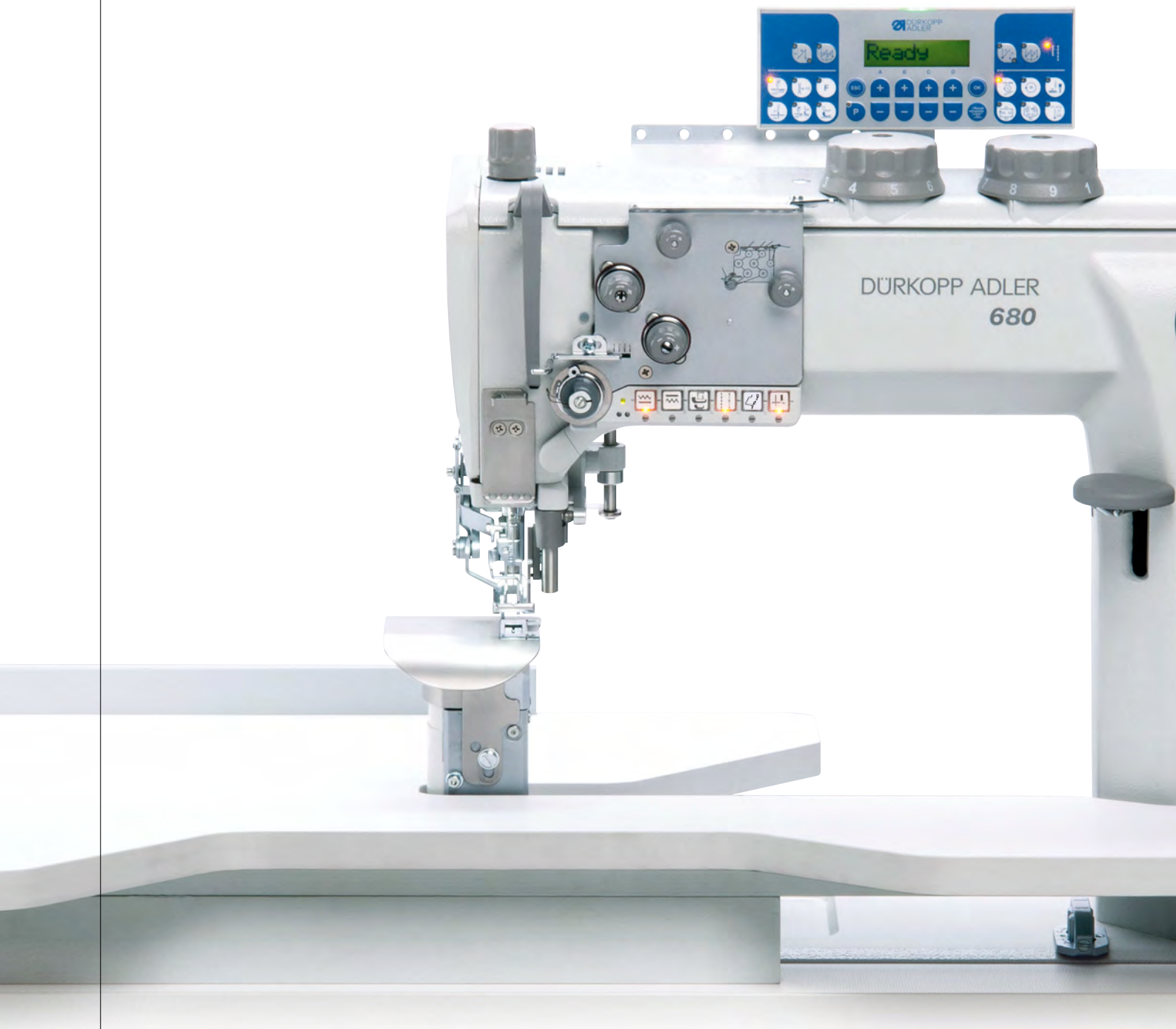
DÜRKOPP ADLER

670/680

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. 123*).

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 Working basis

3.1 Order of the settings

Order

The setting positions for the machine are interdependent.

Always comply with the order of individual setting steps as specified.

It is absolutely essential that you follow all notices regarding prerequisites and subsequent settings that are marked with  in the margin.

NOTICE

Property damage may occur!

Risk of machine damage from incorrect order.

It is essential to follow the working order specified in these instructions.

3.2 Laying the cable guide

Ensure that all cables are laid in the machine such that the function of moving parts is not hampered.

To lay the cable guide:

1. Lay any excess cabling neatly in proper cable snakes.
2. Bind together the cable loops with cable ties.

Important

Tie loops wherever possible to fixed parts.
The cables must be secured firmly.

3. Cut off any overlapping cable ties.

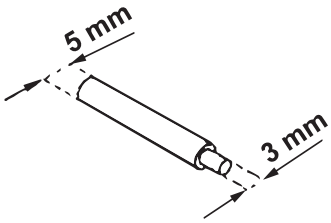
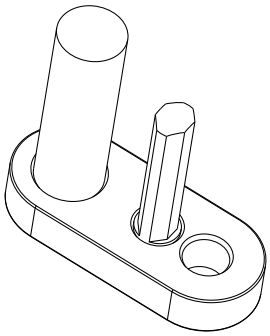
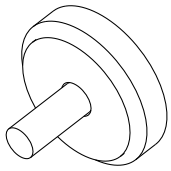
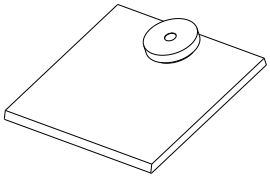
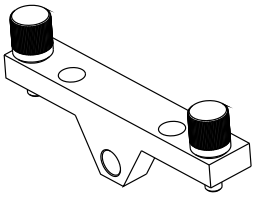
NOTICE

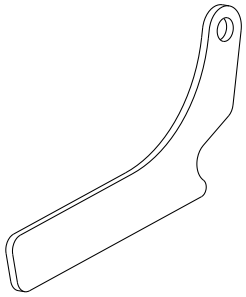
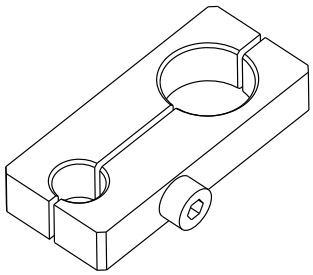
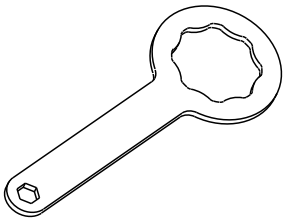
Property damage may occur!

Excess cables can impair the functioning of moving machine parts. This impairs the sewing function and can result in damage.

Lay excess cable as described above.

3.3 Gages

	Gage	Reference
	Locking peg • Locking/unplugging the machine	
	Setting gage (0868 290113) • Setting the needle bar linkage	
	Setting gage (0868 290153) • Setting the post bed feed	
	Setting gage (0868 290163) • Setting the post bed feed	
	Setting gage (0868 290184) • Positioning the sliding shaft	

	Gage	Reference
	Setting gage (0868 290020) • Setting transmission lever	
	Setting gage (0868 290194) • Setting the needle bar linkage • Setting the post bed feed	
	Auxiliary gage (0667 295050) • Setting the basic setting for mechanical stitch adjustment	

3.4 Removing the covers

WARNING

Risk of injury from moving parts!

Crushing possible.

Switch off the machine before removing covers.

WARNING

Risk of injury from sharp parts!

Punctures possible.

Switch off the machine before removing covers.

For many settings, you will have to remove the machine covers first in order to access the components.

This chapter describes how to remove and then assemble the individual covers again. The text for each type of setting work then specifies only the cover that needs to be removed at that particular time.

3.4.1 Access to the underside of the machine

Cover

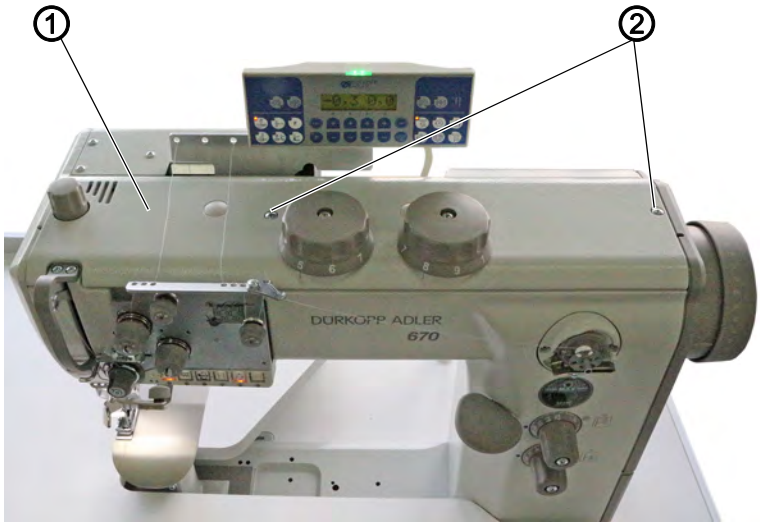
To access the components on the underside of the machine, swivel up the machine head.

To tilt the machine head:

1. Tilt the machine head as far as it will go.
   Do NOT tilt the machine on the control panel.

3.4.2 Removing the arm cover

Abb. 1: Removing the arm cover



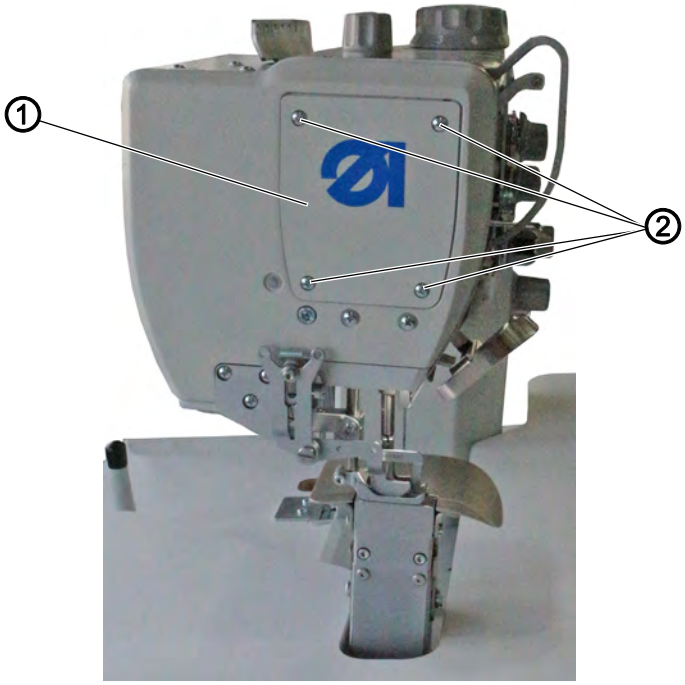
(1) - Arm cover *(2) - Screws*

To remove the arm cover:

1. Loosen the screws (2).
2. Remove the arm cover (1).

3.4.3 Removing the head cover

Abb. 2: Removing the head cover



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

To remove the head cover:

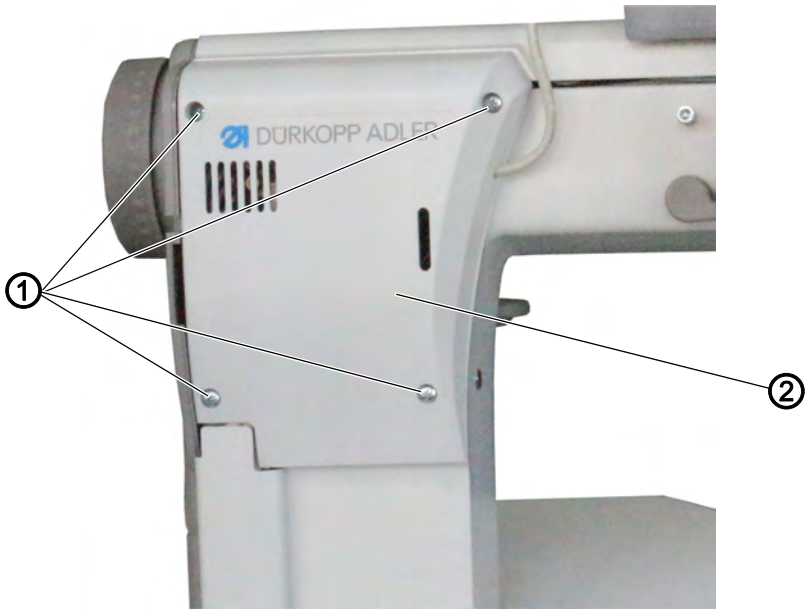
1. Loosen the screws (2).
2. Remove the head cover (1).

3.4.4 Removing the valve cover

Important

When removing and placing the valve cover, be sure not to pull off any cables.

Abb. 3: Removing the valve cover



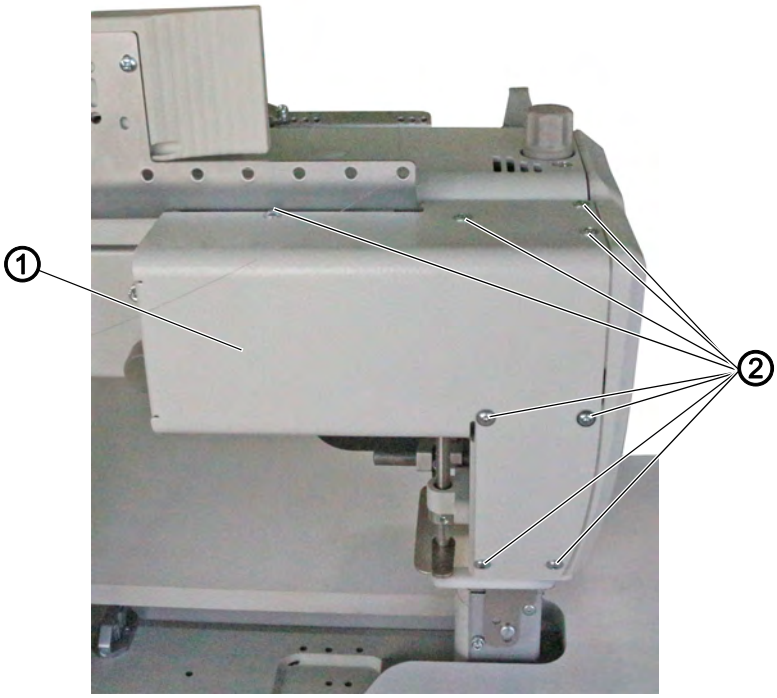
(1) - Screws *(2) - Valve cover*

To remove the valve cover:

1. Loosen the screws (1).
2. Remove the valve cover (2).

3.4.5 Removing the rear cover

Abb. 4: Removing the rear cover



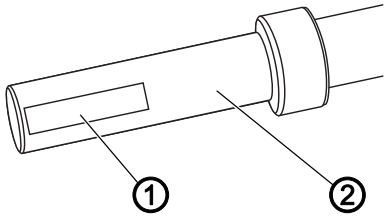
(1) - Rear cover *(2) - Screws*

To remove the rear cover:

1. Loosen the screws (2).
2. Remove the rear cover (1).

3.5 Flats on shafts

Abb. 5: Flats on shafts



(1) - Flat *(2) - Shaft*

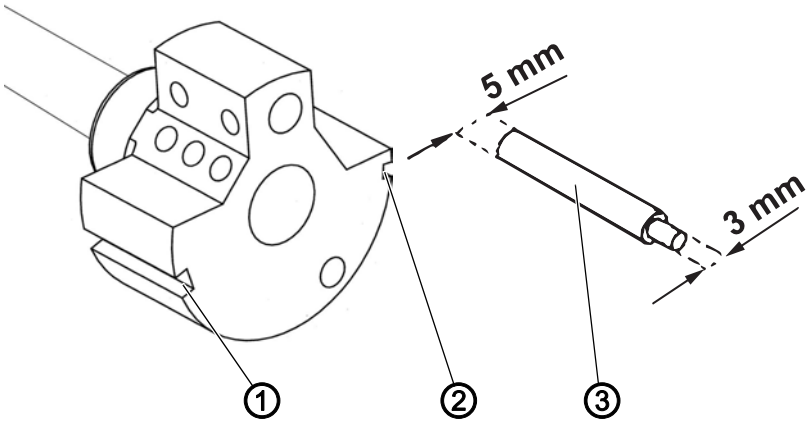
Some shafts have flat surfaces at the points where the components are screwed on. This stabilizes the connection and makes setting easier. For all settings on the surface, the first screw is screwed in rotational direction onto the surface.

Important

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

3.6 Locking the machine in place

Abb. 6: Locking the machine in place (1)



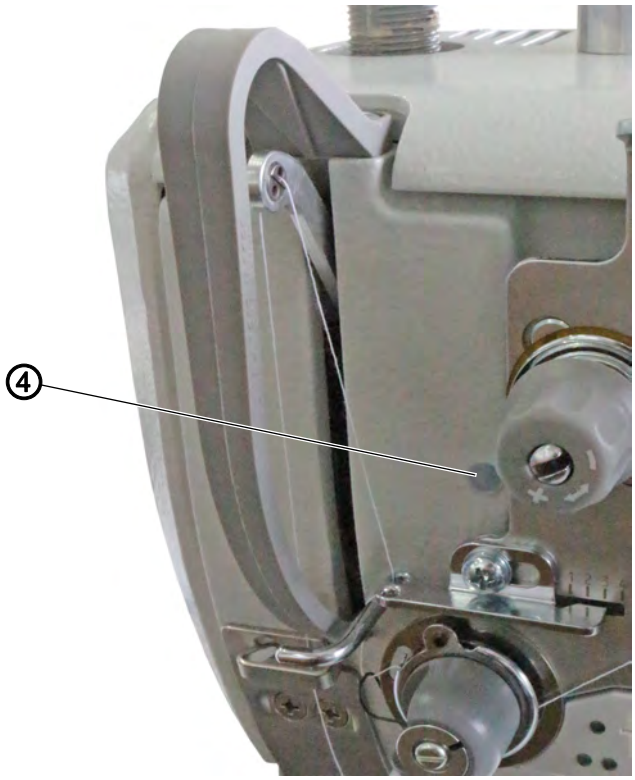
(1) - Large arresting groove
(2) - Small arresting groove
(3) - Locking peg

For some settings, the machine must be locked in place. To do this, the locking peg (3) from the accessory pack is inserted into a slot on the arm shaft crank, blocking the arm shaft.

There are 2 securing positions:

- **Position 1**: Loop stroke position
  - 5 mm end in the large arresting groove (1)
  - Setting the loop stroke and needle bar height
- **Position 2**: Handwheel zero position
  - 3 mm end in the small arresting groove (2)
  - Setting the handwheel position and checking the top dead center for the needle bar

Abb. 7: Locking the machine in place (2)



(4) - Locking opening

Locking the machine in place

To lock the machine in place:

1. Remove the plug from the locking opening (4).
2. Turn the handwheel until the appropriate arresting groove (1) or (2) is in front of the locking opening (4):
   - Small arresting groove (2) at handwheel position 0°
   - Large arresting groove (1) at handwheel position 203°
3. Insert the locking peg (3) with the appropriate end into arresting groove (1) or (2).

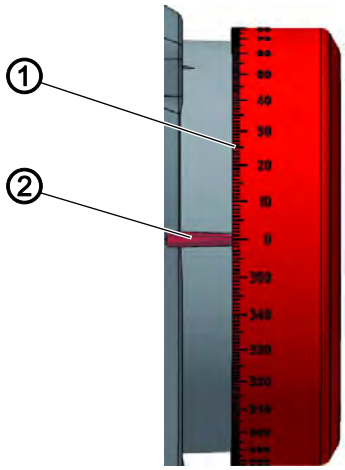
Removing the lock

To remove the lock:

1. Pull the locking peg (3) out of arresting groove (1) or (2).
2. Insert the plug into the locking opening (4).

3.7 Setting the handwheel into position

Abb. 8: Setting the handwheel into position



(1) - Graduated scale *(2) - Marking*

For some settings, the graduated scale (1) on the handwheel has to be moved to a certain position.

To set the handwheel into position:

1. Turn the handwheel until the specified number on the graduated scale (1) is next to the marking (2).

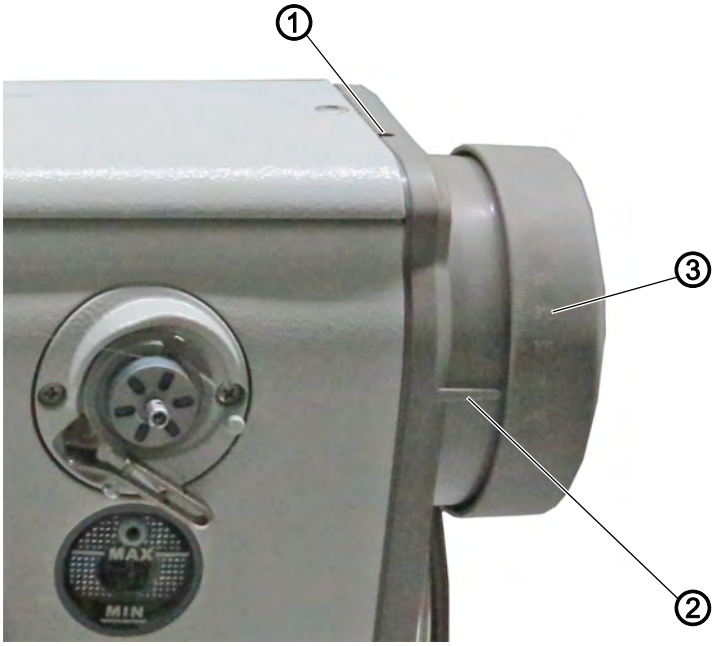
4 Setting the handwheel scale

Proper setting

1. Lock the machine in place at position 2 (📖 *p. 21*).

↳ The handwheel is at position 0°.
If a different degree number is next to the marking, then you will have to reset the graduated scale.

Abb. 9: Setting the handwheel scale



(1) - Slot
(2) - Marking
(3) - Handwheel scale

To set the handwheel scale:

1. Lock the machine in place at position 2 (📖 *p. 21*).
2. Loosen the fastening screw for the handwheel through the slot (1).
3. Turn the handwheel so that the marking (2) points to the degree number 0° on the handwheel scale (3).
4. Tighten the fastening screw.
5. Turn the handwheel to 50° and tighten the 2nd the fastening screw.

5 Positioning the arm shaft

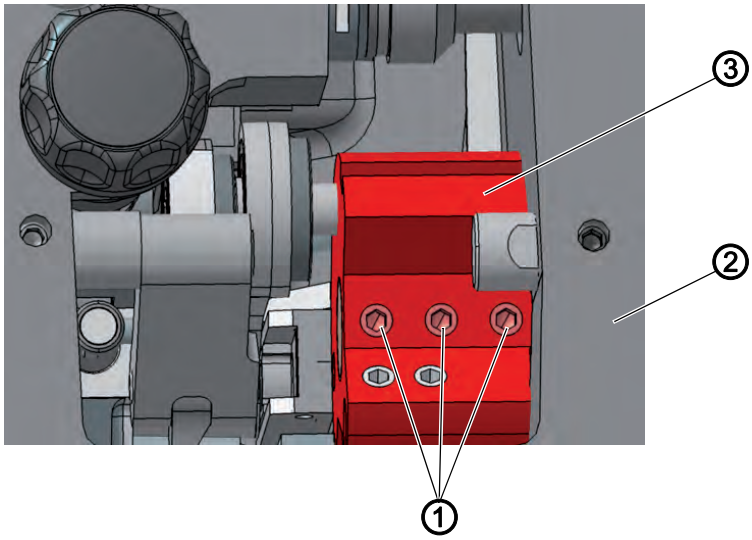
WARNING

Risk of injury from moving parts!

Crushing possible.

Switch off the machine before you check and set the position of the arm shaft crank.

Abb. 10: Positioning the arm shaft



(1) - Threaded pins
(2) - Machine casting
(3) - Arm shaft crank

Proper setting

The 3 threaded pins (1) on the arm shaft crank (3) are seated completely on the flat. The arm shaft crank (3) is flush with the machine casting (2).

To position the arm shaft:

1. Remove the arm cover (📖 *p. 17*).
2. Loosen the threaded pins (1).
3. Turn the arm shaft crank (3) such that the threaded pins (1) are seated completely on the flat of the arm shaft.
4. Push the arm shaft (3) to the right as far as it will go and flush with the machine casting.
5. Tighten the threaded pins (1).

6 Positioning the toothed belt wheels

WARNING

Risk of injury from moving parts!

Crushing possible.

Switch off the machine before positioning the toothed belt wheels.

Proper setting

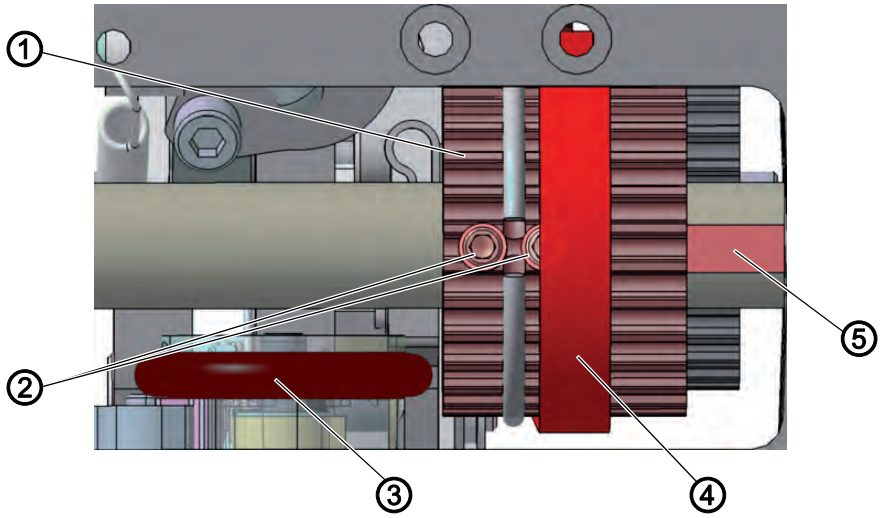
The two toothed belt wheels must be positioned above each other so that the toothed belt can run correctly. The winder wheel is directly next to the upper toothed belt wheel and determines its alignment.

Important

The position of the upper toothed belt wheel is defined by the distance to the winder wheel.
Therefore, you must first align the upper toothed belt wheel on the winder wheel and then align the lower toothed belt wheel so that the toothed belt runs correctly over both wheels.

6.1 Positioning the upper toothed belt wheel

Abb. 11: Positioning the upper toothed belt wheel



(1) - Upper toothed belt wheel
(2) - Threaded pins
(3) - Winder wheel
(4) - Toothed belt
(5) - Flat of arm shaft

Proper setting

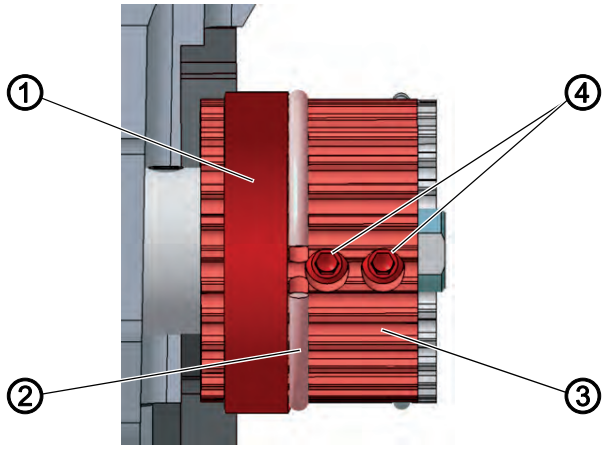
The 2 threaded pins (2) for the upper toothed belt wheel (1) are seated flush on the arm shaft (5).
The distance between the winder wheel (3) and the upper toothed belt wheel (1) must be 0.8 mm.
The toothed belt (4) runs correctly without running against the retaining ring or slipping off.

To position the upper toothed belt wheel:

1. Remove the arm cover (📖 *p. 17*).
2. Push the toothed belt (4) sufficiently far to the side so that the 2 threaded pins (2) can be reached.
3. Loosen the threaded pins (2).
4. Turn the upper toothed belt wheel (1) so that the threaded pins (2) are seated flush on the flat of the arm shaft (5).
5. Move the upper toothed belt wheel (1) to the side so that the distance to the winder wheel (3) is 0.8 mm.
6. Tighten the threaded pins (2).
7. Push the toothed belt (4) back.

6.2 Positioning the lower toothed belt wheel

Abb. 12: Positioning the lower toothed belt wheel



(1) - Toothed belt
(2) - Retaining ring
(3) - Lower toothed belt wheel
(4) - Threaded pins

Proper setting

The 2 threaded pins for the lower toothed belt wheel (3) are seated flush on the flat of the lower shaft.
The toothed belt (1) runs correctly without running against the retaining ring (2) or slipping off.

