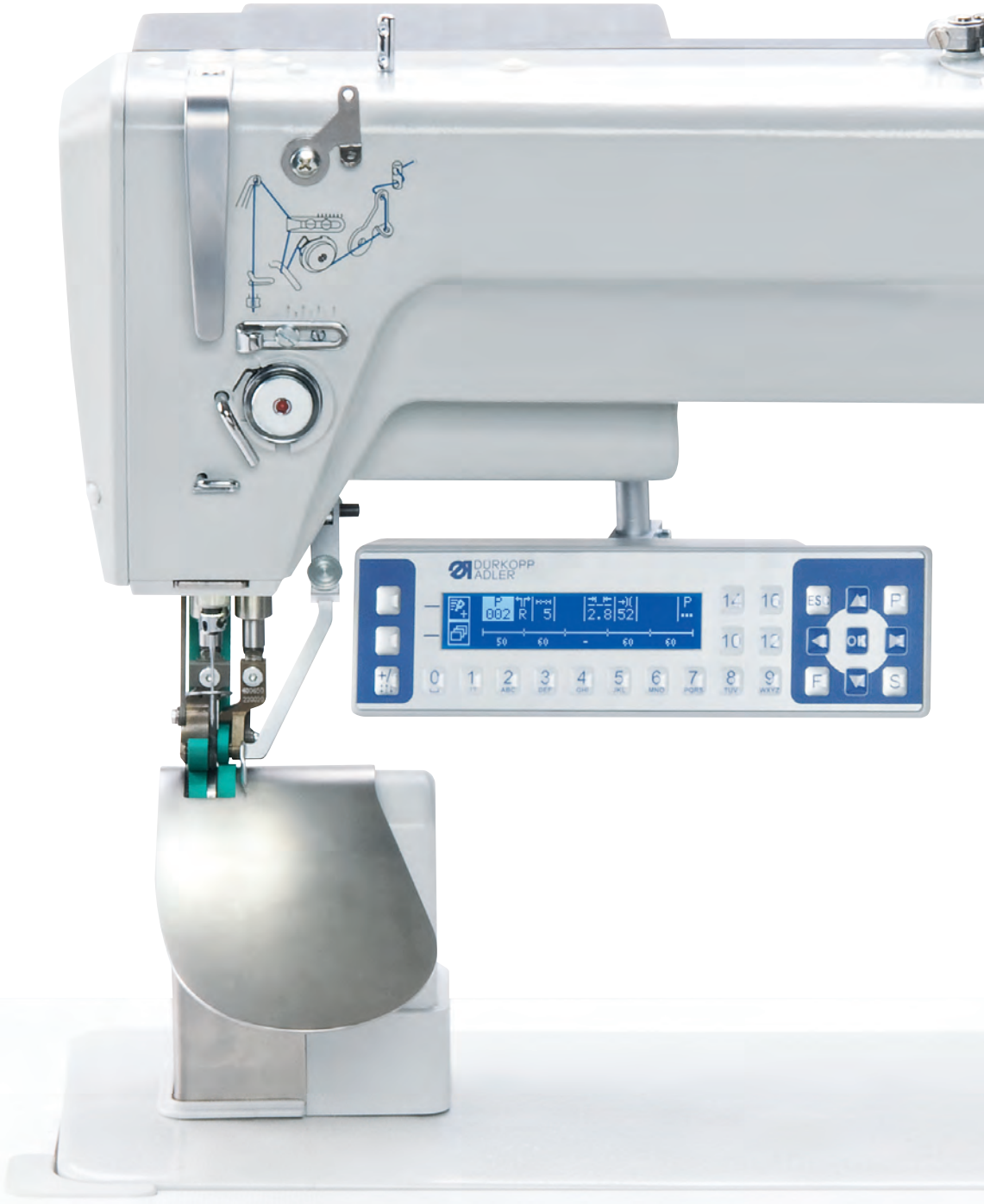
DÜRKOPP ADLER

650-16

Service instructions



IMPORTANT
READ CAREFULLY BEFORE USE
KEEP FOR FUTURE REFERENCE

1 About these instructions

These instructions have been prepared with utmost care. They contain information and notes intended to ensure long-term and reliable operation.

Should you notice any discrepancies or if you have improvement requests, then we would be glad to receive your feedback through **Customer Service** (📖 *p. 121*).

Consider the instructions part of the product and store them in a place where they are readily available.

1.1 For whom are these instructions intended?

These instructions are intended for:

- Specialists:
  This group has the appropriate technical training for performing maintenance or repairing malfunctions.

With regard to minimum qualification and other requirements to be met by personnel, please also follow the chapter **Safety** (📖 *p. 9*).

1.2 Representation conventions – symbols and characters

Various information in these instructions is represented or highlighted by the following characters in order to facilitate easy and quick understanding:

Proper setting

Specifies proper setting.

Disturbances

Specifies the disturbances that can occur from an incorrect setting.

Cover

Specifies which covers must be disassembled in order to access the components to be set.

Steps to be performed when operating the machine (sewing and equipping)

Steps to be performed for service, maintenance, and installation

Steps to be performed via the software control panel

The individual steps are numbered:

1. First step
2. Second step

… The steps must always be followed in the specified order.

- Lists are marked by bullet points.

Result of performing an operation

Change to the machine or on the display/control panel.

Important

Special attention must be paid to this point when performing a step.

Information

Additional information, e.g. on alternative operating options.

Order

Specifies the work to be performed before or after a setting.

References

📖 Reference to another section in these instructions.

Safety Important warnings for the user of the machine are specifically marked. Since safety is of particular importance, hazard symbols, levels of danger and their signal words are described separately in the chapter **Safety** (📖 *p. 9*).

Location information If no other clear location information is used in a figure, indications of **right** or **left** are always from the user's point of view.

1.3 Other documents

The machine includes components from other manufacturers. Each manufacturer has performed a hazard assessment for these purchased parts and confirmed their design compliance with applicable European and national regulations. The proper use of the built-in components is described in the corresponding manufacturer's instructions.

1.4 Liability

All information and notes in these instructions have been compiled in accordance with the latest technology and the applicable standards and regulations.

Dürkopp Adler cannot be held liable for any damage resulting from:

- Breakage and damage during transport
- Failure to observe these instructions
- Improper use
- Unauthorized modifications to the machine
- Use of untrained personnel
- Use of unapproved parts

Transport

Dürkopp Adler cannot be held liable for breakage and transport damages. Inspect the delivery immediately upon receiving it. Report any damage to the last transport manager. This also applies if the packaging is not damaged.

Leave machines, equipment and packaging material in the condition in which they were found when the damage was discovered. This will ensure any claims against the transport company.

Report all other complaints to Dürkopp Adler immediately after receiving the product.

2 Safety

This chapter contains basic information for your safety. Read the instructions carefully before setting up or operating the machine. Make sure to follow the information included in the safety instructions. Failure to do so can result in serious injury and property damage.

2.1 Basic safety instructions

The machine may only be used as described in these instructions.

These instructions must be available at the machine's location at all times.

Work on live components and equipment is prohibited. Exceptions are defined in the DIN VDE 0105.

For the following work, switch off the machine at the main switch or disconnect the power plug:

- Replacing the needle or other sewing tools
- Leaving the workstation
- Performing maintenance work and repairs
- Threading

Missing or faulty parts could impair safety and damage the machine. Only use original parts from the manufacturer.

Transport

Use a lifting carriage or forklift to transport the machine. Raise the machine max. 20 mm and secure it to prevent it from slipping off.

Setup

The connecting cable must have a power plug approved in the relevant country. The power plug may only be assembled to the power cable by qualified specialists.

Obligations of the operator

Follow the country-specific safety and accident prevention regulations and the legal regulations concerning industrial safety and the protection of the environment.

All the warnings and safety signs on the machine must always be in legible condition. Do not remove!
Missing or damaged warnings and safety signs must be replaced immediately.

Requirements to be met by the personnel

Only qualified specialists may:

- set up the machine
- perform maintenance work and repairs
- perform work on electrical equipment

Only authorized persons may work on the machine and must first have understood these instructions.

Operation

Check the machine during operating for any externally visible damage. Stop working if you notice any changes to the machine. Report any changes to your supervisor. Do not use a damaged machine any further.

Safety equipment

Safety equipment should not be removed or deactivated. If it is essential to remove or deactivate safety equipment for a repair operation, it must be assembled and put back into operation immediately afterward.

2.2 Signal words and symbols used in warnings

Warnings in the text are distinguished by color bars. The color scheme is based on the severity of the danger. Signal words indicate the severity of the danger.

Signal words

Signal words and the hazard they describe:

Signal word	Meaning
DANGER	(with hazard symbol) If ignored, fatal or serious injury will result
WARNING	(with hazard symbol) If ignored, fatal or serious injury can result
CAUTION	(with hazard symbol) If ignored, moderate or minor injury can result
CAUTION	(with hazard symbol) If ignored, environmental damage can result
NOTICE	(without hazard symbol) If ignored, property damage can result

Symbols

The following symbols indicate the type of danger to personnel:

Symbol	Type of danger
	General
	Electric shock

Symbol	Type of danger
	Puncture
	Crushing
	Environmental damage

Examples Examples of the layout of warnings in the text:

DANGER

Type and source of danger!

Consequences of non-compliance.

Measures for avoiding the danger.

↳ This is what a warning looks like for a hazard that will result in serious injury or even death if ignored.

WARNING

Type and source of danger!

Consequences of non-compliance.

Measures for avoiding the danger.

↳ This is what a warning looks like for a hazard that could result in serious or even fatal injury if ignored.

CAUTION

Type and source of danger!

Consequences of non-compliance.

Measures for avoiding the danger.

↳ This is what a warning looks like for a hazard that could result in moderate or minor injury if the warning is ignored.

CAUTION

Type and source of danger!

Consequences of non-compliance.

Measures for avoiding the danger.

↳ This is what a warning looks like for a hazard that could result in environmental damage if ignored.

NOTICE

Type and source of danger!

Consequences of non-compliance.

Measures for avoiding the danger.

↳ This is what a warning looks like for a hazard that could result in property damage if ignored.

3 Individual settings

Always adhere to the specified sequence for the individual steps.

Always observe all information on requirements and following settings marked at the side with .

NOTICE

Property damage due to incorrect sequence!

Failure to observe can result in damage to the machine.

It is essential to adhere to the working sequence specified in this manual.

WARNING

Risk of injury from moving parts, cutting and sharp parts!

Crushing, cutting and puncturing are possible.

Switch off the main switch.
If possible, only change settings when the machine is switched off.

3.1 Laying the cables

Ensure that all cables in the machine are laid in such a way that they do not impair the function of the moving parts.

NOTICE

Property damage and malfunctions due to laying the cables incorrectly!

Excess cabling may obstruct moving machine parts in their ability to function correctly. This affects the sewing process and can result in damage to the machine.

Lay excess cable as described above.

To lay the cables:

1. Lay any cable that is too long neatly in proper cable snakes.
2. Tie the snakes together using a cable tie.
   If possible, bind the snakes to fixed parts.

Important

The cables must be fixed in place!

3. Cut off any overlapping cable ties.

3.2 Loosen screws in safety covers

Screws used in safety covers must not be completely removed from the screw hole.

1. As soon as the screws are loosened, remove the cover.

↳ The screws can either remain in the housing or in the cover.

Such screws are identified in the text by the suffix **safety cover**.

3.3 Removing the covers

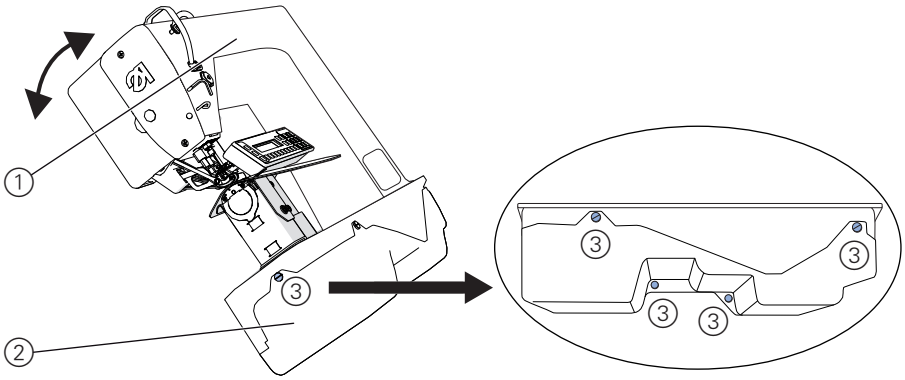
For many types of setting work, you will have to remove the machine covers in order to access the components.

Described here is how to remove the individual covers and how to refit them. Just the covers that need to be removed is then specified in the text for that particular type of setting work.

3.3.1 Tilting and re-erecting the machine head

To access the components on the underside of the machine, swivel up the machine head.

Fig. 1: Tilting and re-erecting the machine head



(1) - Machine head
(2) - Tray
(3) - Screws

Tilting the machine head

To tilt the machine head:

1. Tilt the machine head (1) as far as it will go.
2. Loosen all five screws (3).

3. Remove the tray (2) downwards.

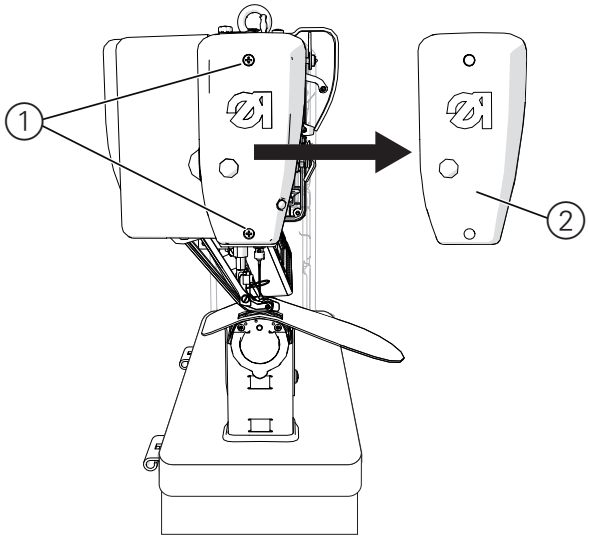
Erecting the machine head

To erect the machine head:

1. Fit the tray (2).
2. Tighten all 5 screws (3).
3. Erect the machine head (1).

3.3.2 Removing and re-fitting the head cover

Fig. 2: Removing and re-fitting the head cover



(1) - Screws *(2) - Head cover*

Removing the head cover

To remove the head cover:

1. Loosen both screws (1).
2. Remove the head cover (2)

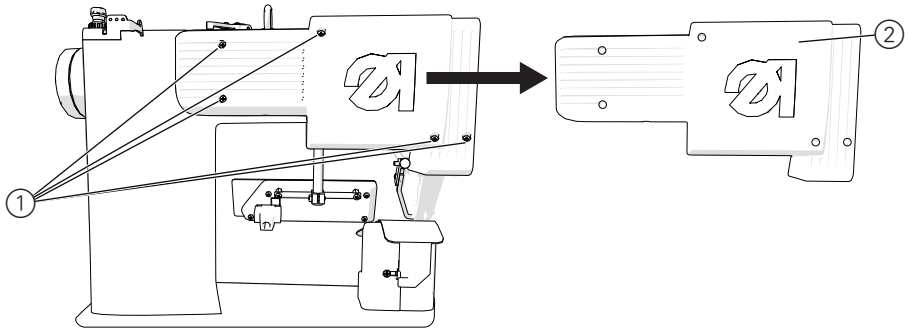
Re-fitting the head cover

To re-fit the head cover:

1. Fit the head cover (2).
2. Tighten both screws (1).

3.3.3 Removing and re-fitting the rear arm cover

Fig. 3: Removing and re-fitting the rear arm cover



(1) - Screws *(2) - Rear arm cover*

Removing the rear arm cover

To remove the rear arm cover:

1. Loosen all five screws (1) on the rear arm cover.
2. Remove the rear arm cover (2).

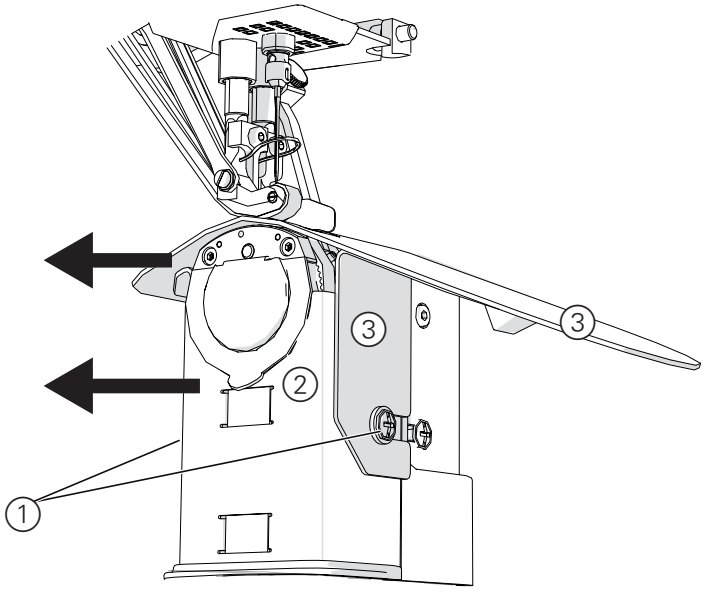
Re-fitting the rear arm cover

To re-fit the rear arm cover:

1. Fit the rear arm cover (2).
2. Tighten all five screws (1) on the rear arm cover.

3.3.4 Removing and re-fitting the sewing material support and column cover

Fig. 4: Removing and re-fitting the sewing material support and column cover



(1) - Screws
(2) - Column cover
(3) - Sewing material support

Removing the sewing material support and column cover

To remove the sewing material support and column cover:

1. Loosen both screws (1).
2. Lift the sewing material support (3) slightly and remove it to the left.
3. Lift the column cover (2) slightly and remove it to the left.

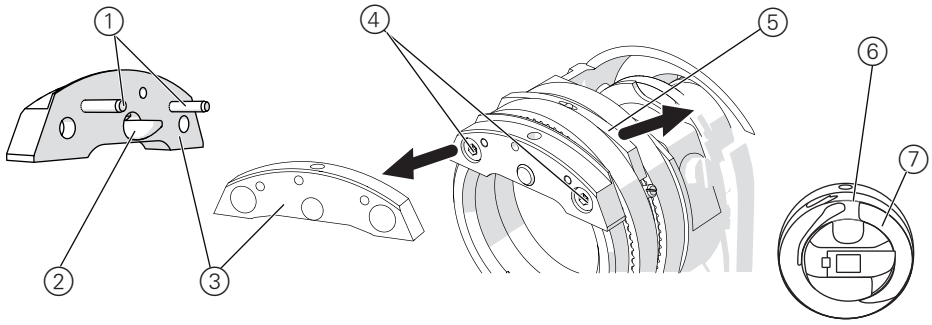
Re-fitting the sewing material support and column cover

To re-fit the sewing material support and column cover:

1. Fit the column cover (2) from the top left.
2. Fit the sewing material support (3) from the top left.
3. Tighten both screws (1).

3.3.5 Removing and inserting the throat plate

Fig. 5: Removing and inserting the throat plate



(1) - Pins
(2) - Middle section holder
(3) - Guide piece
(4) - Screws
(5) - Throat plate
(6) - Recess
(7) - Hook

To remove the throat plate:

1. Remove the material support and column cover (📖 *p. 17*).
2. Loosen the screws (4).
3. Remove the guide piece (3).
4. Remove the throat plate (5) upwards.

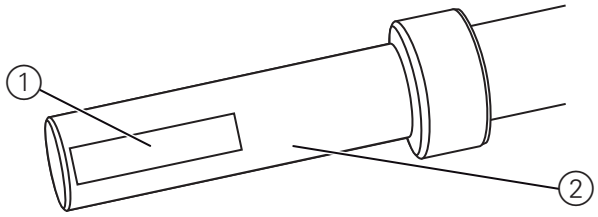
Inserting the throat plate

To insert the throat plate:

1. Insert the throat plate (5) from above.
2. Insert the guide piece (3) such that the pins (1) engage in the throat plate (5) and the middle section holder (2) fits into the recess (6) for the hook (7).
3. Tighten the guide piece (3) using the screws (4).
4. Fit the material support and column cover (📖 *p. 17*).

3.4 Flats on shafts

Fig. 6: Flats on shafts



(1) - Flat
(2) - Shaft

Some shafts have flat surfaces at the points where the components are screwed on. This stabilizes the connection and makes adjustment easier.

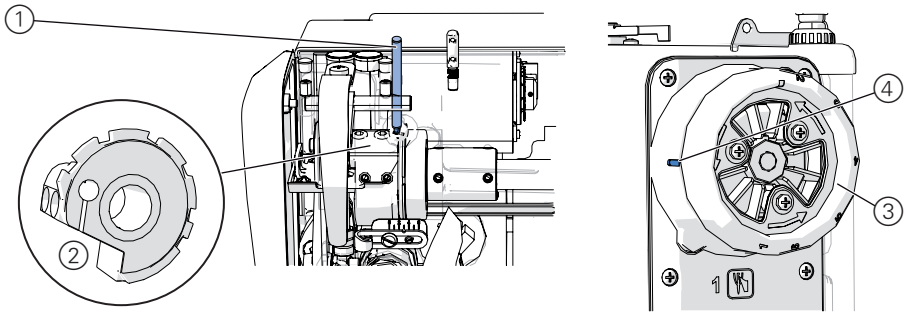
Important

Always ensure that the screw faces are completely flush with the surface!

3.5 Locking the machine in place

For some settings, the machine has to be locked in place. To do this, the arresting pin (1) from the accessory pack is inserted into a slot on the arm shaft crank (2), blocking the arm shaft.

Fig. 7: Locking the machine in place (1)



(1) - Locking peg
(2) - Arm shaft crank with arresting grooves
(3) - Handwheel
(4) - Marking

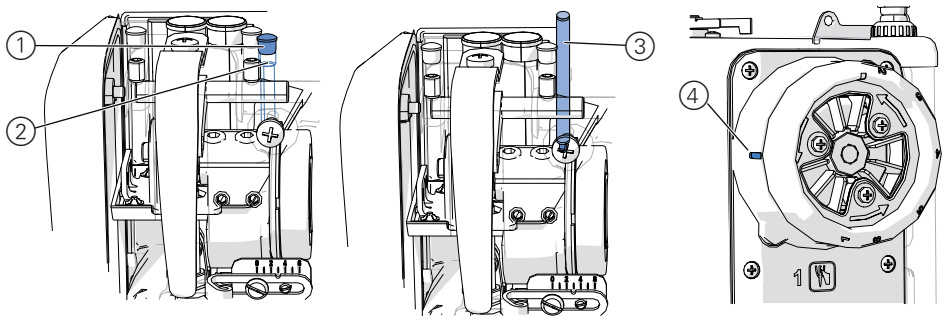
For orientation purposes, there are numbers on the handwheel (3). If you turn the handwheel with one of the numbers aligned to the marking (4), the appropriate groove of the arm shaft crank (2) will be underneath the opening for the locking peg (1).

There are three locking positions for the following settings:

- **Position 1**
  - Loop stroke position
  - Hook clearance to needle
- **Position 4**
  - Control cam for the thread cutter
- **Position 6**
  - Reference position for the controller when the needle is in the lower dead center

Positions 2, 3, and 5 are not allocated.

Fig. 8: Locking the machine in place (2)



(1) - Plug
(2) - Locking opening
(3) - Locking peg
(4) - Marking

Locking the machine in place

To lock the machine in place:

1. Remove the plug (1) from the locking opening (2).
2. Turn the handwheel until the number for the required locking position is next to the marking (4).
3. Insert the locking peg (3) through the locking opening (2) and into the groove of the arm shaft crank.

Important

The numbers on the handwheel are used for rough orientation! If necessary, you may still have to turn the handwheel slightly in order to meet the groove exactly.

Removing the positional lock

To remove the positional lock:

1. Pull out the locking peg (3).
2. Insert the plug (1) into the locking opening (2).

3.6 Adjusting the lightbeam sensor disk

WARNING

Risk of injury due to moving parts!

Crushing possible.

Switch off the machine before adjusting the lightbeam sensor disk.

The lightbeam sensor disk is used as a reference for positioning by the control unit.

It must be adjusted so that the incoming edge of the 180° disk lines up precisely at the height of the lightbeam slot - in rotational direction of the machine - when the needle is at bottom dead centre.

Proper setting

Lock the machine in *Position 6* (📖 *p. 19*).

↳ The 180° disk points to the front and it lower edge is precisely lined up with the lightbeam slot.

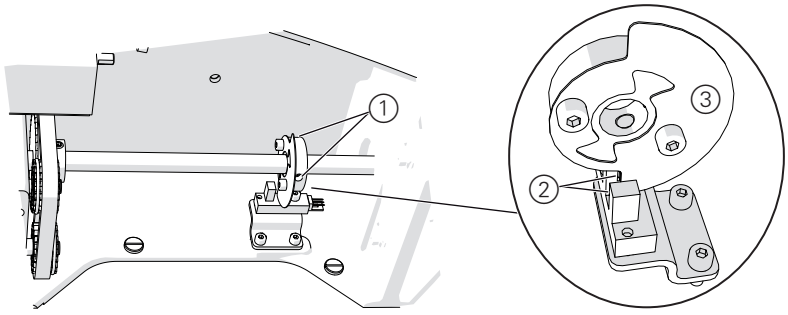
Disturbance

- Damage to fabric, wrinkling
- Incorrect needle position, needle jams in hole
- Incorrect transport times
- Incorrect thread trimming
- Poor sewing results

Cover

- Access to the underside of the machine (📖 *p. 14*)

Fig. 9: Adjusting the lightbeam sensor disk



(1) - Grub screws
(2) - Lightbeam slots
(3) - 180° disk

To adjust the lightbeam sensor disk:

1. Lock the machine in *Position 6* (📖 *p. 19*).

2. Remove both grub screws (1) on the sensor disk.
3. Turn the sensor disk so that the 180° disk (3) points to the front and its lower edge is precisely lined up with the lightbeam slot (2).

Important

The sensor disk must be aligned laterally so that the 180° disk (3) does not touch the lightbeam housing.

