



Label Printer

A+ The Premium Class.

Service Manual for the following products

Family	Type
A+	A2+
	A4+
	A4.3+
	A6+
	A8+
	A4+M

Edition: 6/2008 - Part No. 9008508

Copyright

This documentation as well as translation hereof are property of cab Produkttechnik GmbH & Co. KG.

The replication, conversion, duplication or divulgement of the whole manual or parts of it for other intentions than its original intended purpose demand the previous written authorization by cab.

Trademark

Centronics® is a registered trademark of the Data Computer Corporation.

Microsoft® is a registered trademark of the Microsoft Corporation.

Windows 2000®, 2003®, XP® are registered trademarks of the Microsoft Corporation.

TrueType™ is a registered trademark of Apple Computer, Inc.

Editor

Regarding questions or comments please contact cab Produkttechnik GmbH & Co. KG.

Topicality

Due to the constant further development of our products discrepancies between documentation and product can occur.

Please check www.cabgmbh.com for the latest update.

Terms and conditions

Deliveries and performances are effected under the General conditions of sale of cab.

Germany

cab Produkttechnik
GmbH & Co KG
Postfach 1904
D-76007 Karlsruhe
Wilhelm-Schickard-Str. 14
D-76131 Karlsruhe
Telefon +49 721 6626-0
Telefax +49 721 6626-249
www.cab.de
info@cab.de

Other subsidiaries on request.

France

cab technologies s.a.r.l.
Z.A. Nord du Val de Moder
F-67350 Niedermodern
Téléphone +33 388 722 501
www.cab-technologies.fr
info@cab-technologies.fr

USA

cab Technology Inc.
90 Progress Avenue Unit #2
Tyngsboro MA, 01879
Phone +1 978 649 0293
www.cabtechn.com
info@cabtechn.com

Asia 亞洲分公司

希愛比科技股份有限公司
cab Technology Co, Ltd.
台灣台北縣板橋市
民生路一段33號十九樓之一
19F-1, No. 33, Sec. 1,
Min Sheng Road
Panchiao 220,
Taipei, Taiwan, R.O.C.
電話 Phone +886 2 2950 9185
網址 www.cabasia.net
詢問 cabasia@cabgmbh.com

1	Important Information	4
1.1	General Safety Instructions.....	4
1.2	Protective Devices	4
1.3	Handling Electricity	5
1.4	Procedure in Case of Accidents	5
2	Cleaning	6
2.1	Cleaning by the Operator.....	6
2.2	Cleaning the Label Sensor A6+, A8+	6
2.3	Cleaning the Label Sensor A4+M	7
3	Replacing Assembly Units	8
3.1	Tools.....	8
3.2	Removing and Installing the Plastic Cover.....	8
3.3	Replacing the Printhead.....	9
3.3.1	Replacing the Printhead A2+, A4+, A4.3+, A4+M	9
3.3.2	Replacing the Printhead A6+, A8+.....	10
3.4	Replacing the Print Roller and Rewind Assist Roller.....	12
3.5	Replacing the Slipping Clutches	13
3.6	Replacing the Label Sensor	15
3.6.1	Replacing Standard Label Sensor A+	15
3.6.2	Replacing Label Sensor A4+M.....	16
3.7	Replacing the PCB CPU	17
3.8	Replacing the Power Supply Unit.....	18
4	Adjustments	19
4.1	Measuring and Adjusting the Winding Torques	19
4.1.1	Measuring the Winding Torques	19
4.1.2	Adjusting the Winding Torques	22
4.2	Adjusting the Printing Mechanism.....	23
4.2.1	Preparing the Printer for Adjustment	23
4.2.2	Adjusting the Printhead Position.....	24
4.2.3	Adjusting the Printhead Pressure.....	25
4.2.4	Adjusting the Transfer Ribbon Feed Path.....	26
4.2.5	Final Test	26
4.3	Adjusting the Belt Tension at the Main Drive Motor	27
4.4	Adjusting the Head Switch	28
5	Troubleshooting and Error Treatment	29
5.1	Failure of Device Functions.....	29
5.2	Hardware Faults.....	30
6	Block Diagram	31
7	Layout Diagram PCB CPU	32
8	Index	34

1 Important Information

1.1 General Safety Instructions

This service manual is intended for use by qualified service and maintenance personnel. For more operation and configuration information, refer to the user or configuration manual.

Follow the general safety rules below:

- Keep the area around the device clean at all times!
- Work with safety in mind.
- Parts of device that are removed during the maintenance work must be put in a safe place.
- Avoid risks of tripping over.



Danger!

Danger to life and limb from increased current flow through metal parts in contact with the device.

- ▶ Do not wear clothing with metal parts.
- ▶ Do not wear jewelry.
- ▶ Do not wear spectacles with metal frames.



Warning!

Items of clothing drawn into the device by moving parts can lead to injuries.

- ▶ Do not wear any items of clothing which could get caught by moving parts.

1.2 Protective Devices



Warning!

There is a risk of injury if protective devices are missing or defective.

- ▶ Replace all protective devices (covers, safety notices, grounding cables etc) after maintenance work has been completed.
- ▶ Replace parts that have become defective or unusable.

Wear protective goggles for:

- Knocking pins or similar parts in or out with a hammer.
- Using spring hooks.
- Inserting or removing springs, retaining rings or grip rings.
- Using solvents, cleansers or other chemicals.

1.3 Handling Electricity

The following work may only be done by trained and qualified electricians:

- Work on electrical components.
- Work on an open device still connected to the mains supply.

