DÜRKOPP ADLER

650-16

Additional Instructions

Conversion from DAC3 to DAC comfort

IMPORTANT
READ CAREFULLY BEFORE USE
KEEP FOR FUTURE REFERENCE

1 General information

These instructions provide a description on how to convert the DAC3 control into the DAC comfort control.

Components of the kit

Check whether the scope of delivery for kit 9880 650005 is correct prior to installation.

Part number	Quantity	Description
0580 490194	1	Rotary encoder
0791 100043	1	CE Declaration of Conformity
9203 002422	2	Cylinder-head bolt (M2, 5x4)
9207 170227	3	Chipboard screw (3,5x17)
9401 000194	2	Pedal rod
9401000204	1	Setpoint device DAC
9800 580050	1	Stepper motor
9840 120045	1	Mounting clip
9850 001309	1	Machine ID
9850 650500	1	Control DAC comfort
9870 001412	1	Sewing motor cable
9870 650008	1	Cable set DAC comfort
9880 001006	1	Fixing parts DAC comfort
9870 650012	1	Cable set DAC comfort
9800 350002	1	Setpoint device
9400 100010	1	Angle
9207 170847	3	Chipboard screw (5x25)
9202 002148	4	Cylinder-head bolt (M4x40)
9330 000087	5	Washer (A4.3)
9840 120003	1	Nail clamp
9840 123003	1	Steel needle (2x30)
9840 121002	20	Cable tie (3,5x200)
9870 009021	1	Grounding wire (200 mm R4/5)
9870 009025	1	Grounding wire (200 mm R5/6)
9202 002077	1	Cylinder-head bolt (M4x10)
9830 530001	1	Contact washer (4 mm)
0791 650702 EN	1	Additional Instructions

2 Converting the control

DANGER

Risk of injury from electricity!

Unprotected contact with electricity can result in serious injuries or death.

Work on the electrical system must ONLY be carried out by qualified electricians or appropriately trained and authorized personnel.
ALWAYS pull the power plug before working on the electrical equipment.

2.1 Disassembling the DAC3 control

2.1.1 Disassembling control and extension box

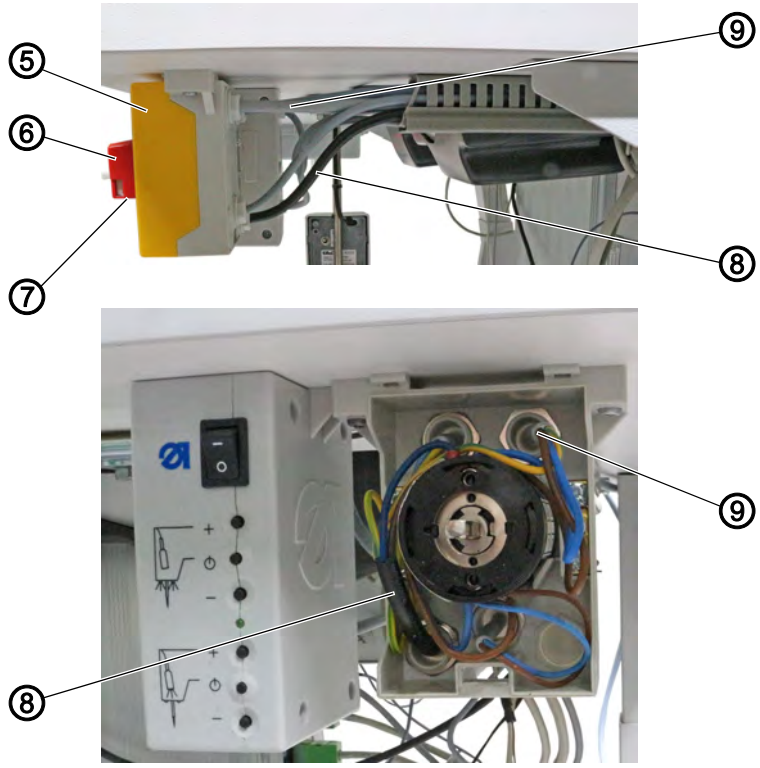
Fig. 1: Disassembling control and extension box (1)

(1) - Power cable (220 V)
(2) - Extension box
(3) - Cables
(4) - Control

To disassemble the control and the extension box:

1. Disconnect the power cable (220V) (1).
2. Disconnect all cables (3) from the control (4) and the extension box (2).
3. Disconnect all grounding wires from the control (4) and the extension box (2).

Fig. 2: Disassembling control and extension box (2)

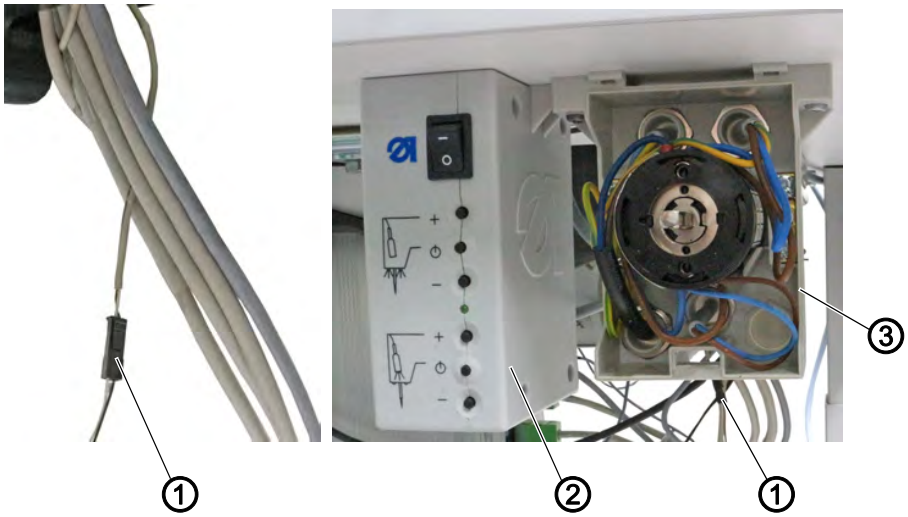


(5) - Main switch cover
(6) - Rotary knob
(7) - Screw
(8) - Control power cable
(9) - Extension box power cable

4. Loosen the screw (7) on the bottom side of the rotary knob (6).
5. Remove the rotary knob (6).
6. Remove the main switch cover (5).
7. Disconnect the control power cable (8) and the extension box power cable (9) from the main switch.
8. Loosen the control (4) and the extension box (2) from the tabletop.

2.1.2 Disassembling sewing lamp transformer and main switch

Fig. 3: Disassembling sewing lamp transformer and main switch



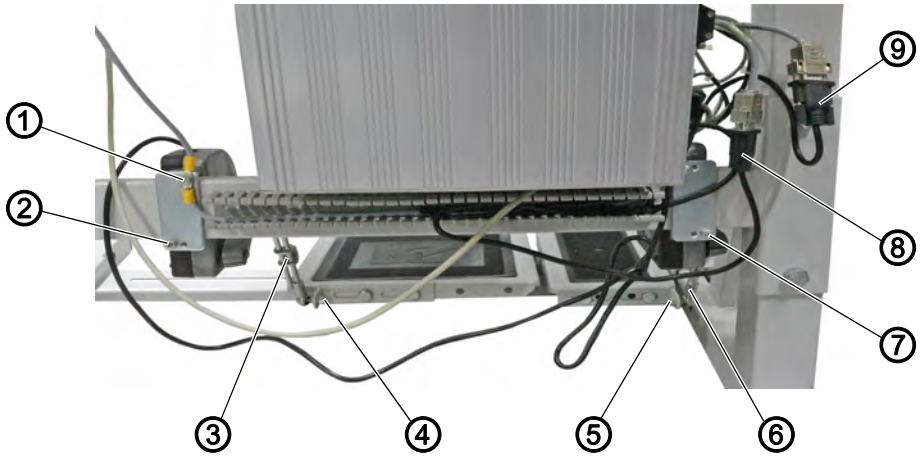
(1) - Plug
(2) - Sewing lamp transformer
(3) - Main switch

To disassemble the sewing lamp transformer and the main switch:

1. Disconnect the plug (1).
2. Loosen the sewing lamp transformer (2) and the main switch (3) from the tabletop.

2.1.3 Disassembling the pedal rod

Fig. 4: Disassembling the pedal rod



(1) - Screw
(2) - Screw
(3) - Pedal rod
(4) - Screw
(5) - Screw
(6) - Fullness pedal rod
(7) - Screw
(8) - Plug
(9) - Plug

Disassembling the sewing pedal rod

To disassemble the sewing pedal rod:

1. Loosen the screw (1).
2. Remove the grounding wires.
3. Loosen the screw (4).
4. Loosen the pedal rod (3) from the pedal.
5. Loosen the screw (2).
6. Remove the pedal rod (3) from the stand.
7. Disconnect the plug (8).