4. Tighten both grub screws (1) without changing the position of the sensor disk.
5. Release the lock (📖 *p. 19*).

3.7 Adjusting hook and needle bar

The following 3 settings must be coordinated with each other:

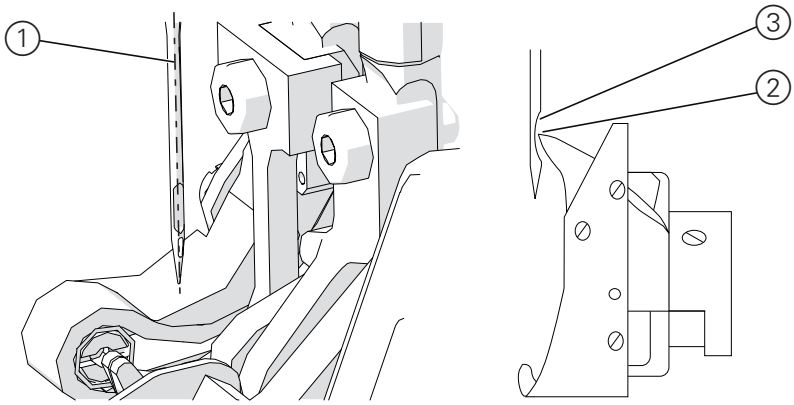
- Loop stroke
- Hook clearance to needle
- Needle bar height

Information

The **loop stroke position** is the position of the hook in which the hook tip points precisely at the center line of the needle.

The **loop stroke** is the path length from the bottom dead center of the needle bar up to the height where the hook is in the loop stroke position. The loop stroke of the 650-16 is 1.8 mm.

Fig. 10: Adjusting hook and needle bar



(1) - Center line of the needle
(2) - Hooktip
(3) - Groove

Proper setting

When the machine is locked in place in the loop stroke position *(Position 1)* (📖 *p. 19*), the hook tip (2) should be precisely at the center line of the needle (1). The needle must be aligned such that the surface of the groove (3) is parallel to the sewing direction of the hook tip. From that height, the hook tip (2) should be in the lower third of the groove (3).

Disturbance

- Damage to the hook
- Damage to the needle
- Missing stitches
- Thread break

Order

Prerequisite:

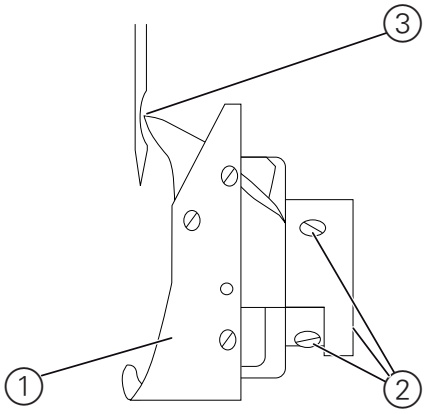
- A straight and undamaged needle must be used (📖 *Operating Instructions*)

3.7.1 Setting loop stroke and hook clearance

Cover

- Remove the material support and column cover (📖 *p. 17*)
- Removing the throat plate (📖 *p. 18*)

Fig. 11: Setting loop stroke and hook clearance



(1) - Hook
(2) - Screws
(3) - Hooktip

To set the loop stroke and the hook clearance:

1. Lock the machine in place at *Position 1* (📖 *p. 19*).
2. Loosen the three screws (2) on the hook.
3. Setting the loop stroke:
   Turn the hook (1) such that the hook tip (3) points exactly to the center line of the needle.

4. Setting the hook clearance:
   Move the hook sideways such that the distance between the hook tip (3) and the groove of the needle is 0.05 – 0.1 mm.
5. Tighten the three screws (2) of the hook without changing the loop stroke position or the hook clearance.

Order

After correcting the loop stroke position or the hook clearance, check the needle bar height (*p. 24*).

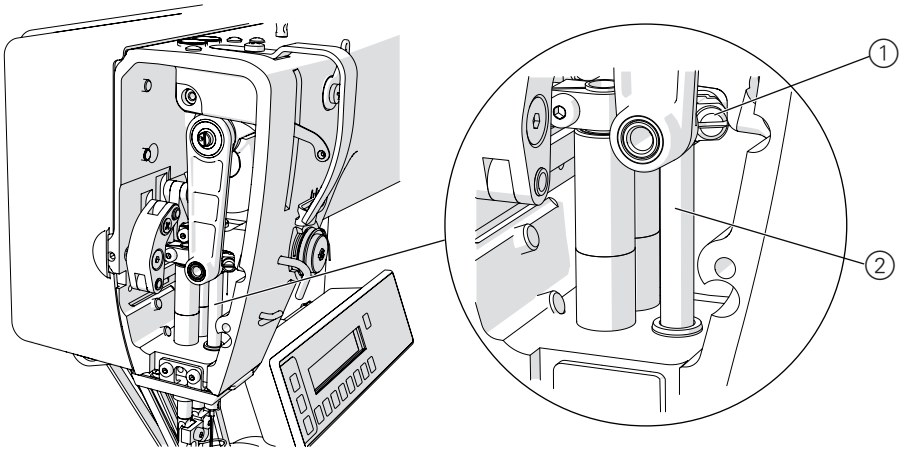
6. Remove the locking mechanism (*p. 19*).

3.7.2 Setting the needle bar height

Cover

- Remove the head cover (*p. 15*)

Fig. 12: Setting the needle bar height



(1) - Screw

(2) - Needle bar

To set the needle bar height:

1. Lock the machine in place at *Position 1* (*p. 19*).
2. Loosen the screw (1).
3. Move the height of the needle bar (2) such that the hook tip is in the lower third of the groove for the needle.

Important

When doing this, take care not to twist the needle bar to one side!

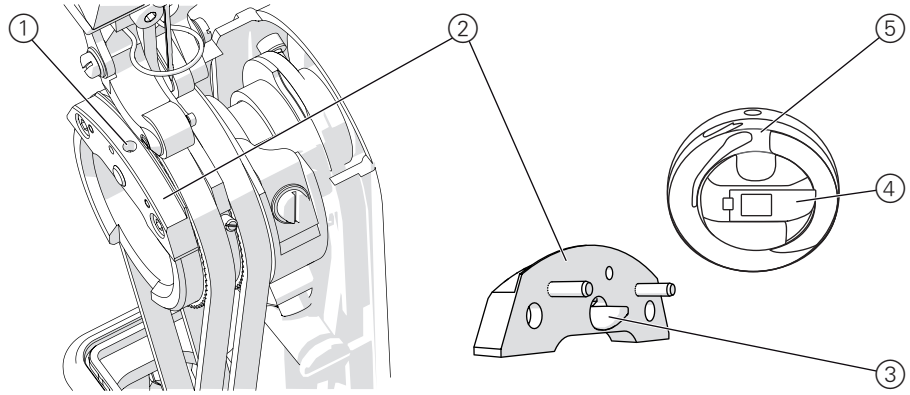
4. Tighten the screw (1).

Order

After changing the needle bar height, check the loop stroke position and the hook clearance, as well (*p. 23*).

3.8 Setting the thread passage on the middle section holder

Fig. 13: Setting the thread passage on the middle section holder



(1) - Setscrew
(2) - Guide piece
(3) - Middle section holder
(4) - Hook
(5) - Recess

Proper setting

The middle section holder (3) must only be inserted in the middle part of the hook deep enough that the thread can slip through the middle section holder (3) and the recess (5) for the hook (4) without problem.

Disturbance

- Thread break
- Formation of loops

Cover

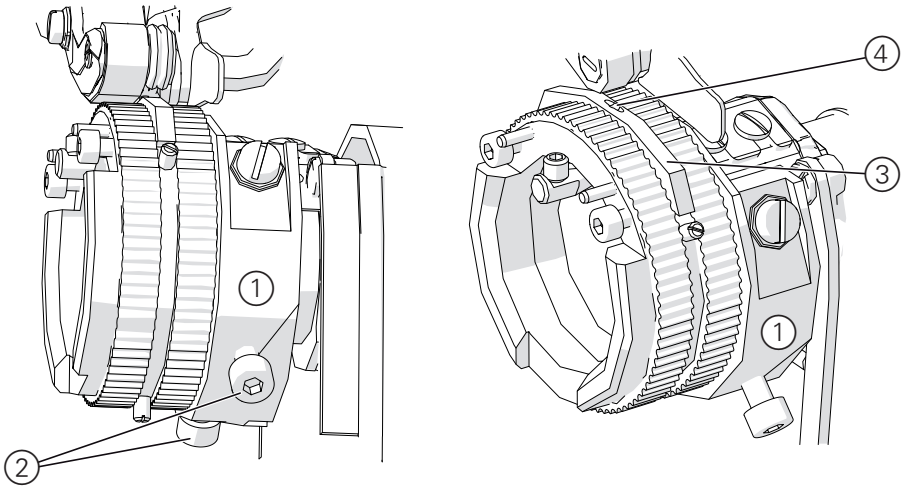
- Remove the material support and column cover (📖 *p. 17*)

To set the thread passage on the middle section holder:

1. Turn the handwheel and check the passage of the thread.
2. Loosen the setscrew (1).
3. Screw in or pull out the middle section holder (3).
   The distance from the hook must not become unnecessarily large.
4. Tighten the setscrew (1).

3.9 Setting the throat plate

Fig. 14: Setting the throat plat



(1) - Column head
(2) - Screws
(3) - Throat plate
(4) - Needle hole

Proper setting

The needle must enter the needle hole on the throat plate precisely in the center.

Disturbance

- Incorrect stitch pattern

Cover

- Remove the material support and column cover (📖 *p. 17*).

To set the throat plate:

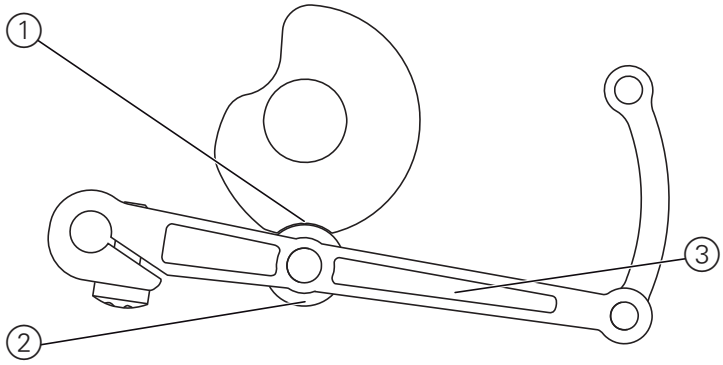
1. Remove the lower conveyor belts (📖 *p. 41*), in order to be able to turn the column head (1).
2. Loosen both screws (2).
3. Use the hand wheel to turn the needle so far that insertion into the throat plate can be checked.
4. Turn the column head (1) and move it sideways such that the needle pierces exactly in the center of the needle hole (4) on the throat plate (3).
5. Tighten both screws (2) without changing the position of the column head (1).

3.10 Adjusting the thread cutter

To ensure that the thread cutter functions correctly, set the control cam as well as the thread-pulling knife and the counter blade.

3.10.1 Setting the control cam

Fig. 15: Setting the control cam (1)



(1) - Small recess
(2) - Roller
(3) - Thread cutter lever

Proper setting

Machine is locked in place at *Position 4* (📖 *p. 19*).

↳ When you push the thread cutter lever (3) upwards, the roller (2) latches into place exactly in the small recess (1) of the control cam.

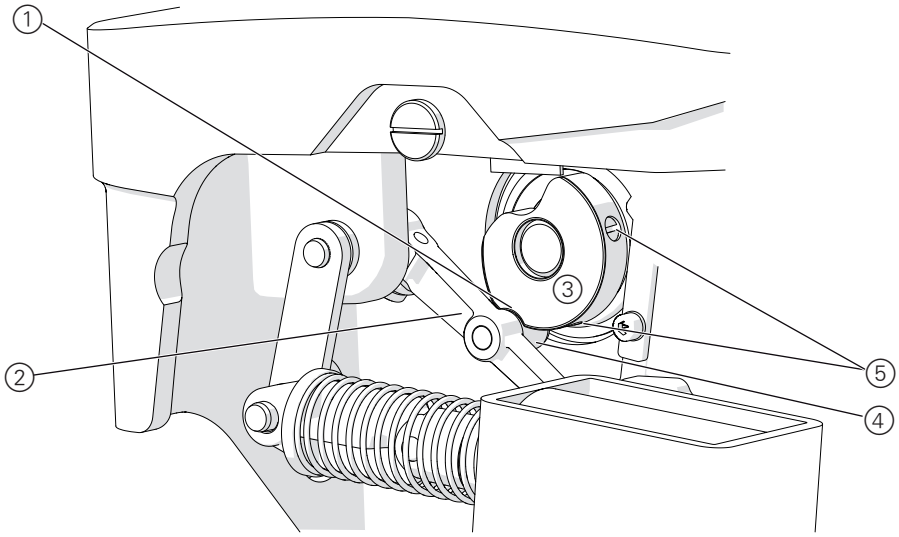
Disturbance

- Damage to the needle
- Threads are not cut

Cover

- Tilt the machine head (📖 *p. 14*)

Fig. 16: Setting the control cam (2)



(1) - Small recess
(2) - Thread cutter lever
(3) - Control cam
(4) - Roller
(5) - Control cam setscrews

To set the position of the control cam:

1. Lock the machine in place at *Position 4* (📖 *p. 19*).
2. Loosen the control cam setscrews (5).
3. Press the thread cutter lever (2) upwards and turn the control cam (3) such that the roller (4) latches into place exactly in the small recess (1).
4. Tighten the control cam setscrews (5) without changing the position of the control cam.
5. Remove the locking mechanism (📖 *p. 19*).

Setting the distance between control cam and roller

Proper setting

When the thread cutter is at rest, the distance between the roller and the control cam at its maximum diameter is 0.2 mm.

Important

Do not measure the distance at one of the recesses! To check and set the control cam, turn it so that the recesses do not point towards the roller.

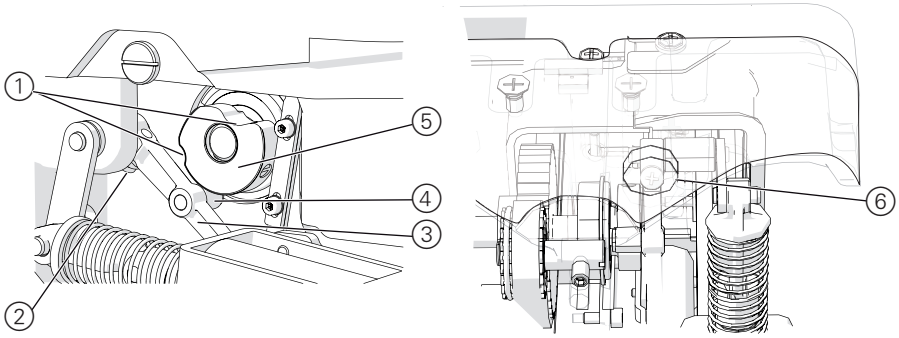
Disturbance

- Thread-pulling knife jammed with counter blade

Cover

- Tilt the machine head (📖 *p. 14*)

Fig. 17: Setting the distance between control cam and roller



(1) - Recesses
(2) - Screw
(3) - Thread cutter lever
(4) - Roller
(5) - Control cam
(6) - Screw opening in the housing

To set the distance between the control cam and the roller:

1. Turn the handwheel such that the recesses (1) on the control cam (5) do not point towards the roller (4).
2. Loosen the screw (2) on the thread cutter lever (3) through the screw opening (6) in the housing.
3. Push the thread cutter lever (3) so far up or down that the distance between the roller (4) and the control cam (5) at its maximum diameter is 0.2 mm.

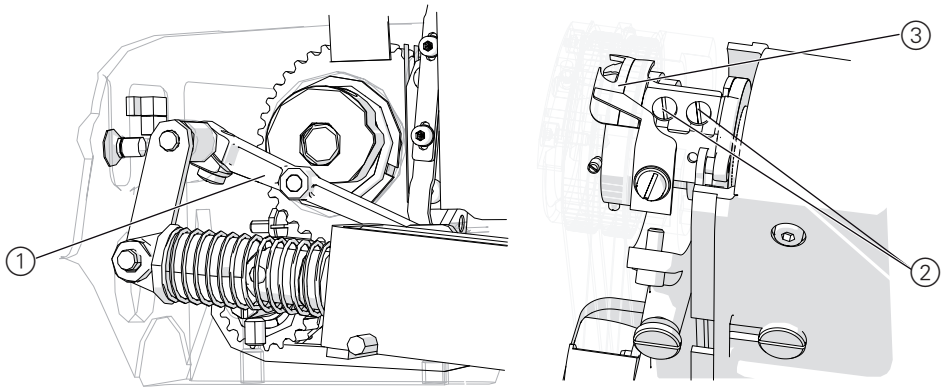
Important

The armature of the thread cutter magnet must be completely extended!

4. Tighten the screw (2) of the thread cutter level (3) through the screw opening (6) in the housing without changing the position of the lever.

3.10.2 Replacing and setting the thread-pulling knife

Fig. 18: Replacing and setting the thread-pulling knife



(1) - Thread cutter lever
(2) - Screws
(3) - Thread-pulling knife

Proper setting

The cutouts in the thread-pulling knife are pushed onto the screws as far as they can go.

Disturbance

- Threads are not cut
- Threads are cut too long

Cover

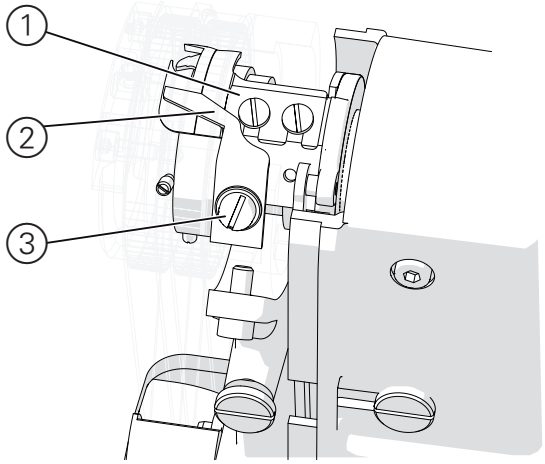
- Tilt the machine head (📖 *p. 14*)
- Remove the material support and column cover (📖 *p. 17*)
- Removing the throat plate (📖 *p. 18*)

To replace the thread-pulling knife:

1. Push the thread cutter lever (1) upwards and turn the handwheel until the thread-pulling knife (3) swivels forwards and the screws (2) are accessible.
2. Loosen the screws (2).
3. Remove the old thread-pulling knife backwards whilst releasing the thread cutter lever (1) downwards.
4. Insert the new thread-pulling knife.
5. Push the thread-pulling knife (3) forward onto the screws (2) as far as it will go.
6. Tighten the screws (2).

3.10.3 Changing the counter blade

Fig. 19: Changing the counter blade



(1) - Thread-puling knife
(2) - Counter blade
(3) - Screw

Cover

- Remove the material support and column cover (📖 *p. 17*)

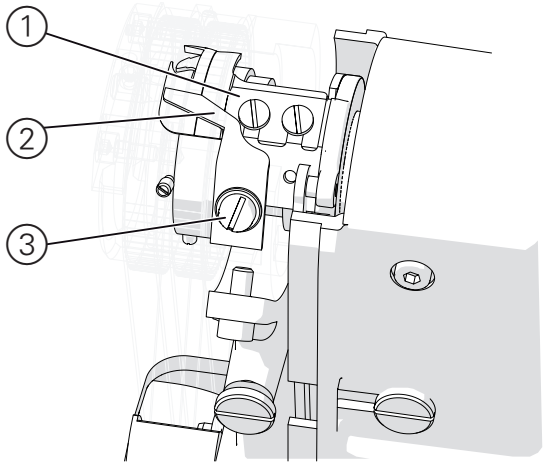
To change the counter-blade:

1. Loosen the screw (3) completely.
2. Remove the old counter-blade forwards.
3. Insert the new counter-blade.
4. Tighten the screw (3).

3.10.4 Setting the counter-blade and cutting pressure

The shape of the thread-pulling knife and the counter-blade creates a scissor effect. The threads must be cut using as little pressure as possible.
Do not set the pressure higher than necessary.
The higher the pressure, the more the knife wears.

Fig. 20: Setting the counter blade and cutting pressure



(1) - Thread-puling knife
(2) - Counter blade
(3) - Screw

Proper setting

Any 2 threads with the greatest strength used for sewing can be neatly cut simultaneously.

Disturbance

- Increased knife wear
- Threads are not cut
- Threads are cut too long

Cover

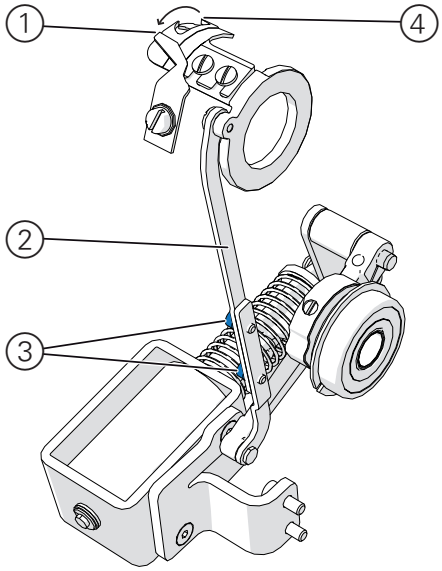
- Tilt the machine head (📖 *p. 14*)
- Remove the material support and column cover (📖 *p. 17*)
- Removing the throat plate (📖 *p. 18*)

To set the counter-blade and cutting pressure:

1. Push the thread cutter lever upwards and turn the handwheel until the thread-pulling knife (1) swivels forwards.
2. Loosen the screw (3).
3. Push the counter-blade (2) upwards or downwards such that the cutting edges of the thread-pulling knife (1) and the counter-blade (2) touch but do not get caught.
4. Tighten the screw (3).
5. Perform a cutting test and repeat steps 2 to 4 if necessary.

3.10.5 Setting the path of the thread-pulling knife

Fig. 21: Setting the path of the thread-pulling knife



(1) - Tip of the counter blade edge
(2) - Blade lever
(3) - Screws on the lever
(4) - Tip of the thread-pulling knife edge

Proper setting

If the thread-pulling knife is not swung out, the tips of the thread-pulling knife and the counter-blade are exactly flush on top of each other.

Disturbance

- Threads are not cut
- Threads are cut too long

Cover

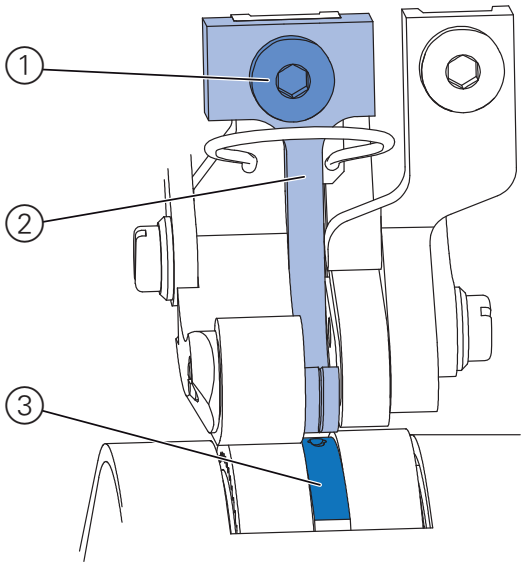
- Tilt the machine head (📖 *p. 14*)
- Remove the material support and column cover (📖 *p. 17*)
- Removing the throat plate (📖 *p. 18*)

To set the path of the thread-pulling knife:

1. Loosen the screws on the lever (3).
2. Push the blade lever (2) upwards or downwards such that the tip of the thread-pulling knife edge (4) is exactly flush with the tip of the counter-blade edge (1).
3. Tighten the screws on the lever (3).
4. Perform a cutting test and repeat steps 1 to 3 if necessary.
   - If the threads are cut too long:
     Push the thread-pulling knife further back.
   - If the threads are not cut:
     Push the thread-pulling knife further forwards.

3.11 Setting the middle foot

Fig. 22: Setting the middle foot



(1) - Screw
(2) - Middle foot
(3) - Throat plate

In its delivery state, the distance between the throat plate and the middle foot is exactly 0.6 mm.

Proper setting

The correct height of the middle foot depends on the thickness of the sewing material:

- Thick material: Set the middle foot higher
- Thin material: Set the middle foot lower

Disturbance

Middle foot too low for thick sewing material:

- Incorrect curve support
- Fullness incorporated incorrectly
- Ruffling on the seam
- Unsuitable stitch length

Middle foot too high for thin sewing material:

- Ruffling on the seam

To set the middle foot:

1. Remove the needle from the needle bar (📖 *Operating Instructions*).
2. Loosen the screw (1).
3. Push the middle foot (2) up or down until the height matches the thickness of the sewing material.

4. Tighten the screw (1).
5. Insert the needle into the hole in the needle bar until it reaches the end stop.

3.12 Adjusting the toothed belt

WARNING

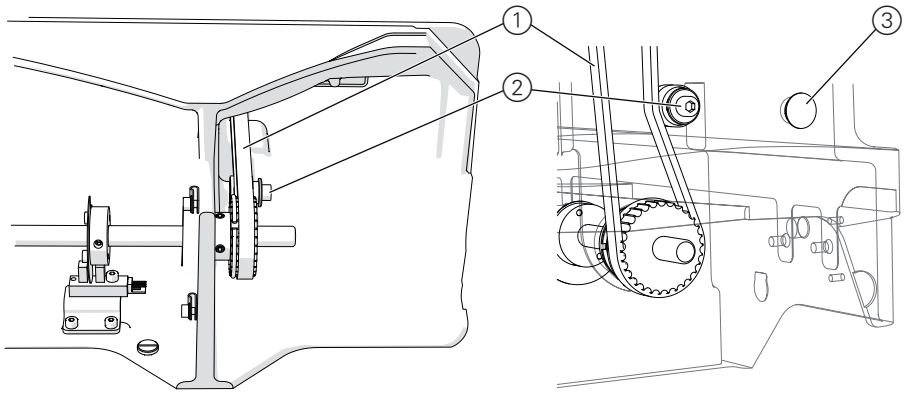
Risk of injury due to moving parts!

Crushing possible.

Switch off the machine before adjusting the toothed belt.

3.12.1 Setting the toothed belt between upper and lower shaft

Fig. 23: Setting the toothed beld between upper and lower shaft



(1) - Toothed belt (front strand)
(2) - Tension pulley screw
(3) - Plug in the housing opening

Proper setting

At the front strand, the tension of the toothed belt is 60 – 80 Hz.

Cover

- Tilt the machine head (📖 *p. 14*)

To set the toothed belt between the upper and lower shaft:

1. Remove the plug (3).
2. Insert the wrench from the right through the housing opening into the tension pulley screw (2).

3. Loosen the tension pulley screw (2).
4. Change the tension using the tension pulley:
   - Place the pulley nearer to the toothed belt = increased tension
   - Place the pulley further from the toothed belt = decreased tension
5. Tighten the tension pulley screw (2).

