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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 (p. 107).

Consider these instructions as part of the product and keep it easily accessible.

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 manufac-
turer has performed a hazard assessment for these purchased parts and confirmed their design compliance with applicable European and na-
tional 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 connection cable must have a power plug approved in the relevant country. The power plug may only be assembled to the connection 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:

- Setting up the machine
- Performing maintenance work and repairs
- Performing 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>
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<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="symbol1.png" alt="Icon" /></td>
<td>General</td>
</tr>
<tr>
<td><img src="symbol2.png" alt="Icon" /></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.

---

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type of danger</th>
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<tbody>
<tr>
<td><img src="Image" alt="Puncture Symbol" /></td>
<td>Puncture</td>
</tr>
<tr>
<td><img src="Image" alt="Crushing Symbol" /></td>
<td>Crushing</td>
</tr>
<tr>
<td><img src="Image" alt="Environmental Damage Symbol" /></td>
<td>Environmental damage</td>
</tr>
</tbody>
</table>
CAUTION

Type and source of danger!
Consequences of non-compliance.
Measures for avoiding the danger.

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

NOTICE

Type and source of danger!
Consequences of non-compliance.
Measures for avoiding the danger.

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

3.1 Order of the settings
The setting positions for the sewing machine are interdependent. Always comply with the order of individual setting steps as specified. It is absolutely essential that you follow all notices regarding prerequisites and subsequent settings that are marked with 

**NOTICE**

Property damage may occur!
Machine damage from incorrect order.
It is essential to follow the working order specified in these instructions.

3.2 Laying the cables

**NOTICE**

Machine damage and malfunctions can be caused by laying the cables incorrectly!
Excess cables can impair the functioning of moving machine parts. This impairs the sewing function and can result in damage.
Lay excess cables as described.

To lay the cables:

1. Lay any excess cabling neatly in proper cable snakes.
2. Bind together the cable loops with cable ties.
   Tie loops wherever possible to fixed parts.

**Important**
The cables must be secured firmly.

3. Cut off any overlapping cable ties.
3.3 Removing and assembling covers

CAUTION

Risk of injury from moving parts!
Crushing possible.
Switch off the machine before removing or re-assembling covers.

For many types of setting work, you will have to remove the machine covers first in order to access the components. Each explanation of a setting step includes information on which cover to remove.

This chapter describes how to remove the individual covers. The covers need to be refitted in reverse order. Re-installation will, therefore, not be described unless special requirements have to be followed.

3.3.1 Access to the underside of the machine

Cover

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

Fig. 1: Access to the underside of the machine

Tilting the machine head

To tilt the machine head:

1. Tilt the machine head as far as it will go.
**Erecting the machine head**

1. Erect the machine head into the working position.

**3.3.2 Removing the arm cover**

If necessary, each of the two covers can be removed separately.

*Fig. 2: Removing the arm cover*

1. Turn left adjusting wheel (2) to position 0.
2. Turn right adjusting wheel (1) to position 8.

**Important**

The cover cannot be removed unless the adjusting wheels are set to the proper position.

3. Loosen the 5 screws on the left arm cover (3).
4. Lift the left arm cover (3) up and off.

**Removing the right arm cover**

To remove the right arm cover:

1. Loosen the 4 screws on the right arm cover (4).
2. Raise the right arm cover (4) and disconnect the power plug for the fan that is attached to the underside of the cover.
3. Lift the right arm cover (4) up and off.
3.3.3 Removing the head cover

Fig. 3: Removing the head cover

To remove the head cover:

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

3.3.4 Removing the ventilation grid

Fig. 4: Removing the ventilation grid

To remove the ventilation grid:

1. Loosen the screws (2).
2. Remove the ventilation grid (1).
3.3.5 Removing the belt cover

To remove the belt cover:

1. Loosen the screws (1).
2. Remove the handwheel (2).
3. Loosen the screws (4).
4. Remove the belt cover (3).
3.3.6 Removing the thread tension plate

Fig. 6: Removing the thread tension plate

To remove the thread tension plate:

1. Remove the right arm cover (3) (p. 15).

Important

The thread tension plate is connected to cables and hoses that are attached below the upper right cover.

2. Loosen the screws (2).
3. Remove the thread tension plate (1).
3.3.7 Removing the hook compartment cover

**Fig. 7: Removing the hook compartment cover**

To remove the hook compartment cover:

1. Slide one finger into the slot (2).
2. Pull the cover (1) up and off.
3. Use moderate force to pull the cover (3) up and off. The cover is secured by permanent magnets.
4. Loosen the screws (5).
5. Remove the plate (4).
3.3.8 Disassembling the throat plate

**CAUTION**

Risk of injury from sharp and moving parts!
Puncture or crushing possible.
Switch off the machine before you disassemble the throat plate.

![Fig. 8: Disassembling the throat plate](image)

To disassemble the throat plate:
1. Remove the hook compartment cover (p. 19).
2. Swivel up the sewing foot.
3. Loosen the screws (1).
4. Remove the throat plate (2).
3.3.9 Disassembling and assembling the feed dog

**CAUTION**

Risk of injury from sharp and moving parts!
Puncture or crushing possible.
Switch off the machine before disassembling the feed dog.

![Fig. 9: Disassembling and assembling the feed dog](image)

**Disassembling the feed dog**

To disassemble the feed dog:

1. Disassemble the throat plate (p. 20).
2. Loosen the screws (2).
3. Remove the feed dog (3) from the feed dog carrier (1).

**Assembling the feed dog**

To assemble the feed dog:

1. Insert the feed dog (3)
2. Slightly tighten the screws (2).
3. Assemble the throat plate.
4. Set the feed dog (3) so that it has an equal amount of play on both sides when inside the throat plate.
5. Tighten the screws (2).
3.4 Flats on shafts

Fig. 10: Flats on shafts

Some shafts (1) have flat surfaces (2) at the points where components are screwed on with adjusting screws. These flats increase the stability of the connection and allow the component to be assembled to the shaft at an angle.

Important
Always ensure that the screw faces are completely flush with the surface. If the component to be assembled has several screws all around, while the shaft only possesses one flat, the first screw should be located in the shaft's direction of rotation.

3.5 Axial play for shafts running in plain bearings

Fig. 11: Axial play for shafts running in plain bearings

Shafts (2) running in plain bearings (1) are axially adjusted when the lever (3) and the adjusting ring (4) touch the front face of the plain bearing (1).
Important
When adjusting components mounted on shafts running in plain bearings, always ensure that the axial play of these shafts is as small as possible, or 0.

3.6 Locking the machine in place
Some settings allow for the sewing machine to be locked in place at the setting position. To do this, the locking peg from the accessory pack is inserted into a slot on the arm shaft crank, blocking the arm shaft.

There are 2 locking positions:

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

![Fig. 12: Locking the machine in place](image)

Locking the machine in place
To lock the machine in place:

1. Turn the handwheel until the appropriate slot (1) is in front of the locking opening (3):
   - Smaller slot at handwheel position 180°
   - Larger slot at handwheel position 206°
2. Insert the locking peg (2) with the appropriate end into the slot (1).
Removing the lock

To remove the lock:

1. Pull the locking peg (2) out of the slot (1).

3.7 Setting the handwheel into position

Some settings require that the specified handwheel position be set using the angle scale.

*Fig. 13: Setting the handwheel into position*

To set the handwheel into position:

1. Turn the handwheel until the specified number on the scale (1) is next to the marking (2).
4 Positioning the arm shaft

**CAUTION**

Risk of injury from moving parts!
Crushing possible.
Switch off the machine before positioning the arm shaft.

**Proper setting**
The three threaded pins (1) are seated flush on the flat. The arm shaft crank is flush with the machine casting.

**Cover**
- left arm cover (p. 15).

*Fig. 14: Positioning the arm shaft*

![Image of positioning the arm shaft]

(1) - Threaded pins

To position the arm shaft:
1. Loosen the threaded pins (1) on the arm shaft crank.
2. Turn the arm shaft crank so that the threaded pins (1) are seated flush on the flat of the arm shaft.
3. Tighten the threaded pins (1).
5 Setting the handwheel scale

CAUTION

Risk of injury from moving parts!
Crushing possible.
Switch off the machine before you set the handwheel scale.

Proper setting
The machine is locked in place at position 2 by the locking peg (p. 23).
The handwheel is at the 180° position.

Cover
• Belt cover (p. 17)

Fig. 15: Setting the handwheel scale

To set the handwheel scale:
1. Disassemble the V-ribbed belt (p. 27).
2. Loosen the screws (1).
3. Assemble belt cover and handwheel.
4. Lock the machine in place at position 2 (p. 23).
5. Slide a hexagonal wrench through the slot (3) and tighten the adjusting screw.
6. Remove belt cover and handwheel (p. 17).
7. Tighten the screws (1).
8. Assemble the V-ribbed belt.
9. Assemble belt cover and handwheel.
6 Setting the drive

CAUTION
Risk of injury from moving parts!
Crushing possible.
Switch off the machine before setting the drive.

6.1 Setting the drive ratio (Classic)
The machine is equipped with a 2-step pulley, which can be used to adjust the drive ratio between the drive motor and the machine, and increase the penetration force of the needle.
In order to change the ratio, the drive belts must be disassembled and the pulley changed to the opposite position. The drive belt is then refitted and tensioned.

Cover
• Belt cover (p. 17).

6.1.1 Disassembling the V-ribbed belt

To disassemble the V-ribbed belt:
1. Loosen the screws (4).
2. Rotate the tensioning roller (2) and belt tensioner (3).
3. Remove the V-ribbed belt (1).
6.1.2 Setting the drive pulley

**Proper setting**

Regardless of which side of the drive pulley (2) is being used, there is a difference in height of **16 mm** between the faces of the two pulleys.

