DÜRKOPP ADLER

610-01/630-01

Service Instructions

IMPORTANT
READ CAREFULLY BEFORE USE
KEEP FOR FUTURE REFERENCE

1 About these instructions

The service instructions were compiled with the 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. 113*).

1.1 Scope of the instructions

These instructions describe the setting and maintenance work.
The proper use and setup is described in the 📖 *Operating Instructions.*

1.2 Representation conventions – symbols and characters

Various information in these operating 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 removed in order to access the components to be set.

•

Lists

Lists are identified by bullet points. The order is not important in this case.

Steps to be performed for service, maintenance, and installation

Steps to be performed via the software control panel

The **individual steps are numbered:**

1.
2.
3.
...

1. First setting step
2. Second setting step
3. Third setting step, etc.

The sequence of setting steps must always be followed.

Result of performing an operation

If, as a result of a setting step, a change occurs in the machine or a new message appears on the display which is important feedback for you, this change is marked with an arrow: ↳

Specifies setting steps for the software via the control panel. The steps are numbered. The sequence of setting steps must always be followed.

Important

Indicates that special attention must be paid to this point when performing a step.

Information

Provides additional information.

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

1.4 Liability

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

The manufacturer cannot be held liable for damages resulting from:

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

1.4.1 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.

1.4.2 Proper use

The machine may only be used with sewing material that satisfies the requirements of the specific application at hand.

The machine is intended only for use with dry sewing material. The material must not contain any hard objects.

The machine is intended for industrial use.

The machine may only be set up and operated in dry conditions on well-maintained premises. If the machine is operated on premises that are not dry and well-maintained, then further measures may be required which must be compatible with EN 60204-31:1999.

Only authorized/trained persons may work on the machine.

The manufacturer will not be held liable for damage resulting from improper use.

2 Safety instructions

These service instructions describe the recommended order of steps to be taken when setting up the sewing unit.

NOTICE

Property damage may occur!

Different setting positions are dependent on one another.

It is essential therefore that the individual settings must be performed in accordance with the described order.

NOTICE

Property damage may occur!

Property damage from incorrect setting possible.

After the sewing unit was dismantled, the settings operations necessary as described in these service instructions must be completed before the unit is put back into operation.

2.1 Basic safety instructions

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

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

For the following work, the machine must be disconnected from the power supply using the main switch or by disconnecting the power plug:

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

Before all setting operations on stitch-forming parts:
Insert a new, faultless needle.

Exception:
Setting operations that are conducted using test or setting programs.

Exercising extreme caution and following all safety measures, perform adjustment work and function testing with the sewing unit running.

Setting operations in the area of the needle:
Remove all relevant parts that may cause injury prior to performing the setting operations, except for parts that are essential to the completion of the setting operations.

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

Transport

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

Setup

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

Obligations of the operator

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

All the warnings and safety signs on the machine must always be in legible condition, and must not be removed. Missing or damaged labels must be replaced immediately.

Requirements to be met by the personnel

The machine may only be set up by qualified specialists.

Maintenance work and repairs may only be carried out by qualified specialists.

Work on electrical equipment may only be carried out by qualified specialists.

Only authorized persons may work on the machine. Every person who works on the machine must have read the operating instructions first.

Operation

Inspect the machine for any externally visible damage during use.
Stop working if you notice any changes to the machine. Report any changes to your supervisor. Machines must no longer be used if they are damaged.

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 refitted and put back into service immediately afterward.

2.2 Signal words and symbols used in warnings

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

Signal words

Signal words and the hazard they describe:

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

Symbols

The following symbols indicate the type of danger to personnel:

Symbol	Type of danger
	General
	Electric shock
	Puncture
	Crushing
	Environmental damage

Examples Examples of the layout of warnings in the text:

DANGER

Type and source of danger!

Consequences of non-compliance.

Measures for avoiding the danger.

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

WARNING

Type and source of danger!

Consequences of non-compliance.

Measures for avoiding the danger.

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

CAUTION

Type and source of danger!

Consequences of non-compliance.

Measures for avoiding the danger.

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

CAUTION

Type and source of danger!

Consequences of non-compliance.

Measures for avoiding the danger.

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

NOTICE

Type and source of danger!

Consequences of non-compliance.

Measures for avoiding the danger.

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

3 Working basis

3.1 Sequence of settings

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

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

NOTICE

Property damage due to incorrect sequence!

Failure to observe can result in damage to the machine.

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

3.2 Laying the cables

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

NOTICE

Property damage and malfunctions due to laying the cables incorrectly!

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

Lay excess cables as described.

To lay the cables:

1. Lay cables that are too long in tidy loops.
2. Bind together the cable loops with cable ties.

Important

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

3. Cut off the extending ends of cable ties.

3.3 Removing covers

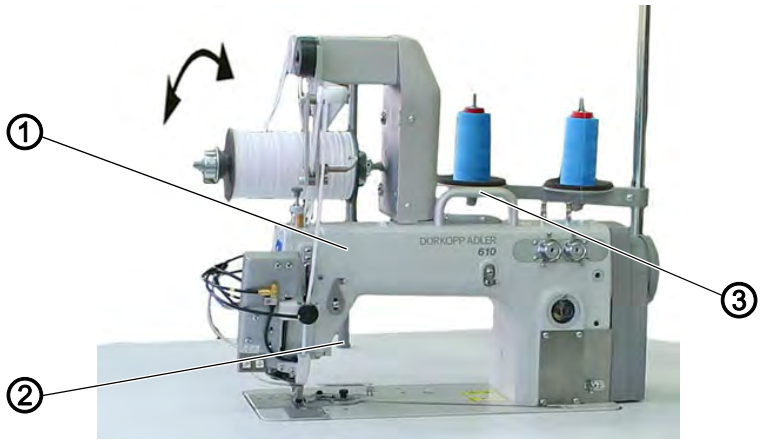
For many setting operations, you must remove the machine covers in order to access the components.

The following is a description of how to remove the individual covers and fit them again. The text for the relevant setting operations then only mentions which of the covers must be removed.

3.3.1 Tilting and re-erecting the machine head

In order to access the components on the underside of the machine, the upper part of the machine must be tilted backwards.

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



(1) - Machine head
(2) - Support
(3) - Handle

Tilting the machine head

To tilt the machine head:

1. Tilt the machine head (1) back to the support (2) using the handle (3).

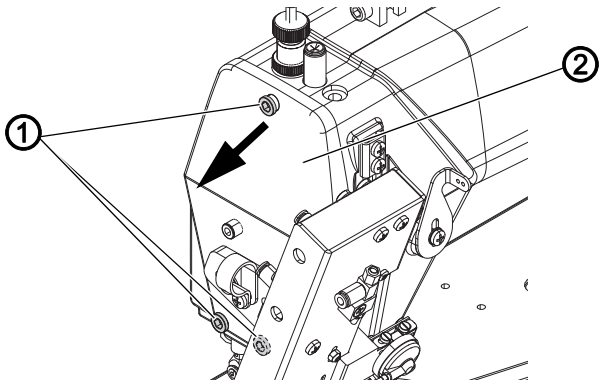
Re-erecting the machine head

To re-erect the machine head:

1. Carefully tilt the machine head (1) forward to its upright position using the handle (3).

3.3.2 Removing and fitting the head cover

Fig. 2: Removing and fitting the head cover



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

Removing the head cover

To remove the head cover:

1. Loosen all 3 screws (1).
2. Remove the head cover (2).

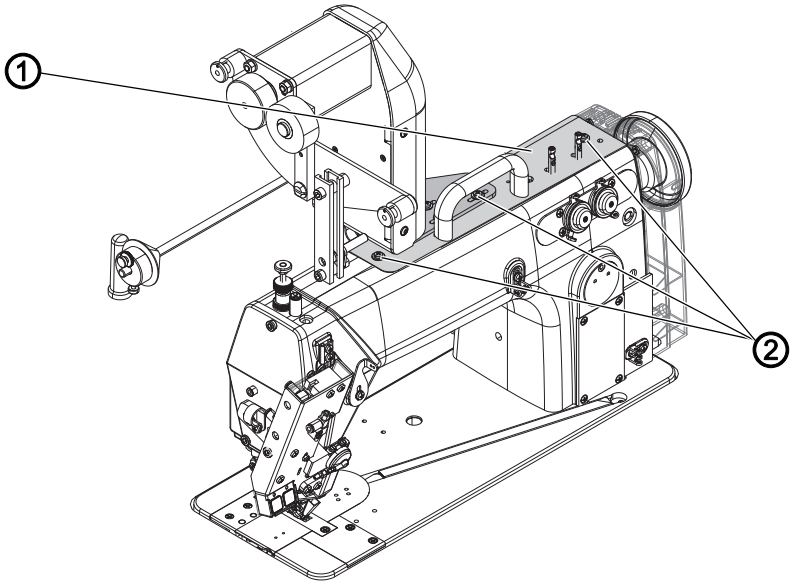
Fitting the head cover

To fit the head cover:

1. Fit the head cover (2).
2. Tighten all 3 screws (1).

3.3.3 Removing and fitting the arm cover

Fig. 3: Removing and fitting the arm cover



(1) - Arm cover

(2) - Screws

Removing the arm cover

To remove the arm cover:

1. Loosen all 3 screws (2).
2. Remove the arm cover (1) carefully.
   Ensure that you do not pull on the cables while doing so.

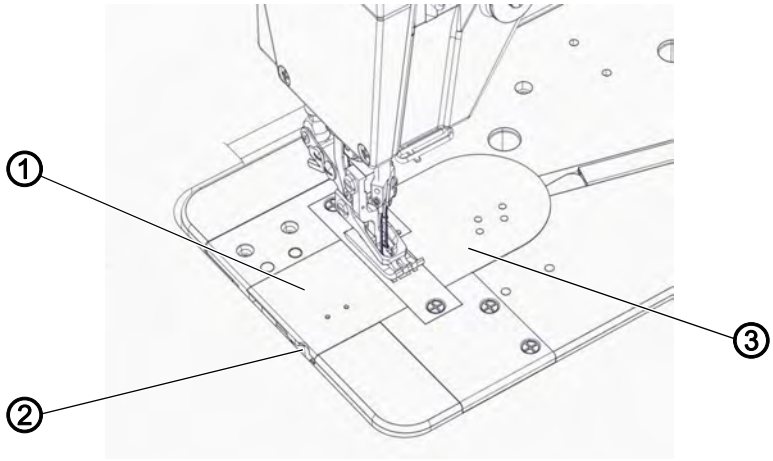
Fitting the arm cover

To fit the arm cover:

1. Fit the arm cover (1) carefully.
   Ensure that you do not catch or squeeze the cables while doing so.
2. Tighten all 3 screws (2).

3.3.4 Removing and fitting the covers on the base plate

Fig. 4: Removing and fitting the covers on the base plate



(1) - Cover, left
(2) - Opening
(3) - Cover, right

Removing the covers

To remove the covers:

1. Raise the left cover (1) using a small screwdriver at the opening (2) and remove.
2. Raise the right cover (3) with a small screwdriver and remove.

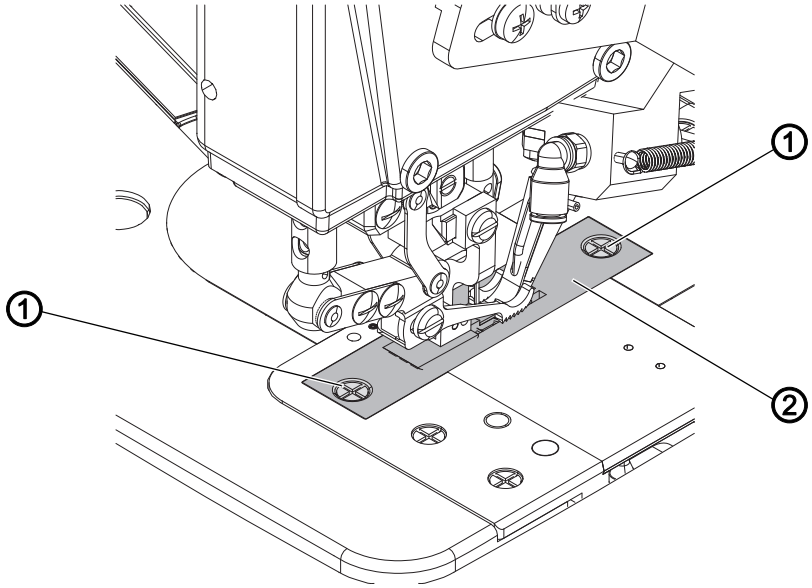
Fitting the covers

To fit the covers:

1. Insert the cover (1).
2. Insert the cover (3).

3.3.5 Removing and inserting the throat plate

Fig. 5: Removing and fitting the throat plate



(1) - Screws *(2) - Throat plate*

Removing the throat plate

To remove the throat plate:

1. Lift and lock the sewing foot.
2. Loosen both screws (1).
3. Remove the throat plate (2) upwards.

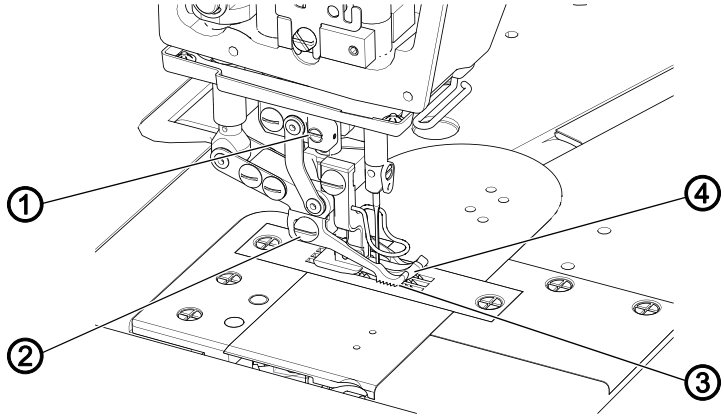
Inserting the throat plate

To insert the throat plate:

1. Lift and lock the sewing foot.
2. Insert the throat plate (2) from above.
3. Tighten both screws (1).

3.3.6 Removing and inserting the top feed foot and sewing foot

Fig. 6: Removing and inserting the top feed foot and sewing foot



(1) - Screw
(2) - Screw
(3) - Top feed foot
(4) - Sewing foot

Removing the top feed foot

To remove the top feed foot:

1. Lift and lock the sewing foot (4).
2. Loosen the screw (2).
3. Remove the top feed foot (3).

Removing the sewing foot

To remove the sewing foot:

1. Loosen the screw (1).
2. Remove the sewing foot (4).

Inserting the sewing foot

To insert the sewing foot:

1. Lift and lock the sewing foot.
2. Fit the sewing foot (4).
3. Secure the sewing foot with screw (1).

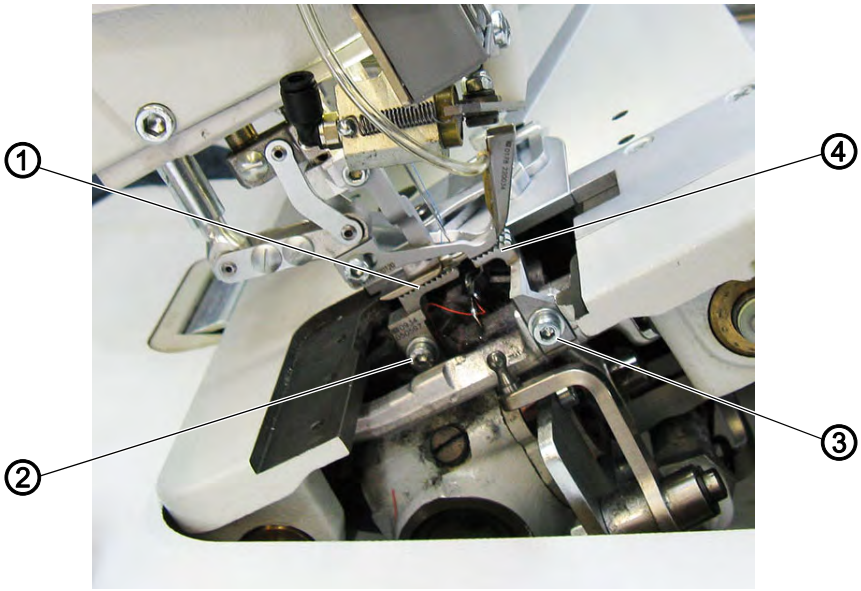
Inserting the top feed foot

To insert the top feed foot:

1. Insert the top feed foot (3).
2. Secure the top feed foot with screw (2).

3.3.7 Removing and installing the feeds

Fig. 7: Removing and installing the feeds



(1) - Main feed
(2) - Screw
(3) - Screw
(4) - Differential feed

Removing the feeds

To remove the feeds:

1. Remove the screws (2) and (3).
2. Remove the main feed (1).
3. Remove the differential feed (4).

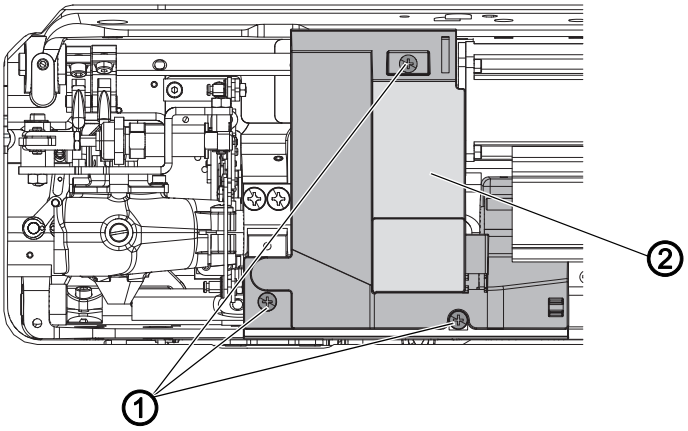
Installing the feeds

To install the feeds:

1. Install the main feed (1).
2. Tighten the screw (2).
3. Install the differential feed (4).
4. Tighten the screw (3).

3.3.8 Removing and fitting the oil pan

Fig. 8: Removing and fitting the oil pan



(1) - Screws *(2) - Oil pan*

Removing the oil pan

To remove the oil pan:

1. Loosen all 3 screws (1).
2. Remove the oil pan (2) downwards.

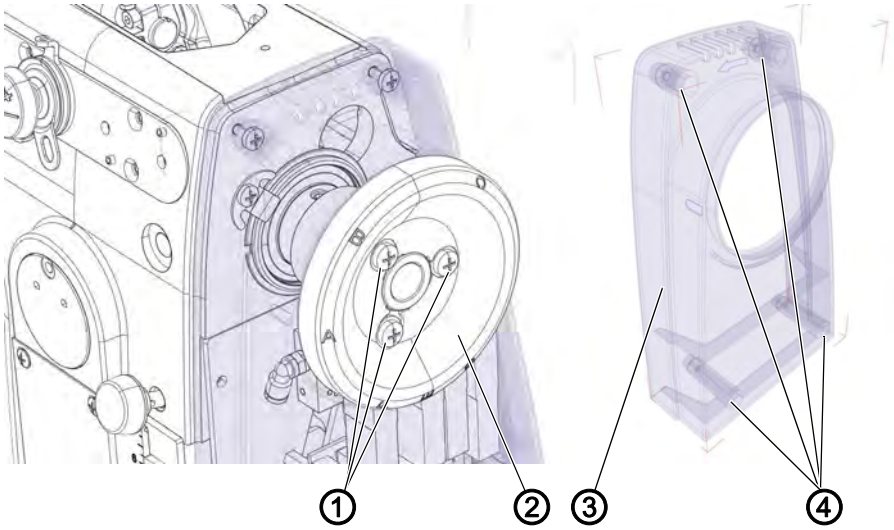
Fitting the oil pan

To fit the oil pan:

1. Fit the oil pan (2).
2. Secure the oil pan by tightening all 3 screws (1).

3.3.9 Removing and fitting the upper belt guard

Fig. 9: Removing and fitting the upper belt guard



(1) - Screws
(2) - Handwheel
(3) - Belt guard
(4) - Screws

Removing the handwheel

To remove the handwheel:

1. Loosen all 3 screws (1).
2. Remove the handwheel (2).

Removing the belt guard

To remove the belt guard:

1. Loosen all 4 screws (4) on the belt guard.
2. Remove the belt guard (3).

Fitting the belt guard

To fit the belt guard:

1. Fit the belt guard (3).
2. Secure the belt guard with all 4 screws (4).

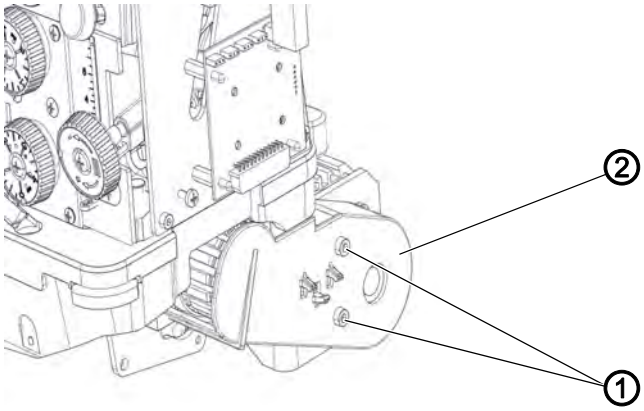
Fitting the handwheel

To fit the handwheel:

1. Fit the handwheel (2).
2. Secure the handwheel by tightening the 3 screws (1).

3.3.10 Removing and fitting the lower belt guard

Fig. 10: Removing and fitting the lower belt guard



(1) - Screws *(2) - Belt guard*

Removing the belt guard

To remove the belt guard:

1. Loosen both screws (1).
2. Remove the belt guard (2) to the right.

Fitting the belt guard

To fit the belt guard:

1. Carefully fit the belt guard (2). Ensure that you do not catch or squeeze the cables while doing so.
2. Secure the belt guard with both screws (1).

3.4 Removing disruptive components

WARNING

Risk of injury from moving parts!

Crushing is possible.

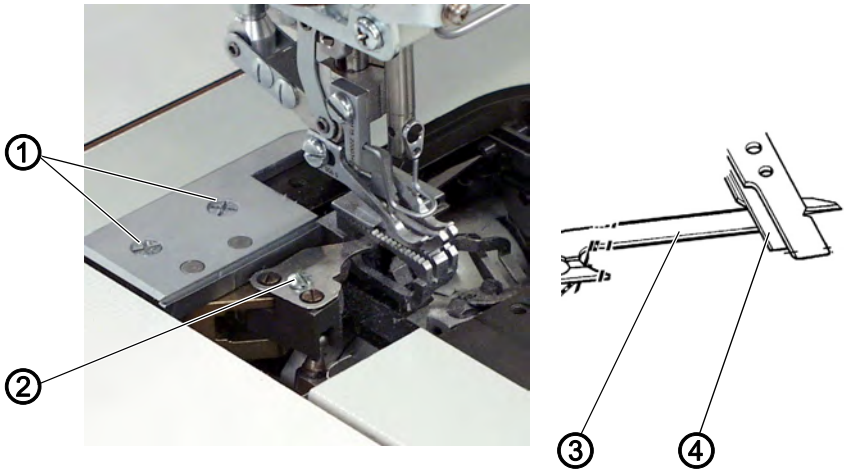
Switch off the machine.

For some setting operations, you must first remove the thread cutting device, needle protection, looper and looper mounting, in order to access the components to be set.

The following is a description of how to remove and re-install the thread cutting device, needle protection, looper and looper mounting.

3.4.1 Removing and installing the thread cutter

Fig. 11: Removing and installing the tread cutter



(1) - Screws
(2) - Screw
(3) - Movable blade
(4) - Counter blade

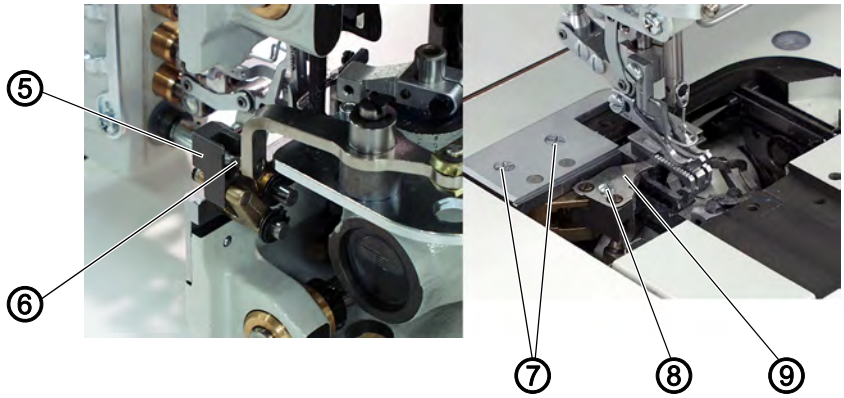
Removing the blade

To remove the blade:

1. Loosen the screw (2).
2. Pull the movable blade (3) to the left out of the counter blade (4).
3. Loosen the screws (1) and remove the thread cutter upwards.

