Service Instructions
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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.

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:

<table>
<thead>
<tr>
<th>Signal word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>DANGER</td>
<td>(with hazard symbol) If ignored, fatal or serious injury will result</td>
</tr>
<tr>
<td>WARNING</td>
<td>(with hazard symbol) If ignored, fatal or serious injury can result</td>
</tr>
<tr>
<td>CAUTION</td>
<td>(with hazard symbol) If ignored, moderate or minor injury can result</td>
</tr>
<tr>
<td>CAUTION</td>
<td>(with hazard symbol) If ignored, environmental damage can result</td>
</tr>
<tr>
<td>NOTICE</td>
<td>(without hazard symbol) If ignored, property damage can result</td>
</tr>
</tbody>
</table>

Symbols
The following symbols indicate the type of danger to personnel:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type of danger</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Symbol" /></td>
<td>General</td>
</tr>
<tr>
<td><img src="image2.png" alt="Symbol" /></td>
<td>Electric shock</td>
</tr>
</tbody>
</table>
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 Sequence of the settings

Observe the sequence!

The setting positions for the sewing machine are interdependent.

Always adhere to the specified sequence for the individual setting steps.

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

ATTENTION

Machine damage possible due to incorrect sequence.
Always adhere to the working sequence specified in this manual.

3.2 Cable routing

Tying the cable together

Ensure that all cables in the machine are laid such that moving parts are not impaired in their ability to function correctly.

1. Lay any excess cabling neatly in proper cable snakes.

2. Tie the snakes together using a cable tie.
   
   If possible, bind the snakes to fixed parts.
   
   The cables must be fixed firmly in place.

3. Cut off any protruding part of the cable tie.

ATTENTION

Machine damage and malfunctions can be caused by laying the cables incorrectly.
Excess cabling may obstruct moving machine parts in their ability to function correctly. This will affect the sewing function and may cause damage.

Lay excess cabling as described above.
3.3 Removing the covers

**WARNING**

Risk of injury
Crushing injuries from moving parts.
Switch the sewing machine off before you remove the covers or refit them

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

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

3.3.1 Access to the machine bottom section

In order to access the components at the machine bottom section, you must first tilt the machine upper section.

*Fig. 1: Tilting and erecting the machine upper section*

**Tilting the machine upper section**

1. Tilt the machine upper section as far as it will go.

**Erecting the machine upper section**

1. Raise the machine upper section.
3.3.2 Removing and fitting the arm cover

Removing the arm cover
1. Position the left adjusting wheel for the sewing foot stroke (2) to 2.
2. Loosen the screws (1).
3. Hold the arm cover (3) at the adjusting wheels and remove it.

Fitting the arm cover
1. Position the left adjusting wheel for the sewing foot stroke (2) to 2.
2. Fit the arm cover (3).
3. Tighten the screws (1).
3.3.3 Removing and fitting the head cover

*Fig. 3: Removing and fitting the head cover*

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

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

3.3.4 Removing and fitting the valve cover

*Fig. 4: Removing and fitting the valve cover*

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

Fitting the valve cover
1. Fit the valve cover (2).
2. Tighten the screws (1).
Removing the valve cover
1. Undo all four screws (1).
2. Remove the valve cover (2).

**Important**: When removing the valve cover, be sure not to pull off any cables.

Fitting the valve cover
1. Fit the valve cover (2).
2. Tighten all four screws (1).

**Important**: When fitting the valve cover, be sure not to pull off any cables.

3.3.5 Opening and closing the throat plate slide

**Fig. 5**: Opening and closing the throat plate slide

Opening the throat plate slide
1. Press the clamping spring (3) downwards.
2. Push the throat plate slide (1) apart.

Closing the throat plate slide
1. Screw the throat plate slide (1) to the throat plate (2).
3.3.6 Removing and installing the throat plate

**WARNING**

**Risk of injury**
Risk of crushing injuries and stab wounds from moving and sharp parts.
Switch the sewing machine off before you remove or install the throat plate.

**Fig. 6: Removing and installing the throat plate**

1. Open the throat plate slide (p. 17).
2. Loosen both screws (1).
3. Remove the throat plate (2).

1. Insert the throat plate (2), ensuring that the nose (3) of the bobbin housing (4) is in the cutout of the throat plate.
2. Tighten both screws (1).
3. Close the throat plate slide (p. 17).

(1) - Screws  
(2) - Throat plate  
(3) - Nose  
(4) - Bobbin housing
3.3.7 Removing and installing the feed-dog

**WARNING**

**Risk of injury**
Risk of crushing injuries and stab wounds from moving and sharp parts.
Switch the sewing machine off before you remove or install the feed-dog.

---

Fig. 7: Removing and installing the feed-dog

(1) - Feed-dog
(2) - Feed-dog carrier
(3) - Screws

---

**Removing the feed-dog**

1. Remove the throat plate (p. 18).
2. Loosen the screws (3).
3. Take the feed-dog (1) off the feed-dog carrier (2).

**Installing the feed-dog**

1. Place the feed-dog (1) onto the feed-dog carrier (2).
2. Tighten the screws (3).
3. Insert the throat plate (p. 18)

**Important:** Check the feed-dog position in its movement at maximum stitch length (depending on the equipment: 6, 9 or 12) by turning the hand-wheel. The feed-dog must not hit against the throat plate.

**Order**

Then check the following setting:

- Feed-dog (p. 38)
3.4 Surfaces on shafts

Some shafts have flat surfaces at those points where the components are screwed on. This strengthens the connection and setting work is made easier.

Always make sure that the whole screw is seated completely on the surface.

3.5 Locking the sewing machine in place

With some settings, the machine has to be locked in place. To do this, the locking peg from the accessory pack is inserted into a groove on the arm shaft crank to block the arm shaft.
There are two securing positions:

- **Position 1:** Loop stroke position
  - 5 mm end in the large groove
  - Setting the loop stroke and needle bar height

- **Position 2:** Handwheel zero position
  - 3 mm end in the small groove
  - Setting the handwheel position and checking the top dead center for the needle bar

**Fig. 10: Locking the sewing machine in place**

---

**Locking the machine in place**

1. Remove the plug from the locking opening (2).
2. Turn the handwheel until the appropriate groove (1) is in front of the locking opening (2):
   - Small groove at handwheel position $0^\circ$
   - Large groove at handwheel position $200 – 205^\circ$
3. Insert the locking peg (3) with the appropriate end into the groove (1).

**Removing the locking mechanism**

1. Pull the locking peg (3) out of the groove (1).
2. Insert the plug into the locking opening (2).
3.6 Putting the handwheel into position

With some settings, the graduated scale on the handwheel has to be put into a certain position.

Fig. 11: Putting the handwheel into position

(1) - Graduated scale (2) - Marking

Setting steps

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

WARNING

Risk of injury
Crushing injuries from moving parts.
Switch the sewing machine off before you check and set the position of the handwheel on the arm shaft.

Checking the correct setting

1. Lock the machine in place at position 2 (p. 20).
   - The handwheel is at position 0°.
   - If a different degree number is next to the marking (2) then you will have to reset the graduated scale.

Setting steps

The handwheel is fastened using two setscrews, which you can see through the screw opening (1).

1. Turn handwheel until the first setscrew is under the opening (1).
2. Release the setscrew through the opening (1).
3. Turn the handwheel by 50° such that the second setscrew is under the opening (1)
4. Release the setscrew through the opening (1).
5. Lock the machine in place at position 2 (p. 20).
6. Turn the handwheel scale so that the 0° is at the center of the marking (2).
7. Tighten the setscrew through the opening (1).
8. Remove the lock (p. 21).
9. Put the handwheel into the 50° position.
10. Tighten the setscrew through the opening (1).
5 Positioning the arm shaft

**WARNING**

Risk of injury
Crushing injuries from moving parts.
Switch the sewing machine off before you check and set the position of the arm shaft crank.

Proper setting

The three setscrews (3) on the arm shaft crank (1) are seated completely on the surface. The arm shaft crank (1) is flush with the machine casting (2).

**Cover**

- Arm cover (p. 15)

*Fig. 13: Setting the arm shaft crank*

1. Release all setscrews (3) on the arm shaft crank (1).
2. Turn the arm shaft crank (1) such that the setscrews (3) are seated completely on the surface of the arm shaft.
3. Push the arm shaft (1) to the right as far as it will go and flush with the machine casting.
4. Screw all setscrews (3) on the arm shaft crank (1) firmly in place.
6  Positioning the toothed belt wheels

The two toothed belt wheels must be positioned one on top of the other such that the toothed belt can run correctly. In machines with normal lengths, the winder wheel is directly next to the upper toothed belt wheel and determines its alignment. In long arm machines, the winder wheel is fastened farther away in the center of the arm.

Order

• Always check the position of the other toothed belt wheel after making a change on a toothed belt wheel.

Differences between long arm machines and machines with normal lengths

In long arm machines, the winder wheel on the driver wheel is aligned in the center of the arm (p. 69) and is irrelevant for the toothed belt wheels. Therefore, in long arm machines, it does not matter which toothed belt wheel you check first.

In machines with normal lengths, 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 such that the toothed belt runs correctly over both wheels.
6.1 Upper toothed belt wheel

**WARNING**

Risk of injury
Crushing injuries from moving parts.
Switch the sewing machine off before you check and set the upper toothed belt wheel.

Proper setting
The two setscrews for the upper toothed belt wheel are seated completely on the surface.

**Machines with normal lengths**

The distance between the winder wheel and the upper toothed belt wheel is 0.8 mm.

**Cover**
- Arm cover (p. 15)

Fig. 14: Setting the upper toothed belt wheel

Setting steps
1. Using the screwdriver, push the toothed belt (4) as far to the side until the two setscrews (2) can be reached.
2. Loosen the setscrews (2).
3. Turn the upper toothed belt wheel (1) such that the setscrews (2) are seated completely on the surface (5) of the arm shaft.
4. **Additional setting step for machines with normal lengths**
   Move the upper toothed belt wheel (1) to the side such that the distance to the winder wheel (3) is 0.8 mm.