*Fig. 17: Setting the drive pulley*

To set the drive pulley:

1. Loosen the screws (3).
2. Pull the drive pulley (2) off the motor shaft and put it back on the other way round.
3. Set a height difference of **16 mm** between the faces of the drive pulley (2) and the driven pulley (1).
4. Tighten the screws (3).
6.1.3 Setting the belt tension

Proper setting

The belt must be tight enough not to deflect by more than approx. 2 mm if pressure is exerted at the checking point.

Fig. 18: Setting the belt tension

To set the belt tension:

1. Insert the V-ribbed belt (7).
2. Turn the tensioning roller (6) with the belt tensioner (3) against the V-ribbed belt (7).
3. Insert a hexagonal wrench into the hexagon slot (2).
4. Tension the V-ribbed belt (7).
5. Tighten the screws (4).
6. Check and, if necessary, correct the belt tension.
6.2 Setting the drive ratio (heavy transport)

The machine is equipped with a 1-step pulley.

Cover

- Belt cover (p. 17).

6.2.1 Disassembling the V-ribbed belt

*Fig. 19: Disassembling the V-ribbed belt*

To disassemble the V-ribbed belt:

1. Loosen the screws (4).
2. Rotate the tensioning roller (2) and belt tensioner (3).
3. Remove the V-ribbed belt (1).
6.2.2 Setting the drive pulley

Proper setting

The pulleys are in alignment.

Fig. 20: Setting the drive pulley

To set the drive pulley:

1. Loosen the screws (2).
2. Pull the drive pulley (3) off the motor shaft and put it back on the other way round.
3. The drive pulley (3) and the driven pulley (1) are in alignment.
4. Tighten the screws (2).
6.2.3 Setting the belt tension

Proper setting

The belt must be tight enough not to deflect by more than approx. **1.5 mm** if pressure is exerted at the checking point.

Fig. 21: Setting the belt tension

To set the belt tension:

1. Insert the V-ribbed belt (7).
2. Turn the tensioning roller (6) with the belt tensioner (3) against the V-ribbed belt (7).
3. Insert a hexagonal wrench into the hexagon slot (2).
4. Tension the V-ribbed belt (7).
5. Tighten the screws (5).
6. Check and, if necessary, correct the belt tension.
6.3 Setting the positioning of the machine

The machine will stop automatically at two angular positions on the main shaft (of the handwheel). To ensure that the machine stops properly at these positions, you need to set the reference position for the handwheel. In order to ensure that the reference position is set properly, the drive ratio between motor and main shaft must be entered correctly into the control program of the machine.

6.3.1 Importing the drive ratio into the control program

Fig. 22: Importing the drive ratio into the control program

To import the drive ratio into the control program:

1. Select parameter setting mode on the OP1000 control panel (1) and set the parameter $t_{08} 19$ (*Instructions for use DAC basic/classic*).
2. Manually rotate the handwheel (2) by at least 2 turns.
3. The display on the control panel will show a new value for the drive ratio.
4. Press the OK button to confirm this new parameter value.
6.3.2 Setting the reference position of the handwheel

Proper setting

The reference position is at 105° on the handwheel scale (2).

Fig. 23: Setting the reference position of the handwheel

To set the reference position of the handwheel:

1. Select parameter setting mode on the OP1000 control panel (1) and set the parameter \[ t0 \] (Instructions for use DAC basic/classic).
2. Manually rotate the handwheel (2) by at least one turn.
3. Set the value 105° on the handwheel (p. 24).
4. Press the OK button to confirm the set position.
5. Press the ESC button to exit parameter setting mode.
6. Switch off and on the machine again.
7 Setting the stitch length adjusting wheel

CAUTION
Risk of injury from moving parts!
Crushing possible.
Switch off the machine before you set the stitch length adjusting wheel.

NOTICE
Property damage may occur!
If you turn the shaft too far, parts on the stitch regulator gear may bend or get stuck.
Turn the shaft carefully and stop as soon as you feel a slight resistance.

Fig. 24: Setting the stitch length adjusting wheels

The 2 adjusting wheels on the machine column determine the stitch length.

- Upper adjusting wheel: large stitch length
- Lower adjusting wheel: small stitch length

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

It is not possible to set a larger stitch length on the upper adjusting wheel than on the lower adjusting wheel.
To switch over between the stitch lengths: Press the button for the stitch length on the machine arm (1).

- If the upper adjusting wheel is activated, then the button (1) lights up. Upon switching on the machine, the stitch length adjusting wheel activated most recently is always active.

**Order**
Set the upper stitch length adjusting wheel first before setting the lower stitch length adjusting wheel.

### 7.1 Setting the upper stitch length adjusting wheel

**Proper setting**
The upper stitch length adjusting wheel is set to the maximum stitch length that can be achieved with the built-in sewing equipment.

*Fig. 25: Setting the upper stitch length adjusting wheel*

To set the upper stitch length adjusting wheel:

1. Switch on the machine.
2. Unthread the needle thread.
3. Press the button on the machine arm.
   - The button lights up.
   - The machine switches over to the upper stitch length adjusting wheel.
4. Hold the upper stitch length adjusting wheel (1) in place using a wrench (6).
5. Loosen the screw (2).
6. Remove the upper stitch length adjusting wheel (1) from the shaft (4).
7. To set the stitch length, use a size 10 wrench to carefully turn the shaft (4).
   - to set a shorter stitch length: turn clockwise
   - to set a longer stitch length: turn counterclockwise

8. Perform a sewing test with a sheet of paper and readjust if necessary.

9. Turn the scale (5) so that the number indicating the stitch length is exactly next to the adjusting mark (3).

10. Place the upper stitch length adjusting wheel (1) onto the shaft (4) and tighten it with the wrench (6).

11. Tighten the screw (2).

7.2 Setting the lower stitch length adjusting wheel

Proper setting

Sew with 2 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.

Fig. 26: Setting the lower stitch length adjusting wheel

To set the lower stitch length adjusting wheel:

1. Switch on the machine.

2. Unthread the needle thread.

3. Press the button \[ \text{[ ]} \] on the machine arm.
   - The button turns off.
   - The machine switches over to the lower stitch length adjusting wheel.

4. Hold the lower stitch length adjusting wheel (2) in place using the wrench (6).

5. Loosen the screw (1).
6. Remove the lower stitch length adjusting wheel (2) from the shaft (4).

7. To set the stitch length, use a size 10 wrench to carefully turn the shaft (4).
   - to set a shorter stitch length: turn counterclockwise
   - to set a longer stitch length: turn clockwise

8. Perform a sewing test with a sheet of paper and readjust if necessary.

9. Turn the scale (5) so that the number indicating the stitch length is exactly next to the adjusting mark (3).

10. Place the lower stitch length adjusting wheel (2) onto the shaft (4) and tighten it with the wrench (6).

11. Tighten the screw (1).

7.3 Setting the stitch length limit

If not all of the stitch lengths are available during sewing operation, a limit can be placed on the maximum stitch length that can be set.

12, 9, or 6 mm can be selected as the maximum stitch length. The appropriate throat plate must be selected for the selected maximum stitch length. The throat plate cutout must be large enough to prevent the feed dog from hitting the edges of the throat plate at the front and rear dead center.

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 set maximum stitch length.

Fig. 27: Setting the stitch length limit

To set the stitch length limit:

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

7.4 Setting the eccentric for the forward and backward stitches

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

**Cover**
• Tilt the machine head (Fig. p. 14)

*Fig. 28: Setting the eccentric for the forward and backward stitches*

To set the eccentric for forward and backward stitches:
1. Loosen the threaded pin (3).
2. Turn the eccentric screw (1) from the right through the slot in the base plate:
   - **Initial position:**
     The slot in the eccentric screw (1) is parallel to the axle of the machine, and the recess (2) faces down.
   If the forward and backward stitches are not the same length:
   - **Turn clockwise:** the forward stitch becomes larger, the backward stitch smaller.
   - **Turn counterclockwise:** the forward stitch becomes smaller, the backward stitch larger.
3. Tighten the threaded pin (3).
8 Setting the feed dog

**CAUTION**
Risk of injury from moving parts!
Crushing possible.
Switch off the machine before setting the feed dog.

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

**Information**
The adjustment notes given below refer to both Classic machines and machines equipped with the option *Heavy Transport*.

**Order**
First, check the following setting:
• Needle bar linkage(図 p. 50)

**8.1 Setting the feed dog position**

**Proper setting**
When the stitch length is set to 0 and the needle is at the bottom dead center, the center of the feed dog opening lines up with the axis of the needle.

**Cover**
• Tilt the machine head (図 p. 14)
8.1.1 Moving the feed dog

Cover

- Remove the throat plate (p. 20)

Fig. 29: Moving the feed dog

To move the feed dog:

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 machine head (p. 14)

*Fig. 30: Moving the feed dog carrier*

To move the feed dog carrier:

1. Set the upper stitch length adjusting wheel to 0.
2. Loosen screw (6) and adjusting ring (8).
3. Loosen screws (2) and adjusting ring (1).
4. Move the feed dog carrier perpendicular to the sewing direction so that the feed dog is exactly in the center of the throat plate cutout.
5. Slide the adjusting ring (1) and clamp (4) toward each other as far as they will go.

**Important**

Make sure that the stroke shaft (3) is firmly held by the clamp (4) and the adjusting ring (1).

6. Tighten the threaded pin of the adjusting ring (1) as well as the screws (2).
7. Slide the adjusting ring (8) and clamp (7) toward each other as far as they will go.

**Important**

When doing this, make sure that the sliding shaft (5) is held firmly in place by the clamp (7) and the adjusting ring (8).

8. Tighten the threaded pin of the adjusting ring (8) as well as the screw (6).
8.1.3 Moving the feed dog in sewing direction

Fig. 31: Moving the feed dog in sewing direction

To move the feed dog in sewing direction:

1. Set the upper stitch length adjusting wheel to 0.
2. Loosen the screw (6).
3. Move the feed dog (9) such that it is in the center of the throat plate cutout, allowing the needle to pierce into the center of the needle hole.
4. Tighten the screw (6).
8.2 Setting the feed dog movement

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

**Order**

First, check the following setting:

- Feed dog position (p. 40)

8.2.1 Setting the feed movement

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

**Proper setting**

Set the handwheel to the 190° position and the upper stitch length adjusting wheel to the maximum stitch length.