Disassembling the fullness pedal rod (optional)

To disassemble the fullness pedal rod:

1. Loosen the screw (5).
2. Loosen the fullness pedal rod (6) from the pedal.
3. Loosen the screw (7).
4. Remove the fullness pedal rod (6) from the stand.
5. Disconnect the plug (9).

2.1.4 Disassembling the X-axis stepper motor

The stepper motor for the X-axis is replaced with an *Ever* motor.

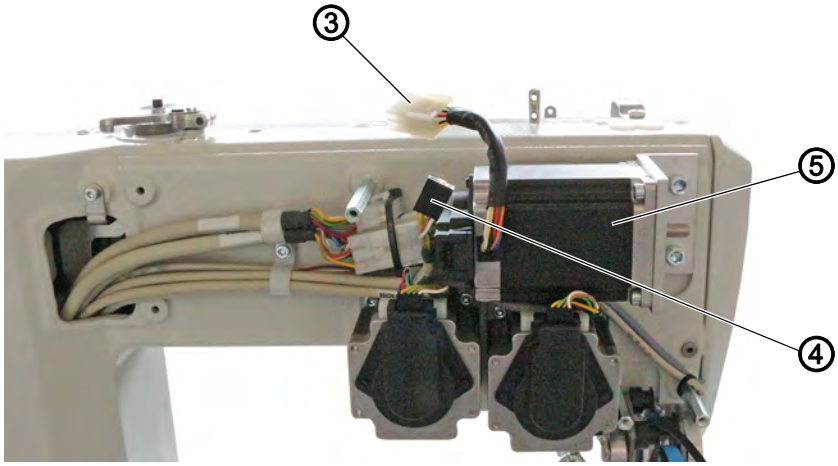
Fig. 5: Disassembling the X-axis stepper motor (1)

(1) - Screws *(2) - Cover*

To disassemble the stepper motor for the X-axis:

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

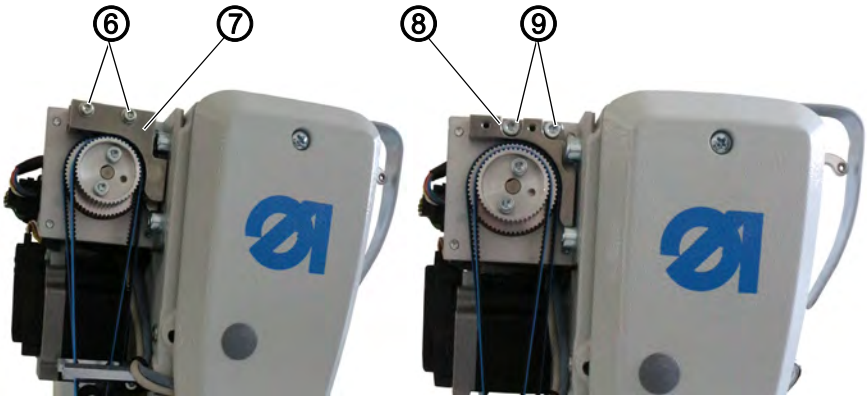
Fig. 6: Disassembling the X-axis stepper motor (2)



(3) - Motor plug
(4) - Encoder plug
(5) - Stepper motor X-axis

3. Motor plug (3) and encoder plug (4) for the stepper motor Disconnect the X-axis (5).

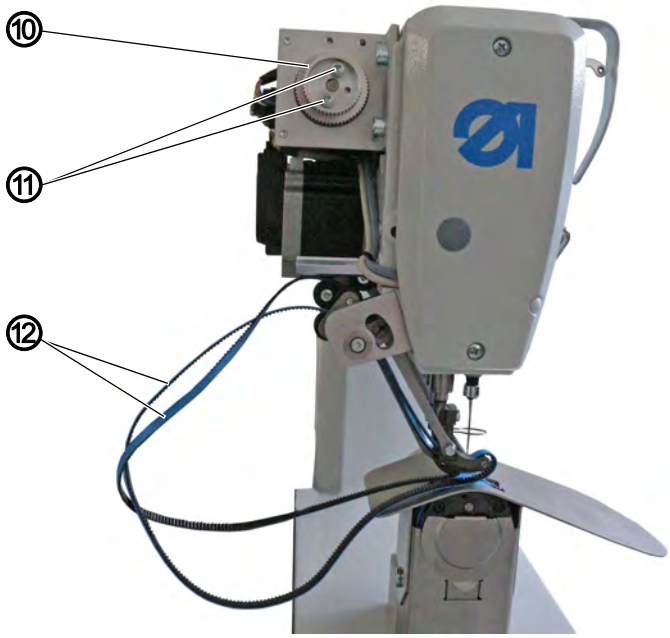
Fig. 7: Disassembling the X-axis stepper motor (3)



(6) - Threaded pins
(7) - Jump protection
(8) - Jump protection
(9) - Threaded pins

4. Loosen the threaded pins (6).
5. Remove jump protection (7).
6. Loosen the threaded pins (9).
7. Remove jump protection (8).

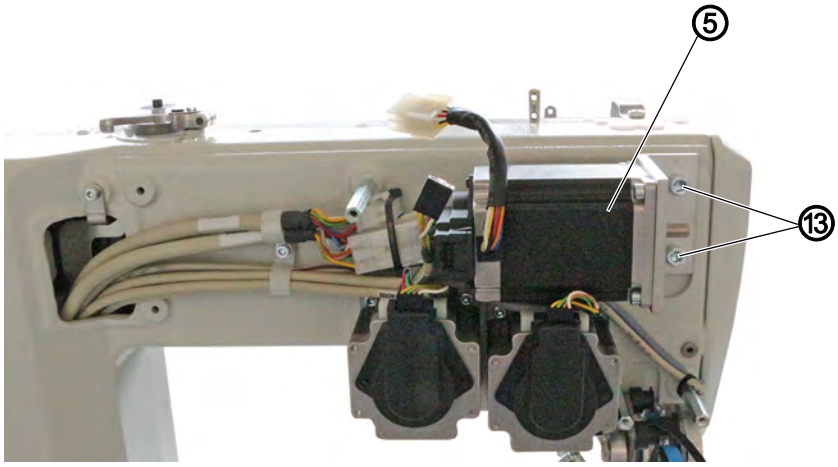
Fig. 8: Disassembling the X-axis stepper motor (4)



(10) - Toothed belt wheels
(11) - Screws
(12) - Conveyor belts

8. Remove the conveyor belts (12).
9. Loosen the screws (11).
10. Remove the toothed belt wheels (10).

Fig. 9: Disassembling the X-axis stepper motor (5)



(5) - Stepper motor X-axis
(13) - Screws

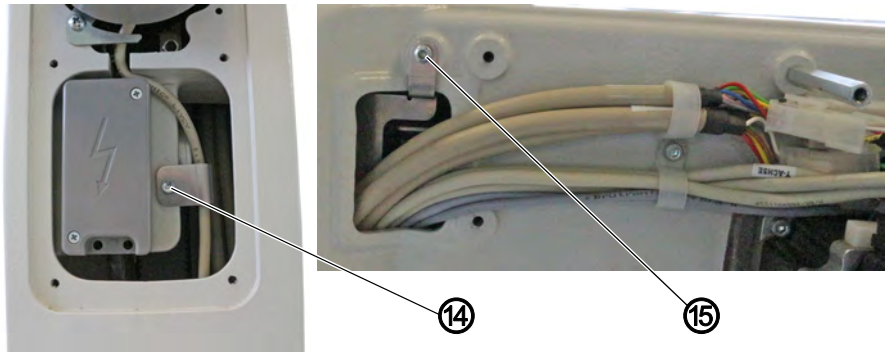
11. Loosen the screws (13).
12. Disassemble the X-axis stepper motor (5).

Important

Lay the stepper motor aside because you will need it later as a stepper motor for the U-axis.