Installing the blade

Fig. 12: Installing the blade



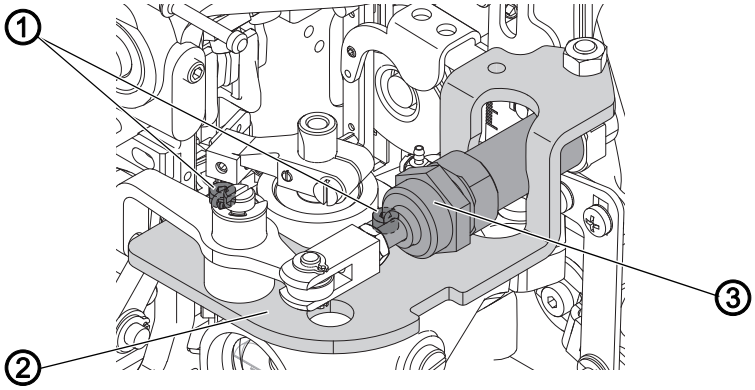
(5) - Ball lever
(6) - Blade mounting
(7) - Screws
(8) - Screw
(9) - Blade

To install the blade:

1. Position the thread cutter such that the blade mounting (6) fits over the ball lever (5).
2. Insert both screws (7) and tighten.
3. Push the movable blade (9) to the right between the counter blade and the spring plate.
4. Secure the blade to the blade mounting (6) with the screw (8).

Removing the support plate

Fig. 13: Removing the support plate



(1) - Screws
(2) - Support plate
(3) - Cylinder

To remove the support plate:

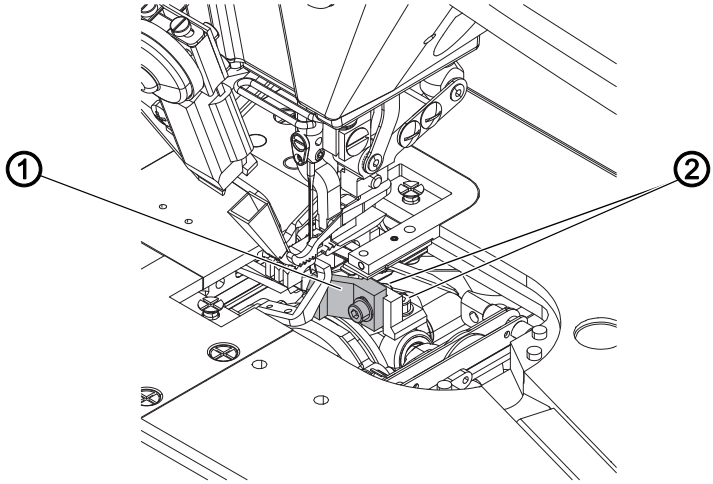
1. Remove both screws (1).
2. Carefully remove the support plate (2) with mechanics and cylinder (3).

To install the support plate:

1. Carefully fit the support plate (2) with mechanics and cylinder (3).
2. Secure the support plate with both screws (1).

3.4.2 Removing and installing the needle protection

Fig. 14: Removing and installing the needle protection mounting



(1) - Needle protection *(2) - Screws*

To remove the needle protection:

1. Loosen both screws (2).
2. Carefully remove the needle protection (1) with mounting.

To install the needle protection:

1. Carefully fit the needle protection (1) with mounting.
2. Secure the needle protection by tightening both screws (2).

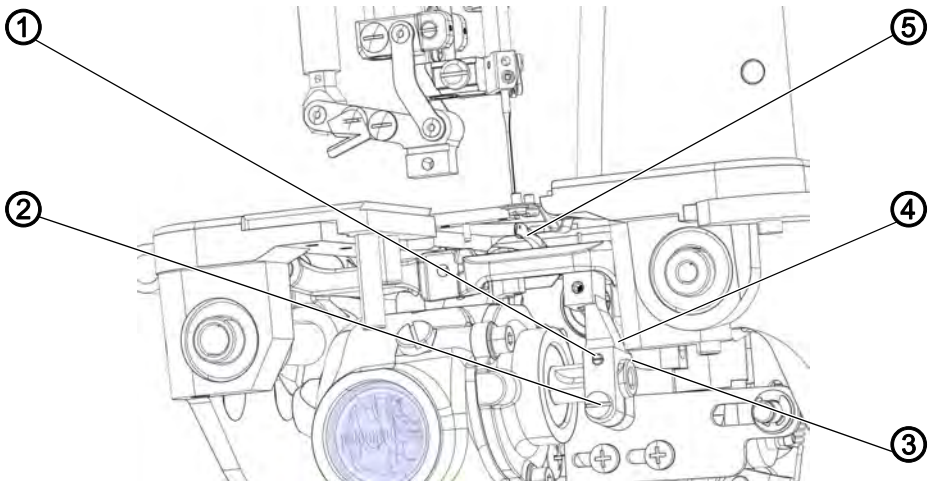
Order

After removing the needle protection mounting, perform the following setting:

- Needle protection (📖 *p. 63*)

3.4.3 Removing and installing the looper and looper mounting

Fig. 15: Removing and installing the looper and looper mounting



(1) - Screw
(2) - Screw
(3) - Screw
(4) - Looper mounting
(5) - Looper

To remove the looper and looper mounting:

1. Loosen both adjusting screws (1) and (3) slightly.
2. Loosen the screw (2).
3. Remove the looper mounting (4) with looper (5) from the shaft.

So install the looper and looper mounting:

1. Push the looper mounting (4) with looper (5) onto the shaft.
2. Tighten both adjusting screws (1) and (3) a little.
3. Tighten the screw (2) on the looper mounting completely.

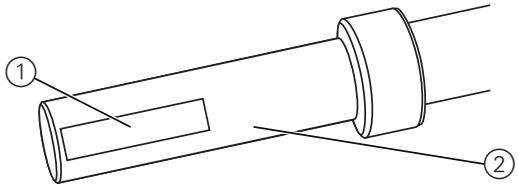
Order

After removing the looper and the looper mounting, perform the following setting:

- Looping stroke and looper gauge (🕮 *p. 57*)
- Needle protection (🕮 *p. 63*)

3.5 Flat surfaces on shafts

Fig. 16: Flat surfaces on shafts



(1) - Flat surface
(2) - Shaft

Some shafts have flat surfaces at places where components are to be attached. These make the connection more stable and setting easier.

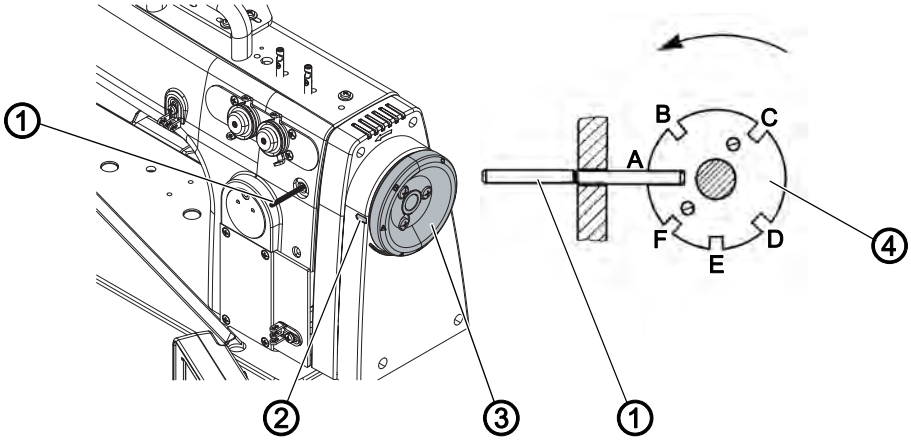
Important

Always ensure that the screws are completely flush with the flat surface.

3.6 Locking the machine

For some settings, the machine must be locked. To this end, the locking pin (1) from the accessory pack is inserted into a groove on the adjusting disk, in order to block the arm shaft.

Fig. 17: Locking the machine (1)



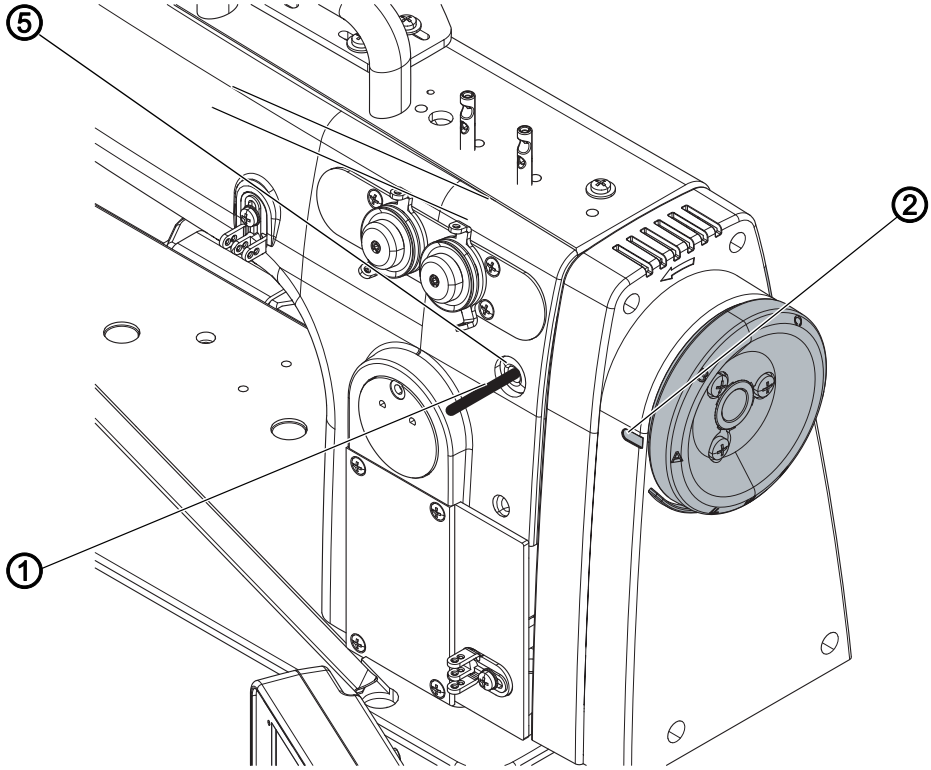
(1) - Locking pin
(2) - Marking
(3) - Handwheel
(4) - Adjusting disks with tracing grooves

There are letters on the handwheel (3) for orientation. If you turn the handwheel such that one of the letters is next to the marking (2), this means that the corresponding groove on the adjusting disk (4) is under the opening for the locking pin (1).

There are 6 locking positions for the following settings:

- **Position A**
  - Adjusting disk on the upper toothed belt wheel with its deepest slot A to the groove in the arm shaft crank
- **Position B**
  - Symmetry of the looper motion, i.e. when turning against the direction of rotation of the machine, the needle tip must also be in line with the center of the needle as is the case for slot C.
- **Position C**
  - Setting of the lower toothed belt wheel
  - Symmetry of the looper motion
  - Looping stroke
  - Needle bar height
- **Position D**
  - not used
- **Position E**
  - Thread pick-up disk
  - Holding position
- **Position F**
  - 1st screw of the top feed lifting cam in the direction of rotation with grooves of the pull rod
  - Stroke setting of the top feed foot

Fig. 18: Locking the machine (2)



(1) - Locking pin
(2) - Marking
(5) - Hole

Locking the machine

To lock the machine:

1. Remove the plug from the hole (5)
2. Turn the handwheel until the letter for the desired position is next to the marking (2).
3. Insert the locking pin (1) through the locking opening (1) into the groove of the adjusting disk.

Important

The letters on the handwheel serve for general orientation. In order to hit the groove precisely, you may have to turn the handwheel slightly.

Removing the lock

To remove the lock:

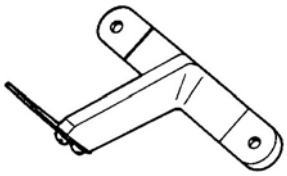
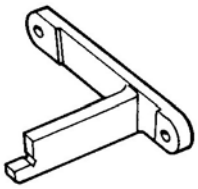
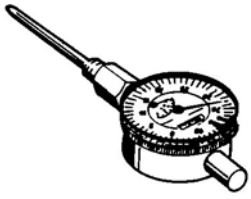
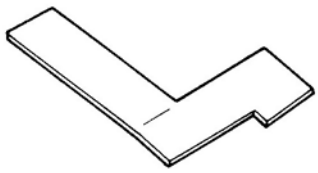
1. Pull out the locking pin (1).

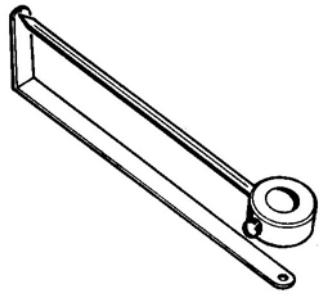
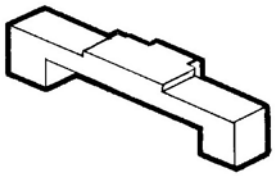
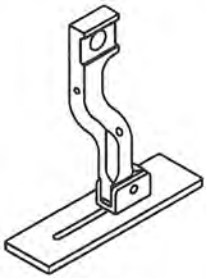
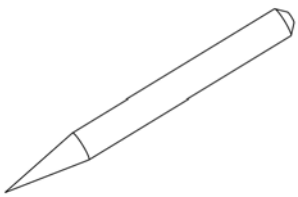
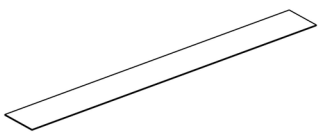
4 Gauge and key set

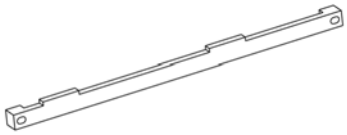
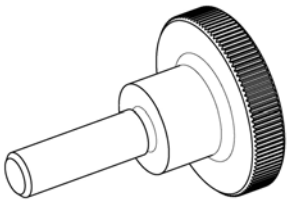
The gauges listed below enable precise setting and testing of the classes 610-01/630-01.

The locking pin listed is included in the accessory pack with every machine supplied. It can be used to lock handwheel positions A - F that are required for the machine settings.

Gauge and key set

Gauge	Part no.	Setting
	0933 000735	Setting the rocker bolt in the looper drive housing
	0933 000739 K	Setting the looper drive housing
	9301 022608 included in the accessory pack	Locking pin 5H8x60 For locking the handwheel in one of the setting positions A - F
	0171 000981	To measure the needle evasive movement (ellipsis width) of the looper drive. If you have your own dial gauge, only the clamping sleeve 171 984 and measuring pin 933 748 are required.
	0171 290010	Slant of the looper of 89° 30’

Gauge	Part no.	Setting
	0933 080192	Uniform looper movement for symmetry
	0933 000740	Height of the thread take-up disk
	0271 000767	Height of the feed
	0178 800024	Calibrating foot
	0558 006060	Adjusting needle Synchronizing the feeds
	0178 800033	PTFE strips Synchronizing the feeds

Gauge	Part no.	Setting
	0178 800010	Gauge bottom feed Synchronizing the feeds
	0238 010353	Cylinder pin 6H8x70
	9210 013397	Knurled screw M5x16

5 Setting the adjusting disk to the arm shaft crank

Information

The deepest slot **A** of the adjusting disk should be in line with the groove (1) in the arm shaft crank.

(Only when the adjusting disk is in this position are the settings to be made in the other slots also correct.)

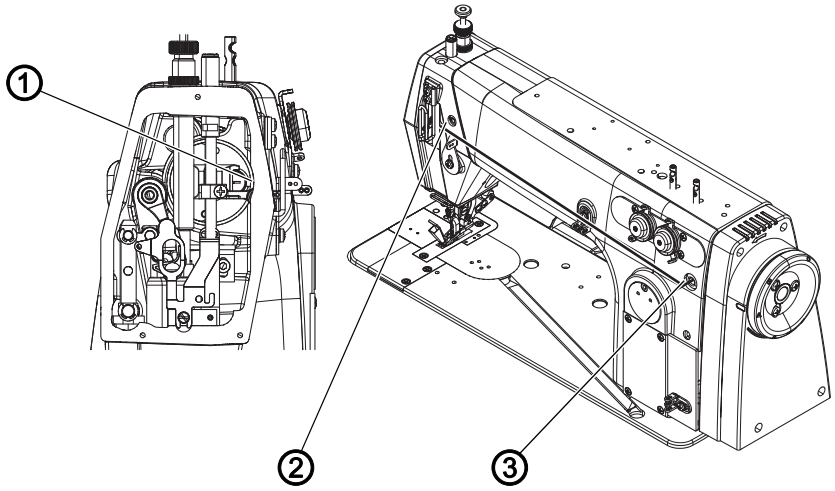
WARNING

Risk of injury due to moving parts!

Crushing is possible.

Switch off the machine befor setting the adjusting disk to the arm shaft crank.

Fig. 19: Setting the adjusting disk to the arm shaft crank (1)



(1) - Groove in the arm shaft crank
(2) - Hole for the locking pin
(3) - Hole for the locking pin

Proper setting

Check the factory setting using 2 locking pins (2, 3) (alternatively twist drill 5 mm).

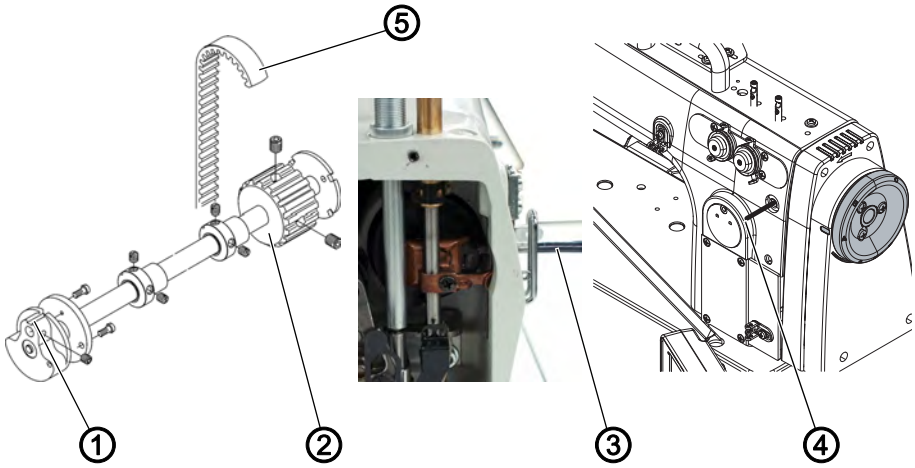
Disturbance

- All function sequences are disrupted

Cover

- Remove the head cover (📖 *p. 17*)
- Remove the arm cover (📖 *p. 18*)

Fig. 20: Setting the adjusting disk to the arm shaft crank (2)



(1) - Groove in the arm shaft crank
(2) - Upper toothed belt wheel
(3) - Locking pin
(4) - Locking pin
(5) - Toothed belt

To set the adjusting disk to the arm shaft crank:

1. Remove the toothed belt (5).
2. Loosen the screws on the upper toothed belt wheel (2).
3. Insert the locking pin (3) in the groove (1) of the arm shaft crank.
4. Turn the handwheel, until the locking pin (4) can be inserted into the deepest slot **A** of the adjusting disk.
5. Tighten the screws on the upper toothed belt wheel (2).
6. Fit the toothed belt (5).

6 Setting the holding position of the machine

NOTICE

Property damage possible!

Damage to the machine is possible.

When turning the ring, make sure that the ring does noct move axially onto the arm shaft.
Ensure that there is sufficient clearance on both sides in the slit of the hybrid light barrier

Proper setting

After the machine is switched on, the needle is in the reference position, top dead center. In handwheel position E, the machine is in this holding position.

Cover

- Remove the arm cover (📖 *p. 18*)

Fig. 21: Setting the holding position of the machine

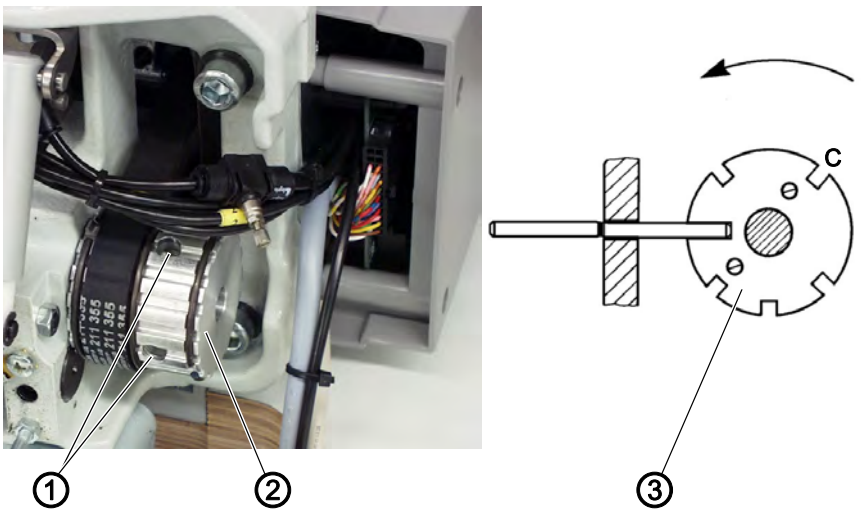
(1) - Edge of the take-up disk
(2) - Ring
(3) - Threaded pin

To set the holding position of the machine:

1. Setting the handwheel position **E**.
2. Loosen the threaded pin (3) of the ring (2) and turn the ring (2) accordingly.
3. Tighten the threaded pin (3).

7 Setting the lower toothed belt wheel

Fig. 22: Setting the lower toothed belt wheel



(1) - Screws
(2) - Lower toothed belt wheel
(3) - Arm shaft crank with tracing grooves

Proper setting

When positioning the toothed belt on the lower toothed belt wheel (2) it is important to ensure that both screws (1) are in slot **C** in the position shown, i.e., easily accessible with a hex key.

Disturbance

- Setting the machine is made more difficult

To set the lower toothed belt wheel:

1. Turn the lower toothed belt wheel (2) into the position shown.
2. Lock machine in position **C** (🕮 *p. 30*).
3. Place toothed belt on upper toothed belt wheel.

Order

After completely repositioning the toothed belt between the upper and lower shaft, make the following settings:

- Symmetry of the looper motion (🕮 *p. 52*)
- Looping stroke (🕮 *p. 57*)
- Needle bar height (🕮 *p. 58*)
- Thrust setting of the top feed foot (🕮 *p. 73*)
- Stroke setting of the top feed foot (🕮 *p. 70*)

8 Setting the sewing foot

8.1 Setting the sewing foot stroke

When the pedal is pressed backwards half-way, the sewing feet are lifted during sewing, e.g. to move the material being sewn.

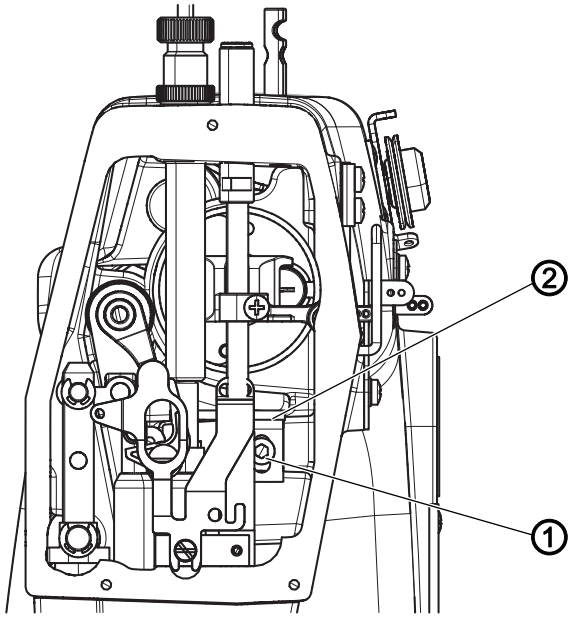
Proper setting

The distance between the lifted sewing feet and the throat plate is pre-set to 9 mm on delivery.

Cover

- Remove the head cover (📖 *p. 17*)

Fig. 23: Setting the sewing foot stroke



(1) - Screw *(2) - End stop*

To set the sewing foot stroke:

1. Loosen the screw (1).
2. Move the end stop (2) upwards.
3. Tighten the screw (1).

8.2 Setting the speed of the sewing foot lifting

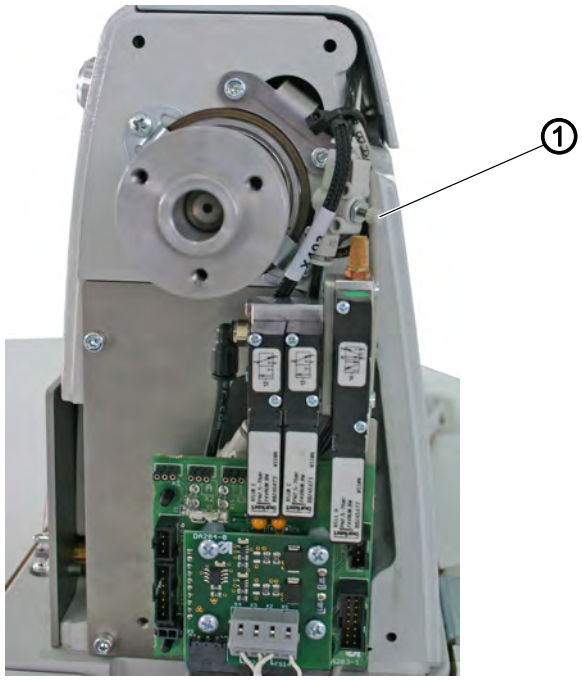
NOTICE

Property damage possible!

If the tulle foot is lowered too quickly, it can be damaged or destroyed.

Set the lowering speed appropriately.