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

**Cover**

- Right arm cover (p. 15)

*Fig. 32: Setting the feed movement*

To set the feed movement:

1. Set the upper stitch length adjusting wheel to the maximum stitch length.
2. Loosen the threaded pins (1).
3. Move the handwheel into the 190° position.
4. Press the stitch adjustment lever (3) down and observe how the feed dog and needle respond.

5. Turn the pusher eccentric (2) so that the feed dog and needle no longer move when the stitch adjustment lever (3) is pressed.

6. Tighten the threaded pins (1).

8.2.2 Setting the feed dog height at top dead center

The feed dog reaches the maximum stroke height at top dead center when the handwheel is positioned at **200°**.

**Proper setting**

Place the feed dog at the top dead center by turning the handwheel.

- The upper edge of the feed dog protrudes **1.3 mm** above the throat plate.

**Cover**

- Tilt the machine head (p. 14)

*Fig. 33: Setting the feed dog height at top dead center (1)*

To set the feed dog height at top dead center:

1. Position the feed dog at top dead center.
2. Loosen the threaded pins (2).
3. Push the feed dog carrier (1) up until the upper edge of the feed dog protrudes **1.3 mm** above the throat plate.
Fig. 34: Setting the feed dog height at top dead center (2)

To check the setting, you can place the cover (3) onto the feed dog as shown above.
At top dead center, the feed dog abuts on the cover (3).

4. Tighten the threaded pins (2).

8.2.3 Setting the feed dog stroke movement

Order
First, check the following setting:
• Set the feed dog height at top dead center (p. 45)

Proper setting
The upper edge of the feed dog must be at the same height when the feed dog is at front dead center (handwheel position 90°) as when it is at the rear dead center (handwheel position 270°).

At 90°, the feed dog is in the upward movement; at 270°, in the downward movement.

Cover
• Right arm cover (p. 15)
Fig. 35: Setting the feed dog stroke movement

To set the feed dog stroke movement:

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 at the same height as the upper edge of the throat plate during the upward movement.
4. Tighten the threaded pins (1).
5. Check if the feed dog is at the same height at 90° and 270°; adjust if necessary.
8.3 Setting the feeding eccentric with adjusting tube

**CAUTION**

Risk of injury from moving parts!
Crushing possible.
Switch off the machine before setting the feeding eccentric.

**Proper setting**

When the adjusting tube on one of the eccentrics (1), (5) or (6) is pushed all the way to the edge of the arm slot, the handwheel scale will show the following value:

- Stroke eccentric sewing feet (1): 23°
- Stroke eccentric feed dog (5): 5°
- Pusher eccentric feed dog (6): 65°

**Cover**

- Left and right arm cover (p. 15)

*Fig. 36: Setting the feeding eccentric with adjusting tube*
Setting the stroke eccentric of the sewing feet

To set the stroke eccentric of the sewing feet (1):

1. Loosen the threaded pins on the stroke eccentric (1).
2. Insert the adjusting tube (3) into the first hole in the direction of rotation (4).
3. Press the adjusting tube (3) against the front edge of the machine arm.
4. Set the handwheel to 23°.
5. Tighten the threaded pins on the stroke eccentric (1).

Setting the pusher eccentric of the feed dog

To set the pusher eccentric of the feed dog (6):

1. Loosen the threaded pins on the pusher eccentric (6).
2. Insert the adjusting tube (3) into the first hole in the direction of rotation (4).
3. Press the adjusting tube (3) against the front edge of the machine arm.
4. Set the handwheel to 65°.
5. Tighten the threaded pins on the pusher eccentric (6).

Setting the stroke eccentric of the feed dog

To set the stroke eccentric of the feed dog (5):

1. Loosen the threaded pins on the stroke eccentric (5).
2. Insert the adjusting tube (3) into the first hole in the direction of rotation (4).
3. Press the adjusting tube (3) against the front edge of the machine arm.
4. Set the handwheel to 5°.
5. Tighten the threaded pins on the stroke eccentric (5).
9 Aligning the needle bar linkage

CAUTION

Risk of injury from moving parts!
Crushing possible.
Switch off the machine before aligning the needle bar linkage.

The axial movement of pins and shafts running in plain bearings must be properly restricted before adjustment begins (p. 22).

9.1 Moving the needle bar linkage sideways

Proper setting

When the stitch length is set to 0 and the value set on the handwheel scale is 90°, needle bar, the sewing foot bar and the presser foot bar are in a line.

Cover

• Left and right arm cover (p. 15)
• Head cover (p. 16)
To move the needle bar linkage sideways:

1. Set the stitch length to 0.
2. Move the handwheel into the 90° position.
3. Loosen the screw (1).
4. Loosen the screws (2).
5. Loosen the screws (3).
6. Loosen the screw (8).
7. Move the needle bar linkage (7) sideways so that needle bar (4), feeding foot bar (5) and presser foot bar (6) are all in a line.
8. Tighten screws (1), (2), (3), and (8).
9.2 Aligning the needle bar linkage in the sewing direction

Proper setting
When the stitch length is set to 0 and the value set on the handwheel scale is 90°, the needle bar is parallel to the presser foot bar.

Cover
- Left and right arm cover (p. 15)

Fig. 38: Aligning the needle bar linkage in the sewing direction

To align the needle bar linkage in the sewing direction:
1. Loosen the screw for the top feed lever (1).
2. Turn the needle bar (2) until it is parallel to the presser foot bar (3).
3. Set the distance between the bars to $L = 44\,\text{mm}$.
4. Tighten the screw (1).
5. Check the axial play (p. 22).
10 Position of the hook and needle

CAUTION

Risk of injury from sharp and moving parts!
Puncture and crushing possible.
Switch off the machine before you check and set the position of the hook and needle.

10.1 Tensioning the hook drive toothed belt

A special measurement tool is required to achieve the proper setting. Follow the information below when setting the belt tension:

• if the tension is too high, the service life of the toothed belt and ball bearings is reduced
• if the tension is too low, the toothed belt may slip off the pulleys

Proper setting
When you press on the toothed belt with a force of 10 N in the direction of the arrow, the belt should deflect about 3 mm.

Cover
• Belt cover (p. 17)
• Tilt the machine head (p. 14)

Fig. 39: Tensioning the hook drive toothed belt

To tension the hook drive toothed belt:
1. Loosen the screw (3).
2. Turn the eccentric pin (1) with the tensioning pulley and tension the toothed belt (2).
3. Tighten the screw (3).
Important
Note that a low tightening torque when turning the eccentric pin (1) can lead to a high tension of the toothed belt (2).

4. Check and, if necessary, adjust the toothed belt tension.

10.2 Setting the dead center of the reciprocating hook movement

Proper setting

Fig. 40: Setting the dead center of the reciprocating hook movement (1)

Cover

• Belt cover (p. 17)
• Tilt the machine head (p. 14)
To set the dead center of the reciprocating hook movement:

1. Use the handwheel to turn the pull rod (3) to the lower dead center.
2. Loosen screws (1) and (2).
3. Set the driver sideways.
   • The driver nose (5) points exactly to the marking (4).
4. Tighten screws (1) and (2).
5. Turn the pull rod to the lower dead center and check if the driver nose (5) points exactly to the marking (4).
6. Readjust if necessary.
10.3 Setting the loop stroke position

Proper setting

When the stitch length is set to 0 and the machine is locked in place at position 1, the hook tip is at the center in relation to the needle axis.

Cover

• Right arm cover (p. 15)

Fig. 43: Setting the loop stroke position (1)

To set the loop stroke position:

1. Set the stitch length to 0.
2. Loosen the screws (1).
3. Lock the machine in place at position 1.
4. Loosen the screw (2).
Fig. 44: Setting the loop stroke position (2)

5. Turn the tip of the hook (3) so that it is central to the axis of the needle.
   - The hook tip is situated in the lower third of the needle groove (4).
6. Tighten the screws (2).
7. Remove the lock.
8. Tighten the screws (1).

10.4 Setting the hook clearance

Proper setting
- Lock the machine in place at position 1.
  - The maximum distance between hook tip and groove is 0.1 mm.
    - The hook tip must not touch the needle when moving past the needle.

Cover
- Disassemble the throat plate (p. 20)
- Remove the feed dog (p. 21)
- Remove the hook compartment cover (p. 19)
- Tilt the machine head (p. 14)
To set the hook clearance:

1. Lock the machine in place at position 1.
2. Loosen the screws in the slots (5).
3. Move the hook cage (3) such that the maximum distance of the hook tip (2) from the needle is 0.1 mm.
4. Tighten the screws in the slots (5).
5. Loosen the screw (6).
6. Move the drive shaft (4) sideways so that it lightly touches the needle (1).
7. Tighten the screw (6).
8. Check the distance between needle (1) and hook tip (2).
   If the distance is too great, driver and hook cage must be readjusted.
   If needle and hook make contact, the driver must be readjusted.
10.5 Setting the loop former

**NOTICE**

**Property damage may occur!**

Damage to the hook if the loop former is set incorrectly.

After fitting the hook, check that the needle has sufficient clearance to pass between the hook drive dog and the loop former. Insert the appropriate distance piece.

The loop former guides the thread loop in the needle toward the tip of the hook, thus increasing the chance of the thread catching. The lateral position of the loop former must be adjusted to suit the thickness of the needle using the distance piece.

**Information**

The needle thickness has been engraved on the distance piece. There is a matching distance piece for every needle thickness, which must be inserted accordingly.

**Cover**

- Tilt the machine head (p. 14)

*Fig. 46: Setting the loop former*

1. Loosen the screws (1).
2. Take out the loop former (2) and distance piece (3).

To set the loop former:

1. Loosen the screws (1).
2. Take out the loop former (2) and distance piece (3).
3. Select the appropriate distance piece for the needle thickness used. Distance pieces are contained in the accessory pack for the machine.

