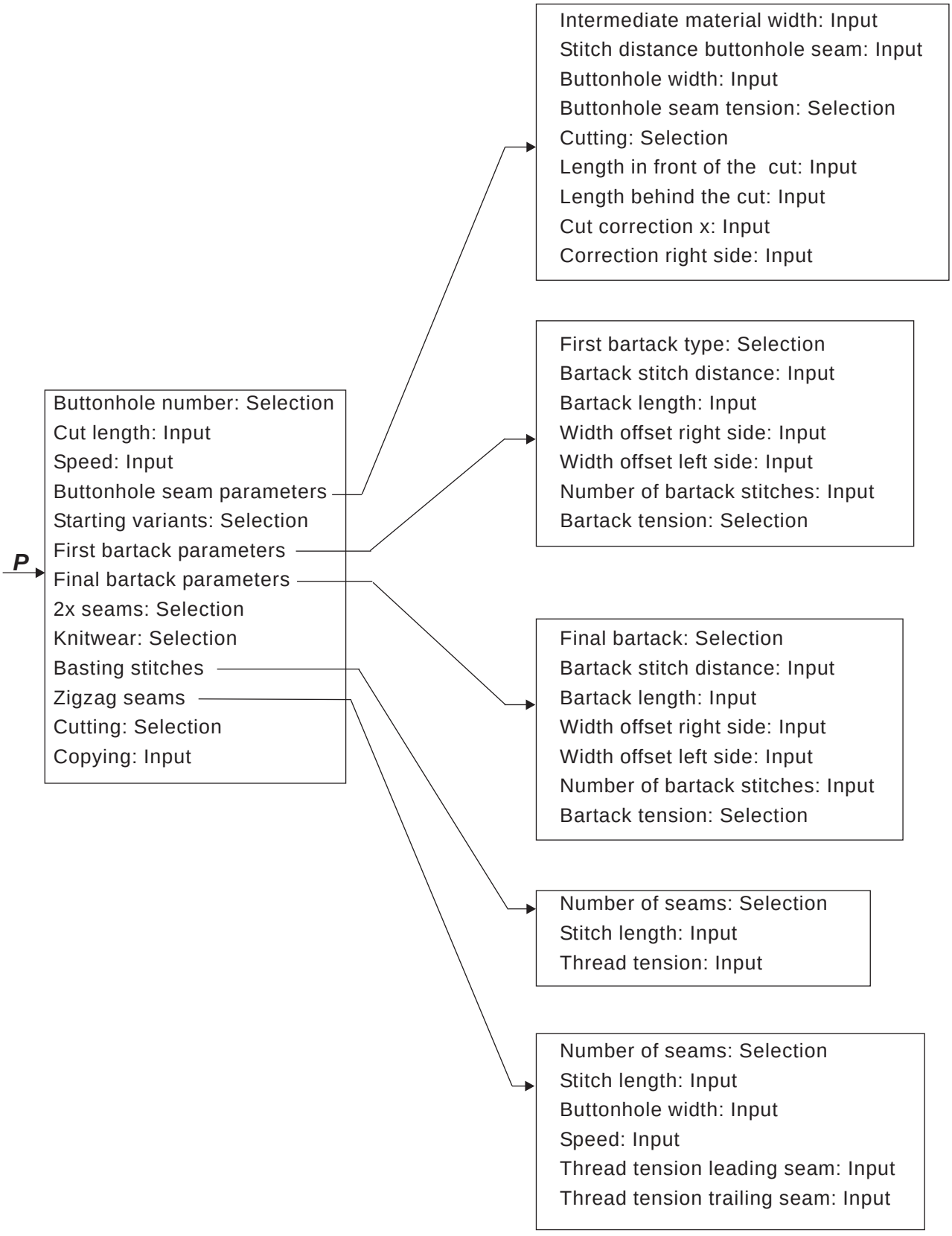


First bartack	First bartack to be sewn in connection to the leading buttonhole seam
Final bartack	Final bartack in connection to the trailing buttonhole seam
Leading buttonhole seam	Buttonhole seam from sewing start to the first bartack
Trailing buttonhole seam	Buttonhole seam between first bartack and final bartack
Buttonhole width	Distance between the outer stitches of a buttonhole
Cut length	Length of the knife's cutting edge in mm
Cut length	Length of the buttonhole to be cut in mm (=Buttonhole seam length)
Intermediate material width	Distance between the inner stitches of the leading buttonhole seam and the trailing buttonhole seam
Throw width	= Buttonhole seam width
Stitch distance	Distance between double stitches in the y-axis
Length in front of the cut	Distance between the first bartack and the cut
Length behind the cut	Distance between the final bartack and the cut

Characteristics

Leading and trailing buttonhole seam	Leading buttonhole seam is symmetrical to the trailing buttonhole seam with the cut length as symmetrical axis.
Buttonhole width = Bartack width	The setting "buttonhole width" automatically gives the bartack width. The bartack width can be altered with the corresponding parameters "offset l" and "offset r" in the bartack menu.
Bartack	The final bartack length is the same as the first bartack length if both bartacks are identical. The bartack length for both is set in the menu "First bartack".
Buttonhole length	The complete buttonhole length is determined by the cut length + length in front of the cut + length behind the cut + first bartack length + final bartack length.

5.2 Submenu program (general view)



5.3 Parameter programming mode

Buttonhole number P1		1 ... 50	Selection of the buttonhole number
Cut length P2		6.0 ... 65.0 mm	
Speed P3		200 ... 4000 RPM	Dependent on buttonhole
Buttonhole seam parameter P4			Select the submenu for the selection of buttonhole seam parameters
Starting variants P5		A,B,C,D	Selection of the sewing start variants
Upper bartack parameter P6			Select the submenu to adjust the upper bartack
Lower bartack parameter P7			Select the submenu to adjust the lower bartack
2x seams P8		ON / OFF	Switching on/off of the double-stitching of the whole buttonhole (the buttonhole is sewn twice).
Knitwear sewing mode P9		ON / OFF	Switching the knitwear sewing mode on or off
Basting stitches P10*			Selection of the submenu for the setting of the number of the basting stitches and the display of the characteristics
Zigzag seams P11*			Selection of the submenu for the setting of a second zigzag seam and the display of the characteristics
Cutting P12*			Cutting during the last cycle Cutting during the cycle before the last one Cutting during both cycles
Copying from P13		0 ... 50	The buttonhole data of the chosen buttonhole number is copied into the currently active buttonhole.

*) Those programs are only visible, if the P9 (Knitwear sewing mode) is switched on.

5.4 Adjusting the cut length

Correcting the buttonhole length (Cut length). The adjustment is possible in both, the main menu and programming mode.

- Select the line “**cut length**” in the main menu with the arrow keys ⇧ and ⇩
- Press the **OK**-key.
  The curser blinks under a digit value.
- Change between the digits with the arrow keys ⇦ and ⇨.
- Increase or decrease the value of the selected digit with the arrow keys ⇧ and ⇩.
- Press the **OK**-key to confirm the value.

5.5 Selecting a starting variant

Select a starting variant

The starting variant of the starting stitch serves to ensure the correct sewing start for different materials and threads. The starting variant is individually set for each individual buttonhole.

Starting variant A (Standard)

- The starting stitches are flat form stitches.

Starting variant B (Thin material, lining)

- The starting stitches are flat form stitches. With the use of a cross stitch the upper thread holds better to the material.

Starting variant C (very thin material)

- The starting stitches are flat form stitches.
  With the use of forward and backward bartack stitches the upper thread holds better to the material.

Starting variant D (very thin material)

- Alternative to starting variant C.

Select starting variant:

- Press **P**-key.
- Select the line “**Starting variant**” with the arrow keys ⇧ and ⇩.
- Press the **OK**-key.
- Select the relevant **Starting variant A**, **B, C** or **D** with the arrow keys ⇧ and ⇩
- Press the **OK**-key
- Press the **ESC**-key.

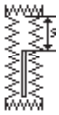
5.6 Setting buttonhole seam

In the program menu “Buttonhole seam”

Select program menu Buttonhole seam

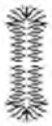
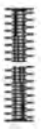
- Press the **P**-key.
- Select the line “**Buttonhole seam**” with the arrow keys ⇧ and ⇩.
- Press the **OK**-key.
- Select the relevant line with the arrow keys ⇧ and ⇩.
- Press the **OK**-key. The curser blinks under one of the digit values.
- Change between the digits with the arrow keys ⇦ and ⇨.
- Increase or decrease the value of the chosen digit with the arrow keys ⇧ and ⇩.
- Press the **OK**-key to confirm. Press the **ESC**-key.

The following parameters can be changed for the buttonhole seam section:

	Intermediate material width P4.1	- 1,0...+1,0 mm	Distance between the inner stitches of the buttonhole seam.
	Stitch distance within the buttonhole seam P4.2	0,3...1,5 mm	Distance in the y-axis of a double stitch.
	Buttonhole width P4.3	1,6...6,0 mm	Overall width of a buttonhole (outer stitches).
	Buttonhole seam tension P4.4	on;off	on: additional thread tension on (raised-form) off: additional thread tension off (flat-form)
	Cutting P4.5	on;off	on: cutting during the sewing cycle off: no cutting
	Length in front of the cut P4.6	-P6.3...5,9 mm	1. Correction of the position of the first tack in relation to the end of the cut 2. Additional buttonhole length in front of the cut with asymmetrical cutting within the buttonhole.
	Length behind the cut P4.7	(1.8 mm - P7.3)-5,9 mm	1. Correction of the position of the first tack in relation to the end of the cut 2. Additional buttonhole seam length behind the cut with asymmetrical cutting within the buttonhole.
	Cut correction x P4.8	-0,5...+0,5 mm	Position of the cut within the buttonhole on the x-axis.
	Correction right side P4.9		Correction of the right sided buttonhole seam width, only visible with bartack type A (Cross bartack).

5.7 Setting bartack

5.7.1 Selectable bartack types

A	Cross tack (horizontal)	top bottom		
B	Round tack (to the middle point)	top bottom		
C	Taper tack	top bottom		
D	Round tack (horizontal)	top bottom		
E	Cross tack (vertical)	top bottom		
F	Cross tack (divided)	top bottom		
G	Eye tack	top bottom		
H	Simple tack (bartack)	top bottom		always together
I	Snaffle-shaped tack	top bottom		
J	Cut right	top bottom		

C	Cut left	top bottom		

The upper and lower tacks of tack types A to G can be combined as desired e.g. G *eye tack* as the top tack and C *taper tack* as the lower tack.

Tack type H *simple tack* (bartack) cannot be combined.

5.7.2 Programming menu Bartack

Selecting programming menu Bartack

- Press the **P** key.
- Use the arrow keys ⇧ and ⇩ to select the line **upper tack** or **lower tack**.
- Press the **OK** key.
- Use the arrow keys ⇧ and ⇩ to select the desired parameter.
- Press the **OK** key.
- The cursor blinks under a digit of the value.
- Change between digits with the arrow keys ⇦ and ⇨.
- Increase or decrease the selected value with the arrow keys ⇧ and ⇩.
- Press the **OK** key to confirm the value.
- Press the **ESC** key.

The following parameters can be changed for the bartack section depending on the selected bartack type.

P6.1/ P7.1 **A cross tack(horizontal) ,** **F Cross tack (divided)**

Tack stitch distance P 6.2/ P 7.2	0.2 ... 1.0 mm	Distance in the y-axis of a double stitch.
Tack length P 6.3/ P 7.3	0.6 ... 6.0 mm	Length of the tack in the y-axis. The input of parameter P7.3 is only possible when the top and bottom tack types are not similar!
Tack width Right offset P 6.4/ P 7.4	-1.0 ... 1.0 mm	The width of the tack is defined through the buttonhole width. With the use of the right offset the width of the tack to the right can be increased.
Tack width Left offset P 6.5/ P 7.5	-1.0 ... 1.0 mm	The width of the tack is defined through the buttonhole width. With the use of the left offset the width of the tack to the left can be increased.
Tack tension P 6.7/ P 7.7	on / off	on: raised form tack off: flat form tack

P6.1/ P7.1 **B Round tack (to the middle point)**

Tack stitch number P 6.6/ P 7.6	2 ... 50	Number of stitches, that form the semicircular tack.
Tacking tension P 6.7/ P 7.7	on / off	on: raised form tack off: flat form tack

P6.1/ P7.1 **C Taper tack**

Tack stitch distance P 6.2/ P 7.2	0.2 ... 1.0 mm	Distance in the y-axis of a double stitch
Tack length P 6.3/ P 7.3	0.6 ... 9.0 mm	Length of the tack in the y-axis
Tack tension P 6.7/ P 7.7	on / off	on: raised form tack off: flat form tack

P6.1/ P7.1 **D Round tack (horizontal)**

Tack stitch distance P 6.6/ P 7.6	0.3 ... 1.0 mm	Distance in the y-axis of a double stitch
Tack tension P 6.7/ P 7.7	on / off	on: raised form tack off: flat form tack

P6.1/ P7.1 **E Cross tack (vertical)**

Tack stitch distance P 6.2/ P 7.2	0.2 ... 1.0 mm	Distance in the y-axis of a double stitch
Tack length P 6.3/ P 7.3	0.6 ... 6.0 mm	Length of the tack in the y-axis. The input of parameter P7.3 is only possible when the top and bottom tack types at are not similar!
Tack width Right offset P 6.4/ P 7.4	-1.0 ... 1.0 mm	The width of the tack is defined through the buttonhole width. With the use of right offset the width of the tack to the right can be increased.
Tack width Left offset P 6.5/ P 7.5	-1.0 ... 1.0 mm	The width of the tack is defined through the buttonhole width. With the use of left offset the width of the tack to the left can be increased.
Moving tack at the top P 6.6/ P 7.6	-1.0 ... 0 mm	The position of the tack can be pushed down.
Moving tack at the bottom P 6.6/ P 7.6	0 ... 1.0 mm	The position of the tack can be pushed up.
Tack tension P 6.7/ P 7.7	on / off	on: raised form tack off: flat form tack

P6.1/ P7.1 **G Eye tack**

Tack width P 6.5/ P 7.5	2.0 ... 6.0 mm	External diameter of the eye
Tack stitch number P 6.3/ P 7.3	2 ... 50	Number of outer stitches, that will form the semicircular tack.
Tack tension P 6.7/ P 7.7	on / off	on: raised form tack off: flat form tack

P6.1/ P7.1 **H Simple tack (bartack),**

The parameter of the special tack types H simple tack are changed with the buttonhole seam parameters.

Stitch distance within the buttonhole seam P4.2	0.2 ... 1.0 mm	Distance in the y-axis of a double stitch
Buttonhole width P 4.3	1.0 ... 6.0 mm	Total width of the buttonhole
Buttonhole seam tension P 4.4	on / off	on: raised form off: flat form
Stitch length of tacking stitches P 4.6	0.2 ... 3.0 mm	Stitch distance of tacking stitches
Thread tension of tacking stitches P 4.7	on / off	Tacking stitch seam resistance

Information

The tack for tack types I, J and K is designed as a continuation of the buttonhole seam. The tack stitch distance varies with the stitch length of the buttonhole seam.

You can set the stitch length of the buttonhole seam in the menu Buttonhole seam (chapter 5.6).