Fig. 24: Setting the speed of the sewing foot lifting



(1) - Throttle

Proper setting

When the throttle was completely closed, it must be opened by 3 full revolutions counterclockwise.

Cover

- Remove the belt guard (📖 *p. 24*)

To set the speed of the sewing foot lifting:

1. Turn the throttle (1):
   - faster lowering: turn the throttle (1) counterclockwise.
   - slower lowering: turn the throttle (1) clockwise.

9 Setting the looper

9.1 Setting the rocker bolt and the left lower shaft bearing

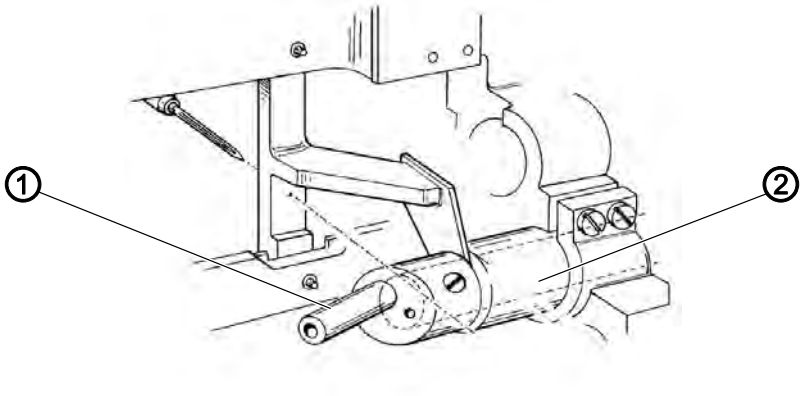
WARNING

Risk of injury due to moving parts!

Crushing is possible.

Switch off the machine before setting the rocker bolt and the left lower shaft bearing.

Fig. 25: Setting the rocker bolt and the left lower shaft bearing



(1) - Rocker bolt

(2) - Left lower shaft bearing

Cover

- Remove the covers on the base plate (📖 *p. 19*)

Order

- Remove the needle
- Remove the throat plate (📖 *p. 20*)
- Remove the oil pan (📖 *p. 23*)
- Remove the thread cutting device (📖 *p. 26*)
- Drain the oil in the looper drive housing (📖 *p. 43*)
- Remove the needle protection (📖 *p. 28*)
- Remove the looper mounting (📖 *p. 29*)
- Remove the looper drive housing (📖 *p. 44*)
- Set the lower bearing and rocker bolt (📖 *p. 42*)

9.1.1 Draining and filling the oil in the looper drive housing

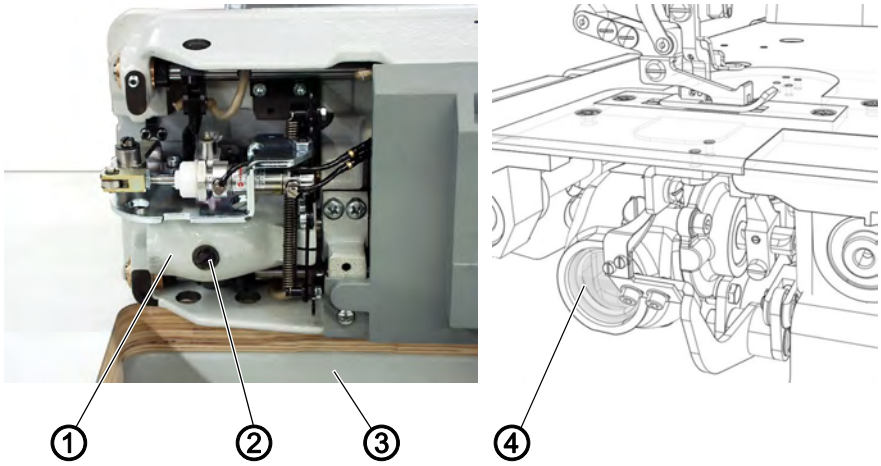
CAUTION

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 the legal regulations.

Fig. 26: Draining and filling the oil in the looper drive housing



(1) - Looper drive housing
(2) - Oil drain screw
(3) - Oil pan
(4) - Mark

Draining the oil

To drain the oil:

1. Tilt the machine head (📖 *p. 16*).
2. Loosen the oil drain screw (2).
3. Place an appropriate collection tray in the oil pan (3).
4. Carefully tilt the machine backward and allow the oil to drain out completely.

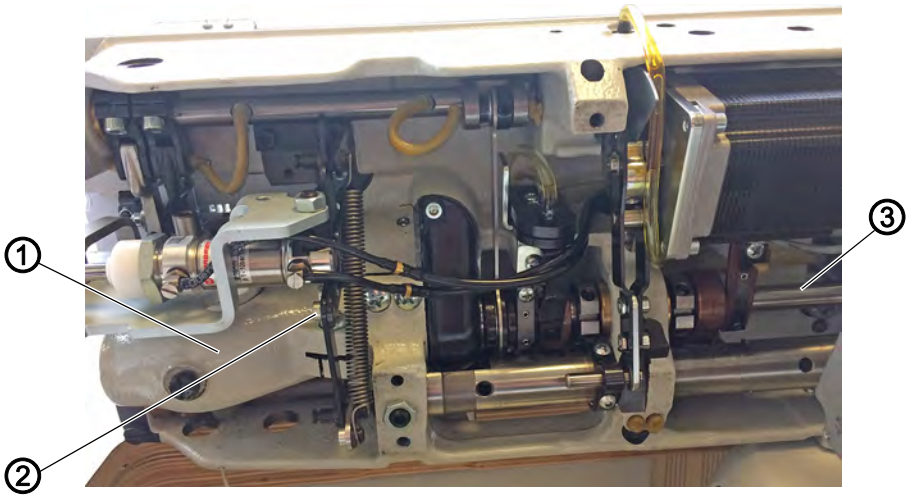
Topping up the oil

To top up the oil:

1. Tilt the machine head (📖 *p. 16*).
2. Top up the looper drive housing (1) with the oil, **DA 10** up to the upper mark (4) on the sight glass.
3. Screw in the oil drain screw (2).

9.1.2 Removing and fitting the looper drive housing

Fig. 27: Removing and placing the looper drive housing



(1) - Looper drive housing
(2) - Lower shaft
(1) - Clamping screw

Removing the looper drive housing

To remove the looper drive housing:

1. Tilt the machine head (📖 *p. 16*).
2. Loosen the clamping screw (2).
3. Pull the looper drive housing (1) carefully off to the left. While doing so, slowly turn the lower shaft (3).

Fitting the looper drive housing

To fit the looper drive housing:

1. Push the looper drive housing (1) carefully on to the right. While doing so, slowly turn the lower shaft (3) until the rocker bolt is engaged in its mounting.
2. Tighten the clamping screw (2).

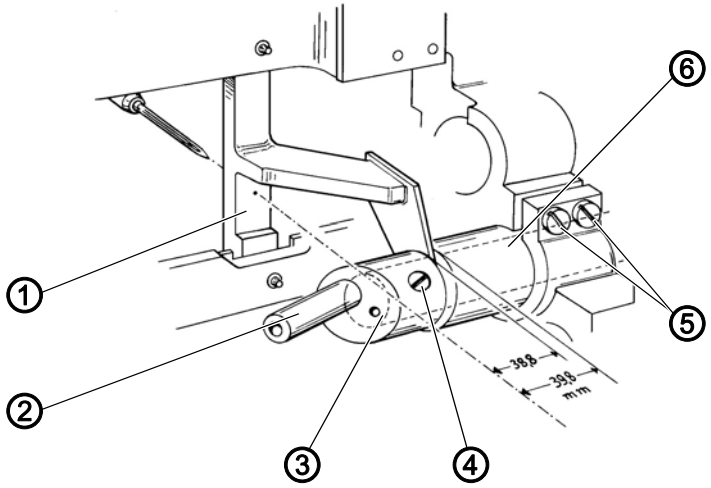
Order

After installing a completely new looper drive housing, make the following settings:

- Set the looper drive housing (📖 *p. 48*)
- Set the needle evasive movement (📖 *p. 49*)
- Set the symmetry of the looper motion (📖 *p. 52*)
- Set the looper in the looper mounting (📖 *p. 54*)
- Set the looper and needle bar height (📖 *p. 56*)

9.1.3 Setting the left lower shaft bearing

Fig. 28: Setting the left lower shaft bearing



(1) - Gauge
(2) - Rocker bolt
(3) - Face of the lower shaft
(4) - Screw
(5) - Screws
(6) - Lower shaft bearing

Proper setting

The distance from the center of the needle to the start of the left lower shaft bearing (6) is to be 39.8 mm and from the center of the needle to the end of the rocker bolt is to be 38.8 mm.

To set the left lower shaft bearing:

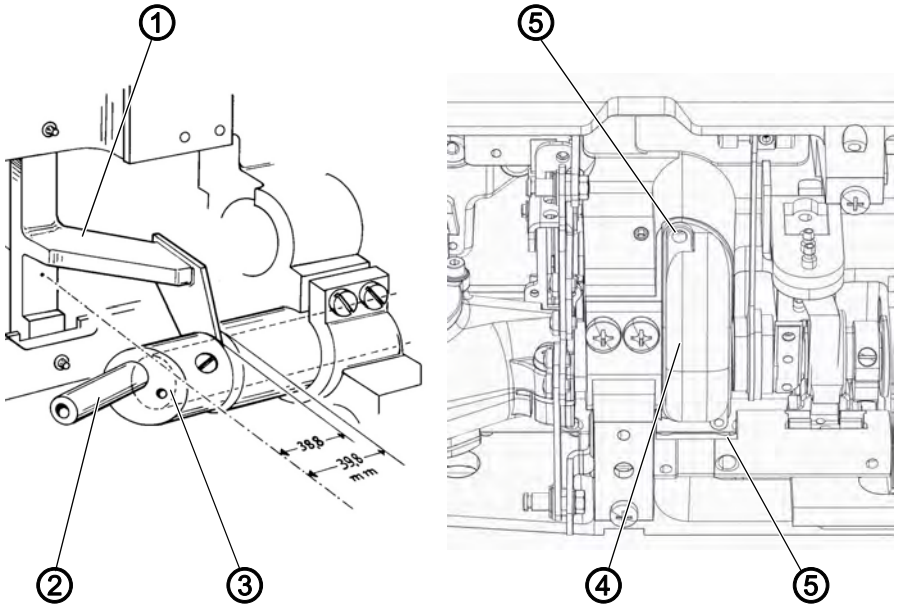
1. Screw the gauge (1), part number 0933 000735, onto the needle plate support.
2. Loosen both clamping screws (5).
3. Move the lower shaft bearing (6) to the gauge (1).
4. Tighten both clamping screws (5).

Disturbance

- Damage to the looper
- Damage to the needle
- Damage to the thread cutter
- Missed stitches
- Thread breakage

9.1.4 Setting the rocker bolt

Fig. 29: Setting the rocker bolt (1)



(1) - Gauge
(2) - Rocker bolt
(3) - Face of the lower shaft
(4) - Grease cap
(5) - Screws

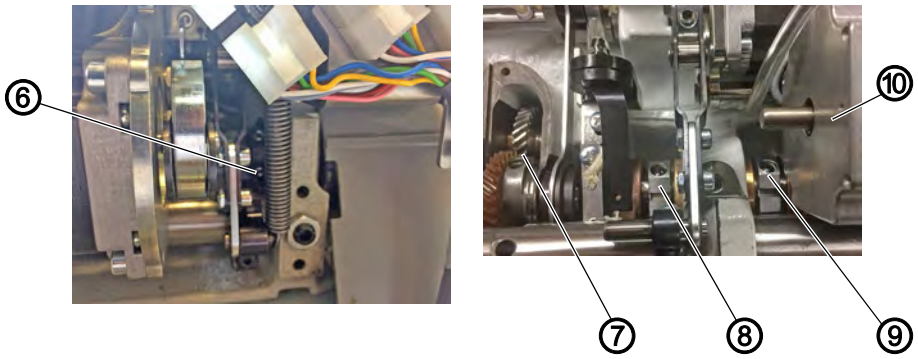
Proper setting

The rocker bolt (2) must be pushed up against the face (3) of the lower shaft.

To set the rocker bolt:

1. Remove the grease cap (4).
   The second fastening screw (5) is accessible from the upper side of the base plate.
2. Screw the gauge (1), part number 0933 000735, onto the needle plate support.

Fig. 30: Setting the rocker bolt (2)



(6) - Screw
(7) - Gear wheel
(8) - Eccentic
(9) - Eccentric
(10) - Lower shaft

3. Loosen eccentics (8) and (9), gear wheel (7), and screw (6).
4. Slide the lower shaft (10) such that there is a distance of 1 mm between lower shaft bearing (4) and rocker bolt (2) or the rocker bolt abuts on the gage (1).
5. Tighten the eccentrics (8) and (9), tighten the screw (6), and align the gear wheel (7).
6. Tighten the screws.
7. Check the movement of the toothed belt on the lower toothed belt wheel. If required, align the lower toothed belt wheel.
8. Fit the looper drive housing (📖 *p. 44*) and fill with **DA** 10 oil (📖 *p. 43*).

Disturbance

- Damage to the looper
- Damage to the needle
- Damage to the thread cutter
- Missed stitches
- Thread breakage

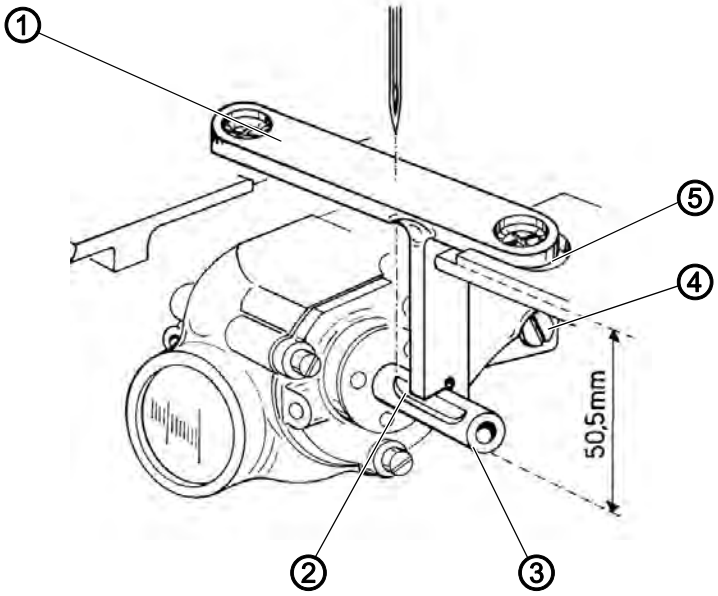
Order

After setting the rocker bolts and left lower shaft, make the following settings:

- Fit all parts
- Symmetry of the looper motion (📖 *p. 52*)
- Looping stroke and looper gauge to the needle (📖 *p. 57*)
- Looper and needle bar height (📖 *p. 56*)

9.2 Setting the looper drive housing

Fig. 31: Setting the looper drive housing (1)



(1) - Gauge
(2) - Looper shaft
(3) - Looper shaft lower edge
(4) - Clamping screw
(5) - Throat plate support

Proper setting

The needle point should point to the center of the looper shaft (2) and the looper shaft lower edge should be parallel to the underside of the needle plate.
This corresponds to a distance of 50.5 mm between the lower edge of the looper shaft (3) and the needle plate support (5).

Disturbance

- Damage to the looper
- Damage to the needle
- Damage to the thread cutter
- Missed stitches
- Thread breakage

Order

- Remove the needle
- Remove the throat plate (📖 *p. 20*)
- Remove the oil pan (📖 *p. 23*)
- Removing the thread cutting device (📖 *p. 26*)
- Remove the needle protection (📖 *p. 28*)
- Remove the looper mounting (📖 *p. 29*)

To set the looper drive housing:

1. Screw the gauge (1), part number 0933 000739 K, onto the needle plate support.
2. Loosen the clamping screw (4).
3. Align the looper drive housing such that the looper shaft (2) lies in the cutout of the gauge (1).
4. Tighten the clamping screw (4).

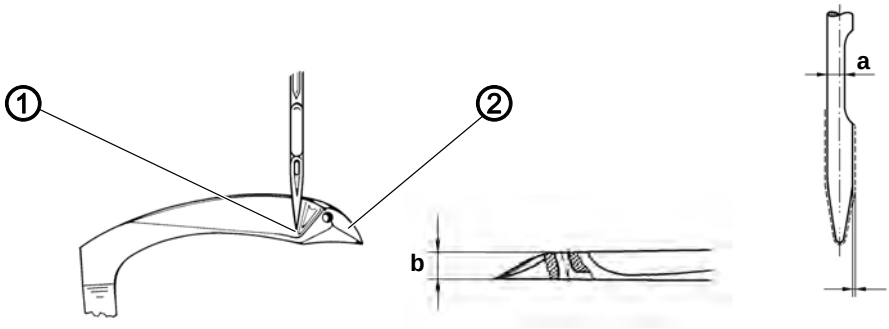
Order

After setting the looper drive housing, make the following settings:

- Symmetry of the looper motion (📖 *p. 52*)
- Looping stroke and looper gauge to the needle (📖 *p. 57*)
- Looper and needle bar height (📖 *p. 56*)

9.3 Setting the needle evasive movement (ellipsis width)

Fig. 32: Setting the needle evasive movement



(1) - Spitze der Nadel
(2) - Greifer
a *- Nadelstärke*
b *- Greiferdicke*

Proper setting

The needle evasive movement is correctly set if during the looper movement from right to left, the distance to the needle is 0.1 mm and during the looper movement from left to right the point (1) of the descending needle is at the back of the looper (2) at the moment when the looper and needle take up the position shown in the above sketch.

The precise dimension of the evasive movement depends on the needle system and the needle thickness.

It must therefore be calculated using the following formula:

$$E = a + b + 0.1 + X$$

Example using a 934 SIN/Nm 110 needle

Needle thickness at "a"= 0.7 mm

Looper thickness at "b"= 1.4 mm

Distance from looper tip to the needle = 0.1 mm

For larger needle thickness 110 Nm "X" *= 0.1 mm

Ellipsis width "E"= 2.3 mm

*X = larger dimension a for larger needle thicknesses.

X for Nm 100	= 0 mm
X for Nm 110 and 120	= 0.1 mm
X for Nm 130	= 0.2 mm

To set, move the lower shaft axially

To the right = ellipsis width is smaller

To the left = ellipsis width is larger

9.3.1 Setting the needle evasive movement

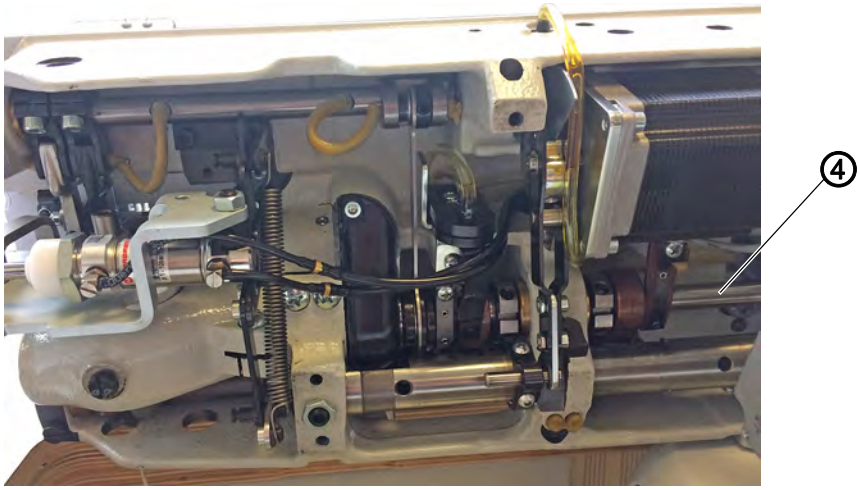
Fig. 33: Setting the needle evasive movement (1)

(1) - Dial gauge
(2) - Clamping sleeve
(3) - Looper shaft

To set the needle evasive movemenrt:

1. Screw on the clamping sleeve (2) and fit the dial gauge (1).
2. Turn the handwheel to position the looper shaft (3) at its lowest point.
3. Set the measured value **0** on the dial gauge (1).
4. Turn the handwheel to position the looper shaft (3) at its highest point.
5. Read the difference off the dial gauge.

Fig. 34: Setting the needle evasive movement (2)



(4) - Lower shaft

Important

If the dimension does not match the calculated dimension for the ellipsis width, the lower shaft (2) must be loosened and adjusted.

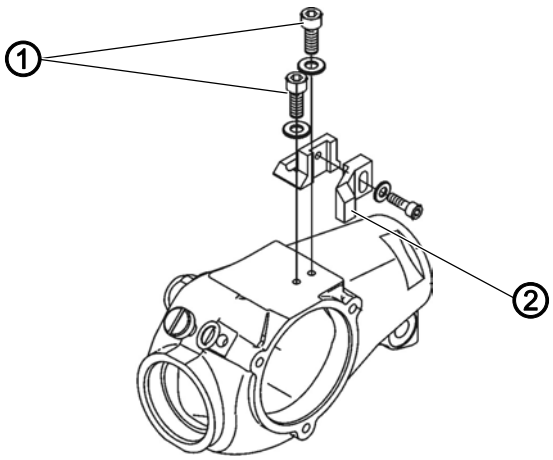
When adjusting in the axial direction, the ellipsis width changes in the ratio of 1:2, i.e., when the lower shaft is moved, e.g. by 0.2 mm, the ellipsis width changes by 0.1 mm.

Disturbance

- Damage to the looper
- Damage to the needle
- Missed stitches
- Thread breakage

9.3.2 Resetting the needle protection

Fig. 35: Resetting the needle protection



(1) - Screw

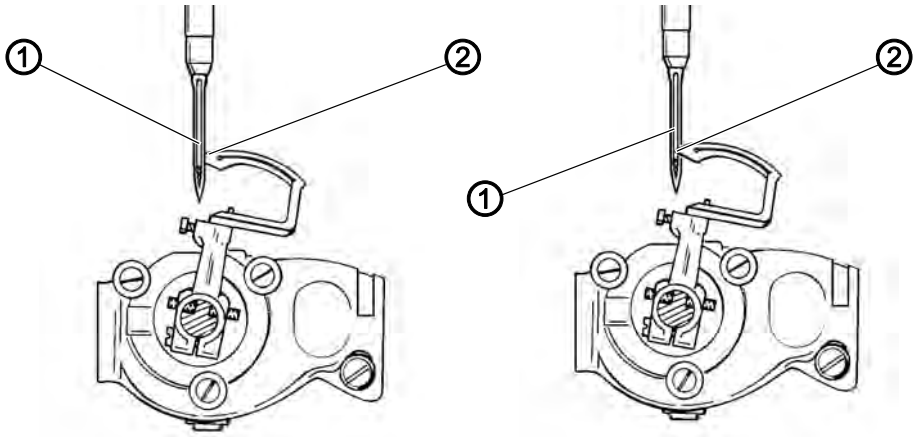
(2) - Needle protection

To reset the needle protection:

1. Loosen the screws (1) and reset the needle protection (2).

9.4 Setting the symmetry of the looper motion

Fig. 36: Setting the symmetry of the looper motion (1)



Position C **Position B**

(1) - Center of the needle

(2) - Looper tip

Proper setting

Setting the symmetry means that the looper tip is in line with the center of the needle for machines locked both in slot **C** and slot **B**.
The looper tip is to be behind the needle in slot **C** and in front of it in slot **B**.

Disturbance

- Damage to the looper
- Damage to the needle
- Missed stitches
- Thread breakage

Order

Before making adjustments, the following parts must be removed:

- Thread cutting device (📖 *p. 26*)

Fig. 37: Setting the symmetry of the looper motion (2)

(3) - Indicator
(4) - Gauge
(5) - Lower toothed belt wheel

To set the symmetry of the looper motion:

1. To ensure precise adjustments, secure the gauge (4), part number 933 80192, to the looper drive housing and the indicator (3) to the looper shaft.
2. Loosen the screws on the lower toothed belt wheel (5).
3. Turn the lower shaft such that the indicator (3) is above the marking on the gauge (4) both in slot **C** and **B**.
4. When you turn the lower shaft, the indicator must swing out to the left.
5. Tighten the screws on the toothed belt wheel (5).

Information

If you do not have a gauge available, perform the adjustment as shown in the drawings.

9.5 Setting the looper in the looper mounting

Proper setting

The front of the looper should be positioned at an angle of 89° 30’ to the edge of the machine plate.

If there are 2 bloopers, the rear one must be aligned and tightened first, followed by the front one.

Setting is performed using the gauge, part number 0171 290010.