4. Insert distance piece (3) and loop former (2).

5. Tighten the screws (1).

### 10.6 Setting the needle bar height

**Order**

First, check the following settings:

- Loop stroke position (p. 56)
- A straight and undamaged needle has to be inserted (Operating Instructions)

**Proper setting**

The machine is locked in place at position 1, and the upper stitch length adjusting wheel is set to 0.

- The hook tip is level with the lower third of the groove on the needle.

**Disturbance**

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

**Cover**

- Remove the head cover (p. 16)

*Fig. 47: Setting the needle bar height*

To set the needle bar height:

1. Lock the machine in place at position 1.
2. Set the upper stitch length adjusting wheel to 0.
3. Loosen the screw (1).
4. Move the height of the needle bar (2) such that the hook tip (3) is in the middle of the lower third of the groove (4) for the needle.

**Important**

Do not twist the needle to the side.
The groove (4) must face toward the hook.

5. Tighten the screw (1).
6. Remove the lock.
7. Check the height of the needle bar at maximum stitch length when sewing forward and in reverse; adjust it again if necessary.
11 Setting the sewing feet

CAUTION
Risk of injury from sharp and moving parts!
Puncture or crushing possible.
Switch off the machine before you set the sewing feet.

11.1 Setting the sewing foot feed

11.1.1 Setting the zero stroke of the sewing feet and the tension force of the torsion spring

Proper setting
The connecting rods are in a line.

☐ The ball pin is touching the stop screw.
The torsion spring is twisted 15° - 20°.

Cover
• left and right arm cover (p. 15)
To set the zero stroke of the sewing feet and the tension force of the torsion spring:

1. Loosen the screw in the slot (5).
2. Loosen the counternut (8).
3. Rotate the frame (2) so that the connecting rods (1) are in a line.
4. Turn the stop screw (9) so that the ball pin (7) is in contact with it and the connecting rods (1) remain in a line.
5. Tighten the counternut (8).
6. Turn the torsion spring (3) with the pin (4) 15° - 20° in the direction of the arrow.
7. Tighten the screw in the slot (5).
11.1.2 Setting the drive dog of the presser foot bar

Proper setting

The stitch length is set to 0, and sewing foot and presser foot are at the same height.

- The drive dog is assembled to the presser foot bar in such a position that the needle shaft touches the presser foot bar.

Cover

- Left and right arm cover (p. 15)
- Head cover (p. 16)

Fig. 49: Setting the drive dog of the presser foot bar

1. Screw
2. Pin
3. Screws
4. Shaft
5. Gully
6. Assembly
7. Plate
8. Presser foot
9. Feeding foot
10. Presser foot bar
11. Slot
12. Sliding block
13. Lever
14. Drive dog screw
15. Drive dog
To set the drive dog of the presser foot bar:

1. Move the handwheel into the 0° position.
2. Set the stitch length to 0.
3. Loosen the screws (3).
4. Loosen the screw (1).
5. Remove the assembly (6) from the shaft (4) and the pin (2).
6. Loosen the drive dog screw (14).
7. Take out the plate (7) and insert it under the sewing feet with the smooth surface facing up.
8. Insert the needle shaft into the slot (11).
9. Turn the lever (13) so that the needle shaft touches the presser foot bar (10) and that presser foot (8) and feeding foot (9) press onto the plate (7).
10. Tighten the drive dog screw (14).
11. Assemble the assembly (6).

 Ensure there is an axial play of 0.2 - 0.3 mm between the sliding block (12) and the floor of the gully (5).

11.1.3 Setting the feed stroke of presser foot and sewing foot

This setting is used to ensure that, at the start of feeding, the presser foot is lifted above the sewing material and the material feeding movement is not obstructed by the sewing foot.

Proper setting

The stitch length is set to 0, and the stroke of presser foot and sewing foot is set to 0.

The lever is attached to the lift bar of the feet in such a way that the presser foot is positioned 0.3 mm higher than the sewing foot.

Cover

- Left and right arm cover (p. 15)
- Head cover (p. 16)
Fig. 50: Setting the feed stroke of presser foot and sewing foot

To set the feed stroke of presser foot and feeding foot:

1. Move the handwheel into the 0° position.
2. Set the stitch length to 0.
3. Set the zero stroke of the feet (p. 62).
4. Loosen the screw (5).
5. Take the plate (3) out of its working position (2).
6. Turn the plate (3) over and place it under feet so that the feeding foot (4) is 0.3 mm lower than the presser foot (1).
7. Manually move both feet down as far as they will go.
8. Tighten the screw (5).
11.1.4 Setting the stroke movement for the feeding foot

In order to ensure a correct feed, the stroke movement for the feeding foot must be aligned to the stroke movement for the feed dog.

**Proper setting**

The left adjusting wheel for the sewing foot stroke is set to maximum stroke.

The upper stitch length adjusting wheel is set to 0.

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

**Cover**

- Left and right arm cover (p. 15)

*Fig. 51: Setting the stroke movement for the feeding foot*

To set the stroke movement for the feeding foot:

1. Screw in the threaded pin (7) so that there is a stroke.
2. Set the upper stitch length adjusting wheel to 0.
3. Loosen the threaded pins (4).
4. Turn the stroke eccentric (5) so that the feeding foot (1) touches down on the feed dog (2) when the handwheel is in the 95° position and the tip of the needle (3) is at the height of the upper edge of the feeding foot (1).

**Important**

Ensure not to move the stroke eccentric (5) laterally on the axle.

5. Tighten the threaded pins (4).
6. Loosen the threaded pin (7) far enough so that the clips (6) are in a line again.

### 11.2 Setting the foot stroke

#### 11.2.1 Setting the foot stroke using the hand lever

The hand lever allows the feet to be raised to the heights of **14 mm** and **20 mm**.

**Proper setting**

The presser foot rests on the throat plate. The hand lever is in the inactive position.

There is a guaranteed clearance of **0.3 - 0.5 mm** between the stroke lever and the drive dog.

**Cover**

- Head cover (p. 16)

*Fig. 52: Setting the foot stroke using the hand lever*

To set the foot stroke using the hand lever:

1. Move the handwheel into the **0°** position. The presser foot rests on the throat plate.
2. Loosen the screw (2) and leave the hexagonal wrench (3) inserted.
3. Turn the stroke lever (4) so that there is a clearance of **0.3 - 0.5 mm** between the stroke lever (4) and the drive dog (5).
4. Tighten the screw (2).
11.2.2 Setting the foot stroke using the pneumatic cylinder

Proper setting
When set by pneumatic cylinder, the presser foot stroke is **30 mm**.

*Fig. 53: Setting the foot stroke using the pneumatic cylinder*

To set the foot stroke using the pneumatic cylinder:

1. Move the handwheel into the **0°** position.
   - The presser foot rests on the throat plate.
2. Loosen the counternut (2).
3. Activate the pneumatic foot lift (Opening Instructions).
   - The presser foot is lifted.
4. Turn the screw (1) until the presser foot (3) is positioned **30 mm** above the throat plate.
5. Tighten the counternut (2).
12 Setting the thread system

CAUTION
Risk of injury from moving parts!
Crushing possible.
Switch off the machine before you set the thread system.

12.1 Setting the thread tension spring
The thread tension spring tensions the needle thread before the needle penetrates the material, so that the needle thread cannot slip under the needle and be pierced by it.

Important
If the thickness of the material is very thin or very thick, the setting of the spring travel must be adjusted accordingly.

• thin material: normal spring travel (initial position: horizontal)
• thick material: long spring travel (initial position: vertically downward)

Standard setting
The initial position of the thread tension spring is horizontal. When at its initial position, the spring is turned by 90°.

Fig. 54: Setting the thread tension spring

(1) - Screw  (2) - Thread tension spring  (3) - Body  (4) - Sleeve
To set the thread tension spring:

1. Loosen the screw (1).
2. Turn the body (3).
3. Turn the sleeve (4) counterclockwise.
4. Hold the sleeve (4) and body (3) in place, and tighten the screw (1).

12.2 Setting the winder

The winder is driven by its own electric motor. After it has wound the bobbin, it switches off automatically.

Proper setting

The adjusting screw is tightened in such a way both winder levers are approximately parallel to one another. The winder is switched off mechanically when the winder pulley reaches a distance of \( L = 8 \text{ mm} \) from the internal diameter of the bobbin. The roller is approx. 1 mm below the outer diameter of the bobbin. When the winder is switched off and locked in place at its initial position, the winder wheel is at a distance of \( L = 14 \text{ mm} \) from the internal diameter of the bobbin.

Cover

• Thread tension plate (\( \text{p. 18} \))

Fig. 55: Setting the winder (1)

To set the winder:

1. Loosen the counternut (3).
2. Tighten the adjusting screw (2) so that the arms of the winder levers (1) are approximately parallel.
3. Set the winder pulley (4) to a distance of \( L = 8 \text{ mm} \) from the internal diameter of the bobbin (5).

4. Loosen the screw (7).

Fig. 56: Setting the winder (2)

5. Swing the switch-off lever (8) into the switch-off position.
   - The edge of the spring (9) rests against the edge of the switch-off lever (8).

6. Tighten the screw (7).

7. Check that the winder switches off when the winder pulley (4) reaches \( 8 \text{ mm} \) from the internal diameter of the bobbin (5).
   - Correct the setting if necessary.

8. Turn the winder lever (1) to the 0 position.
   - The winder is switched off.

9. Loosen the screw (6).

10. Set the blocking lever (11) to the base of the slot in the blocking cam (10).

11. Set the axial play of the blocking cam (10) to approx. 0.5 mm.

12. Keep the blocking cam in the set position.

13. Set the winder pulley (4) to a distance of \( L = 14 \text{ mm} \) from the internal diameter of the bobbin.

14. Tighten the screw (10).

**Proper setting**

- If the winder is switched off, the distance between the friction disk and the rubber pulley is 0.5 mm.
- The drive motor is not switched off by the microswitch until the friction disk is out of contact with the rubber pulley.
- The winder is switched off when the thread has been wound up to 0.5 - 1 mm below the outer diameter of the bobbin.