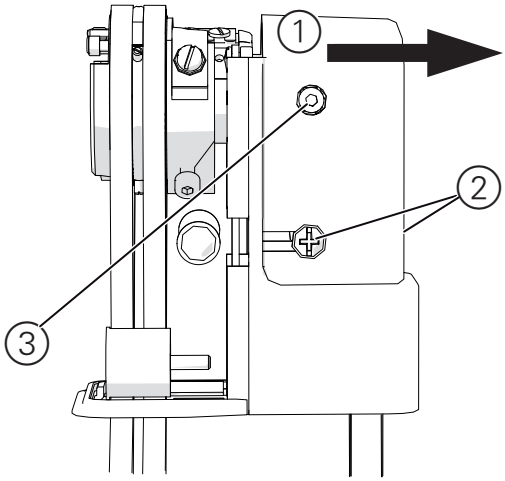
Order

Change the following setting after completely re-fitting the toothed belt between the upper and lower shaft:

- Lightbeam sensor disk (📖 *p. 21*)
- Position of the hook (📖 *p. 23*)

3.12.2 Setting the toothed belt for hook drive

Fig. 24: Setting the toothed belt for hook drive (1)



(1) - Cover
(2) - Screws
(3) - Screw (do not loosen)

Proper setting

At the front strand, the tension of the toothed belt is 65 Hz.

The toothed belt is centered on the upper toothed belt pulley and on the large toothed belt pulley.

The toothed belt has a clearance of 1 mm from the retaining rings on the lower toothed belt pulley.

Cover

- Tilt the machine head (📖 *p. 14*)
- Remove the material support and column cover (📖 *p. 17*)

To set the toothed belt for the hook drive:

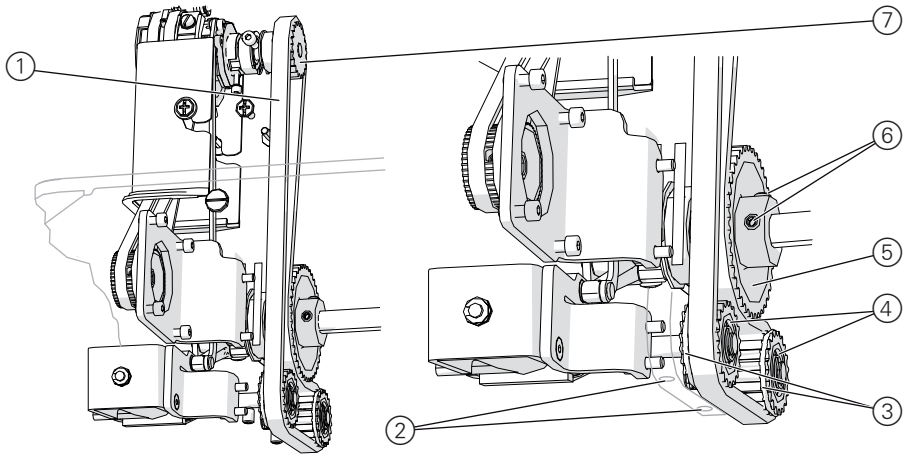
1. Loosen the screws (2) on the front and rear of the cover (3) of the hook toothed belt.

Important

Do not loosen the screw (1)!
If the screw (1) has been unscrewed, re-calibrate the hook (📖 *p. 23*).

2. Lift the cover (3) slightly and remove it to the right.

Fig. 25: Setting the toothed belt for hook drive (2)



(1) - Toothed belt
(2) - Screw openings
(3) - Retaining rings
(4) - Lower toothed belt pulleys
(5) - Large toothed belt pulley
(6) - Setscrews
(7) - Upper toothed belt wheel

3. Loosen the axis fastening of the lower toothed belt pulleys (4) through the screw openings (2).
4. Loosen the setscrews (6) for the large toothed belt pulley (5).
5. Align the toothed belt pulleys:
   - Move the lower toothed belt pulleys (4) together with their axes
   - Move the large toothed belt pulley (5) on the shaft

   Move the 3 toothed belt pulleys such that:
   - The toothed belt is centered on the upper toothed belt pulley (7) and centered on the large toothed belt pulley (5)
   - The toothed belt on the lower toothed belt pulley (4) has a clearance of 1 mm from the retaining rings (3)
6. Tighten the setscrews (6) for the large toothed belt pulley (5).
7. Tighten the axis fastening of the lower toothed belt pulleys (4) through the screw openings (2).
8. Fit the cover from the top right.
9. Tighten the screws on the front and rear of the cover.

Order

Check the following setting after completely re-fitting the toothed belt or loosening the large toothed belt pulley:

- Position of the hook (📖 *p. 23*)

3.13 Top conveyor belts

WARNING

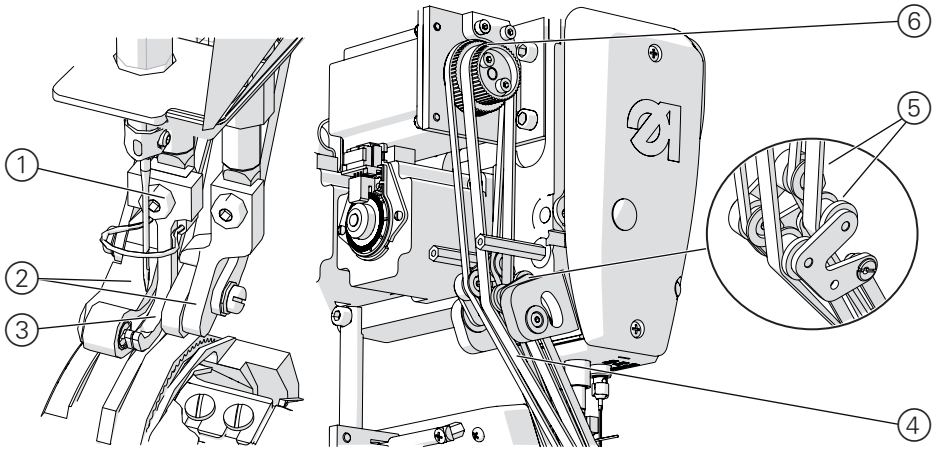
Risk of injury due to moving parts!

Crushing possible.

Switch off the machine before adjusting the top conveyor belts.

3.13.1 Replacing the top conveyor belts

Fig. 26: Replacing the top conveyor belts



(1) - Screw
(2) - Sewing feet
(3) - Middle foot
(4) - Conveyor belts
(5) - Guide
(6) - Gear wheel

Cover

- Remove the rear arm cover (📖 *p. 16*)

Dismounting the top conveyor belts

To dismount the top conveyor belts:

1. Remove the needle from the needle bar (📖 *Operating Instructions*).
2. Loosen the screw (1).
3. Remove the middle foot (3).

4. Push the right sewing foot upwards.
5. Remove the left conveyor belt from the sewing foot.
6. Remove the left conveyor belt from the gear wheel (6) and from the guide (5).
7. Push the left sewing foot upwards and the right sewing foot downwards.
8. Remove the right conveyor belt from the sewing foot.
9. Remove the right conveyor belt from the gear wheel (6) and from the guide (5).

Inserting the top conveyor belts

Important

When inserting the top conveyor belts, watch the arrows: The arrows must point in the direction of rotation.

To insert the top conveyor belts:

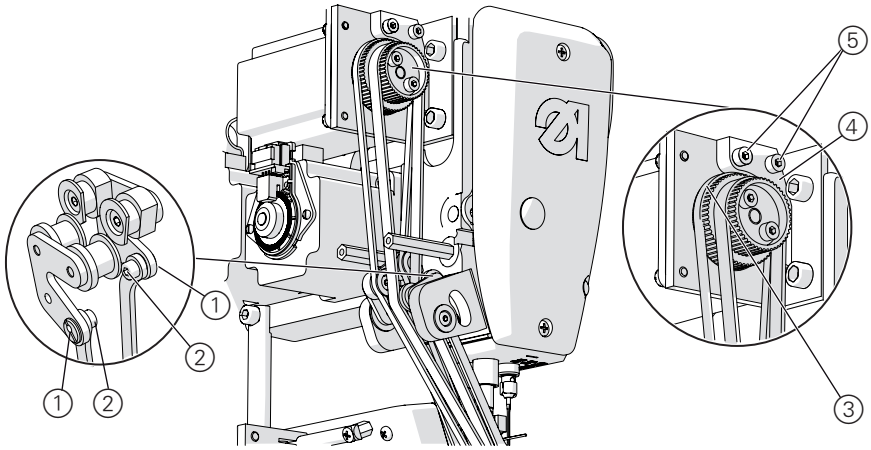
1. Push the right sewing foot downwards and the left sewing foot upwards.
2. Place the right conveyor belt in the right sewing foot.
3. Guide the right conveyor belt through the guide (5).
4. Place the right conveyor belt on the larger of the two gear wheels (6).
5. Turn the conveyor belt gear wheel (6) slowly so that the conveyor belt aligns itself.
6. Push the right sewing foot upwards and the left sewing foot downwards.
7. Place the left conveyor belt in the left sewing foot.
8. Insert the middle foot (3) and tighten it using the screw (1).
9. Guide the left conveyor belt through the guide (5).
10. Place the left conveyor belt on the smaller of the two gear wheels (6).
11. Turn the gear wheel (6) slowly so that the belt aligns itself.

Order

After replacing the top conveyor belts, set the middle foot (📖 *p. 34*).

3.13.2 Setting the top conveyor belts

Fig. 27: Setting the top conveyor belts



(1) - Eccentric
(2) - Screws
(3) - Top right conveyor belt
(4) - Jump protection
(5) - Screws

Proper setting

The tension in the conveyor belts should be set as low as possible without allowing the conveyor belts to sag.

The jump protection must not impede the course of the right conveyor belt. The correct distance between the jump protection and the right conveyor belt is 0.2 – 0.3 mm.

Test possibilities for the stepper motors of the conveyor belts can be found in the multitest menu in the software (📖 *p. 69*) (📖 *p. 110*).

Disturbance

- Irregular stitch length due to excessively low tension
- Transport disruptions and ruffling due to excessively high tension
- Increased wear of belts and feet
- Incomplete lowering of feet

Cover

- Rear arm cover (📖 *p. 16*)

Setting the tension

To set the tension:

1. Loosen the screws (2).
2. Turn the appropriate eccentric screw (1) with a flat-head screwdriver in order to change the tension.
3. Tighten the screws (2).

4. Perform steps 1 – 3 for the other conveyor belt.

Setting the distance from the jump protection

To set the distance from the jump protection:

1. Loosen both screws (5) on the jump protection (4).
2. Push the jump protection (4) upwards or downwards until there is a distance of 0.2 – 0.3 mm from the top right conveyor belt (3).
3. Tighten both screws (5) on the jump protection (4).

3.14 Bottom conveyor belts

WARNING

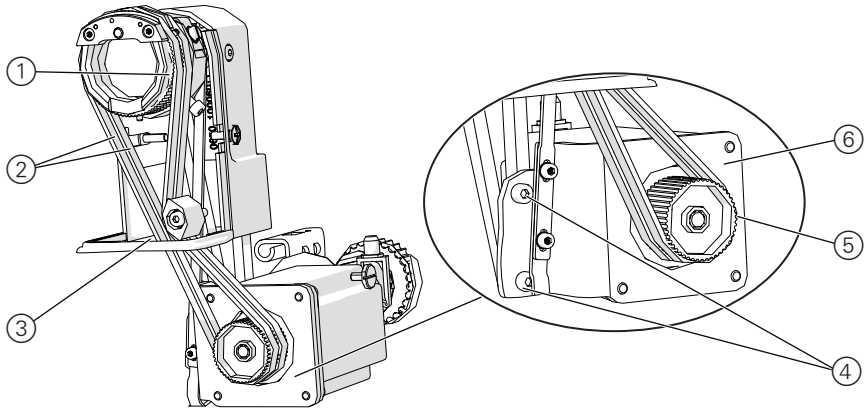
Risk of injury due to moving parts!

Crushing possible.

Switch off the machine before adjusting the bottom conveyor belts.

3.14.1 Replacing the bottom conveyor belts

Fig. 28: Replacing the bottom conveyor belts



(1) - Gear rims
(2) - Bottom conveyor belts
(3) - Base plate cutout
(4) - Screws
(5) - Lower gear wheel
(6) - Mounting bracket

Cover

- Tilt the machine head (📖 *p. 14*)
- Remove the material support and column cover (📖 *p. 17*)
- Removing the throat plate (📖 *p. 18*)

Dismounting the bottom conveyor belts

To dismount the bottom conveyor belts:

1. Use the handwheel to position the needle in the top dead center.
2. Remove both conveyor belts (2) from the bottom gear wheel (5).

Wichtig

Adjust the position of the mounting bracket (6).

3. Pull the conveyor belts (2) upwards through the base plate cutout (3).
4. Remove both conveyor belts from the gear rims on the throat plate (1) one after the other.

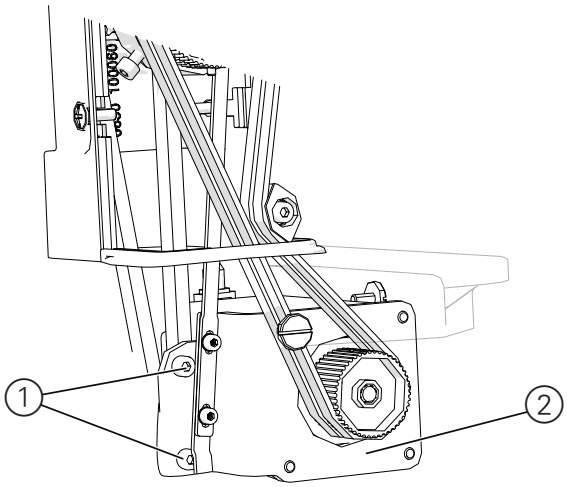
Inserting the bottom conveyor belts

To insert the bottom conveyor belts:

1. Pull the right conveyor belt over the right gear rim (1).
2. Feed the conveyor belt downwards through the base plate cutout (3).
3. Pull the conveyor belt over the lower gear wheel (5).
4. Repeat steps 1 – 3 for the left conveyor belt.

3.14.2 Setting the bottom conveyor belts

Fig. 29: Setting the bottom conveyor belts



(1) - Screws *(2) - Mounting bracket*

Proper setting

The tension in the conveyor belts should be set as low as possible without allowing the conveyor belts to sag. The conveyor belts must be able to nestle up against each other when light pressure is exerted.

Disturbance

- Irregular stitch length due to excessively low tension
- Transport disruptions and ruffling due to excessively high tension
- Increased wear of belts

Test possibilities for the stepper motors of the conveyor belts can be found in the multitest menu in the software (📖 *p. 69*) (📖 *p. 110*).

Cover

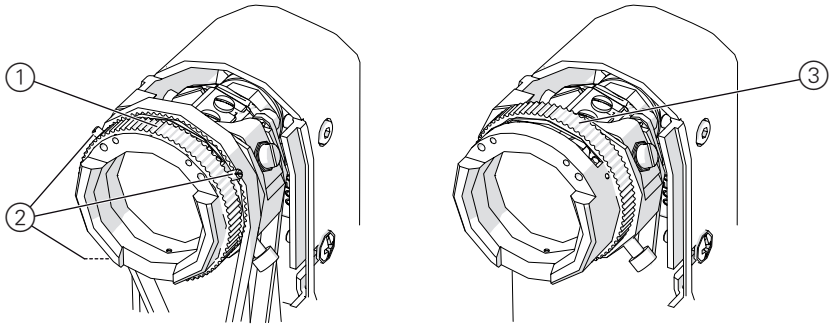
- Tilt the machine head (📖 *p. 14*)
- Remove the material support and column cover (📖 *p. 17*)

To set the bottom conveyor belts:

1. Loosen both screws (1) on the mounting bracket (2).
2. Move the mounting bracket (2) together with the gear wheel and conveyor belts:
   - **Increase the tension**: Move downwards
   - **Decrease the tension**: move upwards
3. Tighten the mounting bracket (2) using the screws (1).

3.14.3 Replacing the gear rims

Fig. 30: Replacing the gear rims



(1) - Front gear rim
(2) - Screws
(3) - Rear gear rim

Cover

- Tilt the machine head (📖 *p. 14*)
- Remove the material support and column cover (📖 *p. 17*)
- Removing the throat plate (📖 *p. 18*)

Dismounting the gear rims

To dismount the gear rims:

1. Remove the bottom conveyor belts (📖 *p. 41*).

2. Remove the front gear rim (1) to the left.
3. Loosen all 3 screws (2).
4. Remove the rear gear rim (3) to the left.

Fitting the gear rims

To fit the gear rims:

1. Slip on the rear gear rim (3) from the left.
2. Tighten all 3 screws (2).
3. Slip on the front gear rim (1) from the left.
4. Insert the bottom conveyor belts (📖 *p. 41*).

3.15 Checking the sewing foot lifting gear

WARNING

Risk of injury due to moving parts!

Crushing possible.

Switch off the machine before checking the sewing foot lifting gear.

Proper setting

1. Switch off the machine.
2. Move the sewing feet back and forth by hand.

↳ The sewing feet must be able to move back and forth slightly.

You can change the following settings for the sewing feet via software:

- Sewing foot ventilation
- Sewing foot calibration

Checking for mechanical problems

1. Dismount the lifting gear as described below.
2. Check components for defects.
3. Fit the lifting gear as described below.

Distrubance

- Incorrect curve support
- Sewing foot stuck

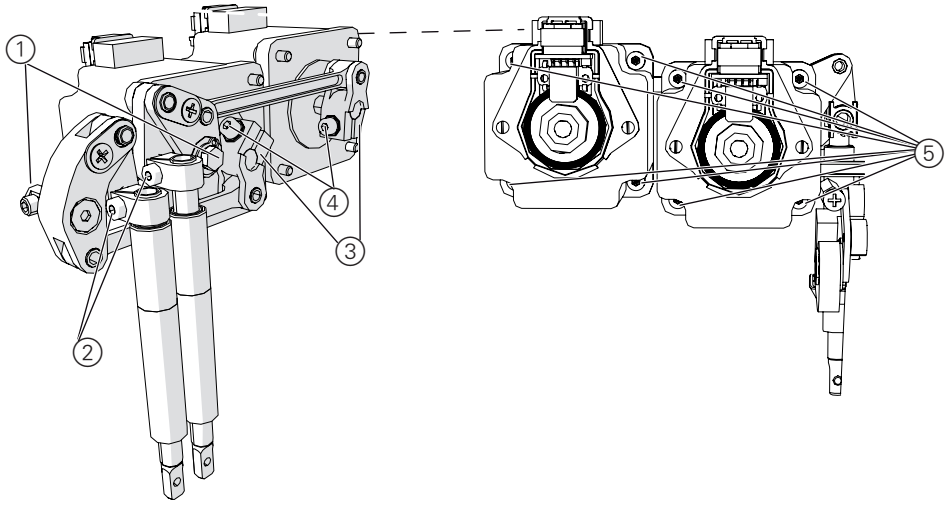
Order

After checking for mechanical problems, recalibrate the sewing feet via software (📖 *p. 67*) (📖 *p. 96*)

Cover

- Rear arm cover (📖 *p. 16*)
- Head cover (📖 *p. 15*)

Fig. 31: Checking the sewing foot lifting gear



(1) - Bearing points
(2) - Screws
(3) - Clamping block
(4) - Clamping block screws
(5) - Stepper motor screws

Dismounting the lifting gear

To dismount the lifting gear:

1. Push the right sewing foot upwards to allow free access.
2. Loosen the screws (4) on the clamping block (3).
   This can be accessed through the machine head.
3. Loosen the 8 screws (5) from the stepper motors from the rear.
4. Remove the stepper motors backwards.
5. Loosen the screws (2).
6. Remove electric thread tensioner in order to gain access to the bearing point in the right lifting gear (📖 *p. 47*). You do not need to remove the thread tensioner cables from the plug to do this.

Important

Make sure you do not damage the cables when pulling out the thread tensioner!

7. Loosen the bearing points (1).
   These can be accessed through the machine head for the left lifting gear. For the right lifting gear, these can be accessed through the opening of the removed thread tensioner.

8. Remove lifting gear.

Controlling the lifting gear

To control the lifting gear:

1. Move all joints in the lifting gear.

↳ All pivots and bearing points must be able to move slightly and must not have any play.

Fitting the lifting gear

To fit the lifting gear:

1. Fit the lifting gear.
2. Tighten the bearing points (1).
   These can be accessed through the machine head for the left lifting gear. For the right lifting gear, these can be accessed through the opening of the removed thread tensioner.
3. Insert the electric thread tensioner (📖 *p. 47*).

Important

Make sure you do not damage the cables and you properly lay cables that are too long when inserting the thread tensioner!

4. Tighten the screws (2).

Important

The upper edge of the clamping block must lock flush with the upper end of the sewing foot rod!

5. Fit the stepper motors.
6. Place the clamping blocks (3) on the stepper motor shaft.
7. Screw on the stepper motors from the rear with the 8 screws (5).

Important

Gently move the lifting gear back and forth before tightening! This will ensure that the lifting gear does not tilt, but is still easily accessible even after tightening.

8. Tighten the clamping block (3) using the screws (4). This can be accessed through the machine head.

Order

After mechanical work on the sewing foot lifting gear, always calibrate the sewing feet using the software (📖 *p. 67*) (📖 *p. 96*).

3.16 Electric thread tensioner

WARNING

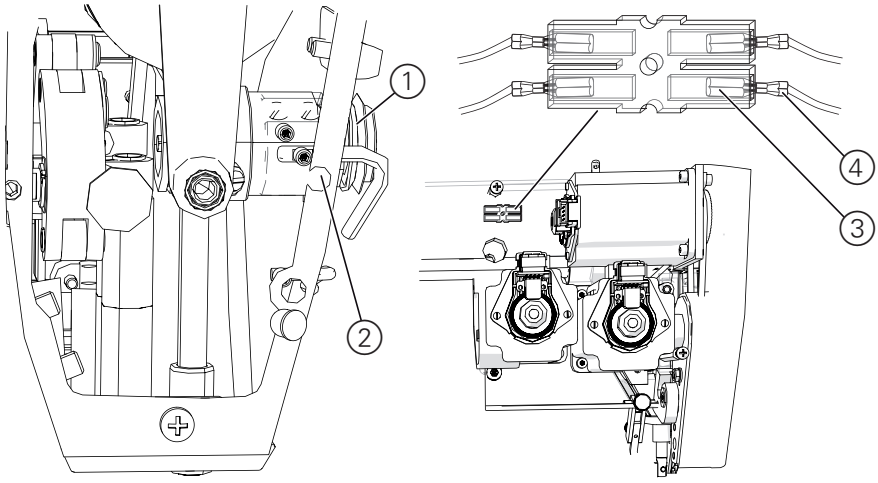
Risk of injury due to sharp and moving parts!

Stiching or crushing possible.

Switch off the machine before dismounting and mounting the electronic thread tensioner.

3.16.1 Dismounting the electric thread tensioner

Fig. 32: Dismounting the electric thread tensioner



(1) - Electric thread tensioner
(2) - Access hole in the housing face side
(3) - Plugs
(4) - Cable shoe

Cover

- Head cover (📖 *p. 15*)
- Rear arm cover (📖 *p. 16*)

To dismount the electric thread tensioner:

1. Loosen the setscrew through the access hole (2).
2. Pull out the thread tensioner (1) approx. 1 cm and turn counterclockwise so that the cables point downwards and can be pulled out through the cable cutout.

Important

Pull out the thread tensioner carefully so as not to damage the cable!

3. Pull the thread tensioner (1) forward as far as the length of the cable allows.

You can now adjust the following settings:

- Check the lifting gear (📖 *p. 44*)
- Change the thread tensioning spring (📖 *p. 49*)
- Set the spring tension (📖 *p. 52*)

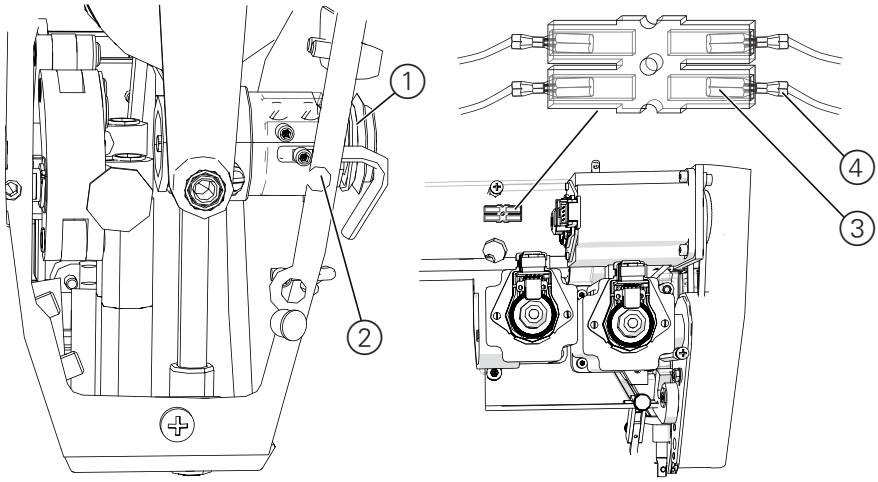
Information

When you install a new thread tensioner, you must pull out the thread tensioner completely:

4. Remove the cable shoe (4) from the transparent plug (3) on the rear of the stepper motor.
5. Carefully remove the thread tensioner (1) forwards together with the cables.

3.16.2 Fitting the electronic thread tensioner

Fig. 33: Fitting the electric thread tensioner



(1) - Electric thread tensioner
(2) - Access hole in the housing face side
(3) - Plugs
(4) - Cable shoe

To fit the electric thread tensioner:

1. Feed the cable of the thread tensioner (1) through the opening in the machine arm and backwards towards the transparent plug (3).
2. Insert the thread tensioner (1).
3. Insert the cable shoe (4) into the transparent plug (3).
4. Lay cables that are too long in loops such that moving machine parts are not impaired in their ability to function correctly.
5. Tie the cable loops together using a cable tie.
6. Tighten the setscrew through the access hole (2).

Information

If you receive a new thread tensioner as a spare part from Dürkopp Adler, this will already be pre-calibrated. The adjusting screw for the spring tension is sealed.

You only need to enter the values for calibration positions 2 and 1 as indicated on the sticker on the machine head using the software (📖 *p. 76*) (📖 *p. 101*).

Set the thread tension for thread cutting using the software:

The thread tension for thread cutting is set via the software (📖 *p. 65*) (📖 *p. 95*).

3.17 Thread tensioning spring

WARNING

Risk nof injury due to sharp and moving parts!