To position the lower toothed belt wheel:

1. Tilt the machine head (📖 *p. 16*).
2. Loosen the threaded pins (4).
3. Turn the lower toothed belt wheel (3) such that the threaded pins (4) are seated on the flat of the arm shaft.
4. Move the lower toothed belt wheel (3) sufficiently far to the side so that the toothed belt (1) makes contact with the retaining ring (2) without being pushed away.
5. Tighten the threaded pins (4).

7 Stitch length adjusting wheels

WARNING

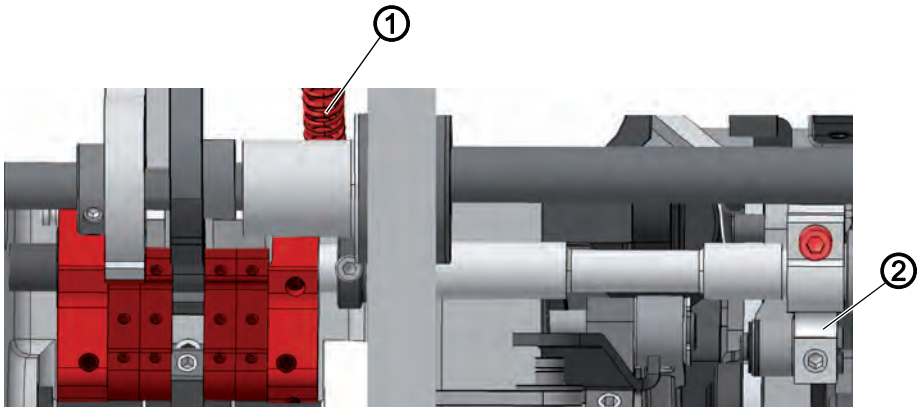
Risk of injury from moving parts!

Crushing possible.

Switch off the machine before you set the bottom feed and the stitch regulator gear.

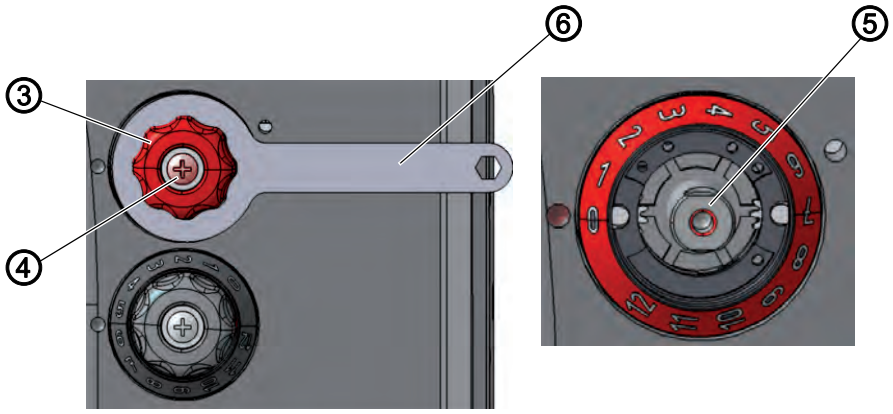
7.1 Setting the upper stitch length adjusting wheel

Abb. 13: Setting the upper stitch length adjusting wheel (1)



(1) - Spring
(2) - Lever

Abb. 14: Setting the upper stitch length adjusting wheel (2)



(3) - Upper stitch length adjusting wheel
(4) - Screw
(5) - Shaft
(6) - Auxiliary gage (0667 295050)

Proper setting

If the upper stitch length adjusting wheel (5) is set to 0, the stitch regulator gear should not have any play.

To set the basic setting of the stitch adjustment:

1. Tilt the machine head (📖 *p. 16*).
2. Remove the spring (1).
3. Hold the upper stitch length adjusting wheel (3) in place with an auxiliary gage (6).
4. Unscrew screw (4) and remove the upper stitch length adjusting wheel (3).
5. Use a size 10 wrench to turn the shaft (5) so far to the right until the lever (2) no longer has any play.

NOTICE

Property damage may occur!

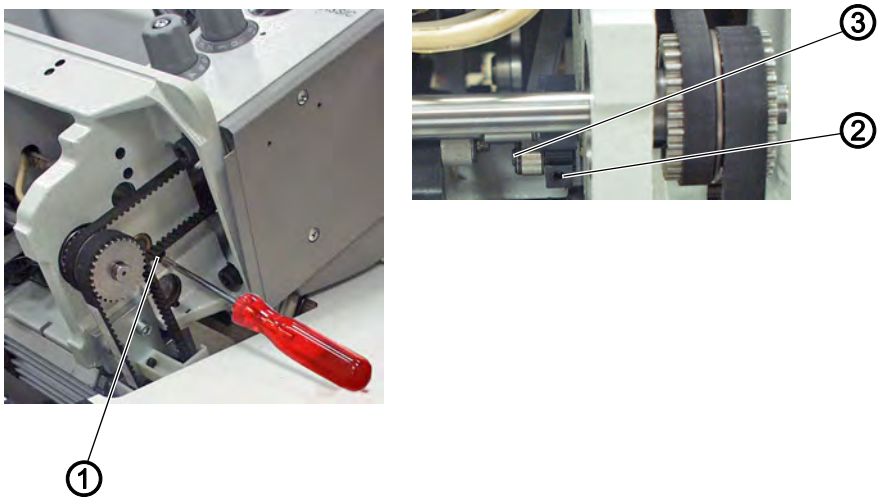
Risk of breakage.
The stitch regulator parts may get stuck, resulting in the maximum stitch length no longer being achieved.

Do not turn the shaft too far to the right.

6. Turn the scale of the upper stitch length adjusting wheel (3) to 0.
7. Place the upper stitch length adjusting wheel (3) again.
8. Tighten the screw (4).
9. Attach the spring (1) again.
10. Check the play of the lever (2).

7.2 Setting the synchronization of top and bottom feed

FIg. 15: Setting the synchronization of top and bottom feed



(1) - Hole
(2) - Threaded pin
(3) - Eccentric

Proper setting

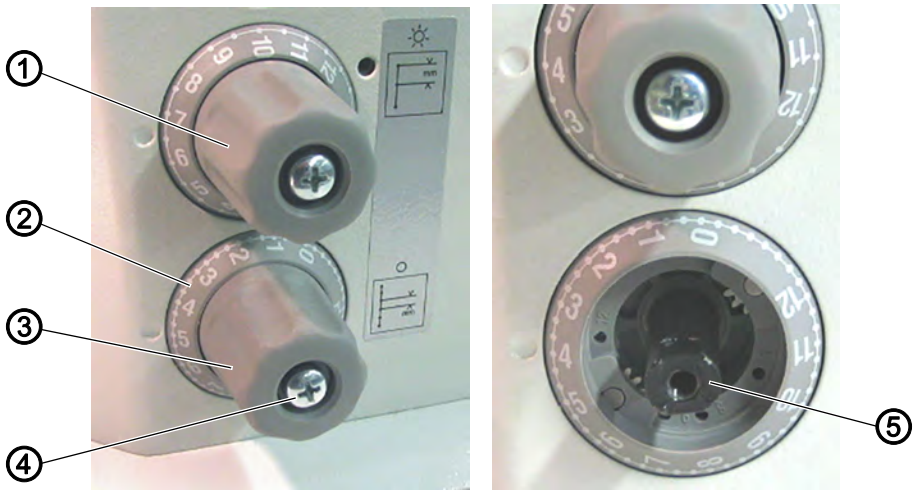
The top and bottom feed run in sync.

To set the synchronization of top and bottom feed:

1. Loosen the threaded pin (2).
2. Turn the eccentric (3) through the hole (1).
3. Tighten the threaded pin (2).
4. Carry out a sewing test with fabric or cardboard strip.
5. Correct setting if necessary.

7.3 Setting the lower stitch length adjusting wheel

Abb. 16: Setting the lower stitch length adjusting wheel



(1) - Upper stitch length adjusting wheel
(2) - Scale
(3) - Lower stitch length adjusting wheel
(4) - Screw
(5) - Shaft

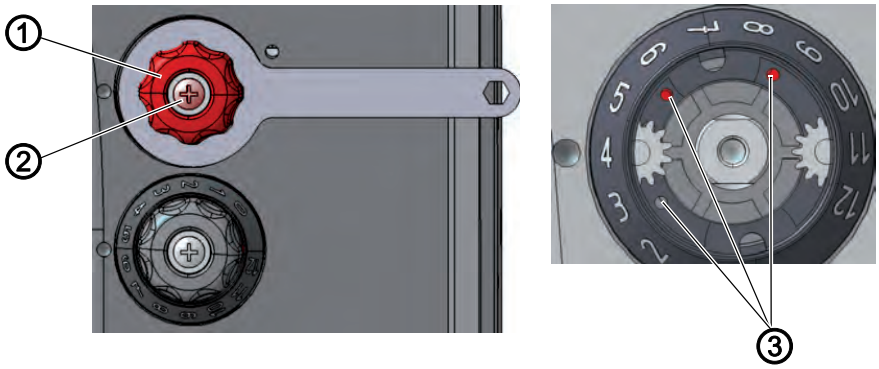
To set the second stitch length:

1. Position the upper stitch length adjusting wheel (1) to 0.
2. Unscrew the screw (4).
3. Remove the lower stitch length adjusting wheel (3).
4. Use a size 10 wrench to turn the shaft (5) clockwise as far as it will go.
5. Turn scale (2) to 0.
6. Place the lower stitch length adjusting wheel (3) again.
7. Tighten the screw (4).

7.4 Setting the stitch length limit

If not all of the stitch lengths are available during sewing operation, a limit can be placed on the maximum stitch length that can be set.
12, 9, or 6 mm can be selected as the maximum stitch length.

Abb. 17: Setting the stitch length limit



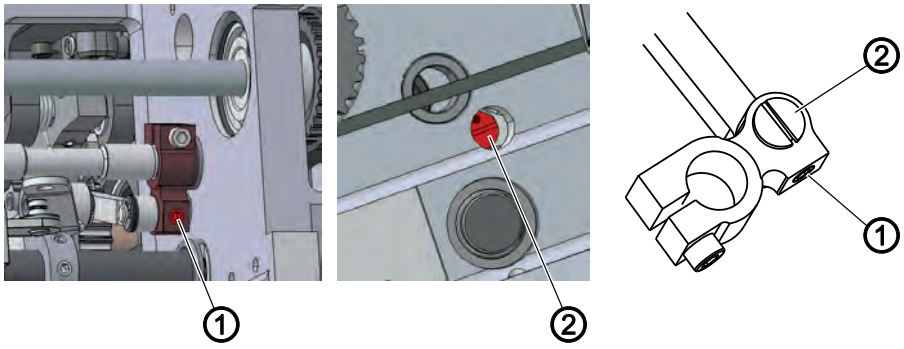
(1) - Upper stitch length adjusting wheel
(2) - Screw
(3) - Mark-off slots

To set the stitch length limit:

1. Position the upper stitch length adjusting wheel (1) to 0.
2. Hold the upper stitch length adjusting wheel (1) in place using a wrench.
3. Loosen the screw (2).
4. Remove the upper stitch length adjusting wheel (1).
5. Loosen the threaded pin from one of the 3 mark-off openings.
6. Screw the threaded pin into the mark-off opening for the required maximum stitch length.
   The slots are marked with numbers for the stitch length.
7. Turn the scale so that the 0 is exactly next to the adjusting mark.
8. Fit the upper stitch length adjusting wheel (1) and hold it in place using a wrench.
9. Tighten the screw (2).

7.5 Setting the eccentric for the forward and backward stitches

Abb. 18: Setting the eccentric for the forward and backward stitches



(1) - Screw *(2) - Eccentric*

Proper setting

The forward and backward stitches are the same length.
As a test, sew a seam forward, stop, and sew a seam backward.
The insertions of the forward and backward stitches have to lie within one another.

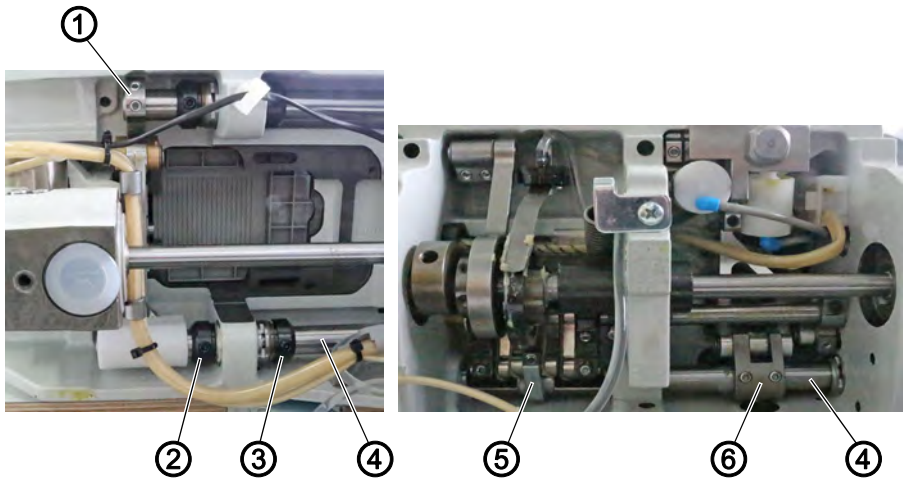
To set the eccentric for forward and backward stitches:

1. Tilt the machine head (📖 *p. 16*).
2. Loosen the screw (1).
3. Turn the eccentric (2) through the hole.
   - Turn clockwise: the forward stitch becomes larger, the backward stitch smaller
   - Turn counterclockwise: the forward stitch becomes smaller, the backward stitch larger.
4. Tighten the screw (1).
5. As a test, sew a seam forward, stop, and sew a seam backward.

↳ The punctures of the forward and backward stitches have to lie within one another.
If the punctures for forward and backward stitches do not lie within one another, correct the setting.

7.6 Setting the feed dog bar

Abb. 19: Setting the feed dog bar (1).

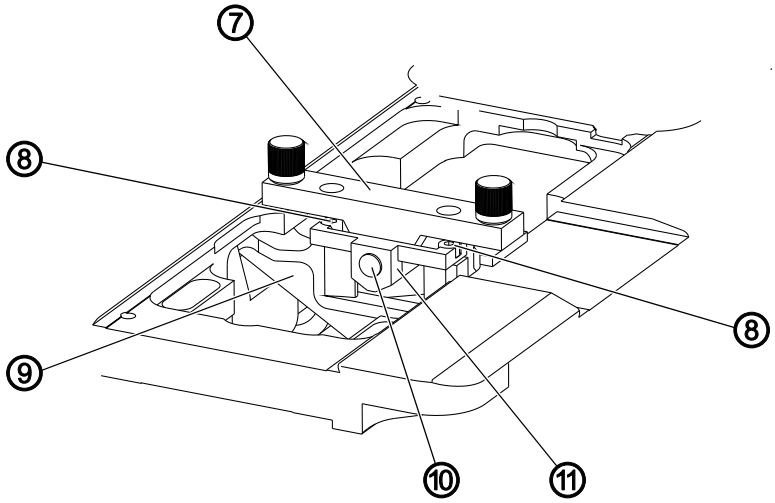


(1) - Lever
(2) - Adjusting ring
(3) - Adjusting ring
(4) - Shaft
(5) - Lever
(6) - Lever

To set the feed dog bar:

1. Loosen the post bed feed (📖 *p. 43*).
2. Loosen the threaded pins on the adjusting rings (2) and (3).
3. Loosen the clamping screw on the lever (5).
4. Loosen the screws on levers (1) and (6).

Abb. 20: Setting the feed dog bar (2).



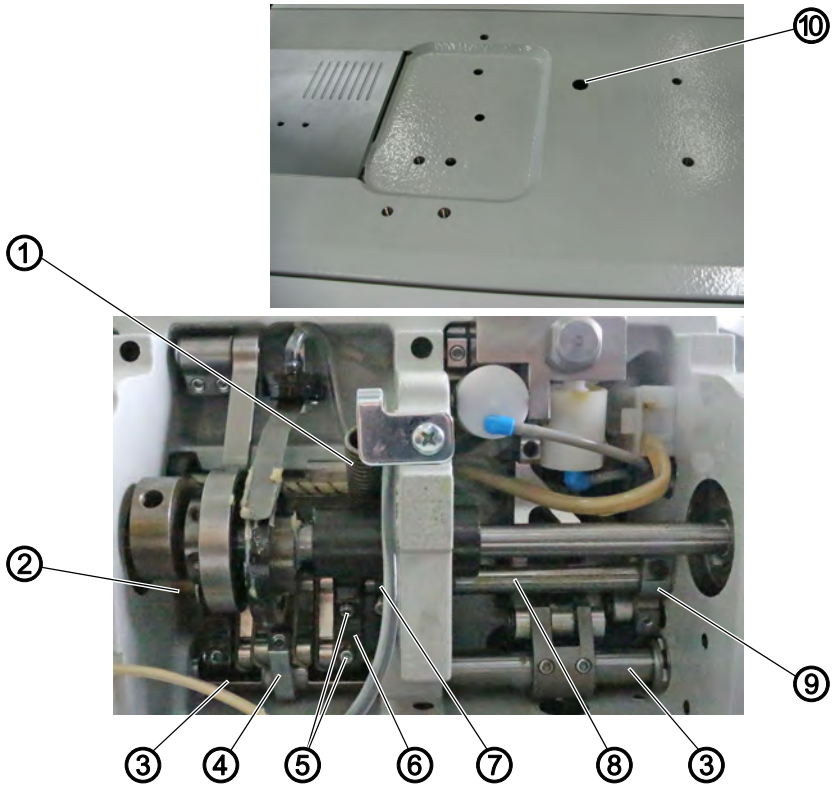
(7) - Gage (0868 290184)
(8) - Screws
(9) - Feed dog bar
(10) - Bolt
(11) - Holder

5. Screw the holder (11) onto the feed dog bar (9).
6. Screw the gage (7) onto the base plate.
7. Use the bolt (10) to connect the holder (11) and the gage (7).

8. Align the feed dog bar (9) to the holder (11).
9. Tighten the screws (8).
10. Tighten the shaft (4) with the adjusting rings (2) and (3) and tighten the screws.
11. Set the stitch length to 0.
12. Tighten the clamping screw on the lever (5).
13. Position the needle bar with the gage (📖 *p. 39*).
14. Tighten the screws on the lever (6).
15. Tighten the screws on the lever (1).
16. Loosen the gage (7).

7.7 Setting the initial position of the feed gear

Abb. 21: Setting the initial position of the feed gear (1)



(1) - Spring
(2) - Bearing bolt
(3) - Shaft
(4) - Block
(5) - Screws
(6) - Adjusting frame
(7) - Adjusting ring
(8) - Shaft
(9) - Block
(10) - Screw

To set the initial position of the feed gear:

1. Remove the spring (1).
2. Loosen the clamping screws on the blocks (4) and (9).
3. Loosen the screw (10).

4. Align the adjusting frame (6) sideways so that it sits in the center of the cutouts in the shaft (3).
5. Tighten the adjusting frame (6) axially with the bearing bolt (2) and adjusting ring (7).
6. Position the upper stitch length adjusting wheel to 0.
7. Turn the adjusting frame (6) so that the plates are parallel.
8. Tighten the clamping screws on the blocks (4) and (9).
9. Attach the spring (1) again.

Information

The shaft (8) is fixed in the adjusting frame (6) with the screws (5).

8 Needle bar linkage

WARNING

Risk of injury from moving parts!

Crushing possible.

Switch off the machine before you check and set the needle bar linkage.

8.1 Aligning the needle bar linkage sideways

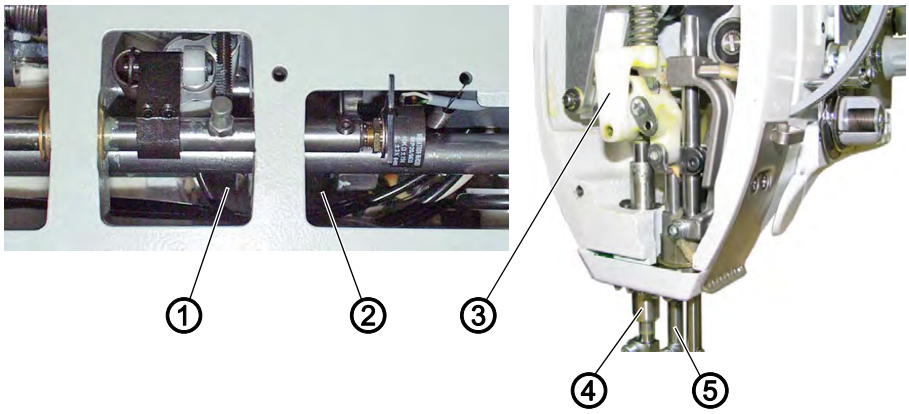
NOTICE

Property damage may occur!

Risk of breakage.

After setting the needle bar linkage, check the distance between the hook tip and the needle and correct it if necessary.

Abb. 22: Aligning the needle bar linkage sideways (1)

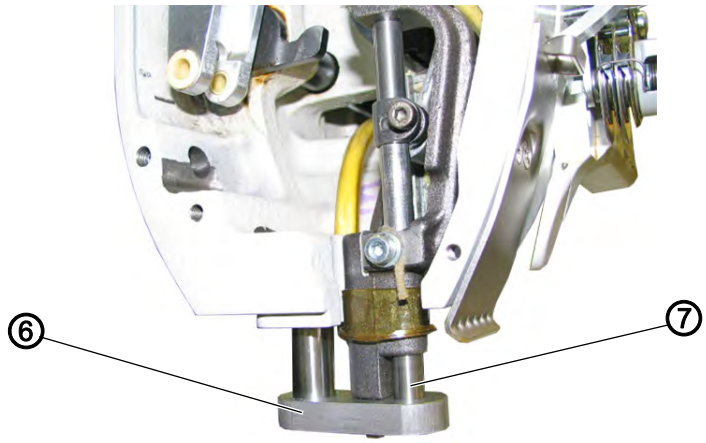


(1) - Adjusting ring
(2) - Adjusting ring
(3) - Spring guide
(4) - Socket
(5) - Feeding foot bar

To align the needle bar linkage sideways:

1. Remove the arm cover (📖 *p. 17*).
2. Remove the head cover (📖 *p. 18*).
3. Loosen the screws on the adjusting rings (1) and (2).
4. Disassemble the spring guide (3) and socket (4).
5. Disassemble the feeding foot bar (5).

Abb. 23: Aligning the needle bar linkage sideways (2)



(6) - Gage (0686 290113) *(7) - Needle bar*

6. Use the gage (6) as illustrated above.
7. Insert the needle bar (7) without the needle block and thread guide into the hole of the gage (6).
8. Tighten the adjusting rings (1) and (2) and screws.
9. Disassemble the gage (6).
10. Re-assemble the spring guide (3), feeding foot bar (5) and socket (1).

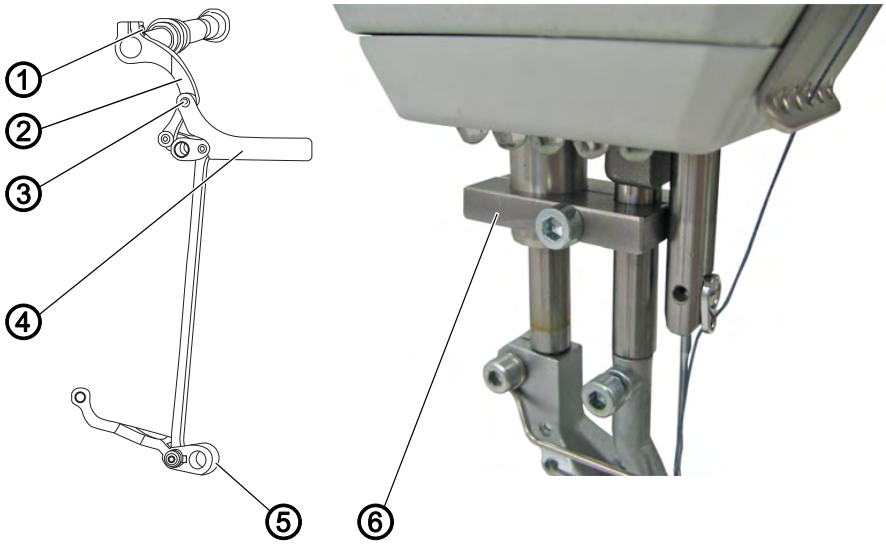
Order

Then check the following setting:

- Distance between the hook tip and needle (📖 *p. 55*)

8.2 Setting transmission lever

Abb. 24: Setting transmission lever (1)



(1) - Clamping screw
(2) - Lever
(3) - Bolt
(4) - Gage (0868 290020)
(5) - Lever
(6) - Gage (0868 290194)

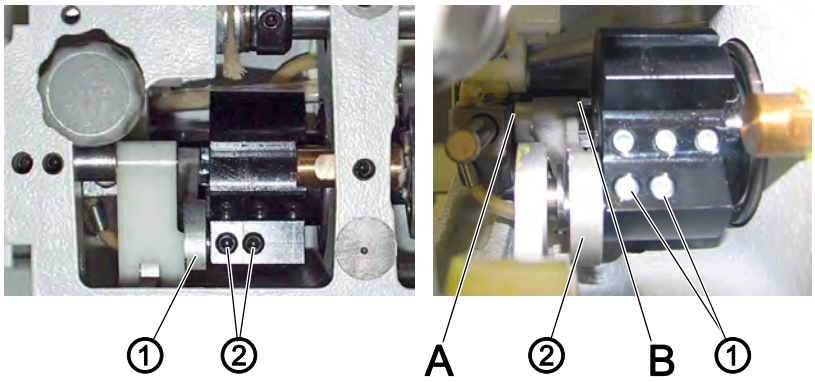
The lever (5) transmits the movement of the feed shaft to the needle bar linkage.

To set the transmission lever:

1. Remove the head cover (📖 *p. 18*).
2. Position the upper stitch length adjusting wheel to 0.
3. Loosen the thrust bolts on the lever (5).
4. Fit gage (4) to the bolt (3) and press it down as far as it will go.
5. Loosen the clamping screw (1) on the lever (2).
6. Position the needle bar linkage with the gage (6).
7. Tighten the clamping screw (1).
8. Tighten the thrust bolts on the lever (5).
9. Disassemble the gages (6) and (4).

8.3 Setting the thread lever

Abb. 25: Setting the thread lever



(1) - Threaded pins *(2) - Pull rod*

To set the thread lever:

1. Loosen the screws (1).
2. Align the thread lever sideways so that the play of the pull rod (2) on the crosshead is the same at positions **A** and **B**.
3. Tighten the threaded pins (1).

9 Post bed feed

WARNING

Risk of injury from moving parts!

Crushing possible.

Make sure the machine is switched off before checking and setting the post bed feed.

9.1 Aligning the post bed feed

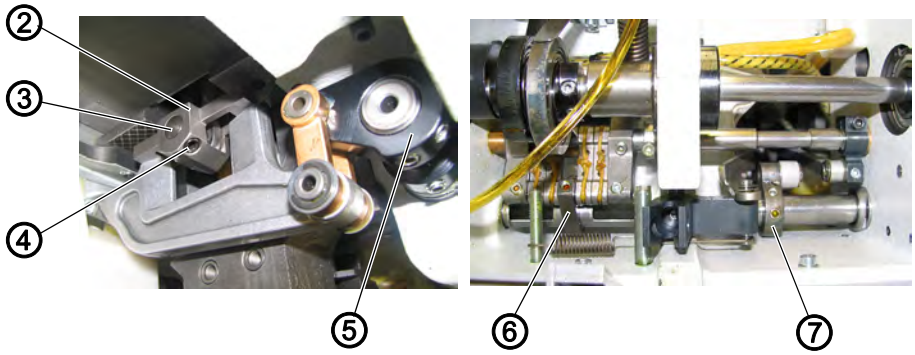
Abb. 26: Aligning the post bed feed (1)

(1) - Gage (0868 290194)

To align the post bed feed:

1. Tilt the machine head (📖 *p. 16*).
2. Position the upper stitch length adjusting wheel to 0.
3. Position the needle bar linkage with the gage (1).