General precautions before starting maintenance work:

- Find out where the emergency and power switches are so that they can be quickly thrown in an emergency.
- Disconnect the current supply before carrying out the following work:
 - Installing or removing power units.
 - Working in the immediate vicinity of open power supply components.
 - Mechanical check of power supply components.
 - Modifying circuits in the device.
- Test the zero potential of the device parts.
- Check the working area for possible sources of danger, such as wet floors, defective extension cables, defective protective conductor connections.

Additional precautions in the case of exposed voltages:

- Ask a second person to remain near the working site. This person must know where the emergency and power switches are, and how to switch the current off if danger arises.
- Only use one hand to work on electric circuits of devices that are switched on. Keep the other hand behind your back or in your pocket.
This prevents electricity from flowing through your own body.

1.4 Procedure in Case of Accidents

- Act calmly and with great care.
- Avoid danger to yourself.
- Switch off power.
- Request medical assistance.
- Give first aid, if necessary.

2.1 Cleaning by the Operator

The following cleaning work is described in the "Operator's Manual":

- cleaning the device
- cleaning the printhead
- cleaning the print roller
- cleaning the label sensor A2+ A4+

2.2 Cleaning the Label Sensor A6+, A8+

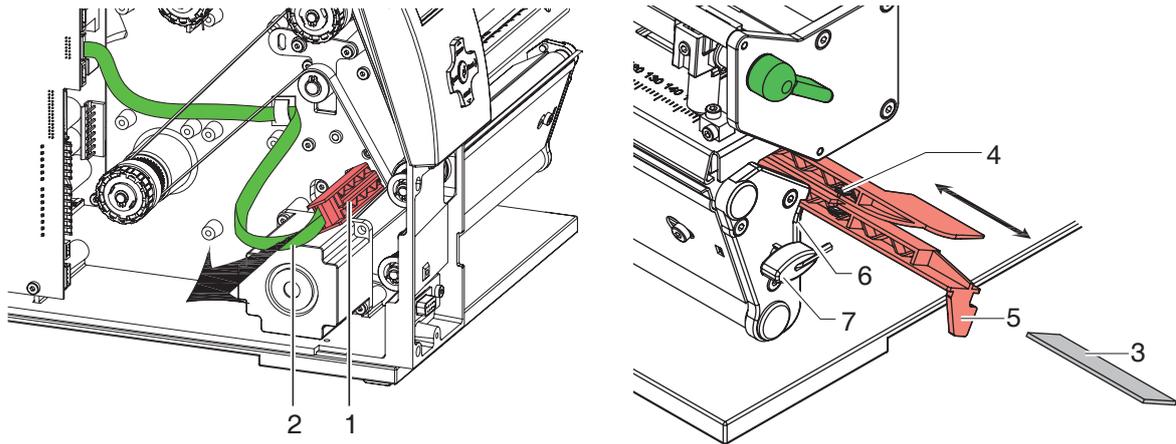


Fig. 1 Cleaning the label sensor A6+, A8+



Danger!

Risk of death via electric shock!

- ▶ **Before opening the housing cover, disconnect the device from the mains supply and wait at least one minute until the power supply unit has discharged.**

1. Remove media from the printer.
2. Remove the Allen key (7) from its retainer.
3. Remove the rear cover of the printer.
4. Slide the label sensor assembly onto the tab (5) toward the rear cover until it stops.
5. Unplug the cable (2) from the plug on the rear end of the label sensor (1).
6. Press the latch (6) and slowly pull label sensor outward via the tab (5). That way the distance plate (3) is pushed out of label sensor guide.
7. Clean label sensor and sensor units (4) with brush or cotton swab soaked in pure alcohol.
8. Push label sensor back via tab (5) .
9. Press the latch (6) and push the distance plate (3) into the guide of the label sensor.
10. Connect the cable (2) to the label sensor (1).
11. Pull the label sensor (1) via the tab (5) as far as possible toward the cover side.
This prevents the cable (2) from being pinched when installing the rear cover.
12. Install the rear cover of the printer.
13. Insert the Allen key (7) into its retainer.