**Cover**

- Thread tension plate (p. 18)
1. Turn the winder lever to position 0.
   ☛ The winder is switched off.

2. Loosen the screw (6).

3. Turn the eccentric (5) so that there is a gap of 0.5 mm between the friction disk (8) and the rubber pulley (9).

4. Tighten the screw (6).

5. Loosen the screws (12).

6. Set the position of the microswitch (11).

7. Tighten the screws (12).
8. Turn the blocking cam (10) in the direction of the arrow and switch on the winder so that the blocking lever (9) rests on the outer diameter of the blocking cam (10).

⚠️ The microswitch (11) must not switch off. A clicking within the microswitch (11) indicates when the microswitch (11) switches off.

9. Turn the winder shaft until the blocking lever (9) engages in the slot in the blocking cam (10).

⚠️ At this position, the microswitch (11) must switch the motor off. If the microswitch (11) fails to switch off the motor, correct the position of the microswitch (11).

10. Assemble the thread tension plate together with the winder.

11. Test the winder for correct operation.

   Check if the winder switches off when the thread has been wound up to 0.5 - 1 mm below the outer diameter of the bobbin (4).
   If the winder fails to do so, tighten the screw (2) further or loosen it and repeat the test.

12. Once the desired result has been obtained, tighten the counternut (3).
12.3 Setting the hook thread guide

Proper setting

The distance between the tensioner element and the machine arm is set so that the bobbin is wound equally on both ends.
If, due to the position of the tensioner element, the bobbin cannot be wound equally, the inclination of the hook thread guide must be changed.

Cover

- Right arm cover (p. 15)

Fig. 59: Setting the hook thread guide

To set the hook thread guide:

1. Insert and wind on the hook thread.

If the hook thread is concentrated at one end of the bobbin:

2. Loosen the screw (5).
3. Align the tensioner element (4) so that it is central to the hook thread guide (3).
4. Tighten the screw (5).
5. If the hook thread is still concentrated at one end of the bobbin, adjust the inclination of the hook thread guide (3) using the threaded pins (1).
13 Set thread cutter

CAUTION
Risk of injury from sharp and moving parts!
Puncture or crushing possible.
Switch off the machine before setting the thread cutter.

13.1 Setting the thread cutter timing

Proper setting
The left edge of the lever must be at a distance of 81.5 mm from the right edge of the arm.
The control cam is located at a distance of 1 mm from the lever.
When the pulley is engaged in the setting groove of the control cam, the handwheel scale indicates 120°.

Cover
• Right arm cover (p. 15)

Fig. 60: Setting the thread cutter timing

To set the thread cutter timing:
1. Loosen the screw (1).
2. Adjust the lever (2) to a distance of 81.5 mm from the right edge of the arm.
3. Tighten the screw (1).
4. Loosen the screws (4).
5. Set the handwheel position to 120°.
6. Adjust the control cam (3) to a distance of 1 mm from the lever (2).
7. Press the lever (2) down manually.
8. Turn the control cam (3) manually until the roller (6) latches into place exactly in the setting groove (7).
9. Tighten the screws (4).

13.2 Setting the basic setting of the thread cutter

**Proper setting**
When the stop lever is touching the base plate of the machine
- the distance between control cam and roller is 0.1 × 0.2 mm
- the distance between the piston of the pneumatic cylinder and the base of the cylinder is 0.5 - 1 mm

**Cover**
- Right arm cover (\* p. 15)
- Tilt the machine head (\* p. 14)

**Fig. 61: Setting the basic setting of the thread cutter (1)**

To set the basic setting of the thread cutter:
1. Loosen the screws (5).
2. Move the handwheel into the 80° position.
3. Lightly tighten the screws (3) such that the stop lever (2) can be turned on the lower shaft (8) with a slight frictional torque.
4. Insert a 0.1 mm feeler gage between the control cam (11) and roller (13).
5. Press the upper lever (10) down while turning the stop lever (2) until it contacts the base plate (1).
6. Tighten both screws of the stop lever (2).
7. Check and, if necessary, adjust the distance between the roller (13) and control cam (11).
   The roller (13) must not touch the control cam (11) during the rotation of the handwheel.
8. Turn the piston (4) of the pneumatic cylinder until nearly reaching the stop of the cylinder base.
   The distance between the piston (4) and the stop of the cylinder base is supposed to be **0.5 mm**.
9. Tighten the screws (5).
13.3 Setting the position of the thread-pulling knife

**Proper setting**

If the stop lever is in the park position, the marking on the thread-pulling knife lines up with the blade of the fixed knife.

**Cover**

- Throat plate (p. 20)
- Feed dog (p. 21)
- Tilt the machine head (p. 14)

*Fig. 63: Setting the position of the movable blade (1)*

1. Move the handwheel into the 80° position.
2. Swing out the thread-pulling knife.
3. Loosen the screw (2).
4. Insert a feeler gage (1.5 mm) into the gap between lever (1) and hook housing.
5. Push the lever (1) to the end position.
   - The tips of the thread-pulling knife protrude approx. 1 mm beyond the blade of the fixed knife (4).
6. Tighten the screw (2).
7. Carry out a cutting test manually: The thread-pulling knife (6) must catch the needle thread (8), preventing it from being cut.

**Important**

The needle thread (8) must be positioned in the slot (7) of the thread-pulling knife (6).

8. If necessary, adjust the position of the thread-pulling knife (6) to the left or the right until the needle thread (8) is positioned in the slot (7) of the thread-pulling knife (6).

9. Perform a sewing test with a sheet of paper at normal speed and readjust if necessary.
13.4 Setting the lateral position of the fixed knife

Proper setting
The fixed knife must be in a line with the movable blade on both sides.

Cover
- Throat plate (p. 20)
- Feed dog (p. 21)
- Tilt the machine head (p. 14)

Fig. 65: Setting the lateral position of the fixed knife

To set the lateral position of the fixed knife:
1. Loosen the screws (3).
2. Move the bracket (4) sideways so that the fixed knife (1) is parallel to the thread-pulling knife (2).
3. Tighten the screws (3).
13.5 Setting the cutting pressure

Proper setting
The cutting pressure is as low as possible, but allows for the thread to be cut in a reliable manner.

Disturbance
• Very rapid wear of the knife if the pressure is set too high

Cover
• Tilt the machine head (p. 14)

Fig. 66: Setting the cutting pressure

To set the cutting pressure:
1. Move the handwheel into the 270° position.
2. Swing out the thread-pulling knife (1).
3. Adjust the cutting pressure using the adjusting screw (2).
4. Insert thread into the thread-pulling knife (1).
5. Retract the thread-pulling knife (1) manually and check the cutting result.
   Repeat the setting if necessary.
13.6 Setting the hook thread clamp

Proper setting

When the pressure of the hook thread clamp is at the proper setting, the end of the hook thread at the seam beginning is 40 - 50 mm.

Cover

• Tilt the machine head (p. 14)

Fig. 67: Setting the hook thread clamp

To set the hook thread clamp:

1. Complete a few short seams including thread cutting at the seam end.
2. Measure the length of the hook thread end (1) at the start of the seams.

Hook thread end (1) shorter than 40 mm: Increase the pressure at the hook thread clamp (4).

1. Loosen the screw (2).
2. Turn the eccentric (3) counterclockwise.
3. Tighten the screw (2).

Hook thread end longer than 50 mm: Reduce the pressure at the hook thread clamp (4).

1. Loosen the screw (2).
2. Turn the eccentric (3) clockwise.
3. Tighten the screw (2).
14 Soft start

The soft start system allows the machine to start at low speed and build up to maximum speed over a defined number of stitches.

Fig. 68: Soft start

To activate soft start:

1. Activate the soft start setting on the OP1000 control panel (1) ([Instructions for use DAC basic/classic](#)).
15 Programming

All software settings are performed using the OP1000 control panel. The control panel is composed of a display and buttons. Using the control panel you can:

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

Information

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

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

Fig. 69: Programming

1. Power LED
2. Thread button group
3. Function button
4. Programming button group
5. Seam program button group
6. LED for 2nd stitch length
7. Display
## Programming

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<tr>
<th>Button</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thread button group</strong></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Start bartack" /></td>
<td>• Sets the start bartack</td>
</tr>
<tr>
<td><img src="image" alt="Multiple start bartack" /></td>
<td>• Sets the multiple start bartack</td>
</tr>
<tr>
<td><img src="image" alt="End bartack" /></td>
<td>• Sets the end bartack</td>
</tr>
<tr>
<td><img src="image" alt="Multiple end bartack" /></td>
<td>• Sets the multiple end bartack</td>
</tr>
<tr>
<td><img src="image" alt="Thread trimmer" /></td>
<td>• Activates or deactivates the thread cutter</td>
</tr>
<tr>
<td><img src="image" alt="Thread clamp" /></td>
<td>• Activates or deactivates the thread clamp</td>
</tr>
<tr>
<td><img src="image" alt="Needle position after sewing stop" /></td>
<td>• Sets the needle position after sewing stops Needle up/down</td>
</tr>
<tr>
<td><img src="image" alt="Sewing foot lift after thread cutter" /></td>
<td>• Activates or deactivates the sewing foot lift after the thread cutter</td>
</tr>
<tr>
<td><img src="image" alt="Sewing foot lift after sewing stop" /></td>
<td>• Activates or deactivates the sewing foot lift after sewing stops</td>
</tr>
<tr>
<td><img src="image" alt="Soft start" /></td>
<td>• Activates or deactivates the soft start</td>
</tr>
<tr>
<td><img src="image" alt="Speed" /></td>
<td>• Reduces the motor speed</td>
</tr>
<tr>
<td><strong>Function button</strong></td>
<td>• Activates or deactivates any stored function</td>
</tr>
<tr>
<td>Button</td>
<td>Function</td>
</tr>
<tr>
<td>--------</td>
<td>----------</td>
</tr>
<tr>
<td><strong>Programming button group</strong></td>
<td></td>
</tr>
<tr>
<td>ESC</td>
<td>• Ends parameter mode</td>
</tr>
</tbody>
</table>
| A+ | • Increases parameter  
    • Changes user level  
    • Selects subprogram |
| B+ | • Increases parameter  
    • Changes to next higher category  
    • Selects subprogram |
| C+ | • Increases parameter  
    • Selects subprogram |
| D+ | • Increases parameter  
    • Selects subprogram |
| OK | • Calls parameters or saves them  
    • Confirms parameters |
| P | • Starts or ends the parameter mode |
| A- | • Decreases parameter  
    • Changes user level  
    • Selects subprogram |
| B- | • Decreases parameter  
    • Changes to next lower category  
    • Selects subprogram |
<table>
<thead>
<tr>
<th>Button</th>
<th>Function</th>
</tr>
</thead>
</table>
| C-     | • Decreases parameter  
|        | • Selects subprogram   |
| D-     | • Decreases parameter  
|        | • Selects subprogram   |
| Reset  | • Resets the (piece) counter |