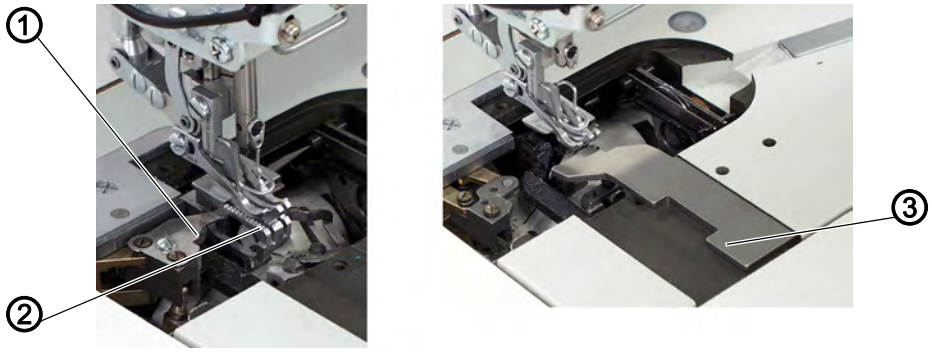
Disturbance

- Damage to the looper
- Damage to the needle
- Missed stitches
- Thread breakage

Cover

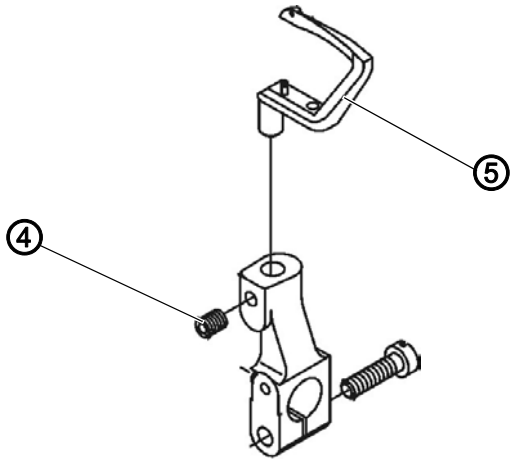
- Remove the covers on the base plate (📖 *p. 19*)
- Remove the throat plate (📖 *p. 20*)
- Remove the feed (2) (📖 *p. 22*)
- Remove the thread cutter (1) (📖 *p. 26*)

Fig. 38: Setting the looper in the looper mounting (1)



(1) - Blade
(2) - Feed
(3) - Gauge

Fig. 39: Setting the looper in the looper mounting (2)



(4) - Screw *(5) - Looper*

To set the looper in the looper mounting:

1. Loosen the screw (4).
2. Place the gauge (3), part number 0171 290010, on the right side of the base plate cutout.
3. Move the looper (5) to the gauge and tighten the screw (4).

9.6 Setting the looper and needle bar height

The following 3 settings must be coordinated:

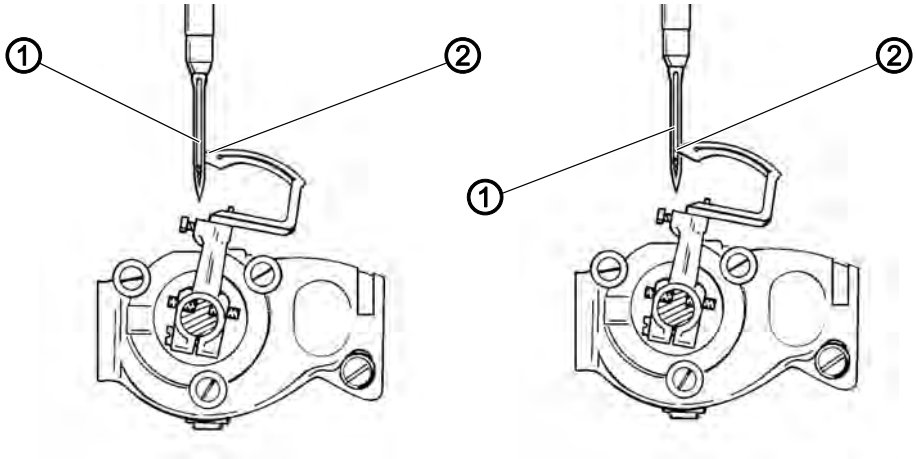
- Looping stroke position and looping stroke
- Needle bar height
- Looper gauge to the needle

Information

The **looping stroke position** is the position of the looper, in which the looper tip points precisely at the center line of the needle.

The **looping stroke** is the length of the distance from the bottom dead center of the needle bar to the height reached by the looper in the looping stroke position. The looping stroke is 3.5 mm.

Fig. 40: Setting the looper and the needle bar height (1)



Position C **Position B**

(1) - Center of the needle *(2) - Looper tip*

Proper setting

When the needle (1) has risen by 3.5 mm from its bottom dead center as a result of turning the handwheel in the direction of rotation, the looper tip (2) must be at the center of the needle - Slot C of the adjusting disk.

This setting must also be present in the opposite direction of rotation - Slot B of the adjusting disk.
For more on this, see also chapter **Setting the symmetry of the looper motion** (📖 *p. 52*).

Disturbance

- Damage to the looper
- Damage to the needle
- Missed stitches
- Thread breakage

Order

Prerequisite:

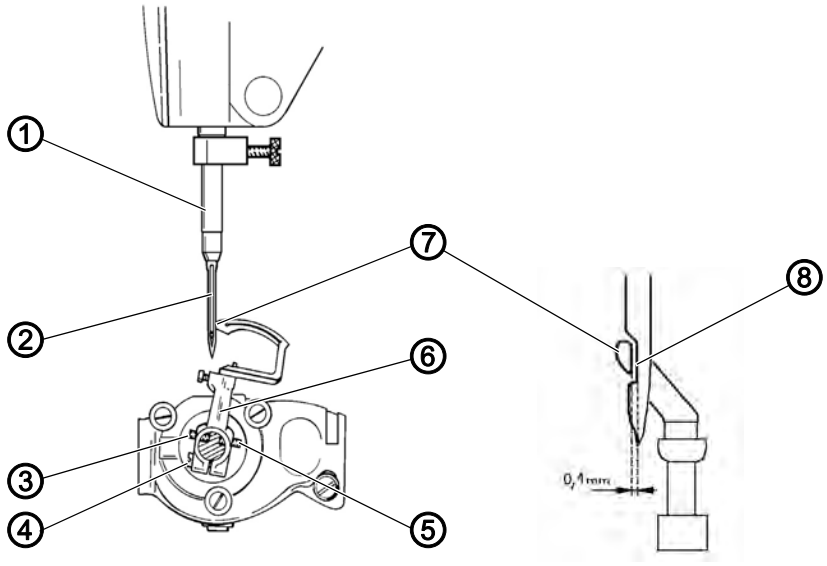
- A straight and undamaged needle must be used (📖 *Operating Instructions*)

9.6.1 Setting the looping stroke position and looper gauge

Cover

- Remove the covers on the base plate (📖 *p. 19*)
- Remove the throat plate (📖 *p. 20*)

Fig. 41: Setting the looping stroke position and looper gauge



(1) - Needle bar
(2) - Needle
(3) - Adjusting screw
(4) - Screw
(5) - Adjusting screw
(6) - Looper mounting
(7) - Looper tip
(8) - Groove of the needle

To set the looping stroke position and looper gauge:

1. Turn the needle bar (1) into the looping stroke position.
2. Lock the machine in slot **C**.
3. Loosen the screw (4).
4. Set the **looping stroke position**:
   Place the looper tip (6) behind the needle (2) on the center line. To do this, turn the adjusting screws (3) and (5) accordingly.
5. **Set the looper gauge**:
   Set a distance of 0.1 mm by moving the looper mounting (6) axially between the looper tip and the needle groove (8).
6. Tighten the screw (4).

Order

After setting the looping stroke position and looper gauge, make the following settings:

- Needle bar height (📖 *p. 58*)
- Check the symmetry of the looper motion (Pos. B and C) (📖 *p. 52*)

7. After definitively aligning the looping stroke position, looper gauge and needle bar: cancel the lock (📖 *p. 30*).

9.6.2 Setting the needle bar height

Cover

- Head cover (📖 *p. 17*)

Proper setting

When the looper eye (4) is in line with the middle of the needle, the lower edge of the needle eye (3) and the upper edge of the looper eye should be at the same level.

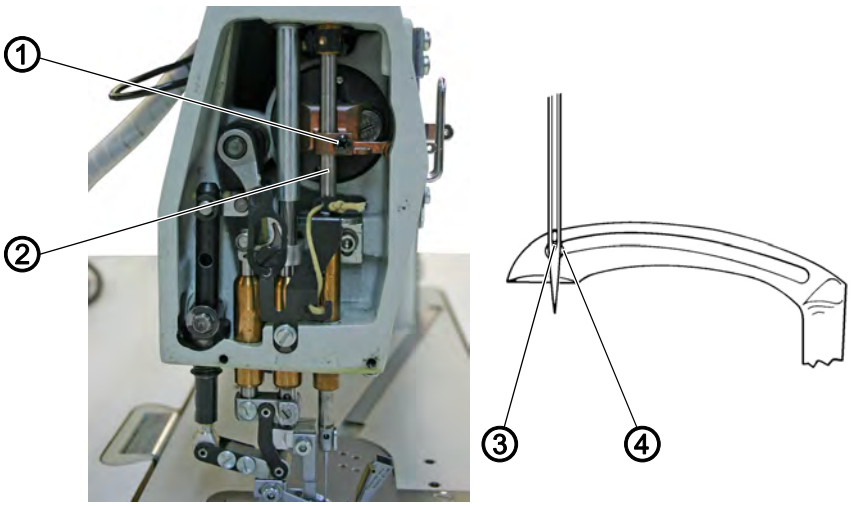
Faults due to incorrect setting

- Missed stitches
- Thread breakage

Order

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

Fig. 42: Setting the needle bar height



(1) - Screw
(2) - Needle bar
(3) - Lower edge of the needle eye
(4) - Lower edge of the looper eye

To set the needle bar height:

1. Loosen the screw (1).

2. Set the needle bar height such that the lower edge of the needle eye (3) and the upper edge of the looper eye (4) are at the same level.

Important

Do not turn the needle bar to the side while doing this.

3. Tighten the screw (1).

Order

After setting the needle bar height, make the following settings:

- Looping stroke position and looper gauge (📖 *p. 57*)

9.7 Setting the retention spring on the looper

Proper setting

When the looper moves from **right to left** the needle thread loop (4) must slide to above the holding point (1) between the retention spring (2) and the looper (3).

When the looper moves from **left to right** the needle thread loop should be held at the holding point (1) until the descending needle has entered the thread triangle on the left in front of the needle thread loop (4).

As the needle moves to its upper position and the looper moves to the left, the needle point should pass the retention spring (2) at a distance of approx. 0.5 mm.

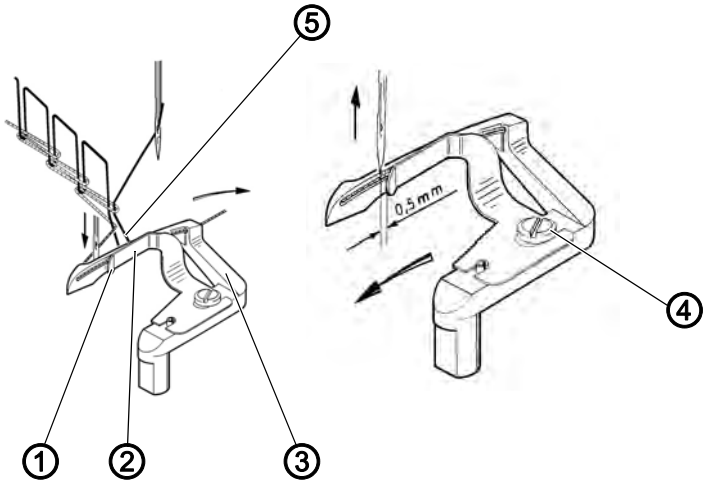
Disturbance

- Missed stitches
- Thread breakage

Cover

- Remove the covers on the base plate (📖 *p. 19*)
- Remove the throat plate (📖 *p. 20*)

Fig. 43: Setting the retention spring on the looper



(1) - Holding point
(2) - Retention spring
(3) - Looper
(4) - Screw
(5) - Needle thread loop

To set the retention spring on the looper:

1. Loosen the screw (4).
2. Set the distance to 0.5 mm by sliding the retention spring (2).
3. Bend the retention spring (2) so that it rests flat against the looper (3). Make sure that the pressure is greatest in front at the holding point (1).
4. Fasten the screw (4).
5. Tilt the machine head and turn the handwheel.

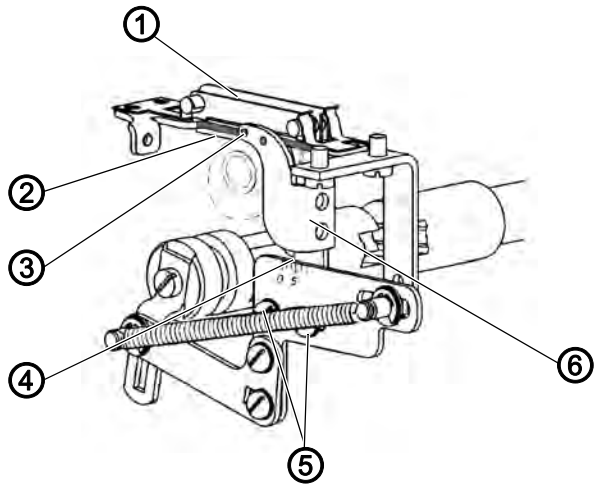
Important

The force of the pressure of the spring against the looper must be checked when the machine is completed and threaded.

6. Check the described stitch formation during the right-to-left and left-to-right looper motion.
   If required, if the needle thread loop is not pushed beyond the holding point (1) reduce the pressure of the retention spring by bending it, or increase the pressure if the needle thread loop is not held at the holding point (1) until the needle enters the thread triangle on the left in front of the needle thread loop.
7. Perform the sewing process.
8. Check the stitch formation.

9.8 Setting the stitch length-controlled thread take-up

Fig. 44: Setting the stitch length-controlled thread take-up



(1) - Thread down-holder
(2) - Thread dorn-holer, lower bar
(3) - Hole
(4) - Scale
(5) - Screws
(6) - Looper thread take-up

Proper setting

The stitch length-controlled thread take-up (1) enables an automatic adjustment of the looper thread quantity to the relevant stitch length.

When adjusting the stitch length, the thread take-up is actuated accordingly via the lower guide shaft.

The setting values are easily reproduced using a scale (2).

Disturbance

- Missed stitches
- Thread breakage

To set the stitch length-controlled thread-take-up:

1. Tilt the machine head.
2. Loosen the fastening screws (5).
3. Move the looper thread take-up (6):
   - **Tighter** seam:
     Move front edge (4) in the direction of **0**.
   - **More elastic** seam:
     Move front edge (4) in the direction of **5**.

Important

Ensure that the height of the looper thread take-up (5) is not changed. The hole (3) must always remain above the bar (2) of the thread down-holder (1).

4. Tighten the fastening screws (5).

5. Re-erect the machine head.

Important

For an extreme setting, e.g. shortest possible stitch length and largest possible thread quantity (flexible seam) it must be ensured that it is possible for the needle to enter into the thread triangle again securely.

Overly large thread quantities can cause missed stitches.

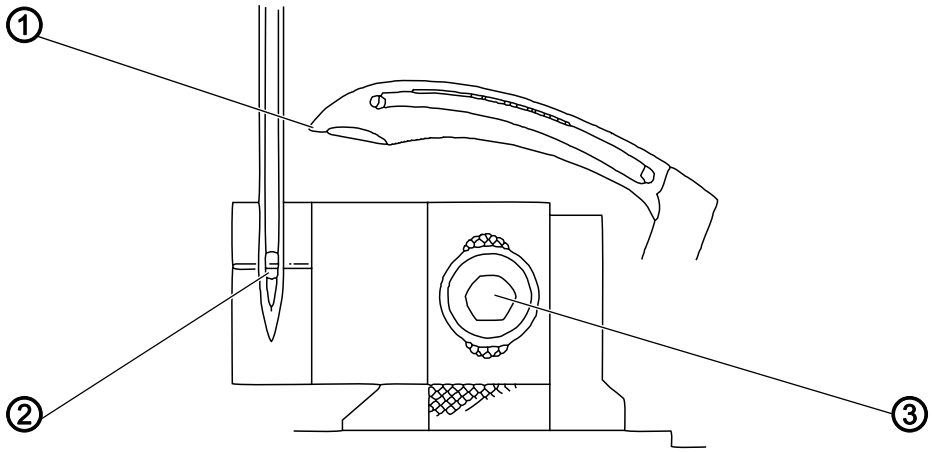
If for the above settings the stitch length must be increased significantly, then the thread guide must be reset in direction 0.

Otherwise the looper thread could come off in area X of the thread take-up disk.

The looper thread would not, during the backward motion of the looper, be pulled back through the take-up disk as required.

10 Setting the needle protection

Fig. 45: Setting the needle protection (1)



(1) - Looper tip
(2) - Eye of the needle
(3) - Screw

Proper setting

If the looper tip (1) moves to the left and reaches the needle, the needle point should lie on the looper protection.
If one were to press against the needle at this time, it should not be possible to press it into the path of the looper tip.
In the lowest needle position, half of the needle eye (2) must remain clear.

Disturbance

- Damage to the looper
- Damage to the needle
- Missed stitches
- Thread breakage

Order

Prerequisite:
A straight and undamaged needle must be used
(📖 *Operating Instructions*).

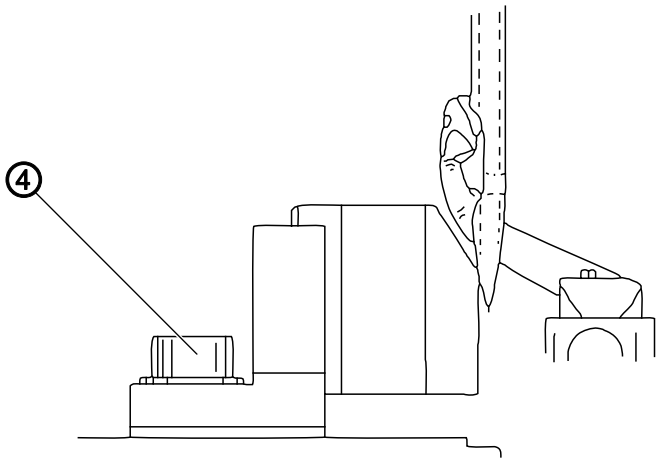
Cover

- Remove the covers on the base plate (📖 *p. 19*)
- Remove the throat plate (📖 *p. 20*)

To set the needle protection:

1. Loosen the screw (3).
2. Adjust the height of the needle protection accordingly.
3. Tighten the screw (3).

Fig. 46: Setting the needle protection (2)



(4) - Screws

4. Loosen screws (4).
5. Move the needle protection to the needle point.
6. Tighten the screws (4).

Important

The needle must not be pushed aside any more than required.

11 Differential top and bottom feed

11.1 Setting the feed motion of the feeds

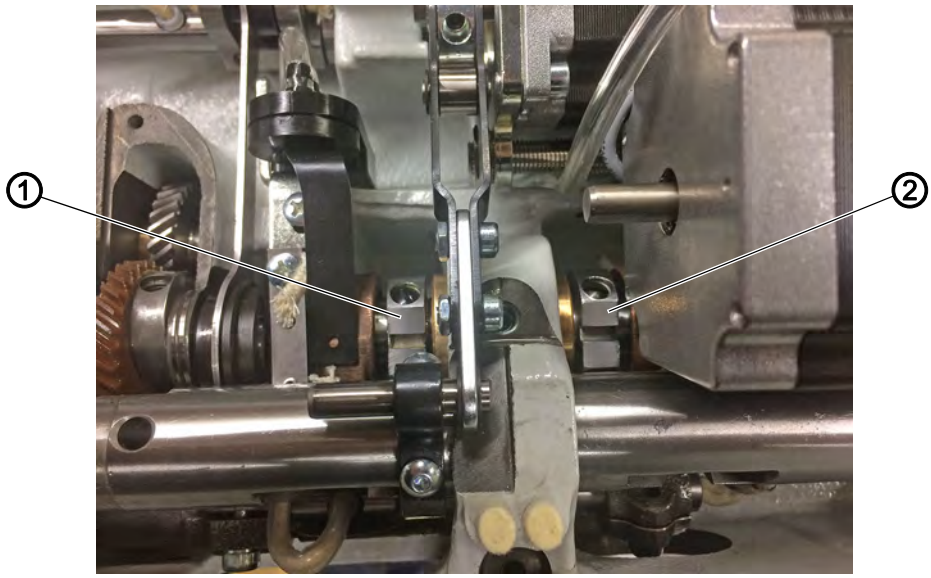
Proper setting

After passing the dead center of the needle bar, the feed should perform another small thrust motion. The groove of the 2 cams (1) and (2) on the lower shaft both point forwards.

Cover

- Tilt the machine (📖 *p. 16*)
- Remove the oil pan (📖 *p. 23*).

Fig. 47: Setting the feed motion of the feeds



(1) - Stroke eccentric (main transport)

(2) - Pusher eccentric (differential transport)

To set the feed motion of the feeds

1. Lock machine in position **D**.
2. Loosen both screws on the stroke cam (1).
3. Align the groove forwards (3 o'clock).
4. Tighten both screws on the stroke cam (1).
5. Loosen both screws on the thrust cam (2).
6. Align the groove forwards (3 o'clock).
7. Tighten both screws on the thrust cam (2).

11.2 Setting the stroke motion of the feed

Proper setting

When the needle eye of the descending needle reaches the hole of the throat plate, the descending tooth points of the feed should be level with the throat plate surface. This setting corresponds to slot D of the adjusting disk.

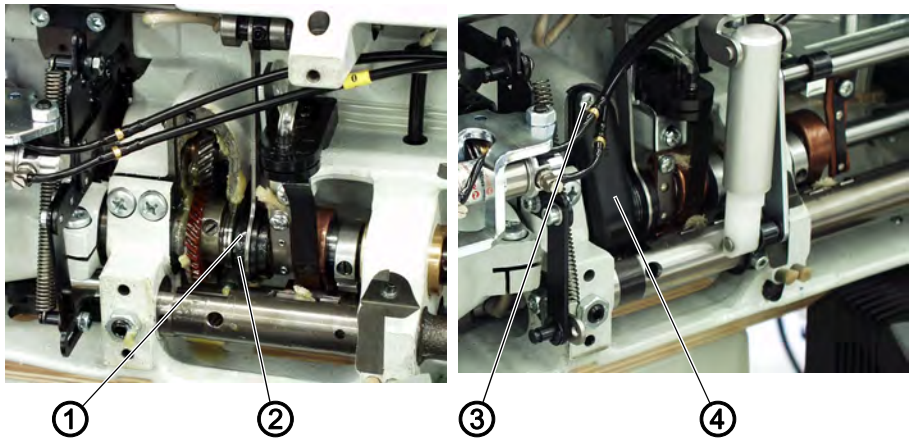
Disturbance

- Damage to the looper
- Damage to the needle
- Missed stitches
- Thread breakage

Cover

- Tilt the machine (📖 *p. 16*)
- Remove the oil pan (📖 *p. 23*)

Fig. 48: Setting the stroke motion of the feed



(1) - Screws
(2) - Stroke cam
(3) - Screw
(4) - Grease cap

To set the stroke motion of the feed:

1. Loosen both screws (3) and remove the grease cap (4).
   The second screw (3) is accessible from the upper side of the base plate.
2. Loosen both screws of the stroke cam (2).
3. Setting the stroke cam:
   - Turn **clockwise**: earlier stroke
   - Turn **counterclockwise**: later stroke
4. Position the grease cap (4) and secure with both screws (3).

11.3 Setting the angle of incline and the height of the feeds

Proper setting

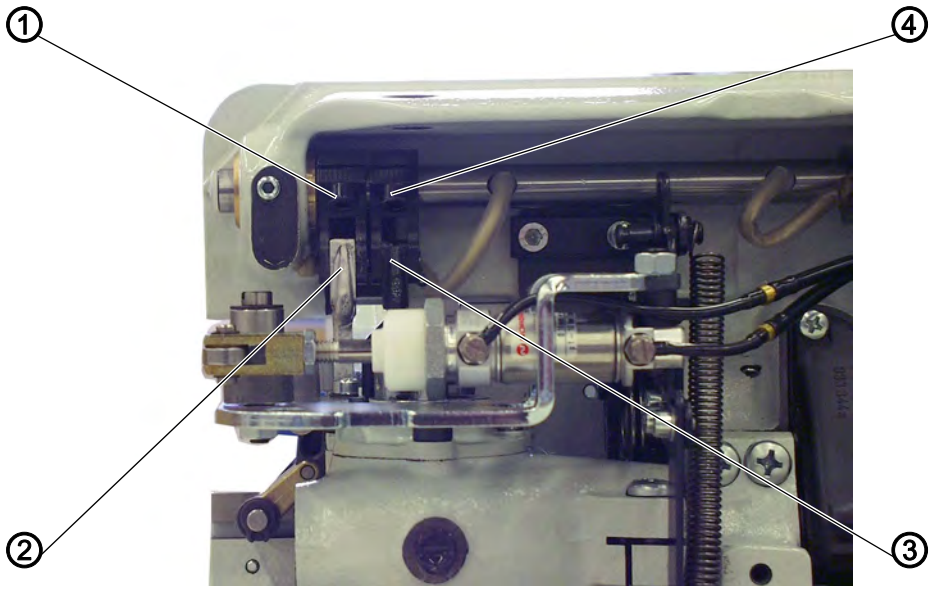
The main feed (right feed mounting - 3) is in the highest position 1.1 mm and parallel above the surface of the throat plate.

The differential feed (left feed mounting - 2) is in the highest position 1.5 mm and parallel above the surface of the throat plate.