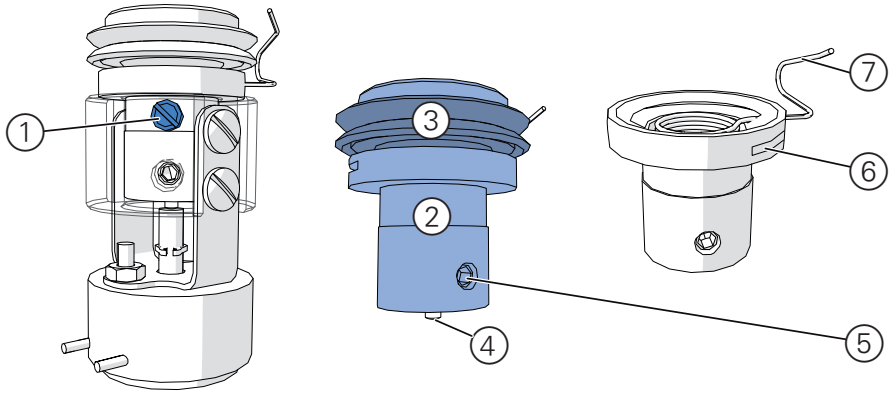
Stitching or crushing possible.

Switch off the machine before making adjustments on the thread tensioning spring.

3.17.1 Changing the thrad tensioning spring

The thread tensioning spring is supposed to hold the needle thread under tension until the tip of the needle has penetrated the sewing material.

Fig. 34: Changing the thread tensioning spring



(1) - Setscrew
(2) - Inner cylinder
(3) - Tension disks
(4) - Release pin
(5) - Setscrew on cylinderr
(6) - Slot
(7) - Thread tensioning spring

Dismounting the thread tensioning spring

Cover

- Head cover (p. 15)

To dismount the thread tensioning spring:

1. Dismount electrical thread tensioner (p. 47).
2. Loosen the setscrew (1).
3. Remove the entire inner cylinder (2).

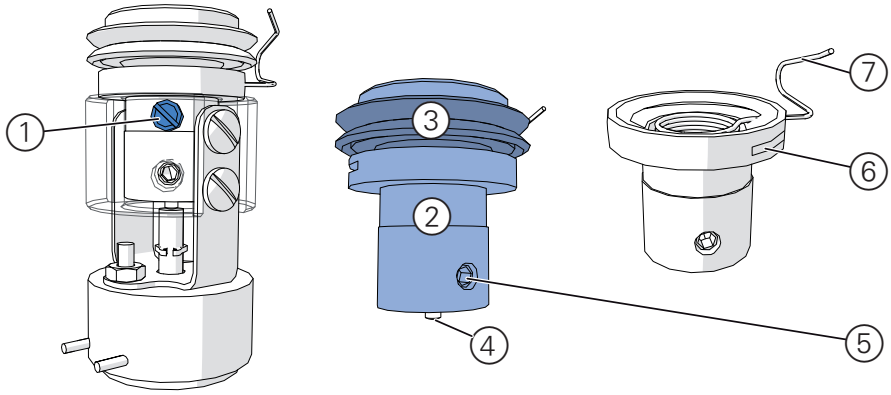
Important

Do not lose the release pin (4) when doing so!

4. Loosen the setscrew (5) on the cylinder.
5. Remove the tensioning bolt together with the tension disks (3).
6. Loosen the thread tensioning spring (7) from the cylinder. To do so, use a screwdriver to remove the spring thread from the inner part.
7. Pull the open end of the thread tensioning spring through the slot (6).

3.17.2 Fitting the thread tensioning spring

Fig. 35: Fitting the thread tensioning spring (1)



(1) - Setscrew
(2) - Inner cylinder
(3) - Tension disks
(4) - Release pin
(5) - Setscrew on cylinderr
(6) - Slot
(7) - Thread tensioning spring

To fit the thread tensioning spring:

1. Pull the loose end of the thread tensioning spring (7) through the slot (6).
2. Insert the thread tensioning spring (7) into the cylinder.
3. Insert the tensioning bolt with the tension disks in the cylinder (3), and put the groove on the hook (8) of the thread tensioning spring.
4. Tighten the setscrew on the cylinder (5).
5. Insert the inner cylinder (2) in the housing of the thread tensioner.

Important

The release pin (4) must be at the bottom of the cylinder!

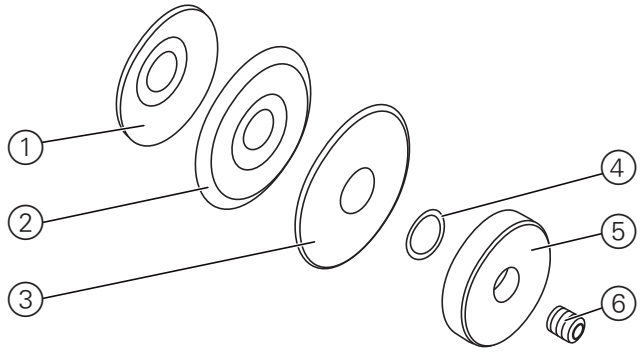
6. Tighten the setscrew (1).
7. Insert the thread tensioner (📖 *p. 47*).

Information

Leave the tension disks on the tension bolt!

If the tension disks have been removed, recalibrate the thread tension using the software (📖 *p. 76*) (📖 *p. 101*).

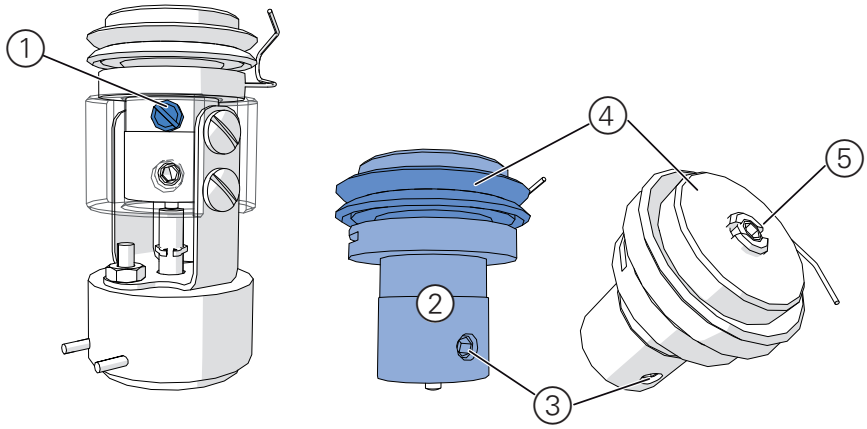
Fig. 36: Fitting the thread tensioning spring (2), Order of the tension disks



(1) - Bridge disk
(2) - 1. Tension disk
(3) - 2. Tension disk
(4) - Rubber O-ring
(5) - Adjusting nut
(6) - Setscrew

3.17.3 Setting the spring tension

Fig. 37: Setting the sping tension



(1) - Setscrew
(2) - Inner cylinder
(3) - Setscrew on cylinder
(4) - Tension disks
(5) - Tension bolt

Proper setting

The spring tension should be between 20 and 50 cN (1 cN = 1 g).
The exact setting depends on the sewing material and the thread thickness.

Cover

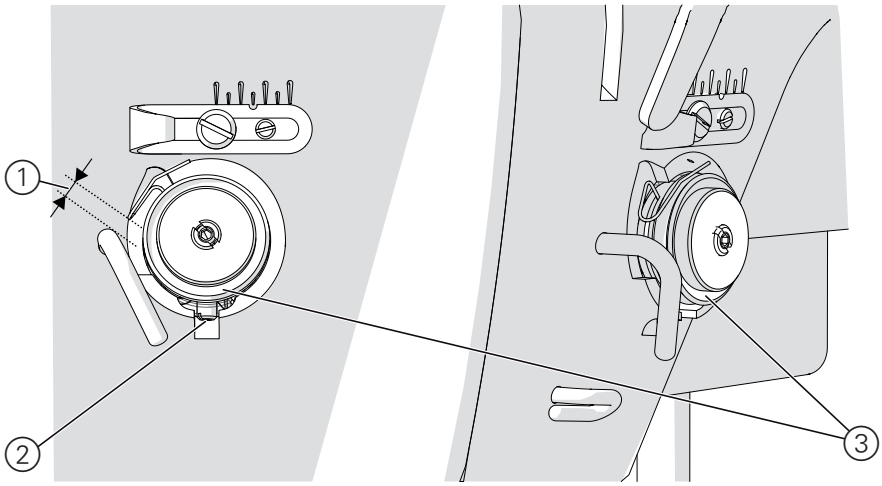
- Head cover (📖 *p. 15*)

To set the spring tension:

1. Dismount electrical thread tensioner (📖 *p. 47*).
2. Loosen the setscrew (1).
3. Pull the inner cylinder (2) out of the thread tensioner.
4. Loosen the setscrew on the cylinder (3).
5. Twist the tension bolt (5) with the tension disks (4):
   - Clockwise rotation = greater tension
   - Counterclockwise rotation = lower tension
6. Tighten the setscrew on the cylinder (3).
7. Insert the inner cylinder (2) in the thread tensioner.
8. Tighten the setscrew (1).
9. Insert the electric thread tensioner (📖 *p. 47*).

3.17.4 Setting the spring travel

Fig. 38: Setting the spring travel



(1) - Spring travel
(2) - Setscrew
(3) - Socket

Proper setting

The recommended length for spring travel (1) is 6.5 mm.
The exact setting depends on the sewing material and the thread thickness.

To set the spring travel:

1. Loosen the setscrew (2).
2. Turn the entire socket (3) until the desired spring travel is reached:
   - **longer spring travel**: turn clockwise
   - **shorter spring travel**: turn counterclockwise
3. Tighten the setscrew (2).

3.18 Setting the thread regulator

The thread regulator determines the needle thread quantity to be guided around the hook. The required thread quantity depends on the thickness of the sewing material, the thread strength, and the stitch length.

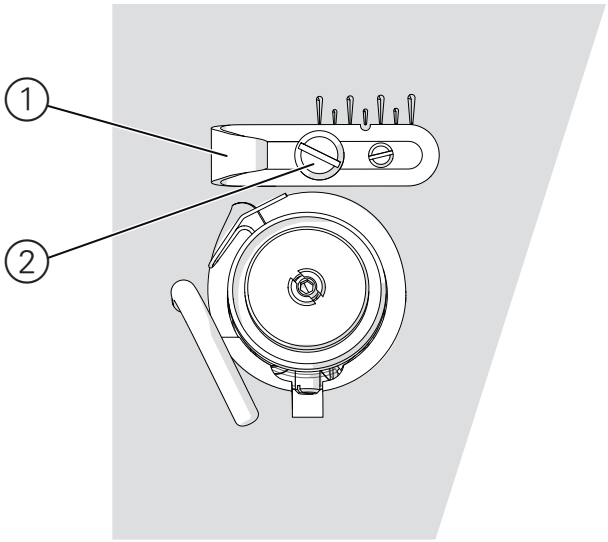
Larger thread quantity for

- thick sewing material
- high thread strengths
- large stitch lengths

Lower thread quantity for

- thin sewing material
- low thread strengths
- small stitch lengths

Fig. 39: Setting the thread regulator



(1) - Thread regulator *(2) - Screw*

Proper setting

Remove the sewing material support and column cover (📖 *p. 17*) and observe the thread cycle around the hook:

The needle thread loop runs without surplus and without jumping over the largest hook diameter.

Distrubance

- Incorrect stitch pattern

To set the thread regulator:

1. Turn the handwheel and observe the cycle of the thread around the hook.

2. Loosen the screw (2).
3. Move the thread regulator (1):
   - **greater thread quantity**: move the regulator to the left
   - **lower thread quantity**: move the regulator to the right
4. Tighten the screw (2).

3.19 Winder

NOTICE

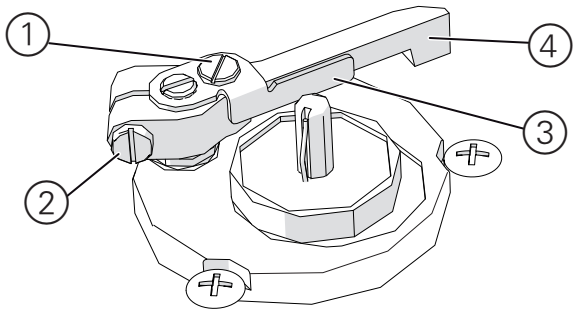
Property damage may occur!

When running without sewing material, sewing feet and the bobbin capsule can be damaged in the hook.

Activate winder mode and take the bobbin capsule out of the hook when you run the test winding process.

3.19.1 Setting the filling quantity

Fig. 40: Setting the filling quantity



(1) - Adjusting screw
(2) - Clamping screw
(3) - Thread guide plate
(4) - Actuating lever

Proper setting

1. Wind up an empty bobbin.

↳ The winding process stops automatically when the bobbin is filled to approx. 0.5 mm under the edge of the winder.

To set the filling quantity:

Rough setting

1. Loosen the clamping screw (2).

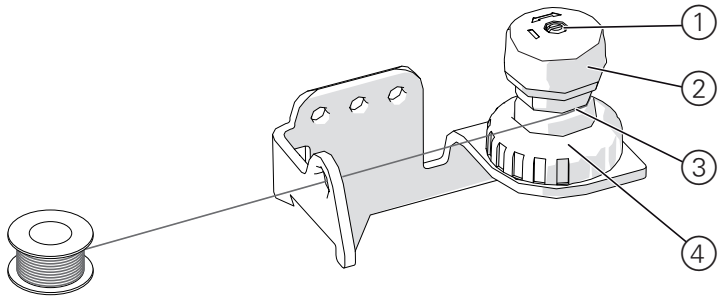
2. Align the actuating lever (4):
   - **smaller filling quantity**: move towards the bobbin
   - **larger filling quantity**: move away from the bobbin
3. Tighten the clamping screw (2).

Fine adjustment

4. Loosen the adjusting screw (1).
5. Move the thread guide plate (3):
   - **smaller filling quantity**: move towards the bobbin
   - **larger filling quantity**: move away from the bobbin
6. Tighten the adjusting screw (1).

3.19.2 Setting the winder winding form

Fig. 41: Setting the winder winding form



(1) - Guide pin
(2) - Setting button
(3) - Gap
(4) - Knurled nut

The height of the gap determines how the hook thread is wound onto the bobbin.

Proper setting

The thread is wound on evenly over the entire height of the bobbin.

The thread runs in a straight line, without any buckling, from the gap through the thread guide to the bobbin.

To set the winder winding form:

1. Loosen the knurled nut (4).
2. Turn the guide pin (4) with a flat-head screwdriver:
   - **make gap (3) lower**: turn clockwise
   - **make gap (3) higher**: turn counterclockwise

Important

When doing so, do not turn the setting button (2)!

3. Tighten the knurled nut (4).

3.19.3 Setting the winding tension

Proper setting

The correct tension during winding depends on the sliding properties and the thickness of the thread.

Disturbance

- Ruffling on the seam
- Incorrect stitch pattern

To set the winding tension:

1. Turn the Setting button (2).
   - **greater tension**: turn clockwise
   - **lower tension**: turn counterclockwise

4 Programming (OP3000)

This chapter describes service settings, such as

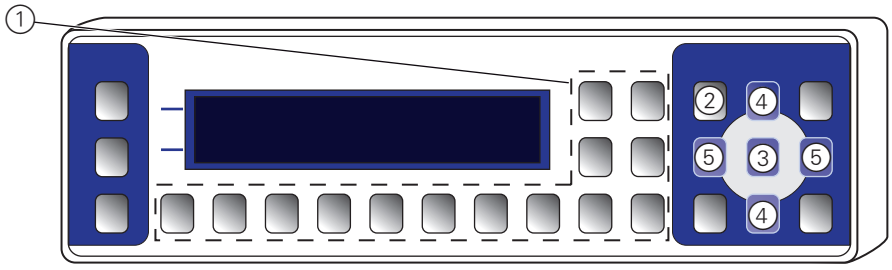
- the basic machine configuration.
- Test functions for individual machine components
- Calibration functions
- Presets for programs and functions

Changes to the stitch length, thread tension, curve support, etc., as well as calling and creating sewing programs are described in the Operating instructions (🕮 *Operating instructions*).

4.1 Basic software operation

The software is controlled via the control panel.

Fig. 42: Basic software education



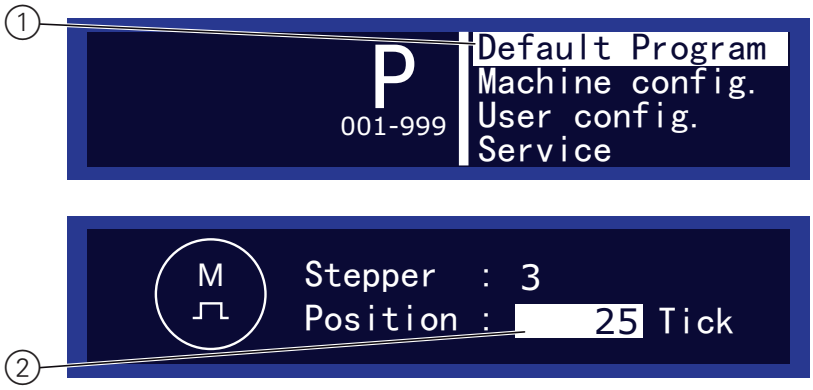
(1) - Number keys
(2) - ESC key
(3) - OK key
(4) - Arrow keys ▲/▼
(5) - Arrow keys ◀/▶

Displaying and selecting

The display shows the menu items of value fields that you can select.

The active entry is always highlighted (brighter).

Fig. 43: Displaying and selecting



(1) - Active entry in a menu list
(2) - Active entry in a value field

The arrow keys let you move from entry to entry:

- ▲/▼ in a list of menu items
- ◀/▶ adjacently in value fields

Back to menu level

Pressing ◀ takes you to the previous menu level.

Cancelling in menu lists

If you press **ESC** in a menu list, you are taken to the user level.

Changing values

In active fields you can enter a value with the number keys or change it step by step with ▲/▼.

If you have entered a value that is not within the preset value range, the software automatically applies the limit value from the value range that is closest to your input.

Pressing **OK** applies the active entry:

↳ In a menu list, this opens the select menu item.

Cancelling processing of values

If you press **ESC** when editing a value field, this cancels the entry without applying your changes.

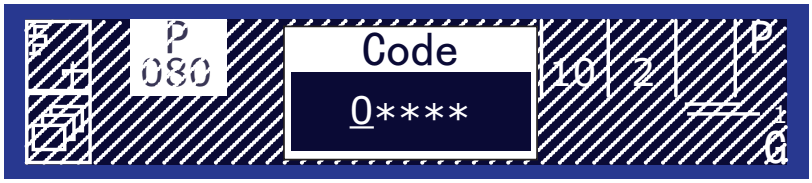
4.2 Accessing technician level

All settings in the service area are performed at technical level.

Information

For safety reasons, the pedal is inactive in technician mode. Although you can test the pedal inputs in the `Multitest` menu, the sewing motor is not activated by pressing the pedal.

Fig. 44: Accessing technicial level



To access the technician level:

1. Press the **P** key and **S** key at the same time.

↳ The display shows the input mask for the code.

2. Enter the technician code *25483* with the numeric keys.

↳ After each keypress with a number, the input cursor automatically moves to the next position. For safety reasons, the figures are not displayed. A 0 is displayed at the entry point, and an asterisk at all other points.
You can press ◀/▶ to move from one entry point to another.

Directly after entering the code, the display shows the 4 menu items for technician level:

- **Default Program**
  Presets for new programs to be created
- **Machine config.**
  Start and end tack, thread trimmer, speeds, stop positions, sewing foot lifting
- **User config.**
  Audible signal between program steps, left pedal function, program cancel with pedal, change between right and left sleeve
- **Service**
  Test functions for solenoids and drives, calibration of transport, sewing feet and thread tension, reset functions

Access after an error message

After some error messages it may be impossible to access menus or programs. Even after switching the machine off and back on, the machine boots with an error message and does not continue into the programs.

For this case, there is the option of sending the machine to technician mode directly on booting, in order to perform *Multitest* diagnostics or of issuing a *Reset all* to restore the factory defaults.

To access after an error message:

1. Switch off the machine at the main switch.
2. Hold down the *F* key and switch on the machine at the main switch.

↳ The machine boots and the display shows the input mask for the code.

3. Enter the technician code 25483.

↳ Only the two submenus *Multitest* and *Reset* are available.

- *Multitest*: Tests for error diagnostics (📖 *p. 69*)
- *Reset all*: Reset the machine to the factory defaults (📖 *p. 78*)

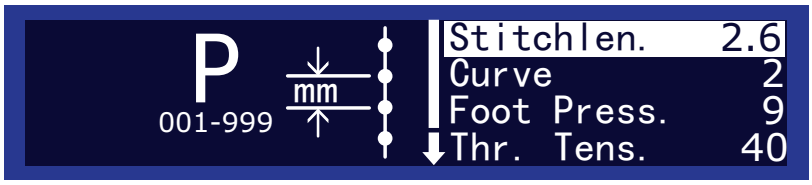
4.3 Menu items at technician level

4.3.1 Menu item *default program*

In this menu item you can define the default values when a new program is created.

Select values that can be kept in as many programs as possible depending on the sewing requirements; this makes it easier to create new programs.

Fig. 45: Menu item default progam



Parameters in the menu item *Default program*

Icon	Entry	Meaning	Permissible value range	Default value
	Stitchlen.	Stitch length	1.0 – 5.5 mm	2.5
	Curve	Curve support	0 – 6	2
	Foot Press.	Sewing foot pressure	1 – 15	9
	Thr. Tens.	Thread tension	1 – 99	40
	Fullness	Working in fullness	-6 – 16	0
	Alternate	Alternating: The sewing foot is lifted by this height for every stitch	0 – 2.5 mm	0
	Start Tack	Start tack	0 = No tack 1 = Tack on	0
	Start Tack	End tack	0 = No tack 1 = Tack on	0
	Thread Trim	Thread trimmer	0 = Thread trimmer off 1 = Thread trimmer on	1
	Teach Side	Sleeve side to be programmed first	R = Start with right sleeve L = Start with left sleeve	R

Icon	Entry	Meaning	Permissible value range	Default value
	Action	Action after programming the 1st sleeve side, to create the 2nd sleeve side	• `nothing` = no 2nd sleeve side • `mirror` = mirror sleeve side • `teach` = After programming the 1st sleeve side, also program the 2nd sleeve side • `ask` = After programming the 1st sleeve side, the selection mask for `nothing`, `mirror` or `teach` appears	mirror

4.3.2 Menu item *Machine config*

This menu lets you define the basic settings for the machine that apply in all programs.

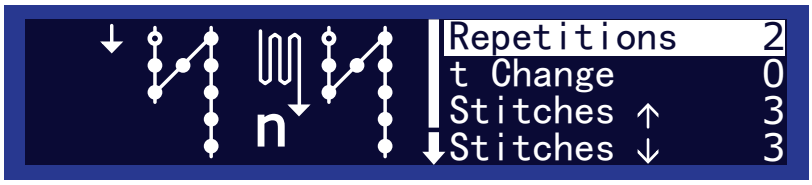
The menu item has the submenus:

- **Start Tack** - Settings for the start tack
- **End Tack** - Settings for the end tack
- **Thread Trim** - Settings for the thread trimmer
- **Speed** - Start, positioning and maximum speed
- **Stop Positions** - Sets the stop positions
- **Foot** - Sets sewing foot lifting

Submenu *Start Tack*

This submenu lets you determine how to sew the start tack.

Fig. 46: Submenu Start Tack



Parameters in the submenu *Start Tack*

Icon	Entry	Meaning	Permissible value range	Default value
	Repetitions	Number of repetitions in the tack	1 – 10	2
	t Changes	Wait time when switching between forward and reverse stitch	0 – 5000	0
	Stitches ↑	Number of forward stitches in the tack	1 – 50	3

Icon	Entry	Meaning	Permissible value range	Default value
	Stitches ↓	Number of reverse stitches in the tack	1 – 50	3
	Speed	Speed for sewing the tack	50 – 2000	1000

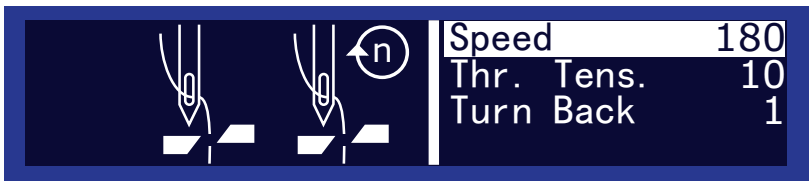
Submenu *End Tack*

This submenu is identical to the submenu *Start Tack*. The same settings are made for the end tack (📖 *p. 64*).

Submenu *Thread Trim*

In this submenu you can define settings for thread trimming.

Fig. 47: Seubmenu Thread Trim



Parameters in the submenu *Thread Trim*

Icon	Entry	Meaning	Permissible value range	Default value
	Speed	Speed for thread trimming	50 – 250	180
	Thr. Tens.	Thread tension for thread trimming	1 – 99 The bigger the value, the shorter the thread is trimmed	10
	Turn Back	After trimming, the machine automatically turns back to a position where the needle is slightly higher.	0 = No automatic turn back 1 = Automatic turn back	1

Submenu *Speed*

In this submenu, you can determine the speed for certain situations.

Fig. 48: Submenu Speed

Parameters in the submenu *Speed*

Icon	Entry	Meaning	Permissible value range	Default value
	Speed	Maximum speed when the pedal is fully depressed	100 – 4000	4000
	Pos. Speed	Speed for positioning	10 – 700	400
	Soft Speed	Speed for softstart stitches	10 – 1000	500
	N Stitches	Number of softstart stitches	1 – 10	1

Submenu *Stop Positions*

This menu item lets you define the needle position on stopping.

The position is given in degrees. The needle position at top dead centre is 0°. The other handwheel positions are derived from this. 360° is a complete turn of the handwheel.

Fig. 49: Submenu Stop Positions

Parameters in the submenu *Stop Positions*

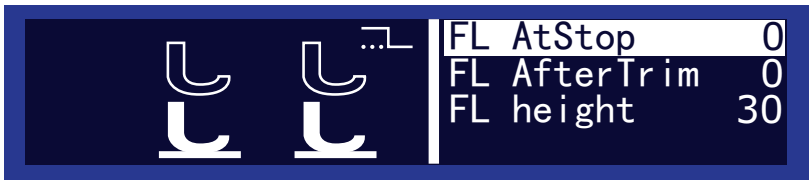
Icon	Entry	Meaning	Permissible value range	Default value
	StopIdle°	Handwheel setting after thread trimming and turning back	0° – 359°	35°
	StopTop°	Handwheel setting for top stop position of the needle on stopping in the seam	0° – 15°	0°

Icon	Entry	Meaning	Permissible value range	Default value
	StopBottom°	Handwheel setting for bottom stop position of the needle on stopping in the seam	0° – 359°	130°

Submenu *Foot*

In this submenu you can define settings for sewing foot lifting.