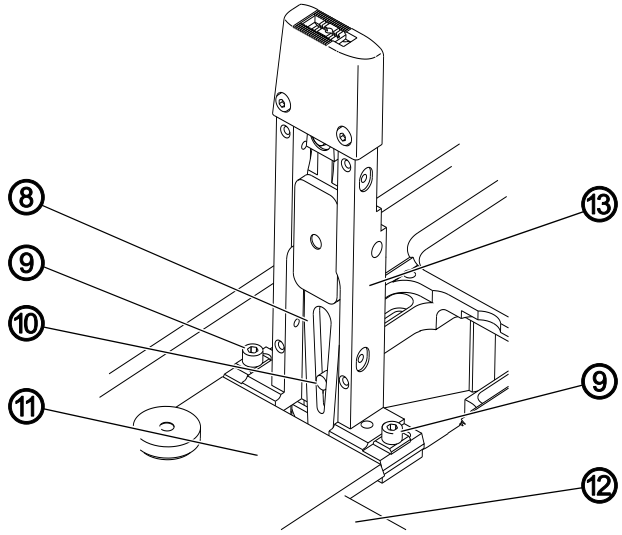
Abb. 27: Aligning the post bed feed (2)



(2) - Holder
(3) - Bolt
(4) - Thrust bolt
(5) - Lever
(6) - Lever
(7) - Lever

4. Loosen the screws on the levers (5) and (7).
5. Loosen the clamping screw on the lever (6).

Abb. 28: Aligning the post bed feed (3)



(8) - Feed dog lever
(9) - Screws
(10) - Gage (0868 290153)
(11) - Gage (0868 290163)
(12) - Base plate
(13) - Post bed feed

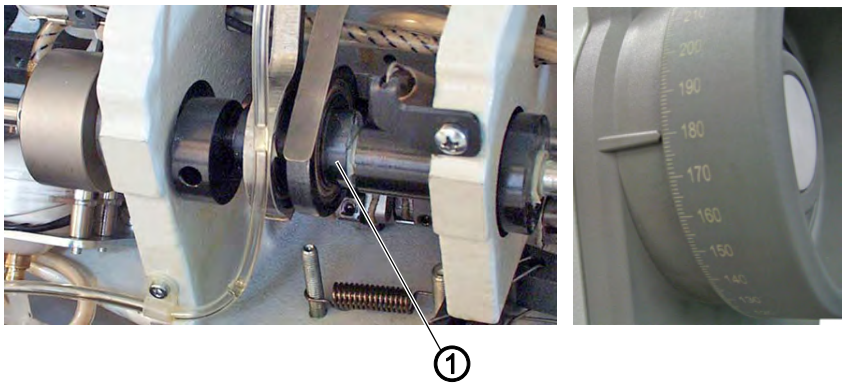
6. Screw the post bed feed (13) onto the base plate (12).
7. Use the bolt (3) to connect the post bed feed (13) to the holder (2).
8. Turn the handwheel into the 180° position.

   ↳ The needle bar is at the bottom dead center.
   The needle plunges into the needle hole.
9. Insert the gage (10) into the post bed feed (13).
10. Slide the feed dog lever (8) up as far as it will go.
11. Align the post bed feed (13) to the needle and the gage (11).
12. Tighten the screws (9).
13. Fix the bolt (3) in place using the thrust bolt (4).

14. Tighten the screws on the levers (5) and (7).
    In doing so, note the feed dog height (📖 *p. 47*).
15. Tighten the clamping screw on the lever (6).
16. Disassemble the gages (1), (10) and (11).

9.2 Setting the feed dog feed movement

Abb. 29: Setting the feed dog feed movement



(1) - Pusher eccentric

Proper setting

At handwheel position 180°, the feed dog must move as little as possible when the largest stitch length is set.

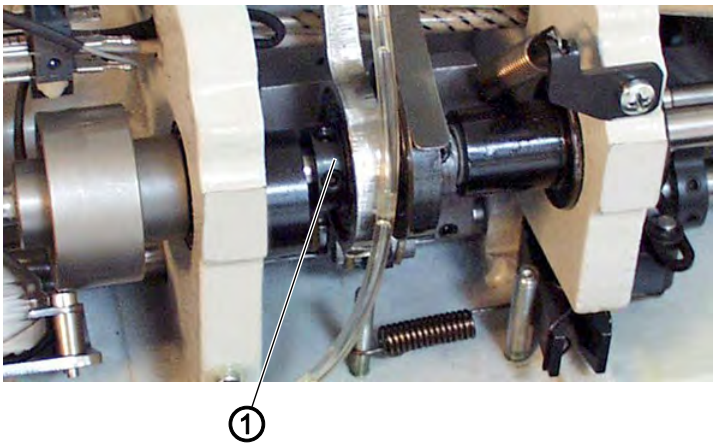
1. Set the largest stitch length.
2. Move the handwheel into the 180° position.
3. Move the stitch adjustment lever and check the feed dog movement.

To set the feed dog feed movement:

1. Tilt the machine head (📖 *p. 16*).
2. Loosen the screws on the pusher eccentric (1).
3. Set the pusher eccentric (1).
4. Tighten the screws on the pusher eccentric (1).
5. Move the stitch adjustment lever and check the feed dog movement.

9.3 Setting the feed dog stroke movement

Abb. 30: Setting the feed dog stroke movement



(1) - Stroke eccentric

Proper setting

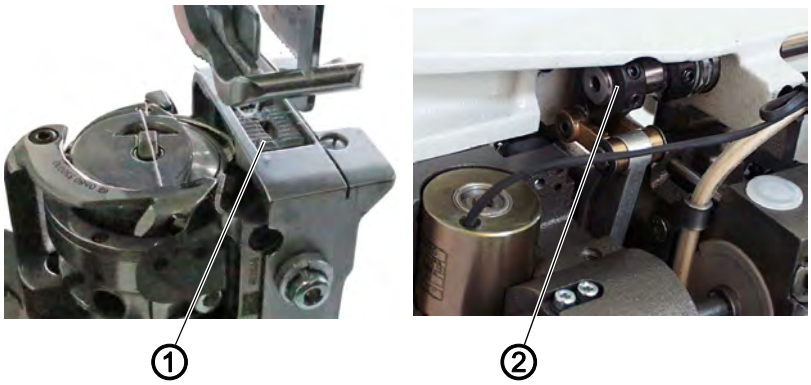
The feed dog has the same height to the throat plate at the front and rear dead center.

To set the feed dog stroke movement:

1. Tilt the machine head (📖 *p. 16*).
2. Loosen the screws on the stroke eccentric (1).
3. Turn the stroke eccentric (1).
4. Tighten the screws on the stroke eccentric (1).
5. Turn the handwheel and check the feed dog movement.

9.4 Setting the feed dog height

Abb. 31: Setting the feed dog height



(1) - Feed dog

(2) - Lever

Proper setting

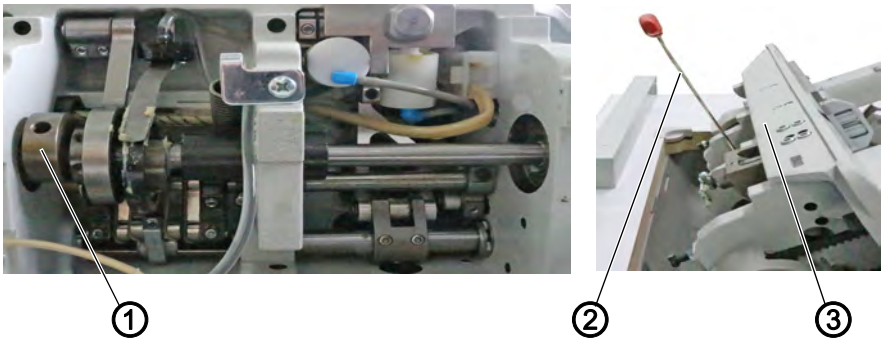
In its highest position, the feed dog must protrude 0.8 mm over the throat plate.

To set the feed dog height:

1. Tilt the machine head (📖 *p. 16*).
2. Turn the handwheel until the feed dog (1) has reached its highest position.
3. Loosen the screws on the lever (2).
4. Turn the lever (2) so that the feed dog (1) protrudes 0.8 mm over the throat plate.
5. Tighten the screws on the lever (2).

9.5 Setting the compensating weight

Abb. 32: Setting the compensating weight



(1) - Compensating weight
(2) - Hex key
(3) - Base plate

Proper setting

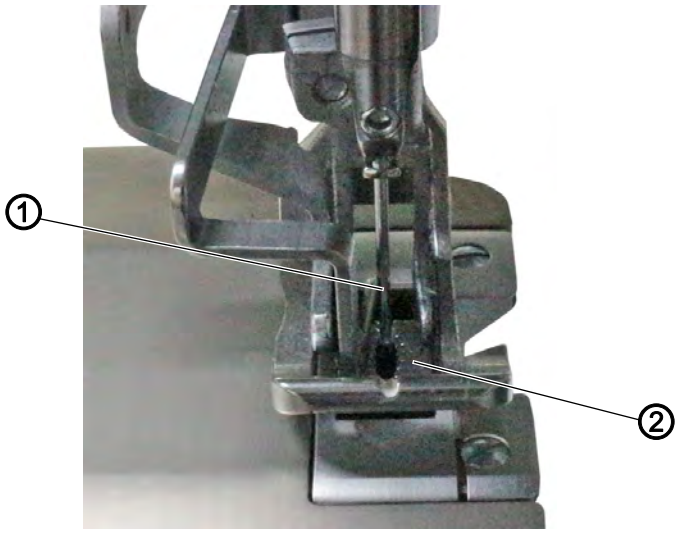
The compensating weight is such that an inserted hex key is parallel to the base plate at handwheel position 30°.

To set the compensating weight:

1. Tilt the machine head (📖 *p. 16*).
2. Loosen the screws on the compensating weight (1).
3. Turn the compensating weight (1).
4. Insert the hex key (2) and check that it is parallel to the base plate (3).
5. Tighten the screws on the compensating weight (1).

9.6 Setting the needle penetration in the feed direction

Abb. 33: Setting the needle penetration in the feed direction



(1) - Needle *(2) - Feed dog*

Proper setting

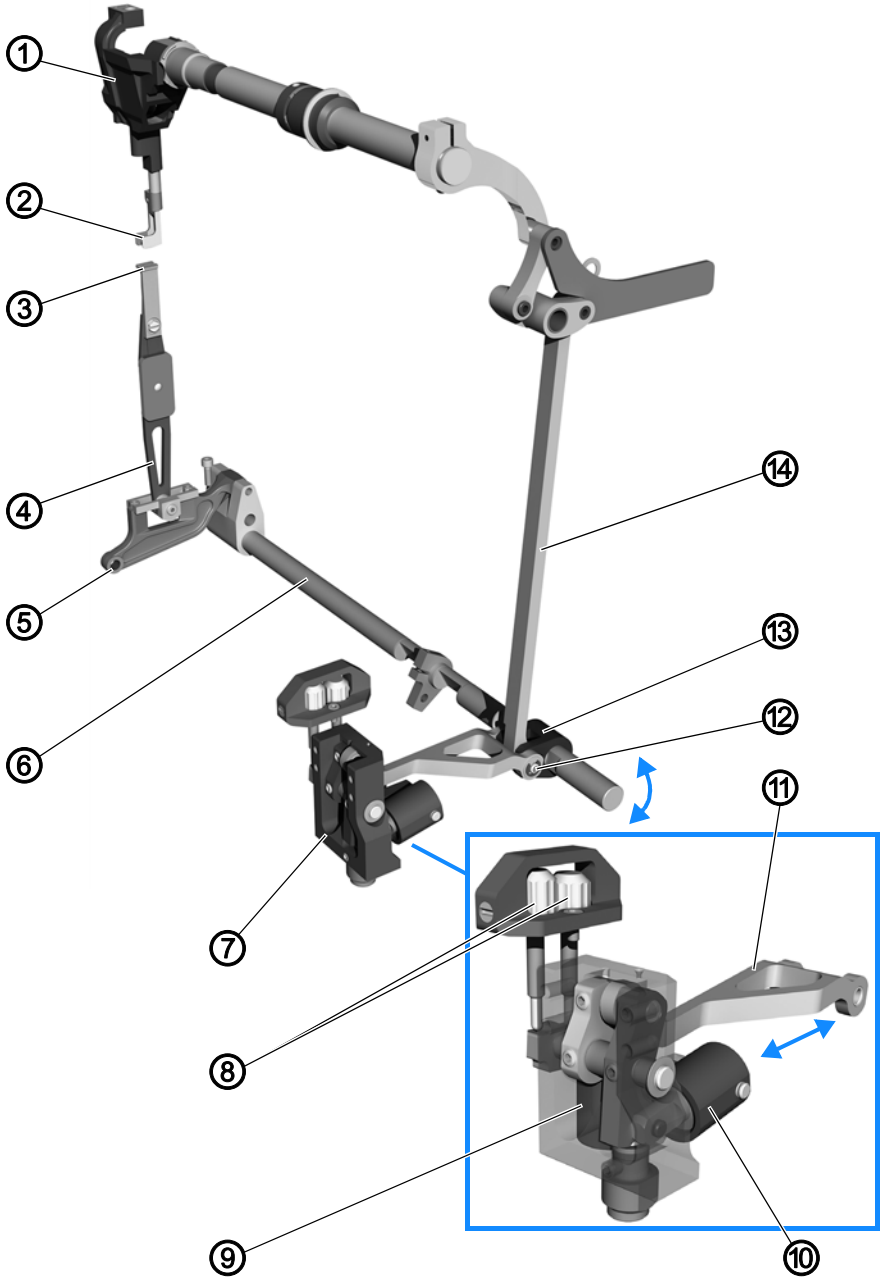
If the stitch length is 0, the needle penetrates the center of the needle hole of the feed dog.

To set the needle penetration in the feed direction:

1. Set the stitch length to 0.
2. Insert the new needle.
3. Turn the handwheel and lower the needle bar.
4. Check the position of the needle in the needle hole.
5. If the needle does not penetrate the center of the needle hole, re-align the post bed feed (📖 *p. 43*).

9.7 Differential feed

Fig. 34: Differential feed



(1) - Needle bar linkage
(2) - Feeding foot
(3) - Feed dog
(4) - Feed dog lever
(5) - Feed dog carrier
(6) - Sliding shaft
(7) - Holder
(8) - Adjusting screws
(9) - Pneumatic cylinder
(10) - Pneumatic cylinder
(11) - Pull rod
(12) - Bolt
(13) - Block
(14) - Push rod

Differential feed function

The sliding shaft (6) completes a movement that corresponds to the set stitch length. The movement of the sliding shaft (6) is transmitted to the feed dog (3) via the feed dog carrier (5) and the feed dog lever (4).
The movement of the sliding shaft (6) is transmitted to the needle bar linkage (1) and the feeding foot (2) via the block (13) and the push rod (14).

When the differential feed is switched on, the bolt (12) is moved via the push rod (11). The result is more or less movement of the feeding foot (2).

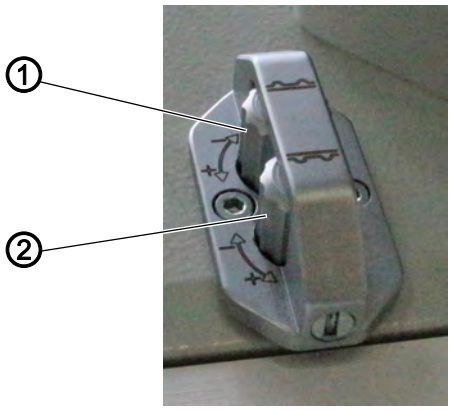
- less movement: The pneumatic cylinder (10) extends, and the pull rod (11) moves closer to the block (13)
- more movement: The pneumatic cylinder (9) extends, and the pull rod (11) moves further away from the block (13)

The adjusting screws (8) can be used to limit the movement of the pneumatic cylinders (9) and (10). The movement of the feeding foot (2) is adjusted accordingly.

9.7.1 Setting the differential feed

The machine sews in upper or lower fullness via the buttons  and  .
The feeding foot will then move more or less in relation to the feed dog.

Fig. 35: Setting the differential feed



(1) - Adjusting screw *(2) - Adjusting screw*

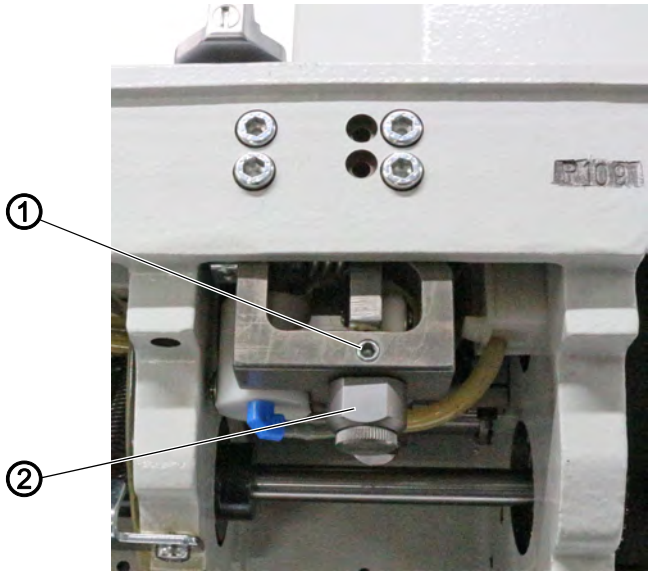
To set the differential feed:

1. Turn the adjusting screw (1) to set the upper fullness.
2. Turn the adjusting screw (2) to set the lower fullness.
3. Perform a sewing test and readjust if necessary.

If no fullness is activated, top and bottom feed will run in sync.

9.7.2 Setting the synchronization of top and bottom feed

Fig. 36: Setting the synchronization of top and bottom feed



(1) - Screw *(2) - Eccentric*

To set the synchronization of top and bottom feed:

1. Tilt the machine head.
2. Loosen the screw (1).
3. Turn the eccentric (2).
4. Tighten the screw (1).
5. Perform a sewing test.
   - Place 2 strips of fabric with equal length exactly on top of each other
   - Sewing

↳ The synchronization of top and bottom feed is set properly when the 2 strips of fabric are transported at the same speed.

10 Position of the hook and needle

WARNING

Risk of injury from moving parts!

Crushing possible.

Switch off the machine before you check and set the position of the hook and needle.

NOTICE

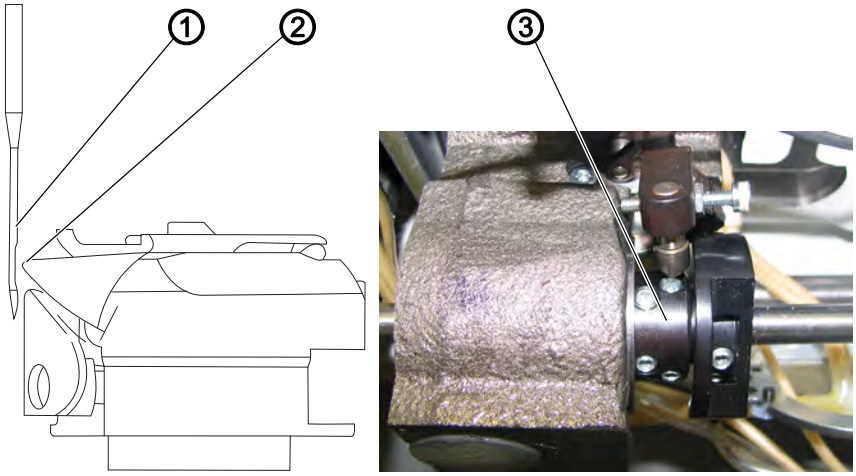
Property damage may occur!

There is a risk of machine damage, needle breakage or damage to the thread if the distance between needle groove and hook tip is incorrect.

Check and, if necessary, reset the distance to the hook tip after inserting a needle with a new size.

10.1 Setting the loop stroke

Abb. 37: Set the loop stroke



(1) - Needle
(2) - Hook tip
(3) - Clamping ring

Proper setting

The loop stroke is 2 mm.

To set the loop stroke:

1. Lock the machine in place at position 1 (📖 *p. 21*).
2. Set the upper stitch length adjusting wheel to 0.
3. Tilt the machine head (📖 *p. 16*).
4. Loosen the screws on the clamping ring (3).

5. Turn the hook so that the hook tip (2) is at the center of the needle (1).
6. Tighten the screws on the clamping ring (3).

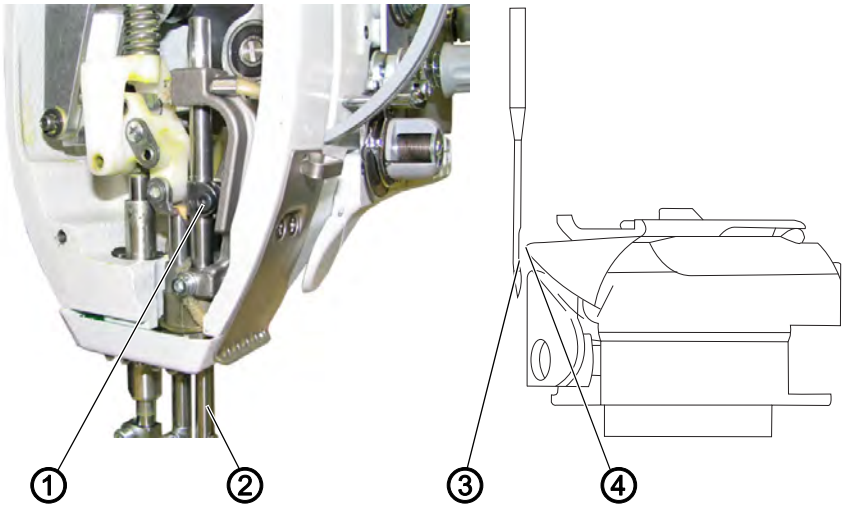
Order

Then check the following setting:

- Thread cutter cam (📖 *p. 76*)

10.2 Setting the needle bar height

Abb. 38: Setting the needle bar height



(1) - Screw
(2) - Needle bar
(3) - Groove
(4) - Hook tip

Proper setting

When the stitch length is set to 0, the hook tip is in the loop stroke position in the lower third of the needle groove.

To set the needle bar height:

1. Remove the head cover (📖 *p. 18*).
2. Set the upper stitch length adjusting wheel to 0.
3. Loosen the screw (2).
4. Move the needle bar (1) so that the hook tip (4) is in the lower third of the needle groove (3).
   When doing so, make sure that you do not turn the needle.
   The groove (3) of the needle must face towards the hook tip (4).
5. Tighten the screw (2).

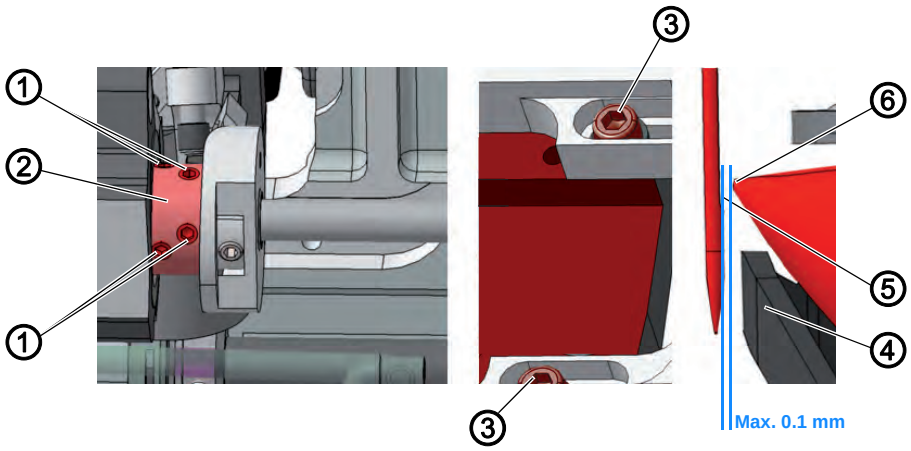
Order

Then check the following setting:

- Needle guard (📖 *p. 56*)

10.3 Setting the hook side clearance

Abb. 39: Setting the hook side clearance



(1) - Threaded pins
(2) - Clamping ring
(3) - Screws
(4) - Needle guard
(5) - Groove
(6) - Hook tip

Proper setting

In the loop stroke position, the distance between the hook tip and the groove of the needle is no greater than 0.1 mm.

To set the hook side clearance:

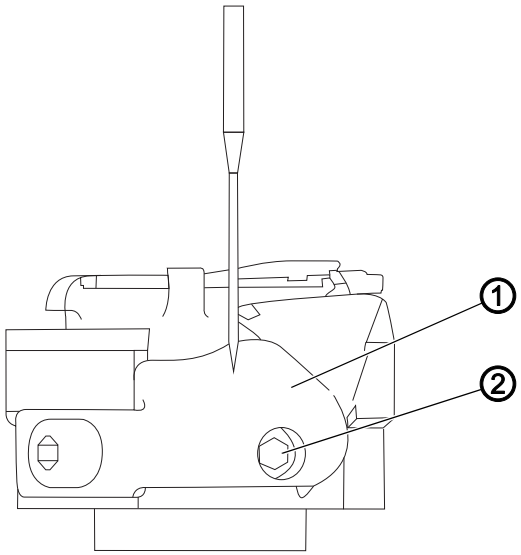
1. Tilt the machine head (📖 *p. 16*).
2. Check whether the needle is pushed away by the needle guard (4) in the loop stroke position.
   If so: swivel down the needle guard.
3. Check the distance between the hook tip (6) and the groove (5) of the needle.

↳ The distance must not exceed 0.1 mm.

4. Loosen the screws (3).
5. Loosen the screws (1).
6. Move the hook housing sideways.
7. Set the loop stroke (📖 *p. 53*).
8. Tighten the screws (1).
9. Tighten the screws (3).

10.4 Setting the needle guard

Abb. 40: Setting the needle guard



(1) - Needle guard *(2) - Screw*

Proper setting

The machine is locked in place at position 1 (📖 *p. 21*).

↳ The needle guard pushes the needle just enough away so that it cannot be touched by the hook tip.

To set the needle guard:

1. Turn the handwheel and check how far the needle guard (1) pushes the needle away.
2. Turn the screw (2) so that the needle guard (1) pushes the needle just so far that the hook tip cannot touch it.
   - To push away more forcefully: turn counterclockwise
   - To push away less forcefully: turn clockwise

11 Setting the bobbin case lifter

CAUTION

Risk of injury from moving parts!

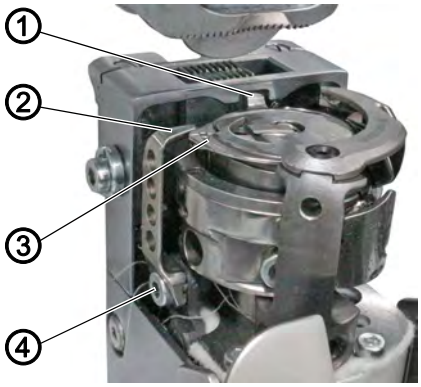
Crushing possible.

Switch off the machine before setting the bobbin case lifter.

11.1 Setting the lifting gap

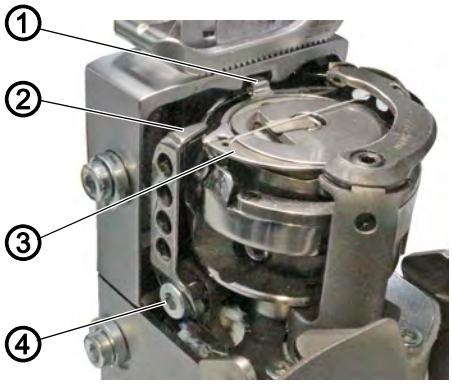
Abb. 41: Setting the lifting gap

680



(1) - Bobbin case nose
(2) - Bobbin case lifter

670



(3) - Hook middle section
(4) - Screw

Proper setting

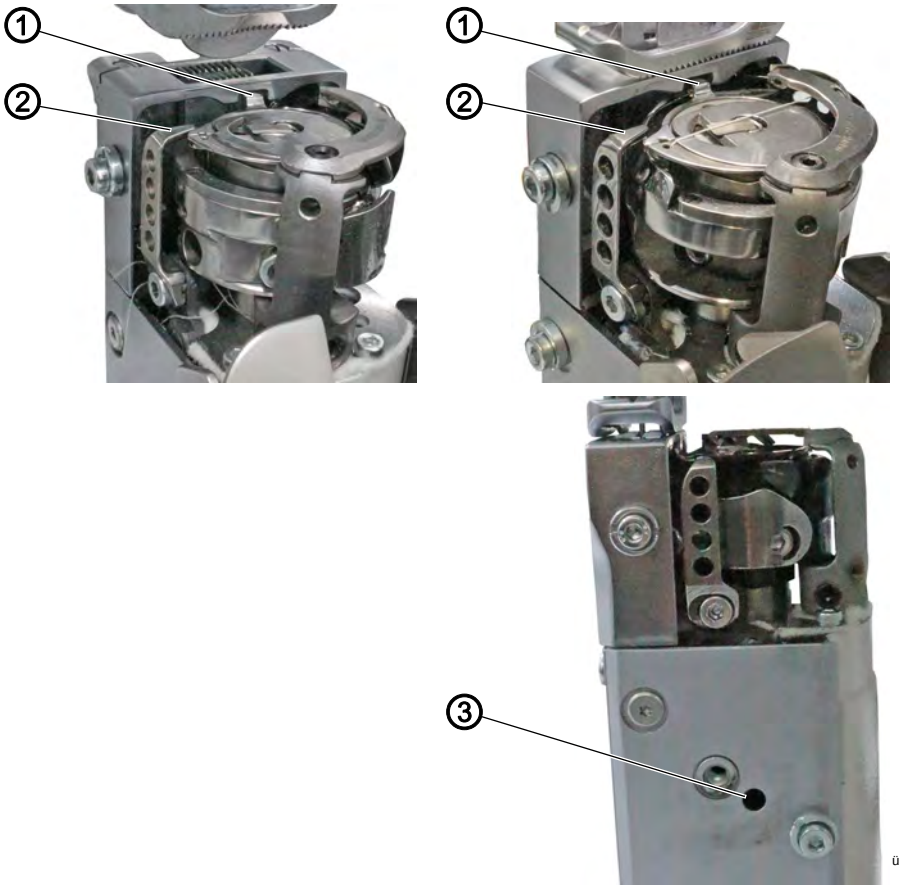
The bobbin case lifter (2) lifts the hook middle section (3) so far that the needle thread can slip freely between the bobbin case nose (1) and the throat plate slot.