2.3 Cleaning the Label Sensor A4+M

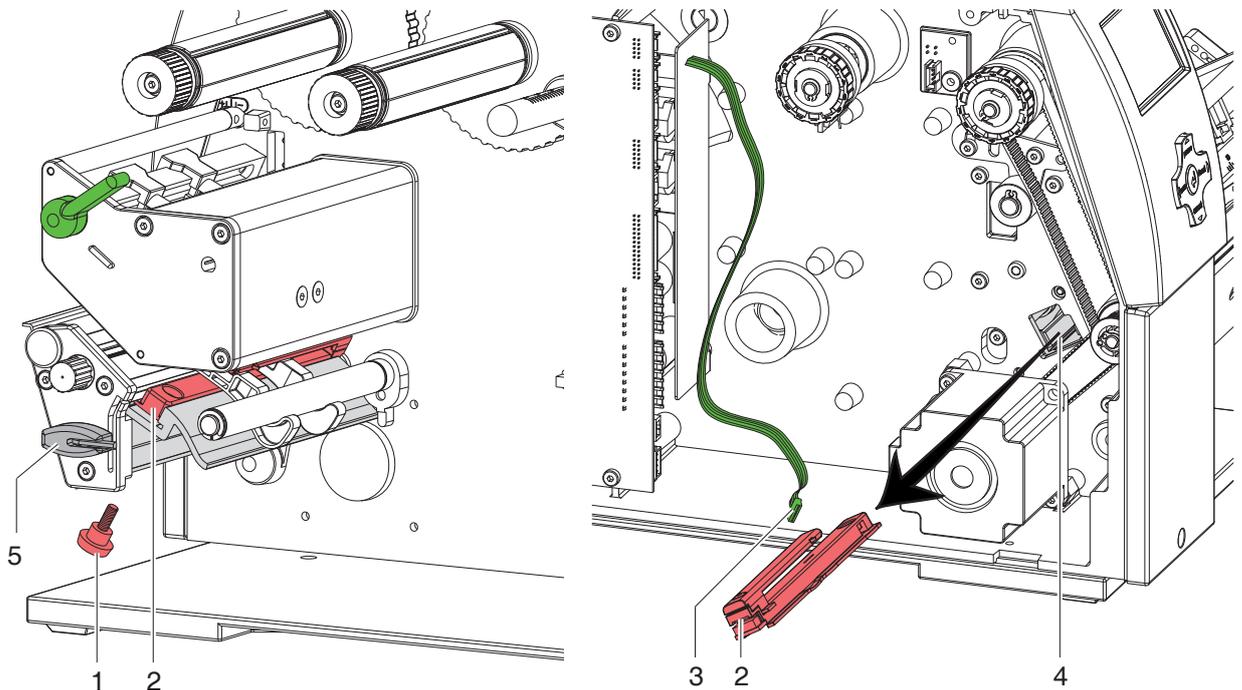


Fig. 2 Cleaning the label sensor A4+M



Danger!

Risk of death via electric shock!

► **Before opening the housing cover, disconnect the device from the mains supply and wait at least one minute until the power supply unit has discharged.**

1. Remove media from the printer.
2. Remove the Allen key (5) from its retainer.
3. Remove the rear cover of the printer.
4. Unscrew knurled thumb screw (1).
5. Unplug the cable (3) from the plug on the rear end of the label sensor (2).
6. Push the label sensor (2) so deep as possible into the guide profile toward the chassis.
7. Slide out the label sensor assembly (2) toward the back side cover.
8. Clean label sensor and sensor units (2) with brush or cotton swab soaked in pure alcohol.
9. Push label sensor back toward the print head side of printer so you can see the hole in the label sensor over the long hole in the profile (guide).
10. Connect the cable (3) to the label sensor (2).
11. Attach knurled thumb screw (1).
12. Pull the label sensor (2) via knurled thumb screw (1) so far as possible toward cover side. This prevents the cable (3) from being pinched when installing the rear cover.
13. Install the rear cover of the printer.
14. Adjust label sensor ▷ operators manual a4+M.
15. Insert the Allen key (5) into its retainer.

3.1 Tools

- ▶ Do not use any worn or damaged tools.
- ▶ Only use tools and testing devices that are suitable for the task at hand.

cab special tools:

- Test collar for transfer ribbon winder (cab item number: 5534199)

Standard tools:

- Phillips-head screwdriver, size 1
- Allen key 1,5 mm
- Screw driver Torx, size TX 20
- Snap ring pliers ZGG 0
- Cylindrical dynamometer (spring scale), 0 - 10 N
- Cylindrical dynamometer (spring scale), 0 - 25 N
- Jaw wrench 8 mm

3.2 Removing and Installing the Plastic Cover



Attention!

The plastic cover can be damaged via careless handling.

- ▶ Do not use force.
- ▶ Do not twist the plastic cover when removing it or pressing it on.

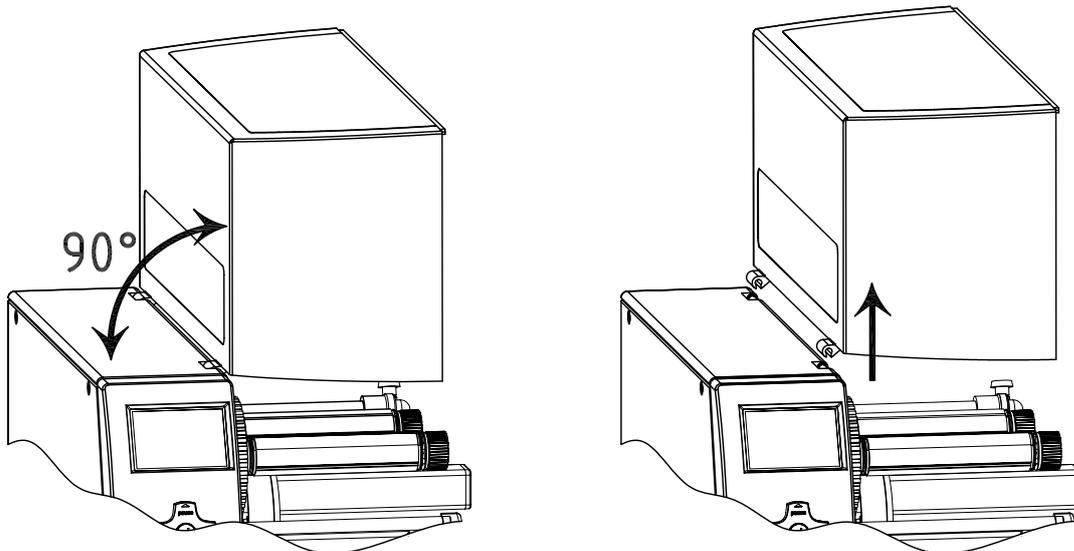


Fig. 3 Removing and installing the plastic cover

Removing the plastic cover :

1. Swivel the plastic cover up 90° and hold it in this position with both hands.
2. Carefully pull the hinges of the plastic cover out of the front mount and then the rear mount.
3. Put the plastic cover in a safe place.