Important

Start by setting the stitch length of the buttonhole seam before adjusting the tack settings.

P6.1/ P7.1 I Snaffle-shaped tack (hook band trimming)

Tack stitch distance		0.2 - 1.2	Distance in the y-axis of a double stitch
Tack length		0.6 - 6	Length of the tack in the y-axis.
Tack width Right offset		-1 - 1	The width of the tack is defined through the buttonhole width. With the use of the right offset the width of the tack to the right can be increased.
Tack width Offset left		-1 - 1	The width of the tack is defined through the buttonhole width. With the use of the left offset the width of the tack to the left can be increased.
Speed		200 - maximum speed set at the Technician level	Speed with which the tack will be sewn.

P6.1/ 7.1 J Cut right

Tack stitch distance		0.2 - 1.2	Distance in the y-axis of a double stitch
Tack length		0.6 - 6	Length of the tack in the y-axis.
Tack width Right offset		-1 - 1	The width of the tack is defined through the buttonhole width. With the use of the right offset the width of the tack to the right can be increased.
Tack width Offset left		-1 - 1	The width of the tack is defined through the buttonhole width. With the use of the left offset the width of the tack to the left can be increased.
Speed		200 - maximum speed set at the Technician level	Speed with which the tack will be sewn.

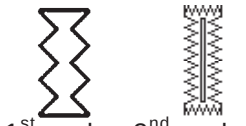
P6.1/ 7.1 J Cut left

Tack stitch distance		0.2 - 1.2	Distance in the y-axis of a double stitch
Tack length		0.6 - 6	Length of the tack in the y-axis.
Tack width Right offset		-1 - 1	The width of the tack is defined through the buttonhole width. With the use of the right offset the width of the tack to the right can be increased.
Tack width Offset left		-1 - 1	The width of the tack is defined through the buttonhole width. With the use of the left offset the width of the tack to the left can be increased.
Speed		200 - maximum speed set at the Technician level	Speed with which the tack will be sewn.

6. Knitwear mode

Use the knitwear mode when stretchable material is to be sewn. In the knitwear mode buttonholes are seamed several times in order to ensure a higher stability.

It is possible to combine a straight basting stitch with a following single or double zigzag. It is also possible to choose whether cutting should take place during the last seam sewing or the one before.
The following modes are available:



1st cycle 2nd cycle

- Combination “**1**”

  Double zigzag
  Cutting during the last cycle.

1st cycle 2nd cycle

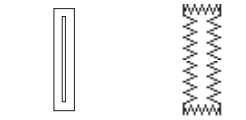
- Combination “**2**”

  Double zigzag
  Cutting during the cycle before the last one.

1st cycle 2nd cycle

- Combination “**3**”

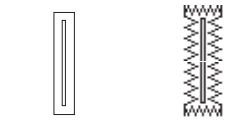
  Basting stitches on
  Cutting during the last cycle.



1st cycle 2nd cycle

- Combination “**4**”

  Basting stitches on
  Cutting during the cycle before the last one.



1st cycle 2nd cycle

- Combination “**5**”

  Basting stitches on
  Cutting during the last cycle and the one before.

1st cycle 2nd cycle 3rd cycle

- Combination “**6**”

  Basting stitches on
  Double zigzag
  Cutting during the last cycle.

1st cycle 2nd cycle 3rd cycle

- Combination “**7**”

  Basting stiches on
  Double zigzag
  Cutting during the cycle before the last one.

1st cycle 2nd cycle 3rd cycle

- Combination “**8**”

  Basting stiches on
  Double zigzag
  Cutting during the last cycle and the one before.

6.1 Selecting or switching off knitwear mode

Select knitwear mode

– Press the **P**-key.
– Select the parameter “**Knitwear**” with the arrow keys ⇧ and ⇩.
– Press the **OK**-key.
– Select the setting “on” with the arrow keys ⇧ and ⇩.
– Press the **OK**-key to confirm the selection.

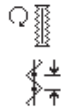
While the knitwear mode is activated the following menu points are visible:

- P9: Basting stitches
- P10: Zigzag seams
- P11: Early cutting (cutting during the cycle before the last one)
  [Only visible when the seam cycles basting stitch + zigzag >1]

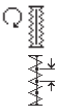
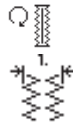
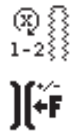
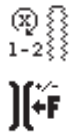
Switching the knitwear mode off

– Press the **P**-key.
– Select parameter “**knitwear**” with the arrow keys ⇧ and ⇩.
– Press the **OK**-key.
– Select with the arrow keys ⇧ and ⇩ setting “off”.
– Press the **OK**-key.
The knitwear mode is switched off.

6.2 Submenu basting stitches

Seam cycles P9.1		0 / 1	Number of the basting stitch seam cycles
Stitch length P 9.2		0.3 ... 3.0 mm	Stitch length of the basting stiches
Thread tension P 9.3		0...100%	Value of the tread tension for basting stitches. This parameter can only be selected when electric thread tension control is available.

6.3 Submenu Zigzag

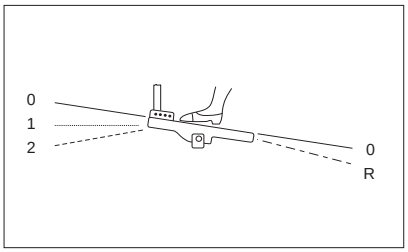
Seam cycles P10.1		1 / 2	Number of the zigzag seam cycles
Stitch length P 10.2		0.3 ... 3.0 mm	Stitch length of the first zigzag. Only visible when the number of zigzag seam cycles = 2
Buttonhole width P10.3		1.0...P4.3	The buttonhole width for the first zigzag ≤ max. buttonhole width P4.3. Only visible when the number of zigzag seam cycles = 2
Speed P10.4		200 ... 4000 RPM	The sewing speed of the first zigzag.
Thread tension P 10.5		0...100%	Thread tension for the leading buttonhole seam of the first zigzag. Only visible when the number of zigzag seam cycles = 2 This parameter can only be selected when electric thread tension control is available.
Thread tension P 10.6		0...100%	Thread tension for the trailing buttonhole seam of the first zigzag. Only visible when the number of zigzag seam cycles = 2 This parameter can only be selected when electric thread tension control is available.

7. Sewing procedure

7.1 Normal sewing procedure

Switching on of the automat

- Check on the maintenance unit that an air pressure of 6 bar is present.
- Switch on the main switch of the automat.
- The machine software will be loaded.
- The needle goes to the reference position.
- The sewing basket goes to the reference position and raises.
- The automat is ready to sew.



Sewing

- Position material to be sewn under the raised sewing basket.
- Press the foot pedal forward to position 1. The sewing basket descends. Releasing the pedal causes the sewing basket to raise again.
- Push the pedal forward to position 2. The sewing procedure will begin.
- After the sewing procedure the automat goes to the reference position and the sewing basket is lifted.
- The sewn material can be removed.

7.2 Interruption of sewing procedure

7.2.1 Interruption by the operator

Interruption by the operator

- Push the pedal backwards.

The machine stops and the needle is driven up high, the sewing basket stays down.

When the material has to be removed:

- Push the pedal backwards again, the automat goes to the reference position and the sewing basket is lifted.

When the sewing procedure is to be started again

- Push pedal forwards to position 2.
- If during the interruption the handwheel has been turned, a continuation is no more possible.

7.2.2 Clearing thread breakage

Thread monitoring

A thread breakage in the upper thread is detected by an electronic upper thread monitor.

Thread breakage

- The automat stops after a thread breakage has been detected by the upper thread monitor. The knife is switched off, the needle is driven up high, the sewing basket stays down and goes with the material to the basket reference position.
  The message thread breakage is displayed.
- The automat now has to be turned off.

– Hook and needle thread can now be threaded or checked.
– Further measures according to the thread breakage modes **Method A**, **B** or **C** preset in the technician level (see thread breakage mode).
– By pressing the **ESC**-key the thread breakage mode can be ended. The automat references, the sewing basket is lifted and the material is released.

Thread breakage mode

There are three possibilities to clear a thread breakage. The respective method has to be preset in the technician level.

Method A:

The buttonhole has to be undone and re-sewn.

– After switching the automat on again, the sewing basket is lifted and releases the material.

The automat is now available for a new sewing cycle.

Method B:

The buttonhole is completely re-seamed.

– After switching on again the sewing basket stays down. The material under the sewing basket remains in position.
– Push pedal forwards to position 2 . Sewing begins.
– After sewing the automat drives to the reference position and the sewing basket is lifted.
– The material can be removed.

The automat is now ready for the next sewing cycle.

Method C:

The buttonhole will continue to be sewn beyond the detected thread breakage spot.

– After the automat is switched on again, the sewing basket stays down. Thus the material under the sewing basket remains in position.
– Push the pedal forwards to position 2. The sewing basket proceeds with the material to the thread breakage spot.
– In order to reach the position to continue sewing without having to sew, use the arrow keys ⇧ and ⇩.
– Push the pedal forwards to position 2. Sewing begins.
– After sewing the machine drives to the reference position and the sewing basket is lifted.
– The material can be removed.
  The automat is now ready for the next sewing cycle.

The number of stitches that the thread breakage monitor does not register before signalling an error is set in the technician level. With the setting **stitch number “0"**, the thread breakage monitor is switched off.

8. Setup

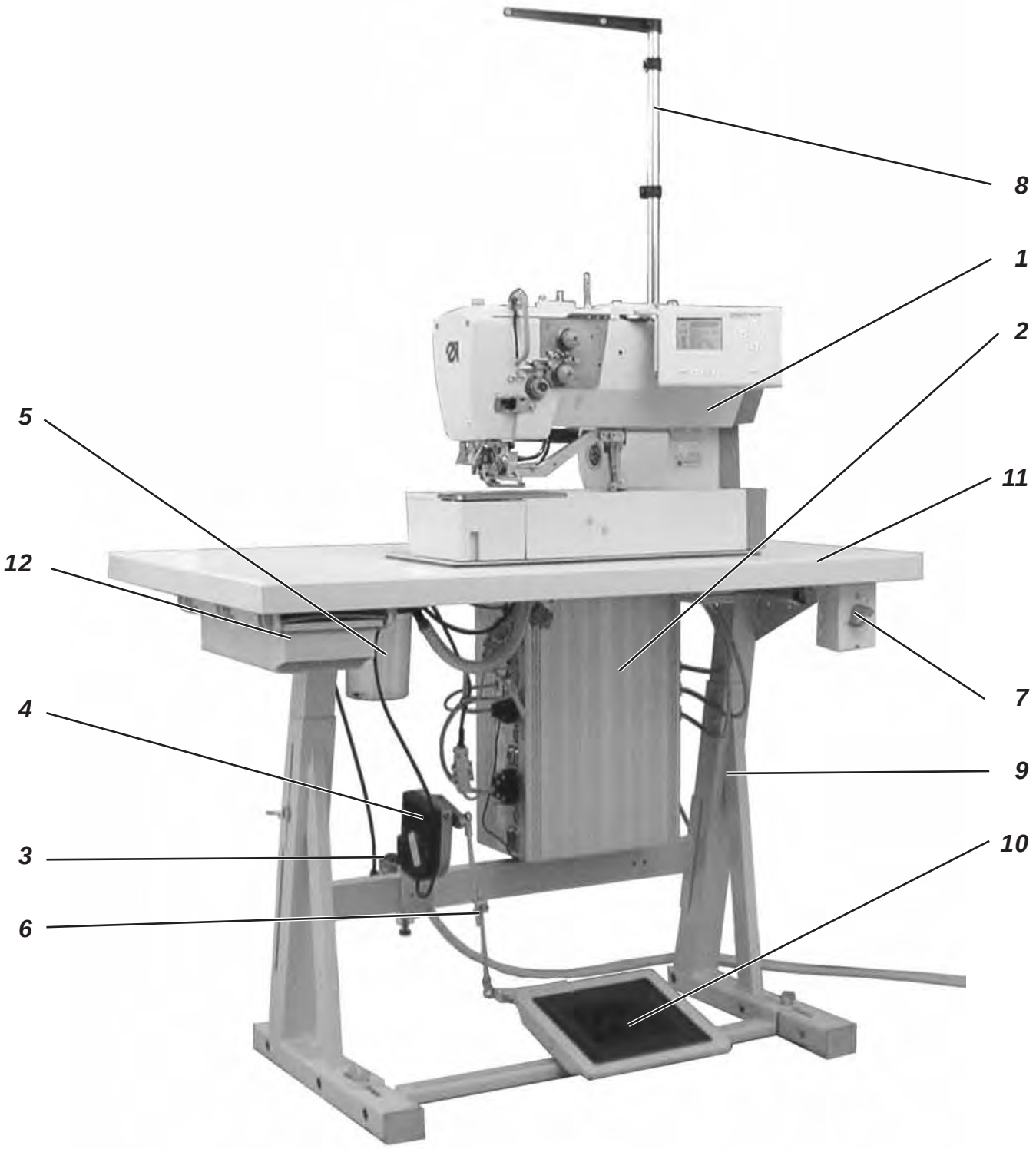
8.1 Scope of delivery

The scope of delivery is dependent upon your order.
Please check that all necessary parts are present.

- 1 Machine head
- 2 Control
- 3 Maintenance unit
- 4 Set value initiator
- 5 Waste container
- 6 Traction rod
- 7 Main switch
- 8 Thread stand
- Small parts in the accessories pack

Only with delivery of frame (optional)

- 9 Frame
- 10 Pedal
- 11 Table top
- 12 Drawer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8.2 General and Transportation Safety

ATTENTION !

The sewing automat 540 must only be installed by trained specialist staff !

Transport securing devices

If you have bought an assembled buttonholer; the following transport securing devices have to be removed:

Securing tapes and wood battens at machine head, table and stand.

Ring bolt

The ring bolt makes it easier to lift the automat onto the frame. You can lift the automat using a ceiling crane or two people can lift the automat using a stable bar putting it through the ring bolt. The ring bolts are in the accessories pack.

- Screw the ring bolt in the case lid of the machine head.
- Lift the machine head onto the table plate.
- Remove the ring bolt.

8.3 Equipment

8.3.1 Structure of Equipment

	Equipment: E 126/22
Cutting	1 = Cutting equipment with slit in the throat plate
Throat plate/basket	1 = blouses, shirts raised throat plate (0,6 mm); basket sole cross toothed 2 = working clothes, heavy material flat throat plate; basket sole cross toothed 3 = ties, cuffs flat throat plate; basket sole cross toothed, narrow 4 = polo shirts flat throat plate; basket sole cross toothed, single side narrow, sewing basket steep sided 5 = ladies outer wear, working clothes, sports and leisure wear with varying material thickness throat plate not raised; basket sole layered with Vulkollan foam to even out level differences 6 = knitwear throat plate sharply raised (1,6 mm); basket sole toothed
Stitch row width	3 = stitch row width max. 3 mm 4 = stitch row width max. 4 mm 6 = stitch row width max. 6 mm
Sewing area and basket length	22 = Buttonhole length to max. 22 mm 35 = Buttonhole length to max. 35 mm 48 = Buttonhole length to max. 48 mm 70 = Buttonhole length to max. 70 mm

Sewing automat equipment components

The components for up-to-date equipment can be found at **www.duerkopp-adler.com** in the **Download area**.