5. Tighten the setscrews (2).
6. Use the screwdriver to push the toothed belt (4) back again.

### 6.2 Lower toothed belt wheel

**WARNING**

Risk of injury
Crushing injuries from moving parts.
Switch the sewing machine off before you check and set the lower toothed belt wheel.

**Proper setting**

The two setscrews for the lower toothed belt wheel are seated completely on the surface of the lower shaft.

The toothed belt runs correctly without running against the retaining ring or slipping off.

**Cover**

- Tilt the upper section ([p. 14](#))

*Fig. 15: Setting the lower toothed belt wheel*
Setting steps

1. Loosen the setscrews (4).
2. Turn the lower toothed belt wheel (3) such that the setscrews (4) are seated on the surface of the arm shaft.
3. Move the lower toothed belt wheel (3) to the side such that the toothed belt (1) makes contact with the retaining ring (2), without being pushed away.
4. Tighten the setscrews (4).
7 Setting the stitch length adjusting wheels

Fig. 16: Stitch length adjusting wheels

The two adjusting wheels on the machine column determine the stitch length.

• Upper adjusting wheel: larger stitch length
• Lower adjusting wheel: smaller stitch length

On the lower adjusting wheel, it is not possible to set a larger stitch length than on the upper adjusting wheel.

To switch over between the stitch lengths: Press the key for the stitch length on the machine arm (1).

If the upper adjusting wheel is activated, then the key (1) lights up.

Upon switching on the machine, the stitch length adjusting wheel activated most recently is always active.

An automatic switchover to the upper adjusting wheel is made when you switch the machine off at the main switch.

Order

Set the upper stitch length adjusting wheel first and then the lower stitch length adjusting wheel.
7.1 Setting the upper stitch length adjusting wheel

**WARNING**

Risk of injury
Crushing injuries from moving parts.
Switch the sewing machine off before you set the upper stitch length adjusting wheel.

Proper setting
Upper stitch length adjusting wheel to 0:

- No play on the stitch regulator gear. The plates for the gear are parallel, the frame cannot be moved.

Cover
- Tilt the upper section (p. 14)

Setting steps
1. Switch off the machine at the main switch.
   - The machine switches over to the upper stitch length adjusting wheel.

![Fig. 17: Setting the upper stitch length adjusting wheel I](image)

2. Hold the upper stitch length adjusting wheel (1) using a key (7).
3. Loosen the screw (2).
4. Remove the upper stitch length adjusting wheel (1) from the shaft (5).
5. Carefully turn the shaft (5) clockwise using a 10 mm wrench.

Fig. 18: Setting the upper stitch length adjusting wheel II

6. Check whether the frame (7) for the stitch regulator gear can be moved.
   In machines that have a stitch adjustment lever, check this by pressing the stitch adjustment lever.
   In machines that do not have a stitch adjustment lever, insert the locking peg or a hex key into the opening (9) and try to move the frame (7) up and down.

7. As soon as the frame (7) no longer moves: Remove the wrench from the shaft (5).

8. Turn the scale (6) such that the 0 is exactly next to the adjusting mark (4).

9. Place the upper stitch length adjusting wheel (1) onto the shaft (5) and tighten it with a wrench (7).

10. Screw down the upper stitch length adjusting wheel (1) using screw (2).

11. Check whether the plates for the stitch regulator gear (8) are parallel to one another.

   If the plates (8) are not parallel to one another:
   12. Remove the tension spring (10).
   13. Loosen the screw (11).
   14. Manually position the plates (8) so that they are parallel.
   15. Tighten the screw (11).
   16. Attach the tension spring (10).

ATTENTION

Machine damage possible if the shaft is turned too strongly.

If you turn the shaft too far, then parts on the stitch regulator gear could bend or get stuck.
Turn the shaft carefully and stop as soon as you can feel slight resistance.

(8) - Frame for the stitch regulator gear
(9) - Plates for the stitch regulator gear
(10) - Hole
(11) - Tension spring
(12) - Screw
7.2 Setting the lower stitch length adjusting wheel

**WARNING**

**Risk of injury**

The lower stitch length adjusting wheel has to be set when the machine is switched on, because a switchover is automatically made to the upper adjusting wheel when the machine is switched off. Carry out all work with extreme caution.

**Checking the correct setting**

- Sewing with two different stitch lengths:
  - The stitch lengths on the seam correspond with the set stitch lengths.
  - The lower stitch length adjusting wheel can only be turned up to the stitch length set on the upper stitch length adjusting wheel.

**Cover**

- Tilt the upper section (p. 14)

*Fig. 19: Setting the lower stitch length adjusting wheel I*

```
(1) - Keypad key for the machine arm
(2) - Upper stitch length adjusting wheel
(3) - Lower stitch length adjusting wheel
```

**Setting steps**

1. Position the upper stitch length adjusting wheel (2) > 3.
2. Switch machine to short stitch length.
   - The key for the stitch length (1) does not light up.
   - If the key lights up, press key (1) again.
3. Hold the lower stitch length adjusting wheel (3) using a key (7).
4. Loosen the screw (2).
5. Remove the lower stitch length adjusting wheel (3) from the shaft (5).

**ATTENTION**

**Machine damage possible if the shaft is turned too strongly.**

If you turn the shaft too far, then parts on the stitch regulator gear could bend or get stuck.

Turn the shaft carefully and stop as soon as you can feel slight resistance.

6. Carefully turn shaft (5) clockwise with a size 10 wrench until you can feel significant play on the frame for the stitch regulator gear.
7. Carefully turn shaft (5) counterclockwise with a size 10 wrench until you no longer feel any play.
8. As soon as the frame no longer moves: Remove the wrench from the shaft (5).
9. Turn the scale (6) such that the 0 is exactly next to the adjusting mark (4).
10. Place the lower stitch length adjusting wheel (3) onto the shaft (5) and tighten it with a wrench (7).
11. Screw down the lower stitch length adjusting wheel (3) using screw (2).
7.3 Setting the stitch length limit

If during the sewing operation not all stitch lengths are available, then you do have the option to limit the maximum stitch length that can be set.

**WARNING**

*Risk of injury*
Crushing injuries from moving parts.
Switch off the sewing machine before setting the maximum stitch length limit.

12, 9, or 6 mm can be selected as the maximum stitch length. In doing so, the appropriate throat plate has to be selected for the respective maximum stitch length. The throat plate cut-out must be large enough that the feed-dog does not hit against the edges of the throat plate at the front and rear dead center.

**ATTENTION**

*Risk of damaging the feed-dog due to incorrect throat plate size*
If the throat plate cut-out is too small, then the feed-dog can hit against the edges.
Make sure that an appropriate throat plate is used for the maximum stitch length set.

**Proper setting**

Turn the upper stitch length adjusting wheel clockwise as far as it will go.

The upper stitch length adjusting wheel can only be turned up to the maximum stitch length set.

*Fig. 21: Setting the stitch length limit*

1. Upper stitch length adjusting wheel
2. Screw
3. Mark-off openings

(1) - Upper stitch length adjusting wheel
(2) - Screw
(3) - Mark-off openings
Setting steps
1. Position the upper stitch length adjusting wheel (1) to 0.
2. Hold the upper stitch length adjusting wheel (1) using a key.
3. Loosen the screw (2).
4. Remove the upper stitch length adjusting wheel (1).
5. Remove the setscrew from one of the three mark-off openings (3).
6. Screw the setscrew into the mark-off opening for the required maximum stitch length. The openings are given numbers for the stitch length:
7. Turn the scale such that the 0 is exactly next to the adjusting mark.
8. Fit the upper stitch length adjusting wheel (1) and hold it using a key.
9. Tighten the screw (2).

7.4 Setting the eccentric for the forward and backward stitches

**WARNING**

**Risk of injury**
Crushing injuries from moving parts.
Switch off the sewing machine before setting the eccentric.

**Proper setting**
The forward and backward stitches are the same length.
As a test, sew a seam forwards, stop, and sew a seam backwards. The insertions of the forward and backward stitches have to lie within each other.

**Cover**
- Tilt the upper section (p. 14)

*Fig. 22: Setting the eccentric for the forward and backward stitches*

1 - Clamp
2 - Setscrew
3 - Eccentric screw
4 - Recess
Setting steps

1. Unscrew the setscrew (2).
2. Turn the eccentric screw (3) from the right through the opening in the base plate:

   **Basic position:**
   The slot in the eccentric screw (3) is parallel to the setscrew (2), the recess (4) faces the front.

If the forward and backward stitches are not the same length:

   • **Turning clockwise:**
     The forward stitch becomes larger, the backward stitch smaller.

   • **Turning counterclockwise:**
     The forward stitch becomes smaller, the backward stitch larger.

3. Tighten the setscrew (2).
8 Setting the feed-dog

The position and the movement of the feed-dog and needle bar have to be coordinated such that the needle pierces exactly in the center of the needle hole of the feed-dog.

Order

First check the following setting:

• Needle bar linkage (p. 47)

8.1 Setting the feed-dog position

**WARNING**

Risk of injury
Crushing injuries from moving parts.
Switch off the sewing machine before setting the feed-dog position.

Proper setting

The feed-dog is exactly in the center of the throat plate cut-out, both sideways and in the sewing direction.

If the stitch length is 0, the needle pierces exactly in the center of the needle hole.

Various settings can be made depending on how far the position of the feed-dog differs from the correct setting:

• For minimal deviations, it suffices to move the feed-dog on the carrier (p. 38).
• If this is not sufficient, move the entire feed-dog carrier on the sliding shaft (p. 39).
8.1.1 Moving the feed-dog

Cover

- Throat plate (p. 18)

Fig. 23: Moving the feed-dog on the feed-dog carrier

Setting steps

1. Loosen the screws (3).
2. Move the feed-dog (1) on the feed-dog carrier (2).
   Place the removed throat plate next to it as an aid for orientation so that the feed-dog can be screwed on straight.
3. Tighten the screws (3).
8.1.2 Moving the feed-dog carrier

The feed-dog carrier is connected to the stitch regulator gear via the sliding shaft and can be moved on this shaft.