Installing the plastic cover :

1. Place the hinges of the plastic cover onto the mounts with the open side downward.
2. First carefully press the rear hinge onto the respective mount and then do the same with the front hinge.
3. Swivel the plastic cover closed.

3 Replacing Assembly Units

3.3 Replacing the Printhead

3.3.1 Replacing the Printhead A2+, A4+, A4.3+, A4+M

The printhead of the label printer can be replaced without the need for fine adjustment. The printhead must be replaced if worn or when switching to a printhead with higher or lower resolution. For better differentiation, the print heads have a label stating the printer type and resolution.

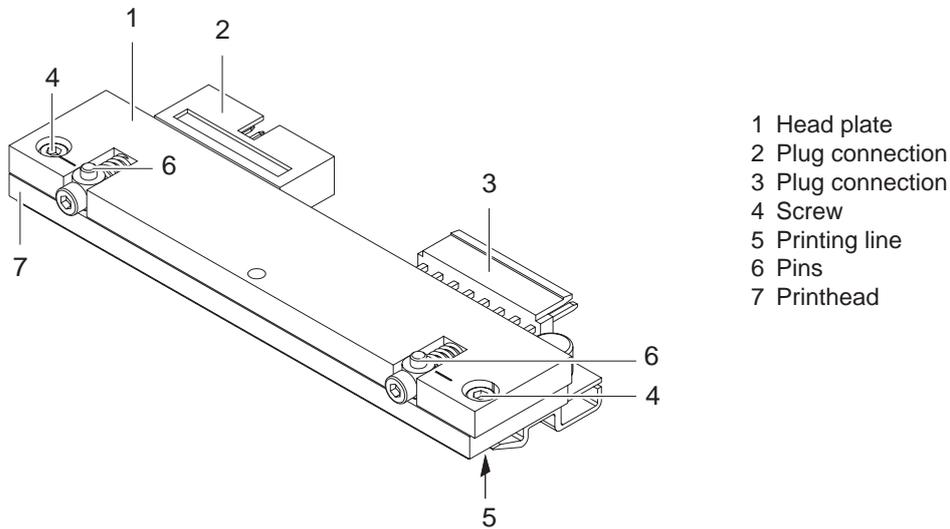


Fig.4 Structure of the printhead A2+, A4+, A4.3+, A4+M



Attention!

The printhead (7) is adjusted on a head plate (1) and precisely aligned at the factory. Do not loosen the screws (4) under any circumstances.



Attention!

The printhead can be damaged by static electricity discharges and impacts!

- ▶ Set up printer on a grounded, conductive surface.
- ▶ Ground your body, e.g. by wearing a grounded wristband.
- ▶ Do not touch contacts on the plug connections (2, 3).
- ▶ Do not touch printing line (5) with hard objects or your hands.

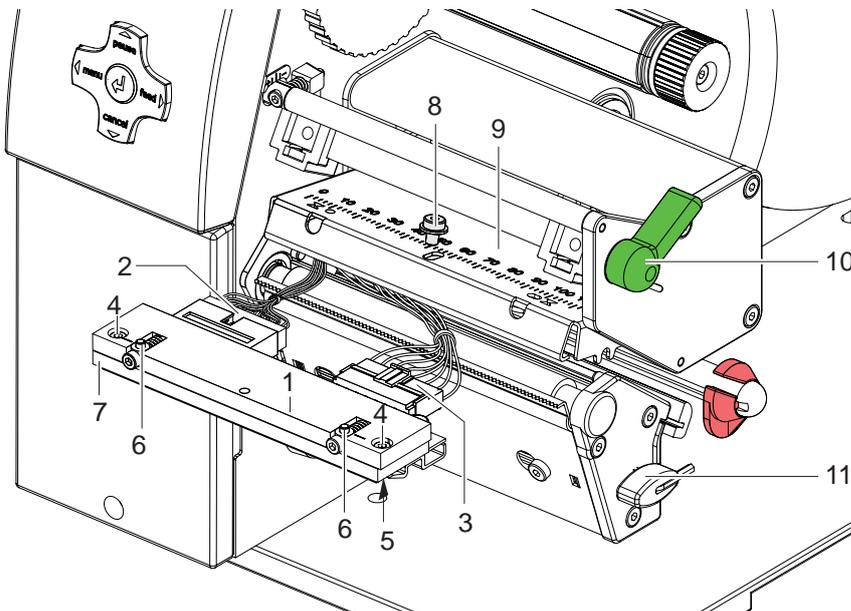


Fig. 5 Removing and installing the printhead A2+, A4+, A4.3+, A4+M

Removing the printhead

1. Turn lever (10) counterclockwise to lift the printhead.
2. Remove labels and transfer ribbon from the printer.
3. Remove Allen key (11) from its retainer.
4. Lightly keep printhead mounting bracket (9) on the print roller with one finger and screw out screw (8) with the Allen key and remove it and the washer.
5. Swivel printhead mounting bracket (9) upward.
6. Remove printhead from the printhead mounting bracket (9) if necessary.
7. Loosen both plug connections (2, 3) on the printhead and set printhead down on a clean, soft surface.

Installing the printhead

1. Attach plug connections (2, 3).
2. Position printhead in printhead mounting bracket (9) in such a way that the pins (6) are secured in the corresponding holes in the printhead mounting bracket (9).
3. Lightly keep printhead mounting bracket (9) on the print roller with one finger and check for correct positioning of the printhead mounting bracket (9).
4. Screw in screw (8) with washer with the Allen key and tighten it.
5. Reload labels and transfer ribbon.