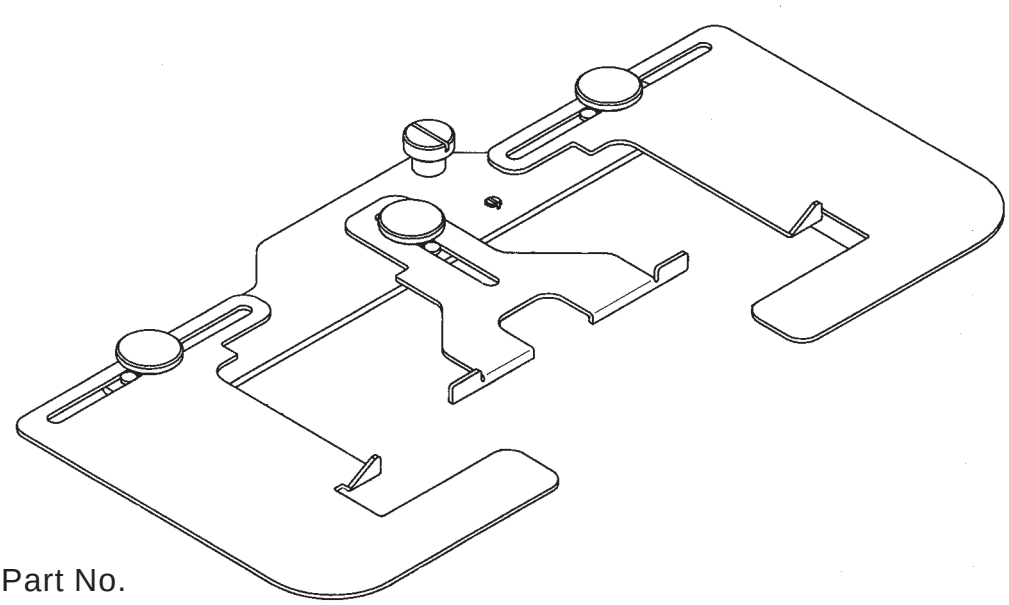
8.3.2 Available equipment

540 E 113/22	Sewing equipment for buttonholes in shirts and blouses, closely woven material, max. buttonhole width 3 mm, max. buttonhole length 22 mm.
540 E 114/22	Sewing equipment for buttonholes in shirts and blouses, closely woven material, max. buttonhole width 4 mm, max. buttonhole length 22 mm.
540 E 114/35	Sewing equipment for buttonholes in shirts and blouses, closely woven material, max. buttonhole width 4 mm, max. buttonhole length 35 mm.
540 E 154/22	Sewing equipment for buttonholes in ladies outer wear, working clothes, sportswear and casual wear with cloth presser basket compensating the height differences, max. buttonhole width 4 mm, max. buttonhole length 22 mm.
540 E 154/35	Sewing equipment for buttonholes in ladies outer wear, working clothes, sportswear and casual wear with cloth presser basket compensating the height differences, max. buttonhole width 4 mm, max. buttonhole length 35 mm.
540 E 156/35	Sewing equipment for buttonholes in ladies outer wear, working clothes, sportswear and casual wear with cloth presser basket compensating the height differences, max. buttonhole width 6 mm, max. buttonhole length 35 mm.
540 E 133/22	Sewing equipment for buttonholes in collars of shirts and blouses and cuffs, with a narrow cloth presser basket, max. buttonhole width 3 mm, max. buttonhole length 22 mm.
540 E 134/22	Sewing equipment for buttonholes in collars of shirts and blouses and cuffs, with a special cloth presser basket , max. buttonhole width 4 mm, max. buttonhole length 22 mm
540 E 146/22	Sewing equipment for buttonholes in Polo shirts, max. buttonhole width 6 mm, max. buttonhole length 22 mm.
540 E 166/22	Sewing equipment for buttonholes in woven and knitted fabrics, max. buttonhole width 6 mm, max. buttonhole length 22 mm.
540 E 166/35	Sewing equipment for buttonholes in woven and knitted fabrics, max. buttonhole width 6 mm, max. buttonhole length 35 mm.
540 E 126/22	Sewing equipment for buttonholes in working clothes, medium weight material, max. buttonhole width 6 mm, max. buttonhole length 22 mm.
540 E 126/35	Sewing equipment for buttonholes in working clothes, medium weight material, max. buttonhole width 6 mm, max. buttonhole length 35 mm.
540 E 126/48	Sewing equipment for buttonholes in working clothes, medium weight material, max. buttonhole width 6 mm, max. buttonhole length 48 mm.
540 E 126/70	Sewing equipment for buttonholes in seat belt openings in stroller and infant safety seat, max. buttonhole width 6 mm, max. buttonhole length 70 mm.

9. Optional equipment

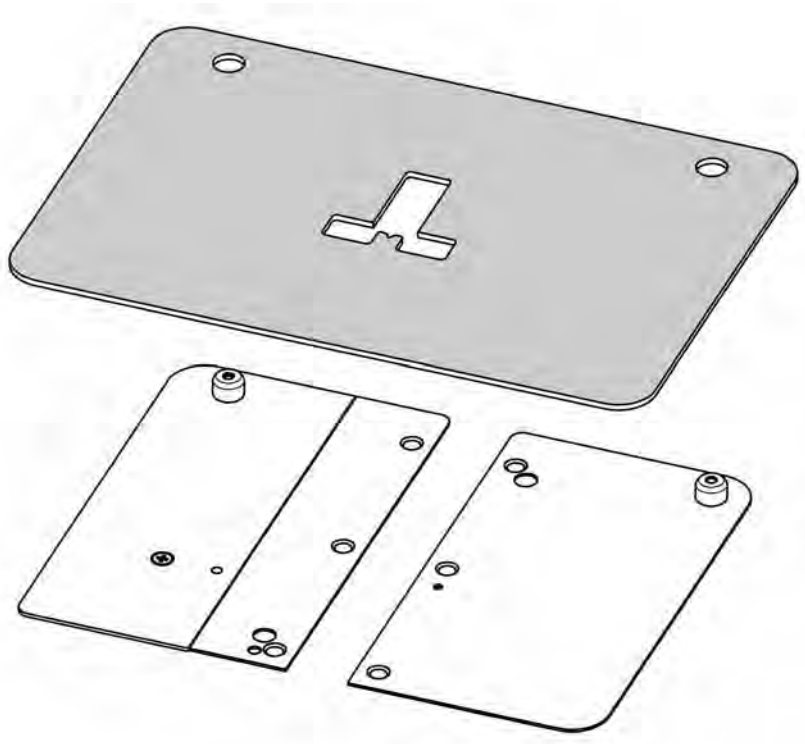
0540 211324	Cloth presser basket coated with Vulkollan (only for E 113/22) and smooth material slider for buttonholes in shirts and blouses, prevents impressions in sensitive material.
0540 211424	Cloth presser basket coated with Vulkollan (only for E 114/22) and smooth material slide for buttonholes in shirts and blouses, prevents impressions in sensitive material.
0540 211434	Cloth presser basket coated with Vulkollan (only for E 114/35) and smooth material slide for buttonholes in shirts and blouses, prevents impressions in sensitive material.
0540 590064	Swivel device for rapid change between lengthwise and widthwise installation, for a flexible mode of operation.
0540 590014	Pneumatic needle cooler.
9822 510026	Halogen tripod – sewing light incl. transformer, 1 x 190-240V/12V sec. = 20 Watt (additionally needed are a table clamp and a connection kit).
9822 510027	Table clamp (for sewing light 9822 510026).
9870 001021	Sewing lamp connection kit (electrical connection for sewing light 9822 510026).

Positioning aids



Part No.
0540 590144

Spacing ruler with lateral guide for linen buttonholes in the front welt of men’s shirts and ladies’ blouses.



Part No.
0540 590154

Template positioning aid for collar tips, collar welts, cuffs, double cuffs and shirt flaps.

The enclosed cardboard templates (5 pieces) are to be cut according to the form of the piece of clothing that is to be sewn. By turning the template only one template is needed for the sewing process, f. e. first sew the left collar welts and then the right collar welts with it.

10. Assembling the sewing automat

10.1 Making the table top

If you are manufacturing your own table top then use the measurements in figure 1.

Part number: 0700 054003

1 Punch mark on the bottom

2 Table plate bottom

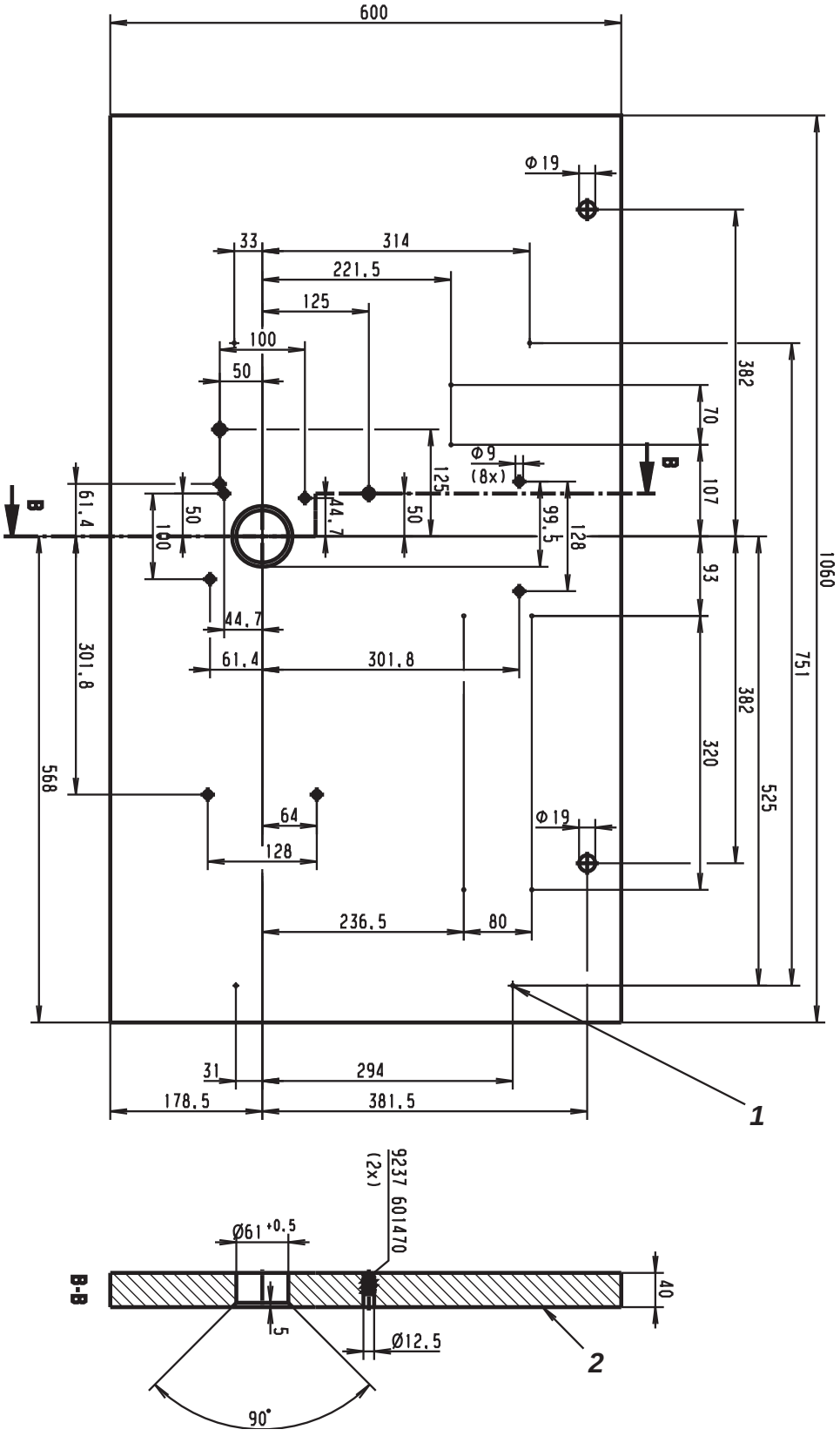


Fig. 1

10.2 Mounting the frame

- Mount the frame as shown in figure 2
- To ensure a safe standing, all 4 feet have to have contact with the ground.
- Screw the oil can onto the frame bar.

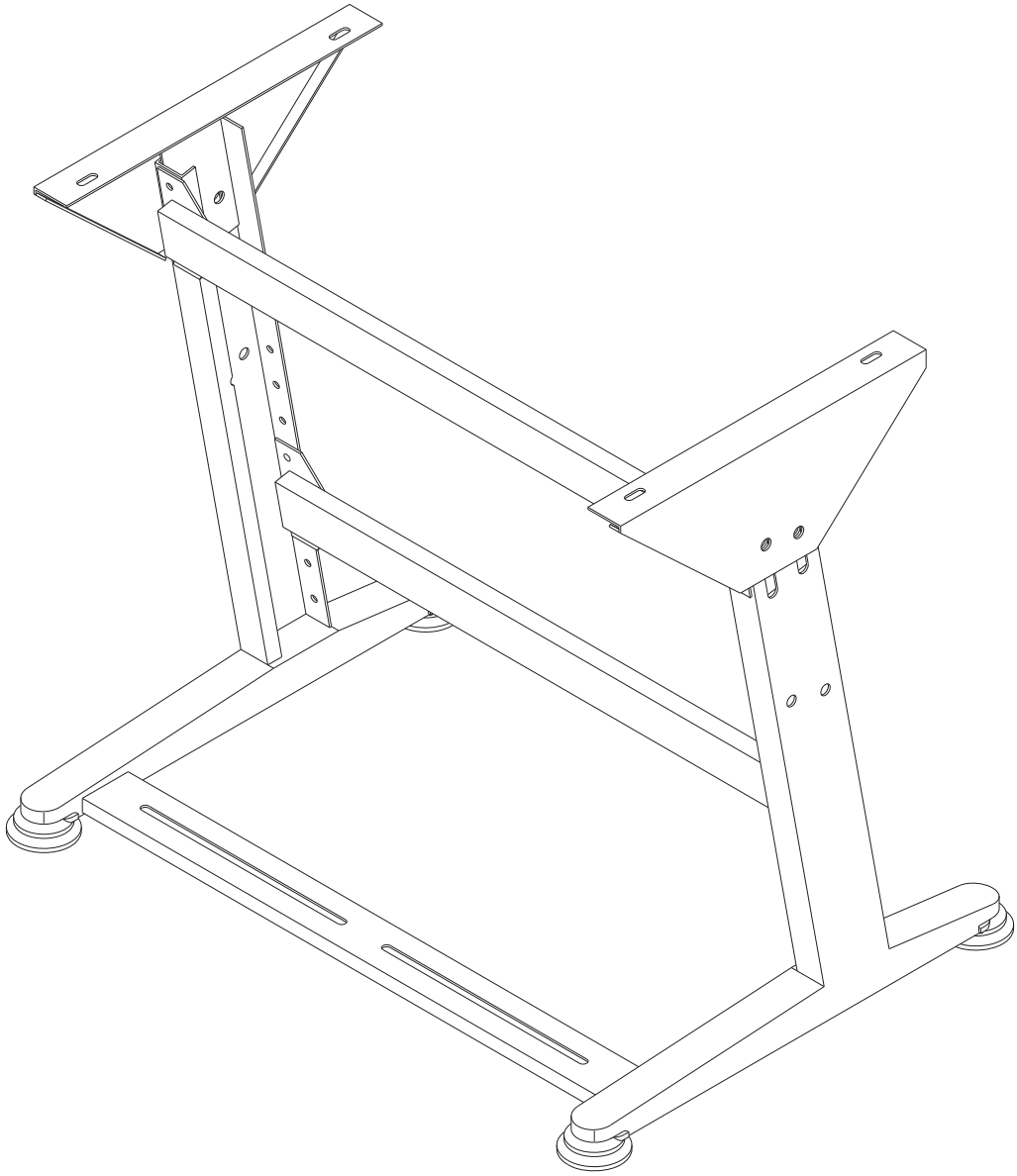


Fig. 2

10.3 Completion and mounting of table top

If you are mounting the table top yourself then please use the measurements in figure 2.