To set the lifting gap:

1. Pull up the hook cover and pivot it.
2. Turn the handwheel until the bobbin case lifter (2) has reached its highest lifting path.
3. Loosen the screw (4).
4. Set the bobbin case lifter (2) so that the bobbin case nose (1) is positioned in the center of the throat plate cutout.
5. Tighten the screw (4).

11.2 Setting the timing for opening

Abb. 42: Setting the timing for opening



(1) - Bobbin case nose
(2) - Bobbin case lifter
(3) - Screw opening

Proper setting

When sewing, the needle thread must slip freely through the bobbin case nose (1) and the bobbin case lifter (2).

To set the timing for opening:

1. Disassemble the hook cover.
2. Loosen the screw through the screw hole (3).
3. Move the handwheel into position.
   - Class 670: 305°
   - Class 680: 205°
4. Tighten the screw through the screw hole (3).

12 Sewing feet

WARNING

Risk of injury from sharp and moving parts!

Puncture or crushing possible.

Switch off the machine before you set the sewing feet.

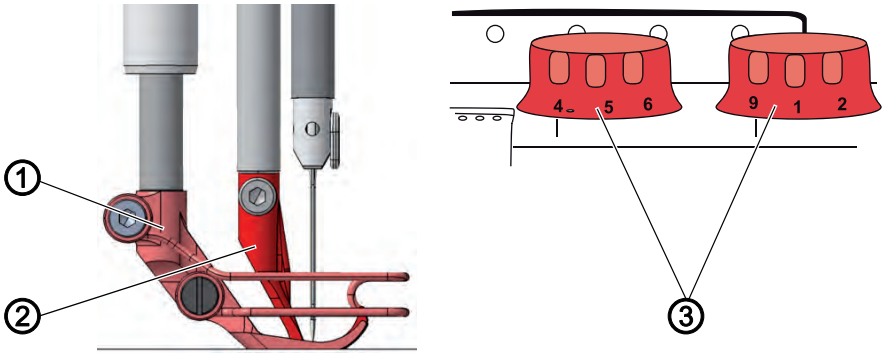
NOTICE

Property damage may occur!

Machine can be damaged if the adjusting wheels are forced.

Do not attempt to use force to set a lower sewing foot stroke at the right adjusting wheel.

Abb. 43: Sewing feet

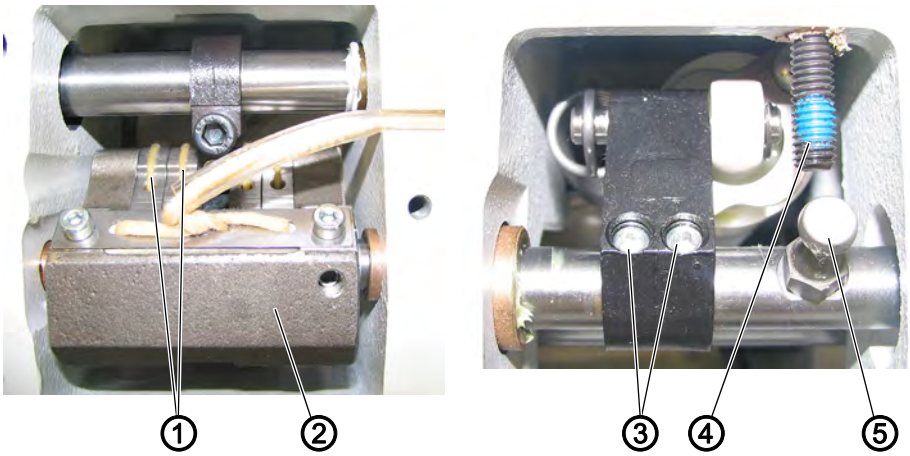


(1) - Presser foot
(2) - Feeding foot
(3) - Adjusting wheels for the sewing foot stroke

The 2 adjusting wheels (3) on the machine arm determine how high the presser foot (1) and feeding foot (2) are raised when sewing.
The left adjusting wheel determines the normal sewing foot stroke.
The right adjusting wheel determines the increased sewing foot stroke.
The increased sewing foot stroke must NOT be lower than the normal sewing foot stroke.

12.1 Setting the initial position of the lifting gear

Abb. 44: Setting the initial position of the lifting gear



(1) - Plates
(2) - Lifting gear
(3) - Screws
(4) - Screw
(5) - Cam

Proper setting

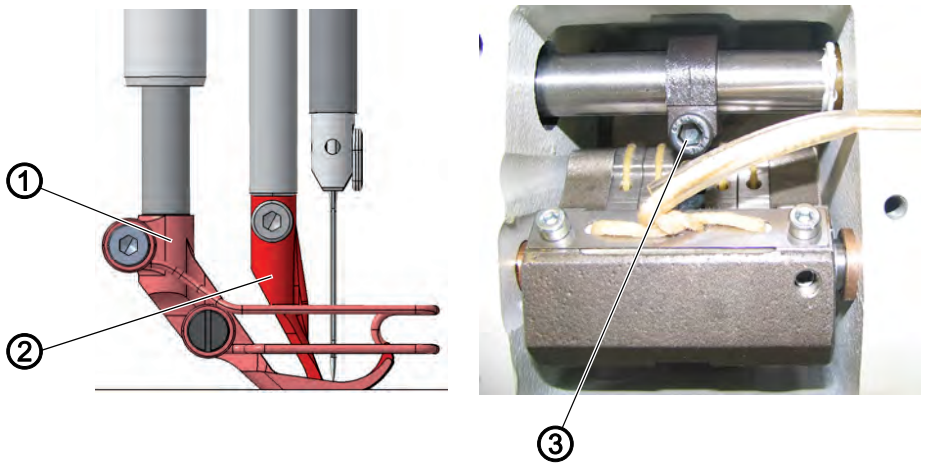
When the screw (4) is put away, the plates (1) of the lifting gear (2) are parallel to each other.

To set the initial position of the lifting gear:

1. Remove the arm cover (📖 *p. 17*).
2. Turn the screw (4) so far that the cam (5) is free.
3. Loosen the screws (3).
4. Position the plates (1) so that they are parallel.
5. Tighten the screws (3).

12.2 Setting an even sewing foot stroke

Abb. 45: Setting an even sewing foot stroke



(1) - Presser foot
(2) - Feeding foot
(3) - Screw

Proper setting

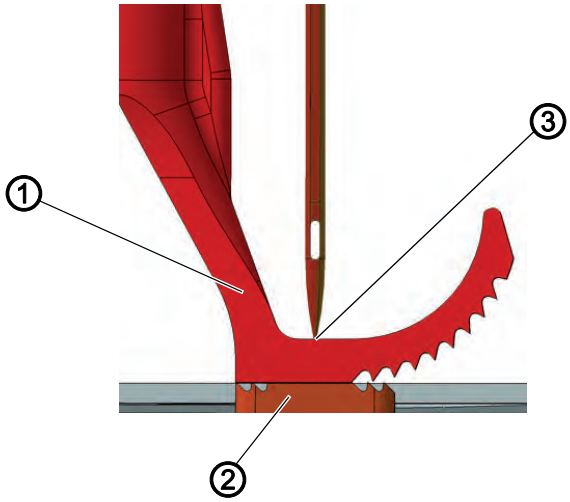
For sewing foot stroke 3, the presser foot and feeding foot are raised by the same height.

To set an even sewing foot stroke:

1. Remove the arm cover (📖 *p. 17*).
2. Set the handwheel to position 0.
3. Loosen the screw (3).
4. Press the feeding foot (2) onto the throat plate.
5. Tighten the screw (3).
6. Place the arm cover.
7. Turn the adjusting wheel for the sewing foot stroke to 3.
8. Check whether the presser foot (1) and the feeding foot (2) are raised to the same height and correct the setting if necessary.

12.3 Setting the stroke movement for the feeding foot

Abb. 46: Setting the stroke movement for the feeding foot (1)



(1) - Feeding foot
(2) - Feed dog
(3) - Needle tip

Order

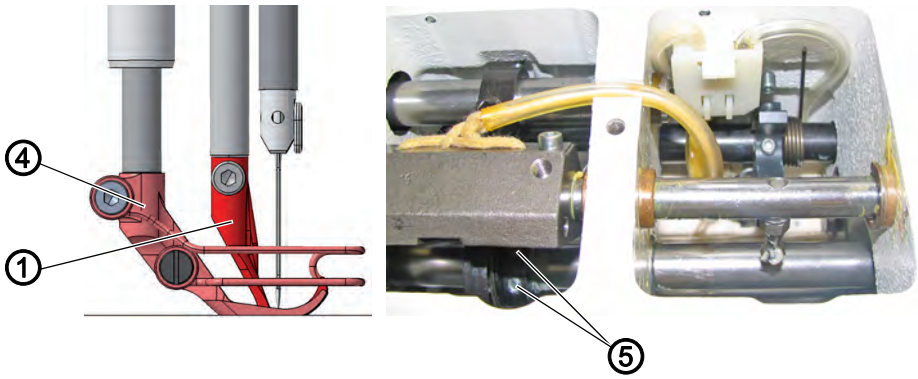
First, check the following setting:

- Even sewing foot stroke (📖 *p. 61*)
- The feed dog stroke movement (📖 *p. 46*)

Proper setting

The feeding foot (1) touches down exactly on the feed dog (2) when the downward movement of the needle tip (3) reaches the upper edge of the feeding foot. This occurs at handwheel position 95°.

Abb. 47: Setting the stroke movement for the feeding foot (2)



(1) - Feeding foot
(4) - Presser foot
(5) - Screws

To set the stroke movement for the feeding foot:

1. Remove the arm cover (📖 *p. 17*).
2. Set the maximum stitch length.
3. Set the maximum sewing foot stroke.

4. Loosen the screws (5).
5. Turn the stroke eccentric.
   When doing so, make sure that you do not move the stroke eccentric axially.
6. Tighten the screws (5).
7. Check the setting and correct it if necessary.

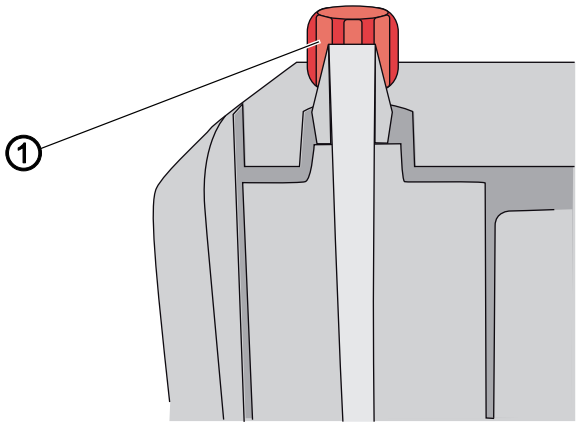
12.4 Setting the sewing foot pressure

The adjusting wheel at the top left of the machine arm determines the pressure for the sewing feet on the sewing material. The pressure can be adjusted continuously by turning the adjusting wheel.

The correct pressure depends on the sewing material:

- Lower pressure for soft materials
- Higher pressure for durable materials

Abb. 48: Setting the sewing foot pressure



(1) - Adjusting wheel for the sewing foot pressure

To set the sewing foot pressure:

1. Turn the adjusting wheel for the sewing foot pressure (1):
   - Higher pressure: turn clockwise
   - Lower pressure: turn counterclockwise

12.5 Setting the sewing foot lifting height

CAUTION

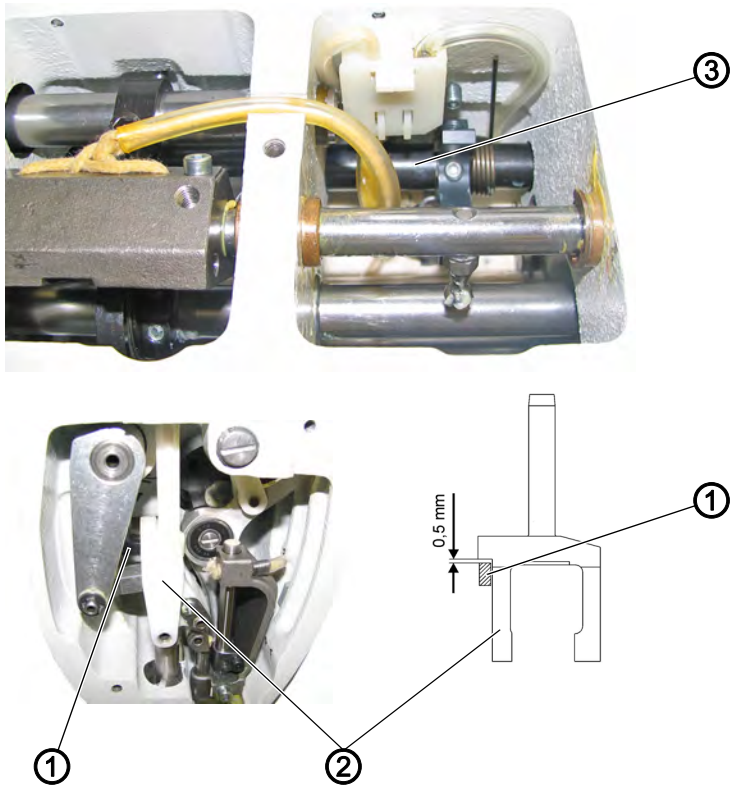
Risk of injury from moving parts!

Crushing possible.

The machine must remain switched on so that the sewing feet can be raised.
Exercise particular caution when setting the sewing foot lifting height.
Do NOT place your hands under the sewing feet when they are being lowered.

12.5.1 Setting the mechanical sewing foot lifting

Abb. 49: Setting the mechanical sewing foot lifting (1)

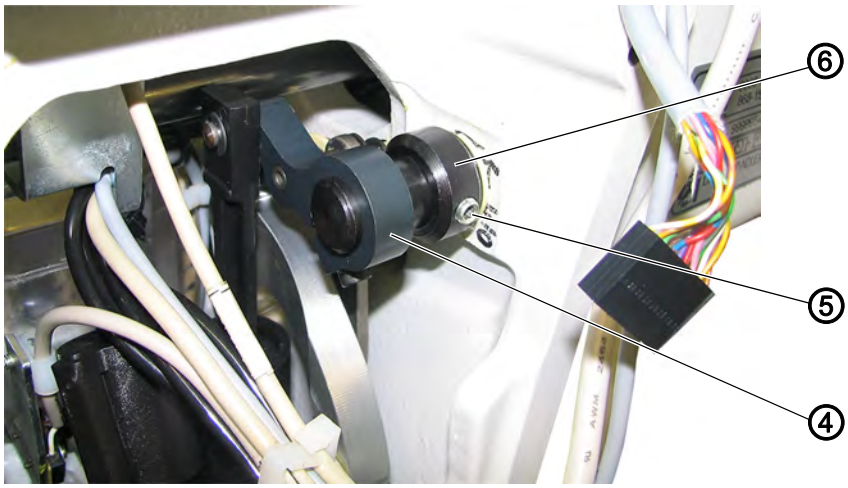


(1) - Lifter lever
(2) - Spring guide
(3) - Lifter shaft

Proper setting

The lifter shaft (3) must move smoothly, but must not have any axial play. The play of the lifting mechanism should be approximately 0.5 mm between the spring guide (2) and the lifter lever (1).

Abb. 50: Setting the mechanical sewing foot lifting (2)



(4) - Lifter block
(5) - Screw
(6) - Adjusting ring

To set the mechanical sewing foot lifting:

1. Remove the arm cover (📖 *p. 17*).
2. Remove the head cover (📖 *p. 18*).
3. Unscrew the electrical and pneumatic unit.

Tightening the lifter shaft

4. Loosen the screw (5).
5. Slide the lifter shaft (3) all the way to the right.
6. Slide the adjusting ring (6) onto the bearing bush.
7. Tighten the screw (5).
   Make sure that the shaft can still run easily.

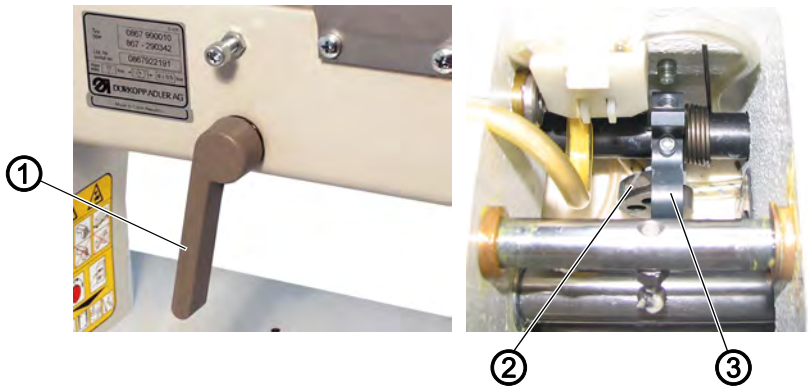
Setting the lifter shaft play

8. Loosen the screws on the lifter block (4).
9. Move the lifter shaft (3) until play exists.
10. Tighten the screws on the lifter block (4).

12.5.2 Setting the sewing foot lifting height

Setting the height of the sewing feet locked with the hand lever

Abb. 51: Setting the height of the sewing feet locked with the hand lever



(1) - Hand lever
(2) - Eccentric washer
(3) - Lifting lever

Proper setting

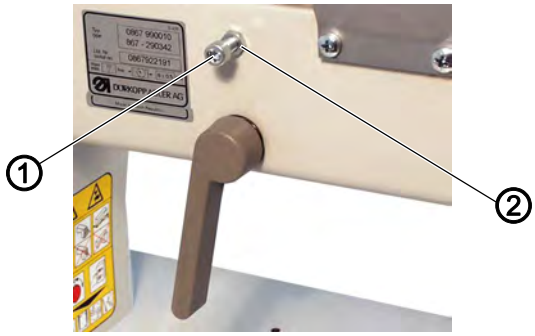
If the sewing feet are locked with the hand lever (1) in the raised position, they should be at a distance of 10 mm to the throat plate.

To set the height of the sewing feet locked with the hand lever:

1. Remove the arm cover (📖 *p. 17*).
2. Lift sewing feet.
3. Place the distance piece (10 mm) under the sewing feet.
4. Loosen the screws on the lifting lever (3).
5. Push the hand lever (1) down.
6. Push the lifting lever (3) onto the eccentric washer (2).
7. Tighten the screws on the lifting lever (3).

Setting the height of the pneumatically raised sewing feet

Abb. 52: Setting the height of the pneumatically raised sewing feet



(1) - Screw *(2) - Counternut*

Proper setting

If the sewing feet are raised pneumatically or via the knee button, they should be at a distance of 20 mm to the throat plate.

To set the height of the pneumatically raised feet:

1. Lower the sewing feet.
2. Turn the handwheel until the needle bar is at the top dead center.
3. Raise the sewing feet pneumatically and measure the lifting height.
4. Loosen the counternut (2).
5. Turn the screw (1).
   - Increase the lifting pressure: turn counterclockwise
   - Reduce the lifting pressure: turn clockwise
6. Tighten the counternut (2).

13 Setting the needle thread tension

CAUTION

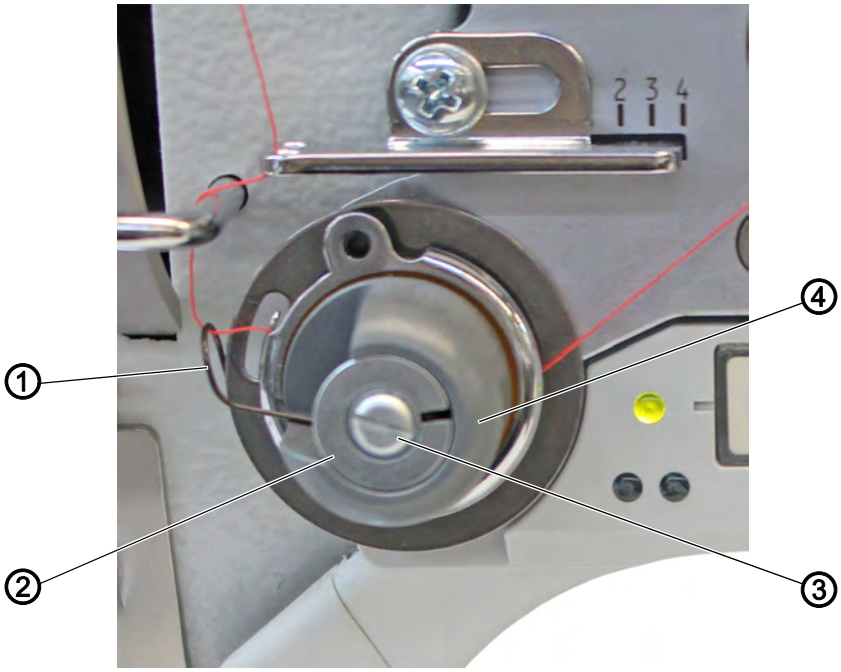
Risk of injury from moving parts!

Crushing possible.

Switch off the machine before setting the needle thread tension.

Setting the thread tension spring

Abb. 53: Setting the thread tension spring



(1) - Thread tension spring
(2) - Tension disk
(3) - Screw
(4) - Stop collar

The thread tension spring holds the needle thread under tension from the top dead center of the thread lever up to the point when the needle eye plunges into the sewing material.

Proper setting

The thread tension spring does not contact the stop until the needle eye has plunged into the sewing material.

The setting for the thread tension spring must be varied according to the sewing material and the required sewing result.

To set the thread tension spring:

1. Loosen the screw (3).
2. Turn the stop collar (4) to set the spring travel.
   - Longer spring travel: turn counterclockwise
   - Shorter spring travel: turn clockwise
3. Turn the tension disk (2) to set the spring tension.
   - Greater spring tension: turn counterclockwise
   - Lower spring tension: turn clockwise

Important

Do not twist the stop collar in doing so.

4. Tighten the screw (3).

14 Winder

WARNING

Risk of injury from moving parts!

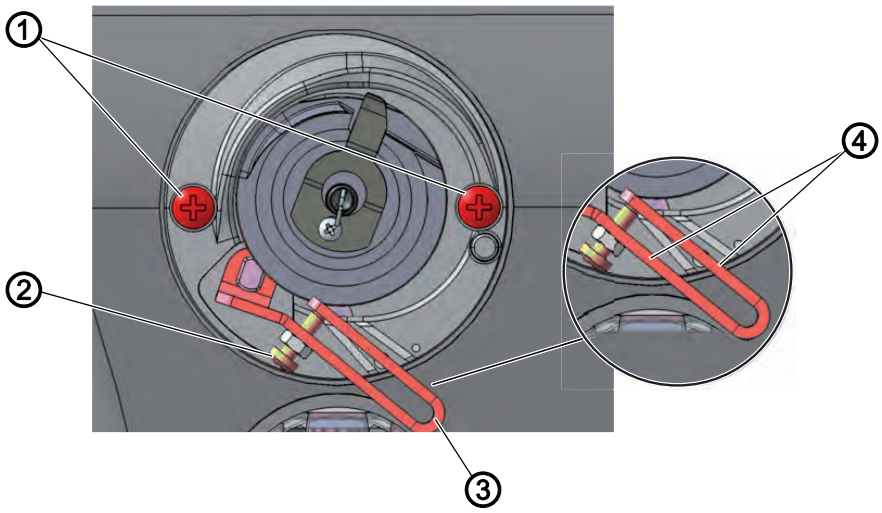
Crushing possible.

Switch off the machine before setting the winder.

14.1 Setting the winder

Setting the winder filling quantity

Abb. 54: Setting the winder filling quantity



(1) - Screws
(2) - Screw
(3) - Winder lever
(4) - Arm

Proper setting

The winder wheel runs smoothly and without axial play.
The winding process will stop automatically when the required filling quantity of the bobbin is reached.

To set the winder filling quantity:

1. Remove the arm cover (📖 *p. 17*).
2. Loosen the screws (1).
3. Remove the winder.

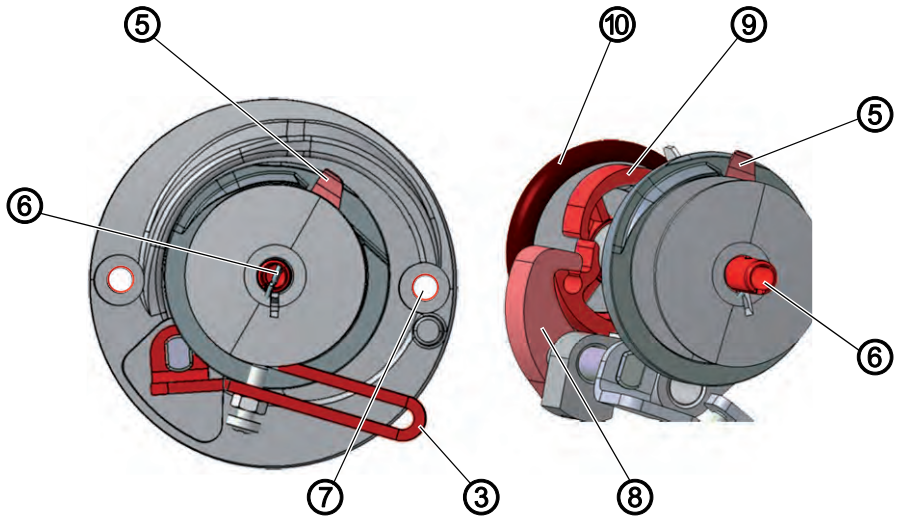
The position of the arms (4) on the winder lever (3) determines the filling quantity:

- Arm (4) parallel: automatic winding stop at 0.5 mm below the edge of the winder
- Arm (4) closer together: automatic winding stop with larger filling quantity
- Arm (4) further apart from each other: automatic winding stop with smaller filling quantity

4. Turn the screw (2):
   - Arms (4) closer together: turn counterclockwise
   - Arms (4) further apart from each other: turn clockwise
5. Put the completely filled bobbin onto the winder.
6. Fold the winder lever (3) upwards as far as it will go to the thread.

Setting the winder spacing

Abb. 55: Setting the winder spacing



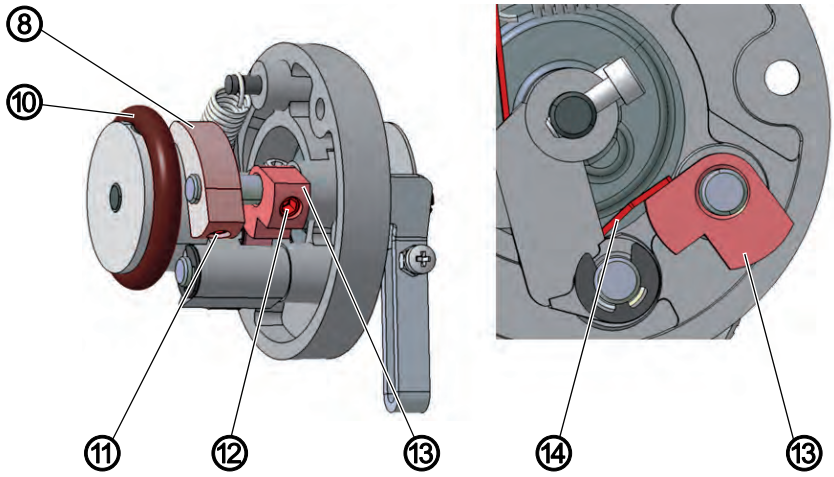
(3) - Winder lever
(5) - Thread-pulling knife
(6) - Winder spindle
(7) - Right-hand screw hole
(8) - Block
(9) - Locking disk
(10) - Winder wheel

To set the winder spacing:

1. Turn the winder spindle (6) such that the thread-pulling knife (5) is at the top right and is facing the right-hand screw hole (7).
2. Loosen the threaded pin in the block (8).
3. Set the winder lever (3) so that the distance between the thread on the bobbin and the winder lever is 2-3 mm.
4. Set the block (8) such that it is resting against the locking disk (9).
5. Set the block (8) such that its distance to the winder wheel (10) is 0.5 mm.
6. Tighten the threaded pin in the block (8).