3.3.2 Replacing the Printhead A6+, A8+

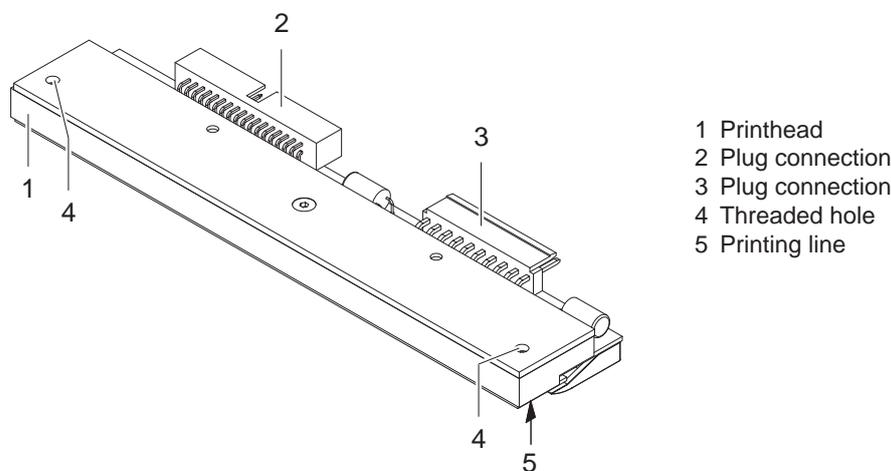


Fig. 6 Structure of the printhead A6+, A8+



Attention!

The printhead can be damaged by static electricity discharges and impacts!

- ▶ Set up printer on a grounded, conductive surface.
- ▶ Ground your body, e.g. by wearing a grounded wristband.
- ▶ Do not touch contacts on the plug connections (2, 3).
- ▶ Do not touch printing line (5) with hard objects or your hands.

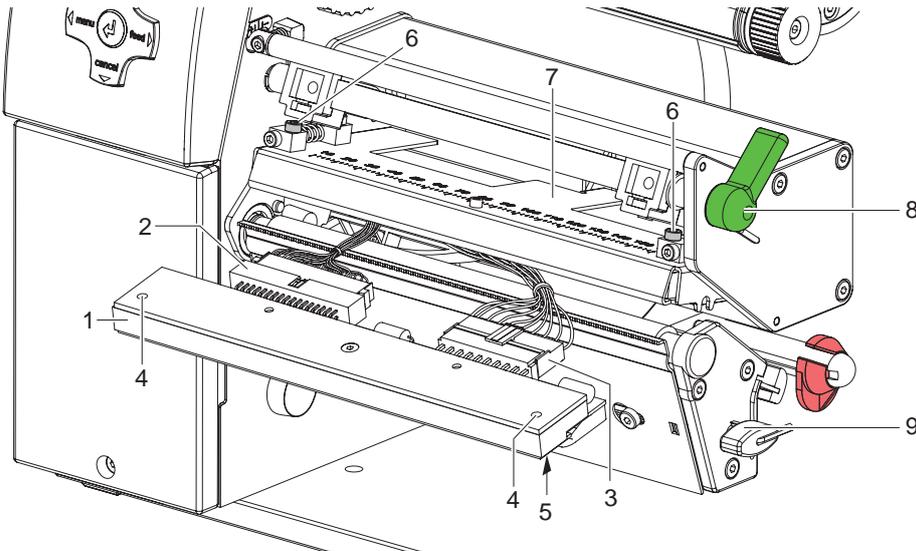


Fig. 7 Removing and installing the printhead A6+, A8+

Removing the printhead

1. Turn lever (8) counterclockwise to lift the printhead.
2. Remove labels and transfer ribbon from the printer.
3. Remove Allen key (9) from its retainer.
4. Lightly keep printhead mounting bracket (7) on the print roller with one finger and loosen screws (6) with the Allen key.
5. Swivel printhead mounting bracket (7) upward.
6. Remove printhead from the printhead mounting bracket (7) if necessary.
7. Loosen both plug connections (2, 3) on the printhead.

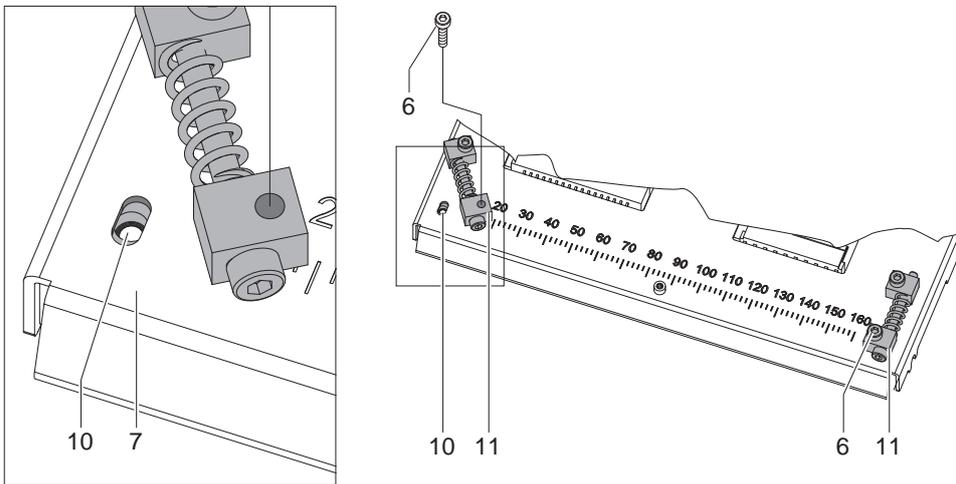


Fig. 8 Installing the printhead A6+, A8+

Installing the printhead

1. Attach plug connections (2, 3).
2. Swing the adjustment elements (11) sideways to uncover the slots (10) in the printhead carriage.
3. Put in the printhead into the printhead carriage and swing down the printhead assembly by hand and hold it.
4. Position the printhead in such a way that the threaded holes of the printhead are centered into the slots (10) of the printhead carriage.
5. Swing back the adjustment elements (11) to the home position.
6. Insert and tighten the screws (6).
7. Reload labels and transfer ribbon.