13. Remove handwheel and cover.

Fig. 10: Disassembling the X-axis stepper motor (6)



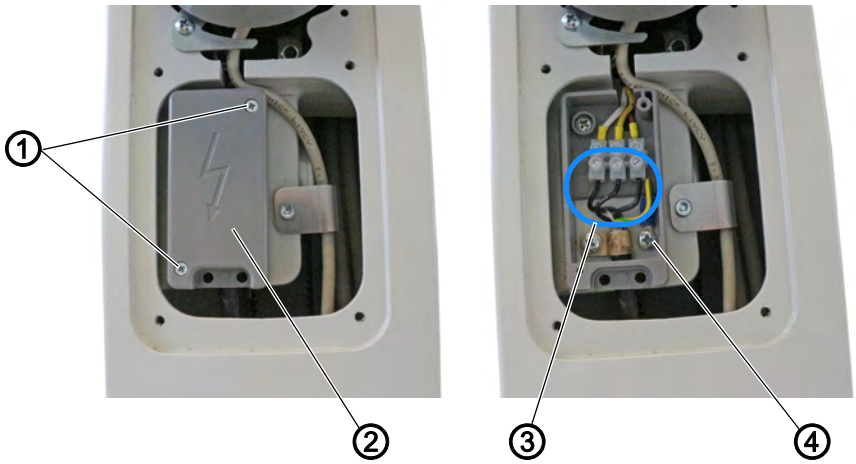
(14) - Screw

(15) - Screw

14. Loosen screws (14) and (15).
    - The bracket has been loosened, allowing you to pull the cables downward through the machine.
15. Carefully pull all 6 cables (3 stepper motor cables and 3 encoder cables) down and out through the machine one at a time.

2.1.5 Disconnecting the sewing motor

Fig. 11: Disconnecting the sewing motor



(1) - Screws

(2) - Cover

(3) - Sewing motor cable

(4) - Screw

To disconnect the sewing motor:

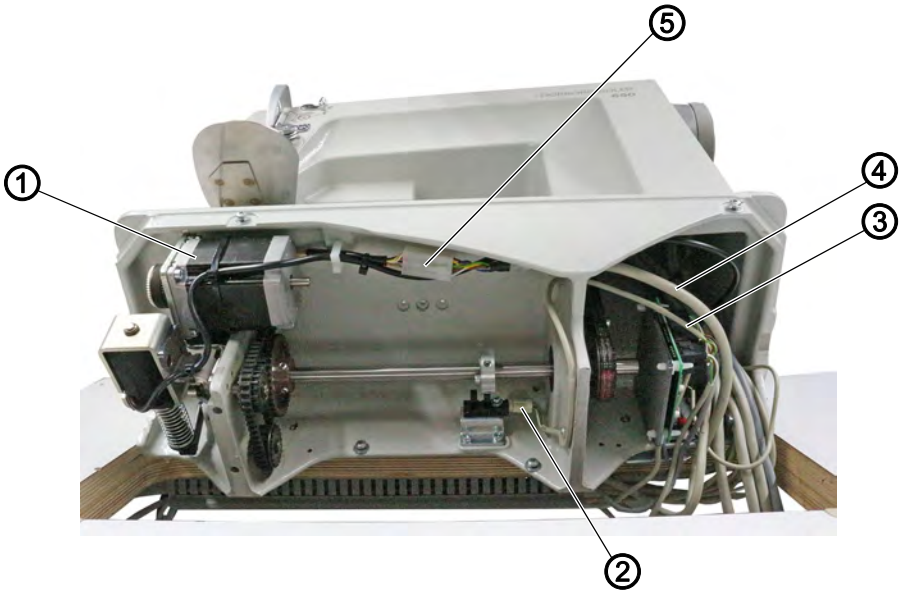
1. Loosen the screws (1).
2. Remove cover (2).
3. Disconnect the sewing motor cable (3).
4. Loosen the screw (4) and remove the ground cable.

Information

The extension cord for the sewing motor encoder cable is no longer required during reassembly.

2.1.6 Disassembling the U-axis stepper motor

Fig. 12: Disassembling the U-axis stepper motor (1)

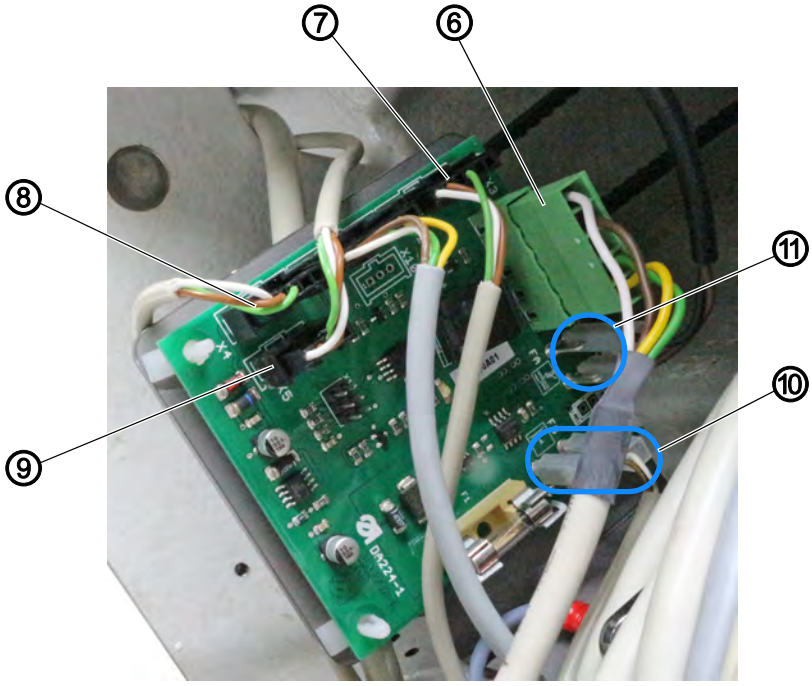


(1) - U-axis stepper motor
(2) - Plug
(3) - Synchronizer cable
(4) - Stepper motor cable
(5) - Plug

To disassemble the stepper motor for the U-axis:

1. Tilt the machine head and loosen the oil pan.
2. Disconnect the plug (5).
3. Pull off the stepper motor cable (4).
4. Disconnect the plug (2).
5. Pull off the synchronizer cable (3).

Fig. 13: Disassembling the U-axis stepper motor (2)



(6) - Plug X3
(7) - Plug X2
(8) - Plug X4
(9) - Plug X5
(10) - Plug X8/X9 (thread tension)
(11) - Plug X6/X7 (thread cutter)

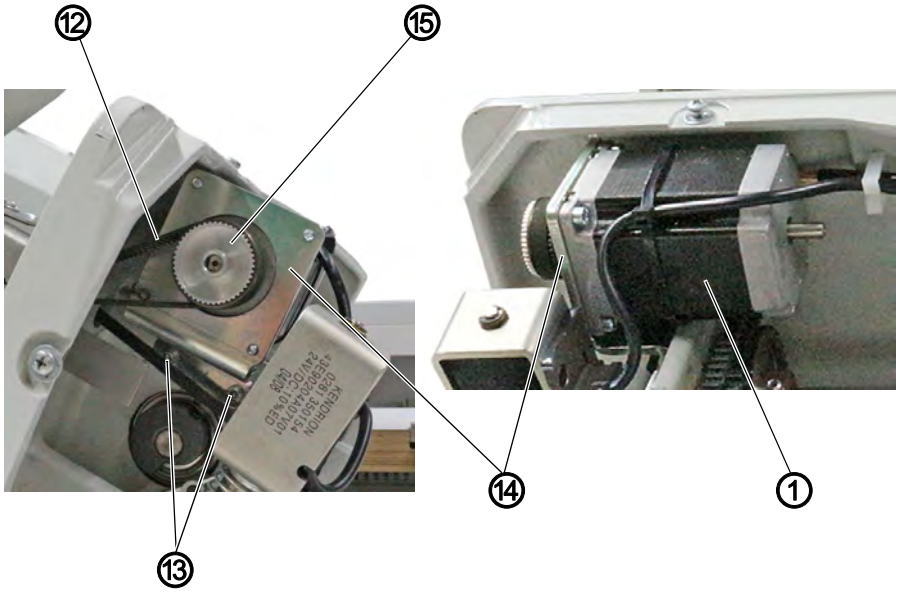
6. Pull plug X3 (6), plug X2 (7), plug X4 (8) and plug X5 (9) off the circuit board.

↳ The cables are no longer required.

7. Pull plug X6/X7 (11) and plug X8/X9 (10) off the circuit board.

↳ The cables will be used again with the new control.

Fig. 14: Disassembling the U-axis stepper motor (3)



(1) - U-axis stepper motor
(12) - Toothed belt
(13) - Screws
(14) - Angle
(15) - Toothed belt wheel

8. Remove the toothed belt (12).
9. Loosen the toothed belt wheel (15) from the motor shaft.
10. Loosen the screws (13).
11. Remove the bracket (14) with the U-axis stepper motor (1).
12. Loosen the U-axis stepper motor (1) from the bracket (14).