Disturbance

- Damage to the looper
- Damage to the needle

Fig. 49: Setting the angle of incline and the height of the feeds



(1) - Screw
(2) - Left feed mounting
(3) - Right feed mounting
(4) - Screw

To set the angle of incline and the height of the feeds:

1. Loosen the screws (1) and (4).
2. Setting the height of the feed mounting:
   - Main feed (3): 1.1 mm
   - Differential feed (2): 1.5 mm
3. Tighten the screws (1) and (4).

11.4 Basic setting of bottom feed guides

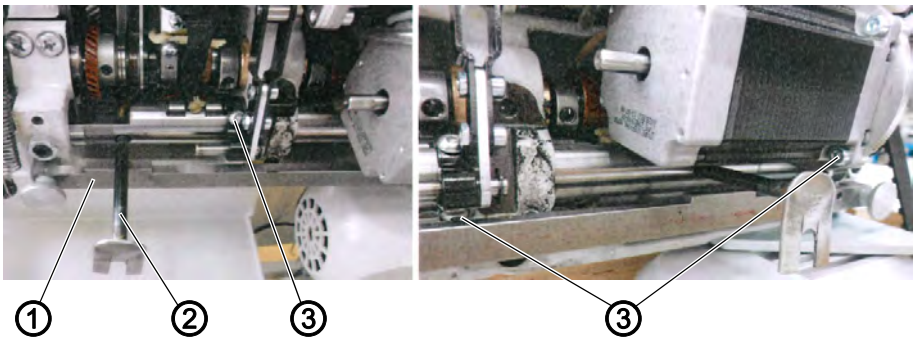
Disturbance

- Damage to the throat plate
- Damage to the feeds
- Noise

Cover

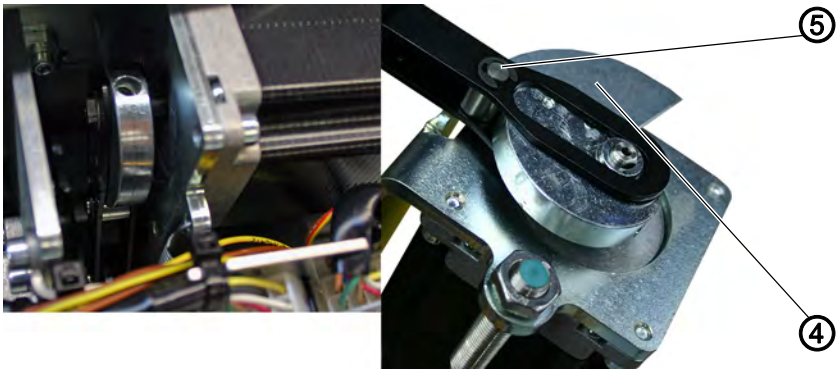
- Remove the arm cover (📖 *p. 18*)
- Tilt the machine (📖 *p. 16*)

Fig. 50: Basic setting of bottom feed guides (1)



(1) - Bottom feed gauge
(2) - 6 mm pin (0238 0103553)
(3) - Screw

Fig. 51: Basic setting of bottom feed guides (2)



(4) - Switching flag
(5) - Roller

To set the basic setting of the bottom feed guides:

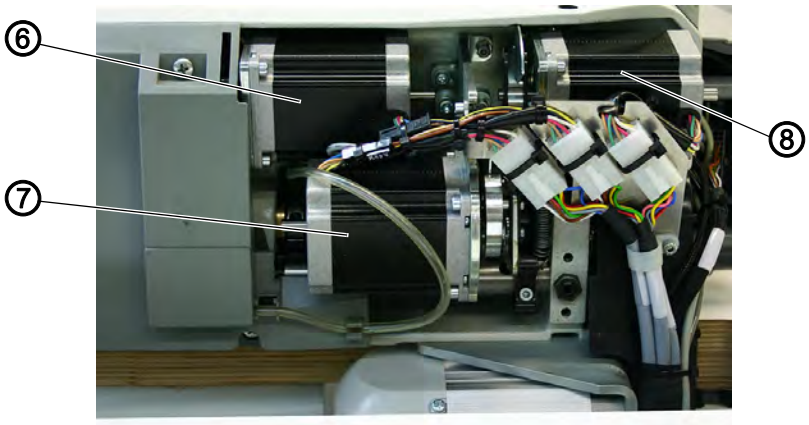
1. Secure the bottom feed gauge (0178 800010) with 2 M5x16 screws or knurled screw (9210 013397).
2. Turn both switching flags (8) of both upper stepper motors (4,6) such that the rollers (7) are at the largest diameter of the switching flags.

↳ The edge of the switching flag lies on the roller.

3. Loosen the clamping screws (3) for both guides.
4. Insert 6 mm pin (2) into the left hole of one guide and turn the guides such that the 6 mm pin (2) comes to rest against the gauge (1).

5. Insert 6 mm pin into the right hole of the other guide and turn the guides such that the 6 mm pin (2) comes to rest against the gauge (1).
6. Secure the clamping screws (3) for both guides.
7. Remove the bottom feed gauge (1).

Fig. 52: Basic setting of bottom feed guides (3)



(6) - Stepper motor main feed
(7) - Stepper motor differential top feed
(8) - Stepper motor differential bottom feed

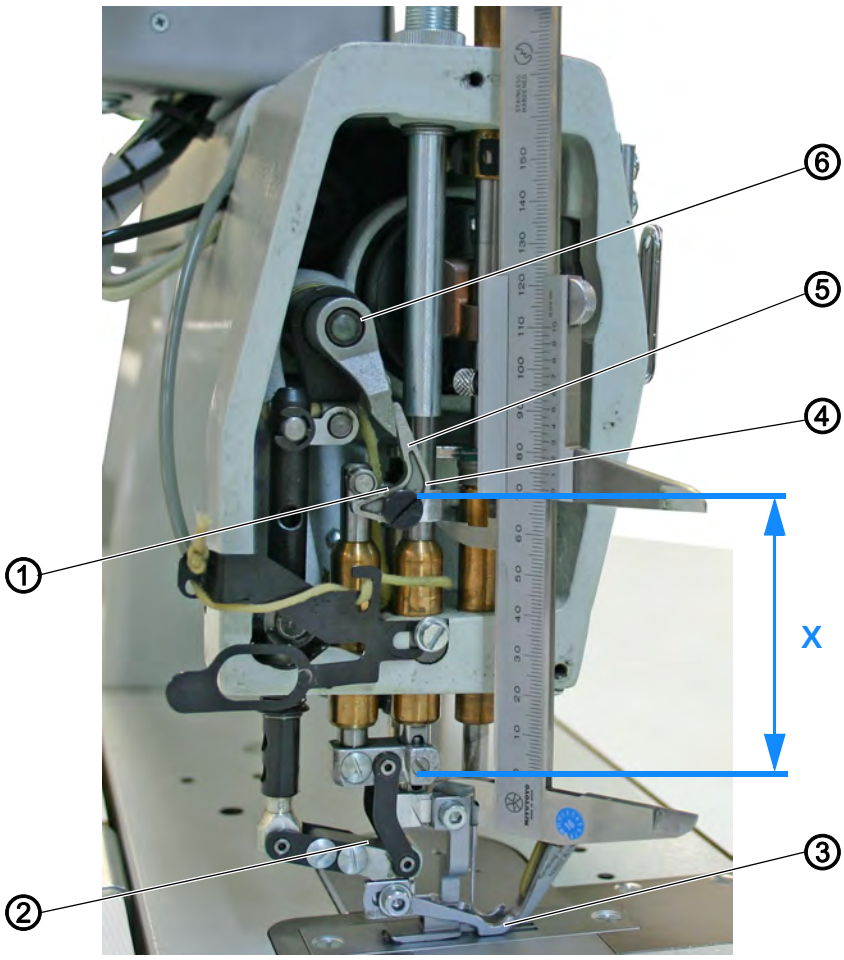
12 Foot top feed

Proper setting

The top feed is synchronized with the bottom feed. A light stroke is produced; i.e. in the feed phase, the center foot pressure is reduced. The center foot pressure and top feed foot pressure can be adjusted separately.

12.1 Setting the stroke height of the top feed

Fig. 53: Setting the stroke height of the top feed (1)



(1) - Screw
(2) - Foot fastening block
(3) - Top feed foot
(4) - Bearing block
(5) - Rocker lever
(6) - Lifting shaft

Proper setting

The top feed foot (3) has a maximum stroke of 2 mm to the throat plate.

The distance between the foot fastening block (2) and the bearing block (4) of the rocker lever (5) is 71.5 mm.

Disturbance

- Poor feed behavior

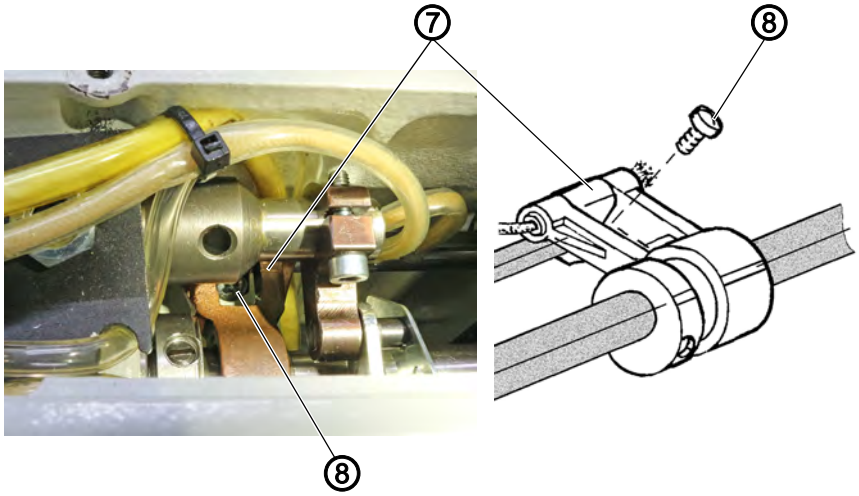
Cover

- Remove the arm cover (📖 *p. 18*)
- Remove the head cover (📖 *p. 17*)

To set the stroke height of the top feed:

1. Loosen the screw (1).
2. Move the bearing block (4) and set the dimension to 71.5 mm.
3. Tighten the screw (1).
4. Release the rocker lever (5) (swivel to the left).

Fig. 54: Setting the stroke height of the top feed (2)

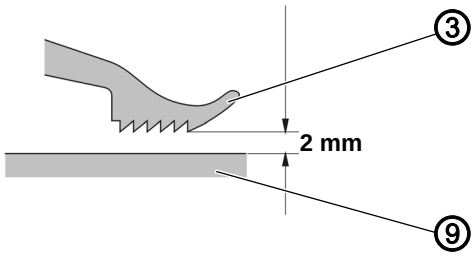


(7) - Clamping hub

(8) - Screw

5. Loosen the screw (8) of the clamping hub (7).

Fig. 55: Setting the stroke height of the top feed (3)



(3) - Top feed foot

(9) - Throat plate

6. Turn the lifting shaft (6).
   The top feed foot (3) should have a maximum stroke of 2 mm to the throat plate (9).
   Turn the lifting shaft until the top feed has achieved the required stroke.

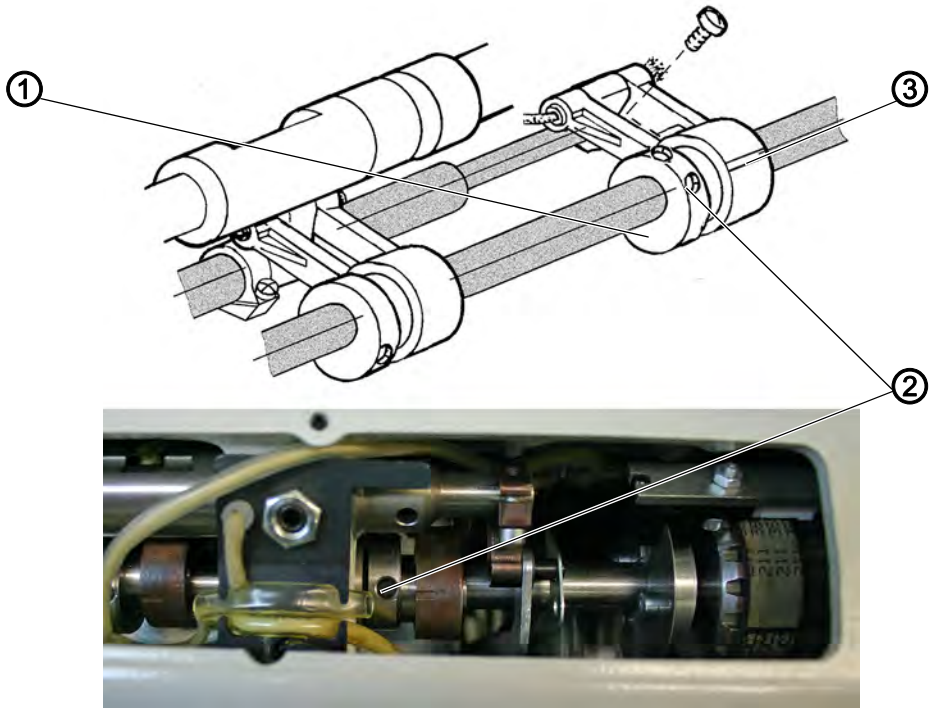
Important

Set only as much lift as required. The higher the stroke, the shorter the movement of the top feed on the feed.

7. Tighten the screw (8).

12.2 Setting the time of the stroke motion

Fig. 56: Setting the time of the stroke motion



(1) - Stroke cam
(2) - Screw
(3) - Groove

Proper setting

In handwheel position **F** the first screw (2) in the direction of rotation of the stroke cam (1) is aligned with the groove (3) of the push rod.

Disturbance

- Increased wear of mechanical parts
- Feed behavior not optimal, poss. loud machine noises

Cover

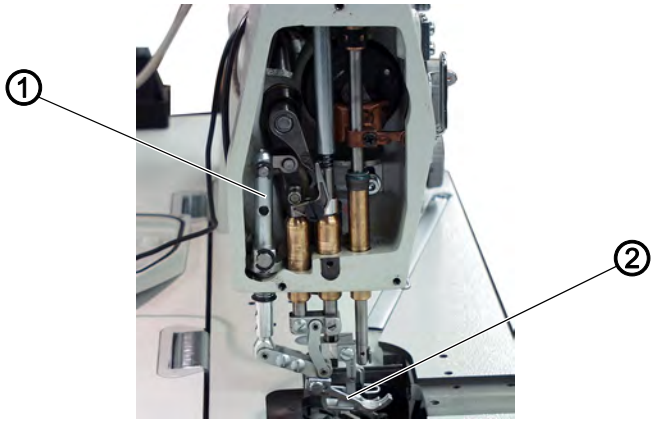
- Remove the arm cover (📖 *p. 18*)

To set the time of the stroke motion:

1. Lock machine in position **F**.
2. Loosen both screws of the stroke cam (1).
3. Turn stroke cam (1) until the first screw in the direction of rotation is aligned with the groove (3) of the push rod.
4. Tighten both screws of the stroke cam (1).

12.3 Setting the time of the feed motion

Fig. 57: Setting the time of the feed motion (1)



(1) - Advance lever *(2) - Top feed foot*

Proper setting

If the machine is in position **D**, the advance lever (1) should be vertical.

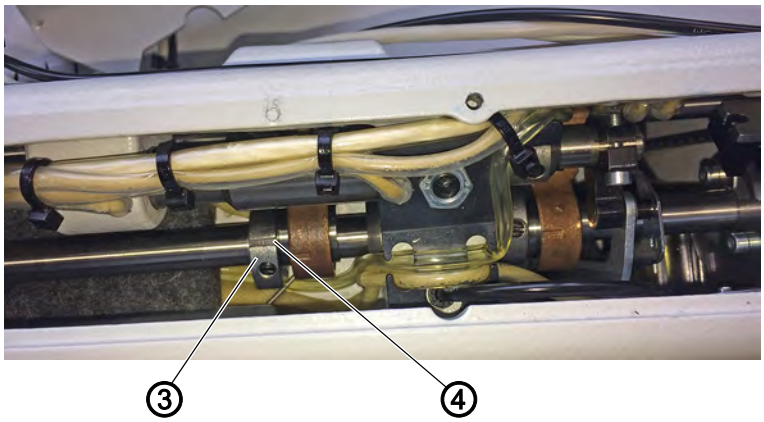
Disturbance

- Poor synchronization of the top feed to the bottom feed
- Ruffing behavior is poor

Cover

- Remove the head cover (📖 *p. 17*)
- Remove the arm cover (📖 *p. 18*)

Fig. 58: Setting the time of the feed motion (2)



(3) - Pusher eccentric *(4) - Slot*

To set the time of the feed motion:

1. Lock the machine in position **F**.
2. Loosen both screws of the pusher eccentric (3).
3. Turn the pusher eccentric (3) so that the center of the slot (4) is pointing up vertically in position **F** (12 o'clock).
4. Tighten both screws of the pusher eccentric (3).

12.4 Setting the position of the top feed foot

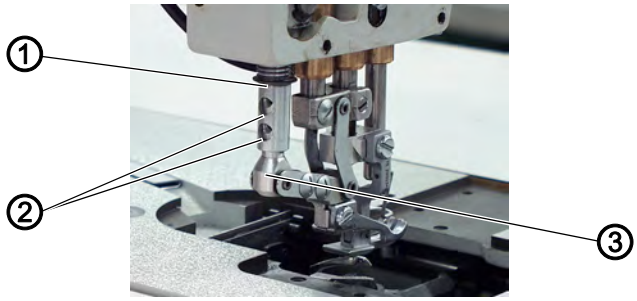
Proper setting

The top feed foot is set in the factory such that parallel support on the feed is guaranteed for light to medium-weight sewing material.
The support surface (inclination) can be adjusted to suit the sewing material.

Disturbance

- Material damage

Fig. 59: Setting the position of the top feed foot



(1) - Feed shaft *(3) - Pin*
(2) - Threaded pins

To set the position of the top feed foot:

1. Loosen threaded pins (2).
2. Push the pin (3) into or out of the feed shaft (1) as required. This adjusts the angle of incline of the top feed foot.
3. Tighten the threaded pins (2).

Order

After adjusting the angle of incline of the top feed, the lift height must be checked and corrected if necessary.

12.5 Basic setting of top feed guides

Cover

- Remove the arm cover (📖 *p. 18*)
- Tilt the machine (📖 *p. 16*)

Fig. 60: Basic setting of top feed guides (1)

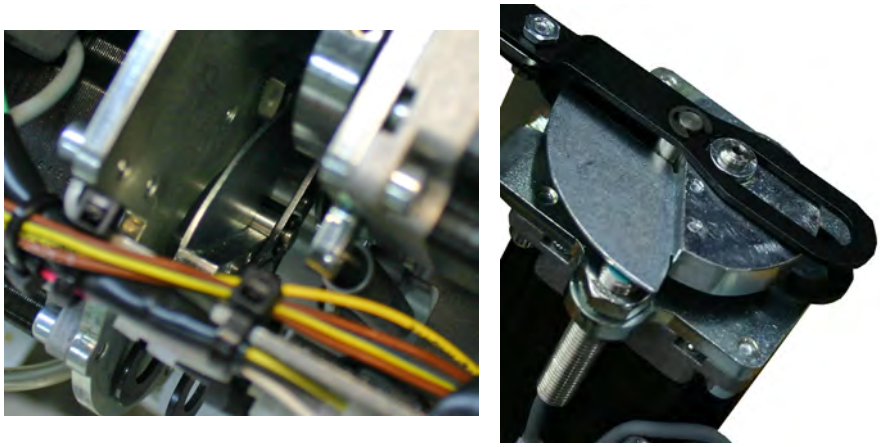
(1) - Clamping screw
(2) - 5 mm pin
(3) - Edge

To set the basic setting of the top feed guide:

1. Turn the switching flag of the center stepper motor such that the sensing roller is at the smallest diameter of the switching flag.

↳ The edge of the switching flag lies on the roller.

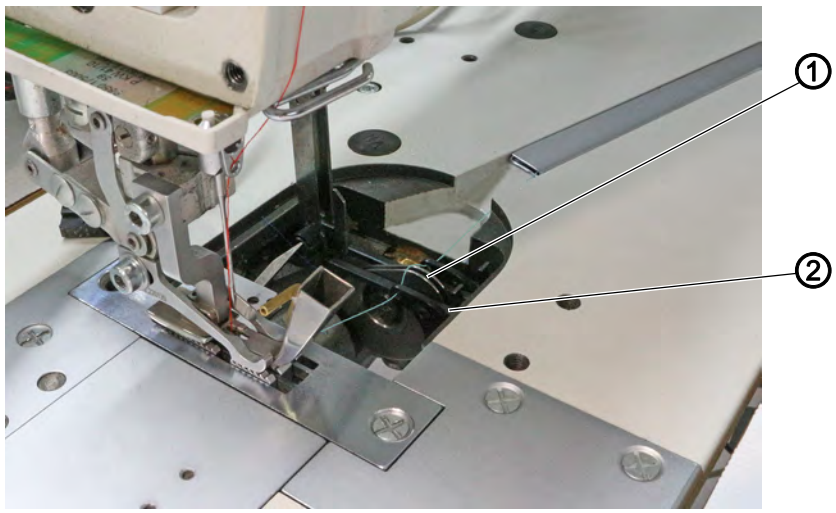
Fig. 61: Basic setting of top feed guides (2)



2. Loosen the clamping screws (1).
3. Align the guide with a 5-pin (1) to the edge.
4. Secure the clamping screws (3) for both guides.

13 Setting the thread take-up disk

Fig. 62: Setting the thread take-up disk (1)



(1) - Thread take-up disk *(2) - Carrier plate*

Propert setting

The thread take-up disk (1) should be 5 mm above the carrier plate (2) for a machine locked in slot **E** (top dead center of needle bar).

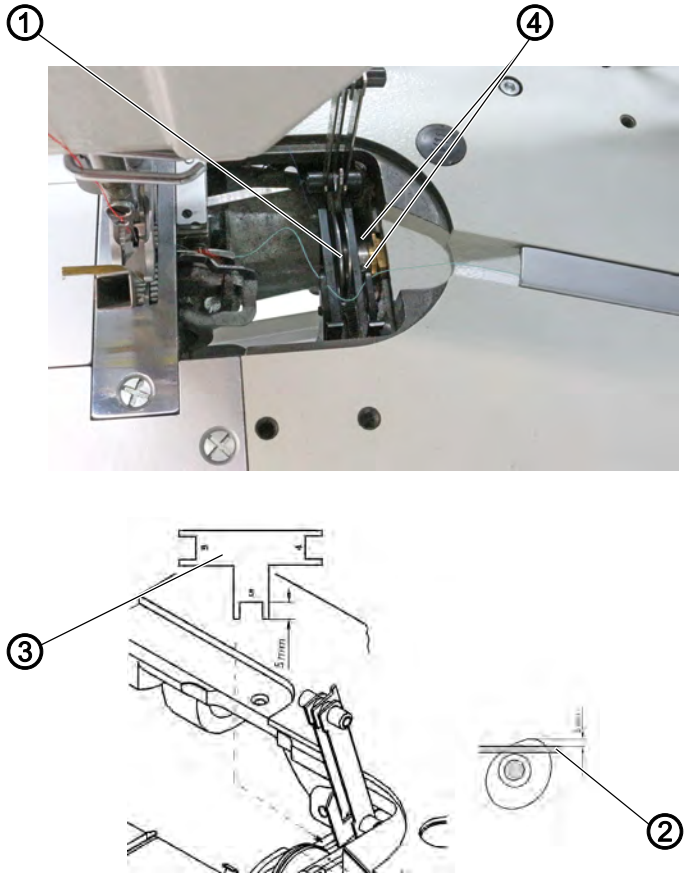
Disturbance

- Missed stitches
- Thread breakage

Cover

- Remove the covers on the base plate (📖 *p. 19*)

Fig. 63: Setting the thread take-up disk (2)



(1) - Thread take-up disk
(2) - Carrier plate
(3) - Gauge
(4) - Screws

To set the thread take-up disk:

1. Loosen the screws (4).
2. Insert the locking pin in slot **E**.
3. Turn the thread take-up disk (1) accordingly.
   The measurement can be performed using gauge (3).
4. Set the disk tightly and tighten the screws (4).

14 Setting the thread cutter

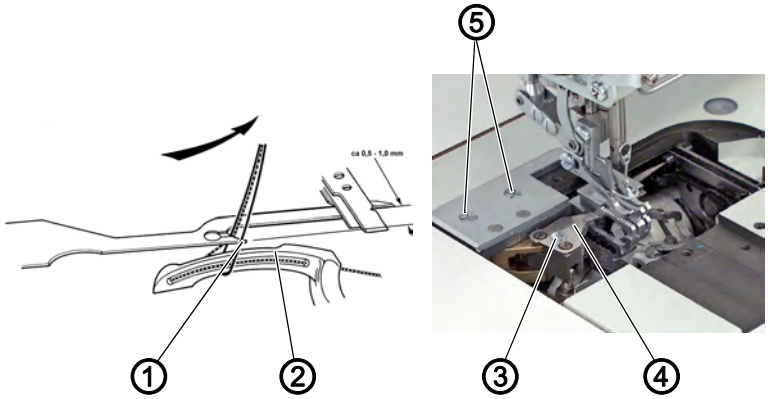
Proper setting

The looper thread that is behind the looper and the rear thread of the needle thread loop must be grasped by the point of the movable blade during the cutting process.