- Screw cable channel 1 onto the table top.
- Screw the mount for drawer 2 onto the table top.
- Screw the main switch 3 onto the table top.
- Fasten the table top onto the frame with four wood screws (B8 x 35).

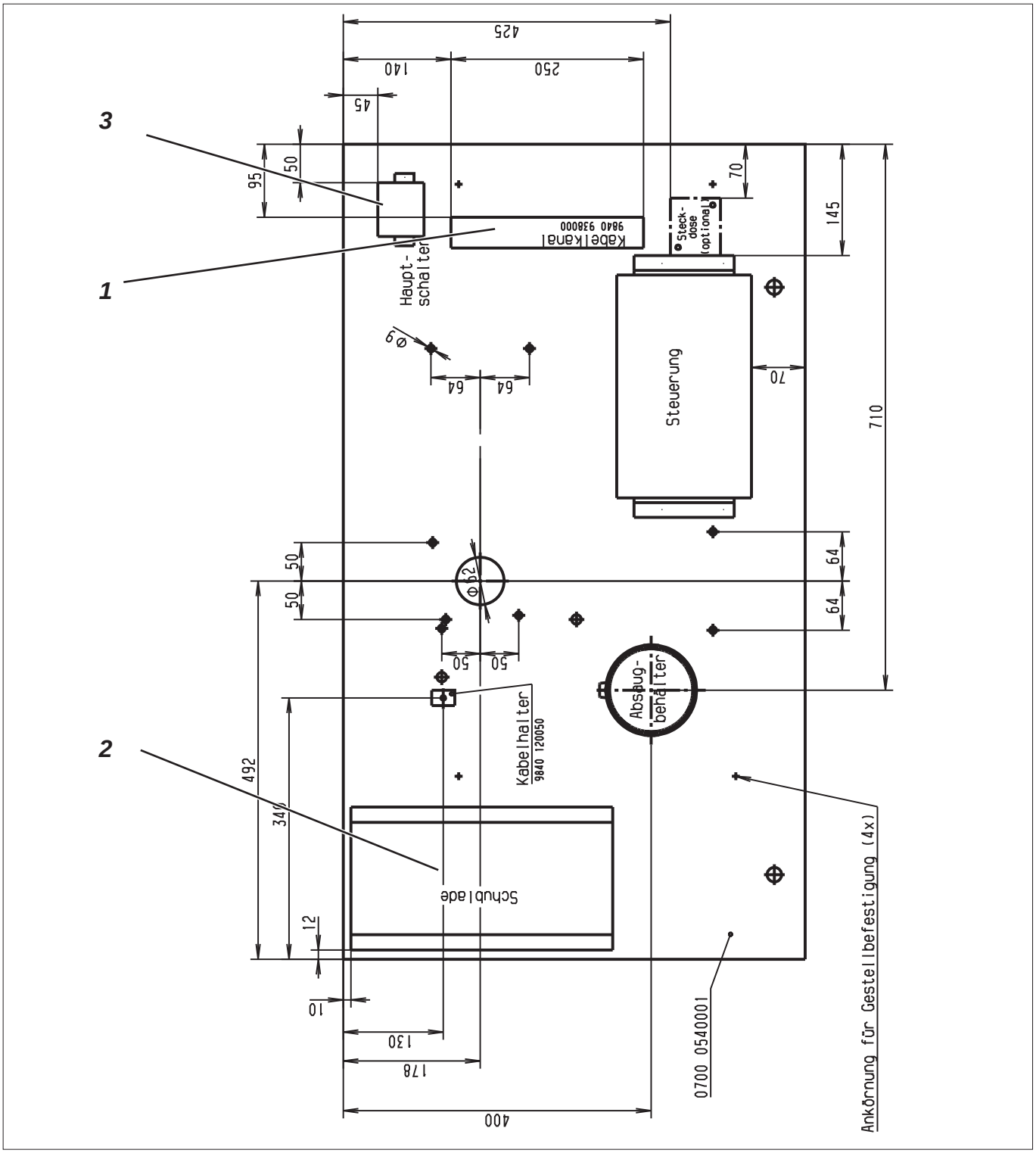
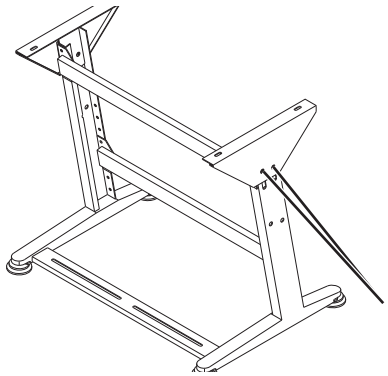


Fig. 2

10.4 Setting the working height



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The working height is adjustable.

– Loosen both screws 5 on each of the frame bars.
– Set the desired working height. Ensure that if possible both sides are pulled out or pushed in evenly.
– Tighten both screws 5 again.

10.5 Setting up the machine head

Fig. 1

When taking the machine head out of the transport box, do not grab hold of the blocks, the cloth press plate or the control panel. Make sure that the oil reservoir is taped up to prevent that oil escapes during the set up.

The machine head can be mounted lengthwise or widthwise. A swivel device is optionally available allowing lengthwise or widthwise installation to be changed quickly.

10.5.1 Lengthwise installation

Fig. 2

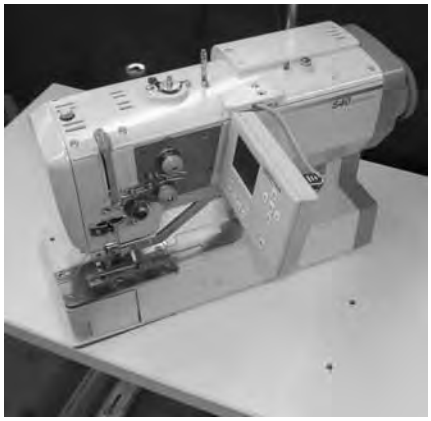
– Place the machine head on the table plate according to figure 1.
– Feed all cables and hoses through the bore hole in the table top.
– Set the machine head and screw it to the table top, according to figure 2, using 4 hexagonal screws .

10.5.2 Widthwise installation

Fig. 3

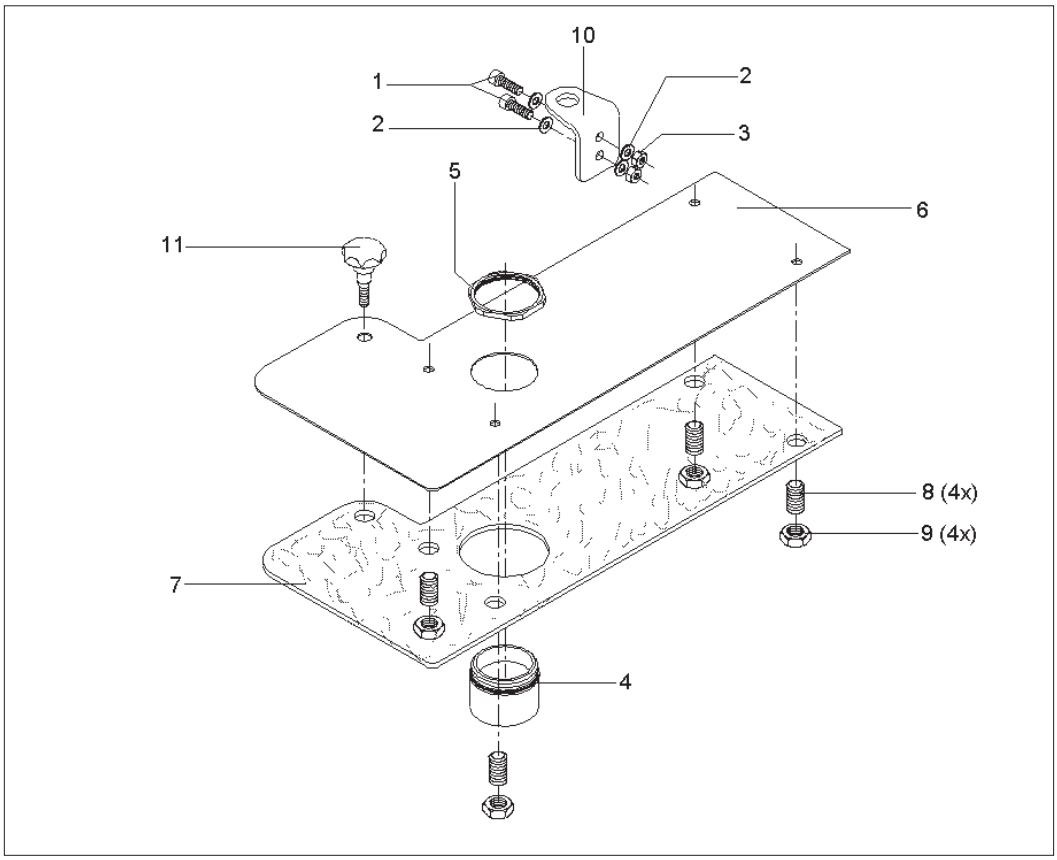
– Place the machine head on the table plate according to figure 1.
– Feed all cables and hoses through the bore hole in the table top.
– Set the machine head and screw it to the table plate, according to figure 3, using 4 hexagonal screws .

10.5.3 Swivel device (optional)



- Loosen all cables and hoses, connected to the machine head under the table top.
- Unscrew the fastening screws of the machine head under the table top.
- Screw on the L-bracket 10 for the thread stand on the rear of the bed plate. Please use the provided screws 1 (2x), washer 2 (4x) und nuts 3 (2x).
- Set aside the machine head (Fig. 1)
  Note:
  Make sure that the oil reservoir is taped up to avoid oil leak.
- Fix the plastic fittings 4 with the nut 5 on the hinged plate 6.
- Slide the felt 7 over the fitting 4.
- Feed all cables and hoses through the fitting 4.
  For this purpose, the housing of the plug x120b must be dismantled.
- Screw the hinged plate 6 under the bed plate.
  For this purpose, screw the threaded pin 8 (4x) on the rubber feet of the bed plate and secure the hinged plate using the falt nuts 9 (4x). After tightening the threaded pin, those must be flush with. They should in any case not be sticking out of the nuts.
- Feed all cables and hoses through the bore hole in the table top.
- Set the machine head with the swivel device on the bore holes of the table top.
- Connect the cables and the hoses.
- Screw the thread stand on the L-bracket 10.
- Arrest the machine head lengthwise or widthwise using the set screw 11.

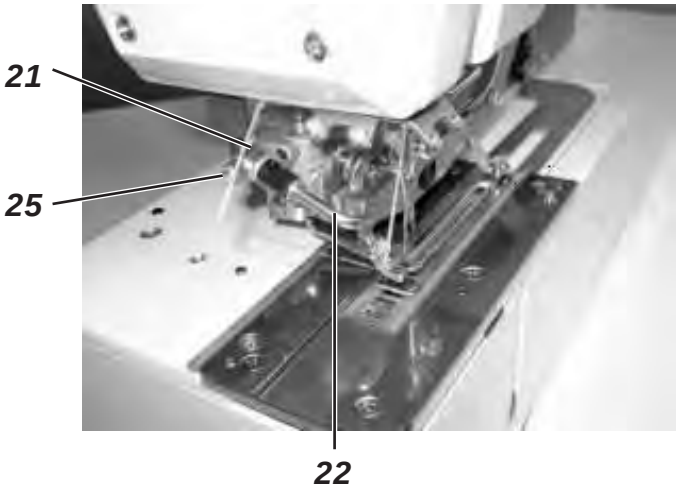
Fig. 1

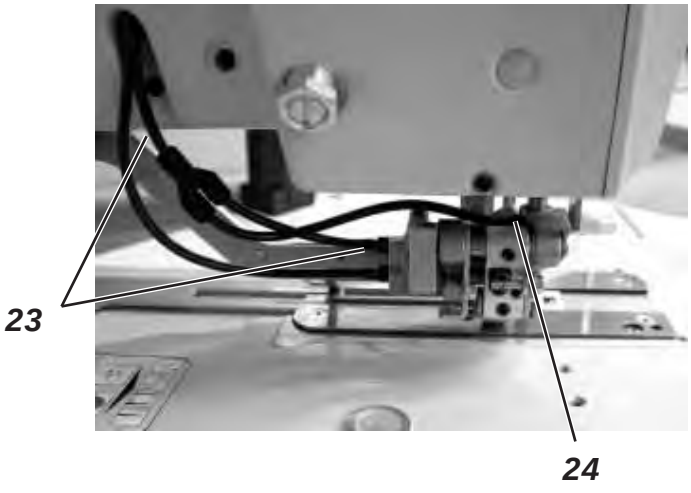


10.5.4 Needle cooler (optional)

Function

The needle cooler operates parallel to the scissors pivoting cylinder. This means that the needle cooler is active while the scissors are swung out.





Installation

- Screw the throttle 21 into the tap hole of the scissors block.
- Push the blower pipe 22 with its long arm into the throttle nozzle. The position of the air outlet can be varied by turning and pulling out the blower pipe.
- Cut the pneumatic line 23 leading to the pivoting cylinder 5 cm underneath the arm outlet.
- Insert the Y-piece.
- Lay a new pneumatic line from the connection 24 on the scissors block to the Y-piece.
- Shut the throttle 21 by turning the throttle screw 25 clockwise.
- Switch the machine on.
- Skip to the service menu.
- Select the menu item T3.1.1 outputs. Activate the output Y2 for the swinging out of the scissors.
- The throttle 21 of the needle cooler now receives compressed air. Adjust the desired air-flow by opening the throttle screw 25.
- Quit the service menu by actuating the ESC key.
- Test the function of the scissors swinging out by sewing a test seam.

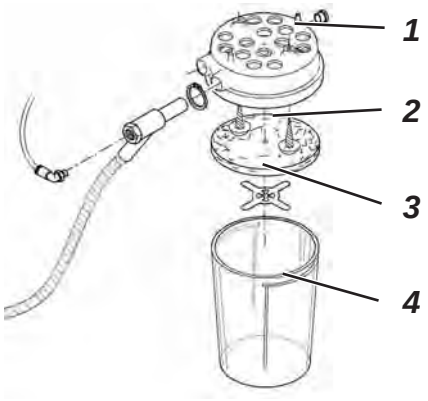
Attention!