2.2 Assembling the DAC comfort control

2.2.1 Aligning the tabletop on top of the stand

NOTICE

Property damage may occur!

The machine may tip over if its center of gravity shifts.

Slide the tabletop on top of the stand as needed to offset the shifted center of gravity.

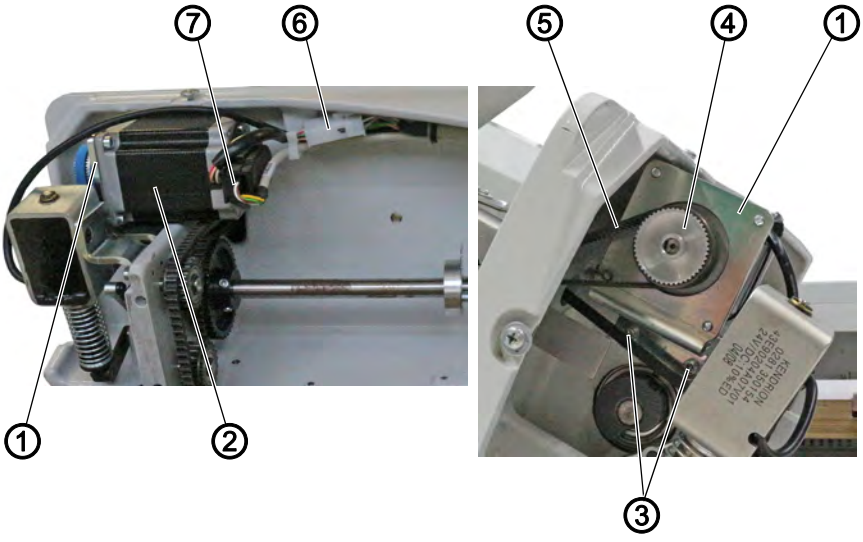
To align the tabletop on top of the stand:

1. Move the tabletop on top of the stand; see tabletop drawing in the **Appendix** (📖 *p. 35*):
   - 50 mm to the rear
   - 5 mm to the left
2. Tighten the tabletop to the stand

2.2.2 Assembling the U-axis stepper motor

The stepper motor for the U-axis is replaced by the old stepper motor used for the X-axis.

Fig. 15: Assembling the U-axis stepper motor (1)

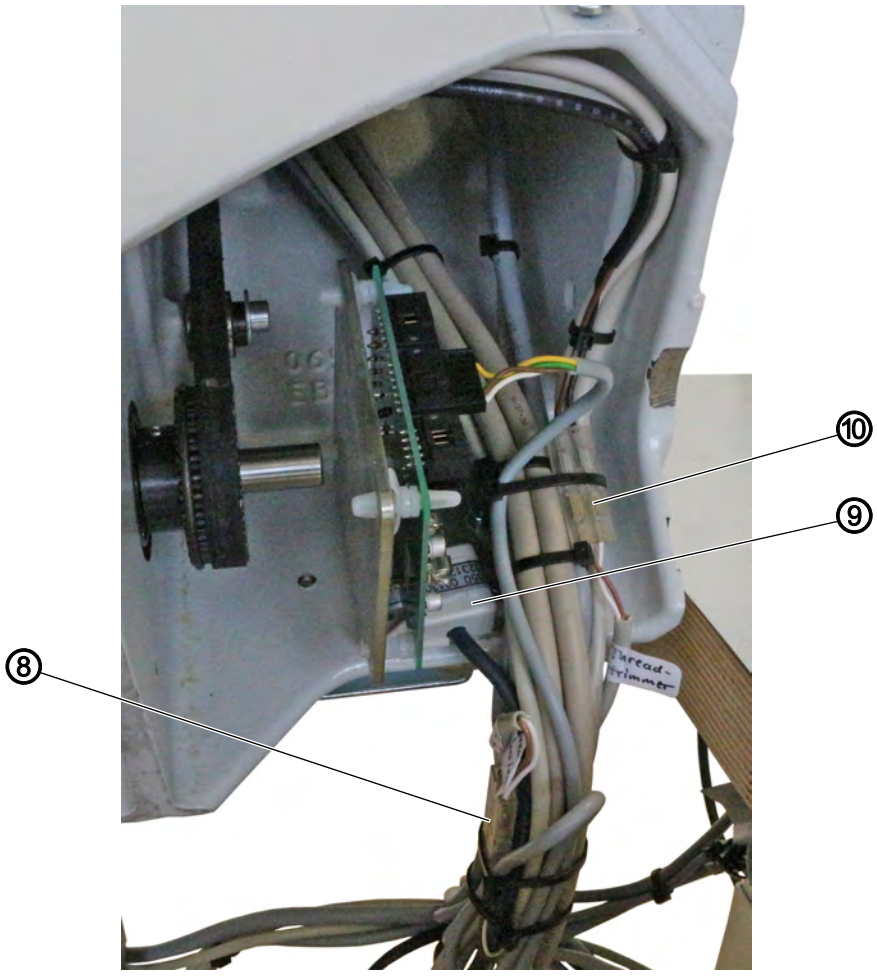


(1) - Angle
(2) - U-axis stepper motor
(3) - Screws
(4) - Toothed belt wheel
(5) - Toothed belt
(6) - Motor plug
(7) - Encoder plug

To assemble the stepper motor for the U-axis:

1. Screw the U-axis stepper motor (2) to the bracket (1).
2. Screw the bracket (1) under the base plate using the screws (3).
3. Tighten the toothed belt wheel (4) on the motor shaft.
4. Place the toothed belt (5).
5. Connect the motor plug (6) to the new cable.
6. Connect the encoder plug (7).

Fig. 16: Assembling the U-axis stepper motor (2)



(8) - Plug
(9) - Machine ID
(10) - Plug

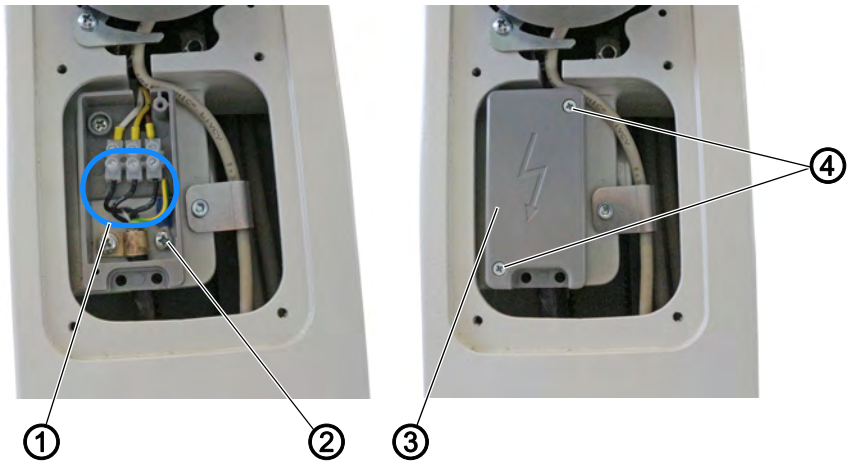
7. Connect the plugs (8) and (10) for the thread tension and thread cutter to the cable marked X90.

- Connect the plug (8) for the thread tension.
  - white + black
  - brown + brown
    The plugs were previously installed in slots X8/X9 on the circuit board.
- Connect the plug (10) for the thread cutter.
  - white + white
  - brown + brown
    The plugs were previously installed in slots X6/X7 on the circuit board.

8. Tighten the machine ID (9) next to the circuit board.

2.2.3 Connecting the sewing motor

Fig. 17: Connecting the sewing motor



(1) - Sewing motor cable
(2) - Screw
(3) - Cover
(4) - Screws

To connect the sewing motor:

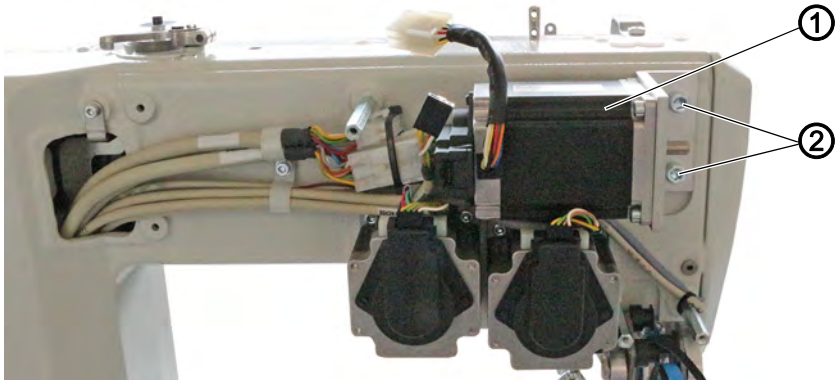
1. Connect the sewing motor cable (1).
   - white + cable 1
   - yellow + cable 3
   - brown + cable 2
2. Assemble the grounding wire with screw (2).
3. Assemble the cover (3).
4. Tighten the screws (4).