Setting the winder run

Abb. 56: Setting the winder run



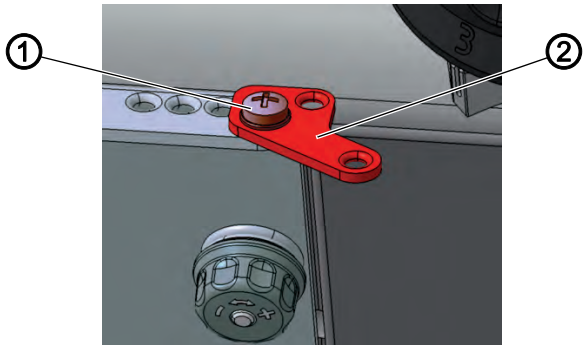
(8) - Block
(10) - Winder wheel
(11) - Threaded pin
(12) - Threaded pin
(13) - Switch cam
(14) - Leaf spring

To set the winder run:

1. Loosen the threaded pin (12).
2. Set the switch cam (13) such that it is just contacting the leaf spring (14) when the block (8) has engaged in the locking disk.
3. Set the switch cam (13) such that the winder lever (3) has no axial play.
4. Tighten the threaded pin (12).
5. Re-assemble the winder.

14.2 Setting the hook thread guide

Abb. 57: Setting the hook thread guide



(1) - Screw *(2) - Hook thread guide*

The position of the hook thread guide determines how the hook thread is wound onto the bobbin.

Proper setting

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

To set the hook thread guide:

1. Loosen the screw (1).
2. Turn the hook thread guide (2):
   - To the front: The hook thread will be wound on further to the front
   - To the rear: The hook thread will be wound on further to the rear

15 Thread cutter

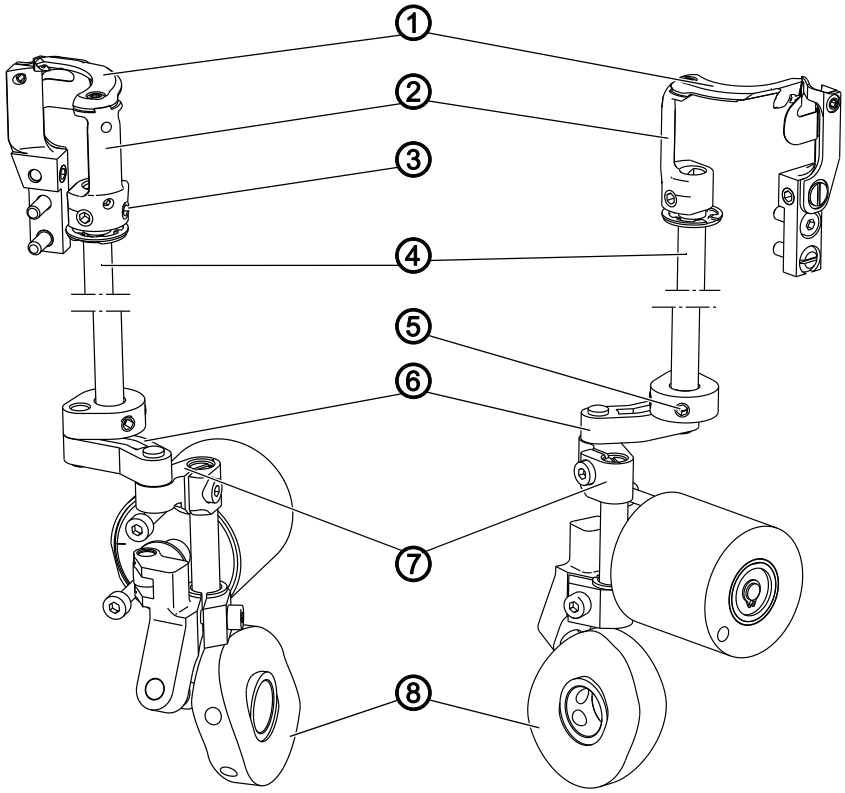
WARNING

Risk of injury from sharp parts!

Cutting possible.

Switch off the machine before setting the thread cutter.

Abb. 58: Thread cutter



(1) - Thread-pulling knife
(2) - Knife carrier
(3) - Screw
(4) - Shaft
(5) - Screw
(6) - Lever
(7) - Lever
(8) - Control cam

The thread-pulling knife (1) cannot be moved on the knife carrier (3). The thread-pulling knife (1) can thus be replaced without having to reset the cutting pressure.

The screws (3) and (5) are tightened to the surfaces on the shaft (4).

To avoid a collision, the lever (6) must be fitted with its short side on the lever (7).

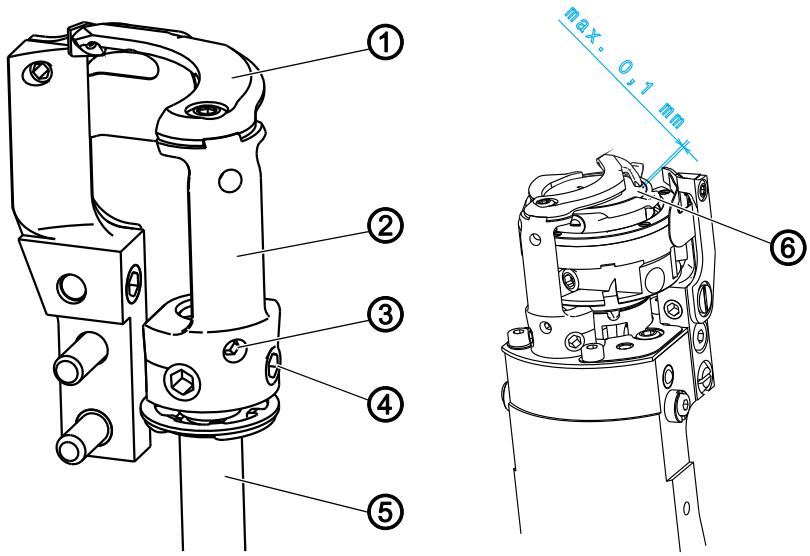
The control cam (8) is designed for operating with the XL hook and the XXL hook.

Important

The control cam (4) and clamping ring are both mutually used as a stop and must not be loosened at the same time.

15.1 Setting the height of the thread-pulling knife

Abb. 59: Setting the height of the thread-pulling knife



(1) - Thread-pulling knife
(2) - Knife carrier
(3) - Screw
(4) - Screw
(5) - Shaft
(6) - Bobbin

Proper setting

The thread-pulling knife (1) travels as close as possible to the bobbin (6). The distance between the thread-pulling knife (1) and the bobbin (6) must not exceed 0.1 mm.

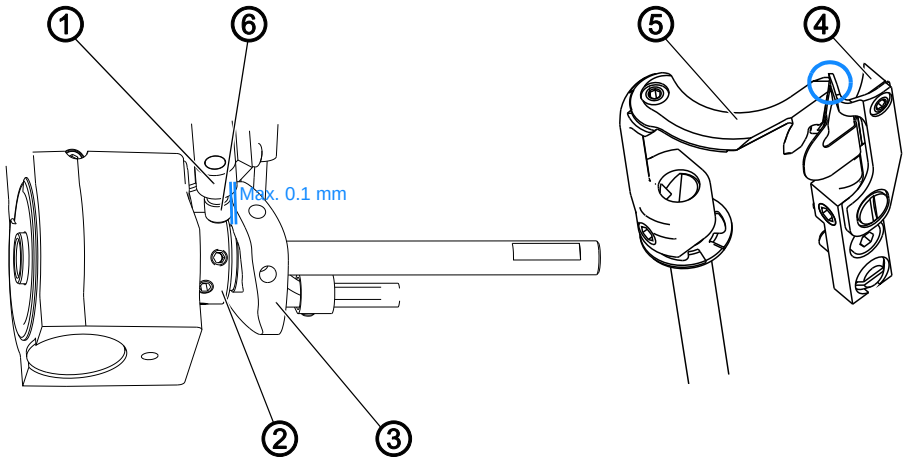
To set the height of the thread-pulling knife:

1. Loosen the screws on the knife carrier (2).
2. Turn the screw (3) to set the height of the thread-pulling knife.

   The distance between the thread-pulling knife (1) and the bobbin (6) must not exceed 0.1 mm.
3. Tighten the screws on the knife carrier (2).
   In doing so, ensure that the screw (4) is flush with the surface of the shaft (5).

15.2 Setting the cutoff curve

Abb. 60: Setting the cutoff curve



(1) - Lever
(2) - Clamping ring
(3) - Control cam
(4) - Counter blade
(5) - Thread-pulling knife
(6) - Roller

Proper setting

The control cam (3) makes direct contact with the clamping ring (2).
The distance between the widest extent of the control cam (3) and the roller (6) is no greater than 0.1 mm.

In the rest position, the thread-pulling knife (5) is flush with the cutting edge of the counter blade (4).
The thread-pulling knife (5) must move smoothly, but must not have any axial play.

To set the cutoff curve:

1. Tilt the machine head (📖 *p. 16*).
2. Loosen the threaded pins on the clamping ring (2).
3. Push the clamping ring (2) as far as it will go to the left.
4. Tighten the threaded pins on the clamping ring (2).

Important

Tighten the threaded pins on the clamping ring (2) before you loosen the threaded pins on the control cam (3). The clamping ring (2) and control cam (3) are both mutually used as a stop and must not be loosened at the same time.

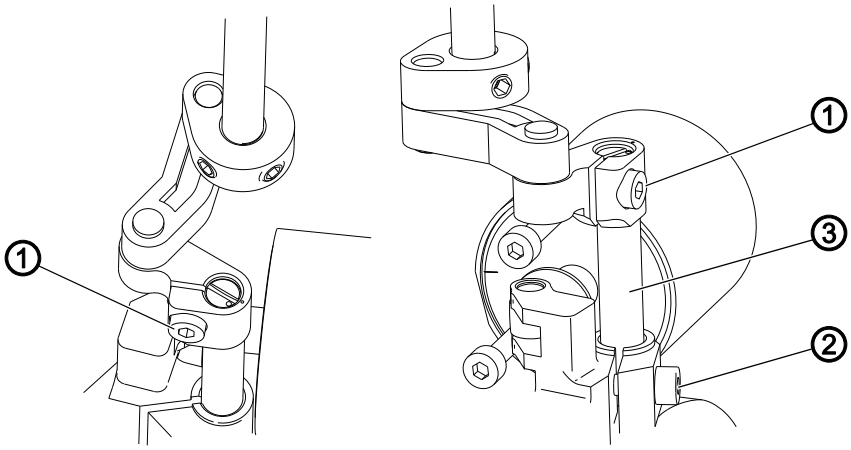
5. Loosen the threaded pins on the control cam (3).
6. Press the lever (1) against the solenoid.
7. Set the distance between the roller (7) and control cam (3) at the highest point of the control cam (3) to 0.1 mm.
8. Tighten the threaded pins on the control cam (3).

To set the blades flush:

1. Loosen the clamping screw on the lever (1).
2. Turn the thread-pulling knife (5) so that the tip is flush with the cutting edge of the counter blade (4).
3. Tighten the clamping screw on the lever (1).
   In doing so, ensure that there is no axial play.
4. Loosen the threaded pins on the clamping ring (2).
5. Push the clamping ring (2) as far as possible to the right against the control cam (3).
6. Check the loop stroke (📖 *p. 53*).
7. Tighten the threaded pins on the clamping ring (2).

15.3 Setting the swivel range of the thread-pulling knife

Abb. 61: Setting the swivel range of the thread-pulling knife



(1) - Screw
(2) - Screw
(3) - Eccentric bolt

Proper setting

The thread-pulling knife can move from its park position to the maximum swivel angle without colliding with the hook cover.
The swivel range of the thread-pulling knife is at its smallest when the eccentric bolt (3) is rotated by 180°.

To set the swivel range of the thread-pulling knife:

1. Loosen screws (1) and (2).
2. Turn the eccentric bolt (3).
3. Tighten screws (1) and (2).
4. Check the swivel range and readjust it if necessary.

Important

5. Reset the park position of the thread-pulling knife (📖 *p. 76*).

15.4 Setting the cutting pressure

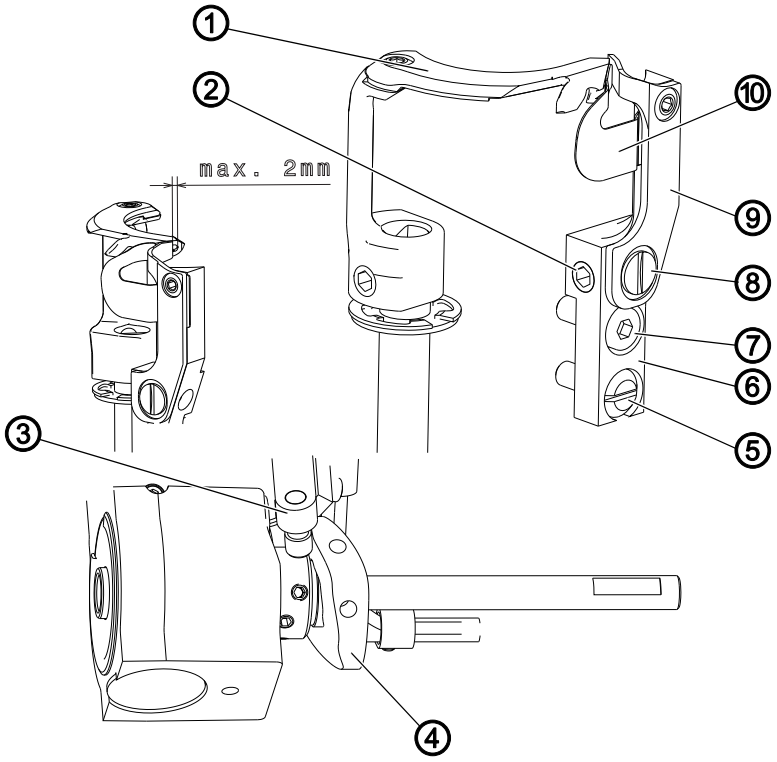
NOTICE

Property damage may occur!

Increased knife wear or breakage is possible.

Do not set the pressure of the counter blade too high.

Abb. 62: Setting the cutting pressure



(1) - Thread-pulling knife
(2) - Screw
(3) - Lever
(4) - Control cam
(5) - Screw
(6) - Counter blade support
(7) - Screw
(8) - Eccentric
(9) - Counter blade
(10) - Hook thread clamp

The shape of the thread-pulling knife automatically creates the required cutting pressure as soon as the thread-pulling knife and counter blade make contact.

Proper setting

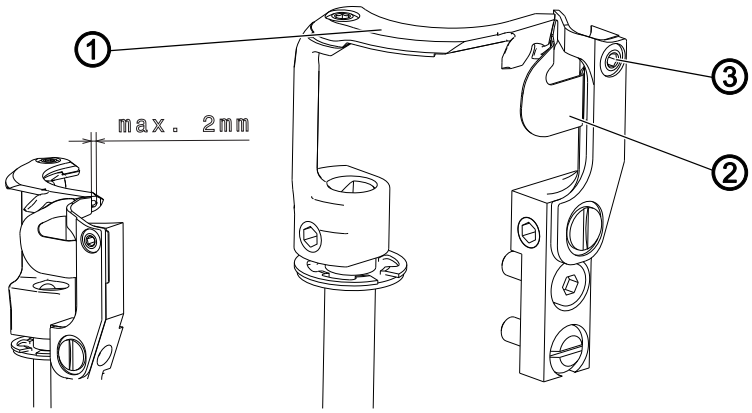
In the rest position, the hook thread clamp (10) makes contact with the thread-pulling knife (1) without any pressure being applied.
Any 2 threads with the greatest strength used for sewing can be neatly cut simultaneously.

To set the cutting pressure:

1. Turn the handwheel until the thread-pulling knife (1) can be swung out by hand.
2. Swivel the thread-pulling knife (1) so far that the distance between the 2 cutting edges is approx. 2 mm.
3. Loosen the screw (7).
4. Turn the counter blade support (6) by screwing the screw (5) against the thread-pulling knife (1).
5. Loosen the screw (2).
6. Adjust the eccentric (8) so that the cutting edge of the counter blade (9) is parallel to the cutting edge of the thread-pulling knife (1).
   The counter blade (9) must abut on the thread-pulling knife (1).
7. Tighten the screw (2).
8. Tighten the screw (7).
9. Check the cutting pressure and readjust it if necessary.

15.5 Setting the hook thread clamp

Abb. 63: Setting the hook thread clamp



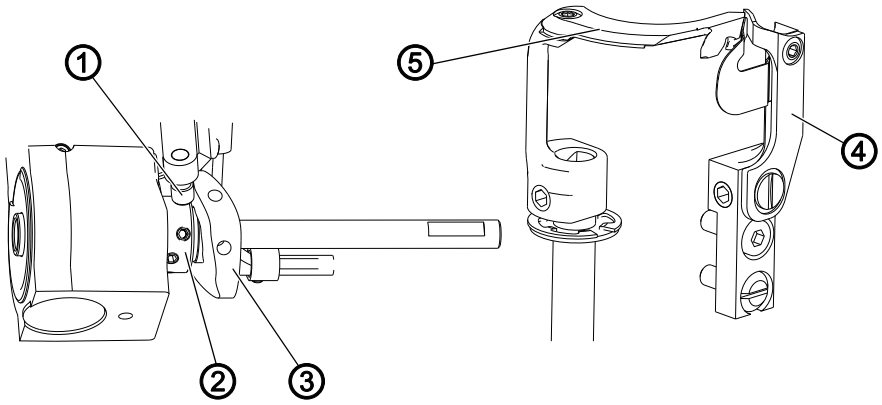
(1) - Thread-pulling knife
(2) - Hook thread clamp
(3) - Screw

To set the hook thread clamp:

1. Turn the handwheel until the thread-pulling knife (1) can be swung out by hand.
2. Swivel the thread-pulling knife (1) so far that the distance between the 2 cutting edges is approx. 2 mm.
3. Loosen the screw (3).
4. Move the hook thread clamp (2) so that it abuts on the thread-pulling knife (1).
5. Tighten the screw (3).
6. Check the clamping effect and readjust it if necessary.

15.6 Setting point in time for cutting

Abb. 64: Setting point in time for cutting



(1) - Roller
(2) - Clamping ring
(3) - Control cam
(4) - Counter blade
(5) - Thread-pulling knife

Proper setting

The threads are cut when the thread lever is at the top dead center (handwheel at position 60°).

To set the point in time for cutting:

1. Loosen the threaded pins on the control cam (3).
2. Swivel the thread-pulling knife (1) until the cutting edge of the thread-pulling knife (1) lines up with the cutting edge of the counter blade (2).
3. Move the handwheel into the 60° position.
4. Push the control cam (3) to the left as far as it will go and against the clamping ring (2).
5. Turn the control cam (3) until it is in contact with the roller (1).
6. Tighten the threaded pins on the control cam (3).
7. Check setting:
   - Insert the thread into the thread-pulling knife (1) and slowly turn the handwheel.
   - Check the handwheel position at which the thread is cut.
   - Readjust the setting if necessary.

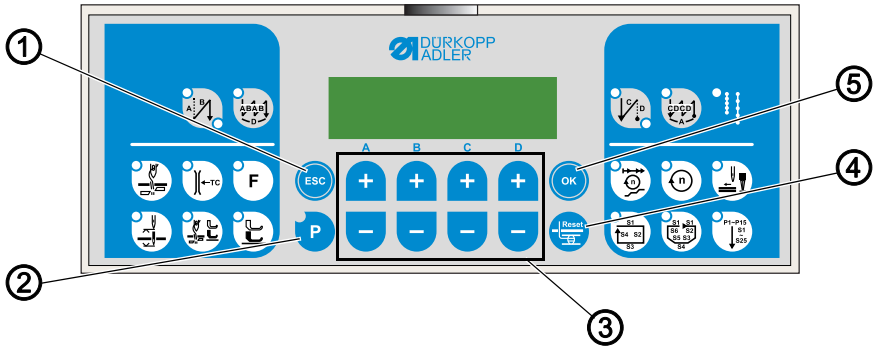
16 Setting the potentiometer

The potentiometer adjusts the number of stitches to the set sewing foot stroke and reduces the number of stitches if the sewing foot stroke is too much.

Proper setting

The lifting gear is at 0.
If, at Technician level, the parameter `t 10 04` is called and the **OK** button is pressed, the display shows `1` in first place on the left and the corresponding maximum speed next to it.

Abb. 65: Setting the potentiometer (1)



(1) - ESC button
(2) - P button
(3) - Plus/Minus buttons
(4) - Reset button
(5) - OK button

To set the potentiometer:

1. Remove the arm cover (📖 *p. 17*).
2. Switch off the machine.
3. Keep the buttons **P** (2) and **Reset** (4) pressed down simultaneously and switch on the machine when doing so.

↳ The display starts.

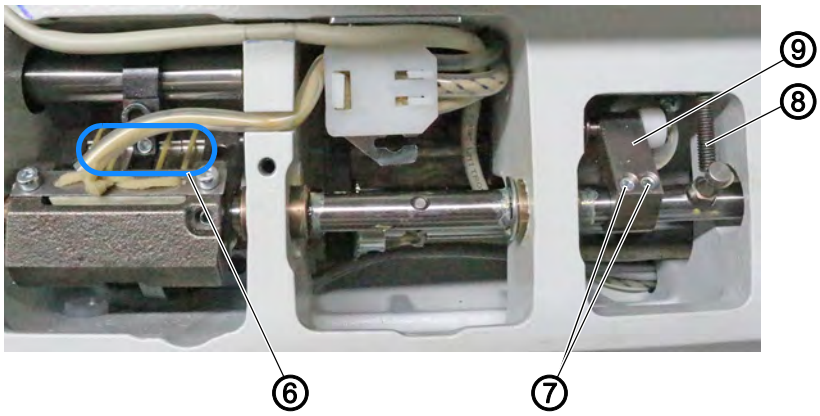
4. Release the buttons **P** (2) and **Reset** (4).

↳ The display indicates the current level.

The potentiometer is set at technician level `t 10 04`.
If the display indicates a different level:

5. Calling the technician level using the Plus/Minus buttons (3):
   As the case may be, press the Plus or Minus button below the letter or the number until the display indicates `t 10 04`.
6. Press the **OK** button.

Abb. 66: Setting the potentiometer (2)

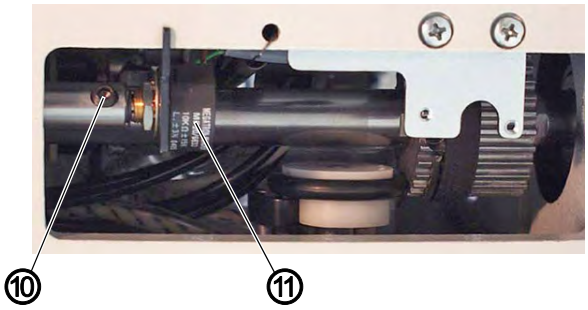


(6) - Plates
(7) - Threaded pins
(8) - Threaded pin
(9) - Block

7. Check whether the plates (6) of the lifting gear are flush.
8. If the plates (6) are not flush:
   - loosen the threaded pins (7), and the block (9) will be pulled downward by spring force.
   - Set the threaded pin (8) through the hole on the rear so that the plates (6) are flush.
   - Tighten the threaded pins (7).

↳ The lifting gear is at 0.

Abb. 67: Setting the potentiometer (3)



(10) - Threaded pin
(11) - Potentiometer

9. Loosen the threaded pin (10).
10. Turn the potentiometer axle such that the left display shows 4 in the first instance and the relevant maximum speed next to it.
11. Tighten the threaded pin (10) without the value in the display changing.
12. Press the **ESC** button twice.

Important

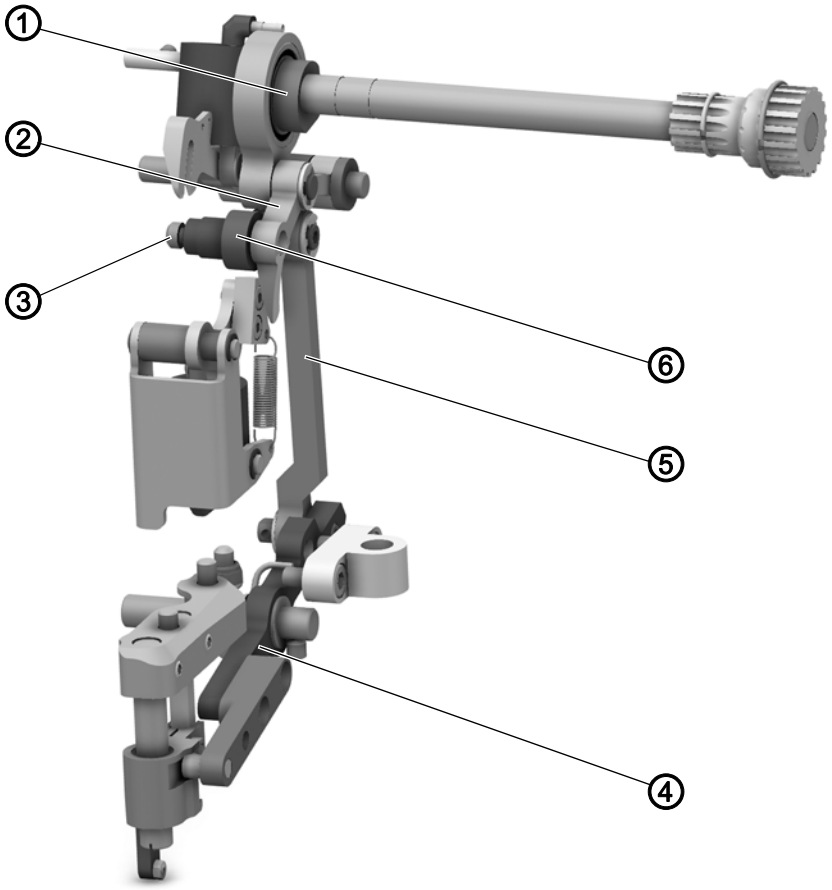
13. Switch off the machine.
14. Switch on the machine.

↳ Switching off and on will save the setting.

17 Edge cutter (only 680)

The edge cutter can be electropneumatically switched via 2 switching cylinders.

Abb. 68: Edge cutter



(1) - Eccentric
(2) - Lever
(3) - Movable bolt
(4) - Lever
(5) - Pull rod
(6) - Lever

Edge cutter function

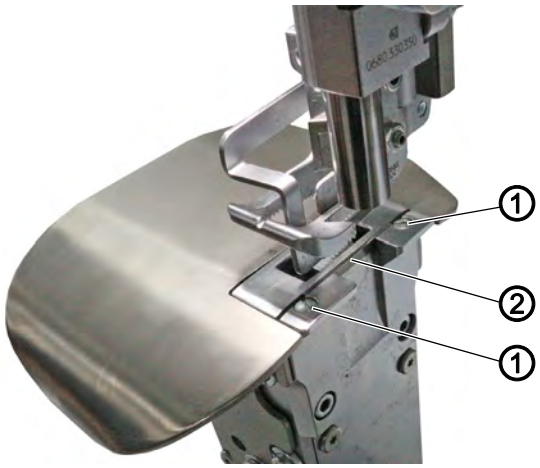
When the **edge cutter is activated**, the eccentric (1) completes a stroke movement through the arm shaft movement. The stroke movement is transmitted to the lever (2).
The movable bolt (3) is engaged in the hole of the lever (2) and is connected to the lever (6). The movement of the lever (6) is transmitted to the pull rod (5). The movement of the pull rod (5) moves the lever (4) up and down and generates the cutter movement.

When the **edge cutter is deactivated**, the clevis pulls out the bolt (3) and the lever (6) is moved into a different position. The torsion spring pulls the pull rod downwards and the cutter upwards via the lever (4).