Disturbance

- Thread that is not cut or not cut cleanly

Fig. 64: Setting the thread cutter (1)



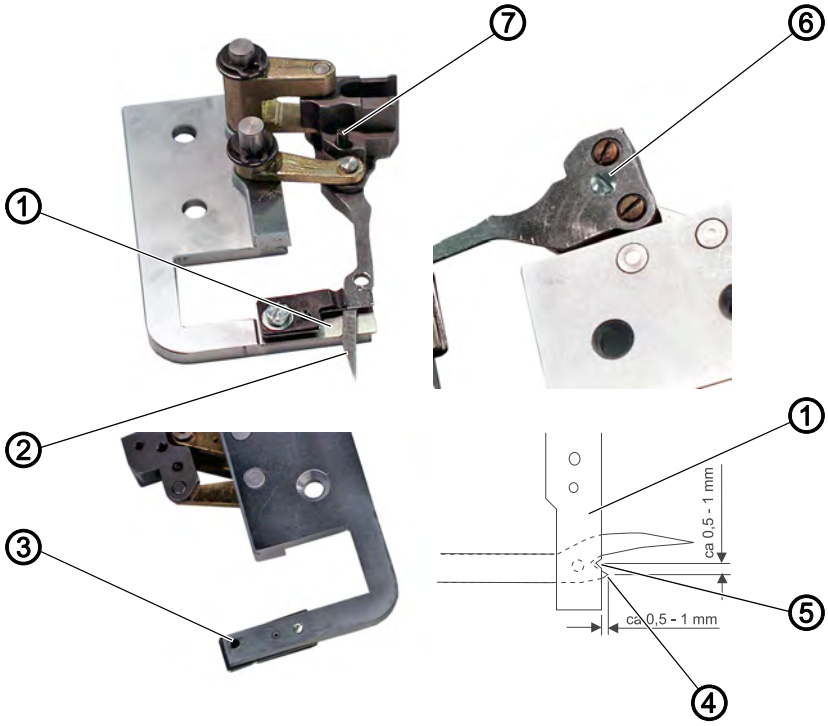
(1) - Point of the movable blade
(2) - Looper
(3) - Screw
(4) - Movable blade
(5) - Screw

1) Removing the blade

To remove the blade:

1. Loosen screw (3) and remove the movable blade (4).
2. Loosen screws (5).
3. Remove the entire thread cutter.

Fig. 65: Setting the thread cutter (2)



(1) - Blade
(2) - Movable blade
(3) - Pressure screw
(4) - Point of the movable blade
(5) - Notch
(6) - Screw
(7) - Pressure screw

2) Manual cutting test

To perform a manual cutting test:

1. First loosely secure the movable blade (2) with the screw (6).
2. Align the point of the movable blade (4) with the notch (5) of the stationary blade (1).
   The point should be approx. 0.5 - 1.0 mm away from the notch.
3. Tighten the screw (6).
4. Perform cutting test with thread.

Important

If the cut is not clean, check the blade for sharpness or replace with a new sharp blade.

5. Set the movable blade (2) in cutting position by gently turning in the pressure screw (7).

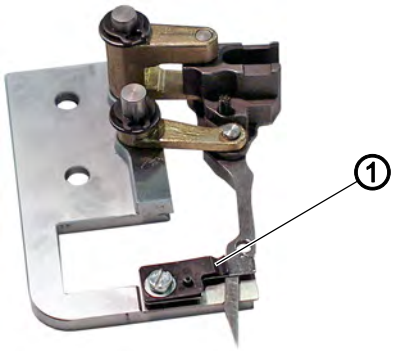
Important

A smooth blade movement must be guaranteed.

6. If required, align the stationary blade (1) to the movable blade (2) using the pressure screw (3).

3) Thread clamping plate

Fig. 66: Setting the thread cutter (3)



(1) - Thread clamping plate

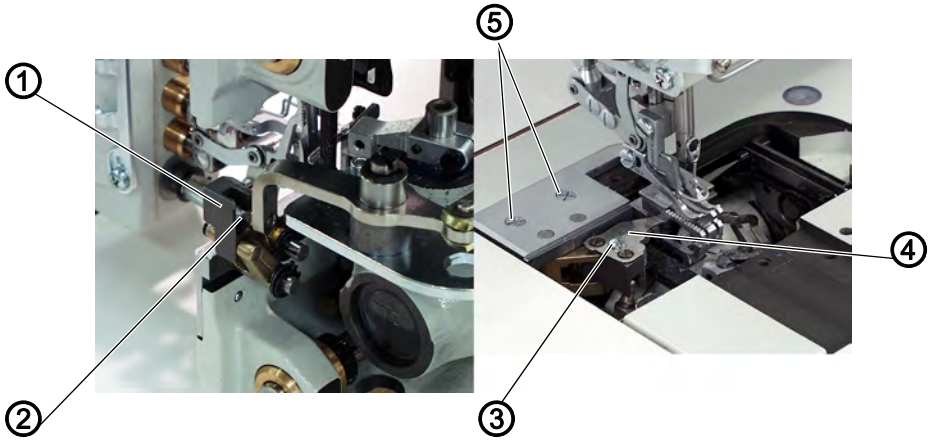
The thread clamping plate (1) should hold the cut thread ends gently to ensure a smooth start to sewing.

Important

If the clamping plate is too tight this can case ruffing at the start of sewing.

4) Install the thread cutter

Fig. 67: Setting the thread cutter (4)



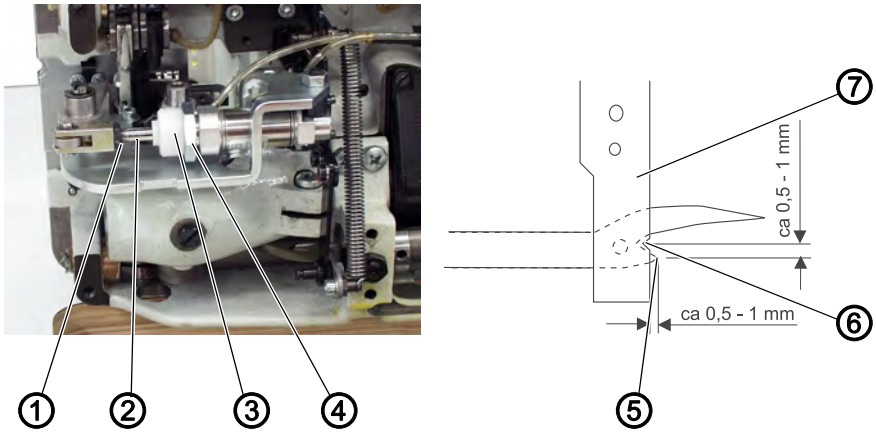
(1) - Blade mounting
(2) - Ball lever
(3) - Screw
(4) - Blade
(5) - Screw

To install the thread cutter:

1. Loosen screw (3) and remove the movable blade (4).
2. Position the thread cutter such that the blade holder (1) fits over the ball lever (2).
3. Tighten the screws (5).
4. Insert blade (4) and secure with screw (3).

5) End positions of the thread cutter

Fig. 68: Setting the thread cutter (4)



(1) - Counternut
(2) - Piston rod
(3) - End stop
(4) - Nut
(5) - Point of the movable blade
(6) - Notch
(7) - Stationary blade

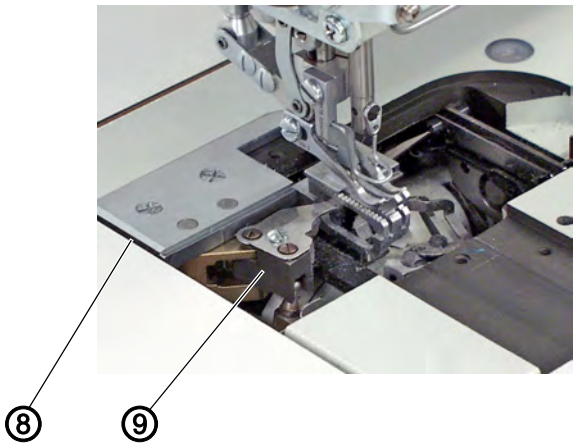
To set the end positions of the thread cutter:

1. Disconnect the machine from the compressed air supply.
2. Slide the piston rod (2) into the left end position.
3. Loosen the counternut (1) and turn the piston rod (2) as far as required until the position depicted in the sketch on the right is achieved.

Important

The point of the movable blade (5) should be approx. 0.5 - 1 mm below the notch (6) of the stationary blade (7).
The point of the movable blade (5) should be approx. 0.5 - 1 mm behind the edge of the stationary blade (7).

Fig. 69: Setting the thread cutter (5)

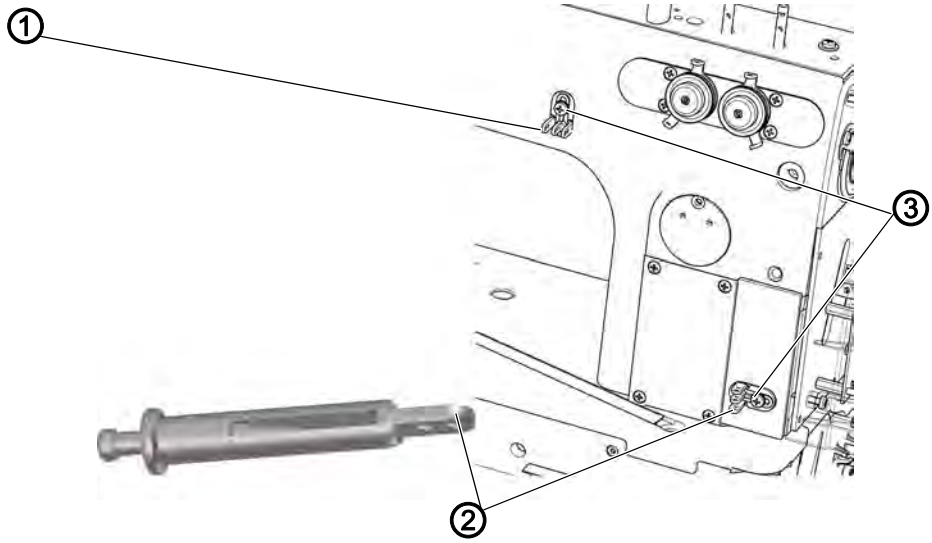


(8) - Edge of the table plate
(9) - Edge of the blade mounting

4. If one moves the piston rod (2) into its right end position, the edge of the blade mounting (9) and edge of the table plate (8) should be flush with one another.
5. Loosen the nut (4) and set the end position of the cylinder accordingly using the end stop (3).
6. Perform cutting test while sewing for both the smallest and largest stitch length.

6) Thread puller for looper and needle thread

Fig. 70: Setting the thread cutter (6)



(1) - Thread puller for the needle thread
(2) - Thread puller for the looper thread
(3) - End stop

While cutting the thread, the thread tensioners are opened and the thread puller for the looper thread (2) and the thread puller for the needle thread (1) are activated.

The pulled, tension-free thread serves to ensure proper stitch formation the next time sewing commences.

No more thread than is required should be pulled as this determines the length of the thread end remaining at the start of the seam.

The thread puller is stepped. By adjusting the end stop (3) more or less thread can be pulled.

15 Setting the thread guide on the machine arm

Proper setting

If the looper is in the left end position (thread lever in the top dead center), the thread forms a horizontal line between the thread guide (2) and the thread lever (1).

Fig. 71: Setting the thread guide on the machine arm

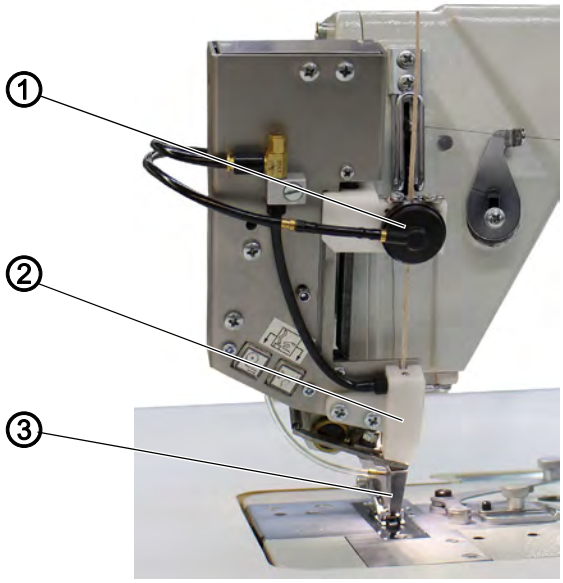
(1) - Thread lever
(2) - Thread guide
(3) - Screw

To set the thread guide on the machine arm:

1. Loosen the screw (3).
2. Setting the thread guide (2).
3. Tighten the screw (3).

16 Setting the tape feed (only 610)

Fig. 72: Setting the tape feed



(1) - Tape clamp
(2) - Tape guide
(3) - Tulle foot

Proper setting

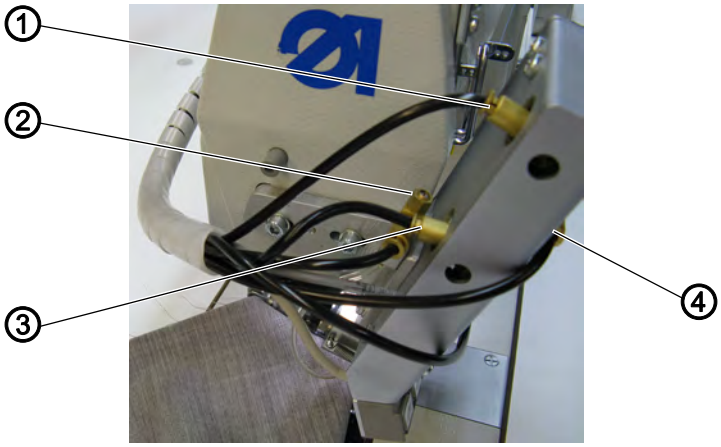
The air flows and speed of the tape guide are coordinated with one another:

- The speed of the feed movement is not too fast.
- The air flow of the tape guide (2) transports the tape faster than the tape clamp (1) supplies the tape.
- The reverse movement of the tape clamp (1) is not too fast. The tape does not hang between the tape clamp and the tape guide.
- The air flow is not too strong such that the tape flaps before entry into the tulle foot (3) and possibly passes it by.

The tape is fed into the tulle foot (3) at the center, both when viewed from the front and from the side.

Basic setting of the throttles

Fig. 73: Basic setting of the throttles



(1) - Throttle reverse movement
(2) - Throttle tulle foot
(3) - Throttle feed movement
(4) - Throttle tape clamp

To set the throttles:

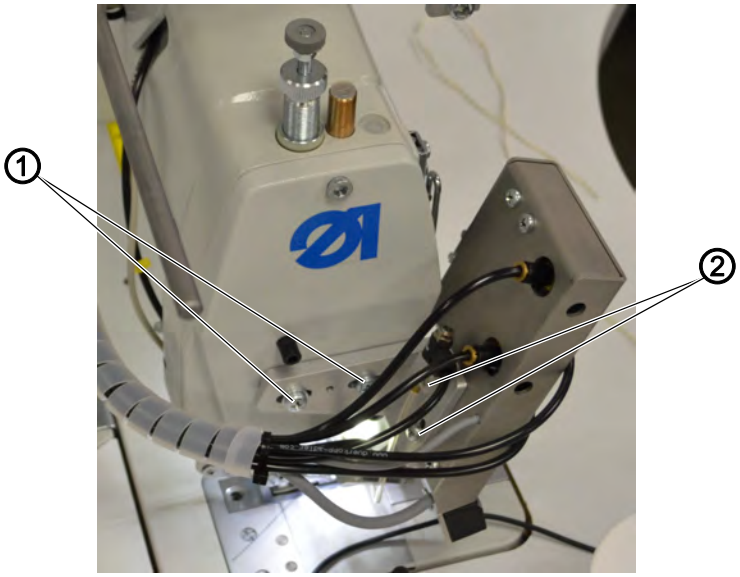
1. Close the throttles.
2. Open the throttles.
   - **Tulle foot** (2): 4 revolutions opened
   - **Tape clamp** (4): 3 revolutions opened
   - **Reverse movement** (1): 1.5 revolutions opened
   - **Feed movement** (3): 1.5 revolutions opened

Important

The edge on the base plate above the tape guide may not generate a braking effect.

Setting the feed into the tulle foot

Fig. 74: Setting the feed into the tulle foot



(1) - Screws

(2) - Screws

To set the feed into the tulle foot:

1. Loosen the screws (1).
2. Move the tape guide to the side.
3. Tighten the screws (1).
4. Loosen the screws (2).
5. Move the tape feed upwards.
6. Tighten the screws (2).

17 Programming

17.1 Basic settings for new programs

Parameter	Meaning
Stitch Length	Stitch length in mm: 1-4
Thread Tension at Needle	Needle thread tension in percent: 1-99
Thread Tension at Hook	Looper thread tension in percent: 1-99
Fullness Top/Bottom	Fullness setting of top feed/bottom feed: • 1: Top feed • 2: Bottom feed • 3: Top feed and bottom feed
Fullness	Fullness factor: 1-16
Additional Fullness	Correction of the differential bottom feed to the differential top feed for fullness
Stitch Condensing at Start	Stitch condensing at the start of the seam: • 0: off • 1: on
Stitch Condensing at End	Stitch condensing at the end of the seam: • 0: off • 1: on
Seam Gender	Symbolic seam representation for work step • 0: Free sewing • 1: Sleeve crown • 2: Front armhole • 3: Rear armhole
Grading Factor	Grading factor in percent, growth from variable to variable
Teach Side (R/L)	Specimen part, right/left side

17.2 Basic settings, machine

Stitch Condensing at Start - Stitch condensing at the start of the seam

Parameter	Meaning
Number Stitch Condensing	Stitch number of stitch condensing: 1-50 stitches
Stich Condensing Factor	Stitch length of condensing in relation to the set stitch length
Speed	Speed during stitch condensing: 50 - 200 rpm

Stitch Condensing at End - Stitch condensing at the end of the seam

Parameter	Meaning
Number Stitch Condensing	Stitch number of stitch condensing: 1-50 stitches
Stich Condensing Factor	Stitch length of condensing in relation to the set stitch length
Speed	Speed during stitch condensing: 50 - 200 rpm

Thread Trim - Thread cutter

Parameter	Meaning
Speed	Speed when cutting thread: 50 - 200 rpm
Thread Tension Needle	Needle thread tension when the thread is cut in percent: 1-50
Thread Tension Hook	Looper thread tension when the thread is cut in percent: 0-5
Turn Backward after Trimming	Turn backward after cutting thread: • 0: off • 1: on

Speed

Parameter	Meaning
Maximum Speed	Max. permissible speed: 100 - 4000 rpm
Positioning Speed	Speed when positioning: 10 - 70 rpm
Softstart Speed	Speed on soft start: 10 - 1000 rpm
Number Stitches Softstart	Number of softstart stitches: 1-10

Stop Positions

Parameter	Meaning
Stop Position after Sewing	Stop position after sewing (needle up)
Stop Position Needle Up	not used
Stop Position Needle Down	Needle down, basic position of the arm shaft: 120 - 204°

Foot

Parameter	Meaning
Foot Lift between Seam	Lifting foot in the seam • 0: off • 1: on
Foot Lift at Seam End	Lifting foot at the seam end • 0: off • 1: on

Duration Thread Tension after Seam End - Duration for needle thread tension closed at the end of the seam

Setting range in seconds: 1 - 7

Other devices

Parameter	Meaning
Tape Feeder Exists	Tape feed device • 0: not present • 1: present
Tape Length Cutter to Needle	Tape length after cutting: 0 - 100 mm

17.3 Language selection

Parameter	Meaning
German	Menu language, German
English	Menu language, English
Chinese	Menu language, Chinese

17.4 User settings

Parameter	Meaning
Signal Sound at Segment End	Acoustic signal at the end of the segment: • 0: off • 1: on
Side Switch at Seam End	Automatic side change after the end of the seam: • 0: off • 1: on
Abort Program at Pedal -2	Program is aborted at pedal position -2: • 0: off • 1: on
Mode Second Pedal	Function assignment of the 2nd pedal: • 1: Fullness correction • 2: Curve support • 6: Manual operation, fullness 1-7 • 7: Manual operation, fullness 0-16

17.5 USB settings

Parameter	Meaning
Write Active Sewing Program to USB	Copy, save the active program to the USB stick
Read Sewing Program to USB	Load program from USB stick
Write Global Data of Control Unit to USB	Save control data on the USB stick
Overwrite Global Data of Control Unit with USB Data	Load control data from USB stick

17.6 Machine calibration

Parameter	Meaning
Adjust Flat Sewing Top	Correction/fine adjustment of differential top feed in percent: -50 - +50
Adjust Flat Sewing Bottom	Correction/fine adjustment of differential bottom feed in percent: -50 - +50
Motor Calibration	Synchronizing the feeds, see 🕮 *p. 95*
Thread Tension Calibration	Calibrating electrical thread tension, see 🕮 *p. 93*

17.7 Reset settings

Parameter	Meaning
Reset All	Reset all factory settings
Reset Sewing Programs	Resetting sewing programs
Control Unit Update	Updating the control program

17.8 Test input/output

Test of input and output elements

17.9 Calibrating electrical thread tension

Order

Prerequisite: A thread scale is present and the calibration takes place with a thread with yarn strength 120.

Calibration points

The following three calibration points must be set for the needle and looper threads:

- **Point 3** - Maximum tension (300 g)
- **Point 2** - Medium tension (150 g)
- **Point 1** - Minimum tension (5 g)

Calibration steps, needle thread

1. Set calibration point 3

To set the calibration point 3:

1. Thread the thread up to the thread lever (🕮 *Operating Instructions, Thread needle thread*).
2. Thread the thread after the thread lever into the thread scale.

3. Select the menu `Service` > `Calibrations` > `Thread Tension Calibration` > `Tension Top 300g`.
   Result: The left tension element is closed.
4. Measure the tension value. It must be 300 g.

Fig. 75: Calibrating electrical thread tension

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

If 300 g is not present, this must be corrected as follows:

5. Loosen threaded pin (3).
6. Open tensioner element. To this end, select any value for Tension Bottom in the opened Calibration menu.
7. Turn the adjusting nut (2) very slightly. Turning clockwise reduces the value, turning counterclockwise increases the tension value.
8. Select the menu point `Tension Top 300g` again and measure the tension value.
9. When the thread scale shows the value 300 g:
   Tighten the thread pin (3), without changing the position of the adjusting nut (2).

2. Set calibration point 2

To set the calibration point 2:

1. Select `Tension Top 150g`.
2. Change the thread tension with +/-1 or +/-10, until the thread scale reads 150 g.
3. Exit menu point.

3. Set calibration point 3

To set the calibration point 3:

1. Select `Tension Top 5g`.
2. Change the thread tension with +/-1 or +/-10, until the thread scale reads 5 g.
3. Exit menu point.

Calibration steps, looper thread

To calibratie the looper thread:

1. Repeat procedure for the looper thread tension for the calibration steps 3-1 using the menu points *Tension Bottom 300g*, *150g* and *5g*.

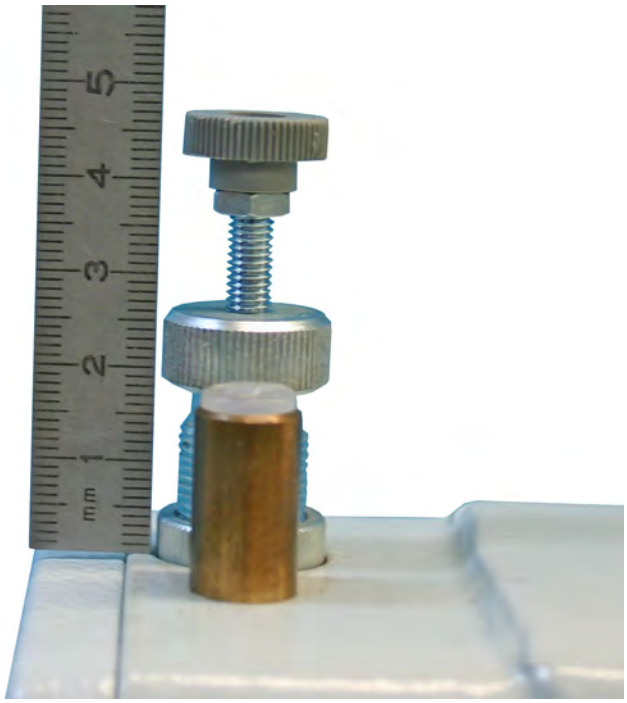
17.10Synchronizing the feeds

17.10.1Calibrating the main feed

To calibrate the main feed:

1. Ensure that the mechanical basic setting is performed completely.
2. Set the sewing foot pressure to the base value (26/47 mm).

Fig. 76: Calibrating the main feed



3. Disassemble the top transport foot and the center foot.
4. Assemble the calibrating foot (0178 800024).
5. Lower the bottom differential feed.
6. Set the adjusting needle (0558 006060) such that it creates a stitch on a cardboard strip.
7. Switch on the machine.
8. Select the menu *Service* > *Calibrations* > *Motor Calibration* > *Motor Main 2mm*.
9. Lift the sewing feet and insert the strip of cardboard.