2.2.4 Assembling the X-axis stepper motor

To assemble the stepper motor for the X-axis:

1. Carefully route all 6 cables (3 stepper motor cables and 3 encoder cables) up through the machine one at a time and fix them in place on the machine head using cable clamps.

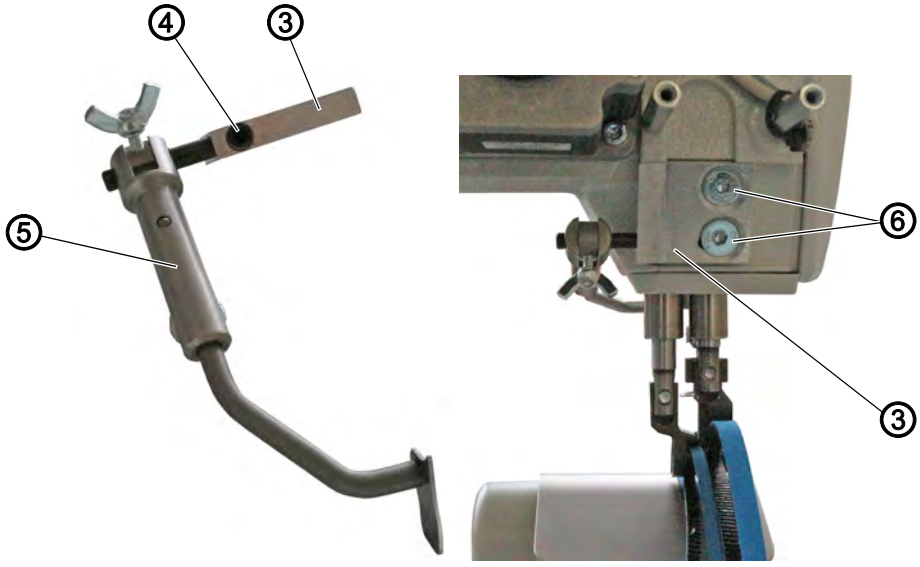
Fig. 18: Assembling the X-axis stepper motor (1)



(1) - Stepper motor X-axis
(2) - Screws

2. Tighten the stepper motor for the X-axis (1) on the machine head using the screws (2).

Fig. 19: Assembling the X-axis stepper motor (2)



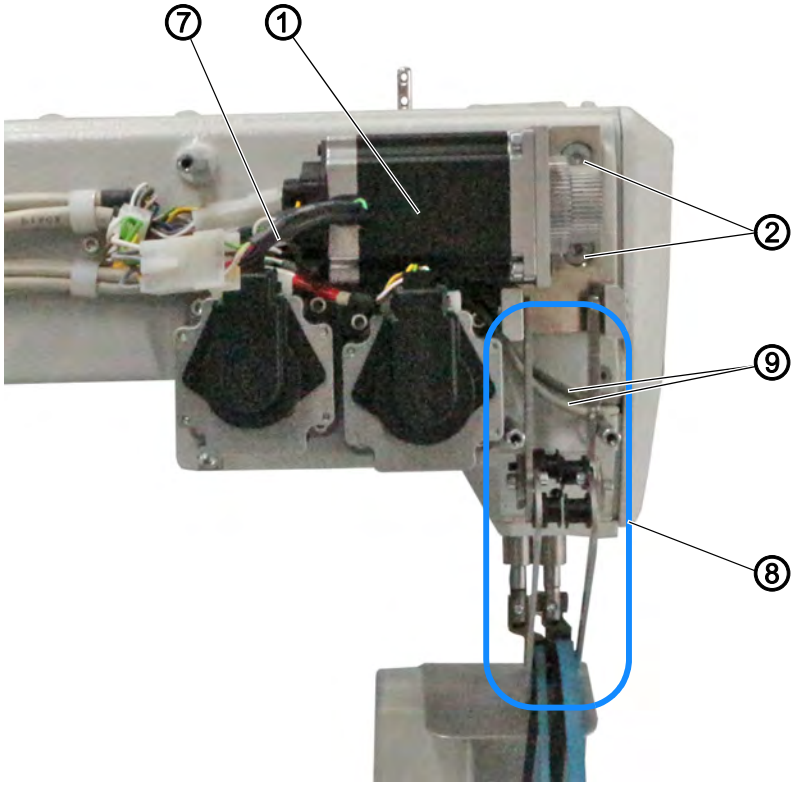
(3) - Plate
(4) - Threaded pin
(5) - Edge guide
(6) - Screws

To assemble the new tape transport:

1. Screw the edge guide (5) to the plate (3).
   Ensure that the threaded pin (4) is flush with the surface.

2. Screw the plate (3) and the edge guide (5) to the machine head using the screws (6).

Fig. 20: Assembling the X-axis stepper motor (3)



(1) - Motor
(2) - Countersunk screws
(7) - Encoder plug
(8) - Deflector mechanism
(9) - Cables

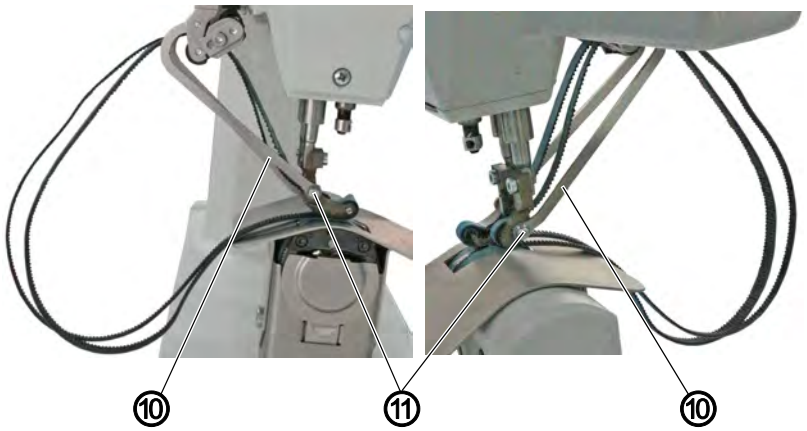
3. Tighten the new motor (5) and the new deflector mechanism (8) to the machine head using the countersunk screws (10).

Important

Do not tighten the countersunk screws (10) all the way.
The slotted holes in the bracket make it possible to later shift the position of the motor (1).
Ensure that the cables (9) are properly fixed in place by cable ties without being pinched.
The conveyor belts must not come into contact with the cables (9) following assembly.

4. Connect the encoder plug (7).

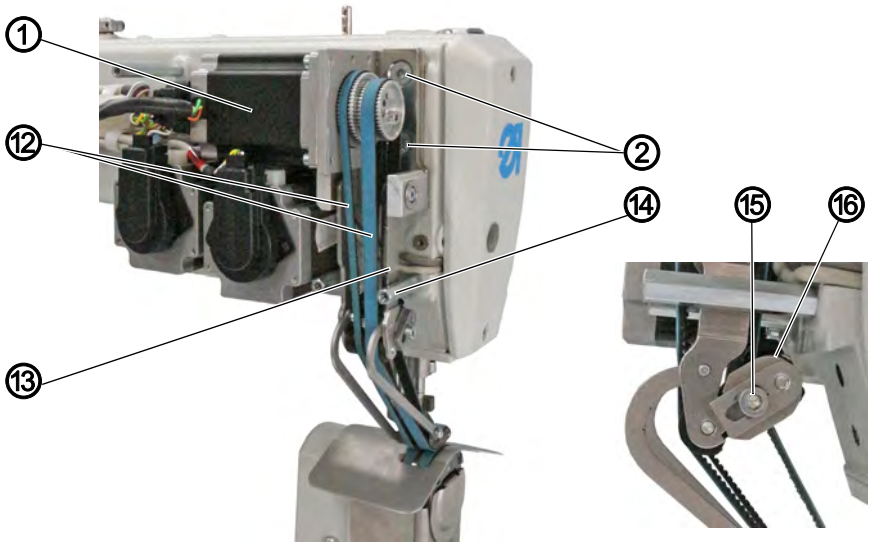
Fig. 21: Assembling the X-axis stepper motor (4)