17.1 Assembling and setting the blade

17.1.1 Assembling the counter blade

Abb. 69: Assembling the counter blade



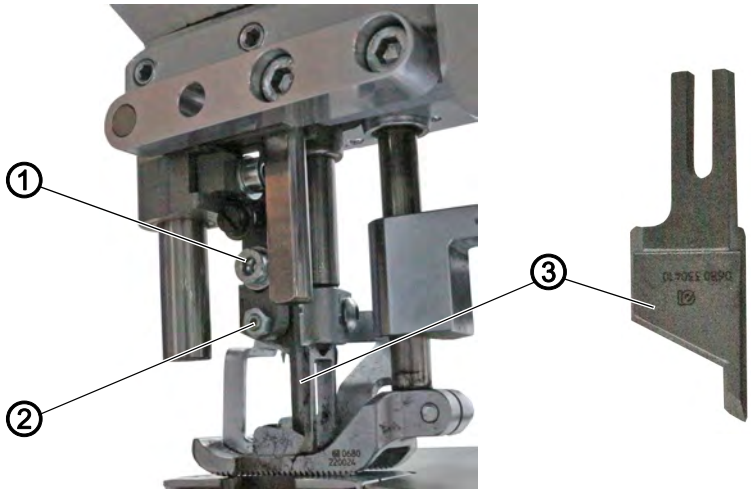
(1) - Screws
(2) - Counter blade

To assemble the counter blade:

1. Clamp the counter blade (2) next to the throat plate.
   ↳ The blade slant must point to the throat plate.
2. Fix the counter blade (2) in place using screws (1).

17.1.2 Assembling and setting the movable blade

Abb. 70: Assembling and setting the movable blade (1)



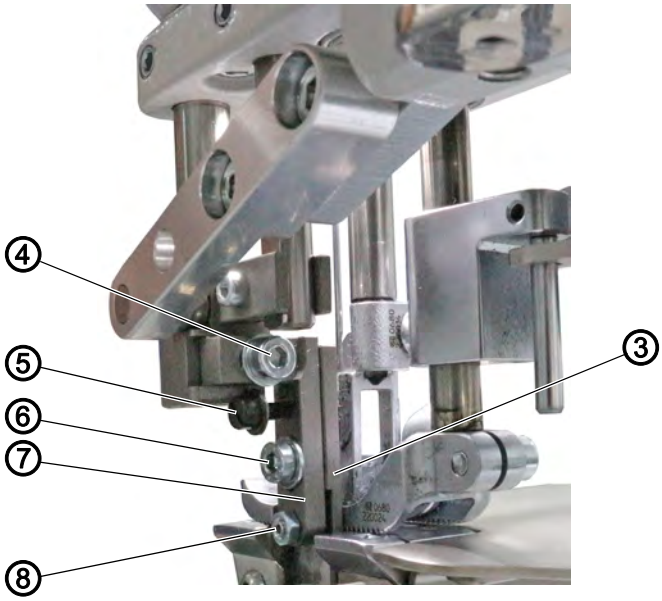
(1) - Screw
(2) - Threaded pin
(3) - Movable blade

To assemble and set the movable blade:

1. Loosen the screw (1).
2. Turn back the threaded pin (2).

3. Disassemble the movable blade (3).

Abb. 71: Assembling and setting the movable blade (2)



(3) - Movable blade
(4) - Screw
(5) - Screw
(6) - Screw
(7) - Knife carrier
(8) - Threaded pin

4. Press the  button.

↳ The knife carrier (7) moves down.

5. Loosen the screw (4).
6. Turn the screw (5) to move the knife carrier (7) to the side.
7. Loosen the threaded pin (8).
8. Press the  button.

↳ The knife carrier (7) moves up.

9. Insert a new movable blade (3).

↳ The movable blade (3) is flush on top with the knife carrier (7).

10. Press the knife carrier (7) down manually.
11. Turn the screw (5) so that the movable blade (3) abuts on the counter blade with as little pressure as possible.

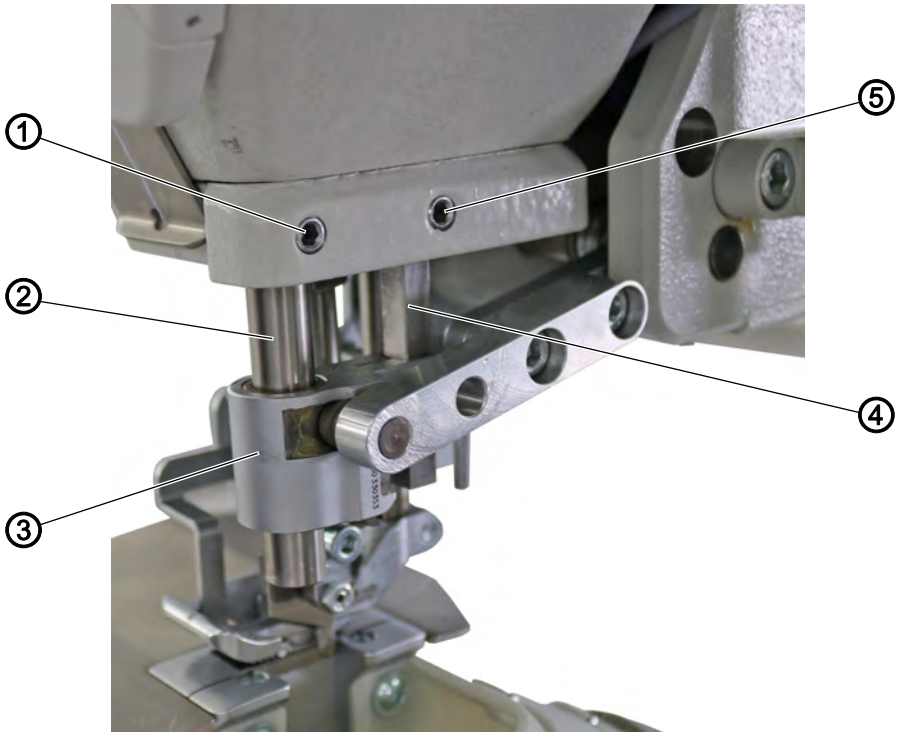
↳ The movable blade (3) fits exactly into the throat plate cutout.

12. Tighten the screw (4).

17.1.3 Setting the cutting angle

To achieve good cutting results, we recommend to set a small cutting angle.
The scissor effect of the movable knife and counter knife helps to achieve good cutting results even with low cutting pressure.

FIg. 72: Setting the cutting angle



(1) - Clamping screw
(2) - Eccentric bolt
(3) - Knife block
(4) - Square bolt
(5) - Clamping screw

To set the cutting angle:

1. Loosen clamping screws (1) and (5).
2. Turn the eccentric bolt (2).

↳ The cutting angle changes.

3. Clamp the eccentric bolt (2) in place using the clamping screw (1).
4. Clamp the square bolt (4) in place using the clamping screw (5).

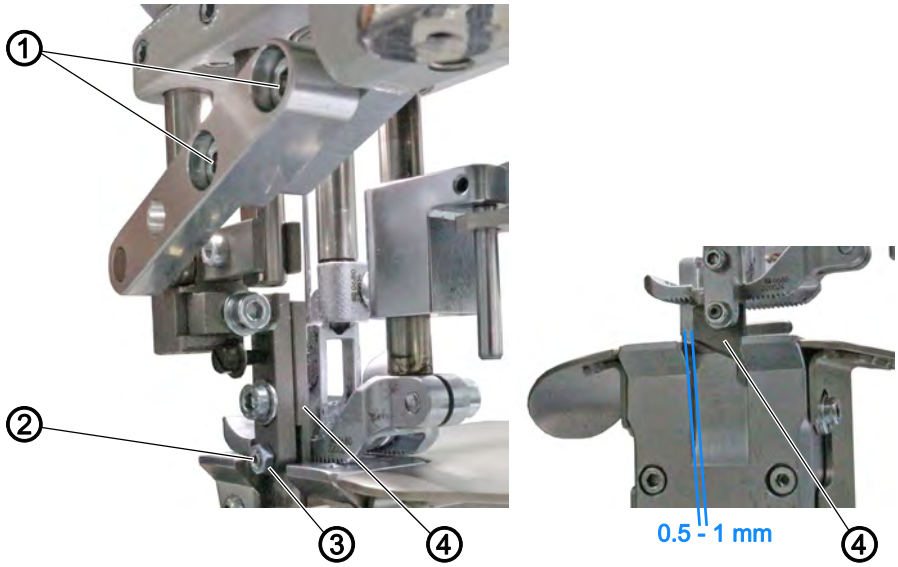
Information

If you turn the eccentric bolt (2), the alignment changes to the square bolt (4). If necessary, also turn the square bolt (4) so that the knife block (3) can continue to move easily.

5. Set the cutting pressure (📖 *p. 87*).

17.1.4 Setting the cutting pressure and blade position

Abb. 73: Assembling and setting the blade (3)



(1) - Screws
(2) - Threaded pin
(3) - Counternut
(4) - Movable blade

To set the **cutting pressure**:

1. Loosen the counternut (3).
2. Screw in or loosen the threaded pin (2) to set the cutting pressure.
   - More cutting pressure: screw in the threaded pin (2).
   - Less cutting pressure: loosen the threaded pin (2).
3. Tighten the counternut (3).

↳ The threaded pin is also used for the stability of the movable blade (3) and ensures a stable cutting pressure.

To set the **blade position**:

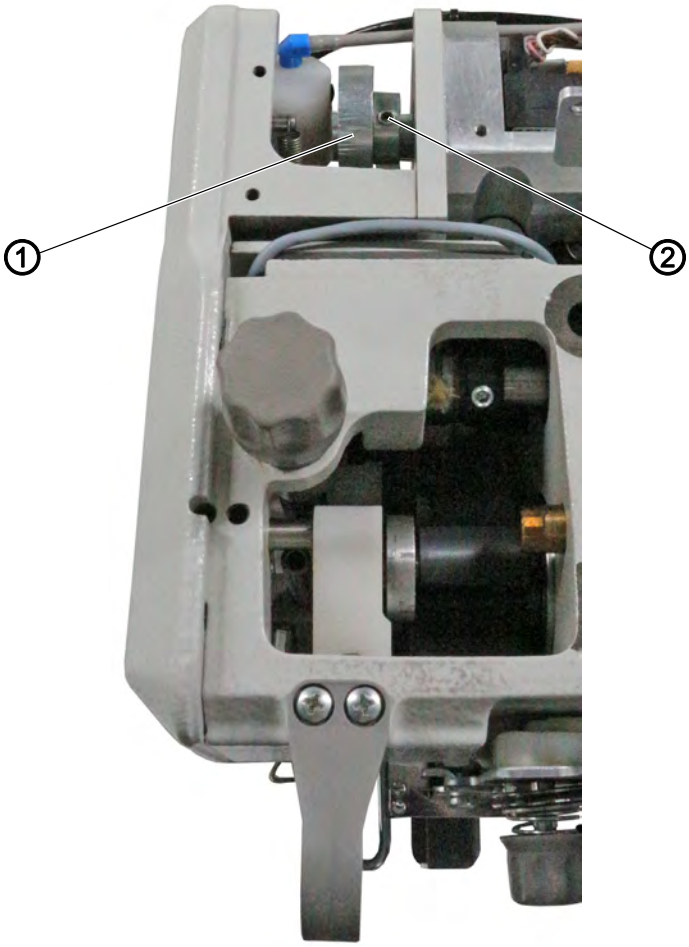
1. Loosen the screws (1).
2. Set the movable blade (4).

↳ When the movable blade (4) is at the bottom dead center, there is a gap of 0.5-1 mm between the front edge of the blade and the throat plate.

3. Tighten the screws (1).

17.2 Setting the timing of the blade stroke movement

Abb. 74: Setting the timing of the blade stroke movement



(1) - Eccentric *(2) - 1st screw in rotational direction*

To set the timing of the blade stroke movement:

1. Remove the rear cover (📖 *p. 20*).
2. Move the handwheel into the 350° position.

↳ The 1st screw in rotational direction (2) on the eccentric (1) is up.

3. If the 1st screw in rotational direction (2) is not up, loosen both screws on the eccentric (1) and set the eccentric (1) correctly.

OR

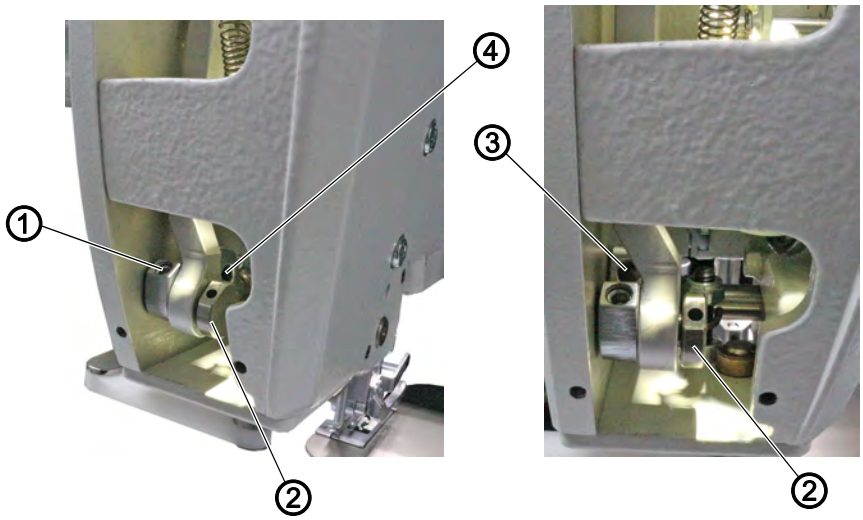
1. Remove the rear cover (📖 *p. 20*).
2. Turn the handwheel until the needle is at the top dead center and the blade is at the bottom dead center.

↳ The 1st screw in rotational direction (2) on the eccentric (1) is up.

3. If the 1st screw in rotational direction (2) is not up:
   - Loosen both screws on the eccentric (1).
   - Turn the handwheel until the needle is at the top dead center and the blade is at the bottom dead center.
   - Re-tighten both screws.

17.3 Setting the stroke height of the blade

Abb. 75: Setting the stroke height of the blade



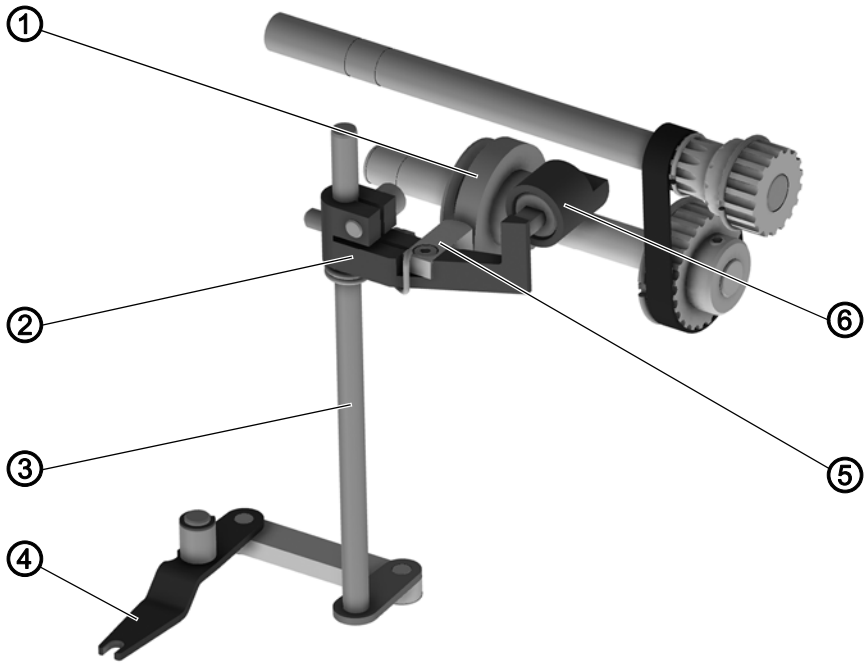
(1) - Threaded pin
(2) - Bolt
(3) - Threaded pin
(4) - Hole

To set the stroke height of the blade:

1. Remove the rear cover (📖 *p. 20*).
2. Loosen the threaded pin (1).
3. Pull the bolt (2) out.
4. Insert the bolt (2) together with the transmission rod into the hole (4).
   - Outside hole: stroke height of the blade 10 mm
   - Inside hole: stroke height of the blade 20 mm
5. Tighten the threaded pin (3) in the hole (4).

18 Stitch loosening unit

Fig. 76: Stitch loosening unit



(1) - Control cam
(2) - Sensor lever
(3) - Vertical shaft
(4) - Lever
(5) - Probe
(6) - Pneumatic cylinder

Stitch loosening unit function

When the **stitch loosening unit is activated**, the probe (5) is on the control cam (1).
The movement is transmitted to the lever (4) via the sensor lever (2) and the vertical shaft (3).
The lever (4) moves the stitch loosening unit.

When the **stitch loosening unit is deactivated**, the pneumatic cylinder (6) is extended. The probe (5) lifts off from the control cam (1), and no movement is transmitted.

18.1 Setting the swivel movement timing

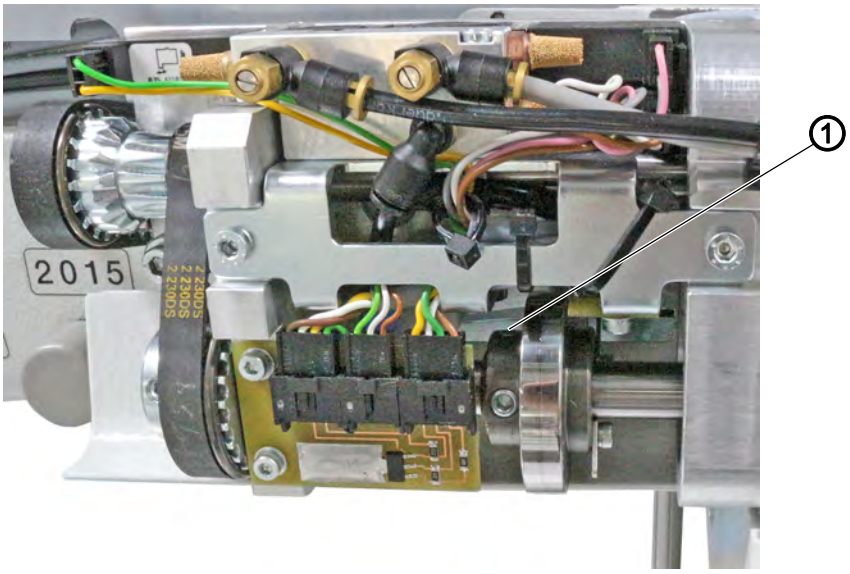
NOTICE

Property damage may occur!

Risk of breakage if setting is incorrect.

Set the swivel movement such that it will begin when the needle is at the top dead center.

Fig. 77: Setting the swivel movement timing (1)



(1) - 1st screw in rotational direction

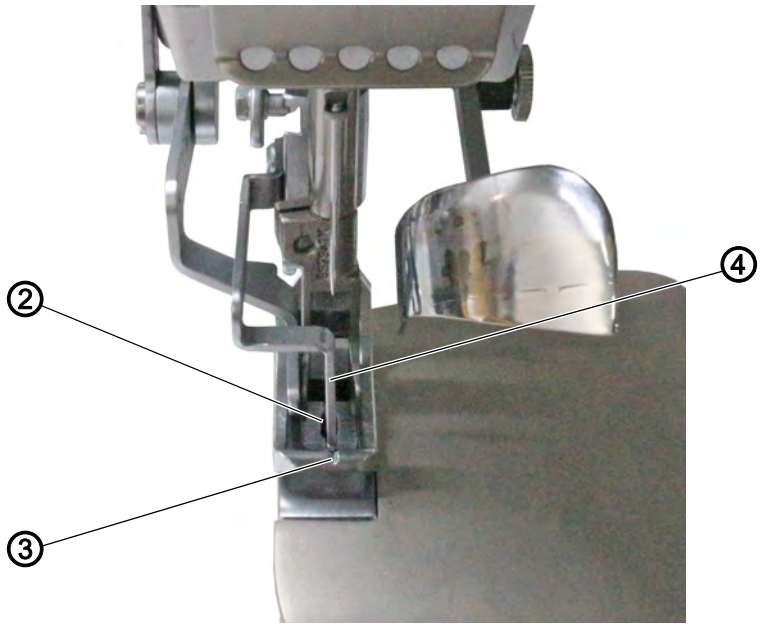
To set the swivel movement timing:

1. Remove the rear cover (📖 *p. 20*).
2. Move the handwheel into the 180° position.

↳ The needle is at the bottom dead center.
The 1st screw in rotational direction (1) on the control cam is up.
The stitch loosening is done from the left.

OR

Fig. 78: Setting the swivel movement timing (2)



(2) - Throat plate
(3) - Notch
(4) - Stitch loosening finger

1. Move the handwheel into the 0° position.

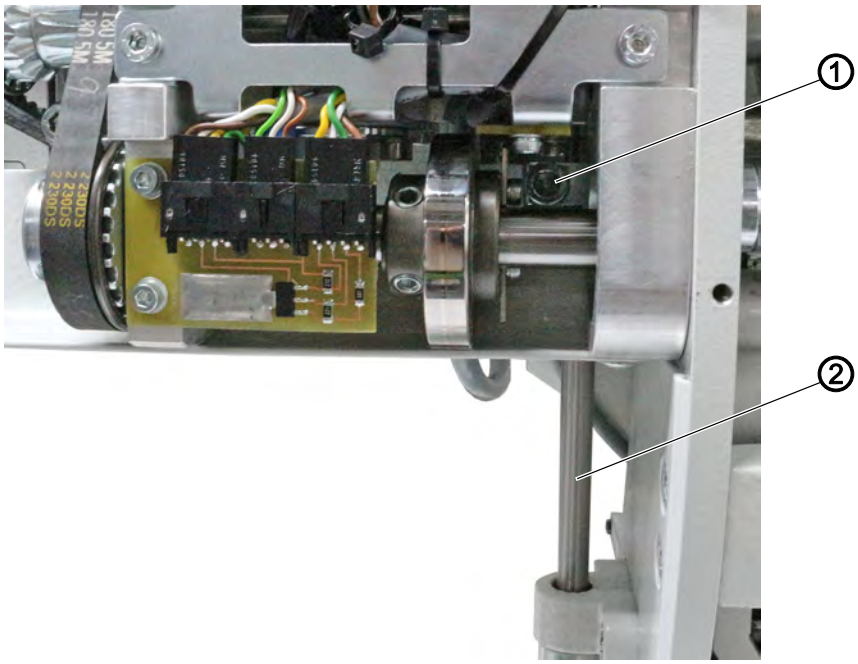
↳ The needle is at the top dead center.
The stitch loosening finger (4) is positioned over the center of the needle hole (2).
The stitch loosening finger (4) is exactly in line with the notch (3) in the sewing foot.

18.2 Setting the position of the swivel movement

Proper setting

The stitch loosening finger swivels in the center of the feeding foot. In the left and right end position, the stitch loosening finger is at a distance of approx. 0.3 mm to the feeding foot.

Fig. 79: Setting the position of the swivel movement



(1) - Screw

(2) - Vertical shaft

To set the position of the swivel movement:

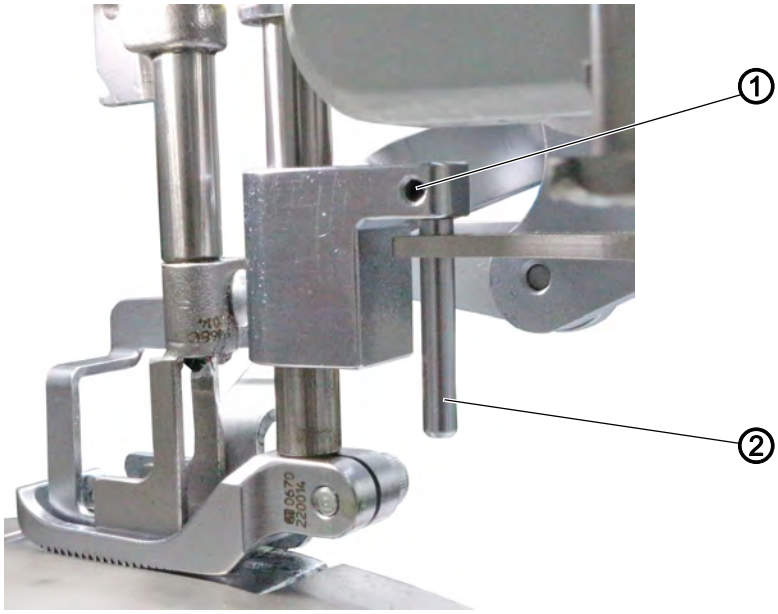
1. Remove the rear cover (📖 *p. 20*).
2. Loosen the screw (1).
3. Turn the vertical shaft (2) slightly.
4. Tighten the screw (1).
5. Test the swivel movement and readjust it if necessary.

Testing the swivel movement of the stitch loosening unit

To test the swivel movement of the stitch loosening unit:

1. Turn the handwheel.
2. Check if the position of the stitch loosening unit is correct.

Fig. 80: Testing the swivel movement of the stitch loosening unit



(1) - Threaded pin *(2) - Eccentric*

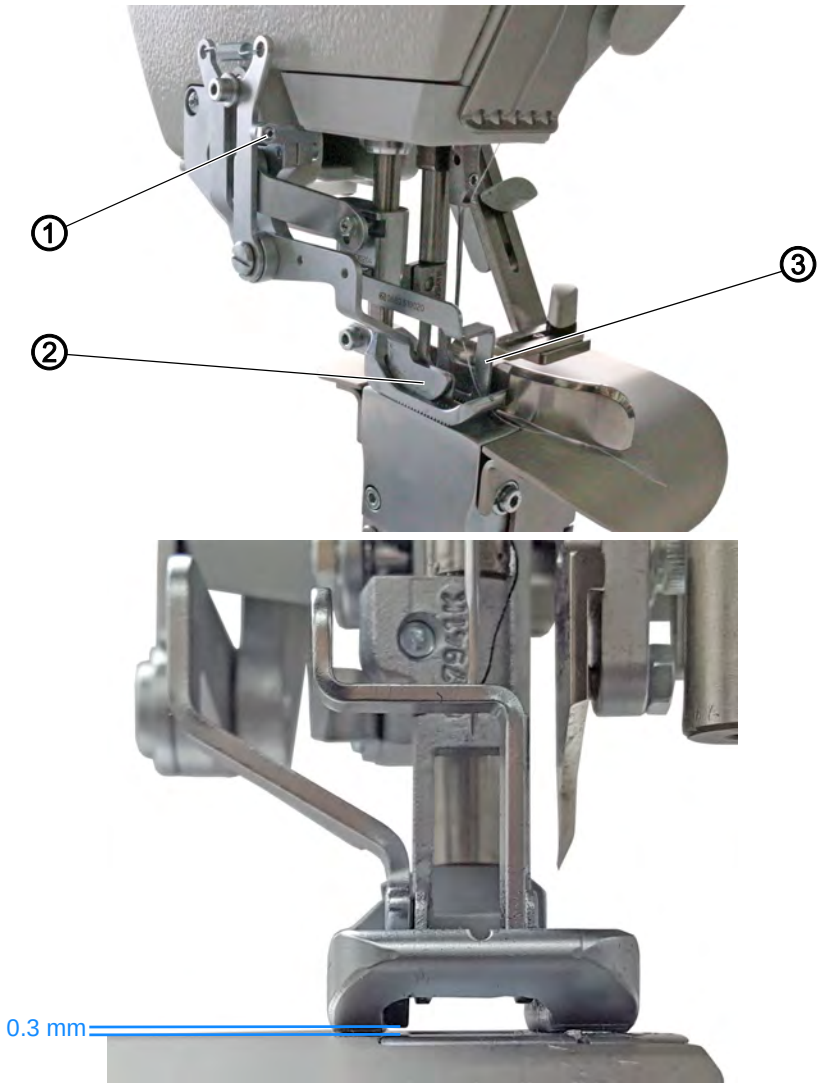
3. Loosen the threaded pin (1).
4. Turn the eccentric (2) slightly.
5. Tighten the threaded pin (1).
6. Perform a sewing test and readjust if necessary.

18.3 Setting the material thickness scanner for the stitch loosening unit

The stitch loosening finger and the material thickness scanner must not rest on the sewing material during sewing to ensure unhindered transport.

The height stop prevents the stitch loosening unit from lowering onto the sewing material under its own weight.