Seam program button group

<table>
<thead>
<tr>
<th>Seam program</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>• Activates seam program I</td>
</tr>
<tr>
<td>II</td>
<td>• Activates seam program II</td>
</tr>
<tr>
<td>III</td>
<td>• Sets seam program III</td>
</tr>
</tbody>
</table>
Creating a seam program

For some work processes - such as sewing on labels - you will find it useful to create seam programs that let you save a sewing process for repeated use.

It is possible to create seam programs consisting of 4 or 6 seam sections and up to 25 freely programmable seam sections.

The following parameters can be set for each individual seam section:

- Soft start
- Thread clamp
- Locking mechanism
- Sewing backwards
- Thread trimmer
- Automatic sewing foot lift
- Needle position
- Speed reduction
- Number of stitches
- Stitch length (upper and lower adjusting wheel)
16 Maintenance

**WARNING**

Risk of injury from sharp parts!
Punctures and cutting possible.
Prior to any maintenance work, switch off the machine or set the machine to threading mode.

**WARNING**

Risk of injury from moving parts!
Crushing possible.
Prior to any maintenance work, switch off the machine or set the machine to threading mode.

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

**Maintenance intervals**

<table>
<thead>
<tr>
<th>Work to be carried out</th>
<th>Operating hours</th>
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<td>8</td>
</tr>
<tr>
<td>Removing lint and thread remnants</td>
<td>●</td>
</tr>
<tr>
<td>Check the oil level</td>
<td>●</td>
</tr>
<tr>
<td>Servicing the pneumatic system</td>
<td>●</td>
</tr>
<tr>
<td>Lubricating the needle bar</td>
<td></td>
</tr>
</tbody>
</table>
16.1 Cleaning

**WARNING**

Risk of injury from flying particles!
Flying particles can enter the eyes, causing injury.

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

**NOTICE**

Property damage from soiling!
Lint and thread remnants can impair the operation of the machine.

- Clean the machine as described.

**NOTICE**

Property damage from solvent-based cleaners!
Solvent-based cleaners will damage paintwork.

- Use only solvent-free substances for cleaning.
Points that need to be cleaned particularly thoroughly:
- Thread-pulling knife (3)
- Area between throat plate and feed dog (2)
- Hook (4)
- Thread cutter (1)
- Area around the needle (5)

To clean the machine:
1. Switch off the machine.
2. Disassemble the throat plate (p. 20).
3. Remove any lint and thread remnants using a brush or compressed air gun.
16.2 Lubricating

**CAUTION**

Risk of injury from contact with oil!
Oil can cause a rash if it comes into contact with skin.
Avoid skin contact with oil.
If oil has come into contact with your skin, wash the affected areas thoroughly.

**NOTICE**

Property damage from incorrect oil!
Incorrect oil types can result in damage to the machine.
Only use oil that complies with the data in the instructions.

**CAUTION**

Risk of environmental damage from oil!
Oil is a pollutant and must not enter the sewage system or the soil.
Carefully collect up used oil.
Dispose of used oil and oily machine parts in accordance with national regulations.

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

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

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

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

<table>
<thead>
<tr>
<th>Container</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>250 ml</td>
<td>9047 000011</td>
</tr>
<tr>
<td>1 l</td>
<td>9047 000012</td>
</tr>
<tr>
<td>2 l</td>
<td>9047 000013</td>
</tr>
<tr>
<td>5 l</td>
<td>9047 000014</td>
</tr>
</tbody>
</table>
Check the oil level

Fig. 71: Check the oil level

![Diagram of an oil level indicator with labels]

Proper setting

The oil level must not rise above the maximum level marking (2) or drop below the minimum level marking (3).

Information

In the *Classic* equipment version of the machine, the oil level indicator will light up red if the oil level has dropped below the minimum level marking.

To top off the oil:

1. Switch off the machine.
2. Fill oil through the oil filler opening (1) no higher than the maximum level marking (2).
3. Switch on the machine again.
16.3 Servicing the pneumatic system

16.3.1 Setting the operating pressure

**NOTICE**

**Property damage from incorrect setting!**
Incorrect operating pressure can result in damage to the machine.
Ensure that the machine is only used when the operating pressure is set correctly.

---

Proper setting

Refer to the Technical data (p. 115) chapter for the permissible operating pressure. The operating pressure cannot deviate by more than ± 0.5 bar.

Check the operating pressure on a daily basis.

*Fig. 72: Setting the operating pressure*

To set the operating pressure:

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

**NOTICE**

Property damage from excess water!
Excess water can cause damage to the machine.
Drain water as required.

Water condensation accumulates in the water separator (2) of the pressure controller.

**Proper setting**
Water condensation must not rise up to the level of the filter element (1).
Check the water level in the water separator (2) on a daily basis.

*Fig. 73: Draining the water condensation*

To drain water condensation:

1. Disconnect the machine from the compressed air supply.
2. Place the collection tray under the drain screw (3).
3. Loosen the drain screw (3) completely.
4. Allow water to drain into the collection tray.
5. Tighten the drain screw (3).
6. Connect the machine to the compressed air supply.
16.3.3 Cleaning the filter element

**NOTICE**

Damage to the paintwork from solvent-based cleaners!
Solvent-based cleaners damage the filter.
Use only solvent-free substances for washing out the filter tray.

---

**Fig. 74: Cleaning the filter element**

1. Disconnect the machine from the compressed air supply.
2. Drain the water condensation (p. 97).
3. Loosen the water separator (2).
4. Loosen the filter element (1).
5. Blow out the filter element (1) using the compressed air gun.
6. Wash out the filter tray using benzine.
7. Tighten the filter element (1).
8. Tighten the water separator (2).
9. Tighten the drain screw (3).
10. Connect the machine to the compressed air supply.
16.4 Lubricating the needle bar

**Fig. 75: Lubricating the needle bar**

To lubricate the needle bar:

1. Remove the head cover (p. 16).
2. Place the grease gun onto the lubricating nipple (3) on the needle bar frame (2) and keep pressing until the flow of grease stops.
   - The lubricating nipple (3) is used to lubricate the needle bar and the feeding bar of the presser foot.
3. Place the grease gun onto the lubricating nipple (1) on the needle bar frame and keep pressing until the flow of grease stops.
   - The lubricating nipple (1) is used to lubricate the upper part of the needle bar.
4. Assemble the head cover.
5. Press the buttons **P** and **Reset** on the control panel at the same time.
6. Use the buttons + and - to set the parameter **t 51 14**.
7. Set parameter **t 51 14** to the value 1 and press **OK** to confirm.
8. Switch off the machine.
9. Switch on the machine again.
   - The machine is ready for sewing, and the counter has been reset.
16.5 Securing the shafts of the stitch length adjusting wheels

Information

If the stitch length shifts by itself after frequent bartacking, the shafts of the stitch length adjusting wheels need to be secured.

Fig. 76: Securing the shafts of the stitch length adjusting wheels (1)

To secure the shafts of the stitch length adjusting wheels:

1. Remove the ventilation grid (p. 16).
2. Loosen the screw (4).
3. Slide the clamping ring (2) to the right.
4. Slide the stitch adjustment lever (5) to the right.
5. To secure the upper stitch length adjusting wheel:
   - Slide the lever (7) to the left
   - Loosen the screws (6)
   - Remove the upper stitch length adjusting wheel (1)
   - Tighten the screw (10)
     Only tighten the screw (10) far enough to secure the shaft, making sure that the shaft cannot move easily, but the stitch length can still be set.
  
  The shaft of the upper stitch length adjusting wheel has been secured.
   - Place the upper stitch length adjusting wheel (1)
   - Tighten the screws (6)
6. To secure the **lower stitch length adjusting wheel**:
   - Slide the lever (7) to the right
   - Loosen the screws (8)
   - Remove the lower stitch length adjusting wheel (3)
   - Tighten the screw (9)
     Only tighten the screw (10) far enough to secure the shaft, making sure that the shaft cannot move easily, but the stitch length can still be set.

   The shaft of the lower stitch length adjusting wheel has been secured.
   - Place the lower stitch length adjusting wheel (3)
   - Tighten the screws (8)

7. Align the lever (7) such that it is seated in the center on top of the bolt (11).

8. Slide the stitch adjustment lever (5) back to the left.

9. Push the clamping ring (2) up against it.

10. Tighten the screw (4).

**Order**

Next, set the stitch length adjusting wheels (p. 35).