**Cover**

- Tilt the upper section (p. 14)

*Fig. 24: Moving the feed-dog carrier*

1. Position the upper stitch length adjusting wheel to 0.
2. Loosen the connection to the tie rod using the two screws (1).
3. Loosen the rear screw (6).
4. Unscrew the setscrews for the adjusting rings (2).
5. Move the feed-dog carrier cross-line to the sewing direction such that the feed-dog is exactly in the center of the throat plate cut-out.
6. Push the adjusting rings (2) toward each other as far as they will go. Make sure that the sliding shaft (3) is tightened by the clamping rings.
7. Tighten the setscrews for the adjusting rings (2).
8. Move the feed-dog carrier in the sewing direction such that the feed-dog is exactly in the center of the throat plate cut-out.
9. Tighten the rear screw (6).
10. Tighten the connection to the tie rod using the screws (1).

In the process, make sure that the feed-dog height has the correct setting (p. 41).
8.2 Setting the feed-dog movement

The feed-dog moves in an elliptical cycle. To align this correctly, both the feed movement and the stroke height and stroke movement of the feed-dog have to be set.

Order

First check the following setting:

- Feed-dog (p. 37)

8.2.1 Setting the feed movement

**WARNING**

Risk of injury

Crushing injuries from moving parts.

Switch the sewing machine off before you check and set the feed movement of the feed-dog.

The correct setting for the feed movement is checked at standstill and set using the pusher eccentric.

Proper setting

Handwheel at the 190° position and set the upper stitch length adjusting wheel to the maximum stitch length.

If the stitch regulator is pressed down, the feed-dog stops.

Cover

- Tilt the upper section (p. 14)

Fig. 25: Setting the feed movement for the feed-dog

Setting steps

1. Set the upper stitch length adjusting wheel to the maximum stitch length.
2. Unscrew the setscrews (1).
3. Put the handwheel into the 190° position.
4. Press stitch adjustment lever (3) downwards and observe the feed-dog and needle in the process.
5. Turn the pusher eccentric (2) such that the feed-dog and needle no longer move when the stitch adjustment lever (3) is pressed.
6. Tighten the setscrews (1).

8.2.2 Setting the feed-dog height in the top dead center

**WARNING**

**Risk of injury**
Crushing injuries from moving parts.
Switch off the sewing machine before checking and setting the feed-dog height.

The feed-dog reaches the maximum stroke height at the top dead center when the position of the handwheel is 190°.

**Proper setting**
Place the feed-dog in the uppermost position by turning the handwheel.
- The upper edge of the feed-dog protrudes 0.5 mm above the throat plate.
- In machines with short thread cutters (STC), the upper edge of the feed-dog protrudes 0.8 mm above the throat plate.

**Cover**
- Tilt the upper section (p. 14)

*Fig. 26: Setting the feed-dog height*

**Setting steps**
1. Put the handwheel into the 190° position.
2. Loosen the setscrews (2) on the lever (1) at the left, above the hook.
3. Turn the lever (1) such that the upper edge of the feed-dog protrudes 0.5 mm (STC = 0.8 mm) above the throat plate.
4. Tighten the setscrews (2).
8.3 Feed dog stroke (default)

8.3.1 Setting the stroke movement

**WARNING**

Risk of injury
Crushing injuries from moving parts.
Switch the sewing machine off before you check and set the stroke movement of the feed-dog.

**Order**
First check the following setting:
- Feed-dog height (p. 41)

**Proper setting**
At the front dead center (handwheel position 90°) and at the rear dead center (handwheel position 270°) for the feed-dog, the upper edge of the feed-dog is at the same height as the upper edge of the throat plates.
At 90°, the feed-dog is in the upward movement; at 270°, in the downward movement.

**Cover**
- Tilt the upper section (p. 14)

*Fig. 27: Setting the feed-dog lift*

Setting steps
1. Unscrew the setscrews (1).
2. Put the handwheel into the 90° position.
3. Turn the stroke eccentric (2) such that the upper edge of the feed-dog is in the upward movement and at the same height as the upper edge of the throat plates.

4. Tighten the setscrews (1).

8.3.2 Setting the compensating weight

**WARNING**

**Risk of injury**
Crushing injuries from moving parts.
Switch the sewing machine off before you check and set the position of the compensating weight.

**Proper setting**

- Handwheel position 210°:

  - The setscrew for the compensating weight is parallel to the base plate.

**Cover**

- Tilt the upper section (Fig. p. 14)

**Fig. 28: Setting the position of the compensating weight**

![Diagram](image)

(1) - Setscrew
(2) - Compensating weight
(3) - Base plate

**Setting steps**

1. Put the handwheel into the 210° position.
2. Unscrew the setscrew (1) and leave the hex key inserted in the set-screw.
3. Turn the compensating weight (2) such that the setscrew (1) is parallel to the base plate (3). Use the hex key inserted in the setscrew as a means of orientation.

4. Tighten the setscrew (1).

8.4 Feed dog stroke (adjustable stroke eccentric)

8.4.1 Setting the stroke movement

**WARNING**

Risk of injury!
Crushing injuries from moving parts.
Switch the sewing machine off before you check and set the stroke movement of the feed dog.

**Order**
First, check the following setting:

- Feed dog height (p. 41)

**Proper setting**
At the front dead center (handwheel position 90°) and at the rear dead center (handwheel position 270°) for the feed dog, the upper edge of the feed dog is at the same height as the upper edge of the throat plate.

At 90°, the feed dog is moving upward, at 270°, it is moving downward.

**Cover**
- Tilt the machine head (p. 14)

*Fig. 29: Setting the stroke movement*

1. Threaded pins
2. Stroke eccentric
**Setting steps**

1. Loosen the threaded pins (1).
2. Move the handwheel into the 90° position.
3. Turn the stroke eccentric (2) such that the upper edge of the feed dog is in the upward movement and at the same height as the upper edge of the throat plate.
4. Tighten the threaded pins (1).

**8.4.2 Setting the stroke eccentric**

**NOTICE**

**Property damage may occur.**

The feed dog may damage the thread-pulling knife on machines with a short thread cutter.

Make sure the feed dog does not sink too deeply into the throat plate to prevent damage to the thread-pulling knife.

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**Cover**

- Tilt the machine head (p. 14)

*Fig. 30: Setting the stroke eccentric*
Setting steps

1. Loosen the screws (1).
2. Turn the disk (3).
   - Grain (2) in the + range: Feed dog stroke increased
   - Grain (2) in the - range: Feed dog stroke reduced
   - Grain (2) on the center line: Default feed dog stroke
3. Tighten the screws (1).
4. Raise the machine head.
5. Check the feed dog stroke and readjust it if necessary.

Important

The higher the feed dog stroke, the deeper the feed dog plunges into the throat plate and may damage the thread-pulling knife or the hook tip. Making sure that the feed dog stroke is not set too high is particularly important on machines with a short thread cutter (setting in the + range) in order to keep the thread-pulling knife from sustaining damage.

6. Check the setting:
   - Position the feed dog at top bottom center
   - slide a sheet of paper between feed dog and thread-pulling knife

   If the sheet of paper can be slid effortlessly between feed dog and thread-pulling knife, the feed dog stroke is set correctly.
   If the sheet of paper cannot be slid or is crushed between feed dog and thread-pulling knife, the feed dog stroke must be reduced.
9 Aligning the needle bar linkage

Order
First check the following setting:

• A straight and undamaged needle has to be inserted
  (Operating manual Section, Inserting and replacing the needle)

Proper setting
Position the upper and lower stitch length adjusting wheel to 0.

- The needle pierces exactly in the center of the feed-dog needle hole.

9.1 Moving the needle bar linkage sideways

WARNING
Risk of injury
Crushing injuries from moving parts.
Switch off the sewing machine before aligning the needle bar linkage sideways.

Cover
• Arm cover (p. 15)
• Head cover (p. 16)

Fig. 31: Aligning the needle bar linkage sideways

Setting steps
1. Set the upper and lower stitch length adjusting wheel to 0.
2. Loosen the setscrews (1) on the two adjusting rings (2) at the right-hand end of the shaft for the needle bar linkage.
3. Release both setscrews (6) on the arm shaft crank (5). Make sure that the setscrews stay on the surface.

4. Move the needle bar linkage (4) sideways such that the needle pierces exactly in the center of the needle hole (3) for the feed-dog.

5. Push the two adjusting rings (2) inwards as far as they will go and tighten them.

6. Tighten the setscrews (1) on the two adjusting rings (2).

7. Align the thread lever (7) exactly in the middle of the slot.

8. Tighten both setscrews (6) on the arm shaft crank (5).

Order
Then check the following settings:

- Loop stroke position (p. 52)
- Distance of the hook to the needle (p. 50)
9.2 Aligning the needle bar linkage in the sewing direction

**WARNING**

Risk of injury
Crushing injuries from moving parts.
Switch the sewing machine off before you check and set the position of the needle bar linkage in the sewing direction.

**Cover**

- Valve cover (p. 16)
- Tilt the upper section (p. 14)

*Fig. 33: Aligning the needle bar linkage in the sewing direction*

---

**Proper setting**

Upper stitch length adjusting wheel to 0:

- The lever (3) is positioned such that the distance from the surface of the arm (1) to the middle of the bolt is (2) 123.6 mm.

**Setting steps**

1. Position the lower stitch length adjusting wheel to 0.
2. Position the upper stitch length adjusting wheel to 0.
3. Loosen the setscrews (4).
4. Loosen the screw (5).
5. Position the lever (3).
6. Tighten the setscrews (4).
7. Tighten the screw (5).