Fig. 81: Setting the material thickness scanner for the stitch loosening unit



(1) - Threaded pin for height stop
(2) - Material thickness scanner
(3) - Stitch loosening finger

To set the material thickness scanner for the stitch loosening unit:

1. Screw in or unscrew the threaded pin (1).
   - To set material thickness scanner (2) and stitch loosening finger (3) **lower**:
     Unscrew the threaded pin (1)
   - To set material thickness scanner (2) and stitch loosening finger **higher**:
     Screw in the threaded pin (1)

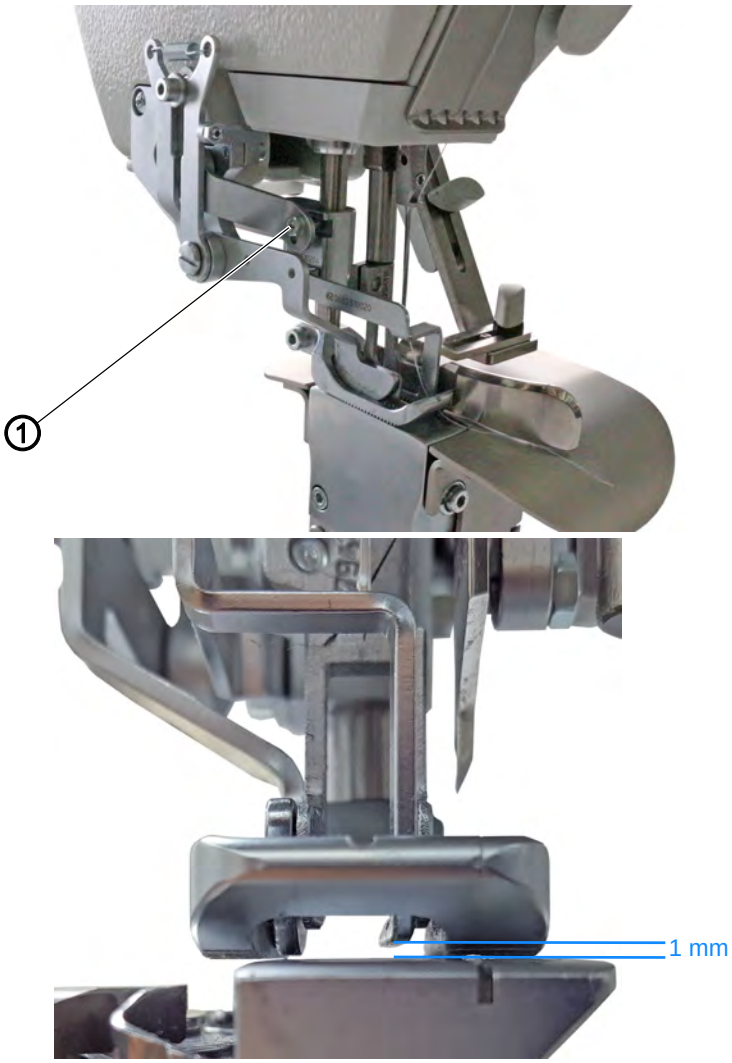
↳ When the sewing foot is lowered, the material thickness scanner (2) has a distance of 0.3 mm to the throat plate.

Order

ALWAYS set the height of the stitch loosening finger afterwards (📖 *p. 97*).

18.4 Setting the height of the stitch loosening finger

Fig. 82: Setting the height of the stitch loosening finger



(1) - Nut and threaded pin

The height of the stitch loosening finger determines the looseness of the seam.

Order

Set the material thickness scanner for the stitch loosening unit (🕮 *p. 95*).

To set the height of the stitch loosening finger:

1. Loosen the nut and threaded pin (1).
2. Move the threaded pin (1) into the slotted hole.
   - Greater looseness of the seam: push the threaded pin (1) upwards
   - Less looseness of the seam: Push the threaded pin (1) downwards
3. Tighten the nut and threaded pin (1).

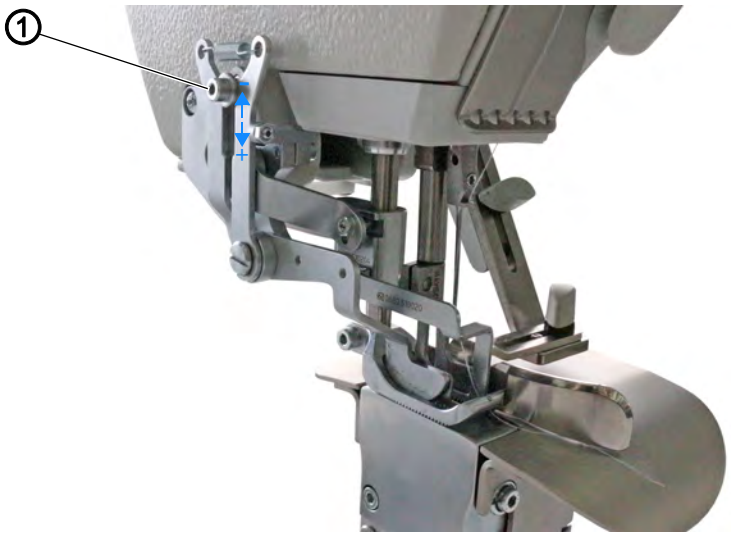
Information

If you want the seam to be looser than it is at this initial position, you need to adjust the drive ratio of the stitch loosening finger (📖 *p. 98*).

18.5 Setting the looseness of the seam

The looseness of the seam results from the drive ratio of the stitch loosening finger when the sewing foot is lifted.

Fig. 83: Setting the looseness of the seam



(1) - Screw

To set the looseness of the seam:

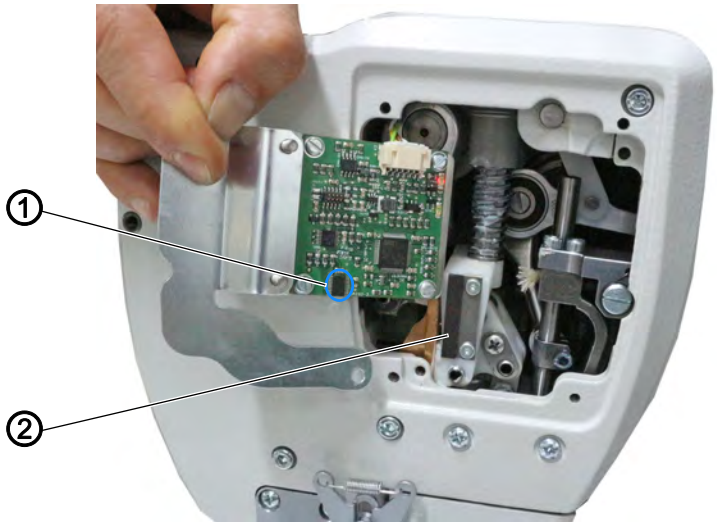
1. Loosen the screw (1).
2. Move the screw (1) into the slotted hole.
   - more stroke: Move the screw (1) downwards
   - less stroke: Move the screw (1) upwards
3. Tighten the screw (1).
4. Check the looseness of the seam and readjust it if necessary.

19 Setting the automatic material thickness detection

The sensor for automatic material thickness detection is located in the machine head. The sensor must be set so that the automatic stitch loosening can be set correctly using the OP1000 control panel (📖 *p. 107*).

Proper setting

Abb. 84: Setting the automatic material thickness detection (1)



(1) - Sensor *(2) - Magnetic strips*

The sensor (1) is located at a distance of 1 mm ± 0,1 mm exactly above the magnetic strip (2).

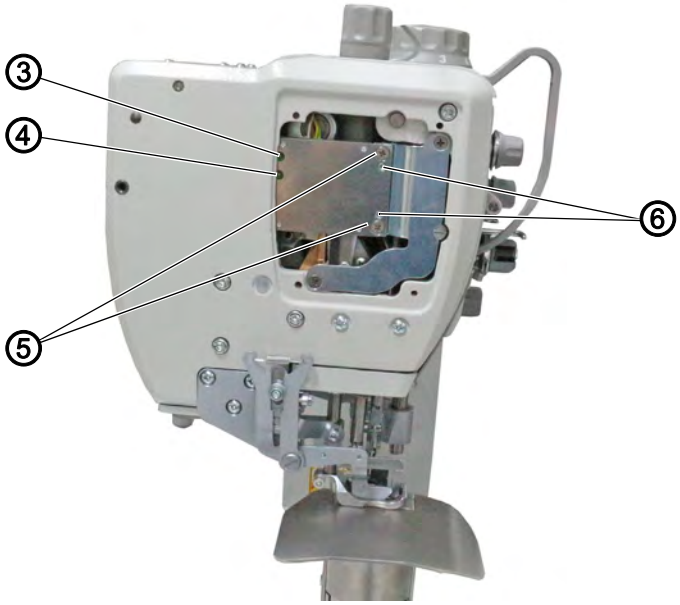
Important

The distance must not be less than 0.4 mm, otherwise the sensor will no longer recognize the magnetic strip.

To set the automatic material thickness detection:

1. Remove the head cover (📖 *p. 18*).

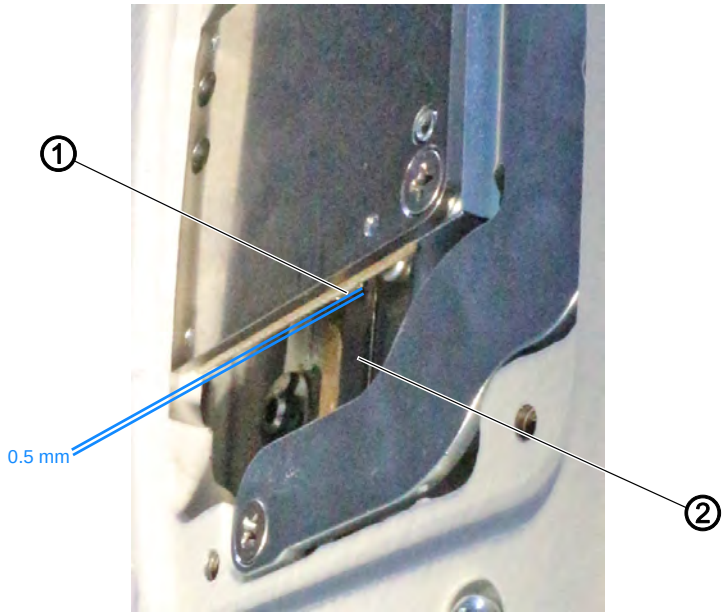
Abb. 85: Setting the automatic material thickness detection (2)



(3) - LED
(4) - LED
(5) - Screws
(6) - Threaded pins

2. Loosen the screws (5).
3. Turn the threaded pins (6) to set the distance between the sensor (1) and the magnetic strips (2).
   - Increase the distance: Screw in the threaded pins (6).
   - Reduce the distance: Loosen the threaded pins (6).

Abb. 86: Setting the automatic material thickness detection (3)



(1) - Magnet
(2) - Magnetic strips

4. Tighten the screws (5).

5. Move the sewing foot right up to the top with the hand lever

↳ The LED (4) lights up green.
The LED (3) does not light up.

6. If the LED (3) lights up red, correct the setting.

20 Programming

All software settings are performed using the OP1000 control panel.

The control panel is composed of a display and buttons.

Using the control panel you can:

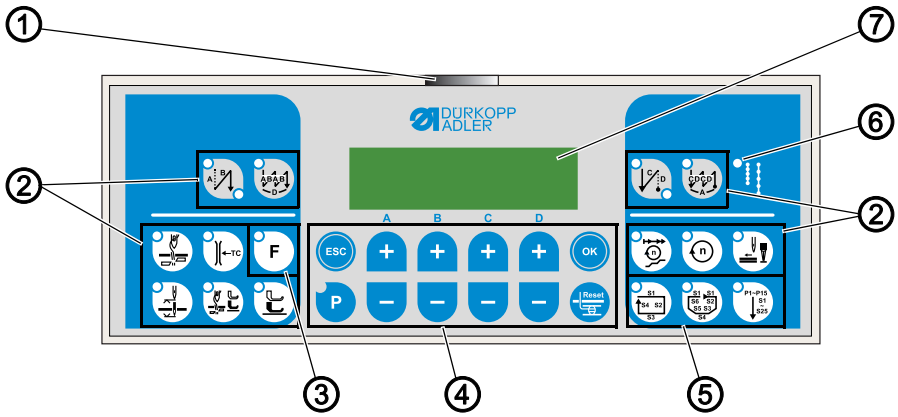
- Use groups of buttons to select machine functions
- Read service and error messages.

Information

This chapter describes the machine-specific functions of the OP1000 control panel.

Refer to the 🕮 *Instructions for use DAC basic/classic* for further information on the control and the OP1000 control panel.

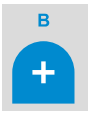
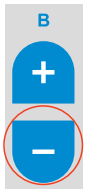
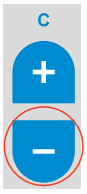
Abb. 87: Programming



(1) - Power LED
(2) - Thread button group
(3) - Function button
(4) - Programming button group
(5) - Seam program button group
(6) - LED for 2nd Stitch length
(7) - Display

OP1000 buttons and functions

Button		Function
Thread button group		
	Start bartack	• Sets the start bartack
	Multiple start bartack	• Sets the multiple start bartack
	End bartack	• Sets the end bartack
	Multiple end bartack	• Sets the multiple end bartack
	Thread cutter	• Activates or deactivates the thread cutter
	Thread clamp	• Activates or deactivates the thread clamp
	Needle position after sewing stop	• Sets the needle position after sewing stop
	Sewing foot lift after thread cutter	• Activates or deactivates the sewing foot lift after the thread cutter
	Sewing foot lift after sewing stop	• Activates or deactivates the sewing foot lift after sewing stops
	Soft start	• Activates or deactivates the soft start
	Speed	• Reduces the motor speed
	**Function button**	• Activates or deactivates any stored function
Programming button group		
	ESC	• Ends parameter mode

Button	Function
 A+	• Increases parameter • Changes user level • Selects subprogram
 B+	• Increases parameter • Changes to next higher category • Selects subprogram
 C+	• Increases parameter • Selects subprogram
 D+	• Increases parameter • Selects subprogram
 OK	• Calls parameter or saves it
 P	• Starts or ends the parameter mode
 A-	• Decreases parameter • Changes user level • Selects subprogram
 B-	• Decreases parameter • Changes to next lower category • Selects subprogram
 C-	• Decreases parameter • Selects subprogram

Button	Function
 D-	• Decreases parameter • Selects subprogram
 Reset	• Resets the (piece) counter
Seam program button group	
 Seam program I	• Activates seam program I
 Seam program II	• Activates seam program II
 Seam program III	• Sets seam program III

20.1 Setting the reference position

The reference position is used to align the synchronizer with the actual rechanical position.

To set the reference position:

1. Press the P and Reset buttons at the same time.

↳ You are on the technician level.

2. Use the buttons under the display to select the parameter **t 08 10**.
3. Press the OK button.

↳ *Syn?:* appears on the display.

4. Turn the handwheel.

↳ *Ref.Pos?:* appears on the display.

5. Turn the handwheel into position 125°.
6. Confirm with OK.

20.2 Activating automatic stitch loosening

Stitch loosening is used to loosen the seam at a thickened seam. Stitch loosening prevents the thread from tightening, keeping the seam soft.

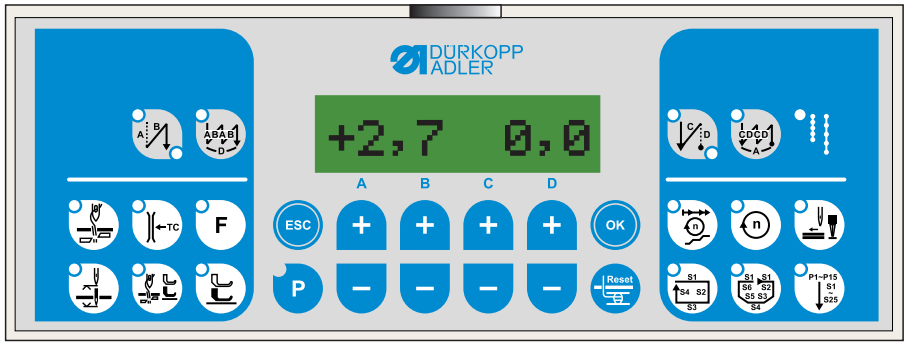
The sewing material thickness must be between 0 and 10 mm to allow for stitch loosening.

To activate the automatic stitch loosening:

1. Press the  button.

↳ The button lights up.
The display shows numerical values.

Abb. 88: Activating automatic stitch loosening



2. Use the buttons **A** and **B** to set the values.
   - **A**: Changing signs
     +: the thickness of sewing material for which stitch loosening is used
     -: the thickness of sewing material for which stitch loosening stops
   - **B**: Set the value at which stitch loosening is used or stops
   - **C/D**: Status indicator showing the thickness of the current sewing material and the height which the sewing foot is raised

3. Press button  to switch between stitch loosening modes.
   - **Only stitch loosening active**: mode 0, LED is not lit
   - **2nd stitch length plus stitch loosening active**: mode 1, LED is lit
   - **2nd stitch length and 2nd stroke height plus stitch loosening active**: mode 2, LED flashes

21 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	●			
Checking the oil	●			
Servicing the pneumatic system	●			
Lubricating the edge cutter bolt				●

21.1 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!

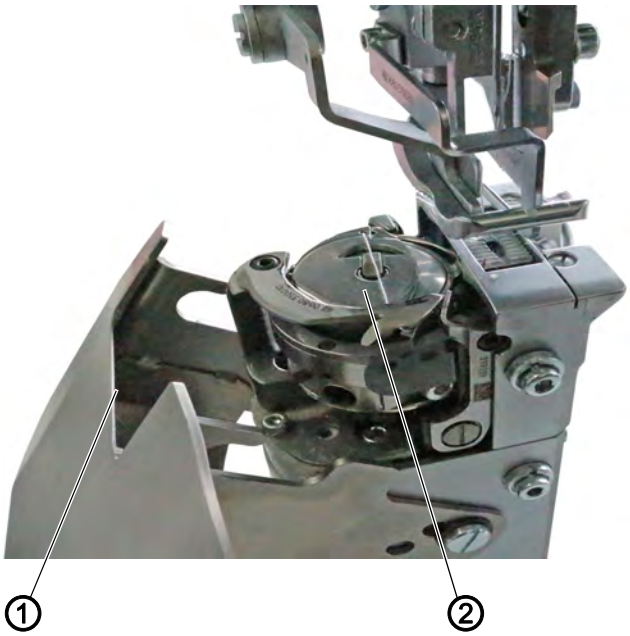
Solvent-based cleaners will damage paintwork.

Use only solvent-free substances for cleaning.

Lint and thread remnants should be removed after every 8 operating hours using a compressed air gun or a brush. If very fluffy material is being sewn the machine must be cleaned more frequently.

A clean machine provides protection from faults during the sewing process.

Abb. 89: Cleaning



(1) - Underside of sewing table *(2) - Hook*

Areas requiring special cleaning

- Underside of throat plate
- Area around the hook (2)
- Area around the needle
- Underside of sewing table (1)

Also remove any lint and thread remnants from the oil pan.

21.2 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.

The machine is equipped with a central oil-wick lubrication system.
The bearings are supplied from the oil reservoir.

For topping off the oil reservoir, use only lubricating oil **DA 10** or oil of equivalent quality with the following specifications:

- Viscosity at 40 °C: 10 mm²/s
- Flash point: 150 °C

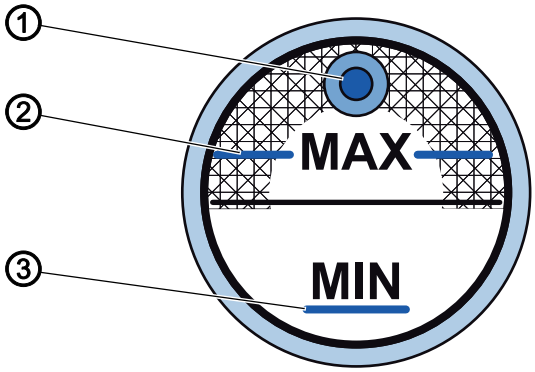
You can order the lubricating oil from our sales offices using the following part numbers:

Container	Part no.
250 ml	9047 000011
1 l	9047 000012
2 l	9047 000013
5 l	9047 000014

Checking the oil level

The machine is equipped with a central oil-wick lubrication system.
The bearings are supplied from the oil reservoir.

Abb. 90: Checking the oil level



(1) - Oil filler opening
(2) - MAX marking
(3) - MIN marking

Proper setting

The oil level must not raise above the MAX marking (2) or drop below the MIN marking (3).
If the oil level is too low, the inspection glass of the oil reservoir lights up red.

To top off the oil:

1. Fill oil through the oil filler opening (1) up to the MAX marking (2).

21.3 Servicing the pneumatic system

21.3.1 Setting the operating pressure

NOTICE

Property damage from incorrect setting!

Incorrect operating pressure can result in damage to the machine.

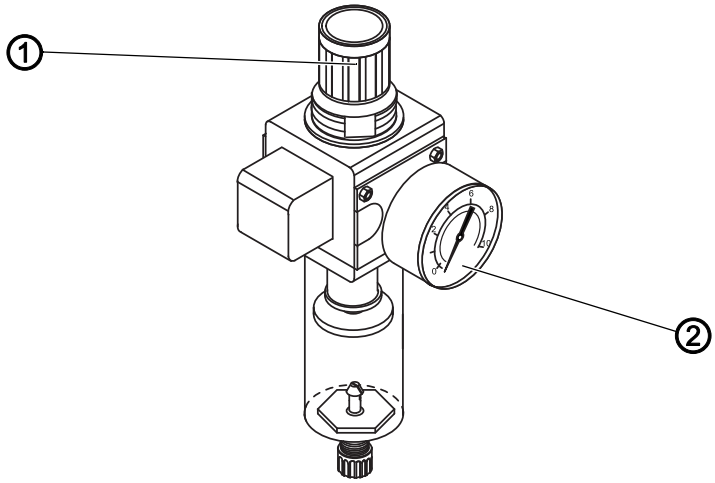
Ensure that the machine is only used when the operating pressure is set correctly.

Proper setting

Refer to the **Technical data** (📖 *p. 131*) chapter for the permissible operating pressure. The operating pressure cannot deviate by more than ± 0.5 bar.

Check the operating pressure on a daily basis.

Abb. 91: Setting the operating pressure



(1) - Pressure controller *(2) - Pressure gage*

To set the operating pressure:

1. Pull the pressure controller (1) up.
2. Turn the pressure controller until the pressure gage (2) indicates the proper setting:
   - Increase pressure = turn clockwise
   - Reduce pressure = turn counterclockwise
3. Push the pressure controller (1) down.

21.3.2 Draining the water-oil mixture

NOTICE

Property damage from excess liquid!

Too much liquid can result in damage to the machine.

Drain liquid as required.

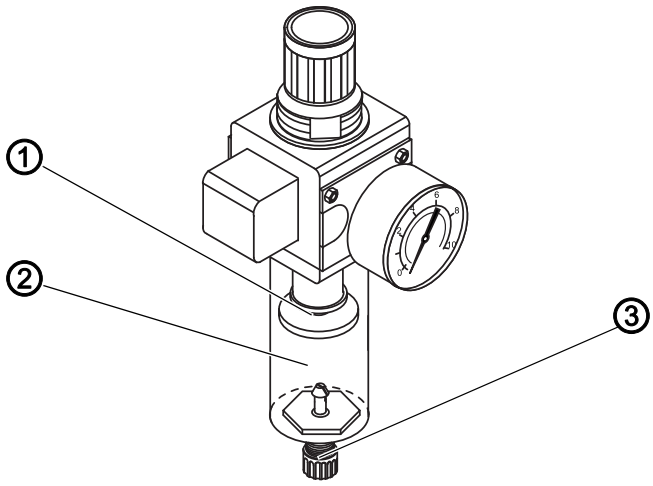
The collection tray (2) of the pressure regulator will show accumulation of a water-oil mixture.

Proper setting

The water-oil mixture must not rise up to the level of the filter element (1).

Check the level of the water-oil mixture in the collection tray (2).

Abb. 92: Draining the water-oil mixture



(1) - Filter element
(2) - Collection tray
(3) - Drain screw

To drain the water-oil mixture:

1. Disconnect the machine from the compressed air supply.
2. Place the vessel under the drain screw (3).
3. Loosen the drain screw (3) completely.
4. Allow the water-oil mixture to drain into the vessel.
5. Tighten the drain screw (3).
6. Connect the machine to the compressed air supply.

21.3.3 Cleaning the filter element

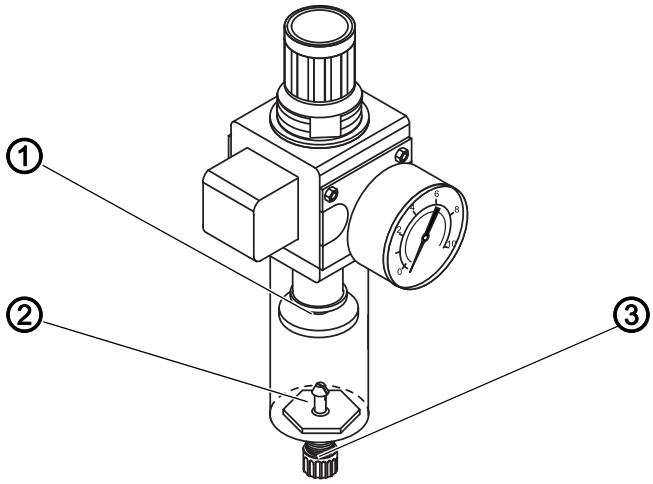
NOTICE

Damage to the paintwork from solvent-based cleaners!

Solvent-based cleaners damage the filter.

Use only solvent-free substances for washing out the filter tray.

Abb. 93: Cleaning the filter element



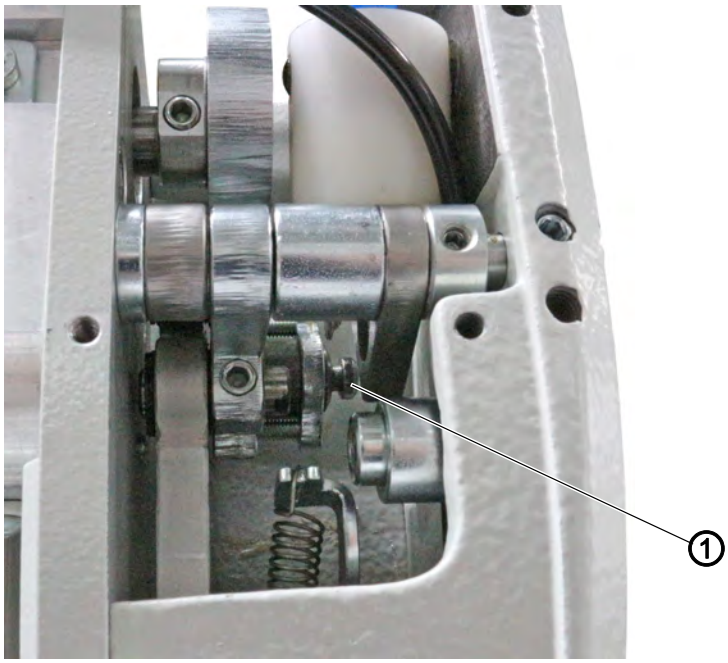
(1) - Filter element
(2) - Water separator
(3) - Drain screw

To clean the filter element:

1. Disconnect the machine from the compressed air supply.
2. Drain the water condensation (📖 *p. 115*).
3. Loosen the water separator (2).
4. Loosen the filter element (1).
5. Blow out the filter element (1) using the compressed air gun.
6. Wash out the filter tray using benzine.
7. Tighten the filter element (1).
8. Tighten the water separator (2).
9. Tighten the drain screw (3).
10. Connect the machine to the compressed air supply.

21.4 Lubricating movable bolt on the edge cutter device

Abb. 94: Lubricating movable bolt on the edge cutter device



(1) - Movable bolt

To lubricate the movable bolt on the edge cutter device:

1. Remove the rear cover.
2. Use a brush to apply grease to the movable bolt (1).
3. Place the rear cover.

21.5 Parts list

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

www.duerkopp-adler.com

22 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.

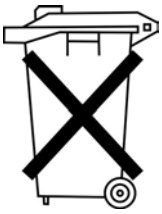
23 Disposal

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.