Do not open the throttle completely. If the air-flow on the needle cooler gets too strong, it impairs the swinging out of the needle thread scissors.

10.6 Mounting the control unit

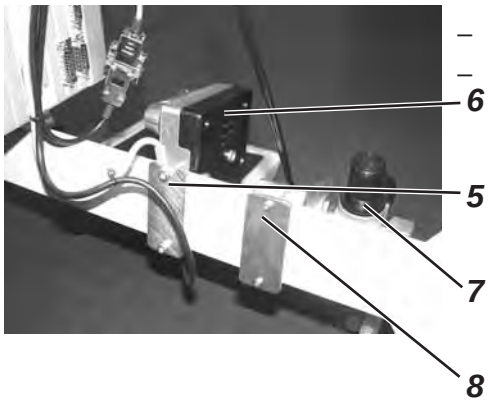
– Mount the control unit (DAC III) onto the table plate using 4 wood screws according to figure 2 on page 10. The side with the bushes for the motors (three bushes, one under the other) has to point to the right side.

10.7 Mounting the waste container



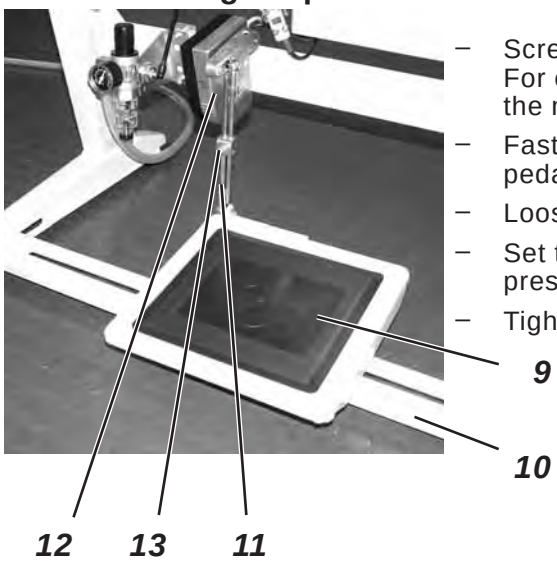
– Remove cover 1 of the waste container.
– Take the filter fleece 2 out of cover 1.
– Screw cover 1 onto the table plate with two wood screws.
– Refit the filter fleece 2 into the cover 1.
– Refit the fleece clamping plate.
– Finally stick the container 4 onto the cover 1.

10.8 Mounting the maintenance unit and the set value initiator



– Screw plate 5 onto the set value initiator 6.
– Screw the set value initiator plate 6 to the maintenance unit L-bracket 7 on the cross strut of the frame 8 according to figure 4.

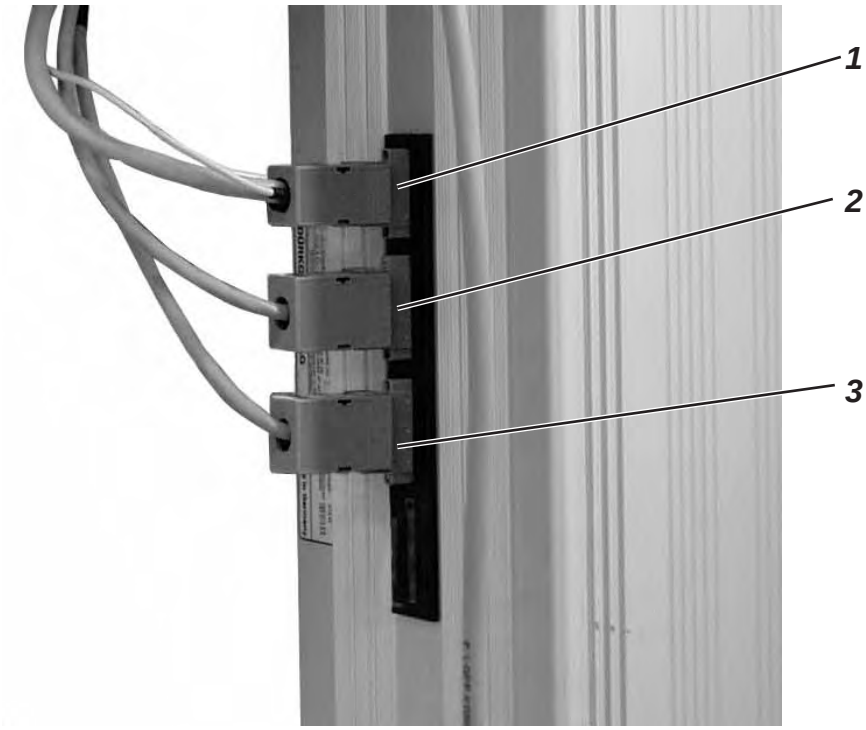
10.9 Mounting the pedal and the traction rod



– Screw pedal 9 onto the frame strut 10.
For ergonomic reasons the pedal center should be directly under the needle.
– Fasten the traction rod 11 to the set value initiator 12 and the pedal 9.
– Loosen screw 13 on the traction rod 11.
– Set the length of the traction rod 11 so that pedal 9, without any pressure on it, has an inclination of about 10°.
– Tighten screw 13 again.

11. Electrical connection

11.1 Plug connections at the multiple pin strip (4-fold)



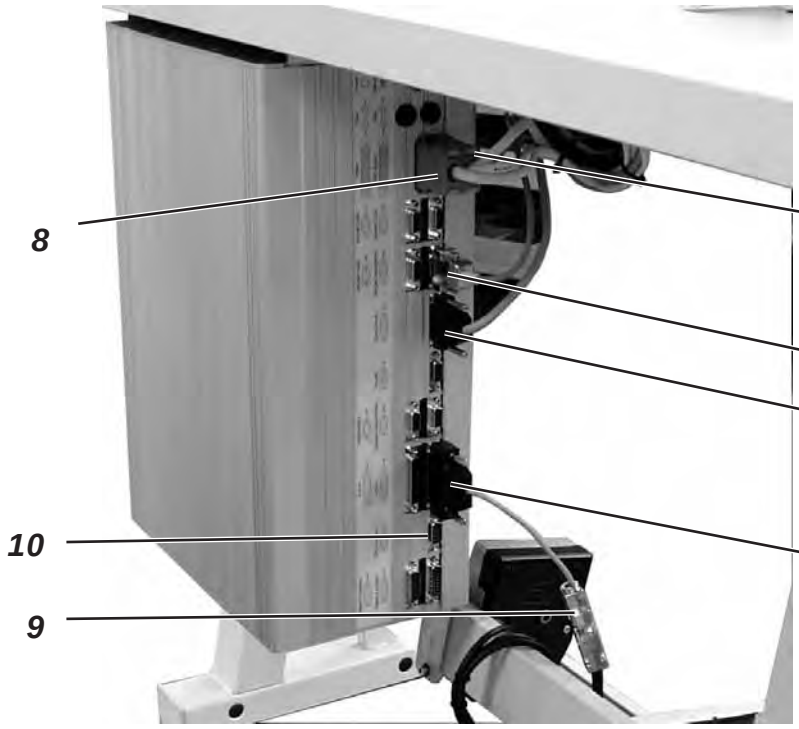
Connect the plug connectors of the linen buttonhole automat as follows:

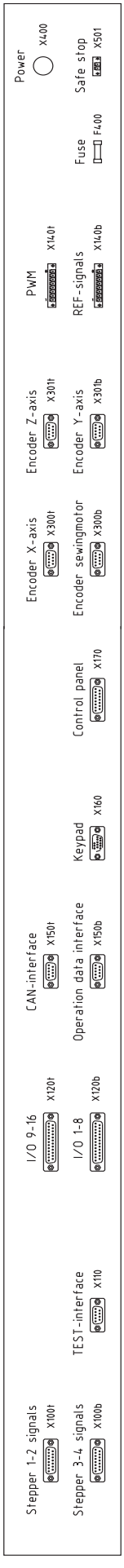
x20 – 4-pole
Plug connector 1 ➔ Sewing motor connector

x30 – 5-pole
Plug connector 2 ➔ Stepping motor for the X-drive

x40 – 5-pole
Plug connector 3 ➔ Stepping motor for Y-drive

11.2 Plug connections at the multiple pin strip (15 fold)





Connect the plug connectors of the buttonhole automat, the set value initiator and the control panel as follows:

x140b – REF-signals
Light barrier plug /sensor
on plug connector 4
Note: 8-pole plug is coded.

x140t – Plug PWM (optional with the electronic thread tensioner)
Magnetic plugs on plug connector 8
Note: 8-pole plug is coded.

x300b – Encoder plug sewing motor
Encoder plug signal sewing motor
on plug connector 5

x170 – Control panel plug
Control panel plug
on plug connector 6

x120b – Plug I/O 1-8
Operating device plug (pedal switch)
via adapter 9 on plug connector 7

x110 – Test-Interface 10
Dongle

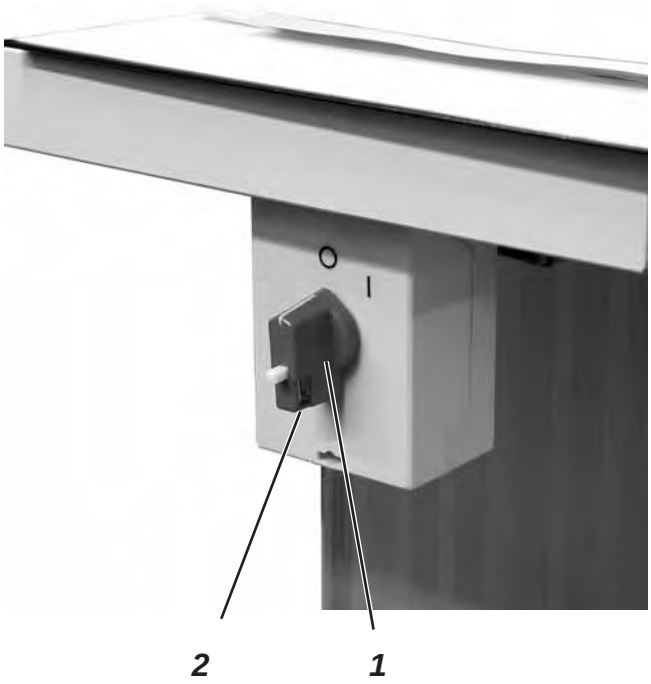
11.3 Potential compensation

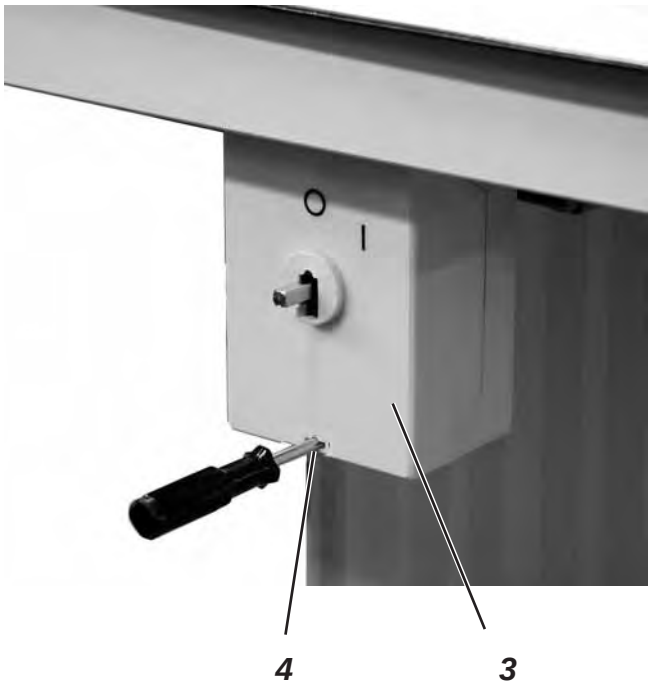
– Screw the potential compensation cable onto the control panel.

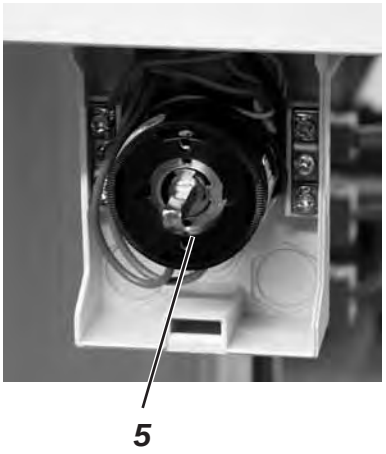
11.4 Control connection to main switch

CAUTION !

All work that needs to be carried out on the electrical installation of the linen buttonhole automat is only allowed to be carried out by an electrician or other qualified personal.
The mains plug is to be unplugged!



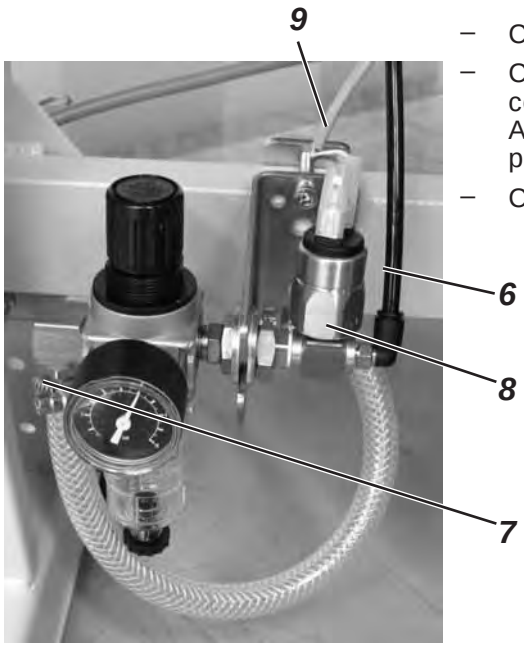




- Remove rotary knob 1.
  To do this loosen the screw 2 in the rotary knob.
- Remove the cover 3 from the main switch.
  To do this use a screwdriver to unlock the latch in bore hole 4.
- Place the cable from the control box in the cable channel.
- Feed the cable into the main switch.
- Connect the cable cores of the control box to the screws “T1" and “T2".
- Connect the earth connection of the control box to the main switch.
- Refit the cover to the main switch.
- Refit the rotary knob and tighten it.

12. Pneumatic connection

12.1 Connecting the maintenance unit



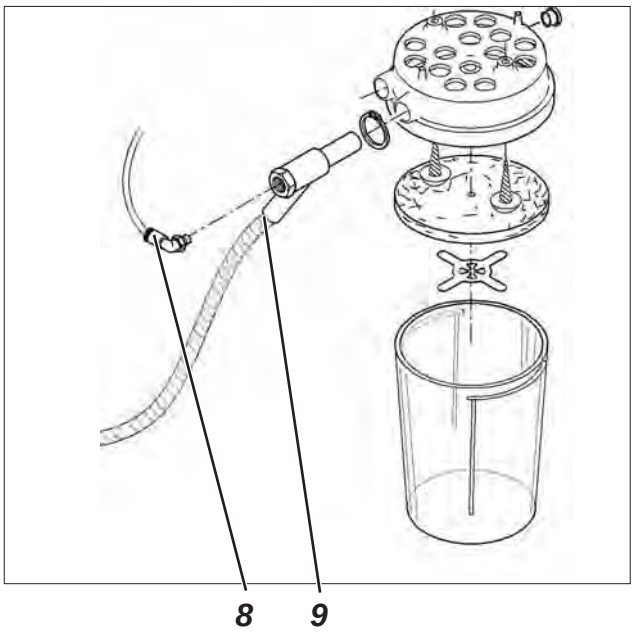
- Connect the air hose 6 to the coupling.
- Connect the hose nozzle 7 with an air hose onto its air supply connection.
  A pneumatic connection kit for the connection onto the existing air pressure network is available under order number: 0797 003031.
- Connect the cable 9 to the pneumatic switch 8.