**Order**

Then check the following setting:

- Loop stroke position (p. 52)
10 Position of the hook and needle

10.1 Setting the hook side clearance

**WARNING**

Risk of injury
Crushing injuries from moving parts.
Switch off the sewing machine before checking and setting the hook side clearance.

**Order**
First check the following settings:

- A straight and undamaged needle has to be inserted
  (*Operating manual Section, Inserting and replacing the needle*)
- Needle bar linkage (*p. 47*)
- Loop stroke position (*p. 52*)

**ATTENTION**

Damage to the machine, needle breakage, or thread damage due to an incorrect clearance between the needle and hook tip
Check the distance to the hook tip after inserting a new needle with a different size.
Reset distance if necessary.

**Proper setting**
Machine locked in place at position 1 (*p. 21*).
- Maximum 0.1 mm distance between the hook tip and the groove for the needle.

**Cover**
- Tilt the upper section (*p. 14*)
- Throat plate slide (*p. 17*)
1. Machine locked in place at position 1 (p. 21).
2. Loosen the screws (4) for the hook support (3).
3. Loosen the setscrews (2) for the hook clamping ring (1).
4. Move the hook support (3) sideways such that the distance between the hook tip (6) and the groove for the needle (5) is 0.1 mm at most, without the hook tip (6) touching the needle.
5. Tighten the screws (4) for the hook support (3).
6. Check the loop stroke position (p. 52).
7. Tighten the setscrews (2) for the hook clamping ring (1).
8. Remove the lock (p. 21).

Order

Then check the following setting:

• Position of the needle guard (p. 54)
10.2 Setting the loop stroke position

**WARNING**

**Risk of injury**
Risk of crushing injuries and stab wounds from moving and sharp parts.
Switch off the sewing machine before checking and setting the loop stroke position.

The loop stroke is the path length from the lower dead center of the needle bar up to the position where the hook tip is exactly on the vertical center line of the groove for the needle.

*Fig. 35: Loop stroke position – position of the hook tip*

The loop stroke is precisely 2 mm.

**Order**
First check the following settings:
- Needle bar linkage (p. 47)
- A straight and undamaged needle has to be inserted
  
  *Operating manual Section, Inserting and replacing the needle*

**Proper setting**
Machine is locked in place at position 1 (p. 21).
- The hook tip (2) points exactly to the vertical center line (1) of the needle.

**Fault caused by an incorrect setting**
- Missing stitches
Position of the hook and needle

Cover

- Tilt the upper section (p. 14)
- Feed-dog (p. 19)

Fig. 36: Setting the loop stroke position

Setting steps

1. Lock the machine in place at position 1 (p. 21).
2. Position the upper stitch length adjusting wheel to 0.
3. Loosen all four setscrews (2) for the hook clamping ring (1).
4. Turn the hook such that the hook tip (4) points exactly to the vertical center line of the needle (3).
5. Tighten the setscrews (2) for the hook clamping ring (1).
6. Remove the lock (p. 21).

Order

Then check the following settings:

- Position of the needle guard (p. 54)
- Point in time in cutting for the thread cutter (p. 78)
10.3 Adjusting the needle guard

**WARNING**

Risk of injury
Risk of crushing injuries and stab wounds from moving and sharp parts.
Switch off the sewing machine before checking and adjusting the needle guard.

The needle guard prevents contact between needle and hook tip.

**Order**

First check the following settings:

- Loop stroke position (p. 52)
- Hook side clearance (p. 50)
- Needle bar height (p. 55)
- A straight and undamaged needle has to be inserted (Operating manual Section, Inserting and replacing the needle)

**ATTENTION**

Damage to the machine, needle breakage, or thread damage due to an incorrect clearance between the needle and hook tip

Check the distance to the hook tip after inserting a new needle with a different size.
Reset distance if necessary.

**Proper setting**

Machine 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.

**Cover**

- Feed-dog (p. 19)
1. Turn the handwheel and check how far the needle guard (2) pushes the needle away.

2. Turn the screw (1) such that the needle guard (2) just pushes the needle (3) far away enough so that it cannot be touched by the hook tip:
   - For pushing away more: Turn it counterclockwise
   - For pushing away less: Turn it clockwise

**10.4 Setting the needle bar height**

**WARNING**

Risk of injury
Risk of crushing injuries and stab wounds from moving and sharp parts.
Switch off the sewing machine before checking and setting the needle bar height.

**Order**
First check the following settings:

- Loop stroke position (p. 52)
- A straight and undamaged needle has to be inserted
  (Operating manual Section, Inserting and replacing the needle)

**Proper setting**
Machine locked in place in position 1 (p. 21) and upper stitch length adjusting wheel set to 0.

- The hook tip is at the level of the lower third of the groove for the needle.
Faualts caused by an incorrect needle bar height

- Damage to the hook tip
- Jamming of the needle thread
- Missing stitches
- Thread breakage
- Needle breakage

Cover

- Head cover (p. 16)

Fig. 38: Setting the needle bar height

Setting steps

1. Lock the machine in place at position 1 (p. 21).
2. Position the upper stitch length adjusting wheel to 0.
3. Loosen the screw (2) for the needle bar (1).
4. Move the height of the needle bar (1) such that the hook tip (4) is in the middle of the lower third of the groove for the needle. Do not twist the needle to the side in doing so. The groove (3) must face towards the hook.
5. Tighten the screw (2) for the needle bar (1).
6. Remove the lock (p. 21).

Order

Then check the following setting:

- Position of the needle guard (p. 54)
11 Setting the spool housing lifter

Fig. 39: Spool housing lifter

The hook pulls the needle thread through between the nose of the spool housing (3) and the recess in the throat plate (4).

The spool housing lifter (2) now pushes the spool housing (1) away so that a gap appears for the thread.

If the hook tip is located below the spool housing lifter, then the spool housing lifter must open so that the thread can also slide past in that position.

So that the thread can slip through without a problem, the width of the lifting gap and the point in time of opening have to be set.

Faults caused by an incorrect setting:

- Thread breakage
- Formation of loops on the bottom side of the seam
- Loud machine noise
11.1 Setting the lifting gap

**WARNING**

**Risk of injury**
Crushing injuries from moving parts.
Switch off the sewing machine before setting the width of the lifting gap.

**Order**
Always check the width of the lifting gap after making changes to the needle thread size. The correct width of the lifting gap depends on the size of the needle thread.

**Proper setting**
The needle thread slides through unobstructed between the nose of the spool housing and the recess in the throat plate.

**Cover**
- Tilt the upper section (p. 14)
- Throat plate slide (p. 17)

*Fig. 40: Setting the lifting gap*

**Setting steps**
1. Loosen the screw (3).
2. Push the cover (2) downwards.
3. Loosen the setscrew (1).
4. Set the spool housing lifter such that the gap between the nose of the spool housing and the recess in the throat plate is just big enough to allow the needle thread to slip through without a problem.
   
   While doing so, ensure that the gap is not so big that the middle part of the hook swings to and fro, hitting the recess in the throat plate.
5. Tighten the setscrew (1).
6. Push the cover (2) upwards.
7. Tighten the screw (3).
11.2 Setting the point in time of opening

**WARNING**

**Risk of injury**
Crushing injuries from moving parts.
Switch off the sewing machine before checking and setting the point in time of opening.

**Proper setting**
The spool housing lifter starts to open exactly at that point when the hook tip is located below the spool housing lifter after the loop is taken up.

In 1-needle machines, this happens when the handwheel position is approx. 100°.
In 2-needle machines, this happens when the handwheel position is approx. 100° for the right-hand hook, and when the handwheel position is approx. 300° for the left-hand hook.
For 100° or 300°, the control cam setscrew (4) is exactly in the middle of the opening. (Insert hex key in the setscrew for orientation)

**Cover**
- Tilt the upper section (p. 14)

*Fig. 41: Setting the point in time of lifting*

**Setting steps**
1. Remove the plug (1) on the bottom side of the hook housing (2).
2. Loosen the control cam setscrew (4) through the opening.
3. Turn the handwheel until the hook tip is exactly below the spool housing lifter.
4. Use the hex key to turn the control cam (3) such that the spool housing lifter opens at the correct point in time.
5. Tighten the setscrew (4).
6. Insert the plug (1) into the opening.
12 Sewing feet

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

ATTENTION

Machine damage possible if the adjusting wheels are turned using brute force

Do not attempt to use brute force to set a smaller sewing foot stroke at the right adjusting wheel.
12.1 Setting an even sewing foot stroke

**WARNING**

**Risk of injury**
Risk of crushing injuries and stab wounds from moving and sharp parts.
Switch off the sewing machine before checking and setting the sewing foot stroke.

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

**Cover**
- Arm cover (p. 15)

*Fig. 43: Setting an even sewing foot stroke*

![Diagram of sewing foot stroke settings](image)

- Presser foot
- Feeding foot
- Screw
- Sewing foot lever

**Performing the setting steps**
1. Set the handwheel to the 0° position.
2. Loosen the screw (3).
3. Lower the presser foot (1) and feeding foot (2) together down to the throat plate.
   While doing so, make sure that the feeding foot is only lowered down to the throat plate. Do not inadvertently lower the feeding foot through the throat plate cut-out down to the feed-dog.
4. Tighten the screw (3).
12.2 Setting the stroke movement for the feeding foot

**WARNING**

Risk of injury
Risk of crushing injuries and stab wounds from moving and sharp parts.
Switch the sewing machine off before you check and set the stroke movement for the feeding foot.

For correct feed, the stroke movement for the feeding foot must be aligned to the stroke movement for the feed-dog.

**Order**

First check the following settings:

- Feed-dog movement (p. 40)
- Even sewing foot stroke (p. 61)

**Proper setting**

Left adjusting wheel for the sewing foot stroke set to 9 and the upper stitch length adjusting wheel to 0.