24 Troubleshooting

24.1 Customer Service

Contact for repairs and issues with the machine:

Dürkopp Adler GmbH

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

24.2 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 cause	Remedial action
1000	Sewing motor encoder plug (Sub-D, 9-pin) not connected	• Connect encoder cable to the control, use correct connection
1001	Sewing motor error: Sewing motor plug (AMP) not connected	• Check connection and plug in, if necessary • Test sewing motor phases (R= 2.8 Ω, high impedance to PE) • Replace the encoder • Replace sewing motor • Replace the control
1002	Sewing motor insulation fault	• Check motor phase and PE for low-impedance connection • Replace the encoder • Replace sewing motor
1004	Sewing motor error: Incorrect sewing motor direction of rotation	• Replace the encoder • Check plug assignment and change, if necessary • Test motor phases and check for correct value

Code	Possible cause	Remedial action
1005	Motor blocked	• Eliminate stiff movement in the sewing machine • Replace the encoder • Replace the motor
1006	Maximum speed exceeded	• Replace the encoder • Perform reset • Check class (parameter `t 51 04`)
1007	Error in the reference run	• Replace the encoder • Eliminate stiff movement in the sewing machine
1008	Encoder error	• Replace the encoder
1010	External synchronizer plug (Sub-D, 9-pin) not connected	• Connect cable of external synchronizer to control, use correct connection (*Sync*) • Only required for machines with transmission!
1011	Encoder Z pulse missing	• Switch off the control, use handwheel to turn, and switch on the control again • If error is not corrected, check encoder
1012	Synchronizer fault	• Replace the synchronizer
1052	Sewing motor overcurrent, internal current increase >25 A	• Check selection of class • Replace the control • Replace sewing motor • Replace the encoder
1053	Sewing motor overvoltage	• Check selection of class • Replace the control
1054	Internal short circuit	• Replace the control
1055	Sewing motor overload	• Eliminate stiff movement in the sewing machine • Replace the encoder • Replace sewing motor
1203	Position not reached	• Check and, if necessary, change controller settings • Make mechanical changes to the machine (e.g. thread cutting setting, belt tension) • Check the position (thread lever at top dead center)
2020	DAC extension box not responding	• Check connection cables • Check LEDs on DAC extension box • Perform a software update
2021	Sewing motor encoder plug (Sub-D, 9-pin) not connected to DAC extension box	• Connect encoder cable to DAC extension box using the correct connection

Code	Possible cause	Remedial action
2101	DA stepper card 1 reference run timeout	• Check reference sensor
2103	DA stepper card 1 step losses	• Check for stiff movement
2120	DA stepper card 1 not responding	• Check connection cables • Check LEDs on DAC extension box • Perform a software update
2121	DA stepper card 1 encoder plug (Sub-D, 9-pin) not connected	• Connect encoder cable to the control, use correct connection
2122	DA stepper card 1 flywheel position not found	• Check connection cables • Check stepper motor 1 for stiff movement
2155	DA stepper card 1 overload	• Check for stiff movement
2201	DA stepper card 2 reference run timeout	• Check reference sensor
2203	DA stepper card 2 step losses	• Check for stiff movement
2255	DA stepper card 2 overload	• Check for stiff movement
2220	DA stepper card 2 not responding	• Check connection cables • Check LEDs on DAC extension box • Perform a software update
2221	DA stepper card 2 encoder plug (Sub-D, 9-pin) not connected	• Connect encoder cable to the control, use correct connection
2222	DA stepper card 2 flywheel position not found	• Check connection cables • Check stepper motor 2 for stiff movement
3100	AC-RDY timeout, intermediate circuit voltage did not reach the defined threshold in the specified time	• Check the mains voltage • If the mains voltage is OK, replace the control
3101	High voltage fault, mains voltage, longer duration >290 V	• Check mains voltage, if nominal voltage is continuously exceeded: stabilize it or use a generator
3102	Low voltage failure (2nd threshold) (mains voltage <150 V AC)	• Check the mains voltage • Stabilize the mains voltage • Use generator
3103	Low voltage warning (1st threshold) (mains voltage < 180 V AC)	• Check the mains voltage • Stabilize the mains voltage • Use generator
3104	Pedal is not in position 0	• Do not press the pedal when switching on the control
3105	U24 V short circuit	• Disconnect 37-pin plug; if error persists, replace control • Test inputs/outputs for 24 V short circuit

Code	Possible cause	Remedial action
3106	U24 V (I^2T) overload	• One or several magnets defective
3107	Pedal not connected	• Connect analog pedal
3108	Speed limited due to insufficient mains voltage	• Check the mains voltage
3109	Operation lock	• Check tilt sensor on machine
3150	Maintenance necessary	• Lubricate the machine 📖 *p. 112*
3151	Maintenance necessary (operation cannot continue unless parameter `t 51 14` is reset)	• Service is required
3155	No release for sewing process	• Parameter `t 51 20 - t 51 33` = 25 • Input signal for sewing process release required
3160	Stitch loosening device: stitch loosening cannot be performed	• Stitch loosening cannot be performed
3170	Poor quality of the sensor for automatic material thickness detection	• Check the mechanical positioning of the sensor
3215	Bobbin stitch counter (info value 0 reached)	• Change bobbin, set counter value
3216	Remaining thread monitor left	• Change the left bobbin
3217	Remaining thread monitor right	• Change the right bobbin
3218	Remaining thread monitor left and right	• Change left and right bobbin
3223	Skip stitch detected	-
3224	Bobbin failed to rotate	-
6353	Internal EEprom communication error	• Switch off the control, wait until the LEDs are off and then switch on again
6354	External EEprom communication error	• Switch off the control, wait until the LEDs are off, check connection for machine ID, switch on control again
6360	No valid data on external EEprom (internal data structures are not compatible with the external data storage device)	• Perform a software update
6361	No external EEprom connected	• Connect machine ID
6362	No valid data on internal EEprom (internal data structures are not compatible with the external data storage device)	• Check machine ID connection • Switch off the control, wait until the LEDs are off and then switch on the machine again • Perform a software update

Code	Possible cause	Remedial action
6363	No valid data on internal and external EEprom (software version is not compatible with the internal data storage device, emergency operating features only)	• Check machine ID connection • Switch off the control, wait until the LEDs are off and then switch on the machine again • Perform a software update
6364	No valid data on internal EEprom and no external EEprom connected (the internal data structures are not compatible with the external data storage device, emergency operating features only)	• Check machine ID • Switch off the control, wait until the LEDs are off and then switch on the machine again • Perform a software update
6365	Internal EEprom defective	• Replace the control
6366	Internal EEprom defective and external data not valid (emergency operating features only)	• Replace the control
6367	Internal EEprom defective and external EEprom not connected (emergency operating features only)	• Replace the control
7202	DAC extension box boot error	• Check connection cables • Perform a software update • Replace DAC extension box
7203	Checksum error during update	• Check connection cables • Perform a software update • Replace DAC extension box
7212	DA stepper card 1 boot error	• Check connection cables • Perform a software update • Replace DAC extension box
7213	Checksum error occurred while updating DA stepper card 2	• Check connection cables • Perform a software update • Replace DAC extension box
7222	DA stepper card 2 boot error	• Check connection cables • Perform a software update • Replace DAC extension box
7223	Checksum error occurred while updating DA stepper card 2	• Check connection cables • Perform a software update • Replace DAC extension box
7801	Software version error (DAC classic only; only the functions of the DAC basic will remain available)	• Perform a software update • Replace the control
7802	Software update error (DAC classic only; only the functions of the DAC basic will remain available)	• Perform software update again • Replace the control
7803	Communication error (DAC classic only; only the functions of the DAC basic will remain available)	• Restart the control • Perform a software update • Replace the control

Code	Possible cause	Remedial action
8401	Watchdog	• Perform a software update • Perform a machine ID reset • Replace the control
8402 - 8405	Internal error	• Perform a software update • Perform a machine ID reset • Replace the control
8406	Checksum error	• Perform a software update • Replace the control
8501	Software protection	• The DA tool must always be used for software updates

24.3 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 assembled 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

25 Technical data

Noise emission

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

L_{pA} = 78 dB (A); K_{pA} = 1.24 dB (A) at

- Stitch length: 6 mm
- Sewing foot stroke: 1.5 mm
- Speed: 1300 rpm
- Sewing material: 2-layer material G1 DIN 23328

25.1 Data and characteristic values

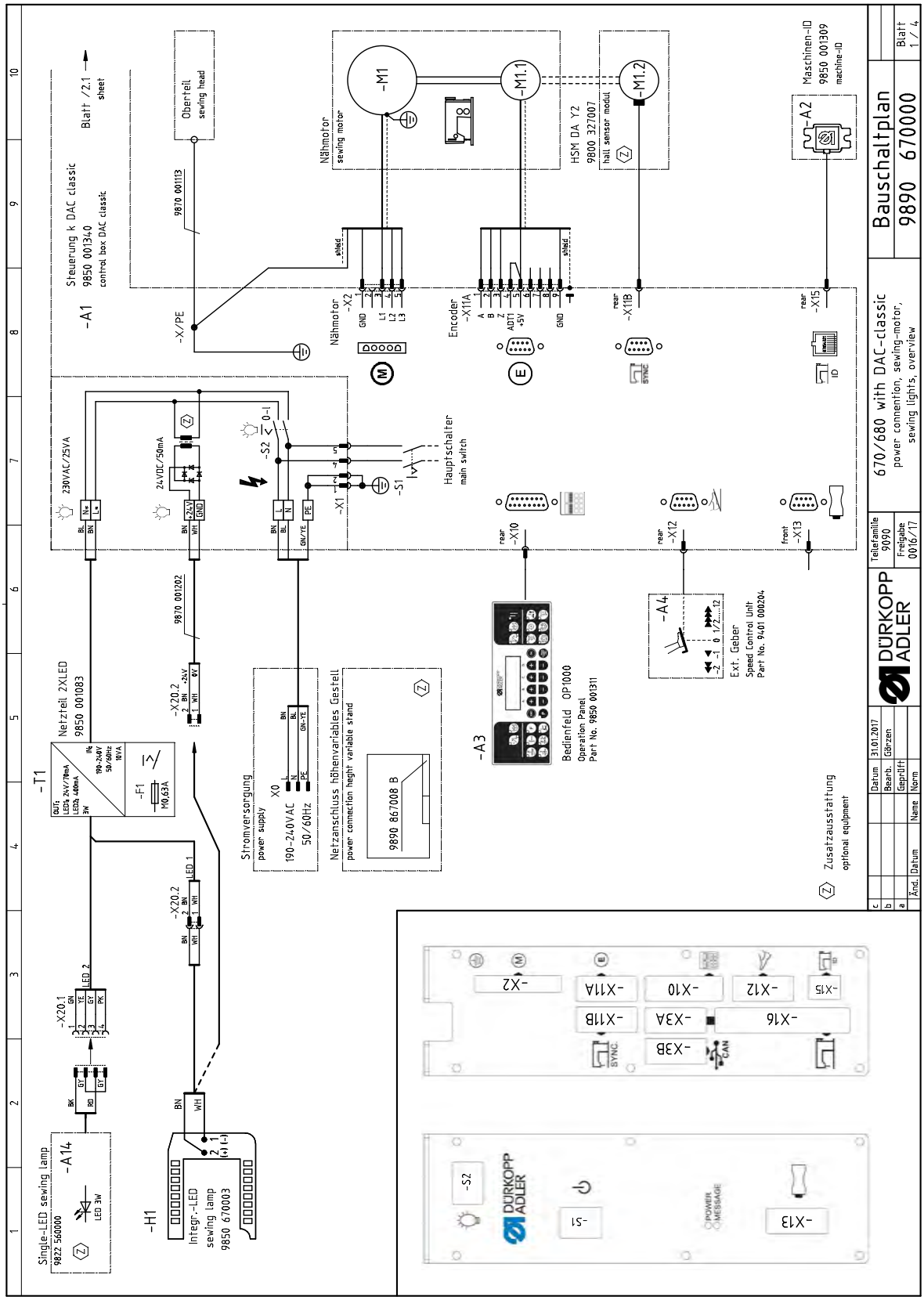
Technical data	Unit	670/680
Machine type		Column double lockstitch machine
Type of stitches		301
Hook type		large vertical hook (L)
Number of needles		1
Needle system		190 R
Needle strength	[Nm]	70 - 200
Thread strength	[Nm]	max. 40
Stitch length	[mm]	max. 9 mm
Speed maximum	[min^{-1}]	1800 (without stitch loosening) 1500 (with stitch loosening)
Speed on delivery	[min^{-1}]	1500
Mains voltage	[V]	230
Mains frequency	[Hz]	50/60
Operating pressure	[bar]	6
Length	[mm]	690
Width	[mm]	220
Height	[mm]	480
Weight	[kg]	63

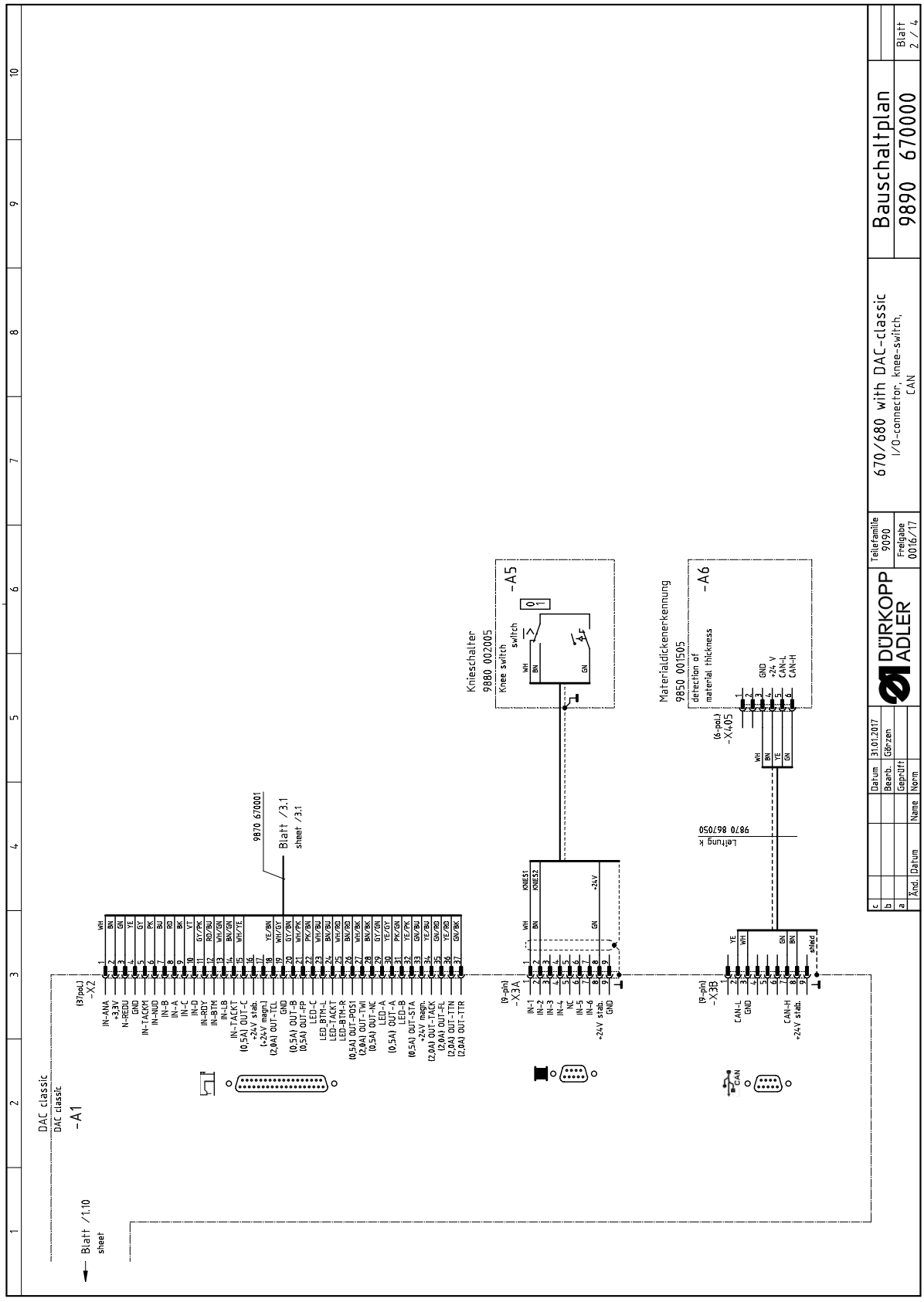
25.2 Requirements for trouble-free operation

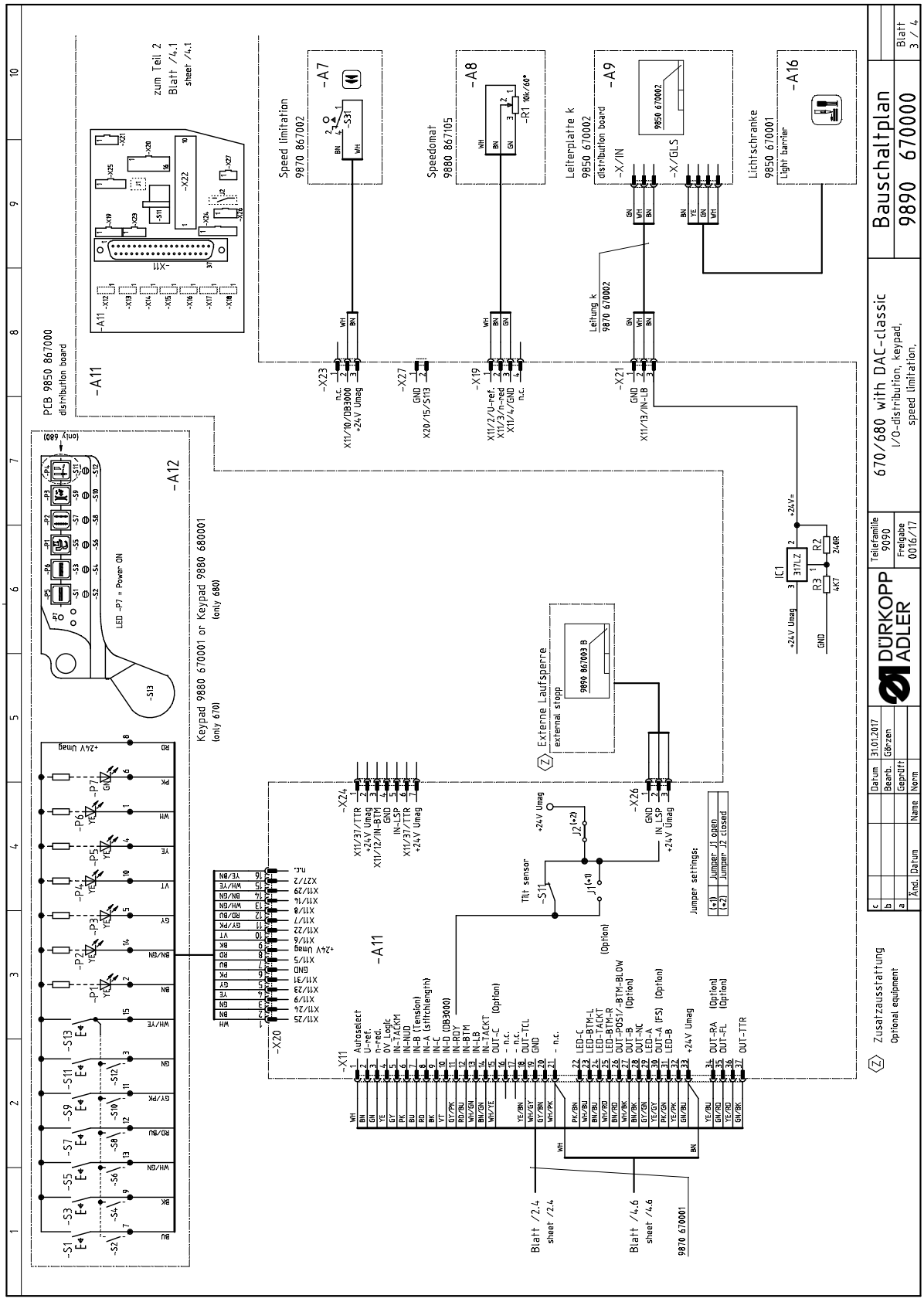
Compressed air quality must be ensured in accordance with ISO 8573-1: 2010 [7:4:4].

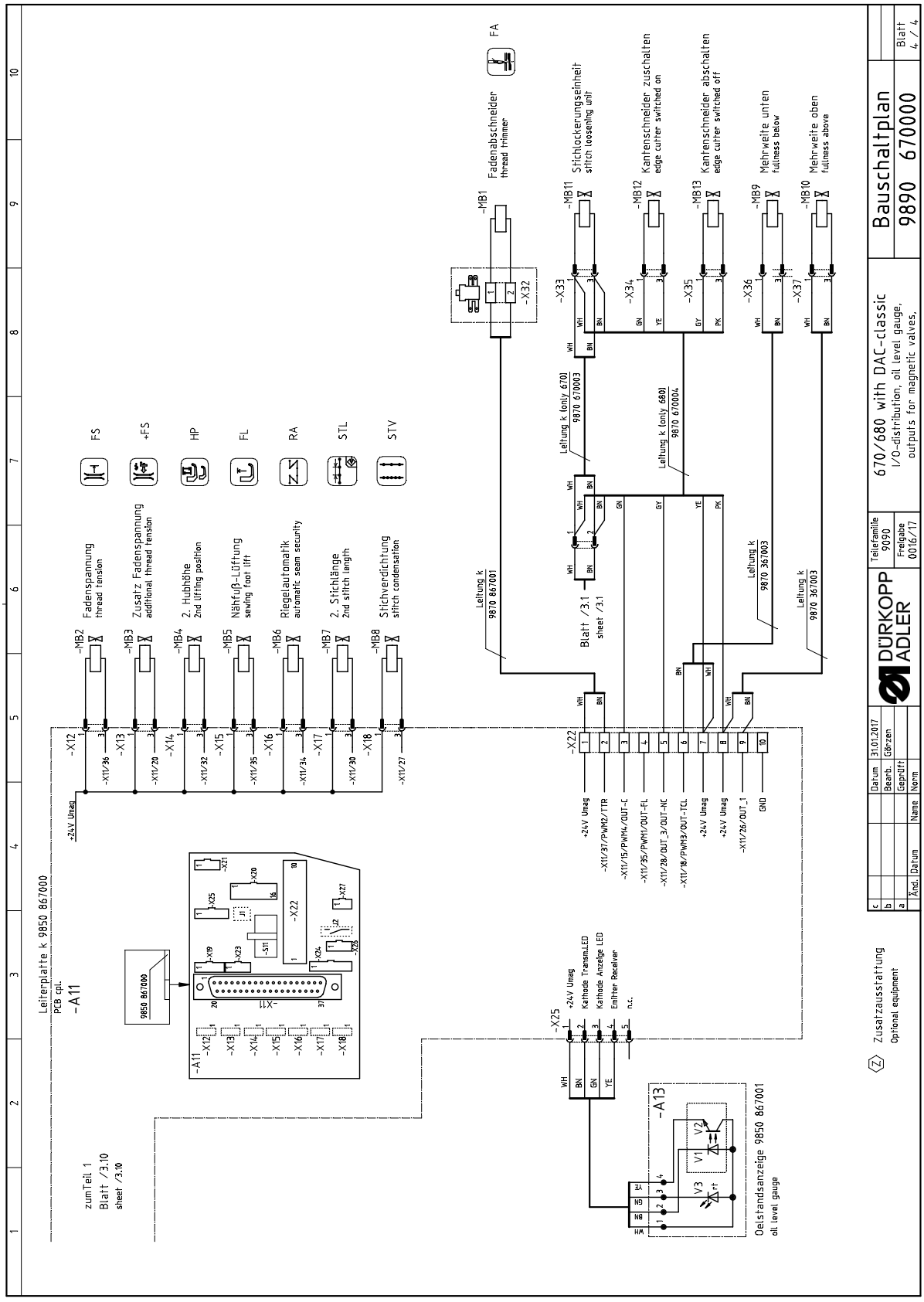
26 Appendix

Wiring diagram




DAC classic
DAC classic
-A1
Blatt /1.10
sheet
(37pol.)
-X2
IN-ANA
+3,3V
N-REDU
GND
IN-TACKM
IN-NUD
IN-B
IN-A
IN-C
IN-D
IN-RDY
IN-STA
IN-B1B
IN-TACKT
(0,5A) OUT-C
+24V stab.
(+24V magn.)
(2,0A) OUT-TCL
GND
(0,5A) OUT-B
(0,5A) OUT-FP
LED-C
LED_BTM-L
LED-TACKT
LED-BTM-R
(0,5A) OUT-POS1
(2,0A) OUT-TWI
(0,5A) OUT-NC
LED-A
(0,5A) OUT-A
LED-B
(0,5A) OUT-STA
+24V magn.
(2,0A) OUT-TACK
(2,0A) OUT-FC
(2,0A) OUT-TTL
(2,0A) OUT-TTR
9870 670001
Blatt /3.1
sheet /3.1
Knieschalter
9880 002005
Knee switch
-A5
Knee switch
WH
BN
GN
(9-pin)
-X3A
KNEE51
KNEE52
IN-1
IN-2
IN-3
IN-4
NC
IN-5
IN-6
+24V stab.
GND
Materialdickenerkennung
9850 001505
detection of
material thickness
-A6
(6-pol.)
-X405
GND
+24 V
CAN-L
CAN-H
WH
BN
YE
GN
Leitung lx
9870 867050
(9-pin)
-X3B
CAN-L
GND
CAN-H
+24V stab.
shield
CAN
DÜRKOPP ADLER
Teilefamilie 9090
Freigabe 0016/17
670/680 with DAC-classic
I/O-connector, knee-switch,
CAN
Bauschaltplan
9890 670000
Blatt 2 / 4
Datum 31.01.2017
Bearb. Görzen
Geprüft
Norm
Änd. Datum Name


Bauschaltplan
9890 670000
670/680 with DAC-classic
I/O-distribution, keypad, speed limitation,
DÜRKOPP ADLER
Zusatzausstattung
Optional equipment
PCB 9850 867000
distribution board
-A11
-A12
Keypad 9880 670001 or Keypad 9880 680001
(only 680)
(only 670)
LED -P7 = Power ON
zum Teil 2
Blatt /4.1
sheet /4.1
Speed limitation
9870 867002
-A7
Speedomat
9880 867105
-A8
Leiterplatte k
9850 670002
distribution board
-A9
-X/IN
-X/GLS
9850 670002
Lichtschranke
9850 670001
Light barrier
-A16
Leitung k
9870 670002
Externe Laufsperre
external stopp
9890 867003 B
Tilt sensor
Jumper settings:
Jumper J1 open
Jumper J2 closed
Blatt /2.4
sheet /2.4
Blatt /4.6
sheet /4.6
9870 670001
Telefamilie 9090
Freigabe 00/16/17
Datum 31.01.2017
Bearb. Görzen
Gepruft
Norm
Änd. Datum Name


Bauschaltplan
9890 670000
Blatt 4 / 4
670/680 with DAC-classic
I/O-distribution, oil level gauge,
outputs for magnetic valves,
DÜRKOPP ADLER
Teilefamilie 9090
Freigabe 0016/17
Datum 31.01.2017
Bearb. Görzen
Gepr. Name Norm
Änd. Datum Name
Leiterplatte k 9850 867000
PCB cpl.
-A11
9850 867000
zum Teil 1
Blatt /3.10
sheet /3.10
FS
+FS
HP
FL
RA
STL
STV
-MB2 Fadenspannung thread tension
-MB3 Zusatz Fadenspannung additional thread tension
-MB4 2. Hubhöhe 2nd lifting position
-MB5 Nähfuß-Lüftung sewing foot lift
-MB6 Riegelautomatik automatic seam security
-MB7 2. Stichlänge 2nd stitch length
-MB8 Stichverdichtung stitch condensation
-MB1 Fadenabschneider thread trimmer
FA
-MB11 Stichlockerungseinheit stitch loosening unit
-MB12 Kantenschneider zuschalten edge cutter switched on
-MB13 Kantenschneider abschalten edge cutter switched off
-MB9 Mehrweite unten fullness below
-MB10 Mehrweite oben fullness above
Leitung k 9870 867001
Leitung k (only 670) 9870 670003
Leitung k (only 680) 9870 670004
Leitung k 9870 367003
Leitung k 9870 367003
Blatt /3.1
sheet /3.1
+24V Umag
-X11/37/PWM2/TTR
-X11/15/PWM4/OUT-C
-X11/35/PWM1/OUT-FIL
-X11/28/OUT_3/OUT-NC
-X11/18/PWM3/OUT-TCL
+24V Umag
-X11/26/OUT_1
GND
+24V Umag
Kathode TransmLED
Kathode Anzeige LED
Emitter Receiver
n.c.
-A13
Oelstandsanzeige 9850 867001
oil level gauge
Zusatzausstattung
Optional equipment

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