(10) - Coupling rods
(11) - Screws

5. Tighten the coupling rods (10) to the sewing foot using the screws (11).

Fig. 22: Assembling the X-axis stepper motor (5)



(1) - Motor
(2) - Countersunk screws
(12) - Conveyor belts
(13) - Guide
(14) - Spacer pin
(15) - Screw
(16) - Guide piece

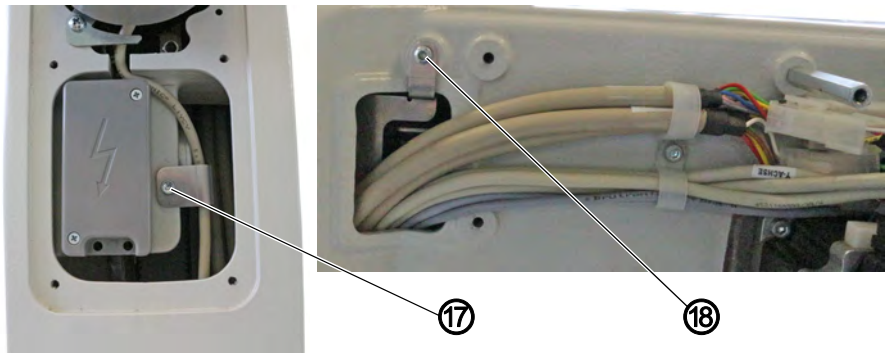
6. Assemble the conveyor belts (12).
7. To tighten the conveyor belts (12), slightly lift the motor (1).
   ↳ The conveyor belts (12) tighten.
8. Tighten the countersunk screws (2).

9. To retighten the conveyor belts (12), loosen the screw (15) on the guide piece (16).
   - To increase the tension: Slide the guide piece (16) to the left
   - To reduce the tension: Slide the guide piece (16) to the right
10. Tighten the screw (15).

Important

Make sure there is only a minimum gap between the guide (13) and the spacer pin (14).
Ensure that the guide piece (16) does not abut on the machine head when the sewing foot is lowered.

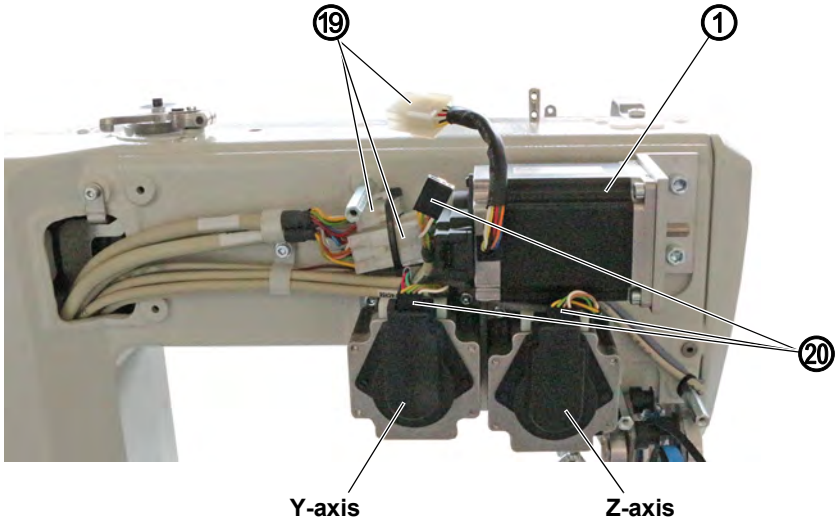
Fig. 23: Assembling the X-axis stepper motor (6)



(17) - Screw
(18) - Screw

11. Tighten screws (17) and (18).

Fig. 24: Assembling the X-axis stepper motor (7)

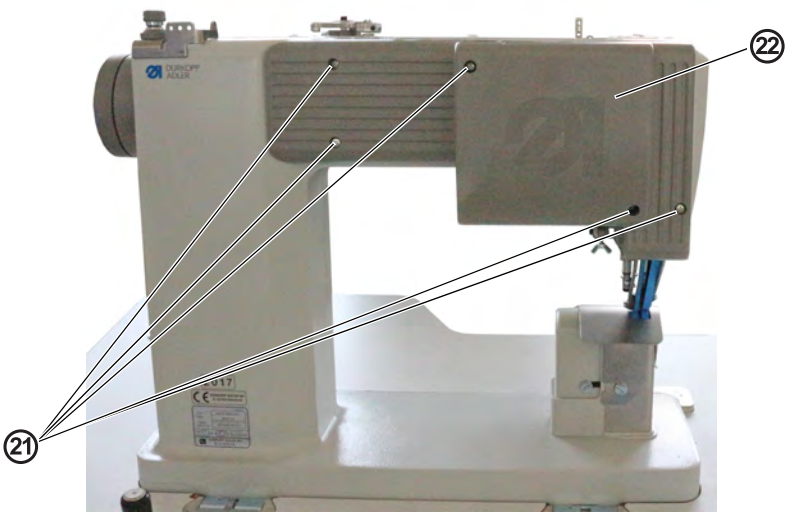


(1) - Stepper motor X-axis
(19) - Motor plug
(20) - Encoder plug

12. Connect all motor plugs (19) and encoder plugs (20).

↳ The cables are labeled.
Make sure to connect the correct cables to the stepper motors and the encoders.

Fig. 25: Assembling the X-axis stepper motor (8)



(21) - Screws *(22) - Cover*

13. Assemble the cover (22).
14. Tighten the screws (21).

2.2.5 Assembling the control

Fig. 26: Assembling the control

(1) - Knee button

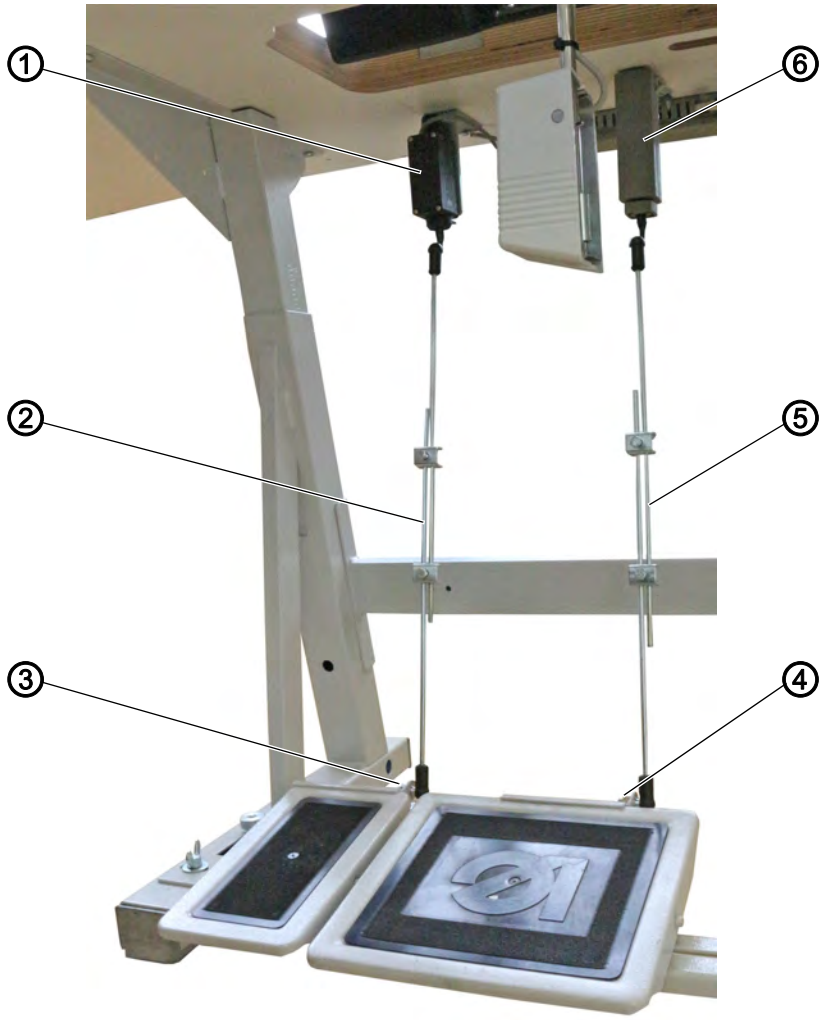
(2) - Control DAC comfort

To assemble the control:

1. Screw the control (2) under the tabletop to the right of the knee button (1).

2.2.6 Assembling the pedal rod

Fig. 27: Assembling the pedal rod



(1) - Setpoint device fullness pedal
(2) - Fullness pedal rod
(3) - Screw
(4) - Screw
(5) - Pedal rod
(6) - Setpoint device