The feeding foot (1) touches down exactly on the feed-dog (2) when the downwards movement of the needle tip (3) reaches the upper edge of the feeding foot. This will occur when the handwheel is in the 95° position.

*Fig. 44: Stroke movement for the feeding foot and feed-dog*

**Cover**

- Arm cover (p. 15)
Setting steps

1. Screw in the setscrew (3) so that a stroke is available.
2. Position the upper stitch length adjusting wheel to 0.
3. Loosen the setscrews (2).
4. Turn the stroke eccentric (1) such that the feeding foot touches down on the feed-dog when the handwheel is in the 95° position. In doing so, do not move the stroke eccentric (1) laterally on the axle.
5. Tighten the setscrews (2).
6. Unscrew the setscrew (3) far enough so that there is no longer any contact with the clamp.

12.3 Setting presser foot pressure

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

The correct pressure depends on the material to be sewn:

• Lower pressure for soft materials, e.g. silk
• Higher pressure for harder materials, e.g. leather

Proper setting

The material being sewn does not slip and is correctly transported.
Setting steps

1. Turn the adjusting wheel for the sewing foot pressure (1):
   - **Clockwise**: more pressure
   - **Counter-clockwise**: less pressure

12.4 Setting the sewing foot lifting height

**WARNING**

**Risk of injury**

The sewing machine must remain switched on so that the sewing feet can be raised.

Work very carefully when you check and set the lifting height for the sewing feet.

Do not put your hands under the sewing feet when they are being lowered.

When the pedal is pressed back halfway, the sewing feet can be raised during sewing, e.g. to move the material being sewn.

When the pedal is pressed completely back, the sewing feet will be raised after the thread is cut so that the material being sewn can be exchanged.

**Proper setting**

The distance between the raised sewing feet and the throat plate is preset to 25 mm on delivery.
**Setting steps**

1. Loosen the counternut (2) for the adjusting screw (1).
2. Turn the adjusting screw (1) to set the distance between the raised sewing feet and the throat plate:
   - **To raise the sewing feet to a lesser height:** Turn it clockwise
   - **To raise the sewing feet higher:** Turn it counterclockwise
3. Tighten the counternut (2) for the adjusting screw (1).
13 Setting needle thread tension

13.1 Setting the thread regulator

WARNING
Risk of injury
Risk of crushing injuries and stab wounds from moving and sharp parts.
Switch off the sewing machine before checking and setting the thread regulator.

The thread regulator determines the tension applied to guide the needle thread around the hook. The required tension depends on the thickness of the material to be sewn, thread strength, and stitch length.

Lower thread tension for
• thin material
• low thread strengths

Greater thread tension for
• thick material
• high thread strengths

Proper setting
The loop of the needle thread slides at low tension over the thickest point of the hook, without forming loops or snagging.

Cover
• Throat plate slide (p. 17)

Fig. 48: Setting the thread regulator

Setting steps
1. Turn the handwheel and observe the cycle of the needle thread around the hook.
2. Loosen the screw (2).
3. Move the thread regulator
   • To reduce tension: Push to the left
   • To increase tension: Push to the right
4. Tighten the screw (2).

### 13.2 Setting the thread tensioning spring

**WARNING**

**Risk of injury**
Risk of crushing injuries and stab wounds from moving and sharp parts.
Switch off the sewing machine before checking and setting the thread tensioning spring.

The thread tensioning spring holds the needle thread under tension from the upper position of the thread lever up to the point when the needle eye plunges into the material being sewn.

**Proper setting**

**Basic setting:** The thread tensioning spring does not contact the stop until the needle eye has plunged into the material being sewn.

The setting for the thread tensioning spring has to vary according to the material being sewn and required sewing result.

**Fig. 49: Setting the thread tensioning spring**

1. Loosen the screw (4).
2. **Setting the spring travel**: Turn the stop collar (1):
   - **Longer spring travel**: Turn to the left:
   - **Shorter spring travel**: Turn to the right:

3. **Setting the spring tension**: Turn the tension disc (3):
   - **Greater spring tension**: Turn to the left:
   - **Less spring tension**: Turn to the right:
   
   Do not twist the stop collar in doing so.

4. Tighten the screw (4).
14 Winder

14.1 Position of the winder wheel in long arm machines

Long arm machines have the winder in the center of the machine arm. The winder wheel is therefore not aligned on the upper toothed belt wheel in long arm machines, but rather on the driver wheel in the machine arm.

**WARNING**

Risk of injury
Crushing injuries from moving parts.
Switch off the sewing machine before setting the position of the winder wheel.

**Proper setting**

The distance between the winder wheel and the driver wheel is 0.8 mm.

**Cover**

- Arm cover (p. 15)

*Fig. 50: Setting the distance between the winder wheel and driver wheel*

**Setting steps**

1. Loosen both setscrews (1).
2. Move the driver wheel (2) to the right or left such that distance to the winder wheel (3) is exactly 0.8 mm.
3. Screw both setscrews (1) firmly in place.
14.2 Setting the winder

**WARNING**

Risk of injury
Crushing injuries from moving parts.
Switch off the sewing machine before setting the winder.

**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.

**Cover**

- Arm cover (p. 15)

*Fig. 51: Removing the winder and setting the winder filling quantity*

**Removing the winder**

1. Loosen the screws (1).
2. Remove the winder.

**Setting the winder filling quantity**

The position of the arms on the screw (2) determines the filling quantity:

- **Parallel:** Automatic winding stop at 0.5 mm under the edge of the winder
- **Closer together:** Automatic stop with larger filling quantity
- **Further apart from each other:** Automatic stop with smaller filling quantity

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

*Fig. 52: Setting the winder run and automatic stop*

6. Loosen the setscrew (8).
7. Set the switch cam (9) such that it is just contacting the leaf spring (10) when the clamp (5) has engaged in the locking disc.
8. Set the switch cam (9) such that the winder lever (3) has no axial play.
9. Tighten the setscrew (8).

*Fig. 53: Setting the winder spacing*

10. Turn the winder spindle (12) such that the tear-off knife (11) is at the top right and is facing the right-hand screw hole (13).
11. Loosen the setscrew in the clamp (5).
12. Set the winder lever (3) such that the upper arm is above the marking for the XXL hook (15).

* The distance between the winder lever and the outer thread on the bobbin is 2 – 3 mm.

13. Set the clamp (5) such that it is resting against the locking disc (14).

14. Set the clamp (5) such that its distance to the winder wheel (6) is 0.5 mm.

15. Tighten the setscrew in the clamp (5).

**Installing the winder**

16. Fit the winder on the machine arm.

17. Tighten the screws (1).
14.3 Setting the hook thread guide

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

Proper setting

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

Fig. 55: Setting the hook thread guide

Setting steps

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

15.1 Setting the height of the thread-pulling knife

**WARNING**

Risk of injury
Risk of crushing injuries and stab wounds from moving and sharp parts.
Switch the sewing machine off before you check and set the height of the thread-pulling knife.

The height of the thread-pulling knife is factory-set such that the distance (5) between the upper edge of the knife carrier (4) and the hook bearing screw-on surface (3) is 10.7±0.05 mm. Fine adjustment is made by means of washers between the knife carrier (4) and the thread-pulling knife (2).

When changing the knives, make sure that you do not lose the washers.

**Proper setting**
The thread-pulling knife (2) pivots as close as possible above the hook and is at the same height as the counter-blade (1).

**Cover**

- Throat plate slide (p. 17)

*Fig. 56: Setting the height of the thread-pulling knife*

**Setting steps**

1. Loosen the screw (6).
2. Remove the thread-pulling knife (2).
3. Place as many washers between the thread-pulling knife (2) and knife carrier (4) that the upper edges of the counter-blade (1) and thread-pulling knife (2) are at the same height.

4. Non-required washers on the top side between the thread-pulling knife (2) and screw (6) should be kept.

5. Screw down the thread-pulling knife (2) using screw (6).

15.2 Setting the cutoff curve

**WARNING**

**Risk of injury**

Risk of crushing injuries and stab wounds from moving and sharp parts.

Switch off the sewing machine before aligning the thread-pulling knife sideways.

**Proper setting**

The control cam (4) makes direct contact with the clamping ring (1).

The distance between the widest extent (6) of the control cam (4) and the roller (3) is 0.1 mm at most.

In resting position, the circle mark on the cutting edge of the thread-pulling knife is exactly next to the tip of the counter-blade.

**Cover**

- Tilt the upper section (p. 14)
- Throat plate slide (p. 17)

Fig. 57: Aligning the thread-pulling knife sideways - Part 1

**Setting steps**

1. Loosen all four setscrews (2) on the clamping ring (1).
2. Push the clamping ring (1) as far as it will go to the left.

3. Tighten all four setscrews (2) on the clamping ring (1).

   Screw the four setscrews (2) tightly in place on the clamping ring (1) before you loosen the setscrews (5). The clamping ring (1) and control cam (4) are both mutually used as a stop and should not be undone at the same time.

4. Loosen the setscrews (5).

5. Press the actuating lever (7) against the solenoid (9).

6. Turn the control cam (4) such that its widest extent (6) is at the top, next to the roller (3).

7. Move the control cam (4) such that the distance between its widest extent (6) and the roller (3) is 0.1 mm at most.

8. Tighten the setscrews (5).

9. Loosen the clamping screw (8) on the actuating lever (7).

Fig. 58: Aligning the thread-pulling knife sideways - Part 2

10. Turn the thread-pulling knife (12) such that the circle mark is exactly next to the tip of the counter-blade (11).

11. Tighten the clamping screw (8) on the actuating lever (7) such that the actuating lever (7) has no axial play.

12. Loosen all four setscrews (2) on the clamping ring (1).

13. Push the clamping ring (1) to the right as far as it will go and against the control cam (4).

14. Check the loop stroke position (S. 52).

15. Tighten all four setscrews (2) on the clamping ring (1).
15.3 Setting the cutting pressure

**WARNING**

Risk of injury

Risk of crushing injuries and stab wounds from moving and sharp parts.