Fig. 50: Submenu Foot



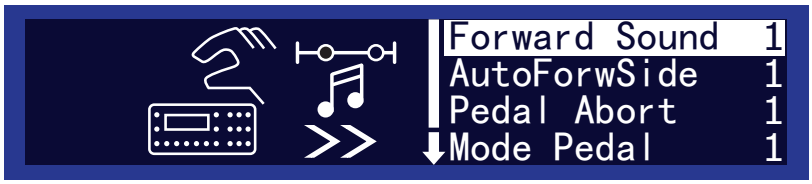
Parameters in the submenu *Foot*

Icon	Entry	Meaning	Permissible value range	Default value
	FL AtStop	Foot lifting on stop during sewing	0 = No sewing foot lifting 1 = Sewing foot lifting	0
	FL After-Trim	Sewing foot lifting after thread trimming	0 = No sewing foot lifting 1 = Sewing foot lifting	0
	FL height	Height of lifted foot	0 – 999	30

4.3.3 Menu item *User config*

In this menu you can define more settings for the machine.

Fig. 51: Menu item User config



Parameters in the submenu *User config*

Icon	Entry	Meaning	Permissible value range	Default value
	Forward Sound	Audible signal on transition between program steps	0 = Signal off 1 = Signal on	1
	AutoFor-wSide	Automatic change between right/left during sewing	0 = No automatic change 1 = Automatic change	1
	Pedal Abort	Program cancel with main pedal	0 = No cancel with main pedal 1 = Cancel with main pedal	1
	Mode Pedal	Function of the optional additional pedal	0 = Additional pedal no function 1 = Change in fullness 2= Change in curve support	1

4.3.4 Menu item *Service*

In this menu you can perform function tests, calibrate the machine or reset to the factory defaults.

Fig. 52: Menu item Service

The menu item has the submenus:

- **Multitest** - Test functions for solenoids and drives
- **Calibration** - Calibrate transport, feet, thread tension
- **Reset** - Reset all programs or parameters to the factory defaults

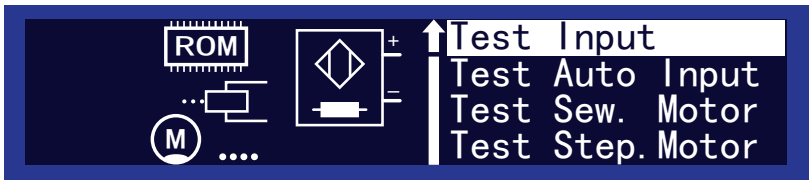
The submenus have additional subitems:

Menu item	Submenu	Subitem
Service	**Multitest**	Test output
		Test PWM
		Test Input
		Test Auto Input
		Test Sew. Motor
		Test Step.Motor
	Calibration	Feed sync.
		Foot Calib.
		Thread Calib.
	Reset	Reset programs
		Reset all

Submenu *Multitest*

In this submenu you can use the software to test if specific solenoids, drives or inputs are functional.

Fig. 53: Submenu Multitest



Subitem *Test output*

Do not select this menu item. The menu item has no assignment on this machine.

Subitem *Test PWM*

In this subitem you can test the solenoids for the thread trimmer and thread tensioner.

Use ▲/▼ in the *PWM* field to select the element you want to test:

- **2 = Thread trimmer solenoid**
- **4= Thread tensioning solenoid**

Test steps thread trimmer solenoid

Fig. 54: Test steps thread trimmer solenoid

To test the thread trimmer solenoid:

1. Press **OK**.

↳ The display for `Value` changes between `ON` and `OFF`.

2. Monitor the thread trimmer and check whether the thread trimmer really is triggered when you press **OK** (📖 *p. 27*).

Test steps thread tensioning solenoid

Fig. 55: Test steps thread tensioning spring

To test the thrad tensioning solenoid:

1. Press **OK**.

↳ The display shows a field for entering a % value.

2. Thread on up to the thread lever. (📖 *Operating instructions*)
3. Press ▲/▼ to change the value in the % field.
4. Pull the loose end of the thread and monitor whether the thread tension increases or is reduced in line with the change in the % field.

Important

The values shown in the % field do **not** correspond to the calibrated thread tension values(📖 *p. 76*), but only give you some orientation as to the extent to which the tension increases or drops.

Subitem *Test Input*

Fig. 56: Subitem Test Input

To perform an input test:

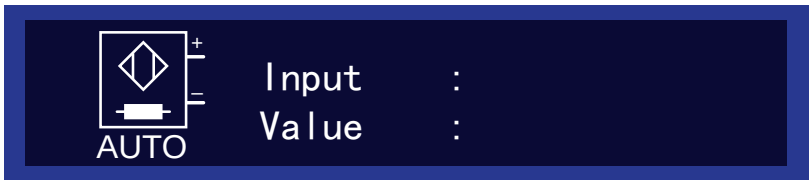
1. Use ▲/▼ in the *Input* field to select the element you want to test:
2. Actuate the element as described in the *Test method* column (see table later on).
3. Monitor the display.

↳ If the element is functional, the display for *Value* changes between *ON* and *OFF*.

Input	Element	Test method
1	Tilt sensor	Tilt the machine back and return to upright position
2 – 4	not used	-----
5	Main pedal input A	Depress the pedal to various positions.
6	Main pedal input B	
7	Main pedal input C	
8	Main pedal input D	
9*	Knee switch in switch position 1*	Press the knee switch
10*	Knee switch in switch position 2*	Press the knee switch
* It is sufficient to test the knee switch in one of the two switch positions.		
11 – 12	not used	-----
13	Mode pedal input A	Depress the pedal to various positions.
14	Mode pedal input B	
15	Mode pedal input C	
16	Mode pedal input D	
90	Reference sensor disk for sewing motor	Turn the handwheel State change at top and bottom dead centre of needle.

Subitem *Test Auto Input*

Fig. 57: Subitem Test Auto Input



In this subitem you can perform the same tests as in *Test Input*, without needing to select the element beforehand in the display.

To perform an automatic input test:

1. Actuate the element as described in the *Test method* column above.

↳ The display shows the last element to be changed for *Input*. If the element is functional, the display for *Value* changes between *ON* and *OFF*.

Subitem *Test Sew. Motor*

Fig. 58: Subitem Test Sew. Motor

To test the sewing motor:

1. Press **OK**.

↳ The machine is referenced.

2. For *Speed* press ▲/▼ to enter a speed in steps of 50.
3. Press **OK**.

↳ The motor runs at the set speed.

4. Press **ESC** to quit.

Subitem *Test Step Motor*

Fig. 59: Subitem Test Step Motor

This subitem tests the step motors for the sewing feet and transport belts.

To test the stepper motor:

1. Press ▲/▼ in the *Stepper* field to select the motor you want to test:
2. Press **OK**.
3. Press ▲/▼ to test the motor in question.

↳ If the motor is working correctly, the behavior shown in the table can be observed.

Stepper no.	Motor	Behavior for functional motor
1	Upper drive for both transport belts	The belts move.
2	Height of right top transport foot	The height changes.
3	Height of left top transport foot	The height changes.
4	Lower drive for both transport belts	The belts move.

Information

There is no separate test for the step motor encoders. They are tested along with the step motors. If the results for the step motors are OK, the encoders are functional.

Submenu *Calibration*

In this submenu you can sync the transport and sewing feed, or calibrate thread tension.

Subitem *Feed sync.*

In this subitem you can set the synchronous run of the top and bottom transports.

Proper setting

1. Switch off the machine at the main switch.
2. Removing the needle (📖 *Operating instructions*).
3. Switch on the machine at the main switch.
4. Switch to manual mode (📖 *Operating instructions*).
5. Press ◀/▶ to select the parameter *Curve support*.
6. Press ▼ to set 0 as the curve support value.
7. Press the numeric key 0 as the fullness.
8. Place 2 identical sheets of cardboard on top of one another on the fabric support.
9. Press the pedal and observe the cardboard being fed:

↳ Both pieces must stay aligned.

If the pieces of cardboard are not aligned, you must synchronize the top and bottom transport in *Feed sync.* in technician level.

Fig. 60: Subitem Feed sync.

To synchronize the top and bottom transport:

1. Access technical level (📖 *p. 61*).
2. Select the menu item *Service*
3. Select the submenu *Calibration.*
4. Select the subitem *Feed sync.* by pressing **OK**.

↳ An input box with a numeric value appears on the right.

5. Change the value in this field by pressing ▲/▼:
   - **Increase top transport:** Increase value
   - **Reduce top transport:** Reduce value
6. Repeat the test with the pieces of cardboard.
7. Repeat steps 1 to 6 if needed.

Subitem *Foot Calib*

Fig. 61: Subitem Foot Calib

The control unit must know the top and bottom positions of the sewing feet. The top position is sent on switching on the machine.

The bottom position is determined by calibrating in this subitem.

Order

Always calibrate the sewing feet after changing settings on the sewing foot gear (📖 *p. 44*).

To calibrate the sewing feet:

1. Access the subitem *Foot Calib.*
2. Press **OK**.

↳ The machine is calibrated automatically: both sewing feet move up and down once. This completes the calibration.

Subitem *Thread Calib*

Fig. 62: Subitem Thread Calib (1)

In this subitem you can calibrate the thread tensioner.

You need an external tension measuring device for calibration.

Information

The thread tension only needs to be calibrated once. Even after a complete reset (📖 *p. 78*) and after loading new software, (📖 *p. 79*) the values are kept.

The thread tension only needs to be calibrated after changing the control unit.

Calibration points

You must set the calibration points 3 – 1 one after another:

- **Point 3** - maximum tension (300 g)
- **Point 2** - medium tension (150 g)
- **Point 1** - minimum tension (5 g)

Calibration steps

To calibrate the needle thread tension:

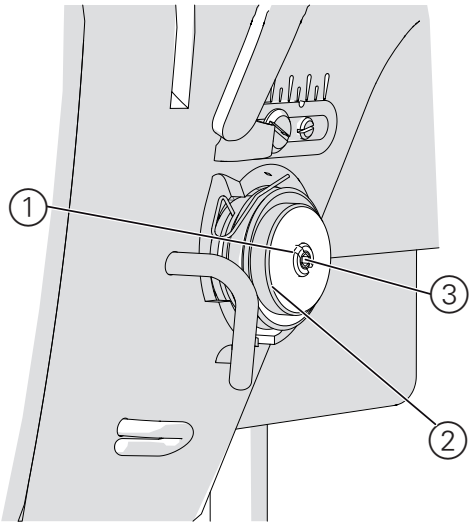
1. Set calibration point 3

1. Thread on up to the thread lever (📖 *Operating instructions*)
2. After the thread lever, thread into the measuring device.
3. Press ▲/▼ to select calibration point 3

Fig. 63: Subitem Thread Calib (2)

4. Press **OK**.

Fig. 64: Unterpunkt Thread Calib (3)



(1) - Adjusting nut
(2) - Tensioning washers
(3) - Grub screw

5. Fully release the grub screw (3) at the centre of the thread tensioner.
6. Turn in the adjusting nut (1) as far as possible without pressing the tensioning washers (2) against each other.
7. Slowly turn the adjusting (1) nut out and monitor the display on the tension measuring device.
8. At the point where the measuring device shows a value of 300 g: tighten the grub screw (3) without changing the position of the adjusting nut (1).
9. Press **OK**.

2. Set calibration point 2

1. Press ▲/▼ to select calibration point 2
2. Press **OK**.
3. Change the thread tension with ▲/▼ until the measuring device reads 150 g.
4. Press **OK**.

3. Set calibration point 1

1. Press ▲/▼ to select calibration point 1
2. Press **OK**.
3. Change the thread tension with ▲/▼ until the measuring device reads 5 g.
4. Press **OK**.

Submenu *Reset*

Fig. 65: Submenu Reset

In this submenu you, you can reset programs or parameters to the factory defaults. For safety reasons, you are first prompted to enter the technician password.

To call the submenu *Reset*:

1. Press ▲/▼ to select the *Reset* submenu.

↳ The display shows the input mask for the password.

2. Enter the technician code 25483 with the numeric keys (📖 *p. 61*).

↳ You are in the *Reset* submenu and can press ▲/▼ to access the desired subitem.

Subitem *Reset programs*

In this subitem, you first delete all your own programs. Only the standard programs are kept, and they are reset to their factory defaults.

To delete all your own programs:

1. Press to select ▲/▼ *Reset programs*.
2. Press **OK**.

↳ All of your own programs are deleted. Only the standard programs are kept, and they are reset to their factory defaults.

Subitem *Reset all*

In this submenu you reset all programs or parameters to the factory defaults.

Only the calibration values for thread tension and the sewing feet are kept.

To reset all programs or parameters to the factory defaults:

1. Press to select ▲/▼ *Reset all*.
2. Press **OK**.

↳ All programs and parameters (except for the calibration values for thread tension and the sewing feet) are reset to the factory defaults.

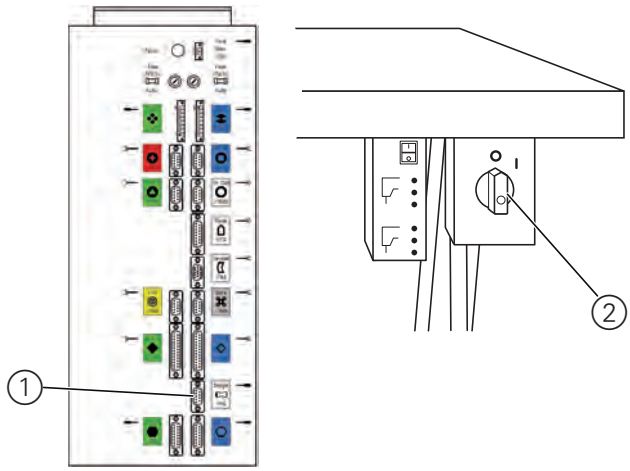
4.4 Installing software with a dongle

When a new software version becomes available, you can download it from www.duerkopp-adler.com and use a dongle to install it. All machine settings are kept.

Information

You can only use the dongle to transfer software. Sewing programs cannot be copied from one machine to another - neither with a dongle nor using a USB stick - instead they must be created again on the machine (📖 *Operating instructions*).

Fig. 66: Installing Software with a dongle (1)



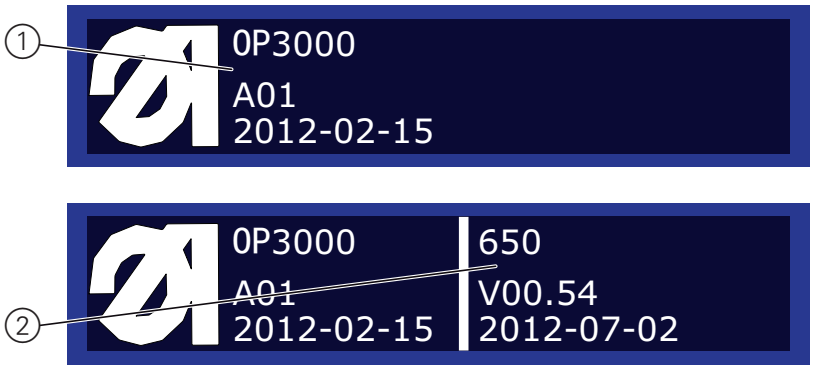
(1) - Connector for Dongle *(2) - Main switch*

To install Software with a dongle:

1. Switch off the machine at the main switch (2).
2. Insert the dongle into the connector (1) on the rear of the control unit.
3. Switch on the machine at the main switch (2).

↳ The machine boots and automatically starts to transfer the software. During this process the display only shows the firmware version for the control panel on the left. Once the transfer has been completed, the display additionally shows the machine software version on the right. The machine is referenced.

Fig. 67: Installing software with a dongle (2)



(1) - Firmware version *(2) - Software version*

4. Remove the dongle.

↳ This completes the software transfer. The machine is ready for sewing.

Behavior in case of a missing software version display

In some cases the machine fails to display the software version on the right side of the display despite completing the transfer.

If no software version appears after 2 minutes:

1. Switch off the machine at the main switch.
2. Remove the dongle.
3. Switch on the machine at the main switch.

↳ Once the transfer has been completed, the display additionally shows the machine software version on the right. The machine is referenced.

↳ The machine is ready for sewing.

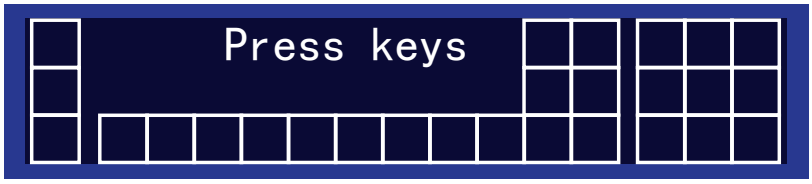
4.5 Checking the key functionality at the control panel

To check the key functionality at the control panel:

1. Switch off the machine at the main switch.
2. Hold down the **ESC** key and switch on the machine at the main switch.

↳ The display shows the following:

Fig. 68: Checking the key functionality at the control panel (1)



3. Press all the keys in the control panel except **ESC** in any order.

↳ If a key is functional, the corresponding field in the display is filled and lit. If the key is not functional the field stays empty.

4. Finally, press the **ESC** key.

   • **If all keys are functional:**

↳ The display shows the following status message:

Fig. 69: Checking the key functionality at the control panel (2)

5. Press **OK**.

   • **If one or more keys are not functional:**

↳ The display shows the following status message: *Keys ... NOT OK!*

↳ The control panel must be replaced.

5 Programming (OP7000)

This chapter describes service settings:

- Presettings for sewing programs and functions
- Basic machine settings
- Advanced machine settings
- Test functions for individual elements in the machine
- Calibration functions
- Resetting the machine

Changes to stitch length, thread tension, curve support, etc. and the calling up and compiling of sewing programs is described in the 🕮 *Operating Instructions*.

5.1 Calling up the Technician level

All settings in the service menu must be carried out at the Technician level.

Important

For safety reasons, the pedal at the Technician level is not active! While you can test the pedal input in the `Multitest` menu item, the sewing motor is not activated by the pedal.

To select the Technician level:

1. Tap the **SERVICE** button.

↳ The input mask for the code appears on the display:

Fig. 70: Calling up the Technician level, input mask

2. Enter the code 25483 using the keypad.

↳ Each time a number is entered, the input cursor will automatically jump to the next position. The numbers are not shown for safety reasons. A 0 appears at the relevant entry point; asterisks are in the other positions.

3. Tap the **OK** button.

After the code is entered, the display shows the menu items at the Technician level:

Fig. 71: Display in service menu

Information

The bar on the right side of the display also gives you access to the menu items *Input/Output Test* and *Create Customer Size Table*.

5.2 Calling up the Technician level from the boot loader

Information

A slimmed-down version of the service menu (*Service on Start*) can be called up from the boot loader.
This service does not require that the motors be operational and will also work if a defective seam program has been loaded.

If an error occurs while the machine is being started, this menu can be used to check and set various functions.

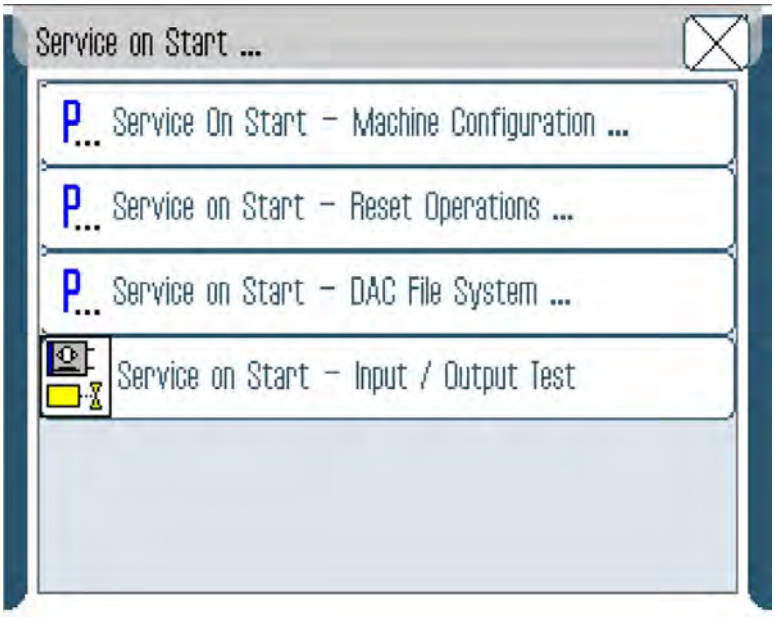
Fig. 72: Calling up the Technician level from the boot loader (1)

To call up the Technician level from the boot loader:

1. Press the **Service** button while the machine is starting up.

↳ The display switches to `Service on Start`.

Fig. 73: Calling up the Technician level from the boot loader (2)

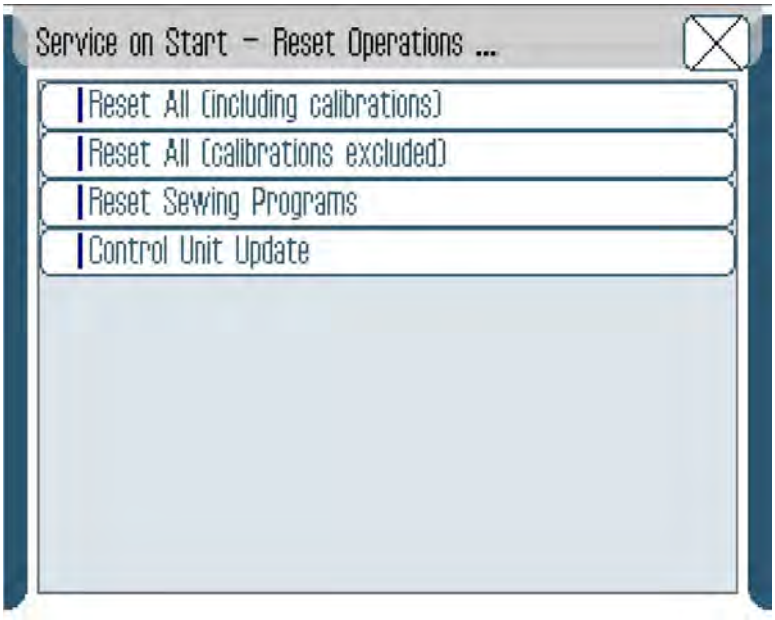


Subitems in the *Service on Start* menu

Entry	
Machine Configuration	📖 *p. 94*
Reset Operations	The subitem *Reset Operations* is different from the subitem that can be called up from the sewing mode on the Technician level. The differences are explained in the table below.
DAC File System	📖 *p. 109*
Input/Output Test	📖 *p. 110*

Reset Operations (*Service on Start*)

Fig. 74: Reset Operations (Service on Start)



Parameters in the menu item *Reset Operations*

Entry	
Reset All (Including calibrations)	The option *Reset All (including calibrations)* is only available in the *Service on Start* menu. This option is used to reset **ALL** settings including all calibrations. You will need to enter the manufacturer's password to continue. The use of this option should be reserved for DA employees (📖 *Customer Service* (📖 *p. 121*))
Reset All (calibrations excluded)	📖 *p. 104*
Reset Sewing Programs	📖 *p. 104*
Control Unit Update	📖 *p. 105*

5.3 Menu items at the Technician level

The following table provides an overview of the structure of the service menu.

Structure of the OP7000 service menu

Menu items					
Menu item	**Numerical**	**Function**	**Subitem**	**Subitem**	**Reference**
Default Program Parameters	1.0	Define presettings which are applicable to all sewing programs			📖 *p. 92*
	1.1		Stitch Length		
	1.2		Curve Intensity		
	1.3		Foot Pressure		
	1.4		Thread Tension		
	1.5		Fullness Top/Bottom		
	1.6		Fullness		
	1.7		Foot Stroke Alternation		
	1.8		Backtack At Start		
	1.9		Backtack At End		
	1.10		Thread Trimmer		
	1.11		Size		
	1.12		Seam Graphic		
	1.13		Grading Factor		
	1.14		Teach Side (L=1/R=2)		

Menu items					
Menu item	**Numerical**	**Function**	**Subitem**	**Subitem**	**Reference**
Machine Configuration	2.0	Define basic machine settings which are applicable to all sewing programs			📖 *p. 94*
	2.1		Backtack At Start		
	2.1.1			Number Of Backtack Repetitions	
	2.1.2			Duration Between Backtack Repetitions	
	2.1.3			Number Stitches Backward	
	2.1.4			Number Stitches Forward	
	2.1.5			Speed	
	2.2		Backtack At End		
	2.2.1			Number Of Backtack Repetitions	
	2.2.2			Duration Between Backtack Repetitions	
	2.2.3			Number Stitches Backward	
	2.2.4			Number Stitches Forward	
	2.2.5			Speed	
	2.3		Thread Trimmer		
	2.3.1			Speed	
	2.3.2			Thread Tension	
	2.3.3			Turn Backward After Trimming	
	2.4		Speed		
	2.4.1			Maximum Speed	
	2.4.2			Positioning Speed	
	2.4.3			Softstart Speed	
	2.4.4			Number Stitches Softstart	

Menu items					
Menu item	**Numerical**	**Function**	**Subitem**	**Subitem**	**Reference**
	2.5		Stop Positions		
	2.5.1			Stop Position After Sewing	
	2.5.2			Stop Position Needle Up	
	2.5.3			Stop Position Needle Down	
	2.6		Foot		
	2.6.1			Foot Lift In Between Seam	
	2.6.2			Foot Lift At Seam End	
	2.6.3			Position Foot Up	
	2.7		Duration Thread Tension After Seam End		
User Configuration	3.0	Define advanced machine settings			🕮 *p. 97*
	3.1		Signal Sound At Segment Change		
	3.2		Side Switch At Seam End		
	3.3		Abort Program At Pedal -2		
	3.4		Mode Second Pedal		
	3.5		Mode Knee Switch		
USB Operations	4.0	Transfer data with a USB key			🕮 *p. 99*
	4.1		Write Active Sewing Program To USB		
	4.2		Read Sewing Program From USB		
	4.3		Write Global Data Of Control Unit To USB		
	4.4		Overwrite Global Data Of Control Unit With USB Data		

Menu items					
Menu item	**Numerical**	**Function**	**Subitem**	**Subitem**	**Reference**
Calibration	5.0	Calibration			📖 *p. 100*
	5.1		Adjust Flat Sewing Top		
	5.2		Feet Difference Calibration		
	5.3		Thread Tension Calibration		
Reset Operations	6.0	Reset data			📖 *p. 103*
	6.1		Reset All (Calibrations excluded)		
	6.2		Reset Sewing Programs		
	6.3		Control Unit Update		
DAC File System	7.0	Clear or show DAC files			
	7.1		Clear DAC File System		
	7.2		Show DAC File System		
Input / Output Test	8.0	Quickly check the input and output elements			📖 *p. 110*
Create Customer Size Table	9.0	Create size tables			

5.4 Menu item *Default Program Parameters*

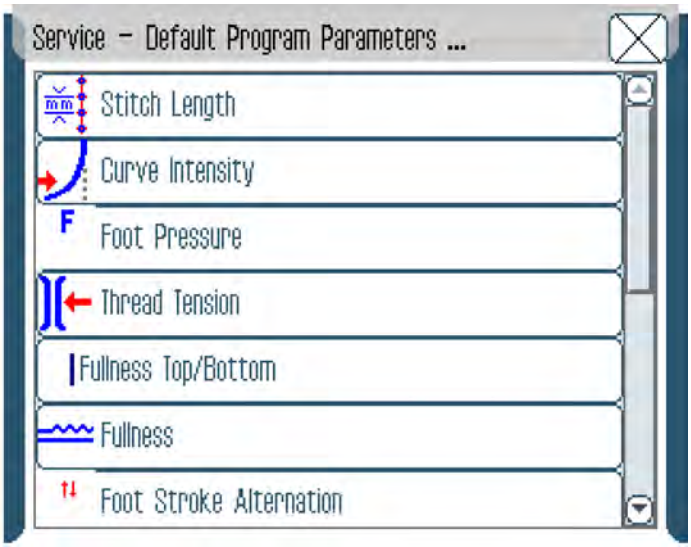
You use the menu item *Default Program Parameters* to define the values that will be preset when a new sewing program is created.