3.4 Replacing the Print Roller and Rewind Assist Roller

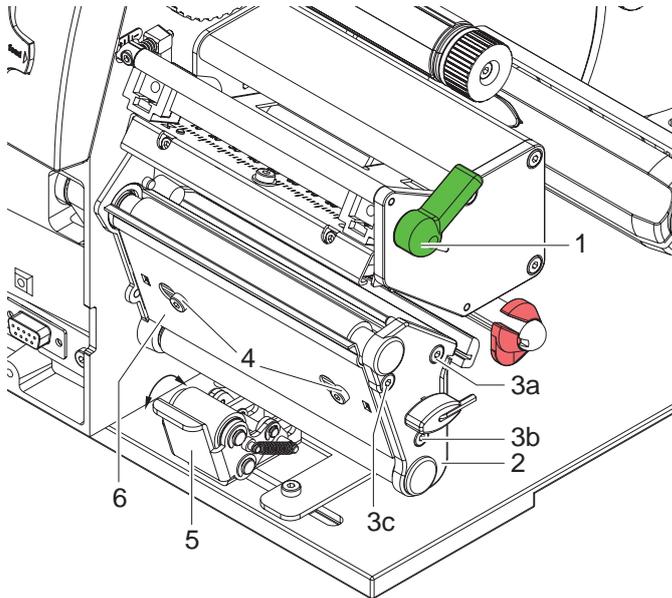


Fig. 9 Removing the side plate

Removing the side plate

1. Turn lever (1) counterclockwise to lift the printhead.
2. Lift the pinch roller (5) off the rewind assist roller.
3. Remove labels and transfer ribbon from the printer.
4. Loosen screws (4) on plate (6) with Allen key by several turns and remove plate (6).
5. Unscrew screws (3abc) of the side plate (2) with Allen key.
At A8+ a pin with a hexagonal shaft is mounted instead of the screw (3b). Loosen the pin with a jaw wrench.
6. Remove side plate (2).

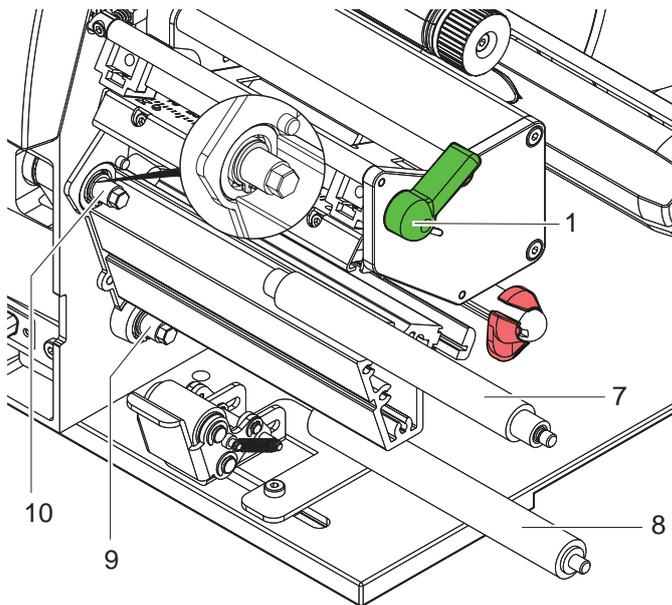


Fig. 10 Removing and installing rollers

Removing and installing rollers

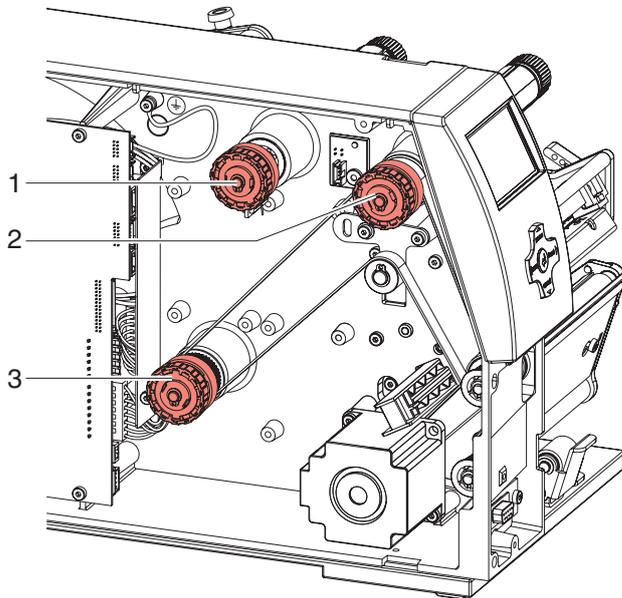
1. Pull print roller (7) and rewind assist roller (8) from the shafts (9, 10) on the housing.
2. Clean shafts (9, 10) of the rollers (see expanded view at shaft (10)).
3. Slide print roller (7) and rewind assist roller (8) onto their respective shafts and turn slightly until the hexagon of the shaft engages in the hexagon socket of the print roller.
4. Set side plate (2) in place and screw it down with the screws (3abc) by tightening the screws in order, i.e. a, b then c.
5. Set plate (6) in place and tighten screws (4) with Allen key.