Switch the sewing machine off before you check and set the counter-blade and the 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 makes contact with the thread-pulling knife without any pressure being applied. Two threads with the greatest strength for sewing can be neatly cut simultaneously.

**Faults caused by an incorrect setting**

- Increased knife wear when the pressure is too great
- Problems when sewing on if the hook thread clamp is too high
- Problems in cutting the thread

**Cover**

- Throat plate slide (p. 17)

*Fig. 59: Setting the cutting pressure*

**Setting steps**

1. Turn the handwheel until the thread-pulling knife (3) can be swung out by hand.
2. Loosen the screw (1).
3. Position the thread-pulling knife (3) such that the arrow mark is exactly next to the tip of the counter-blade (2).

4. Turn the hook thread clamp (5) such that it rests against the thread-pulling knife (3).

5. Turn the counter-blade (2) such that it rests against the thread-pulling knife (3).

6. Tighten the screw (1).

7. Check the position of the cutters, since the counter-blade can easily become warped when the screw is being tightened.

15.4 Adjusting the needle thread tension

**WARNING**

Risk of injury

Risk of crushing injuries and stab wounds from moving and sharp parts.

Switch off the sewing machine before checking and setting the point in time for cutting.

**Proper setting**

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

**Additional setting for 2-needle machines**

The control cam for the right-hand needle or the right-hand hook support is identified by an R and an arrow for the direction of rotation.

The control cam for the left-hand needle or the left-hand hook support is identified by an L and an arrow for the direction of rotation.

**Cover**

- Tilt the upper section (p. 14)
- Throat plate slide (p. 17)
Setting steps

1. Loosen the setscrews (4).
2. Turn the handwheel until the thread-pulling knife (6) can be swung out by hand.
3. Pivot the thread-pulling knife (6) as far forward until the circle mark is exactly next to the tip of the counter-blade (5).
4. Set the handwheel position to 60°.
5. Push the control cam (3) to the left as far as it will go and against the clamping ring (2).
6. Turn the control cam (3) such that the roller (1) runs up at the contour of control cam (3) and the widest extent of the control cam is at handwheel position 60° at the highest point.
7. Tighten the setscrews (4).
8. Check setting:
   - Insert the thread into thread-pulling knife (6) and slowly turn the handwheel.
   - Determine the handwheel position at which the thread is cut.
   - If necessary, repeat setting steps 1 – 7 until the cut takes place at 60°.
16 Short thread cutter (KFA)

Important
Correct setup of the short thread cutter requires that the necessary work steps be performed in the order given in this chapter.

16.1 General information

For videos of KFA settings, visit our YouTube channel.

Fig. 61: Short thread cutter

Requirements

- The needle bar must be positioned at 0° at the top dead centre of the handwheel; if this is not the case: set the handwheel scale (p. 23).
- The hook bearing must be set up properly, see chapter Position of the hook and needle (p. 50).

Thread-pulling knife height

The height of the thread-pulling knife has been set at the factory using adjusting washers between thread-pulling knife (1) and knife carrier (3). When changing the knives make sure that you do not lose the adjusting washers.
The height of the thread-pulling knife is determined by the height of the counter-blade. The upper edges of the two knives must be on the same level.

**Thread-pulling knife position**

The thread-pulling knife (1) cannot be moved on the knife carrier (3). Therefore, the cutting pressure does not have to be set after replacing the thread-pulling knife (1).

The knife carrier (3) can be installed in 2 different positions: Large hook and XXL hook. To do this, the knife carrier (3) is rotated by 180°.

In rest position, the thread-pulling knife (1) completely covers the cutting edge of the counter-blade (2). This prevents the needle thread from being damaged.

The pivot range of the thread-pulling knife is 23°.

Fig. 62: Control cam

The control cam (5) is designed for operating with the large hook and the XXL hook.

The control cam (5) can be on the right-hand side (label is right side up) or on the left side (label is upside down) of the clamping ring (4).

The control cam (5) makes contact with the clamping ring (4).

The label of the control cam (5) is correct in accordance with the installation situation.
16.2 Setting the locking latch

**NOTICE**

**Risk of breakage**

Never operate the machine without the thread-pulling knife.

The reverse-motion lock for the bobbin housing is on the thread-pulling knife.

---

Fig. 63: Setting the locking latch

---

Proper setting

1. Turn the handwheel until the roller (2) is at the highest point of the control cam (3).
2. Press the roller (2) against the control cam (3).
   - The locking latch (1) can be swung out without clamping, and the distance between the locking latch (1) and locking pin (6) is not greater than 0.1 mm.

Setting steps

1. Loosen the nut (4).
2. Turn the screw (5) and adjust the distance.
3. Tighten the nut (4).
16.3 Setting the thread-pulling knife

**WARNING**

Risk of injury!
Risk of crushing injuries and stab wounds from sharp and moving parts.
Switch the sewing machine off before you check and set the thread-pulling knife.

**NOTICE**

Risk of breakage
Never operate the machine without the thread-pulling knife.
The reverse-motion lock for the bobbin housing is on the thread-pulling knife.

![Fig. 64: Setting the thread-pulling knife](image)

Proper setting

- When the thread-pulling knife (1) is at rest, the distance between the highest point of the control cam (7) and the roller (5) is 0.1 mm
- The control cam (7) makes contact with the clamping ring (6)
- The marking (3) on the thread-pulling knife (1) is adjacent to the cutting edge of the counter-blade (2)
- The knife carrier (4) must have no axial play, but still run smoothly
**Setting steps**

1. Loosen all 4 screws on the clamping ring (6) and push the clamping ring (6) toward the hook bearing.
2. Tighten all 4 screws on the clamping ring (6).
3. Loosen both setscrews on the control cam (7).
4. Turn the lever (8) as far as it will go against the screw (10).
5. Set the distance between the roller (5) and the highest point of the control cam (7) to 0.1 mm.
6. Tighten both setscrews on the control cam (7).
7. Loosen the clamping screw (9) on the lever (8).
8. Turn the thread-pulling knife (1) until the marking (3) on the cutting edge of the counter-blade (2) is adjacent to it.
9. Tighten the clamping screw (9). Take care to ensure that there is no axial play.
10. Loosen all 4 screws (6) on the clamping ring and push the clamping ring (6) as far as it will go and against the control cam (7).
11. Tighten all 4 screws on the clamping ring (6).
12. Check the loop stroke.
16.4 Setting the counter-blade

**WARNING**

Risk of injury!
Risk of crushing injuries and stab wounds from sharp and moving parts.
Switch the sewing machine off before you check and set the counter-blade.

---

**Proper setting**

The thread must be reliably cut using little pressure. The pressure is built up starting at the marking (2).

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

1. Turn the handwheel until the thread-pulling knife (1) can be swung out after the latch is triggered.
2. Swing out the thread-pulling knife (1) manually. To do this, press the clamp with the roller (3) against the control cam (4).
3. Insert 2 threads into the thread-pulling knife (1).
4. Turn the handwheel until the cutter swivels down.
5. Check whether the sewing threads have been cleanly cut and pressure is built up starting at the marking (2).

**Faults caused by an incorrect setting**

- Increased knife wear when the pressure is too great
- Problems in cutting the thread
Setting the cutting pressure
The shape of the thread-pulling knife automatically creates the required cutting pressure as soon as both cutting edges are on top of one another.

Fig. 66: Setting the cutting pressure

Setting steps
1. Swing out the thread-pulling knife (1) until the marking (2) is next to the cutting edge of the counter-blade (5).
2. Loosen the screw (6).
3. Place the counter-blade (5) in position against the thread-pulling knife (1).
4. Tighten the screw (6).
16.5 Setting the cutoff position

**WARNING**

Risk of injury!
Risk of crushing injuries and stab wounds from sharp and moving parts.
Switch the sewing unit off before checking and setting the cutoff position.

Fig. 67: Setting the cutoff position

![Diagram](image)

(1) - Thread-pulling knife  
(2) - Marking  
(3) - Roller  
(4) - Clamping ring  
(5) - Control cam  
(6) - Setscrews  
(7) - Lever  
(8) - Locking latch

**Proper setting**

The default is that the cutoff position is at 65° on the handwheel (thread lever at top dead centre). When the machine is at the 65° position on the handwheel, the control cam (5) is at its highest point.

1. Turn the handwheel to the 0° position (thread lever at top dead center).
2. Loosen the locking latch (8).
3. Swing out the thread-pulling knife (1) manually. To do this, press the lever (7) with the roller to the right (3) against the control cam (5).
4. Insert thread into the thread-pulling knife (1).
5. Use the handwheel to turn the machine until the thread is cut shortly before reaching the marking (2).
6. Check if the cut was made at the 65° position on the handwheel.
Setting steps

1. Loosen the setscrews (6) on the control cam (5).
2. Move the control cam (5) towards the clamping ring (4) until it makes contact and correct the position of the control cam (5).
3. Re-tighten the setscrews (6) on the control cam (5).
4. Check the position as described above under Proper setting and correct the position again if necessary.
17 Setting the potentiometer

**WARNING**

*Increased risk of injury*

The machine remains switched on when the potentiometer is set.

 Carry out all work with extreme caution.

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**

After accessing the technician level and pressing the OK key, the left display will show 1 in the first instance and the relevant maximum speed next to it.

**Cover**

- Arm cover (p. 15)

---

**Setting steps**

1. Switch off the machine at the main switch.
2. Keep the P key (2) and Reset key (3) pressed down simultaneously and switch on the machine at the main power switch in doing so.
   - The display starts.
3. Release the P key (2) and the reset key (3).
   - The display indicates the current level.

The potentiometer is set at technician level 10 04.