Assembling the sewing pedal rod

To assemble the sewing pedal rod:

1. Tighten the pedal rod (5) to the pedal using the screw (4).
2. Tighten the setpoint device (6) under the tabletop.

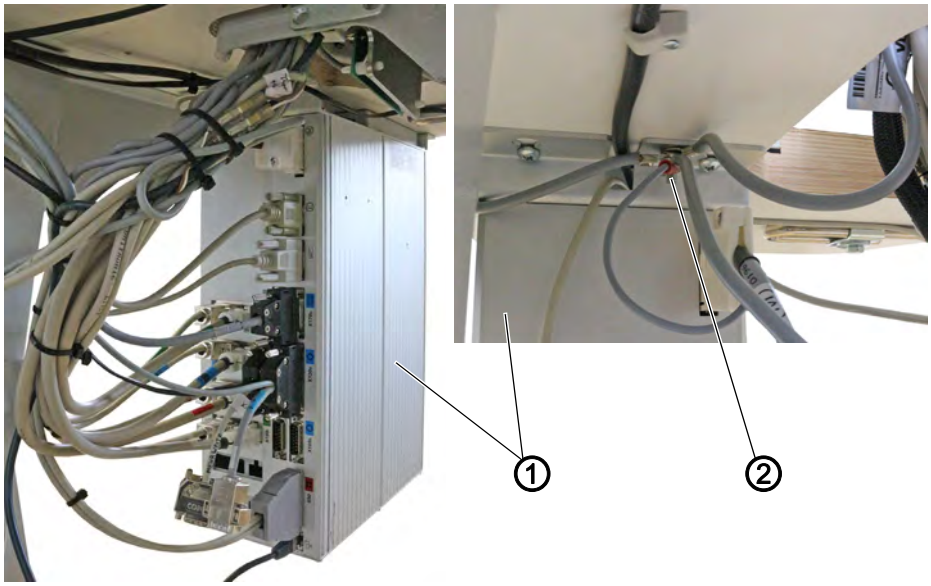
Assembling the fullness pedal rod (optional)

To assemble the fullness pedal rod:

1. Tighten the fullness pedal rod (2) to the pedal using the screw (3).
2. Tighten the setpoint device for the fullness pedal (1) under the tabletop.

2.2.7 Laying the cables

Fig. 28: Laying the cables



(1) - Control

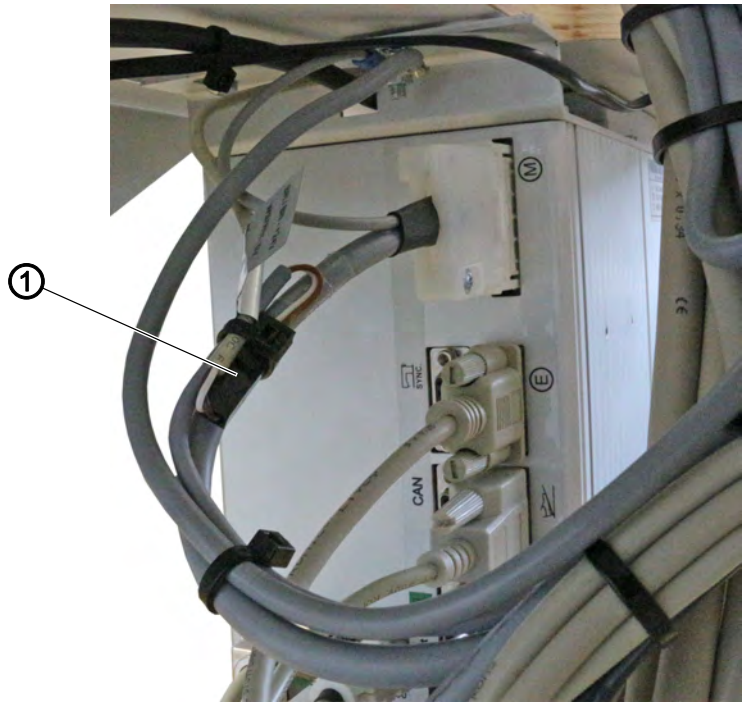
(2) - Screw

To lay the cables:

1. Lay all cables neatly.
   To do so, tighten cable ducts under the tabletop and route the cables through them.
2. Connect all plugs with the control (1).
   All cables are color-coded according to their position at the control (1) or marked with a symbol.
3. Tighten a grounding wire to the machine head, the stand, the fullness pedal and the knee button.
4. Tighten the grounding wires to the control (1) using the screw (2).
5. Fix all cables in place using cable ties.

2.2.8 Connecting the sewing lamp

Fig. 29: Connecting the sewing lamp



(1) - Plug

To connect the sewing lamp:

6. Connect the plug (1).

3 Updating the software

3.1 Loading and setting up the software for machines with an OP3000 control panel

3.1.1 Loading the software

The software will already have been loaded onto machines equipped with the OP3000 control panel.

3.1.2 Setting the *Serial Wiring* parameter

Tape transport requires that the series connection of the upper transport motor be activated.

To set the parameter:

1. Switch off the machine.
2. Keep the **S** button pressed down and switch on the machine.
3. Enter the password 85627.
4. Open the menu item *Feed > Feed Diff Top > Serial Wiring* and select the value *1*.
5. Confirm with **OK**.

3.1.3 Setting the tilt sensor

After the new control has been assembled and the new software has been loaded, the tilt sensor will be set to the factory setting *ON*.
After converting from the DAC3 control to the DAC comfort control, you will have to change the setting to *INV*.

To set the tilt sensor:

1. Press and hold the **S** button.
2. Switch on the machine.
3. Enter code 85627.
4. Open the menu item *Other Devices > Tilt sensor* and select the *INV* option.
5. Press the **OK** button.

↳ The option has been selected.

6. Press the **ESC** button to save the setting.

↳ The display shows the message **! STOP**.

7. Switch off the machine.
8. Switch on the machine.

3.1.4 Calibrating the electronic thread tensioner

To calibrate the electronic thread tensioner:

1. Open the menu item *Service > Calibration* and select the *Thread Calib* option.

Fig. 30: Calibrating the electronic thread tensioner (1)

You use this subitem to calibrate the needle thread tension.
You will need a thread tension measurement device to perform the calibration (600 g spring balance, part number 0APP 001503).

Order

Calibration points

You need to set the calibration points 3 – 1 one after the other:

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

Calibration steps

To calibrate the needle thread tension:

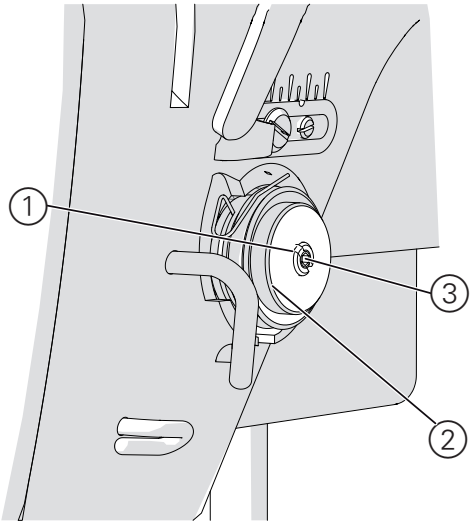
Step 1: Set calibration point 3

1. Insert the thread and guide it up to the thread lever (🕮 *Operating Instructions*).
2. After the thread lever, feed the thread into the measurement device.
3. Use ▲/▼ to select calibration point **3**:

Fig. 31: Calibrating the electronic thread tensioner (2)

4. Press **OK** .

Fig. 32: Calibrating the electronic thread tensioner (3)



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

5. Completely loosen the threaded pin (3) in the middle of the thread tensioner.
6. Screw in the adjusting nut (1) as far as possible without pressing the tension disks (2) against each other.
7. Slowly loosen the adjusting nut (1) again while observing the display on the tension measurement device.
8. At the point at which the measurement device displays a value of 300 g: Tighten the threaded pin (3) without changing the position of the adjusting nut (1).
9. Press **OK**.

Step 2: Set calibration point 2

1. Use ▲/▼ to select calibration point 2.
2. Press **OK**.
3. Use ▲/▼ to change the thread tension until the measurement device shows 150 g.
4. Press **OK**.

Step 3: Set calibration point 1

1. Use ▲/▼ to select calibration point 1.
2. Press **OK**.
3. Use ▲/▼ to change the thread tension until the measurement device shows 5 g.
4. Press **OK**.