3 Replacing Assembly Units

3.5 Replacing the Slipping Clutches

The rewinder for the transfer ribbon and the internal rewinder are coupled to slipping clutches in the main drive. The supply hub of the transfer ribbon is braked with a slipping clutch during printing.

Change the slipping clutch when it can no longer be set ▷ 4.1 on page 17. Removal and installation of the slipping clutch is also required for replacement of a winder.



- 1 Transfer ribbon supply hub: brake
- 2 Transfer ribbon take up hub: coupling
- 3 Internal rewinder: coupling

Fig. 11 Slipping clutches



Danger!

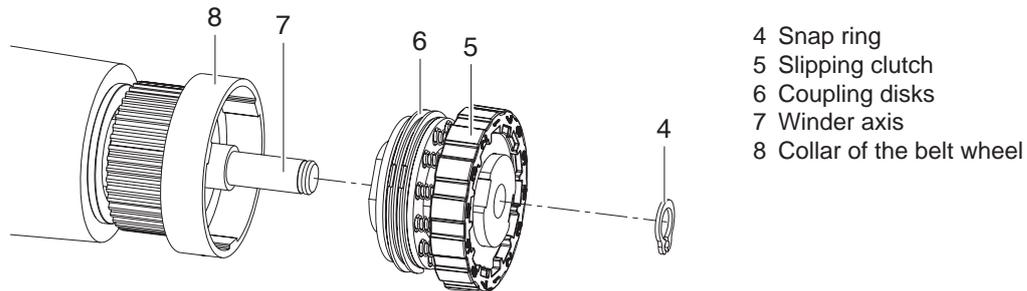
Risk of death via electric shock!

- ▶ Before opening the housing cover, disconnect the device from the mains supply and wait at least one minute until the power supply unit has discharged.

Removing the slipping clutch

1. Unplug the printer from the electrical outlet.
2. Remove the rear cover of the printer.
3. Remove the snap ring (1).
4. Pull coupling or brake (2) from the winder axis (Item 5 in Fig. 12) or (Item 9 in Fig. 13).
5. Ensure that the pin (Item 11 in Fig. 13) remains on the winder axis when pulling the brake off. Reattach the pin to the winder axis if it has been pulled off. The axis profile is shaped in such a way that the pin only fits on the winder axis in one way.

Installing the slipping clutch on the rewinders

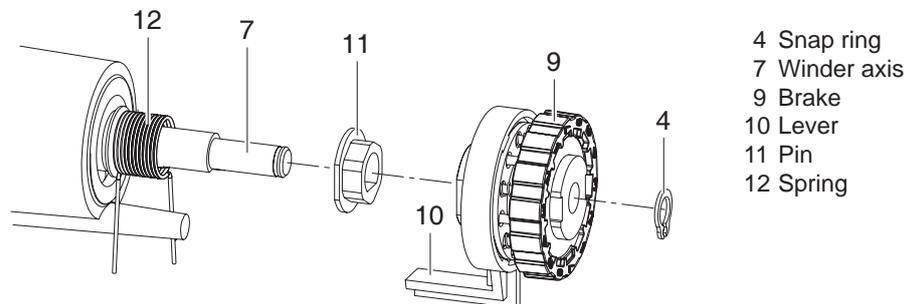


- 4 Snap ring
- 5 Slipping clutch
- 6 Coupling disks
- 7 Winder axis
- 8 Collar of the belt wheel

Fig. 12 Slipping clutch on the rewinders

1. Slide coupling (5) onto the winder axis (7).
2. Align grooves in the coupling disks (6) with the guides in the collar of the belt wheel (8).
3. Slide coupling further until it stops.
4. Secure the snap ring (4).
5. Adjust the coupling ▷ 4.1 on page 17.
6. Pull the label sensor toward the cover side as far as possible and install the rear cover of the printer.

Installing the brake on the transfer ribbon supply hub



- 4 Snap ring
- 7 Winder axis
- 9 Brake
- 10 Lever
- 11 Pin
- 12 Spring

Fig. 13 Brake on transfer ribbon supply hub

1. Slide the brake (9) onto the winder axis (7) in such a way that it fits on the hexagonal profile of the pin (11).
2. Ensure that the lever (10) grasps between the two ends of the spring (12).
3. Secure the snap ring (4).
4. Adjust the coupling ▷ 4.1 on page 17.
5. Pull the label sensor toward the cover side as far as possible and install the rear cover of the printer.

3 Replacing Assembly Units

3.6 Replacing the Label Sensor



Notice!

Soiling of the label sensor can also cause malfunctions. Before replacing the label sensor, check whether it is soiled and clean it if necessary..

For A2+, A4+, A4.3+ ▷ Operator's Manual, for A6+, A8+ ▷ 2.2 on page 6.



Danger!

Risk of death via electric shock!

▶ Before opening the housing cover, disconnect the device from the mains supply and wait at least one minute until the power supply unit has discharged.