To define the preset values:

1. Select *Default Program Parameters* in the service menu.

↳ The following appears on the display:

Fig. 75: Menu item Default Program Parameters



2. Tap the desired parameter.
3. Enter values that reflect your sewing requirements and can be retained in as many sewing programs as possible in order to make the process of creating new sewing program simple.

Parameters in the menu item *Default Program Parameters*

Icon	Entry	Meaning	Possible value range	Preset value
	Stitch Length	Stitch length	1.0 – 4.0	2.5
	Curve Intensity	Curve support	0 – 6	2
	Foot Pressure	Sewing foot pressure	1 – 10	5
	Thread Tension	Thread tension	1 – 99	40
	Fullness Top/Bottom	Fullness Top/Bottom	1 – 2 1 = top 2 = bottom	1

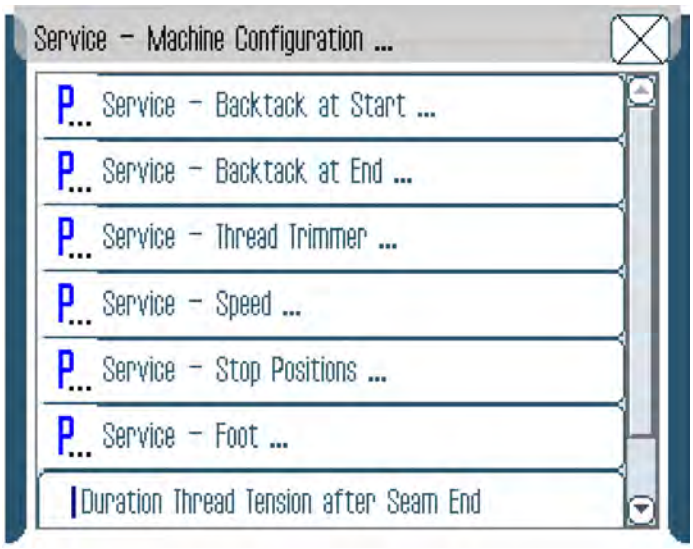
Icon	Entry	Meaning	Possible value range	Preset value
	Fullness	Fullness	0 – 16	0
	**Foot Stroke Alternation**	Alternation: The sewing foot is lifted by this height for each stitch	0 – 2.5	0.0
	**Backtack At Start**	Start bartack	0 – 1	0
	**Backtack At End**	End bartack	0 – 1	0
	**Thread Trimmer**	Thread cutter	0 = off 1 = on	1
	Size	Sewing material size		Germany, France Men
	Seam Graphic	Symbolic seam graphic for work process	0 – 3	1
	Grading Factor	Grading factor as a percentage, increase from size to size	0.0 – 6.0	2.5
	**Teach Side (L=1/R=2)**	Sleeve side which is programmed first	2 = R (start with right sleeve) 1 = L (start with left sleeve)	2

5.5 Menu item *Machine Configuration*

The menu item *Machine Configuration* allows you to determine the basic settings for the machine which apply to all programs.

Machine Configuration has the following subitems:

Fig. 76: Menu item Machine Configuration



The subitems have further subitems (📖 *p. 88*).

5.5.1 *Backtack At Start/End*

In the *Backtack At Start* and *Backtack At End* subitems, you can define how the start and end bartack are sewn.

Parameters in *Backtack At Start/End* subitem

Entry	Meaning	Possible value range	Preset value
Number Of Backtack Repetitions	Number of repetitions per bartack	1 – 10	2
Duration Between Backtack Repetitions	Waiting time when switching between forward and backward stitch	0 – 1000	0
Number Stitches Backward	Number of backward stitches per bartack	1 – 50	3
Number Stitches Forward	Number of forward stitches per bartack	1 – 50	3
Speed	Speed when sewing the bartack	50 – 2000	1000

5.5.2 *Thread Trimmer*

In the *Thread Trimmer* subitem, you can define the settings for cutting the thread.

Parameters in the *Thread Trimmer* subitem

Entry	Meaning	Possible value range	Preset value
Speed	Speed when cutting the thread in min^{-1}	50 – 250	180
Thread Tension At Needle	Needle thread tension when cutting the thread in %	1 – 50	10
Turn Backward After Trimming	Automatic reversal after cutting the thread	0 = off 1 = on	1

5.5.3 *Speed*

In the *Speed* subitem, you can define the speed in certain situations.

Parameters in the *Speed* subitem

Entry	Meaning	Possible value range	Preset value
Maximum Speed	Maximum speed when fully stepping on the pedal in min^{-1}	500 – 4000	4000
Positioning Speed	Speed when positioning in min^{-1}	10 – 700	400
Softstart Speed	Speed on soft start in min^{-1}	10 – 1000	500
Number Stitches Softstart	Number of soft start stitches	0 – 10	1

5.5.4 *Stop Positions*

In the *Stop Positions* subitem, you can determine the position of the needle when sewing stops.

Parameters in the *Stop Positions* subitem

Entry	Meaning	Possible value range	Preset value
Stop Position After Sewing	Handwheel position after sewing (needle raised) in °	0 – 359	35
Stop Position Needle Up	Handwheel position in the needle's upper idle position when sewing stops in °	0 – 359	0
Stop Position Needle Down	Handwheel position in the needle's lower idle position when sewing stops in °	0 – 359	130

5.5.5 *Foot*

Parameters in the *Foot* subitem

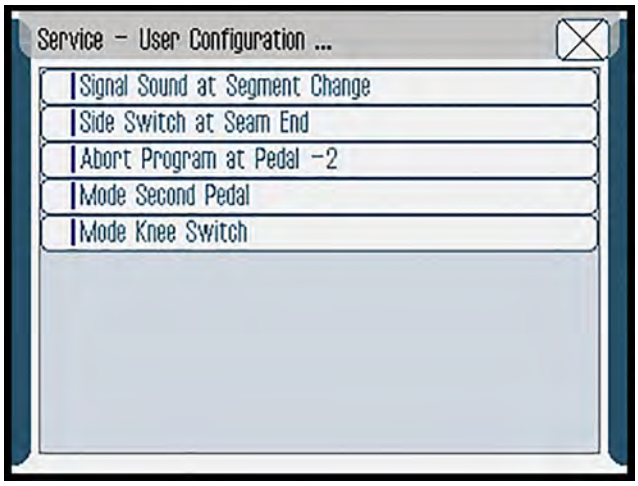
Entry	Meaning	Possible value range	Preset value
Foot Lift In Between Seam	Sewing foot lifting in the seam	0 = off 1 = on	35
Foot Lift At Seam End	Sewing foot lifting at the seam end (after cutting the thread)	0 = off 1 = on	0
Position Foot Up	Sewing foot position when raised	5 – 14	12

5.6 Menu item *User configuration*

The menu item *User Configuration* allows you to define user-specific machine settings.

User Configuration has the following subitems:

Fig. 77: Menu item User Configuration



Parameters in the menu item *User Configuration*

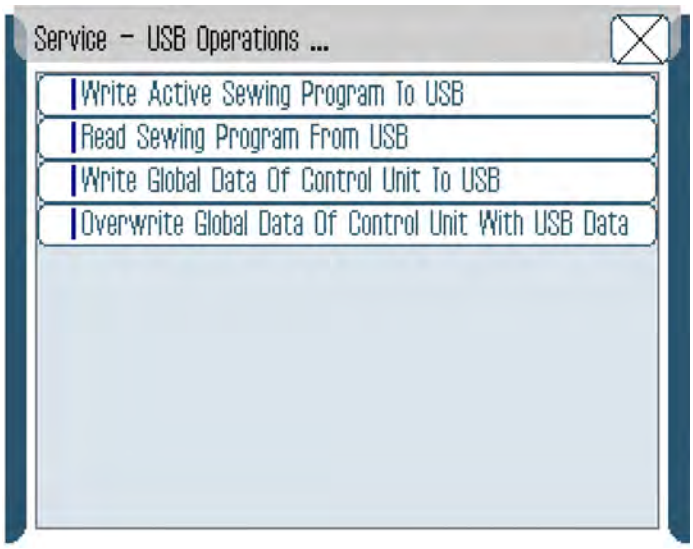
Entry	Meaning	Possible value range	Preset value
Signal Sound At Segment Change	Signal tone when transitioning between program steps	**0** = off **1** = on	1
Side Switch At Seam End	Automatic change of side between right/left at seam end	**0** = off **1** = on	1
Abort Program At Pedal -2	Program termination with main pedal	**0** = off **1** = on	1
Mode Second Pedal	Function of the optional additional pedal	**0** = Additional pedal without function **1** = Modification of fullness **2** = Modification of curve support **6** = Fullness -2 – 7 **7** = Fullness -2 – 16	1
Mode Knee Switch	Function of knee button	**1** = Segment/step progression up to the last segment **2** = Segment/step progression; return to 1 after the last segment	1

5.7 Menu item *USB Operations*

The menu item *USB Operations* allows you to save or load sewing data to or from a USB key.

USB Operations has the following subitems:

Fig. 78: Menu item USB Operations



Parameters in the menu item *USB operations*

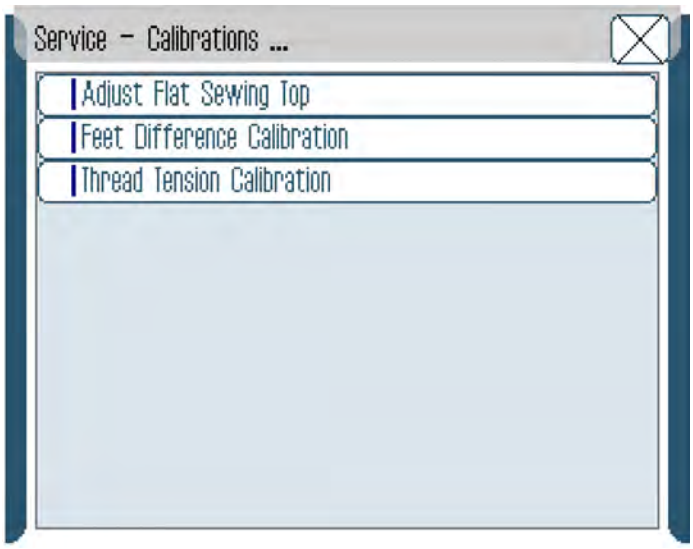
Entry	Meaning
Write Active Sewing Program To USB	Save active sewing program on the USB key
Read Sewing Program From USB	Load sewing program from USB key
Write Global Data Of Control Unit To USB	Transfers all files to a USB key
Overwrite Global Data Of Control Unit With USB Data	Transfer all data from USB key

5.8 Menu item *Calibration*

In the *Calibration* menu item, you can calibrate the machine.

Calibration has the following subitems:

Fig. 79: Menu item Calibration



Parameters in the menu item *Calibration*

Entry	Meaning
Adjust Flat Sewing Top	Correction of differential top feed in %
Feet Difference Calibration	Calibrate values for the sewing feet
Thread Tension Calibration	Calibrate electrical thread tension

5.8.1 *Adjust Flat Sewing Top*

The *Adjust Flat Sewing Top* subitem allows you to correct the upper transport differential as a percentage (-50 – +50). Correction is required after you have changed the conveyor belts (📖 *p. 36*).

To correct the upper transport differential as follows:

1. Change values for the differential top feed with +/-1 or +/-10.
2. Change to manual mode MAN (📖 *Operating Instructions*).
3. Set fullness = 0 and stitch length = 2.
4. Allow 2 PTFE strips to run through with the fabric side outwards. The strips should be fed without offset.

If the strips are not fed without offset, repeat handling steps.

5.8.2 *Feet Difference Calibration*

In the *Feet Difference Calibration* subitem, the values for the sewing feet are automatically calibrated.

5.8.3 *Thread Tension Calibration*

In the *Thread Tension Calibration* subitem, you can calibrate the needle thread tension.

Important

The needle thread tension only needs to be calibrated once! Even after a complete reset (📖 *p. 103*) and after software updates (📖 *p. 105*), the values remain the same.

The needle thread tension only needs to be recalibrated after changing the control.

Prerequisite: An external thread tension measurement device is available, and the calibration is performed with a thread with a thickness of 120.

Order

Set the following 3 calibration positions one after the other for the needle thread:

- **Position 3** – maximum tension (300 g)
- **Position 2** – medium tension (150 g)
- **Position 1** – minimum tension (5 g)

Calibration steps

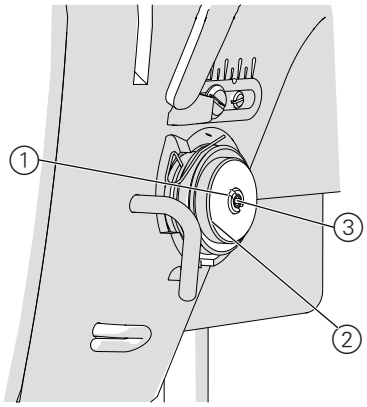
To set calibration position 3:

1. Insert the thread and guide it up to the thread lever (📖 *Operating Instructions, Threading needle thread*).
2. After the thread lever, feed the thread into the thread tension measurement device.
3. Select *Tension Top 300g*.
4. Press *On/Off*.

↳ The tension element is closed.

5. Measure the tension value. It must be at 300 g.

Fig. 80: Thread Tension Calibration



(1) - Adjusting nut
(2) - Tension disks
(3) - Threaded pin

If it is not at 300 g, correct as follows:

6. Loosen the threaded pin (3).
7. Press `On/Off`.
8. The tension element opens.
9. Very gently turn the adjusting nut (1):
   - Turn clockwise = reduce value
   - Turn counterclockwise = increase value
10. Select `Tension Top 300g` again.
11. Press `On/Off` and measure the tension value.
12. At the point at which the thread tension measurement device displays a value of 300 g:
    Tighten the threaded pin (3) without changing the position of the adjusting nut (1).
13. Press `On/Off`.

↳ The tension element opens.

To set calibration position 2:

1. Select `Tension Top 150g`.
2. Change the thread tension with +/-1 or +/-10, until the thread tension measurement device displays 150 g.
3. Exit the menu item.

To set calibration position 1:

1. Select `Tension Top 5g`.
2. Change the thread tension with +/-1 or +/-10, until the thread tension measurement device displays a value.
3. Exit the menu item.

5.9 Menu item *Reset Operations*

The menu item *Reset Operations* allows you to reset sewing programs and parameters to the delivery state. To do this, re-entering the code is requested (for reasons of security).

To select the menu item:

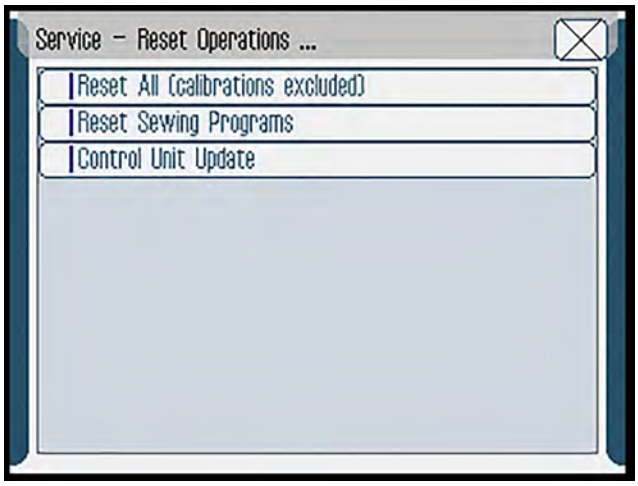
1. Select *Reset? Operations* in the service menu.

↳ The input mask for the code appears on the display.

2. Enter the code 25483 using the keypad.

↳ *Reset Operations* has the following subitems:

Fig. 81: Menu item Reset Operations



Parameters in the menu item *Reset Operations*

Entry	Meaning
Reset All (calibrations excluded)	Reset to factory defaults (except calibrations)
Reset Sewing Programs	Reset sewing programs
Control Unit Update	Perform control unit update

5.9.1 *Reset All*

In the *Reset All* subitem, you can reset all sewing programs and parameters to the delivery state.

Only the calibration values for the thread tension and sewing feet are retained.

To reset all sewing programs and parameters:

1. Press *Reset All*.

↳ All sewing programs and parameters (except for the calibration values for the thread tension and sewing feet) will be reset to their delivery state.

5.9.2 *Reset Sewing Programs*

In the *Reset Sewing Programs* subitem, you can delete all the sewing programs you have created yourself.
Only the standard programs are retained and are returned to their delivery state.

To delete all the sewing programs you have created yourself:

1. Press *Reset Sewing Programs*.

↳ All the sewing programs you have created yourself will be deleted. The standard programs will be returned to their delivery state.

5.9.3 *Control Unit Update*

In the *Control Unit Update* subitem, you start the update of the control.

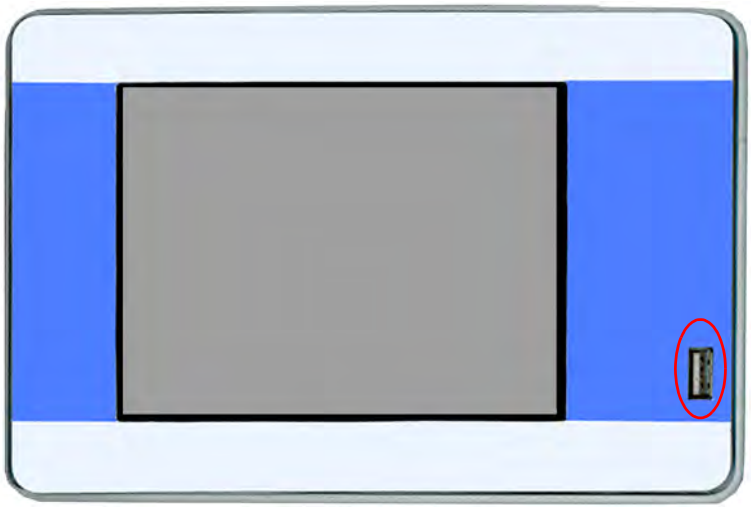
Fig. 82: Control Unit Update (1)

(1) - Control
(2) - USB key
(3) - USB port
(4) - LEDs

To perform the software update:

1. The machine-specific update can be requested by emailing service@duerkopp-adler.com.
   The file is named, for example:
   9899_65000_700_A0*._YYYY_MM_DD.jcbi**
2. Copy the update file to a blank Dürkopp Adler USB key (part number 9835 301003).

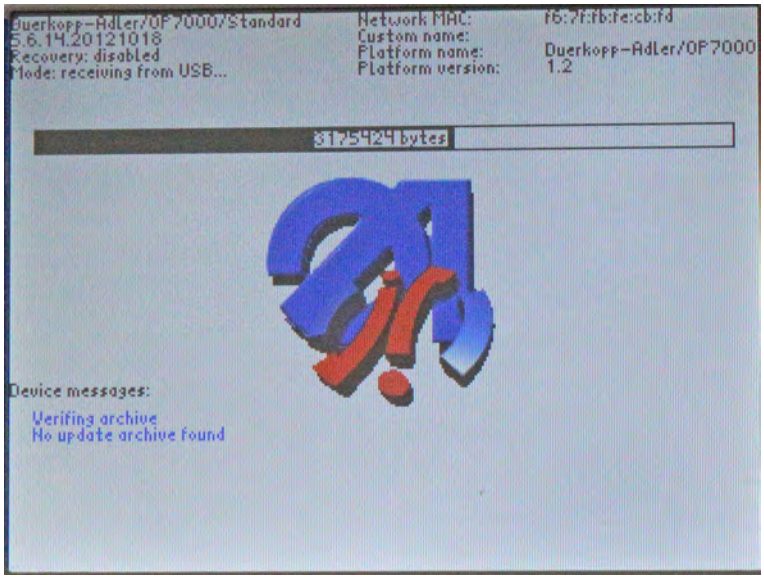
Fig. 83: Control Unit Update (2)



3. Switch off the machine and wait for approx. 15 seconds.
4. Connect the Dürkopp Adler USB key to the OP7000.
5. Restart the machine.

↳ The OP7000 detects the USB key and updates the control panel software.

Fig. 84: Control Unit Update (3)



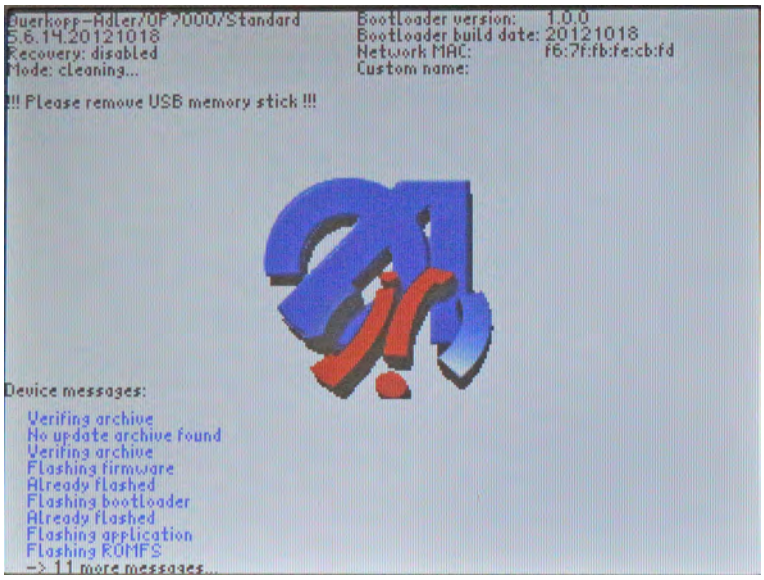
↳ The update will take approx. 2 minutes.

Important

Do not switch off the machine while the update is in progress!

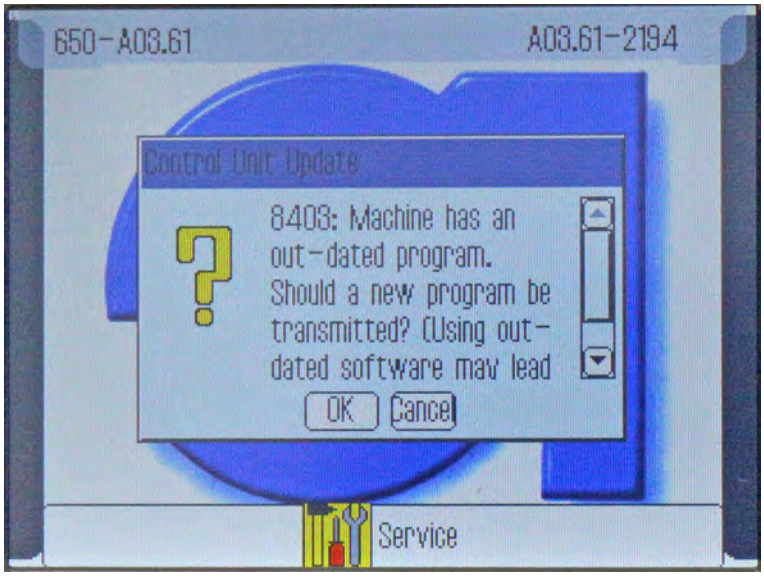
↳ Remove the USB key when prompted to do so:

Fig. 85: Control Unit Update (4)



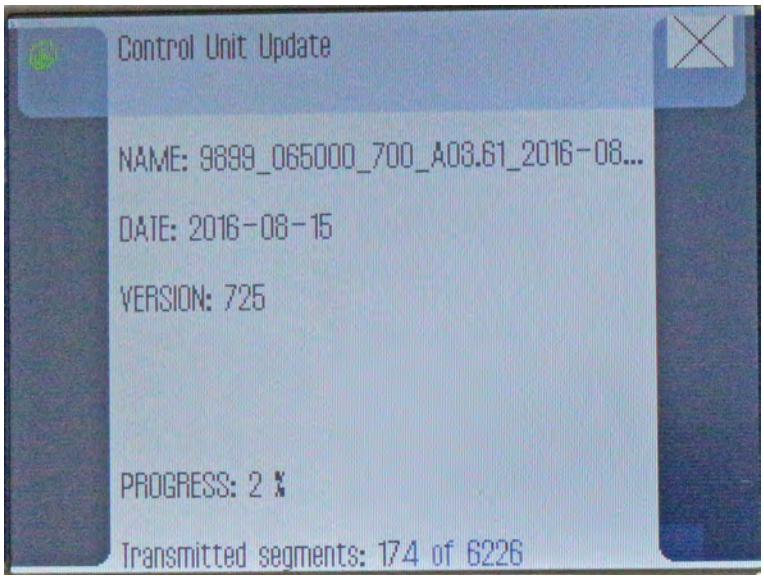
- The machine restarts automatically.
- The display shows notice 8403: *Machine has an outdated program. Should a new program be transmitted?*

Fig. 86: Control Unit Update (5)



6. Confirm with **OK**.
- The update is carried out.

Fig. 87: Control Unit Update (6)

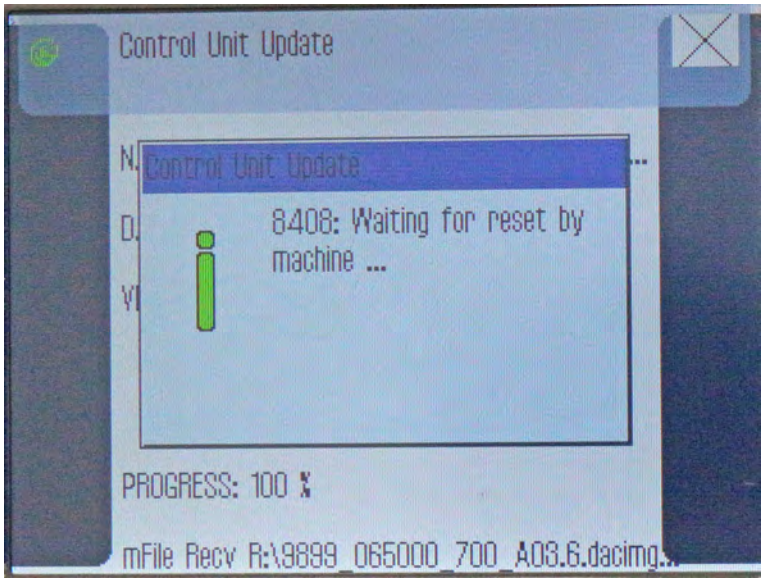


Important

Do not switch off the machine while the update is in progress!