3.1.5 Calibrating the sewing foot pressure

To calibrate the sewing foot pressure:

1. Open the menu item *Service > Calibration* and select the *Foot Calib* option.

Fig. 33: Calibrating the sewing foot pressure

The control must know the upper and lower position of the sewing feet.
The upper position is communicated when switching on the machine.
The lower position is defined by the calibration performed in this subitem.

Order

Always calibrate the sewing feet after making adjustments to the sewing foot lifting gear (📖 *Service Instructions*).

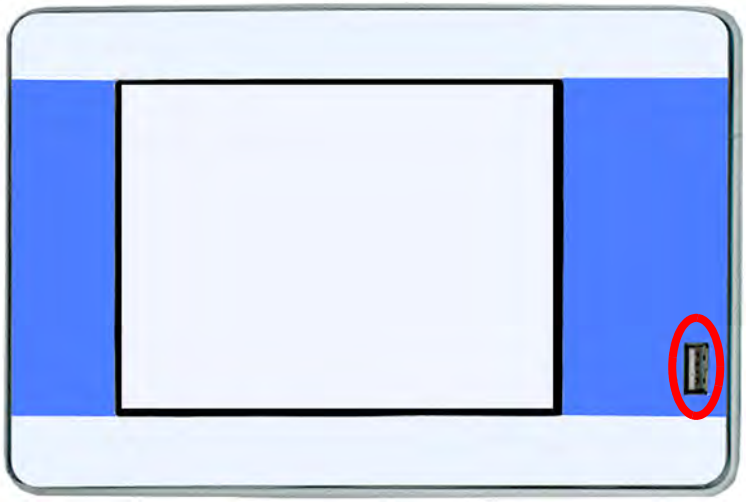
To calibrate the sewing foot pressure:

1. Call up the *Foot Calib* subitem.
2. Press **OK**.
3. The machine will calibrate automatically:
   Both sewing feet move up and down once.
   The calibration is then complete.

3.2 Loading and setting up the software for machines with an OP7000 control panel

3.2.1 Loading the software

Fig. 34: Loading the software



The control software for machines equipped with the OP7000 control panel is included on a USB key.

To load the software:

1. Plug in the USB key into the OP7000 control panel.
2. Start the machine.

↳ The software is updated automatically.

3.2.2 Setting the *Serial Wiring* parameter

Tape transport requires that the series connection of the upper transport motor be activated.

To set the parameter:

1. Switch off the machine.
2. Switch on the machine.
3. The boot loader screen is displayed:

Fig. 35: Setting the Serial Wiring parameter

4. Press the button.
5. Enter the password 85627.
6. Open the menu item *Service On Start > Machine Configuration > Transport Top Motor Serial Wiring* and select the value *1*.
7. Confirm with **OK**.

3.2.3 Setting the tilt sensor

After the new control has been assembled and the new software has been loaded, the tilt sensor will be set to the factory setting *1*.
After converting from the DAC3 control to the DAC comfort control, you will have to change the setting to *2*.

To set the tilt sensor:

1. Switch on the machine.
2. The boot loader screen is displayed:

Fig. 36: Setting the tilt sensor

3. Press the button.
4. Enter code 85627.
5. Open the menu item *Machine config.* > *Other Devices* > *Tilt sensor* and select the *2* option.
6. Confirm with **OK**.
7. Switch off the machine.
8. Switch on the machine.

3.2.4 Calibrating the electronic thread tensioner

To calibrate the electronic thread tensioner:

1. Open the menu item *Service* > *Calibration* and select the *Thread Tension Calibration* option.

You use this subitem to calibrate the needle thread tension.
You will need a thread tension measurement device to perform the calibration (600 g spring balance, part number 0APP 001503).

Order

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

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

Calibration steps

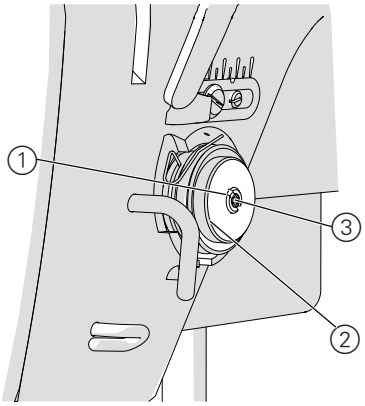
To set calibration position 3:

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

↳ The tension element is closed.

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

Fig. 37: Calibrating the electronic thread tensioner



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

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

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

↳ The tension element opens.

To set calibration position 2:

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

To set calibration position 1:

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

3.2.5 Calibrating the sewing foot pressure

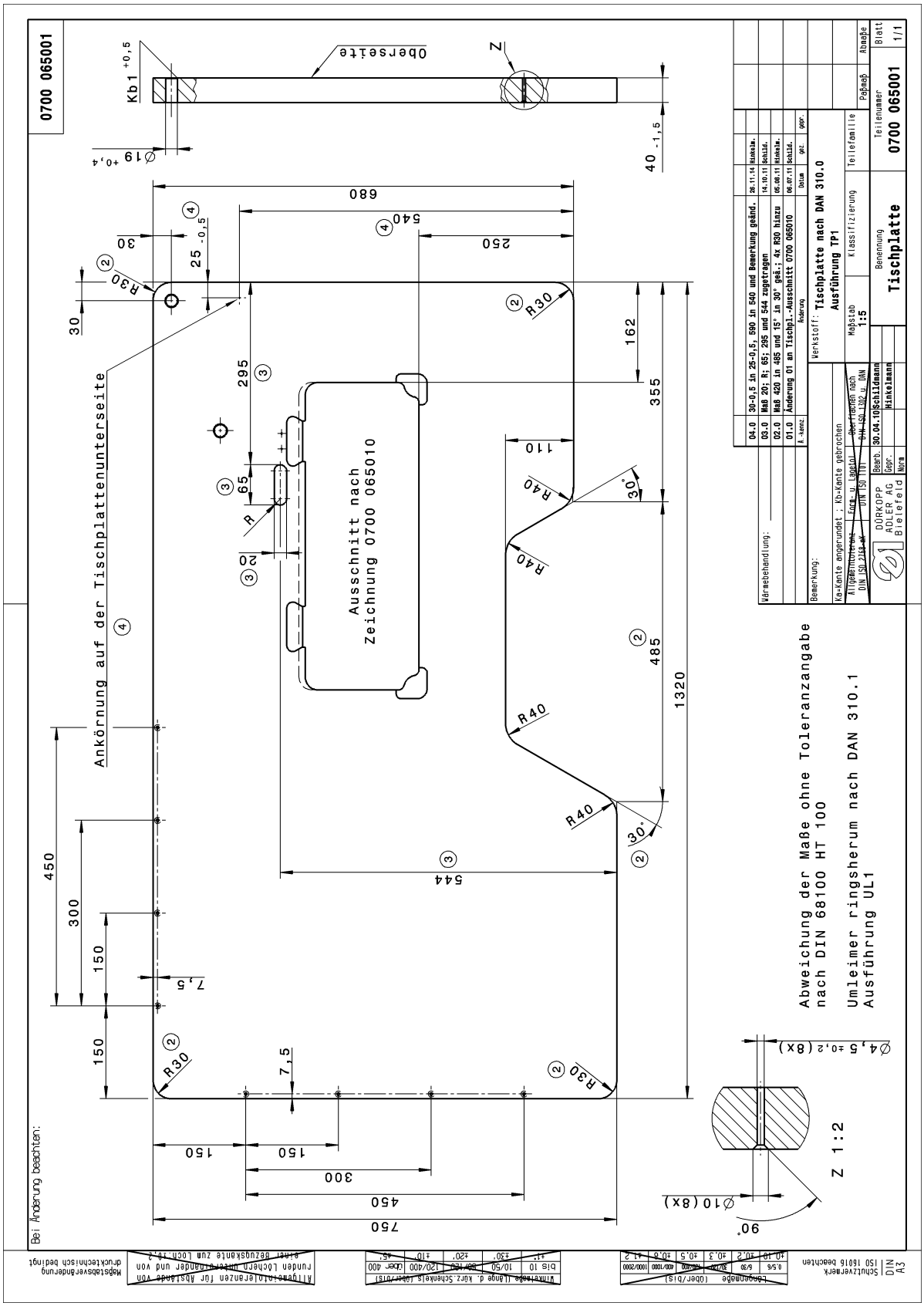
To calibrate the sewing foot pressure:

1. Open the menu item *Service > Calibration* and select the *Feet Difference Calibration* option.

↳ The values for the sewing feet are calibrated automatically.

4 Appendix

Fig. 38: Tabletop drawing



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