CAUTION!

The operating pressure is 6 bar. Check the maintenance unit to see whether 6 bar are indicated! If necessary, adjust the pressure on the maintenance unit to 6 bar.

12.2 Connecting the waste container

- Connect the air hose 8 (the thinner one of the two black air hoses) to the waste container.
- Connect the hose 9 to the waste container. Hose 9 is used to exhaust cutting waste.



13. Software installation

13.1 Standard delivery

With delivery of the sewing automat only the test software is installed in the control unit, which allows the loading of specific sewing software from the boot-dongle. The boot-dongle is in the machine head accessories pack.

CAUTION!

Only use the boot-dongle, that comes with the machine head.

Using a dongle that contains the software of another machine class can cause damage to the sewing automat!

13.2 Software installation

13.2.1 General

Loading a specific sewing software in the DACIII control unit is possible with the help of the “Programmed Dongle”. The “Programmed Dongle” has a label indicating the class and software version.

Such a loading (booting) may be used in order to provide several DACIII control unit with a sewing software (first installation) or to install a newer machine software (update).

With the delivery of the machine only the test software (allowing the loading of sewing software) is installed in the control unit.
The test software offers no further functions. If the test software gets damaged during the loading process, it is no longer possible to load a software using a dongle.
In such a case use a PC with a loader cable.
The detailed procedure for this is described at the homepage of Dürkopp Adler GmbH “*www.duerkopp-adler.com*” among the section of “*Download Area*” and “*Software*”.

CAUTION !

Turn off the main switch before connecting the dongle.

13.2.2 Loading the program

- Turn the machine off at the main switch.
- Insert the dongle **2** into the socket X110 (TEST-Interface) **1** of the control unit (see pictures).
- Switch on the main switch. The Software will be loaded. The loading process takes less than 60 seconds.
- During the loading process do not remove the dongle and do not switch off the machine.
- The machine proceeds with a warm start after the software is loaded.
- Remove the dongle **2**.
- If necessary confirm the software version (caution: the machine software must match the machine class).

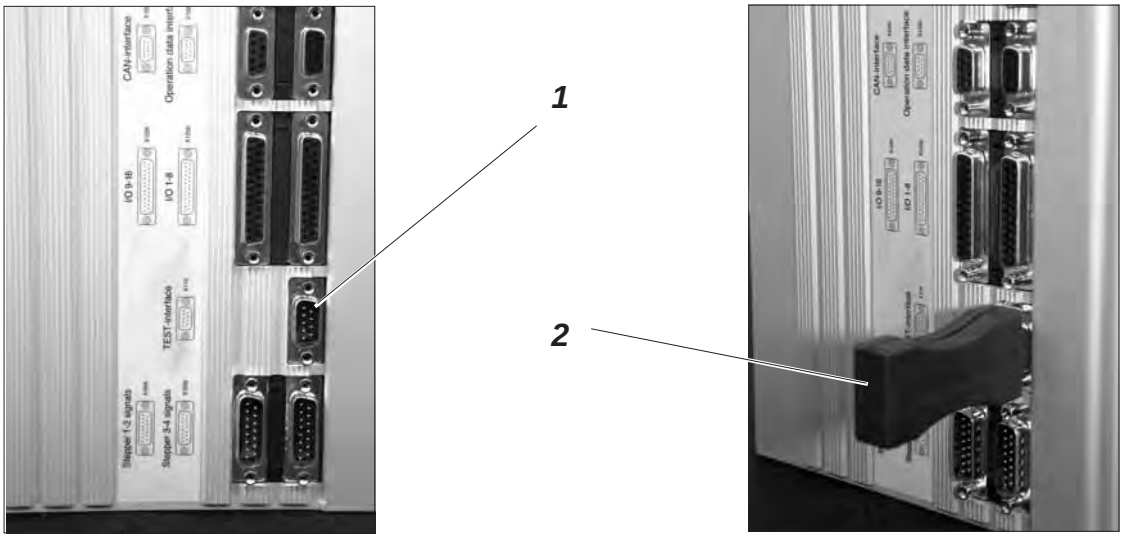
The sub menu for the input of basket width and basket length (T1.4) will automatically be shown on the control panel. The length and width of the sewing basket has to be entered here. This setting only needs to be done with the initial installation.

- Press the **OK** key.
- Select the basket length of the sewing basket that is to be used with the arrow keys ⇧⇩ .
  If you are using your own sewing basket choose ´X´ as basket length and press the **OK** key. Set the desired value with the arrow keys ⇧⇩. Select the position to be edited with the keys ⇦⇨. At the end press the **OK** key.
- With the arrow key ⇩ select the menu point basket width.
  Press the **OK** key.
- Select the basket length of the sewing basket with the arrow keys⇧⇩.
  If you are using your own sewing basket, choose ´X´ as basket width and press the **OK** key. Select the desired value with the arrow keys ⇧⇩. Select the position to be edited with the keys ⇦⇨ .
  At the end press the **OK** key.
- Press the **ESC** key. The main menu will be shown.

CAUTION!

Incorrect setting of the basket length and basket width causes damage to the sewing automat.

- The machine is now ready for use.



Important !

During the loading process do not remove the dongle and do not switch off the machine (you will damage the Software)!

Remove the dongle before the next switch-on, otherwise the sewing software will be reloaded again.

13.2.3 Dongle-Update via Internet

Dongles can be updated with programs available from the Dürkopp Adler homepage. Please open our homepage *“www.duerkopp-adler.com”* where you will find the relevant programs in the “Download” - section. Prerequisite is our auxiliary download software “Dongle Copy” which is available in the same section together with instructions for easy use.

13.3 Language setting

The menu language can only be changed after the basket length and basket width have been set during the initial installation of the sewing software. The choices are English (standard setting), German and parameter. To change the menu language proceed as follows:

- Press the **F** key.
  The menu point input code will be shown.
- **Enter technician code 25483**. Change the value with the arrow keys ⇧⇩, select the position to be changed with the arrow keys ⇦⇨. Confirm by pressing the **OK** key.
- Select the menu point **User Settings** with the arrow keys ⇧⇩. Press the **OK** key
- Select the menu point **Language** with the arrow keys ⇧⇩. Press the **OK** key.
- Select the desired language (German, English, Parameter) with the arrow keys ⇧⇩ .
  Press the **OK** key. A tick is shown behind the chosen language.
- Press the **ESC** key to complete. The main menu will be shown.

14. Sewing test

After completion of the assembly, a sewing test should be made.

– Wind up bobbin thread (see operating instructions chapter 3.2)

Caution: Danger of injury !

Switch off main switch.

Thread in the needle and bobbin thread only when the sewing automat is switched off.

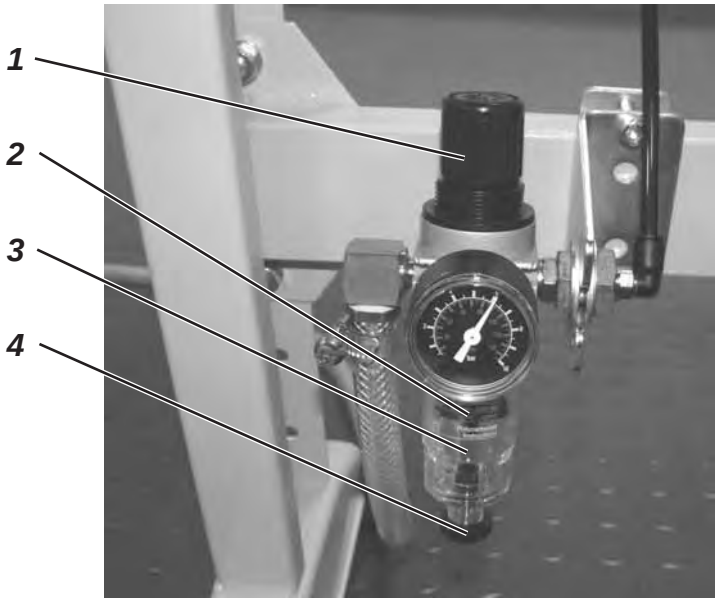
– Thread in the needle thread (see operating instructions chapter 3.1).
– Place the bobbin and its housing (see operating instructions chapter 3.2 and 3.3).
– Switch on main switch.
The control unit is initialized.
– Choose a workpiece to be processed.
– Begin with a low speed at first (see operating instructions).
Gradually increase the speed.
– Check that the buttonhole meets the desired requirements.
If not: Alter the thread tension (see operating instructions chapter 3.7).
If needed please check also the setting instructions described in the service instructions.

15. Maintenance

15.1 Cleaning and inspection

Check air pressure and adjust

- The operating pressure is 6 bar.
- Turn screw 1 to adjust pressure
  Reduce pressure: Turn screw 1 anti-clockwise.
  Increase pressure: Turn screw 1 clockwise.



Scheduled maintenance	Explanation	Operating hours
Machine head Remove sewing dust, thread rests and cutting waste.	Places to be cleaned particularly: - Beneath the throat plate - Sewing basket - Area under the hook - bobbin housing - thread cutter	**8**
Pneumatic system Check or set air pressure		**8**
Check water level in the pressure regulator.	Water level must not rise to the level of the filter element **2**. Screw in drain screw **4** and blow out the water under pressure.	**40**
Clean filter	Through the filter element **2** condensation water and dirt are expelled. Cut off the machine from the air pressure system. Screw in drain screw **4**. The pneumatic system of the machine must be without pressure. Unscrew water trap **3**. Unscrew the filter element **2** and wash out the dirty filter housing and filter element with benzene (not a solvent!) and blow dry. Reassemble the maintenance unit and reconnect.	**500**
Check tightness of systems		**500**

15.2 Oil lubrication

Caution: Danger of injury !

Oil can cause skin eruption.
Avoid protracted contact with the skin.
In the event of contact, thoroughly wash the affected area.

ATTENTION !

The handling and disposal of mineral oils is subject to legal regulations.
Deliver used oil to an authorized collecting station.
Protect your environment.
Take care not to spill oil.

Check regularly the oil level in both of the supply containers 1 and 2. The oil level should not drop below the mark “**min**” on the glass inspection!

Fill up the oil reservoirs exclusively with lubricating oil **DA-10** or an equivalent oil with the following specification:

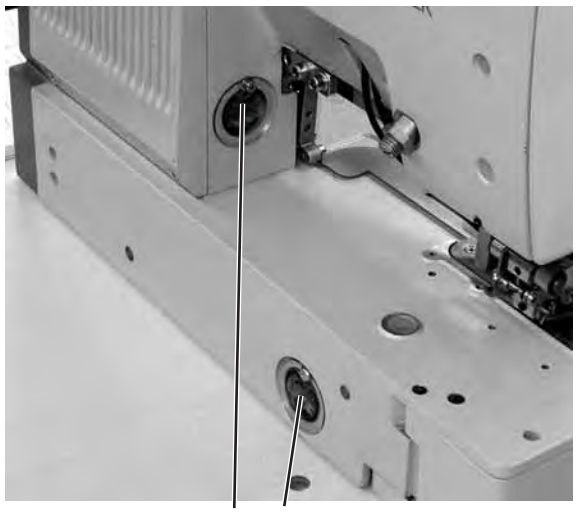
– Viscosity at 40°C: 10 mm²/s
– Ignition point: 150°C

DA-10 oil can be bought at the sales points of **DÜRKOPP ADLER** under the following parts numbers:

250-ml-Container:	9047 000011
1-Litre-Container:	9047 000012
2-Litre-Container:	9047 000013
5-Litre-Container:	9047 000014

Refilling oil supply containers

– Refill the oil supply containers 1 and 2 through the hole in the glass inspection holes.
– The oil level has to be above the “**min**” mark.
Do not fill the oil supply containers beyond the “**max**” mark.



16. Error messages

Number	Error position	Description	Cause	Error elimination
1052	Sewing motor	Overcurrent	- Sewing motor cable - Sewing motor - Control	- Check sewing motor cable - Check sewing motor - Check control
1053	Sewing motor	Overvoltage	Mains too high	- Check mains voltage
1055	Sewing motor	Overload	- Sewing motor (blocked/ rough running) - Control	- Check sewing motor - Check control
1056	Sewing motor	Excess temperature	- Sewing motor (rough running) - Control	- Check sewing motor - Check control
1058	Sewing motor	Speed	- Sewing motor	- Check sewing motor
1059	Sewing motor	Standstill-monitoring	- Sewing motor - Reference switch	- Check sewing motor - Check reference switch
1120	Sewing motor	Initialization	- Sewing motor - Sewing motor cable - Reference switch	- Check sewing motor - Check sewing motor cable - Check reference switch
1205	Sewing motor	Not in UDC (Upper Dead Center)	- Sewing motor - Sewing motor cable - Reference switch	- Switch machine off/on - Check sewing motor - Check sewing motor cable - Check reference switch
1301	Sewing motor	Referencing timeout	- Reference switch - Sewing motor - Control	- Check reference switch - Check sewing motor - Check control
1302	Sewing motor	Current feed error	- Sewing motor - Sewing motor cable - Control	- Check sewing motor - Check sewing motor cable - Check control
1310	Sewing motor	Communication-problem	- Sewing motor - Sewing motor cable - Reference switch	- Check sewing motor - Check sewing motor cable - Check reference switch
1320	Sewing motor	General sewing motor error	- Sewing motor - Sewing motor cable - Reference switch	- Check sewing motor - Check sewing motor cable - Check reference switch
2101	Step motor x-axis	Referencing timeout	- Reference switch - Step motor - Control	- Check reference switch - Check step motor - Check control
2152	Step motor x-axis	Overcurrent	- Step motor - Control	- Check step motor - Check control
2153	Step motor x-axis	Overvoltage	- Step motor - Control	- Check step motor - Check control
2155	Step motor x-axis	Overload	- Step motor - Control	- Check step motor - Check control
2156	Step motor x-axis	Excess temperature	- Step motor - Control	- Check step motor - Check control