↳ The display shows notice 8408: *Waiting for Reset by machine* ...

Fig. 88: Control Unit Update (7)



↳ The machine restarts automatically.
After restarting, the machine loads the start screen.

Information

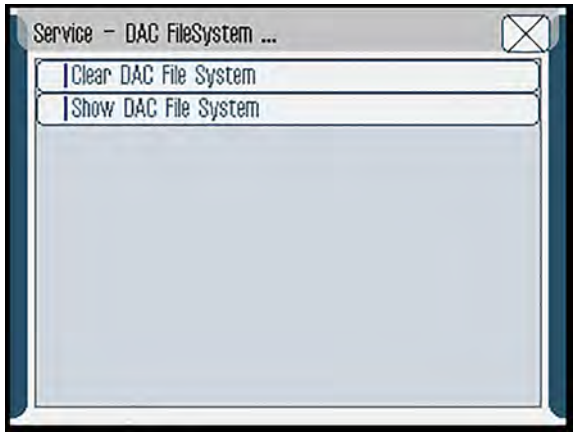
If the machine does not restart automatically, switch the machine off and back on again

5.10 *DAC File System*

In the *DAC File System* menu item, you can delete and display individual size tables.

DAC File System has the following subitems:

Fig. 89: Menu item DAC File System



Parameters in the DAC File System menu item

Entry	Meaning
Clear DAC File System	Delete all individual size tables
Show DAC File System	Display all individual size tables

Clear DAC File System

Delete all individual size tables in the *Clear DAC File System* subitem.

To delete all individual size tables:

1. Tap *Clear DAC File System*.

↳ A display opens including a prompt asking whether all files are supposed to be deleted (**Yes**/**No**).

2. Tap the **YES** button.

↳ All files are deleted.
The size tables are reset to the preset values.

Information

When deleted, the individual size tables are reset to the default size tables. While the seam programs will still work after a reset, the stored size tables will no longer be the individual size tables, but the default size tables.

5.11 *Test Input / Output*

In the menu item *Test Input / Output*, you can test whether certain elements are functioning.

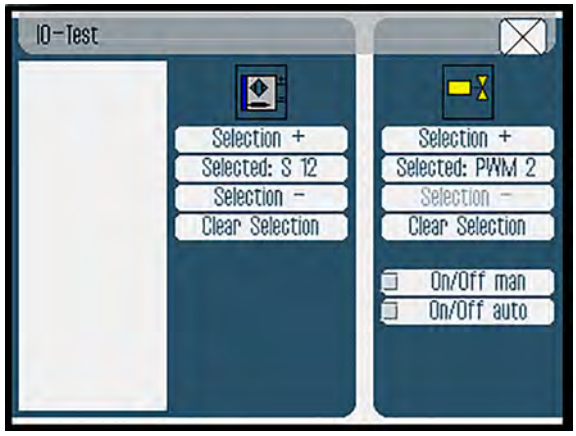
WARNING

Risk of injury from moving, cutting and sharp parts!

Crushing, cutting and punctures are possible.

Exercise the utmost caution when performing tests when the machine is running.

Fig. 90: Test Input/Output



Input elements

Input	
IN 5-8	Pedal
IN 9-10	Knee button
IN 13-16	Additional pedal

Output elements

Output	
PWM 2	Thread cutter
PWM 4	Thread tension

5.12 *Create Customer Size Table*

You can use the *Create Customer Size Table* menu item to create individual size tables.

You can create 5 different size tables.

Important

Just as the table index and the size index, the number of the size table is part of the seam program. If seam programs based on individual size tables are replaced within the company, it must be ensured that

- all machines contain the size tables required
- the same size tables are stored under the same number throughout the company

To create an individual size table:

1. Tap *Create Customer Size Table*.

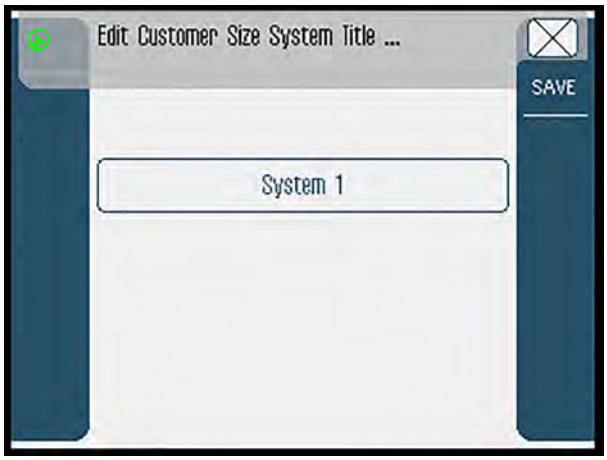
↳ The display switches to:

Fig. 91: Create Customer Size Table (1)

2. Tap one of the 5 systems.

↳ The display switches to:

Fig. 92: Create Customer Size Table (2)



3. Tap the **System X** button.
4. Enter a name for the new table.
5. Tap the **SAVE** button.

↳ The display switches to:

Fig. 93: Create Customer Size Table (3)

6. Enter the desired values into the individual fields.
   You can enter a string (up to 5 characters in length) for each of the 20 size indices.
   Names and strings can be changed at a later time.
7. Tap the **SAVE** button to save the settings.

↳ The display switches to the main screen.

Information

The saved size tables can be called up under `Show DAC File System` (📖 *p. 109*).

6 Maintenance

WARNING

Risk of injury from sharp parts!

Punctures and cutting possible.

Prior to any maintenance work, switch off the machine or set the machine to threading mode.

WARNING

Risk of injury from moving parts!

Crushing possible.

Prior to any maintenance work, switch off the machine or set the machine to threading mode.

This chapter describes maintenance work that needs to be carried out on a regular basis to extend the service life of the machine and achieve the desired seam quality.

Maintenance intervals

Work to be carried out	Operating hours			
	8	40	160	500
Removing lint and thread remnants	●			
Clean engine fan filter	●			
Check the upper and lower conveyor belts for wear		●		
Check sewing foot for wear		●		
Lubricate the joints on the gear				●
Lubricating the needle bar				●

6.1 Cleaning

WARNING

Risk of injury from flying particles!

Flying particles can enter the eyes, causing injury.

Wear safety goggles.
Hold the compressed air gun so that the particles do not fly close to people.
Make sure no particles fly into the oil pan.

NOTICE

Property damage from soiling!

Lint and thread remnants can impair the operation of the machine.

Clean the machine as described.

NOTICE

Property damage from solvent-based cleaners!

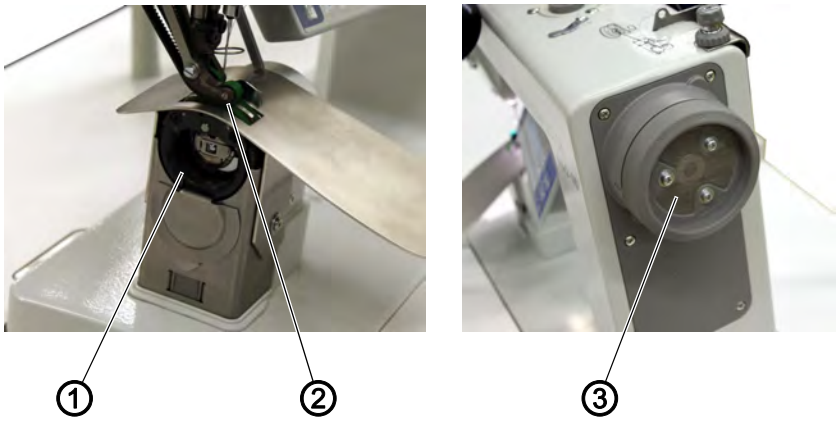
Solvent-based cleaners will damage paintwork.

Use only solvent-free substances for cleaning.

The following areas must be cleaned with a compressed air pistol or a brush:

- Throat plate (2)
- Hook (1)
- Bobbin housing and interior
- Thread trimmer
- Needle
- Engine fan filter (3)

Abb. 94: Cleaning



(1) - Area around the hook
(2) - Area around the throat plate
(3) - Engine fan filter on handwheel

To clean the machine:

1. Remove any lint and thread remnants using a compressed air pistol or a brush.

6.2 Lubricating

CAUTION

Risk of injury from contact with oil!

Oil can cause a rash if it comes into contact with skin.

Avoid skin contact with oil.
If oil has come into contact with your skin, wash the affected areas thoroughly.

NOTICE

Property damage from incorrect oil!

Incorrect oil types can result in damage to the machine.

Only use oil that complies with the data in the instructions.

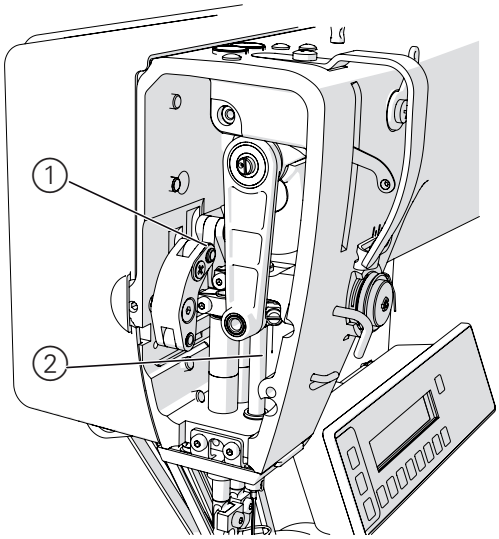
CAUTION

Risk of environmental damage from oil!

Oil is a pollutant and must not enter the sewage system or the soil.

Carefully collect up used oil.
Dispose of used oil and oily machine parts in accordance with national regulations.

Abb. 95: Lubricating



(1) - Joint on the gear *(2) - Needle bar*

To lubricate the machine:

1. Lubricate the following areas on the machine top section with lubricating grease:
   - Joints on the gear
   - Needle bar

6.3 Parts list

A parts list can be ordered from Dürkopp Adler. Or visit our website for further information at:

www.duerkopp-adler.com

7 Decommissioning

WARNING

Risk of injury from a lack of care!

Serious injuries may occur.

ONLY clean the machine when it is switched off.
Allow ONLY trained personnel to disconnect the machine.

CAUTION

Risk of injury from contact with oil!

Oil can cause a rash if it comes into contact with skin.

Avoid skin contact with oil.
If oil has come into contact with your skin, wash the affected areas thoroughly.

To decommission the machine:

1. Switch off the machine
2. Unplug the power plug.
3. If applicable, disconnect the machine from the compressed air supply.
4. Remove residual oil from the oil pan using a cloth.
5. Cover the control panel to protect it from soiling.
6. Cover the control to protect it from soiling.
7. Cover the entire machine if possible to protect it from contamination and damage.

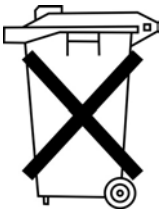
8 Disposal

CAUTION

Risk of environmental damage from improper disposal!

Improper disposal of the machine can result in serious environmental damage.

ALWAYS comply with the national regulations regarding disposal.



The machine must not be disposed of in the normal household waste.

The machine must be disposed of in a suitable manner in accordance with all applicable national regulations.

When disposing of the machine, be aware that it consists of a range of different materials (steel, plastic, electronic components, etc.). Follow the national regulations when disposing these materials.

9 Troubleshooting

9.1 Customer Service

Contact for repairs and issues with the machine:

Dürkopp Adler AG

Potsdamer Str. 190
33719 Bielefeld, Germany

Tel. +49 (0) 180 5 383 756
Fax +49 (0) 521 925 2594
Email: service@duerkopp-adler.com
Internet: www.duerkopp-adler.com

9.2 Messages of the software

Please contact customer service if an error occurs that is not described here. Do not attempt to correct the error yourself.

Code	Possible causes	Remedial action
1051	Sewing motor timeout: • Cable to sewing motor reference switch defective • Reference switch defective	• Replace the cable • Replace the reference switch
1052	Sewing motor overcurrent: • Sewing motor cable defective • Sewing motor defective • Controller defective	• Replace the sewing motor cable • Replace the sewing motor • Replace the control
1053	Sewing motor overvoltage	• Check the mains voltage
1055	Sewing motor overload (I^2T): • Sewing motor not moving freely or blocked • Sewing motor defective • Controller defective	• Remove the cause of the stiff movement or blockage • Replace the sewing motor • Replace the control
1056	Sewing motor overtemperature: • Sewing motor not moving freely • Sewing motor defective • Controller defective	• Correct the cause of not moving freely • Replace the sewing motor • Replace the control

Code	Possible causes	Remedial action
1058	Sewing motor speed greater than setpoint: • Reference switch defective • Sewing motor defective	• Replace the reference switch • Replace the sewing motor
1062	Sewing motor fault (IDMA auto increment)	• Switch the machine off and on again
1302	Sewing motor current error: • Sewing motor blocked • Encoder cable not connected or defective • Encoder defective	• Remove the blockage • Check the encoder cable and replace, if necessary • Replace the sewing motor
1342 - 1344	Sewing motor error • internal error	• switch off an on the machine • perform a software update • contact customer service
1410	Sewing motor: Thread cutting speed not achieved • Encoder defective • Sewing motor defective	• Switch off and on the machine • replace the encoder • replace the sewing motor
1411	Sewing motor: Thread cutting position not achieved	• switch off an on the machine • perform a software update • contact customer service
1412	Sewing motor: Stop position after backing not achieved	• switch off an on the machine • perform a software update • contact customer service
1420	Sewing motor current error • Sewing motor blocked • Encoder cable not connected or defective • Encoder defective	• Remove the blockage • Check the encoder cable and replace, if necessary • Replace the sewing motor
1421	Sewing motor timeout • Cable to the sewing motor reference switch defective • Reference switch defective	• Replace cable • Replace reference switch (part number 9815 935006)
1430	Sewing motor: positioning speed not achieved • Encoder defective • Sewing motor defective	• Switch off and on the machine • Replace encoder • Replace sewing motor • Contact customer service
1431	Sewing motor stop position • stop position not achieved or exceeded	• Reduce positioning speed • Perform a software update
1450	Internal sewing motor error	• Switch off and on the machine • Perform a software update • Replace the control (part number 9850 650002) • Contact customer service
1498 - 1499	Internal sewing motor error	• Switch off and on the machine • Perform a software update • Replace the control (part number 9850 650002) • Contact customer service

Code	Possible causes	Remedial action
2102	X-axis stepper motor: • Stepper motor not moving freely or blocked • Encoder cable not connected or defective • Stepper motor cable not connected or defective • Encoder defective • Stepper motor defective	• Remove the cause of the stiff movement or blockage • Check the encoder cable and replace, if necessary • Replace the encoder If the stepper motor is not supplied with current: • Check the stepper motor cable and replace, if necessary • Replace the stepper motor
2103	X-axis stepper motor step losses: • Stiff mechanical movement or blockage	• Remove the cause of the stiff mechanical movement or blockage
2152	X-axis stepper motor overcurrent	• Replace the stepper motor
2153	Excess voltage	• Check the mains voltage
2155	X-axis stepper motor overload (I^2T): • Stepper motor not moving freely or blocked • Stepper motor defective • Controller defective	• Remove the blockage or the cause of the stiff movement • Replace the stepper motor • Replace the control
2156	X-axis stepper motor: • Stepper motor not moving freely • Stepper motor defective • Controller defective	• Correct the cause of not moving freely • Replace the stepper motor • Replace the control
2162	X-axis stepper motor fault (IDMA auto increment)	• Switch the machine off and on again
2171	Watchdog	• Switch the machine off and on again • Perform a software update • Contact customer service
2551	Communication with additional control • no signal	• Check/replace cable • replace additional control (part number 9850 650001) • Replace control (part number 9850 650002)
3100 - 3103	Machine voltage error • brief voltage drop	• Check the voltage • Stabilize the voltage
3107	Control: temperature excess • vent closed • ventilation grilles dirty • ambient temperature too high	• Check the vent • Clean the ventilation grilles • Let the control cool down
3110	Thread tension magnet not connected	• Connect the thread tension magnet
4202	Communication with memory card • no access to the memory card in the control	• Format/replace the memory card

Code	Possible causes	Remedial action
4440 – 4459	OP3000 control panel: Internal error	• Switch the machine off and on again • Perform a software update • Replace the control panel
6000 – 6299	Interner Error	• Switch the machine off and on again • Perform a software update • Contact customer service
6351 – 6354	Controller defective (I²C)	• Replace the control
6400 – 6999	Internal error	• Switch the machine off and on again • Perform a software update • Contact customer service
7551 – 7659	• Interner Fehler • Cable fault • Cables to the control panel interface defective	• Switch the machine off and on again • Eliminate source of disturbance • Perform a software update • Replace the cable • Contact customer service
8151 - 8161	IDMA error • internal error • disturbance • control defective	• Switch the machine off and on again • Perform a software update • Replace the control
8251 - 8258	Error at ADSP booting or booting • internal error • disturbance	• Switch the machine off and on again • Perform a software update • Contact customer service
9110	Communication with pedal • pedal not in rest position • setpoint generator defective	• do not press the pedal when starting the machine • replace the setpoint generator (part number 9800 330012)
9210	Thread tension: initialization error • plug 120t at DAC3 or X502 not connected or defective • wire 120t-L021A defective • distributor board defective	• Check/replace plug and wire • Replace distributor board (part number 9850 650000)
9220	Communication with electronic thread tension • thread tension magnet defective • plug from distributor board to thread tension magnet not connected oder defective or wire defective • plug 140t to DAC3 oder X502 not connected or defective • wire X140t-L023 defective • distributor board defective	• Check/replace plugs and wires • Replace thread tension (part number 0650 110094) • Replace distributor board (part number 9850 650000)

9.3 Errors in sewing process

Error	Possible causes	Remedial action
Unthreading at seam beginning	Needle thread tension is too firm	Check needle thread tension
Thread breaking	Needle thread and hook thread have not been threaded correctly	Check threading path
	Needle is bent or sharp-edged	Replace the needle
	Needle is not inserted correctly into the needle bar	Insert the needle correctly into the needle bar
	The thread used is unsuitable	Use recommended thread
	Thread tensions are too tight for the thread used	Check thread tensions
	Thread-guiding parts, such as thread tube, thread guide or thread take-up disk, are sharp-edged	Check threading path
	Throat plate, hook or spread have been damaged by the needle	Have parts reworked by qualified specialists
Missing stitches	Needle thread and hook thread have not been threaded correctly	Check threading path
	Needle is blunt or bent	Replace the needle
	Needle is not inserted correctly into the needle bar	Insert the needle correctly into the needle bar
	The needle thickness used is unsuitable	Use recommended needle thickness
	The reel stand is installed incorrectly	Check the assembly of the reel stand
	Thread tensions are too tight	Check thread tensions
	Throat plate, hook or spread have been damaged by the needle	Have parts reworked by qualified specialists

Error	Possible causes	Remedial action
Loose stitches	Thread tensions are not adjusted to the sewing material, the sewing material thickness or the thread used	Check thread tensions
	Needle thread and hook thread have not been threaded correctly	Check threading path
Needle breakage	Needle thickness is unsuitable for the sewing material or the thread	Use recommended needle thickness

10 Technical data

Noise emission

Workplace-specific emission value as per DIN EN ISO 10821:

L_{pA} = 79 dB (A); K_{pA} = 0,83 dB (A)

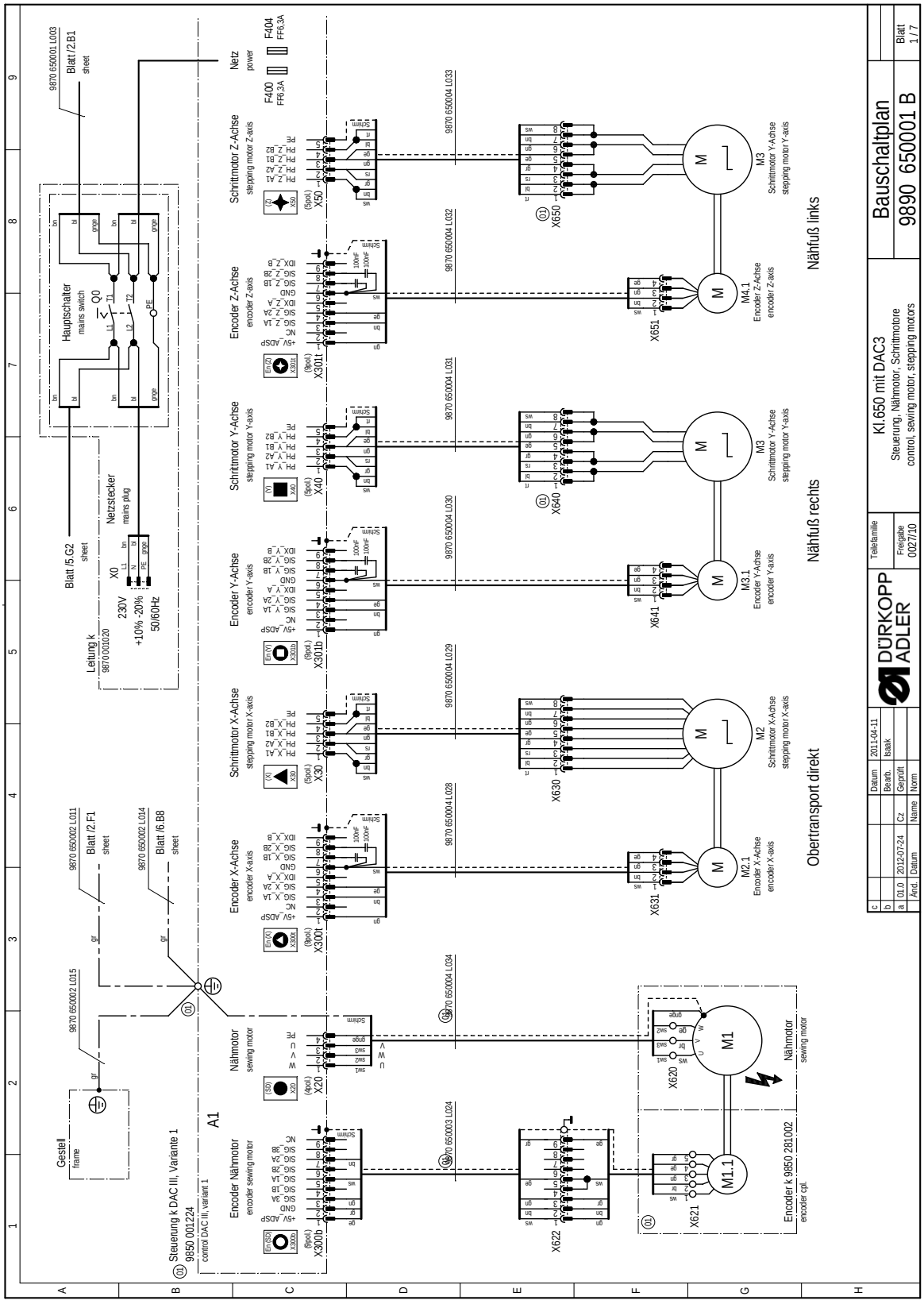
- Stitch length: 3,0 mm
- Speed: 2900 rpm
- Sewing material: 2-layer material G1 DIN 23328