10. Press the pedal forwards.

↳ 11 stitches are sewn. The distance between the first and the last stitch should be precisely 20 mm.

11. If required, change the distance with +/-1 or +/-10. If the distance is to be reduced, a smaller minus figure must be entered. If the distance is to be increased, a higher minus figure must be entered.
12. Repeat the sewing, until the distance is precisely 20 mm.
13. Repeat steps 8 to 11 for the setting *Motor Main 3mm* (30 mm) and *Motor Main 4mm* (40 mm).

17.10.2Calibrating the differential bottom feed

To calibrate the differential bottom feed:

1. Lower the main feed such that it remains precisely under the throat plate.

Important

Check manually, that no parts can collide during the movement.

2. Set the differential bottom feed to height 1.5 mm.
3. Select the menu *Service* > *Calibrations* > *Motor Calibration* > *Motor Bottom Diff 2mm*.
4. Lift the sewing feet and insert the strip of cardboard.
5. Press the pedal forwards.

↳ 11 stitches are sewn. The distance between the first and the last stitch should be precisely 20 mm. If required, change the distance with +/-1 or +/-10.
If the distance is to be reduced, enter a smaller minus figure. If the distance is to be increased, enter a higher minus figure.

6. Repeat the sewing, until the distance is precisely 20 mm.
7. Repeat steps 3 to 6 for:
   - *Motor Bottom Diff 3mm* (30 mm)
   - *Motor Bottom Diff 4mm* (40 mm)
   - *Motor Bottom Diff 6mm* (60 mm)

17.10.3Calibrating the differential top feed foot

To calibrate the differential top feed foot:

1. Disassemble the calibrating foot.
2. Disassemble the adjusting needle.
3. Assemble the top feed foot and the center foot. The main feed remains lowered. The differential bottom feed and differential top feed are in mesh.
4. Change to manual mode *MAN*.
5. Set the fullness to 0 and the stitch length to 2 mm.

6. Run through 2 PTFE strips (0178 800033) with the material side facing outward. The strips should be fed through perfectly aligned.

7. Select the menu *Service* > *Calibrations* > *Motor Calibration* > *Motor Top Diff 2mm* and change the value, if required, using +/- or +/-10.

8. Repeat the sewing process in manual mode, until both PTFE strips are fed through perfectly aligned.
9. Repeat steps 4 to 8 for:
   - *Motor Main 3mm* (30 mm)
   - *Motor Main 4mm* (40 mm)

10. Change to manual mode *MAN*.
11. Set fullness to 16.
12. Repeat steps 6 to 8 for:
    - *Motor Main 6mm* (60 mm)
13. Set the main feed to height 1.1 mm.

18 Maintenance

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.

WARNING

Risk of injury from sharp parts!

During maintenance work, the machine may start up unintentionally and cause puncture injuries.

Switch off the main switch.
Only perform maintenance work when the machine is switched off.

WARNING

Risk of injury from moving parts!

During maintenance work, the machine may start up unintentionally and cause crushing.

Switch off the main switch.
Only perform maintenance work when the machine is switched off.

Work to be carried out	Operating hours			
	8	40	160	1000
Removing lint and thread remnants	●			
Clean engine fan filter	●			
Lubricate the machine head	●			
Lubricate the looper		●		
Checking the water level in the pressure controller		●		
Clean the filter element in the compressed air maintenance unit				●
Check the tightness of the system				●

18.1 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 sump.

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.

Sewing dust and thread remains must be removed every 8 operating hours using a compressed-air pistol or a brush.

Areas that need to be cleaned particularly thoroughly:

- Looper
- Throat plate
- Motor fan sieve

18.2 Lubrication

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 old oil!

Incorrect handling of old oil can result in severe environmental damage.

ALWAYS observe the legally prescribed regulations for handling and disposal of mineral oil.

Take care to ensure that oil is NEVER spilled.

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

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

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

Container	Part number
250 ml	9047 000011
1 l	9047 000012
2 l	9047 000013
5 l	9047 000014

18.2.1 Lubricating the machine head

Fig. 77: Lubricating the machine head

(1) - Refill opening
(2) - Minimum level marking
(3) - Maximum level marking

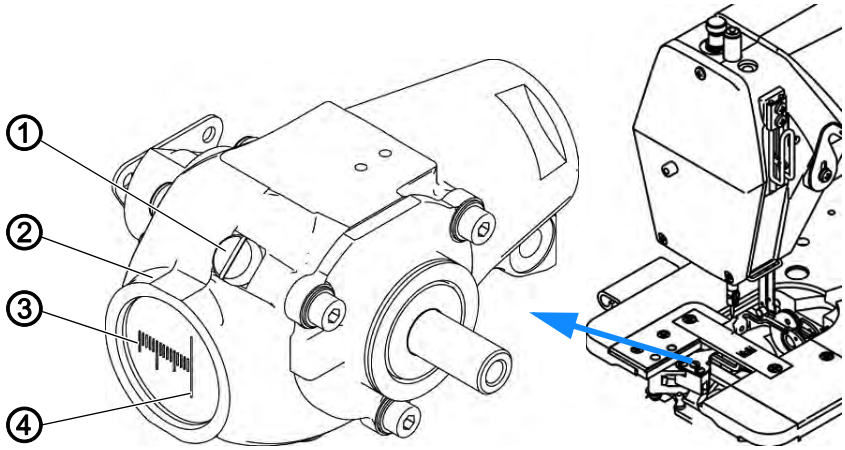
The oil level must not raise above the maximum level marking (3) or drop below the minimum level marking (2).

To lubricate the machine head:

1. Switch off the machine.
2. Refill oil trough the refill opening (1).
3. Switch on the machine.

18.2.2 Lubricating the looper

Fig. 78: Lubricating the looper



(1) - Locking screw
(2) - Oil reservoir
(3) - Minimum level marking
(4) - Maximum level marking

To lubricate the looper:

1. Switch off the machine.
2. Tilt the machine head.
3. Check the oil amount in the oil reservoir.

Proper setting

With the upper part of the machine tilted half-way back, the oil level must not fall below the minimum level marking (3).

4. Loosen the locking screw (1).
5. Refill oil.
6. Tighten the locking screw (1).
7. Re-erect the machine head.
8. Switch on the machine.

18.3 Servicing the pneumatic system

18.3.1 Setting the operating pressure

NOTICE

Property damage from incorrect setting!

Incorrect operating pressure can result in damage to the machine.

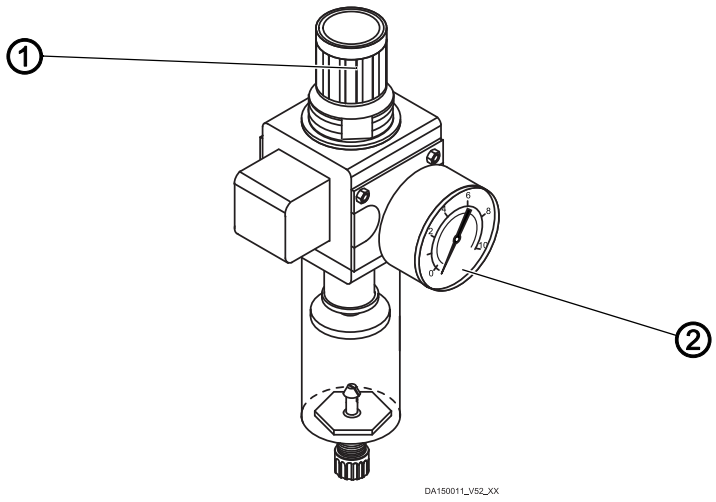
Ensure that the machine is only used when the operating pressure is set correctly.

Proper setting

Refer to the **Technical data** (📖 *p. 261*) chapter for the permissible operating pressure. The operating pressure must not deviate by more than ± 0.5 bar.

Check the operating pressure on a daily basis:

Fig. 79: Setting the operating pressure



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

To set the operating pressure:

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

18.3.2 Draining the water condensation

NOTICE

Property damage from excess water!

Excess water can cause damage to the machine.

Drain water as required.

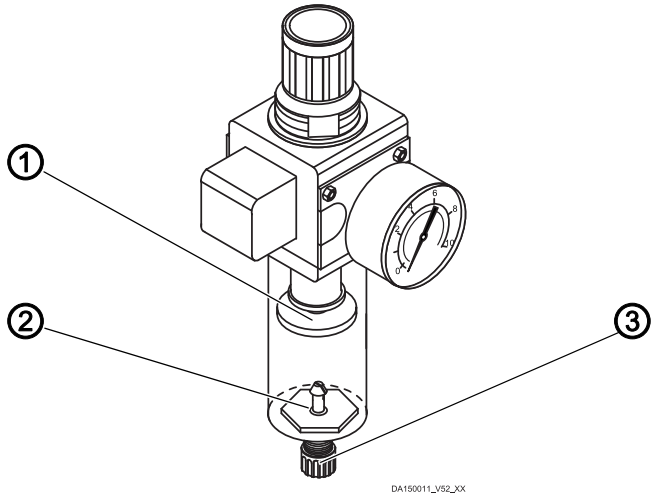
Water condensation accumulates in the water separator (2) of the pressure controller.

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. 80: Draining the water condensation



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

To drain water condensation:

1. Disconnect the machine from the compressed air supply.
2. Place the collection tray under the drain screw (3).
3. Unscrew 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.

18.3.3 Cleaning the filter element

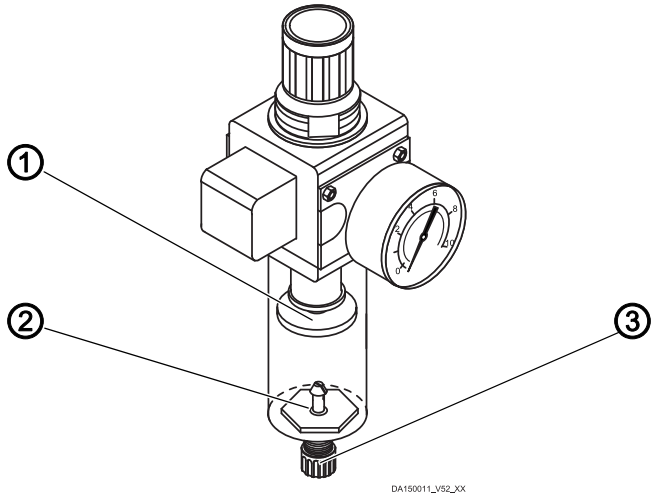
NOTICE

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. 81: Cleaning the filter element



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

To clean the filter element:

1. Disconnect the machine from the compressed air supply.
2. Drain the water condensation (📖 *p. 105*).
3. Unscrew the water separator (2).
4. Unscrew the filter element (1).
5. Blow out the filter element (1) using a 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.

18.4 Parts list

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

www.duerkopp-adler.com

19 Decommissioning

A number of activities must be performed if the machine is to be shut down for a longer period of time or completely decommissioned.

WARNING

Risk of injury due to a lack of care!

Serious injuries may occur.

ONLY clean the machine when it is switched off.
Avoid contact with oil residues.
Allow ONLY trained personnel to disconnect the machine.

Decommission the machine as follows:

1. Switch off the main switch.
2. Unplug the power plug.
3. Wipe out the oil residues with a cloth.
4. Cover the operating panel to protect it from contamination.
5. Cover the controller to protect it from soiling.
6. Cover the entire machine if possible to protect it from contamination and damage.

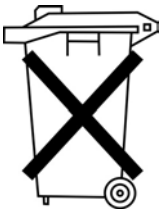
20 Disposal

CAUTION

Risk of environmental damage from improper disposal!

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

ALWAYS comply with the legal regulations regarding disposal.



Do not dispose of the machine in the general household waste.

The machine must be disposed of in a suitable and proper manner and 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.). Observe the applicable national regulations when disposing of these materials.

21 Troubleshooting

21.1 Customer service

Contacts for repairs or in the event of problems 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
E-mail: service@duerkopp-adler.com
Internet: www.duerkopp-adler.com

21.2 Software messages

Should an fault occur that is not described here, please contact Customer Service. Do not try to repair the fault yourself.

Table with software messages

Code	Meaning	Possible causes	Remedial action
1051	Sewing motor timeout	• Cable to the sewing motor reference switch is faulty • Reference switch is faulty	• Replace cable • Replace reference switch
1052	Sewing motor excess current	• Sewing motor cable is faulty • Sewing motor is faulty • Controller is faulty	• Replace sewing motor cable • Replace the sewing motor • Replace the controller
1053	Mains voltage is too high	• Mains voltage is too high	• Check the mains voltage
1055	Sewing motor overload	• Sewing motor is sluggish or is blocked • Sewing motor is faulty • Controller is faulty	• Eliminate sluggishness/block • Replace the sewing motor • Replace the controller
1056	Sewing motor excess temperature	• Sewing motor is sluggish • Sewing motor is faulty • Controller is faulty	• Eliminate sluggishness • Replace the sewing motor • Replace the controller
1058	Sewing motor speed is greater than the set-point	• Reference sensor is faulty • Sewing motor is faulty	• Replace reference sensor • Replace the sewing motor

Code	Meaning	Possible causes	Remedial action
1062	Sewing motor IDMA auto-increment	• Malfunction	• Switch the machine off and on again
1302	Sewing motor current feed fault	• Sewing motor is blocked • Encoder cable is not connected or is faulty • Encoder is faulty	• Remove the block • Check the encoder cable and replace, if required • Replace the sewing motor
1342 - 1344	Sewing motor fault	• Internal fault	• Switch the machine off and on again • Perform the software update • Contact Customer Service
1410	Sewing motor: Thread cutter speed is not achieved	• Encoder is faulty • Sewing motor is faulty	• Switch the machine off and on again • Replace the encoder • Replace the sewing motor
1411	Sewing motor: Thread cutter position is not achieved	• Thread cutter position is not achieved	• Switch the machine off and on again • Perform the software update • Contact Customer Service
1412	Sewing motor: Stop position after turning backward is not achieved	• Stop position after turning backward is not achieved	• Switch the machine off and on again • Perform the software update • Contact Customer Service
1420	Sewing motor current feed fault	• Sewing motor is blocked • Encoder cable is not connected or is faulty • Encoder is faulty	• Remove the block • Check the encoder cable and replace, if required • Replace the sewing motor
1421	Sewing motor timeout	• Cable to the sewing motor reference switch is faulty • Reference switch is faulty	• Replace cable • Replace reference switch
1430	Sewing motor: Positioning speed is not achieved	• Encoder is faulty • Sewing motor is faulty	• Switch the machine off and on again • Replace the encoder • Replace the sewing motor
1431	Sewing motor: Stop position	• Stop position not achieved or overshot	• Reduce the positioning speed • Perform the software update
1450	Internal sewing motor fault	• Internal sewing motor fault	• Switch the machine off and on again • Perform the software update • Replace the controller • Contact Customer Service
1498 - 1499	Internal sewing motor fault	• Internal sewing motor fault	• Switch the machine off and on again • Perform the software update • Replace the controller • Contact Customer Service
21	Stepper motor X-axis: belt top feed		
22	Stepper motor Y-axis: right foot		
23	Stepper motor Z-axis: left foot		

Code	Meaning	Possible causes	Remedial action
.. .. 02	Stepper motor current feed fault	• Stepper motor is sluggish or is blocked • Encoder cable is not connected or is faulty • Stepper motor cable is not connected or is faulty • Encoder is faulty • Stepper motor faulty	• Eliminate sluggishness/block • Check/replace the encoder cable • Replace the encoder • If the stepper motor is not being supplied with current: • Check/replace the stepper motor cable • Replace the stepper motor
.. .. 03	Stepper motor step losses	• Mechanical sluggishness or blocking	• Eliminate mechanical sluggishness or blocking
.. .. 52	Stepper motor excess current		• Replace the stepper motor • Replace the controller
.. .. 53	Stepper motor overvoltage	• Mains voltage is too high	• Check the mains voltage
.. .. 55	Stepper motor overload	• Stepper motor is sluggish or is blocked • Stepper motor faulty • Controller is faulty	• Eliminate sluggishness/block • Replace the stepper motor • Replace the controller
.. .. 56	Stepper motor excess temperature	• Stepper motor sluggish • Stepper motor faulty • Controller is faulty	• Eliminate sluggishness • Replace the stepper motor • Replace the controller
.. .. 62	Stepper motor IDMA auto-increment	• Malfunction	• Switch the machine off and on again
2551	Communication with additional controller	• No signal from additional controller	• Check the cable to the additional controller and replace, if required • Replace the additional controller • Replace the controller
3100 - 3103	Machine: Voltage fault	• Temporary mains voltage interruption	• Check mains voltage and stabilize, if required
3107	Controller: Temperature excess	• Ventilation openings closed • Ventilation grille dirty • Ambient temperature too high	• Check ventilation openings • Clean ventilation grille • Allow the controller to cool down
4202	Communication with memory card	• Access to the memory card in the controller is not possible	• Format or replace the memory card
6000 - 6299	Driver error	• Internal fault	• Switch the machine off and on again • Perform the software update • Contact Customer Service
6351 - 6354	I²C fault	• Controller is faulty	• Replace the controller
6400 - 6999	Driver error	• Internal fault	• Switch the machine off and on again • Perform the software update • Contact Customer Service

Code	Meaning	Possible causes	Remedial action
7551 - 7559	Communication with the control panel interface	• Internal fault • Line fault • Cable to the control panel interface is faulty	• Switch the machine off and on again • Switch off the source of interference • Perform the software update • Replace cable • Contact Customer Service
7651 - 7659	Communication with the control panel interface	• Internal fault • Line fault • Cable to the control panel interface is faulty	• Switch the machine off and on again • Switch off the source of interference • Perform the software update • Replace cable • Contact Customer Service
8151 - 8161	IDMA fault	• Internal fault • Malfunction • Controller is faulty	• Switch the machine off and on again • Perform the software update • Replace the controller • Contact Customer Service
8251 - 8258	Fault during ADSP booting or booting	• Internal fault • Malfunction	• Switch the machine off and on again • Perform the software update • Contact Customer Service
9110	Communication with foot pedal	• Foot pedal not in rest position • Setpoint device faulty	• Do not press the foot pedal when starting up the machine • Replace the setpoint device
9210	Needle thread tension: Initialization error	• 120t plug on DAC3 or X502 is not plugged into the PCB or is faulty • 120t-L021A line is faulty • Distributor board is faulty	• Check the plug and cable and replace, if required • Replace the distributor board
9211	Looper thread tension: Initialization error	• 120t plug on DAC3 or X502 is not plugged into the PCB or is faulty • 120t-L021A line is faulty • Distributor board is faulty	• Check the plug and cable and replace, if required • Replace the distributor board
9220	Communication with electrical needle thread tension device	• Thread tension magnet is faulty • Plug from the distributor board to the thread tension magnets is not plugged in or is faulty or the line is faulty • 140t plug on DAC3 or X503 is not plugged into the PCB or is faulty or the X140t-L023 line is faulty • Distributor board is faulty	• Check the lines and plugs from the magnets to the distributor board and from the distributor board to the controller and replace, if necessary • Replace the needle thread tension device • Replace the distributor board
9221	Communication with electrical looper thread tension device	• Thread tension magnet is faulty • Plug from the distributor board to the thread tension magnets is not plugged in or is faulty or the line is faulty • 140t plug on DAC3 or X503 is not plugged into the PCB or is faulty or the X140t-L023 line is faulty • Distributor board is faulty	• Check the lines and plugs from the magnets to the distributor board and from the distributor board to the controller and replace, if necessary • Replace the looper thread tension device • Replace the distributor board

Code	Meaning	Possible causes	Remedial action
9310	Tape feed (610 only)	• CAN connector not plugged in or faulty • Tape unwinder faulty	• Replace the CAN connector • Replace the tape unwinder • Replace the controller
9320	Tape feed (610 only)	• Tape unwinder dirty • Tape unwinder faulty	• Clean the tape unwinder (📖 *p. 100*) • Open the throttle (📖 *p. 86*) • Replace the tape unwinder

21.3 Errors in sewing process

Meaning	Possible causes	Remedial action
Thread break	• The needle and hook threads are not threaded correctly	• Check threading path (📖 *Operating Instructions*)
	• Needle is bent or sharp-edged • Needle is not inserted correctly into the needle bar	• Replace the needle • Insert the needle into the needle bar
	• The needle used is unsuitable	• Use recommended thread (📖 *Operating Instructions*)
	• Thread tensions are too tight for the thread used	• Check thread tensions (📖 *Operating Instructions*)
	• Thread-guiding parts such as thread tube, thread guide or thread-takeup disk are sharp-edged	• Check the thread path
	• Needle plate, hook or spread have been damaged by the needle	• Have parts reworked by qualified personnel
Missing stitches	• The needle and hook threads are not threaded correctly	• Check threading path (📖 *Operating Instructions*)
	• Needle is blunt or bent • Needle is not inserted correctly into the needle bar	• Replace the needle • Insert the needle into the needle bar
	• The needle thickness used is unsuitable	• Use recommended needle thickness
	• The thread reel holder is installed incorrectly	• Check thread reel holder (📖 *Operating Instructions*)
	• Thread tensions are too tight	• Check thread tensions (📖 *Operating Instructions*)
	• Sewing material is not held correctly	• Check clamping pressure
	• The loop stroke was not corrected when changing the zigzag stitch width	• Set the loop stroke
	• Incorrect parts used for the desired sewing equipment	• Check the parts based on the equipment sheet
	• Needle plate, hook or spread have been damaged by the needle	• Have parts reworked by qualified personnel

Meaning	Possible causes	Remedial action
Loose Stitches	• Thread tensions are not adjusted to the sewing material, the sewing material thickness or the thread used	• Check thread tensions
	• The needle and hook threads are not threaded correctly	• Check threading path (📖 *Operating Instructions*
Needle Breakage	• Needle thickness is unsuitable for the sewing material or the thread	• Use recommended needle
Seam beginning not secure	• Residual tension is too tight for the needle thread	• Adjust residual tension

22 Technical data

Noise emission

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

L_{pA} = 78 dB (a) +/- 1.48 dB (A) at

- Stitch length: 3 mm
- Sewing foot stroke: 0 mm
- Number of stitches: 3000 s.p.m.
- Sewing material: 2-layer material G1 DIN 23328

Data and characteristic values

Technical data	610-01	630-01
Stitch type	401 Double chain stitch	
Looper type	Crossline	
Number of needles	1	
Needle system	934 RG	
Needle strength [Nm]	70-130	
Max. sewing thread thickness (core spun thread)	70 / 3	
Stitch length, forwards only [mm]	1-4	
Feed length maximum for diff. feed [mm]	6	
Feed length maximum for feed foot [mm]	8	
Maximum number of stitches [s.p.m.]	5000	
Number of stitches on delivery [s.p.m.]	3200 (recommended number of stitches)	
Needle stroke [mm]	32	
Sewing foot stroke during lifting [mm]	9	
Operating pressure [bar]	6	
Air consumption [NL per working cycle]	0.1	
Length, width, height (packaging) [mm]	1350, 900, 1250	1350, 900, 1100
Weight of the upper section [kg]	60	54
Total weight (upper section, accessory pack, motor controller, packaging) [kg]	114	108
Rated voltage [V/Hz]	230 V, 50/60 Hz	
Rated power [kVA]	0.5	

Features

- 32 mm needle stroke for light to moderately heavy sewing material
- Stitch length maximum 4 mm, adjustable via the stepper motor
- Differential bottom feed up to maximum 6 mm, adjustable via the stepper motor
- Differential top feed up to maximum 8 mm, adjustable via the stepper motor
- Sews forwards only
- Electronically controlled needle and looper thread tension and automatic adjustment of the looper thread quantity to the stitch length for optimal stitch formation, including for loose stitching
- Sewing foot top feed with automatic stroke adjustment for different sewing material thicknesses
- Equipped with drive motor mounted on the machine
- With electropneumatic sewing foot lift and electropneumatic thread cutter for needle and looper thread

23 Appendix

Fig. 82: Wiring diagram (1)