Number	Error position	Description	Cause	Error elimination
2158	Step motor x-axis	Speed	- Step motor - Control	- Check step motor - Check control
2201	Step motor y-axis	Referencing timeout	- Reference switch - Step motor - Control	- Check reference switch - Check step motor - Check control
2252	Step motor y-axis	Overcurrent	- Step motor - Control	- Check step motor - Check control
2253	Step motor y-axis	Overvoltage	- Step motor - Control	- Check step motor - Check control
2255	Step motor y-axis	Overload	- Step motor - Control	- Check step motor - Check control
2256	Step motor y-axis	Excess temperature	- Step motor - Control	- Check step motor - Check control
2258	Step motor y-axis	Speed	- Step motor - Control	- Check step motor - Check control
2901	Step motor x+y-axis	Referencing: Timeout	- Reference switch - Step motor - Control	- Check all reference switches of the SM - Check step motor - Check control
3100	Machine	Control voltage-error	- Mains voltage-drop (momentary)	- Check mains supply
3101	Machine	Electrical power-error	- Mains voltage-drop (momentary)	- Check mains supply
3102	Machine	Intermediate circuit voltage error sewing motor	- Mains voltage-drop (temporary)	- Check mains supply - Check control
3103	Machine	Intermediate circuit voltage error step motor	- Mains voltage-drop (temporary)	- Check mains supply - Check control
3107	Machine	Excess temperature DAC III (>80°)	Control ventilation grill blocked or dirty	Clear or clean ventilation grill
3121	Machine	Pressure monitor pressure less	- Compressed air supply - Pressure monitor	- Check pressure - Check the el. connect.
3210	Machine	Upper thread breakage		Re-thread the machine
3215	Machine	Hook thread counter ran out		Fit in a new hook thread bobbin
4102	Operation	Exceeding the sewing limits	e.g. cut length longer than sew. basket length	- Correct value
4301	Memo-Dongle	Missing	- Memo Dongle missing - Memo Dongle broken	Insert Memo-Dongle
4303	Memo-Dongle	Empty	Memo-Dongle contains no data	

Number	Error position	Description	Cause	Error elimination
4304	Memo-Dongle	Wrong type	Boot-Dongle is inserted	Use Memo-Dongle
4307	Memo-Dongle	Wrong class	Dongle of the wrong class was inserted	Insert correct Dongle Format the Dongle
5101	Contour data-administration	EEPROM not initialized	- Control - Control contains no machine program	- Check control - Install machine program
5104	Contour data-administration	Checksum error	- Control	The machine resets itself automatically. Inform DA-Service
5301	Contour data-administration	Data memory full	Too many stitches in contour	Reduce number of stitches Inform DA-Service
5303	Contour data-administration	Data memory-overflow	Too many stitches in contour	Reduce number of stitches Inform DA-Service
5305	Contour data-administration	Invalid data storage attempt	Too many stitches in contour	Reduce number of stitches Inform DA-Service
5306	Contour data-administration	Invalid data request		Carry out buttonhole contour reset Inform DA-Service
5315	Contour data-administration	General error		Carry out buttonhole contour reset Inform DA-Service
6151-6952	I²C/ CPU/ Mem-Manager		Fault	Switch machine off and then on again Inform DA-Service
7251-7659	ASC/ SSC/ RS485		Fault	Switch machine off and then on again Inform DA-Service
8151-8351	IDMA/ Xilink/ Test pins		Fault (8151-8159: only an entry in the event memory – no further impairment)	Switch machine off and then on again Inform DA-Service

17. Appendix

Nähleuchte
sewing lamp

X1
L bn
N bl
PE gnge
Steckdose
wall socket

Leitung k
9870 001021

Leitung k
9870 001020

230V
+10% -20%
50/60Hz

X0
L1 bn
N bl
PE gnge
Netzstecker
main plug

Hauptschalter
main switch
Q0
L1 T1 bn
L2 T2 bl
PE gnge

Steuerung k DAC3, 540
9850 540004
control DAC3, 540

A1

Encoder Nähmotor
encoder sewing motor
En (SD) X300b (9pol.) X300b
+5V_ADSP GND SIG_3A SIG_1B SIG_1A SIG_2B SIG_2A SIG_3B NC
ws gn gr ge bn Schirm

Nähmotor
sewing motor
(SD) X20 (4pol.) X20
W V U PE
bn bl sw gnge Schirm
XP

Encoder X-Achse
encoder X-axis
En (X) X300t (9pol.) X300t
+5V_ADSP NC SIG_X_1A SIG_X_2A IDX_X_A GND SIG_X_1B SIG_X_2B IDX_X_B

Schrittmotor X-Achse
stepping motor X-axis
(X) X30 (5pol.) X30
PH_X_A1 PH_X_A2 PH_X_B1 PH_X_B2 PE
ws bn gr rs gn ge bl rt Schirm
(*1) 9870 540000 L30

Encoder Y-Achse
encoder Y-axis
En (Y) X301b (9pol.) X301b
+5V_ADSP NC SIG_Y_1A SIG_Y_2A IDX_Y_A GND SIG_Y_1B SIG_Y_2B IDX_Y_B

Schrittmotor Y-Achse
stepping motor Y-axis
(Y) X40 (5pol.) X40
PH_Y_A1 PH_Y_A2 PH_Y_B1 PH_Y_B2 PE
ws bn gr rs gn ge bl rt Schirm
(*1) 9870 540000 L40

Encoder Z-Achse
encoder Z-axis
En (Z) X301t (9pol.) X301t
+5V_ADSP NC SIG_Z_1A SIG_Z_2A IDX_Z_A GND SIG_Z_1B SIG_Z_2B IDX_Z_B

Schrittmotor Z-Achse
stepping motor Z-axis
(Z) X50 (5pol.) X50
PH_Z_A1 PH_Z_A2 PH_Z_B1 PH_Z_B2 PE
ge bn gn ws Schirm
only Cl. 540-500-01
9870 540010 L50

Netz
power
F400 FF6,3A
F404 FF6,3A

Nähmotor
sewing motor
M1.1
M1

X430 rt bl rs gr ge gn bn ws
M
M2
X-Achse
X-axis

X440 rt bl rs gr ge gn bn ws
M
M3
Y-Achse
Y-axis

X450 ws bn gn ge
M
M4
Z-Achse
Z-axis

(*1): Kl. 540-100-01: 9870 540000
Kl. 540-500-01: 9870 540010

Zusatzeinrichtung
optional equipment

c	04.0	2016-02-05	Isaak	Datum	2003-03-06
b	03.0	2009-11-12	Cz	Bearb.	Ba
a	02.0	2005-04-28	Cz	Geprüft	
	Änd.	Datum	Name	Norm	

DÜRKOPP ADLER

Teilefamilie
Freigabe 0017/16

540-100-01; 540-500-01
Steuerung, Nähantrieb, Schrittmotore
control, sewing drive, stepping motors

Bauschaltplan
9890 540001 B

Blatt 1 / 5

Steuerung k DAC3, 540

9850 540004

control DAC3, 540

A1

Ein-/Ausgänge (Erweiterung)
I/O (add-on)
SM 3-4 X100t (15pol.) X100t
+24V_1 1
OUT_25 2
OUT_26 3
IN_21 4
OUT_27 5
OUT_28 6
IN_22 7
+24V_1 8
OUT_29 9
OUT_30 10
IN_23 11
GND 12
OUT_31 13
OUT_32 14
IN_24 15

Ein-/Ausgänge (Erweiterung)
I/O (add-on)
SM 1-2 X100b (15pol.) X100b
+24V_1 1
OUT_17 2
OUT_18 3
IN_17 4
OUT_19 5
OUT_20 6
IN_18 7
+24V_1 8
OUT_21 9
OUT_22 10
IN_19 11
GND 12
OUT_23 13
OUT_24 14
IN_20 15

Diag-Schnittstelle
test interface
Dongle X110 (9pol.) X110
+5V 1
MRST 2
MTST 3
CLK 4
GND 5
T4IN 6
5V Opto 7
Anode 8
GND Opto 9

Ein-/Ausgänge 9-16
I/O 9-16
IO 9-16 X120t (25pol.) X120t
+24V_1 1
IN_9 2
IN_11 3
IN_13 4
IN_15 5
U_CONST 6
IN_ANA_2 7
+24V_1 8
OUT_9 9
OUT_11 10
OUT_13 11
OUT_15 12
GND 13
GND 14
IN_10 15
IN_12 16
IN_14 17
IN_16 18
GND 19
IN_ANA_4 20
+24V_1 21
OUT_10 22
OUT_12 23
OUT_14 24
OUT_16 25

Ein-/Ausgänge 1-8
I/O 1-8
IO 1-8 X120b (25pol.) X120b
+24V_1 1 ws
IN_1 2
IN_3 3 bn
IN_5 4
IN_7 5 gn
I_CONST 6
IN_ANA_1 7 ge
+24V_1 8 gr
OUT_1 9 rs
OUT_3 10 bl
OUT_5 11 rt
OUT_7 12 sw
GND 13 vi
GND 14 grrs
OUT_2 22 rtbl
OUT_4 23 wsgn
OUT_6 24 bngn
OUT_8 25 wsge
gebn
(*1) 9870 540000 L60
Blatt 4
sheet
IN_2 15 ws
IN_4 16 bn
IN_6 17 gn
IN_8 18 ge
GND 19 rs
IN_ANA_3 20
+24V_1 21 gr
(*1) 9870 540000 L61

PWM
PWM
PWM X140t (8pol.) X140t
+24V_2 1 ws
GND 2
PWM_1 3 ws
NC 4
NC 5
NC 6
+24V_2 7
GND 8
9820 110030
Blatt 4
sheet

Ref.-Signale
ref. signals
REF X140b (8pol.) X140b
+24V_1 1 ws
GND 2
REF_NM 3 bn
REF_X 4 gn
REF_Y 5 ge
REF_Z 6
+5V_ADSP 7
GND 8
(*1) 9870 540000 L62
Blatt 4
sheet

CAN-Schnittstelle
CAN interface
CAN X150t (9pol.) X150t
GND 1
CANL 2
GND 3
NC 4
GND 5
GND 6
CANH 7
NC 8
+24V_1 9

BDE-Schnittstelle
PDA-interface
Data X150b (9pol.) X150b
RXD TTL 1
RS485 D- 2
CTS TTL 3
RTS TTL 4
GND 5
TXD TTL 6
RS485 D+ 7
+5V 8
+24V_1 9

Tastenleiste
keypad
Keypad X160 (15pol.) X160
DATAT- 1
LOADT+ 2
DATAA- 3
LOADA+ 4
GND 5
DATAT+ 6
CLKT- 7
DATAA+ 8
CLKA- 9
GND 10
+24V_1 11
CLKT+ 12
LOADT- 13
CLKA+ 14
LOADA- 15

Bedienfeld
control panel
Panel X170 (15pol.) X170
GND 1
GND 2
BOOT 3
/XSTOPBF 4
RxDBF- 5 gn
TxDBF+ 6 ws
GND 7 gr
+24V_1 8 rt
GND 9 rs
/RESIN_2 10
/RESTERM 11 bl
RxDBF+ 12 ge
TxDBF- 13 bn
GND 14
+24V_1 15
Schirm

Bedienfeld BF3
9850 001066
control panel
(9pol.) A2
X600
(*1) 9870 540000 L63
ws 1 RxDBF+
bn 2 RxDBF-
gn 3 TxDBF-
ge 4 TxDBF+
gr 5 GNDS
rs 6 GND
7 ERROR
bl 8 RESIN
rt 9 +24V
Schirm

sicherer Halt
safety stop
(2pol.) X201
+24V_1 1 gr
IN_SH 2 gr
Stecker k
9850 001208

(9pol.) X500
gr 1 +24V_1
rs 2
3
gn 4 IN_6
5
bn 6 IN_4
ge 7 IN_8
ws 8 IN_2
9

Pedal 9800 330012
pedal
A4

(*1): Kl. 540-100-01: 9870 540000
Kl. 540-500-01: 9870 540010

Kodierung
coding
Zusatzeinrichtung
optional equipment

c	04.0	2016-02-05	Isaak	Datum	2003-03-06
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	Änd.	Datum	Name	Norm	