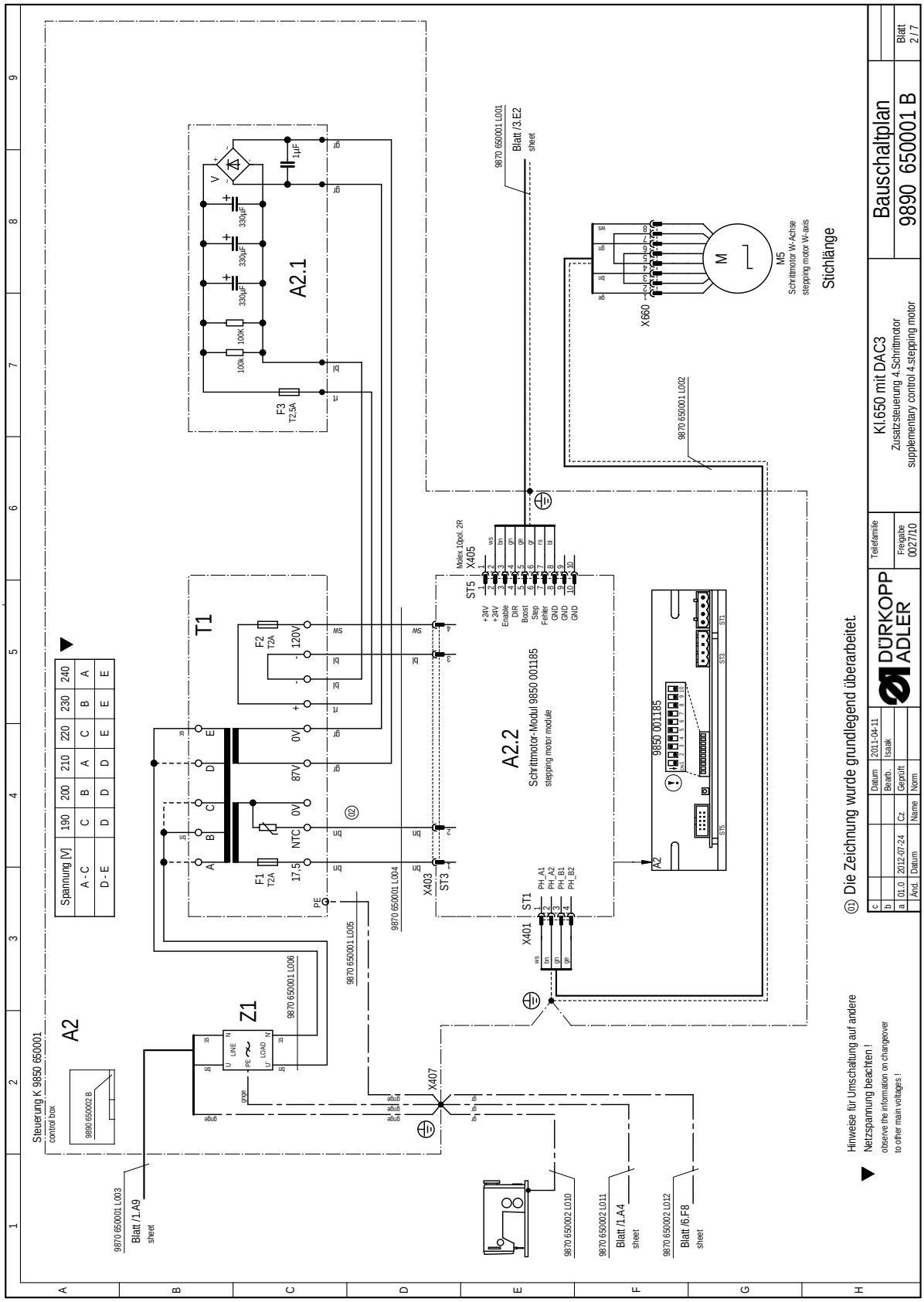
Data and characteristic values

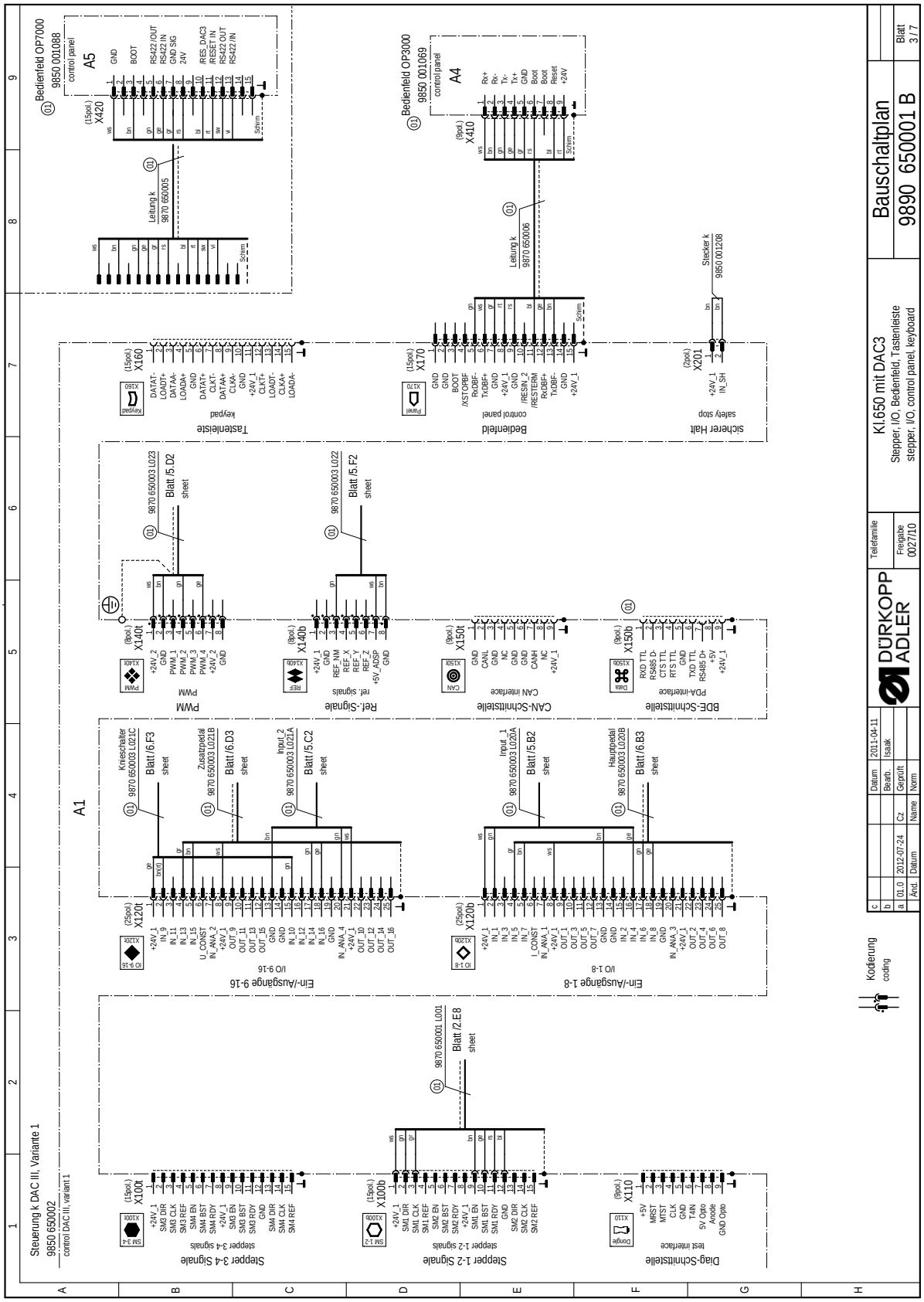
Technical data	Unit	650-16
Type of stitches		301
Hook type		Horizontal hook, oil free
Number of needles		1
Needle system		134-35
Needle strength	[Nm]	70 - 120
Thread strength	[Nm]	max. 50/3
Stitch length	[mm]	1,0 - 4,0
Speed maximum	[min^{-1}]	4000
Mains voltage	[V]	1x230
Mains frequency	[Hz]	50
Length	[mm]	750
Width	[mm]	1320
Height	[mm]	1300
Weight	[kg]	115

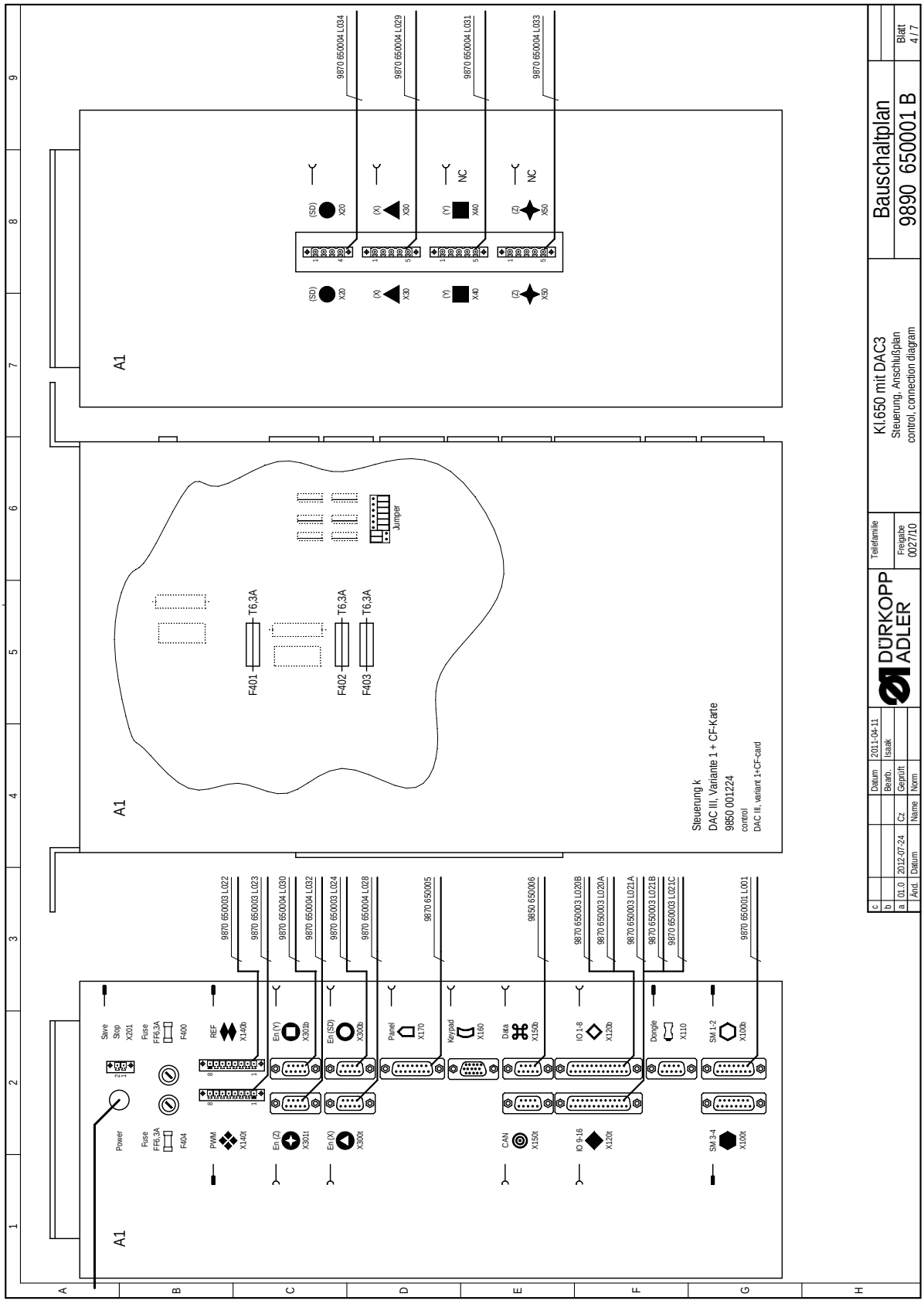
11 Appendix

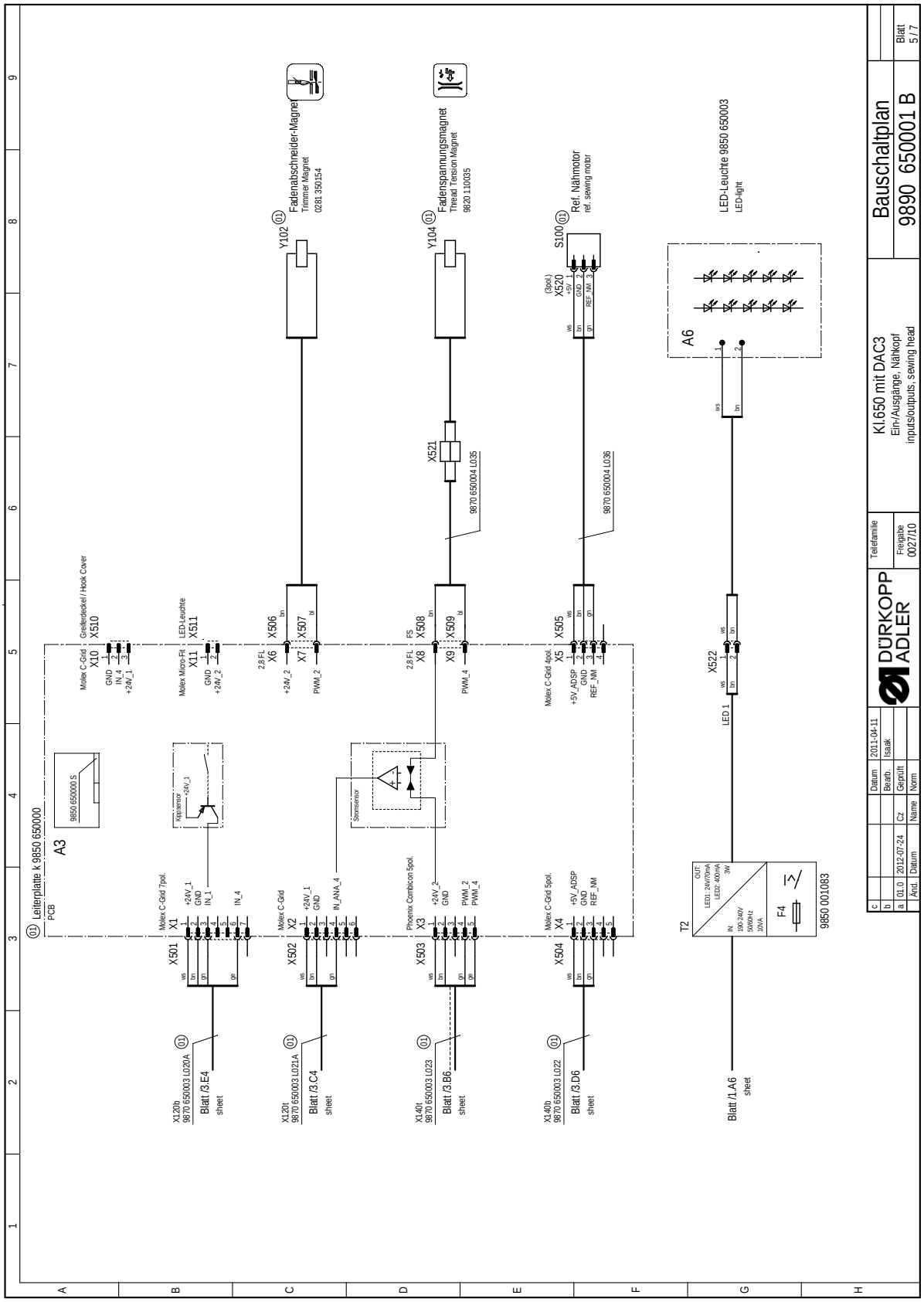
Wiring diagram

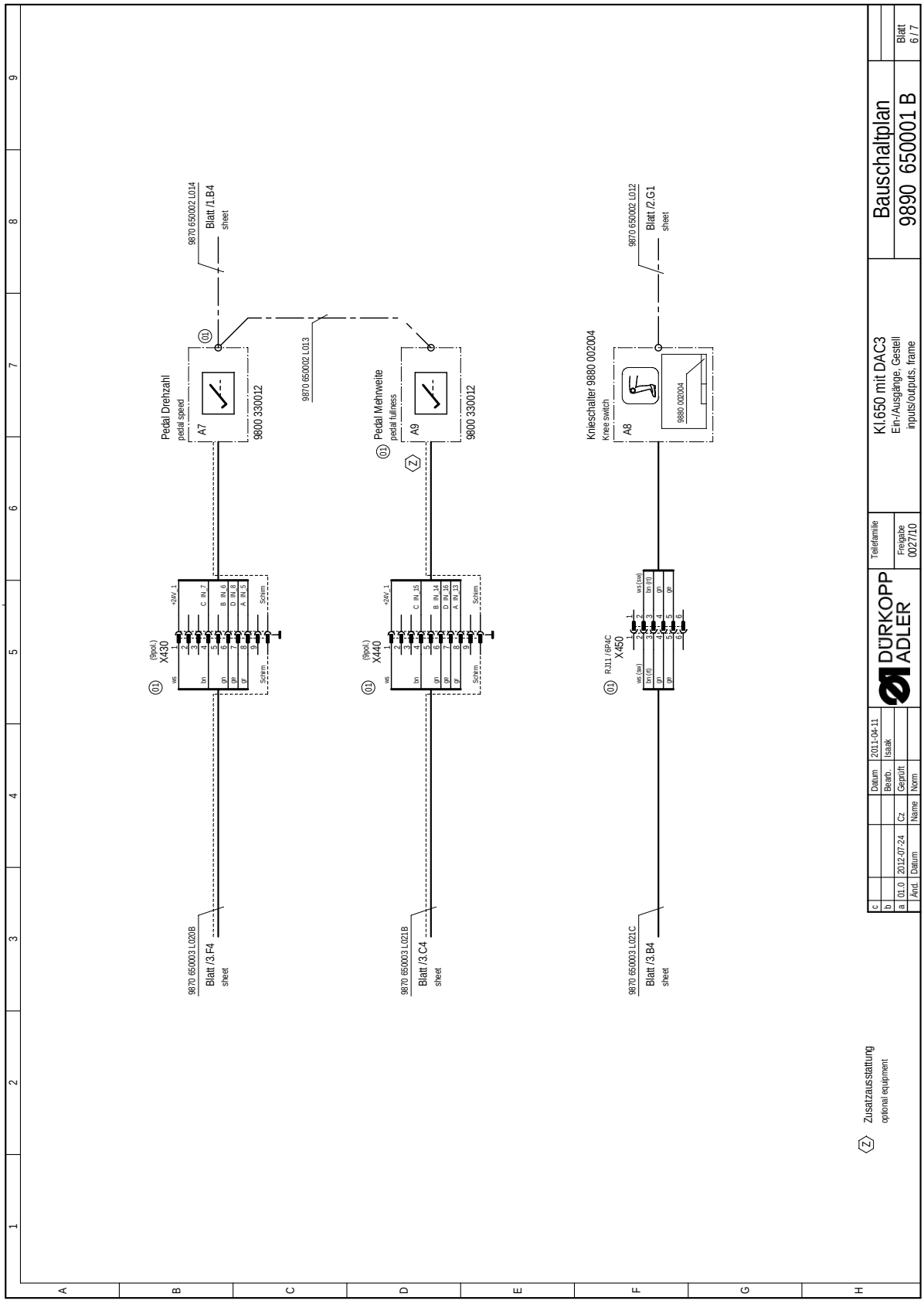


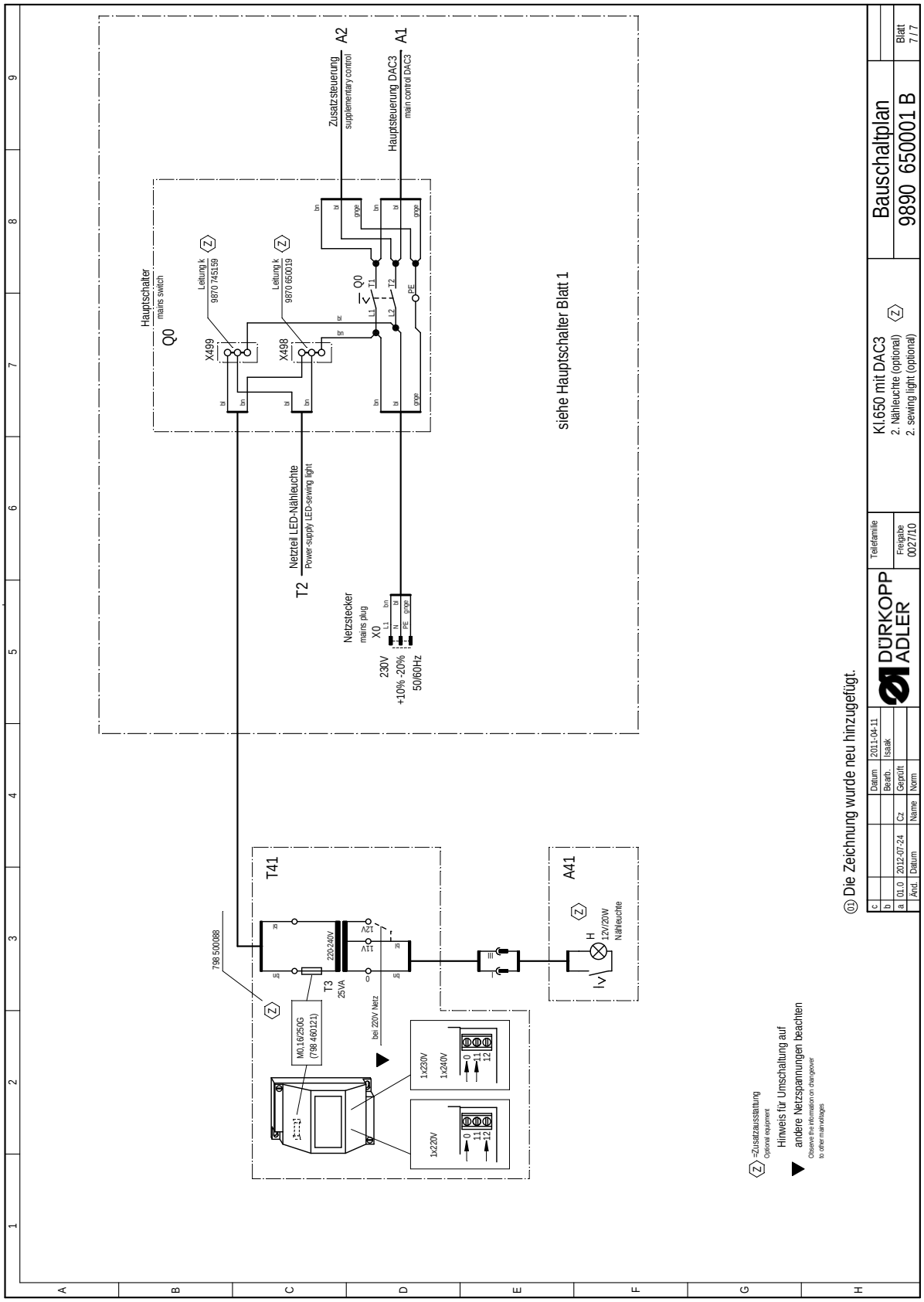

Bauschaltplan
9890 650001 B
Kl.650 mit DAC3
Zusatzsteuerung 4.Schrittmotor
supplementary control 4.stepping motor
Stichlänge
M5
Schrittmotor W-Achse
stepping motor W-axis
A2.1
A2.2
Schrittmotor-Modul 9850 001185
stepping motor module
T1
Z1
A2
Steuerung K 9850 650001
control box
Die Zeichnung wurde grundlegend überarbeitet.
Hinweise für Umschaltung auf andere Netzspannung beachten !
observe the information on changeover to other main voltages !
Spannung [V]
A - C
D - E
190
200
210
220
230
240
Blatt /1.A9
Blatt /3.E2
Blatt /1.A4
Blatt /6.F8
Blatt 2 / 7


Steuerung k DAC III, Variante 1
9850 650002
control DAC III, variant 1
Kl.650 mit DAC3
Stepper, I/O, Bedienfeld, Tastenleiste
stepper, I/O, control panel, keyboard
Bauschaltplan
9890 650001 B
Blatt 3 / 7
Bedienfeld OP7000
9850 001088
control panel
A5
Bedienfeld OP3000
9850 001069
control panel
A4
Leitung k
9870 650005
Leitung k
9870 650006
Stecker k
9850 001208
sicherer Halt
safety stop
Bedienfeld
control panel
Tastenfeld
keypad
PWM
Ref.-Signale
CAN-Schnittstelle
BDE-Schnittstelle
PDA-Interface
A1
Ein-/Ausgänge 1-8
I/O 1-8
Ein-/Ausgänge 9-16
I/O 9-16
Stepper 1-2 Signale
Stepper 3-4 Signale
Diag-Schnittstelle
test interface
Kodierung
coding
DÜRKOPP ADLER
Datum 2011-04-11
Bearb. Isaak
Gepruft
Norm
Name
Datum
Cz
2012-07-24
01.0
Änd.
Freigabe 0027/10
Teilefamilie


Bauschaltplan
9890 650001 B
Kl.650 mit DAC3
Steuerung, Anschlußplan
control, connection diagram
Blatt 4 / 7
DÜRKOPP ADLER
Freigabe 0027/10
Telefamile
Steuerung k
DAC III, Variante 1 + CF-Karte
9850 001224
control
DAC III, variant 1+CF-card
A1
F401 T6,3A
F402 T6,3A
F403 T6,3A
Jumper
9870 650004 L034
9870 650004 L029
9870 650004 L031
9870 650004 L033
9870 650003 L022
9870 650003 L023
9870 650004 L030
9870 650004 L032
9870 650003 L024
9870 650004 L028
9870 650005
9850 650006
9870 650003 L020B
9870 650003 L020A
9870 650003 L021A
9870 650003 L021B
9870 650003 L021C
9870 650001 L001
Slave
Stop
X201
Fuse FF6,3A F400
Power
Fuse FF6,3A F404
REF X140b
PWM X140t
En (Y) X301b
En (Z) X301t
En (SD) X300b
En (X) X300t
Panel X170
Keypad X160
Data X150b
CAN X150t
IO 1-8 X120b
IO 9-16 X120t
Dongle X110
SM 1-2 X100b
SM 3-4 X100t


Bauschaltplan
9890 650001 B
Kl.650 mit DAC3
Ein-/Ausgänge, Nähkopf
inputs/outputs, sewing head
Blatt 5 / 7
Leiterplatte k.9850 650000
PCB
A3
A6
Fadenabschneider-Magnet
Trimmer Magnet
Fadenspannungsmagnet
Thread Tension Magnet
Ref. Nähmotor
ref. sewing motor
LED-Leuchte 9850 650003
LED-light
Molex C-Grid Tpol.
Molex C-Grid
Phoenix Combicon 5pol.
Molex C-Grid 4pol.
Molex C-Grid 5pol.
Molex Micro-Fit
2,8 FL
FS
Kippsensor
Stromsensor
Greiferdeckel / Hook Cover
LED-Leuchte
9850 650000 S
9870 650004 L035
9870 650004 L036
9850 001083
Blatt /3.E4
Blatt /3.C4
Blatt /3.B6
Blatt /3.D6
Blatt /1.A6
sheet
Datum
2011-04-11
Bearb.
Isaak
Gepruft
Norm
2012-07-24
Name
Datum
Änd.
01.0
a
Teilefamilie
Freigabe
0027/10


Pedal Drehzahl
pedal speed
A7
9800 330012
9870 650002 L013
Pedal Mehrweite
pedal fullness
A9
9800 330012
Kniescholter 9880 002004
Knee switch
A8
9880 002004
9870 650002 L014
Blatt /1.B.4
sheet
9870 650002 L012
Blatt /2.G1
sheet
X430
X440
X450
9870 650003 L020B
Blatt /3.F4
sheet
9870 650003 L021B
Blatt /3.C4
sheet
9870 650003 L021C
Blatt /3.B4
sheet
Zusatzausstattung
optional equipment
DÜRKOPP ADLER
Bauschaltplan
9890 650001 B
Kl.650 mit DAC3
Ein-/Ausgänge, Gestell
inputs/outputs, frame
Blatt 6 / 7
Freigabe 0027/10
2012-07-24
2011-04-11
Isaak


Bauschaltplan
9890 650001 B
Kl.650 mit DAC3
2. Nähleuchte (optional)
2. sewing light (optional)
Blatt 7 / 7
Die Zeichnung wurde neu hinzugefügt.
Hauptschalter
mains switch
Q0
Leitung k 9870 745159
Leitung k 9870 650019
X499
X498
Zusatzsteuerung
supplementary control
A2
Hauptsteuerung DAC3
main control DAC3
A1
Netzteil LED-Nähleuchte
Power-supply LED-sewing light
T2
Netzstecker
mains plug
X0
230V +10% -20% 50/60Hz
siehe Hauptschalter Blatt 1
T41
T3 25VA
220/240V
12V
798 500088
M0.16/250G (798 460121)
bei 220V Netz
1x230V
1x240V
1x220V
A41
12V/20W Nähleuchte
Zusatzausstattung
Optional equipment
Hinweis für Umschaltung auf andere Netzspannungen beachten
Observe the information on changeover to other mains voltages

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