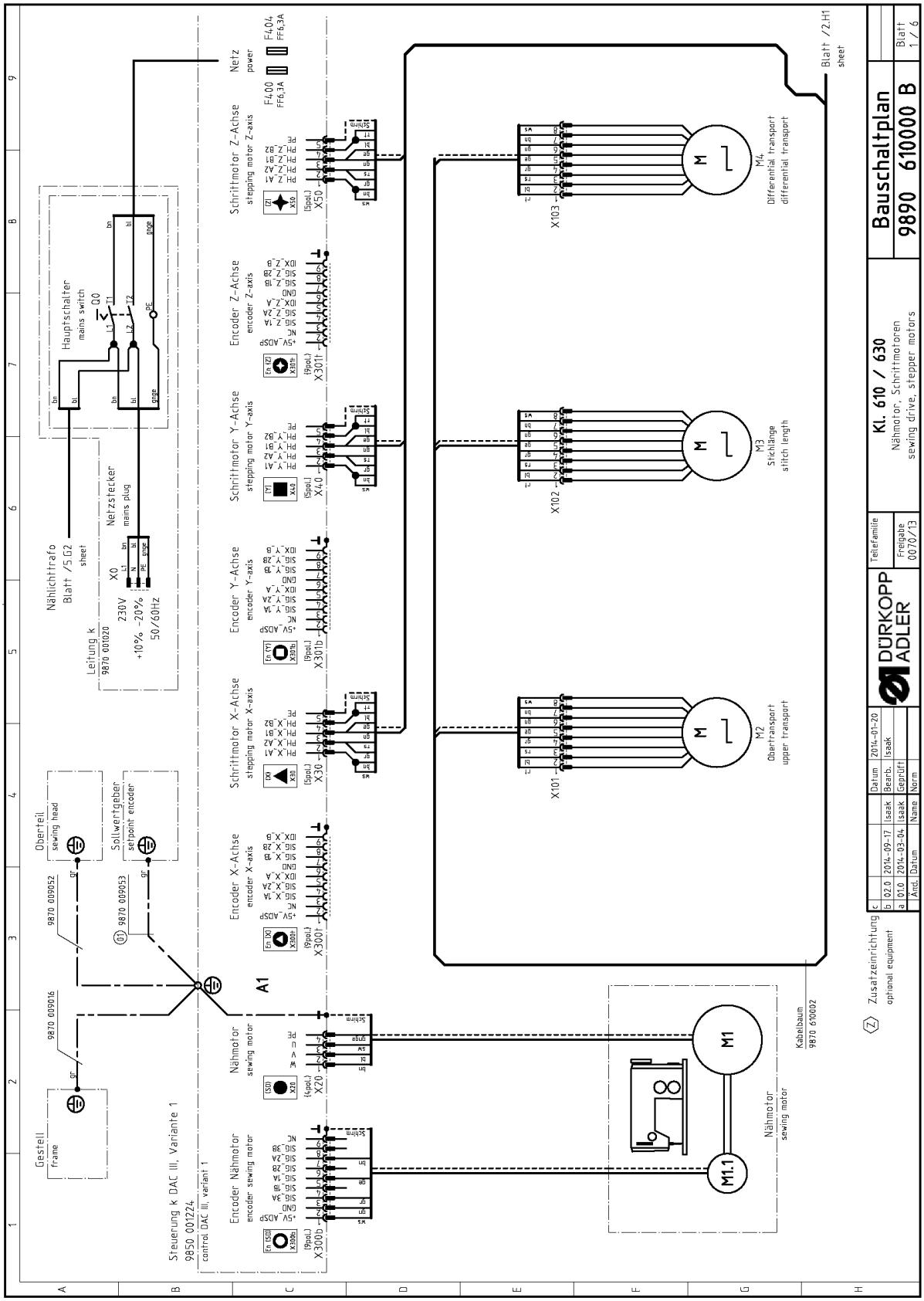


Fig. 83: Wiring diagram (2)

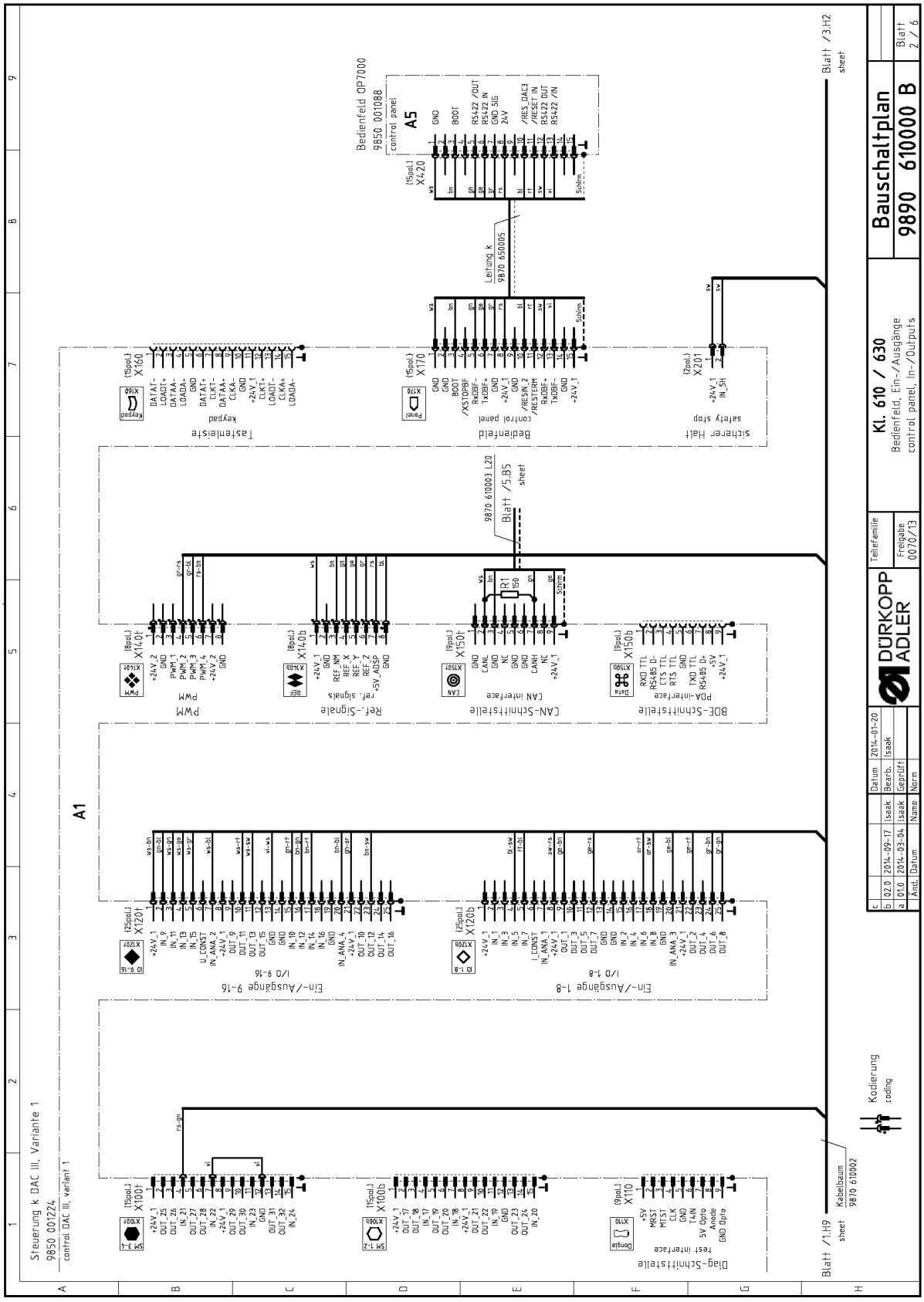


Fig. 84: Wiring diagram (3)

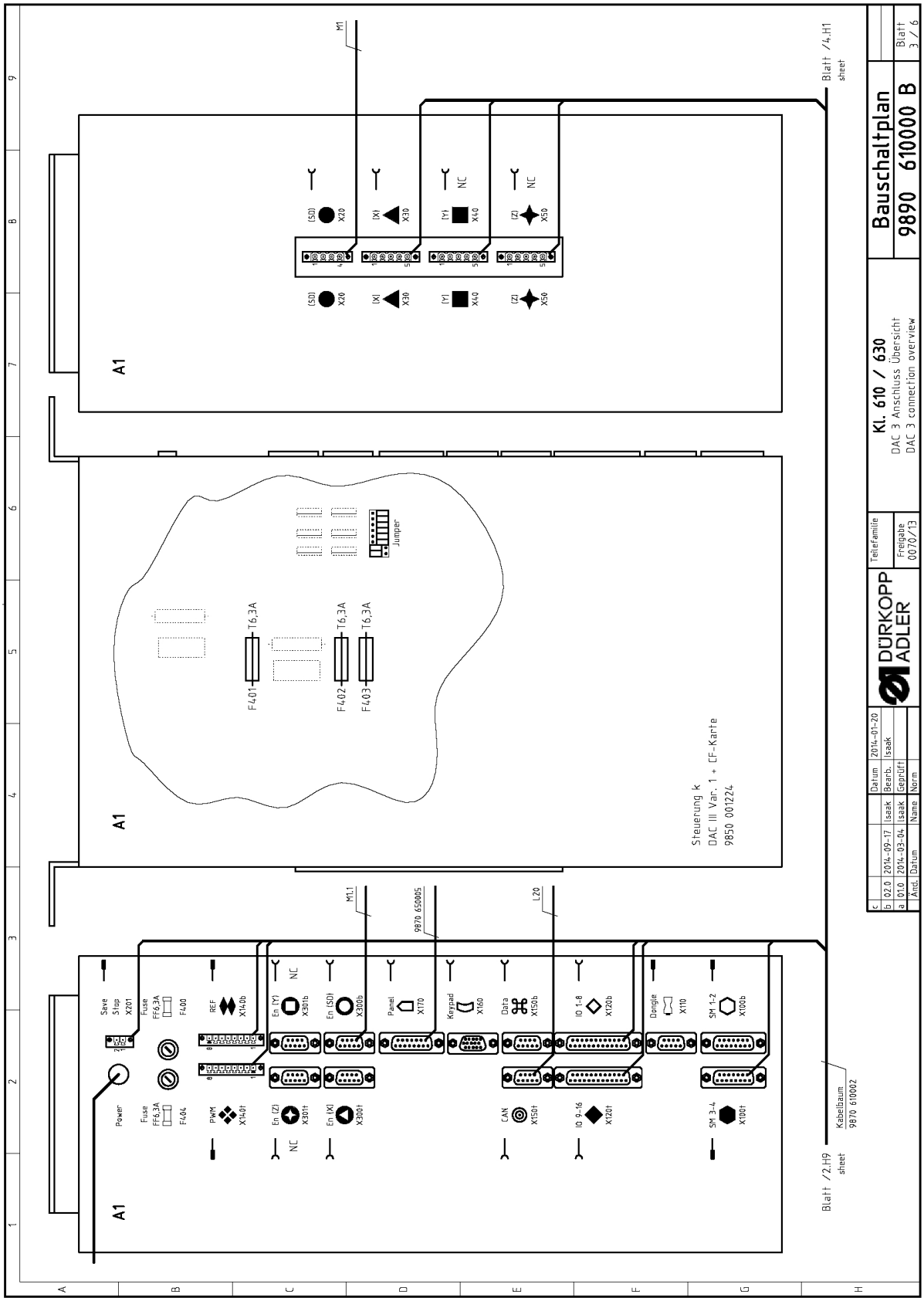


Fig. 85: Wiring diagram (4)

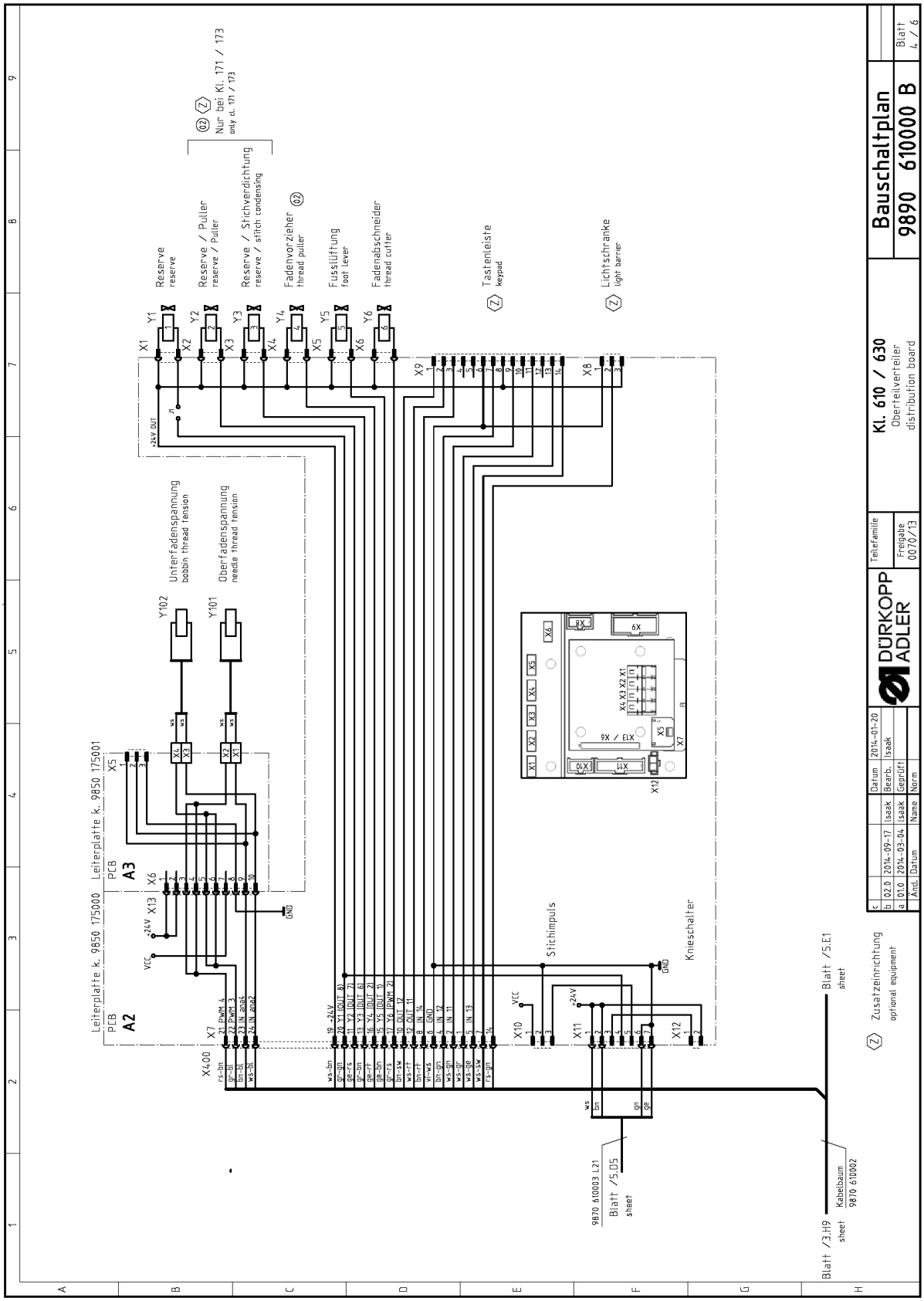


Fig. 86: Wiring diagram (5)

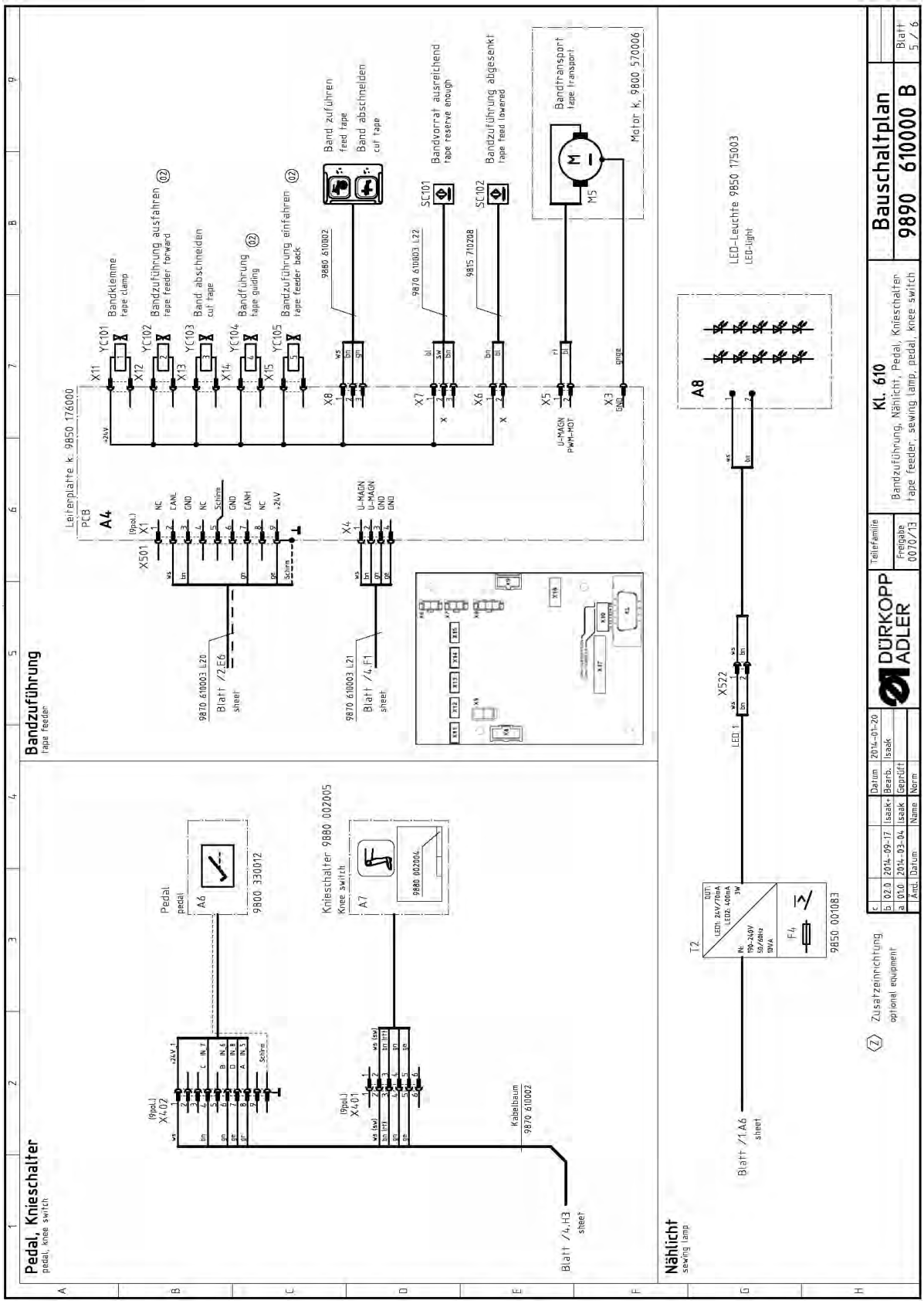


Fig. 87: Wiring diagram (6)

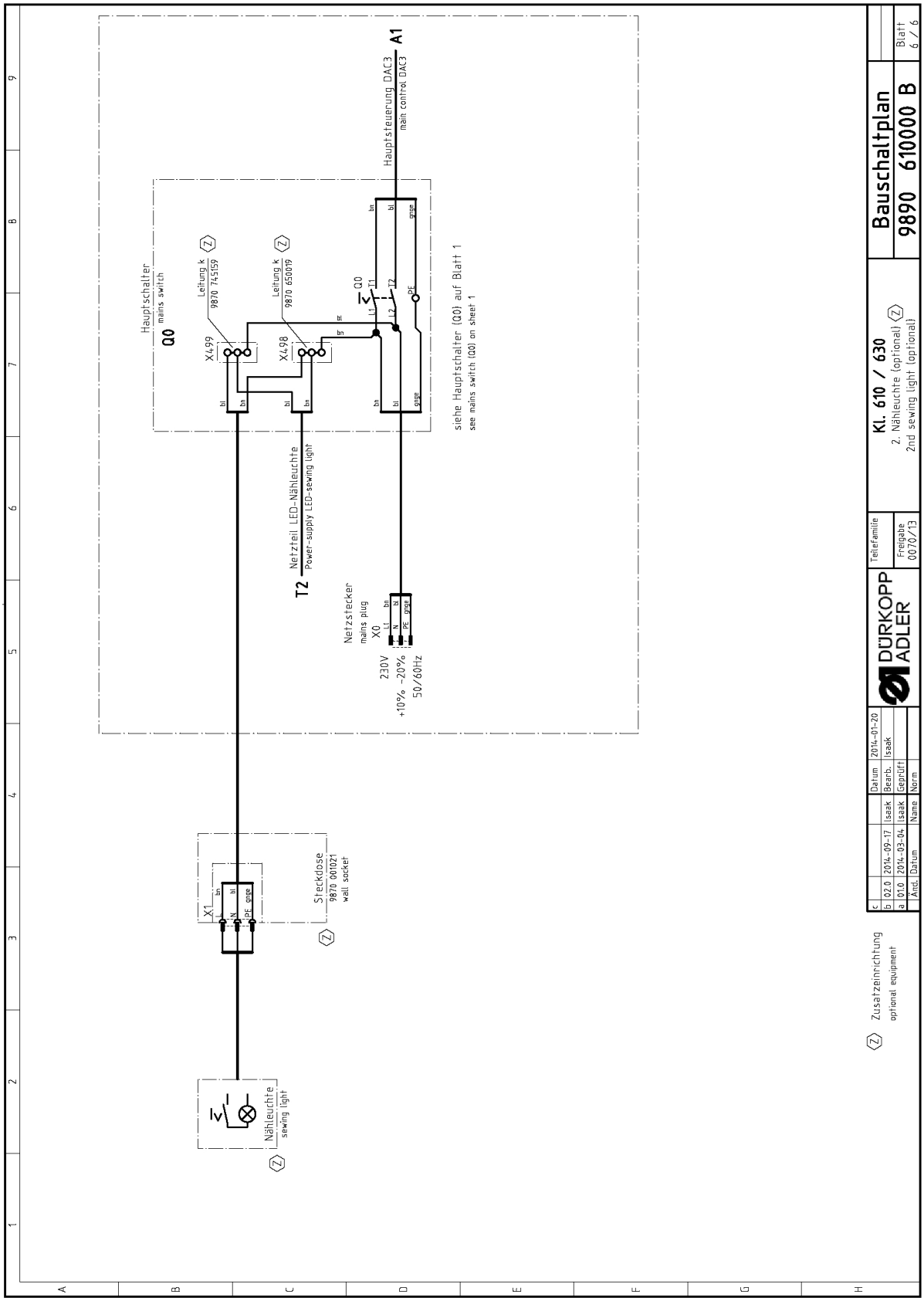
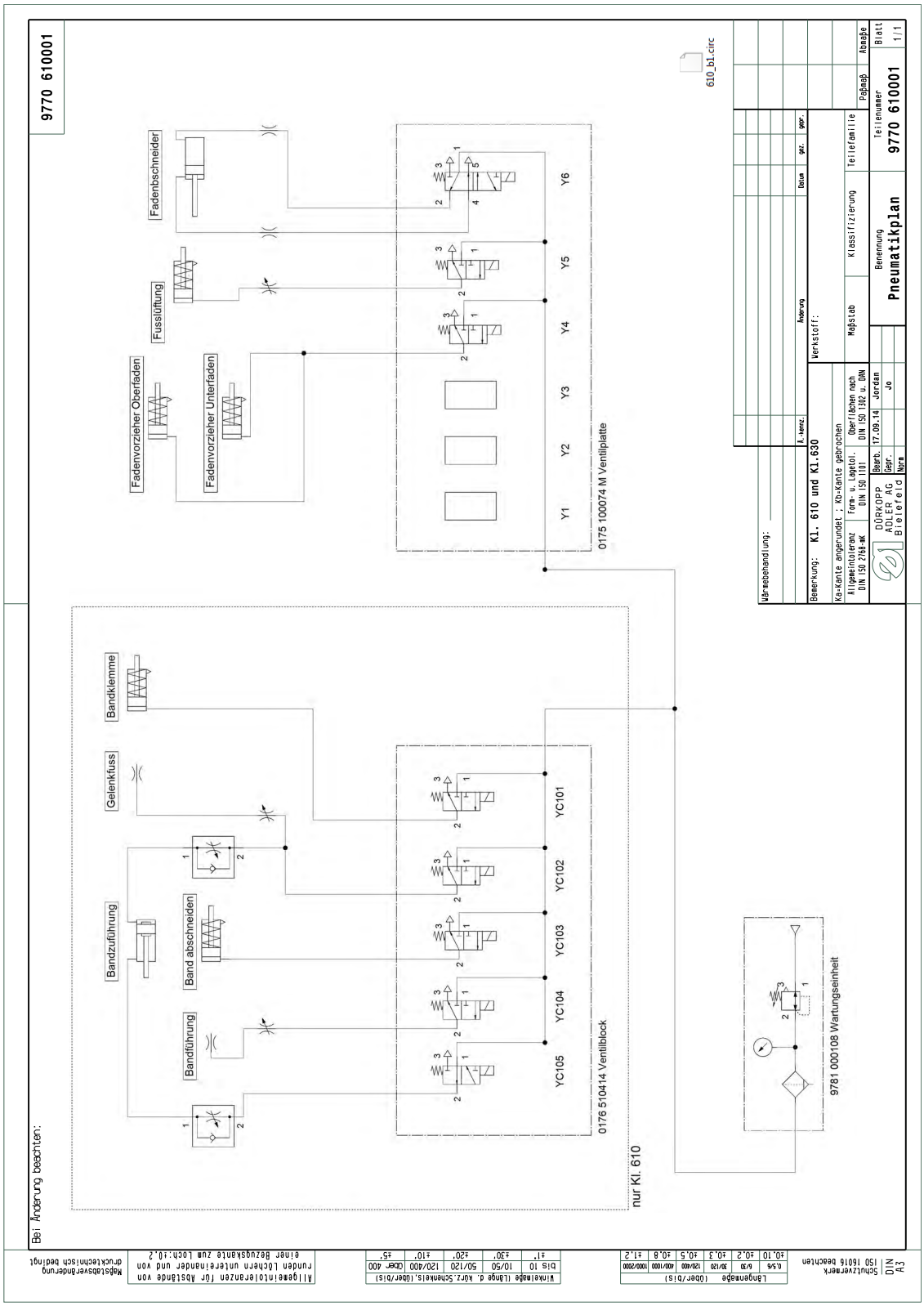


Fig. 88: Pneumatic diagram



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