If the display indicates a different level:
4. Call up the technician level using the **Plus/Minus** keys (3):
   As the case may be, press the Plus or Minus key under the letter or the number until the display indicates \( t \ 10 \ 04 \).

5. Press the OK key (5)

Fig. 69: Setting the potentiometer

6. Check whether the lifting gear plates are flush.
   If the plates are not flush:

7. Loosen the setscrews (1).

8. Set the connecting clamp (2) for the lifting cylinder such that the plates are flush.

9. Tighten the setscrews (1).

10. Loosen the setscrew (3).

11. Turn the potentiometer axle such that the left display shows 1 in the first instance and the relevant maximum speed next to it.

12. Tighten the setscrew (3) without changing the value shown in the display.

13. Press the ESC key two times.

**Important:**

14. Switch off the machine at the main switch.

15. Switch on the machine at the main switch.

Switching off and on will save the setting.
18 Setting the safety snap-on coupling

The safety snap-on coupling disengages in the event of the thread jamming and thus prevents the hook from being misadjusted or damaged.

18.1 Attaching the safety snap-on coupling

**WARNING**

Risk of injury
Crushing injuries from moving parts.
Switch off the sewing machine before you reattach the safety snap-on coupling after the thread has jammed.

**Proper setting**

The four setscrews (1) on the two adjusting rings next to the safety snap-on coupling (3) must be parallel to one another. After the coupling has disengaged, they are no longer parallel.

**Cover**

- Tilt the upper section (p. 14)

![Fig. 70: Attaching the safety snap-on coupling](image)

**Setting steps**

1. Turn the left adjusting ring (2) such that the setscrews (1) are parallel to one another.

   - The coupling engages.
18.2 Setting the torque

**WARNING**

Risk of injury
Crushing injuries from moving parts.
Switch off the sewing machine before checking and setting the safety snap-on coupling.

**ATTENTION**

Machine damage due to incorrect torque
If you change the torque, it could be that the coupling will not disengage although this would be required. This could cause machine damage, e.g. in the event of the thread jamming.

Do not change the factory setting and make sure that the torque remains at 8 Nm.

Proper setting
The machine is set at the factory such that the torque is 8 Nm when the marking point (6) is exactly above the setting slot (5) of the disc.

Cover

- Tilt the upper section (p. 14)

Restoring the correct torque:
1. Loosen the screw (7).
2. Using the screwdriver, turn the disc on the setting slot (5) such that 8 Nm is reached for the torque:
   - **To increase the force**: Turn in the + direction
   - **To reduce the force**: Turn in the – direction
3. Tighten the screw (7).
19 Machines with integrated motor

**DANGER**

Risk of injury from electricity.
Unprotected contact with electricity can result in serious injuries or death.

Work on the electrical system must ONLY be performed by qualified electricians or appropriately trained and authorized personnel.

ALWAYS unplug the power plug before working on the electrical equipment.

**WARNING**

Risk of injury

The machine may only be disassembled and assembled by trained specialists.

19.1 Overview of the components

*Fig. 72: Overview of the components*

1. Handwheel
2. Handwheel flange
3. Encoder
4. Encoder disc
5. Cover plate
6. Stator
7. Ring
8. Rotor
19.2 Disassembling the drive

Removing the handwheel and handwheel flange

Fig. 73: Removing the handwheel and handwheel flange

1. Undo all three screws (2) on the handwheel (1).
2. Undo both setscrews (3) and remove the handwheel flange (4).

Removing the cover

Fig. 74: Removing the cover

1. Undo all five screws (1).
2. Carefully remove the upper cover (2) from the side, paying attention to the dial (3) in doing so.
3. If there is a lower cover mounted: Undo all three screws (4) and remove the lower cover (5).
Removing the encoder

Fig. 75: Removing the encoder

1. Disconnect plugs L1, L2, and L3 (5).
2. Disconnect the encoder plug (4).
3. Unscrew the retaining plate (3).
4. Undo both screws for the encoder (2).
5. Undo the screw for the encoder disc (1).
6. Carefully and uniformly pull the encoder (2) and encoder disc (1) away from the shaft.

(1) - Encoder disc  (4) - Encoder plug
(2) - Encoder  (5) - Plugs L1, L2, L3
(3) - Retaining plate
Removing the stator

1. Undo all three screws (1).
2. Remove the cover plate (2).
3. Remove the stator with ring (3).

Removing the rotor

1. Remove the arm cover.
2. Undo all four threaded screws (1, 2).
3. Remove the rotor with deep groove ball bearing (2).
19.3 Assembling the drive

**Attaching the rotor**

**Fig. 78: Attaching the rotor**

1. Push the rotor (3) onto the shaft until the deep groove ball bearing is resting against the stop.

2. Screw all four threaded screws (1, 2) firmly in place, observing the surface of the shaft in doing so: Screw the first screw in the direction of rotation firmly in place on the surface.
**Attaching the stator**

**CAUTION**

**Magnetism!**
Work carefully and in a controlled manner, since the stator can be pulled out of your hands.

---

1. Push the stator with ring (3) onto the shaft, taking care to pay attention to the ring gap for the cable.
2. Fit the cover plate (2).
3. Evenly screw all three screws (1) firmly in place such that a uniform gap exists between the cover plate (2) and shaft.

---

**Fig. 79: Attaching the stator**

(1) - Screws  
(2) - Cover plate  
(3) - Stator with ring
Attaching the encoder

Fig. 80: Attaching the encoder

1. Push the encoder (2) and encoder disc (1) onto the shaft.
2. Align the encoder disc (1) such that it runs in the middle of the encoder (2).
3. Screw the encoder disc (1) and encoder (2) firmly in place.
4. Tighten the retaining plate (2).
5. Insert plugs L1, L2, and L3 (5).
6. Insert the encoder plug (4).

Attaching the cover

Fig. 81: Attaching the cover

(1) - Encoder disc
(2) - Encoder
(3) - Retaining plate
(4) - Encoder plug
(5) - Plugs L1, L2, L3

(1) - Screws
(2) - Upper cover
(3) - Dial
(4) - Screws
(5) - Lower cover
(depending on machine)
1. Carefully attach the upper cover (2) from the side, paying attention to the dial (3) in doing so.
2. Tighten all five screws (1).
3. Attach the lower cover (5) and tighten all three screws (4).

**Fig. 82: Locking the machine in place**

1. Lock the machine in place using the Ø3 mm locking peg (1).

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* The needle is in the top dead center position.
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**Fig. 83: Attaching the handwheel flange**

1. Attach the handwheel flange (1) such that the two markings (2, 3) are in line.
2. Tighten both setscrews (4), taking care in doing so that there is a distance of approx. 0.5 - 1 mm between the handwheel flange (1) and cover plate.

19.4 Replacing the fuse

The fuse is for the built-in sewing lamp transformer.

1. Replace the fuse. Value: 0.63 A T.
19.5 Replacing the PCB

Fig. 86: Replacing the PCB

(1) - Screws
(2) - PCB

1. Disconnect plugs
2. Undo screws (1) for mounting plate of PCB
3. Replace the PCB (2).
4. Tighten the screws (1).
5. Insert plugs.

**Important:**
Ensure that the motor is correctly connected.
20 Special machines

20.1 Machines with switchable needle bars:

20.1.1 Setting the needle bar height

**WARNING**

Risk of injury
Risk of crushing injuries and stab wounds from moving and sharp parts.
Switch off the sewing machine before checking and setting the needle bar height.

*Fig. 87: Needle bar height for machines with switchable needle bars I*

The needle bar height cannot be set for machines with switchable needles. The height of the needles in relation to the hook tip is set using the needle holders (1).

**Proper setting**

The height of the needle holders should be set such that the hook tip is on the lower third of the groove when the stitch length is 0 and in loop stroke position.

1. Set stitch length adjusting wheel to 0.
2. Lock the sewing machine in place at position 1 (see p. 21).
3. Check the position of the needle in relation to the hook tip.
Faults caused by an incorrect setting

- Damage to the hook tip.
- Jamming of the needle thread between the needle and the needle guard.
- Missing stitches and thread breakage.

Fig. 88: Needle bar height for machines with switchable needle bars II

Setting steps

1. Set stitch length adjusting wheel to 0.
2. Loosen the setscrew (2).
3. Remove the needle clamp (4).
4. Using an SW 2.5 hex key, turn the setscrew (6) in the needle bar (3). The setscrew serves as a stop for the needle clamp.
5. Insert the needle clamp (4) into the needle bar (3) and push it upwards as far as it will go. In doing so, ensure that the hexagonal pin (5) on the needle clamp (4) rests in the hexagon socket of the set screw (6).
6. Tighten the setscrew (2).

Order

After correcting the needle bar height, check the position of the needle guard (Fig. p. 54).
20.1.2 Adjusting the slide for the needle bars

WARNING

Risk of injury
Risk of crushing injuries and stab wounds from moving and sharp parts.
Switch off the sewing machine before adjusting the slide.

Proper setting
The position of the slide (1) must be adjusted such that the center of the pin (4) of the slide (1) is exactly on the peg (3) when the slide is in zero position (both needles switched on).

Setting steps
1. Loosen the screws (2).
2. Adjust slide (1).
3. Tighten the screws (2).
4. Check whether the needle bars switch cleanly.
20.2 Machines with moving binder

Sewing machines with a moving binder allow the edge of the sewing material to be bound simultaneously.

**WARNING**

Risk of injury

Risk of crushing injuries and stab wounds from moving and sharp parts.

Switch off the sewing machine before setting the binder.

**Proper setting**

The binder (1) operates in sync with the feed. You can use the **Plus/Minus** buttons to adjust the binder for more width or less feed.

Fig. 90: Adjusting the binder

Basic setting for synchronous operation

1. Set the handwheel to 100°.
   * The shaft (2) must be parallel to the lower shaft (3).
2. Remove the shaft (2).
3. Check for synchronous operation.