### 16.6 Parts list

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

www.duerkopp-adler.com
17 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.
18 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.
19 Troubleshooting

19.1 Customer Service
Contact for repairs and issues with the machine:

Dürkopp Adler AG
Potsdamer Str. 190
33719 Bielefeld, Germany
Tel. +49 (0) 180 5 383 756
Fax +49 (0) 521 925 2594
Email: service@duerkopp-adler.com
Internet: www.duerkopp-adler.com

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

<table>
<thead>
<tr>
<th>Code</th>
<th>Possible cause</th>
<th>Remedial action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>Sewing motor encoder plug (Sub-D, 9-pin) not connected</td>
<td>• Connect encoder cable to the control, use correct connection</td>
</tr>
<tr>
<td>1001</td>
<td>Sewing motor error: Sewing motor plug (AMP) not connected</td>
<td>• Check connection and plug in, if necessary&lt;br&gt;• Test sewing motor phases (R= 2.8 Ω, high impedance to PE)&lt;br&gt;• Replace encoder&lt;br&gt;• Replace sewing motor&lt;br&gt;• Replace control</td>
</tr>
<tr>
<td>1002</td>
<td>Sewing motor insulation fault</td>
<td>• Check motor phase and PE for low-impedance connection&lt;br&gt;• Replace encoder&lt;br&gt;• Replace sewing motor</td>
</tr>
<tr>
<td>1004</td>
<td>Sewing motor error: Incorrect sewing motor direction of rotation</td>
<td>• Replace encoder&lt;br&gt;• Check plug assignment and change, if necessary&lt;br&gt;• Test motor phases and check for correct value</td>
</tr>
<tr>
<td>Code</td>
<td>Possible cause</td>
<td>Remedial action</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 1005   | Motor blocked                              | • Eliminate stiff movement in the sewing machine  
                          • Replace the encoder  
                          • Replace the motor |
| 1006   | Maximum speed exceeded                     | • Replace encoder  
                          • Perform reset  
                          • Check class (parameter t 52 04) |
| 1007   | Error in the reference run                 | • Replace encoder  
                          • Eliminate stiff movement in the sewing machine |
| 1008   | Encoder error                              | • Replace encoder |
| 1010   | External synchronizer plug (Sub-D, 9-pin) not connected | • Connect cable of external synchronizer to control, use correct connection (Sync)  
                          • Only required for machines with transmission! |
| 1011   | Encoder Z pulse missing                    | • Switch off the control, use handwheel to turn, and switch on the control again  
                          • If error is not corrected, check encoder |
| 1012   | Synchronizer fault                         | • Replace synchronizer |
| 1052   | Sewing motor overcurrent, internal current increase >25 A | • Check selection of class  
                          • Replace control  
                          • Replace sewing motor  
                          • Replace encoder |
| 1053   | Sewing motor overvoltage                  | • Check selection of class  
                          • Replace control |
| 1054   | Internal short circuit                     | • Replace control |
| 1055   | Sewing motor overload                      | • Eliminate stiff movement in the sewing machine  
                          • Replace encoder  
                          • Replace sewing motor |
| 1203   | Position not reached                       | • Check and, if necessary, change controller settings  
                          • Make mechanical changes to the machine (e.g. thread cutting setting, belt tension)  
                          • Check the position (thread lever at top dead center) |
| 2020   | DACextension box not responding            | • Check connection cables  
                          • Check LEDs of DACextension box  
                          • Perform a software update |
<table>
<thead>
<tr>
<th>Code</th>
<th>Possible cause</th>
<th>Remedial action</th>
</tr>
</thead>
<tbody>
<tr>
<td>2021</td>
<td>Sewing motor encoder plug (Sub-D, 9-pin) not connected to DACextension box</td>
<td>• Connect encoder cable to DACextension box using the correct connection</td>
</tr>
<tr>
<td>2101</td>
<td>DA stepper card 1 reference run timeout</td>
<td>• Check reference sensor</td>
</tr>
<tr>
<td>2103</td>
<td>DA stepper card 1 step losses</td>
<td>• Check for stiff movement</td>
</tr>
<tr>
<td>2120</td>
<td>DA stepper card 1 not responding</td>
<td>• Check connection cables</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Check LEDs on DACextension box</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Perform a software update</td>
</tr>
<tr>
<td>2121</td>
<td>DA stepper card 1 encoder plug (Sub-D, 9-pin) not connected</td>
<td>• Connect encoder cable to the control, use correct connection</td>
</tr>
<tr>
<td>2122</td>
<td>DA stepper card 1 flywheel position not found</td>
<td>• Check connection cables</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Check stepper motor 1 for stiff movement</td>
</tr>
<tr>
<td>2155</td>
<td>DA stepper card 1 overload</td>
<td>• Check for stiff movement</td>
</tr>
<tr>
<td>2201</td>
<td>DA stepper card 2 reference run timeout</td>
<td>• Check reference sensor</td>
</tr>
<tr>
<td>2203</td>
<td>DA stepper card 2 step losses</td>
<td>• Check for stiff movement</td>
</tr>
<tr>
<td>2220</td>
<td>DA stepper card 2 not responding</td>
<td>• Check connection cables</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Check LEDs on DACextension box</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Perform a software update</td>
</tr>
<tr>
<td>2221</td>
<td>DA stepper card 2 encoder plug (Sub-D, 9-pin) not connected</td>
<td>• Connect encoder cable to the control, use correct connection</td>
</tr>
<tr>
<td>2222</td>
<td>DA stepper card 2 flywheel position not found</td>
<td>• Check connection cables</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Check stepper motor 2 for stiff movement</td>
</tr>
<tr>
<td>2255</td>
<td>DA stepper card 2 overload</td>
<td>• Check for stiff movement</td>
</tr>
<tr>
<td>3100</td>
<td>AC-RDY timeout, intermediate circuit voltage did not reach the defined</td>
<td>• Check mains voltage</td>
</tr>
<tr>
<td></td>
<td>threshold in the specified time</td>
<td>• If the mains voltage is OK, replace the control</td>
</tr>
<tr>
<td>3101</td>
<td>High voltage fault, mains voltage, longer duration &gt;290 V</td>
<td>• Check mains voltage, if nominal voltage is continuously exceeded: stabilize it</td>
</tr>
<tr>
<td></td>
<td></td>
<td>or use a generator</td>
</tr>
<tr>
<td>3102</td>
<td>Low voltage failure (2nd threshold) (mains voltage &lt; 150 V AC)</td>
<td>• Check mains voltage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Stabilize the mains voltage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Use generator</td>
</tr>
<tr>
<td>Code</td>
<td>Possible cause</td>
<td>Remedial action</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>3103</td>
<td>Low voltage warning (1st threshold) (mains voltage &lt; 180 V AC)</td>
<td>• Check mains voltage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Stabilize the mains voltage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Use generator</td>
</tr>
<tr>
<td>3104</td>
<td>Pedal is not in position 0</td>
<td>• Do not press the pedal when switching on the control</td>
</tr>
<tr>
<td>3105</td>
<td>U24 V short circuit</td>
<td>• Disconnect 37-pin plug; if error persists, replace control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Test inputs/outputs for 24 V short circuit</td>
</tr>
<tr>
<td>3106</td>
<td>U24 V (I²T) overload</td>
<td>• One or several magnets defective</td>
</tr>
<tr>
<td>3107</td>
<td>Pedal not connected</td>
<td>• Connect analog pedal</td>
</tr>
<tr>
<td>3108</td>
<td>Speed limited due to insufficient mains voltage</td>
<td>• Check mains voltage</td>
</tr>
<tr>
<td>3109</td>
<td>Operation lock</td>
<td>• Check tilt sensor on machine</td>
</tr>
<tr>
<td>3110</td>
<td>Maintenance necessary</td>
<td>• Lubricating the needle bar</td>
</tr>
<tr>
<td>3111</td>
<td>Maintenance necessary (operation cannot continue unless parameter t 51 14</td>
<td>• Service is required, See p. 99</td>
</tr>
<tr>
<td></td>
<td>is reset)</td>
<td></td>
</tr>
<tr>
<td>3115</td>
<td>No release for sewing process</td>
<td>• Parameter t 51 20 - t 51 33 = 25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Input signal for sewing process release required</td>
</tr>
<tr>
<td>5160</td>
<td>Stitch loosening device</td>
<td>• Stitch loosening cannot be performed</td>
</tr>
<tr>
<td>3215</td>
<td>Bobbin stitch counter (info value 0 reached)</td>
<td>• Change bobbin, set counter value</td>
</tr>
<tr>
<td>3216</td>
<td>Remaining thread monitor left</td>
<td>• Change the left bobbin</td>
</tr>
<tr>
<td>3217</td>
<td>Remaining thread monitor right</td>
<td>• Change the right bobbin</td>
</tr>
<tr>
<td>3218</td>
<td>Remaining thread monitor left and right</td>
<td>• Change the left and right bobbin</td>
</tr>
<tr>
<td>3223</td>
<td>Skip stitch detected</td>
<td>-</td>
</tr>
<tr>
<td>3224</td>
<td>Bobbin failed to rotate</td>
<td>-</td>
</tr>
<tr>
<td>6353</td>
<td>Internal EEprom communication error</td>
<td>• Switch off the control, wait until the LEDs are off and then switch on again</td>
</tr>
<tr>
<td>6354</td>
<td>External EEprom communication error</td>
<td>• Switch off the control, wait until the LEDs are off, check connection for</td>
</tr>
<tr>
<td></td>
<td></td>
<td>machine ID, switch on control again</td>
</tr>
<tr>
<td>Code</td>
<td>Possible cause</td>
<td>Remedial action</td>
</tr>
<tr>
<td>-------</td>
<td>-------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>6360</td>
<td>No valid data on external EEPROM (internal data structures are not compatible with the external data storage device)</td>
<td>• Perform a software update</td>
</tr>
<tr>
<td>6361</td>
<td>No external EEPROM connected</td>
<td>• Connect machine ID</td>
</tr>
</tbody>
</table>
| 6362  | No valid data on internal EEPROM (internal data structures are not compatible with the external data storage device) | • Check machine ID connection  
• Switch off the control, wait until the LEDs are off and then switch on the machine again  
• Perform a software update |
| 6363  | No valid data on internal and external EEPROM (software version is not compatible with the internal data storage device, emergency operating features only) | • Check machine ID connection  
• Switch off the control, wait until the LEDs are off and then switch on the machine again  
• Perform a software update |
| 6364  | No valid data on internal EEPROM and no external EEPROM connected (the internal data structures are not compatible with the external data storage device, emergency operating features only) | • Check machine ID connection  
• Switch off the control, wait until the LEDs are off and then switch on the machine again  
• Perform a software update |
| 6365  | Internal EEPROM defective                                                      | • Replace control                                                              |
| 6366  | Internal EEPROM defective and external data not valid (emergency operating features only) | • Replace control                                                              |
| 6367  | Internal EEPROM defective and external EEPROM not connected (emergency operating features only) | • Replace control                                                              |
| 7202  | DACextension box boot error                                                    | • Check connection cables  
• Perform a software update  
• Replace DACextension box |
| 7203  | Checksum error during update                                                   | • Check connection cables  
• Perform a software update  
• Replace DACextension box |
| 7212  | DA stepper card 1 boot error                                                   | • Check connection cables  
• Perform a software update  
• Replace DACextension box |
| 7213  | Checksum error occurred while updating DA stepper card 2                      | • Check connection cables  
• Perform a software update  
• Replace DACextension box |
<table>
<thead>
<tr>
<th>Code</th>
<th>Possible cause</th>
<th>Remedial action</th>
</tr>
</thead>
<tbody>
<tr>
<td>7222</td>
<td>DA stepper card 2 boot error</td>
<td>• Check connection cables</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Perform a software update</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Replace DACextension box</td>
</tr>
<tr>
<td>7223</td>
<td>Checksum error occurred while updating DA stepper card 2</td>
<td>• Check connection cables</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Perform a software update</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Replace DACextension box</td>
</tr>
<tr>
<td>7801</td>
<td>Software version error (DACclassic only; only the functions of the DACbasic will remain available)</td>
<td>• Perform a software update</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Replace control</td>
</tr>
<tr>
<td>7802</td>
<td>Software update error (DACclassic only; only the functions of the DACbasic will remain available)</td>
<td>• Perform software update again</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Replace control</td>
</tr>
<tr>
<td>7803</td>
<td>Communication error (DACclassic only; only the functions of the DACbasic will remain available)</td>
<td>• Restart the control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Perform a software update</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Replace control</td>
</tr>
<tr>
<td>8401</td>
<td>Watchdog</td>
<td>• Perform a software update</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Perform a machine ID reset</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Replace control</td>
</tr>
<tr>
<td>8402 - 8405</td>
<td>Internal error</td>
<td>• Perform a software update</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Perform a machine ID reset</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Replace control</td>
</tr>
<tr>
<td>8406</td>
<td>Checksum error</td>
<td>• Perform a software update</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Replace control</td>
</tr>
<tr>
<td>8501</td>
<td>Software protection</td>
<td>• The DA tool must always be used for software updates</td>
</tr>
</tbody>
</table>
### 19.3 Errors in sewing process