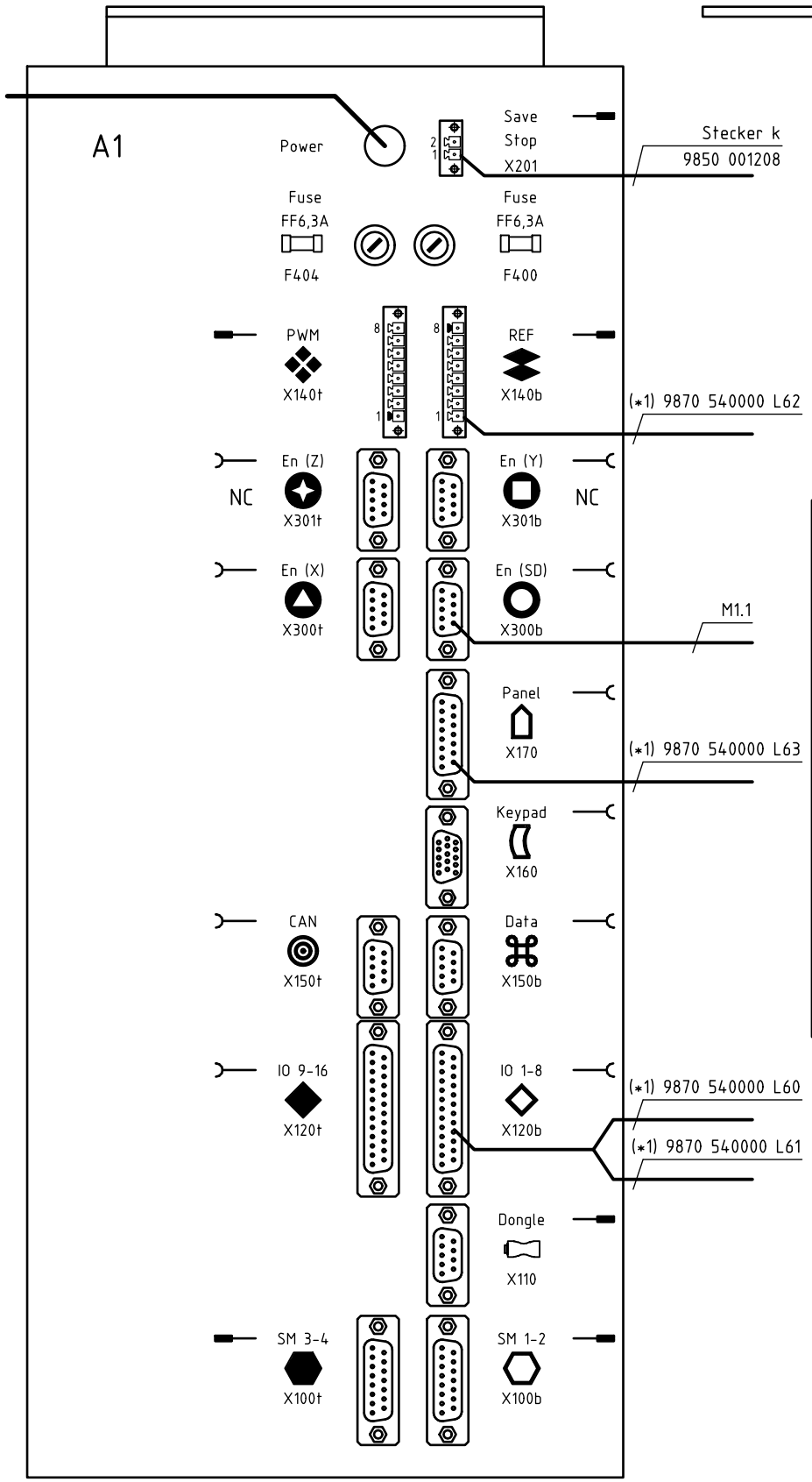
DÜRKOPP ADLER

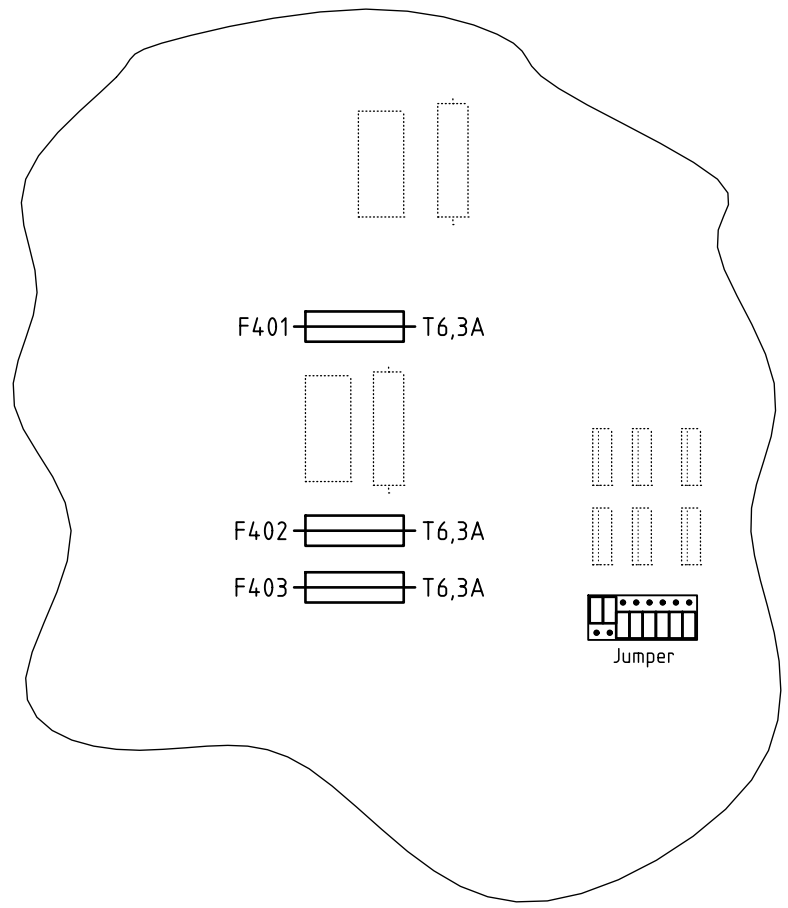
Teilefamilie
Freigabe 0017/16

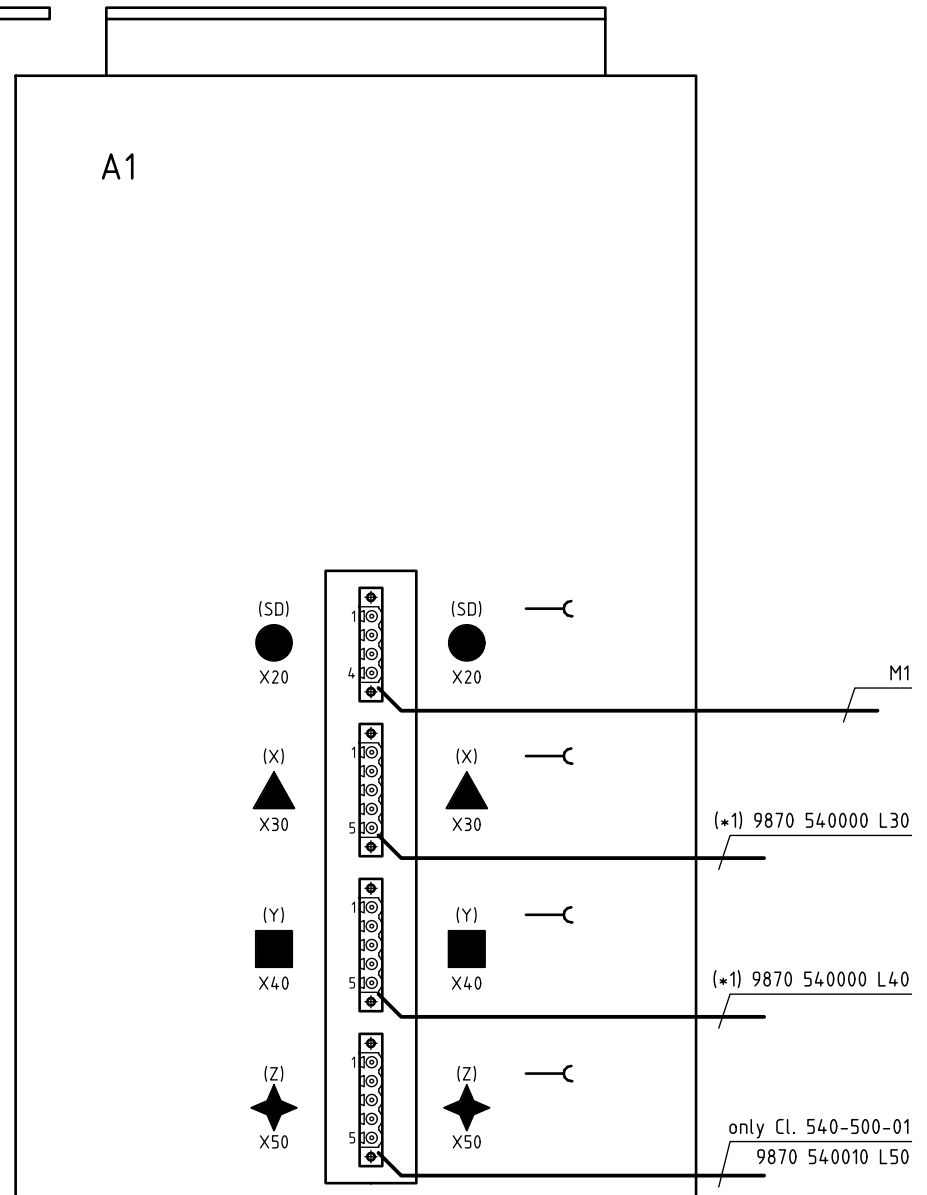
540-100-01; 540-500-01
Steuerung, Nähantrieb, Schrittmotore
control, sewing drive, stepping motors

Bauschaltplan
9890 540001 B

Blatt 2 / 5







Steuerung k DAC3
Kl.540-100; -500
Teilenr. 9850 540004
control DAC3
cl.540-100; -500
Parts No. 9850 540004

(*1): Kl. 540-100-01: 9870 540000
Kl. 540-500-01: 9870 540010

c	04.0	2016-02-05	Isaak	Datum	2003-03-06
b	03.0	2009-11-12	Cz	Bearb.	Ba
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DÜRKOPP ADLER

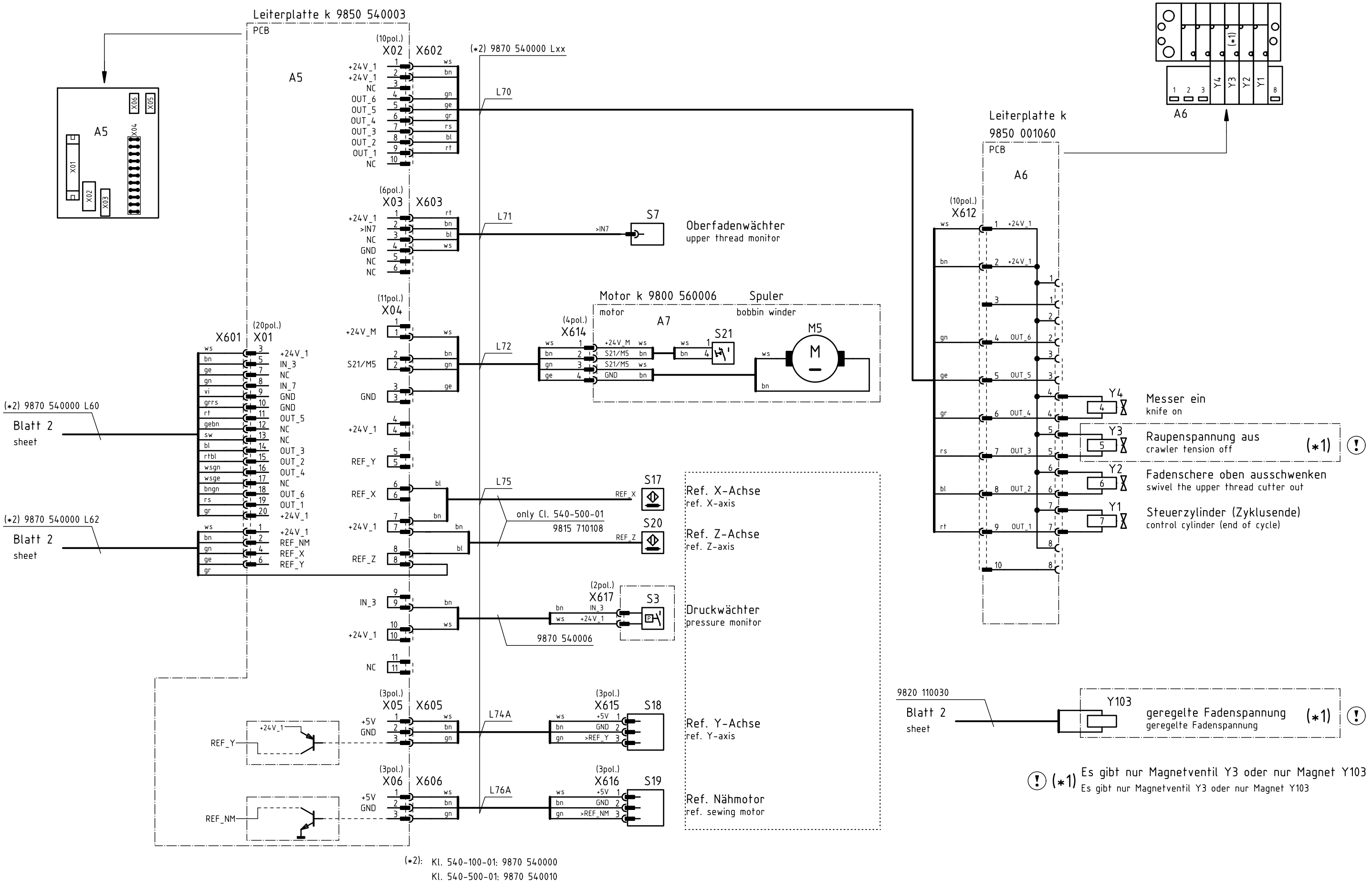
Teilefamilie

Freigabe 0017/16

540-100-01; 540-500-01
Steuerung, Nähantrieb, Schrittmotore
control, sewing drive, stepping motors

Bauschaltplan
9890 540001 B

Blatt 3 / 5



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	Änd.	Datum	Name	Norm	

DÜRKOPP ADLER

Teilefamilie

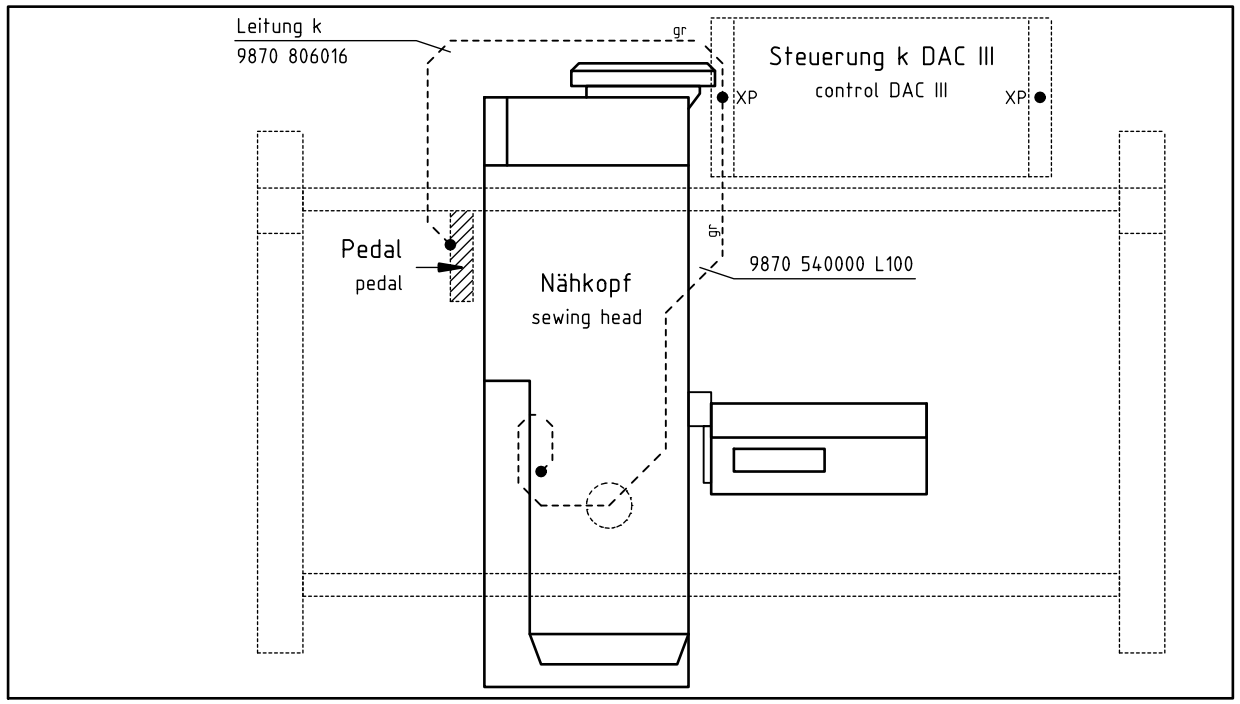
Freigabe 0017/16

540-100-01; 540-500-01
Steuerung, Nähantrieb, Schrittmotore
control, sewing drive, stepping motors

Bauschaltplan
9890 540001 B

Blatt 4 / 5

Ansicht von oben
top view



Partlist

	Part-No.	Denomination	Type	Remark
A1	9850 540004	control	DAC3, 540	var. 1
	9850 001208	plug		jumper X201
A2	9850 330012	pedal	EB301	
A5	9850 540003	PCB	distribution	
A6	9850 001060	PCB	8 magnetic valves	
A7	9800 560003	motor	bobbin winder	
F400	9825 810107	fuse	FF6,3A	5x20mm
F404	9825 810107	fuse	FF6,3A	5x20mm
M1	9800 150009	sewing motor		
M2	9800 580024	step motor	X-axis	
M3	9800 580011	step motor	Y-axis	
M4	9800 580045	step motor	Z-axis	only Cl. 540-500-01
M5	9800 560004	DC-motor	bobbin winder	
Q0	9815 580008	main switch		
S3	0999 220829	manometric switch	G1/8"	
S7	9815 740001	thread monitor	IDS/D	
S17	9815 710108	approximate switch	M8x1x40	
S18	9815 935006	light barrier	GP1A05A	
S19	9815 935006	light barrier	GP1A05A	
S20	9815 710108	approximate switch	M8x1x40	only Cl. 540-500-01
S21	9815 510027	micro switch	SAJA XGK11-81	bobbin winder
X0	9825 190104	mains plug		
X1	9825 190103	wall socket		

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