**Fine adjustment of synchronous operation**

4. Loosen the screw (6).
5. Remove the lever (4).
6. Adjust the clamp (5) on the shaft (2).
   The clamp can be adjusted to the right or left as well as up or down.

**20.3 Machines with a vertical cutter**

Sewing machines with a vertical cutter allow the sewing material to be cut during the sewing process. The vertical cutter is disabled each time the sewing feet are pneumatically lifted. When the knee lever is actuated, it is only disabled after the second/third lifting.

**WARNING**

_Risk of injury_
Risk of crushing injuries and stab wounds from moving and sharp parts.
Switch off the sewing machine before setting the vertical cutter.

**Setting the time for cutter movement**
The cutter should cut the sewing material when material is not being fed.

**Cover**
Head cover (p. 16)

*Fig. 91: Adjusting the vertical cutter I*

(1) - Vertical cutter  
(2) - Toothed belt wheel  
(3) - Screws
Setting steps

1. Undo the screws (3) of the toothed belt wheel (2).
2. Adjust the toothed belt wheel (2) such that the cutter only cuts when no material is being fed.
3. Tighten the screws (2).

Adjusting the cutter stroke

Fig. 92: Adjusting the vertical cutter II

The stroke height of the cutter (1) can be set. This is necessary if the cutter was reground and is now shorter.

Setting steps

1. Unscrew the cover (2).
2. Release the nut (3).
3. Turn the screw (4):
   • **Turn screw upwards** = stroke higher
   • **Turn screw downwards** = stroke smaller
4. Tighten the nut (3).
5. Correct cutter overlap.
Correcting cutter overlap

Fig. 93: Adjusting the vertical cutter III

If the cutter (2) is at the lower dead center, the overlap should be 0.5 mm.

Setting steps
1. Loosen the screw (1).
2. Push the cutter (2) down until it overlaps with the counter-blade (3) by 0.5 mm.
3. Tighten the screw (1).

Adjusting the position and pressure of the cutting edges

Fig. 94: Adjusting the vertical cutter IIIV

The cutter (2) should be somewhat diagonal to the counter-blade (3). The cutter (2) should cut reliably with the least possible pressure.
21 Activating the tensioner lift

**NOTICE**

*Production of loose stitches!*
When sewing corners with active tensioner lift and simultaneous sewing foot lift, the machine will produce a loose stitch.

Do not activate the pneumatic tensioner lift when lifting the sewing feet unless the sewing feet are NOT lifted during the seam.

The factory setting for the machine is such that the tensioner will remain closed during a seam regardless of whether the sewing feet are lifted or not.

Opening the tensioner while the sewing feet are lifted and the seam is not yet completed makes sense, for instance, when you DO NOT sew corners.

To activate the tensioner lift:

1. Press the and buttons at the same time.

   You are on the technician level.

2. Use the buttons under the display to select the parameter t 09 00.

3. Use +/- to enter the desired value (Parameter list 867).

4. Confirm with .
22 Maintenance work

22.1 Lubrication

WARNING
Risk of injuries due to contact with oil.
Contact with oil can cause irritation, rashes, allergies or skin injuries.
ALWAYS avoid long-term contact with oil.
ALWAYS thoroughly wash the affected areas if contact with oil occurs.

ENVIRONMENTAL PROTECTION
Risk of environmental damage from oil.
Oil is a pollutant and must not enter the sewage system or the soil.
Carefully collect waste oil and dispose of the waste oil and oil-contaminated machine parts in the legally prescribed manner.

ATTENTION
Machine damage due to incorrect oil level
An incorrect oil type can cause damage to the machine.
Only use oil that complies with the data in the manual.

Required oil:
Only DA 10 or equivalent oil should be used for the machine, which has the following properties:

• Viscosity at 40 °C: 10 mm²/s - ISO VG10
• Flash point: 150 °C

DA 10 can be obtained under the following part number at DA sales offices:

• 9047 000011 - 250 ml
• 9047 000012 - 1 l
• 9047 000013 - 2 l
• 9047 000014 - 5 l
22.1.1 Lubrication of the upper part of the machine

The central oil lubrication system supplies all bearing positions automatically with oil from the reservoir.

**ATTENTION**

Machine damage due to incorrect oil level

Too little or too much oil can result in damages to the machine. Check the oil level every day and top up the oil, if necessary.

**Proper setting**

The oil level is between the minimum level marking and the maximum level marking.

**Setting steps**

1. Check the oil level indicator every day.
2. If the oil level is below the minimum level marking (3):
   - Pour oil through the refill opening (1) but no higher than the maximum level marking (2).

**CLASSIC equipment**

Note for machines with CLASSIC equipment

If the oil level falls below the minimum level marking (3), the oil level indicator lights up in red.

1. Turn the sewing machine off, then on again after refilling oil.
   - The red light will turn off.
22.1.2 Hook lubrication

**WARNING**

**Risk of injury**
Risk of crushing injuries and stab wounds from moving and sharp parts.
When holding the blotting paper, make sure that you do not reach into the hook or underneath the area of the needle and sewing feet.
Switch off the sewing machine before adjusting the hook lubrication.

The approved amount of oil for hook lubrication is a factory specification. Hold a sheet of blotting paper near to the hook when sewing.

**Proper setting**
After sewing a stretch of approx. 1 m, the blotting paper has been sprayed with a thin and even film of oil.

**Cover**
- Throat plate slide (§ p. 17)

*Fig. 96: Setting the hook lubrication*

![Diagram of hook lubrication](image)

**Setting steps**
1. Turn the screw (3):
   - **Turn counter-clockwise**: more oil is released
   - **Turn clockwise**: less oil is released

The released amount of oil does not change until the operating time has run a few minutes. Sew for several minutes before you check the setting again.
22.2 Pneumatic system

22.2.1 Setting operating pressure

Proper setting

The operating pressure is 6 bar.

Check the pressure on the pressure indicator every day. The pressure cannot deviate by more than 1 bar.

ATTENTION

Machine damage due to incorrect pressure

Incorrect pressure can result in damage to the machine. Make sure that the machine is only used when the operating pressure is set correctly.

Fig. 97: Setting operating pressure

(1) - Rotary handle (2) - Pressure indicator

Setting steps

1. Pull the adjustment knob (1) up.
2. Turn the turning handle until the pressure indicator (2) indicates 6 bar:
   - clockwise: to increase pressure
   - counterclockwise: to reduce pressure
3. Push the adjustment knob (1) down.
22.2.2 Draining the water condensation

Water condensation may accumulate in the water separator of the pressure controller.

**Proper setting**

Water condensation cannot rise up to the filter element (1).

Check the water level in the water separator on a daily basis.

---

**WARNING**

**Risk of injury**

Switch off the machine at the main power switch and disconnect it from the pneumatic network before you drain the water from the water separator.

---

**ATTENTION**

**Machine damage due to too much water**

Too much water can result in damage to the machine.

Check the water level every day and drain water, if necessary.

---

*Fig. 98: Draining the water condensation*

1. Place the collection tray under the drain screw (3).
2. Unscrew the drain screw (3) completely.
3. Allow water to drain into the collection tray.
4. Tighten the drain screw (3).
22.2.3 Cleaning the filter element

**WARNING**

Risk of injury

Switch off the machine at the main power switch and disconnect it from the pneumatic network before you clean the filter element.

---

**ATTENTION**

Damage to the paintwork due to solvent-based cleaners.

Solvent-based cleaners damage the filter. Use only solvent-free substances for washing out the filter tray.

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*Fig. 99: Cleaning the filter element*

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Cleaning steps

1. Drain the water condensation (p. 117).
2. Unscrew the water separator (2).
3. Unscrew the filter element (1).
4. Blow out the filter element (1) using a compressed-air pistol.
5. Wash out the filter tray using benzine.
6. Tighten the filter element (1).
7. Tighten the water separator (2).
8. Tighten the drain screw (3).
22.3 Cleaning work

22.3.1 Cleaning the machine
Lint and thread remnants should be removed after every eight hours of operation using a compressed-air pistol or a brush. In the case of very fluffy material to be sewn, the machine must be cleaned more frequently.

**WARNING**

Risk of injury

Switch off the machine at the main power switch before cleaning the machine.

Flying particles can get in the eyes, causing injury.

Hold the compressed-air pistol so that particles do not fly toward persons.

Make sure no particles fly into the oil pan.

**ATTENTION**

Damage to the paintwork due to solvent-based cleaners.

Solvent-based cleaners will damage paintwork.

Only use solvent-free substances for cleaning.

Fig. 100: Areas requiring special cleaning

(1) - Area around the needle
(2) - Hook
(3) - Area under the needle plate
(4) - Cutter on the bobbin winder

Areas particularly susceptible to soiling:

- Cutter on the bobbin winder for the hook thread (4)
- Area under the throat plate (3)
- Hook (2)
- Area around the needle (1)
Cleaning steps
1. Remove any dust and thread remains using a compressed-air pistol or a brush.

22.3.2 Clean the motor fan sieve
The motor fan sieve must be cleaned once a month using a compressed-air pistol. When very fluffy material is used for sewing, the motor fan sieve must be cleaned more frequently.

**WARNING**

Risk of injury
Switch off the machine at the main power switch before cleaning the motor fan sieve.
Flying particles can get in the eyes, causing injury. Hold the compressed-air pistol so that particles do not fly toward persons.

![Fig. 101: Clean the motor fan sieve](image)

Cleaning steps
1. Remove any sewing dust and thread remains using a compressed-air pistol.
22.4 Checking the toothed belt

**WARNING**

**Risk of injury**
Crushing injuries from moving parts.
Switch off the machine before checking the condition of the toothed belt.

The condition of the toothed belt must be checked once a month.

A damaged toothed belt must be replaced immediately.

**Proper setting**
- The toothed belt exhibits no cracks or fragile areas.
- When pressed with a finger, the toothed belt gives no more than 10 mm.
23 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.
24 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.