<table>
<thead>
<tr>
<th>Error</th>
<th>Possible causes</th>
<th>Remedial action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unthreading at seam beginning</td>
<td>Needle thread tension is too firm</td>
<td>Check needle thread tension</td>
</tr>
<tr>
<td>Thread breaking</td>
<td>Needle thread and hook thread have not been threaded correctly</td>
<td>Check threading path</td>
</tr>
<tr>
<td></td>
<td>Needle is bent or sharp-edged</td>
<td>Replace needle</td>
</tr>
<tr>
<td></td>
<td>Needle is not inserted correctly into the needle bar</td>
<td>Insert the needle correctly into the needle bar</td>
</tr>
<tr>
<td></td>
<td>The thread used is unsuitable</td>
<td>Use recommended thread</td>
</tr>
<tr>
<td></td>
<td>Thread tensions are too tight for the thread used</td>
<td>Check thread tensions</td>
</tr>
<tr>
<td></td>
<td>Thread-guiding parts, such as thread tube, thread guide or thread take-up disk, are sharp-edged</td>
<td>Check threading path</td>
</tr>
<tr>
<td></td>
<td>Throat plate, hook or spread have been damaged by the needle</td>
<td>Have parts reworked by qualified specialists</td>
</tr>
<tr>
<td>Missing stitches</td>
<td>Needle thread and hook thread have not been threaded correctly</td>
<td>Check threading path</td>
</tr>
<tr>
<td></td>
<td>Needle is blunt or bent</td>
<td>Replace needle</td>
</tr>
<tr>
<td></td>
<td>Needle is not inserted correctly into the needle bar</td>
<td>Insert the needle correctly into the needle bar</td>
</tr>
<tr>
<td></td>
<td>The needle thickness used is unsuitable</td>
<td>Use recommended needle thickness</td>
</tr>
<tr>
<td></td>
<td>The reel stand is assembled incorrectly</td>
<td>Check the assembly of the reel stand</td>
</tr>
<tr>
<td></td>
<td>Thread tensions are too tight</td>
<td>Check thread tensions</td>
</tr>
<tr>
<td></td>
<td>Throat plate, hook or spread have been damaged by the needle</td>
<td>Have parts reworked by qualified specialists</td>
</tr>
<tr>
<td>Error</td>
<td>Possible causes</td>
<td>Remedial action</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------------------------------------------------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Loose stitches</td>
<td>Thread tensions are not adjusted to the sewing material, the sewing material thickness or the thread used</td>
<td>Check thread tensions</td>
</tr>
<tr>
<td></td>
<td>Needle thread and hook thread have not been threaded correctly</td>
<td>Check threading path</td>
</tr>
<tr>
<td>Needle breakage</td>
<td>Needle thickness is unsuitable for the sewing material or the thread</td>
<td>Use recommended needle thickness</td>
</tr>
</tbody>
</table>
# Technical data

## Data and characteristic values

<table>
<thead>
<tr>
<th>Technical data</th>
<th>Unit</th>
<th>967-100180</th>
<th>967-100180 (with option Heavy Transport)</th>
<th>967-100382</th>
<th>967-100382 (with option Heavy Transport)</th>
<th>967-100180-100</th>
<th>967-100382-100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of stitches</td>
<td></td>
<td>Lockstitch 301</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hook type</td>
<td></td>
<td>Barrel shuttle hook XL (extra-large)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of needles</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Needle system</td>
<td></td>
<td>794/7x23/328/1000H</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Needle thread thickness [Nm]</td>
<td></td>
<td>40/3 - 5/3, 40/3 - 5/3 + braided thread 1.6</td>
<td>40/3 - 5/3, 40/3 - 5/3 + braided thread 1.6</td>
<td>40/3 - 5/3, 40/3 - 5/3 + braided thread 1.6</td>
<td>40/3 - 5/3, 40/3 - 5/3 + braided thread 1.6</td>
<td>40/3 - 5/3</td>
<td>40/3 - 5/3</td>
</tr>
<tr>
<td>Hook thread thickness [Nm]</td>
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<td>60/3 - 8/3, 60/3 - 5/3</td>
<td>60/3 - 8/3, 60/3 - 5/3</td>
<td>60/3 - 8/3, 60/3 - 5/3</td>
<td>60/3 - 8/3, 60/3 - 5/3</td>
<td>60/3 - 8/3</td>
<td>60/3 - 8/3</td>
</tr>
<tr>
<td>Stitch length [mm]</td>
<td></td>
<td>15/15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speed maximum [min⁻¹]</td>
<td></td>
<td>1000, 800, 1250, 800, 1000</td>
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</tr>
<tr>
<td>Speed set at the factory [min⁻¹]</td>
<td></td>
<td>1000, 800, 1000, 800, 700</td>
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<tr>
<td>Mains voltage [V]</td>
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<tr>
<td>Mains frequency [Hz]</td>
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<td>50/60</td>
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<td></td>
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<tr>
<td>Operating pressure [bar]</td>
<td></td>
<td>6</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Length [mm]</td>
<td></td>
<td>700</td>
<td></td>
<td></td>
<td></td>
<td>1300</td>
<td></td>
</tr>
<tr>
<td>Width [mm]</td>
<td></td>
<td>250</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>290</td>
</tr>
<tr>
<td>Height [mm]</td>
<td></td>
<td>420</td>
<td></td>
<td></td>
<td></td>
<td>420</td>
<td></td>
</tr>
<tr>
<td>Weight [kg]</td>
<td></td>
<td>Standard arm: 90, Long arm: 145</td>
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</tbody>
</table>
Characteristics
Single-needle double lockstitch flatbed sewing machine with bottom feed, needle feed and alternating foot-top feed and with automatic lifter and direct drive.

Technical features Eco and Classic:
• The machines are equipped with an extra large, XL, barrel shuttle hook.
• Pneumatic sewing foot lift: The clearance under the sewing feet when lifted is max. 30mm with needle system 794, with needle system 7x23, with needle system 1000H, and with needle system 328 (stitch length max. 12mm)
• DC drive with reversing mechanism in order to position the needle above the feet.
• Electronic handwheel which can be turned to move the machine/arm shaft forward or back by drive motor power.
• Initial alignment stitch by pressing the electronic handwheel
• Automatic wick lubrication with an inspection glass housed in the arm for lubricating the machine and one inspection glass in the base plate for lubricating the hook.
• DAC Classic control including DA direct drive with OP1000 control panel built into the machine.

Additional features for Classic model:
• Automatic thread cutter with remaining thread length of approx. 40mm.
• 2nd switchable stitch length, 2nd switchable thread tension, quick stroke adjustment via knee button, automatic bartack.
• Integrated dimmable sewing lamp
• 6 push buttons with programmable favorite button An additional button panel has been placed within easy reach of the sewer and allows the sewer to assign the same 6 functions of the buttons housed in the button bar. Possible operating functions are manual bartack, needle up/down, bartack suppression, second stitch length, and switchable thread tension.
21 Appendix

Fig. 78: Wiring diagram