3.6.1 Replacing Standard Label Sensor A+

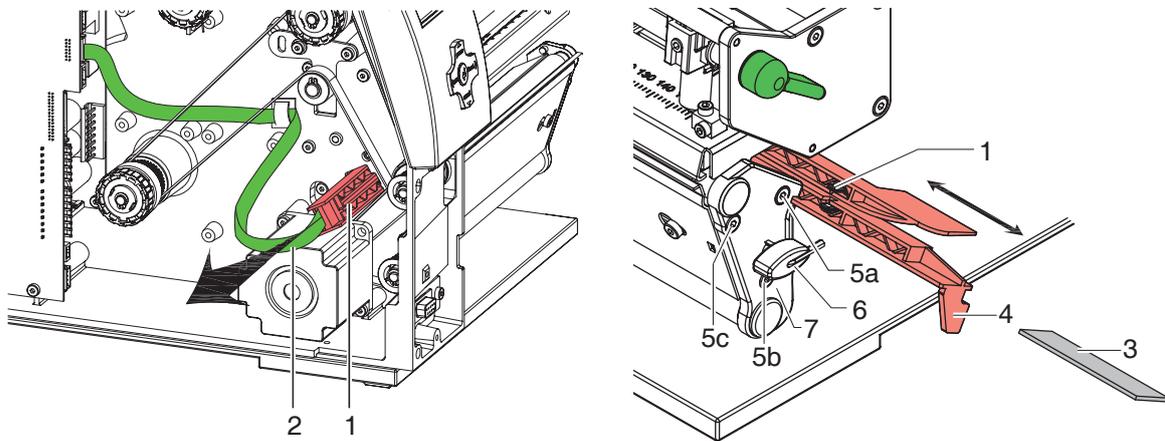


Fig. 14 Replacing the standard label sensor

Removing the label sensor

1. Remove media from the printer.
2. Remove the Allen key (6) from its retainer.
3. Remove the rear cover of the printer.
4. Slide the label sensor assembly onto the tab (4) toward the rear cover until it stops.
5. Unplug the cable (2) from the plug on the rear end of the label sensor (1).
6. Unscrew the screws (5) with an Allen key and remove the side plate (7).
7. Pull out the label sensor (1) via the tab (4) toward the cover side. At A6+ and A8+ that way the distance plate (3) is pushed out of label sensor guide.

Installing the label sensor

1. Insert the label sensor (1) into the guide from the cover side and slide it onto the tab (5) toward the rear cover until it stops. At A6+ push the distance plate (3) into the guide of the label sensor.
2. Remount the side plate (7) with the screws (5) by tightening the screws in order, i.e. a, b then c.
3. Connect the cable (2) to the label sensor (1).
4. Pull the label sensor (1) via the tab (4) as far as possible toward the cover side. This prevents the cable (2) from being pinched when installing the rear cover.
5. Install the rear cover of the printer.
6. Insert the Allen key (6) into its retainer.
7. Adjust the label sensor ▷ Configuration Manual.

3.6.2 Replacing Label Sensor A4+M

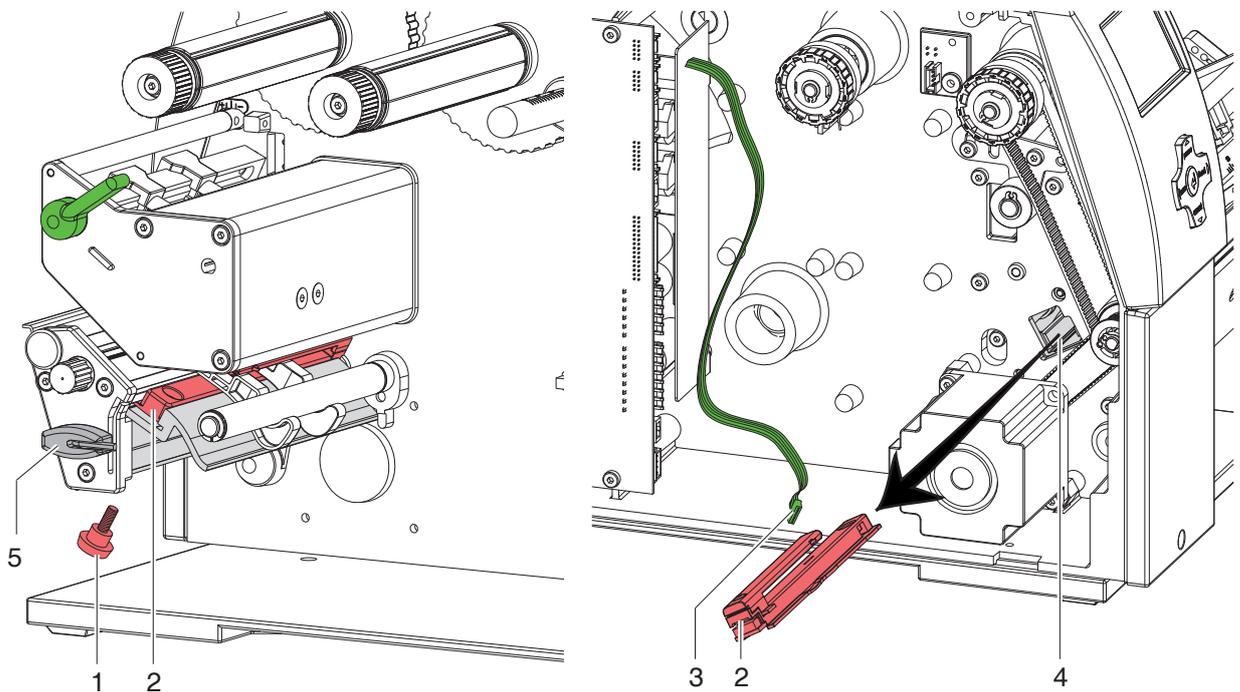


Fig. 15 Replacing the label sensor A4+M

**Danger!**

Risk of death via electric shock!

- ▶ **Before opening the housing cover, disconnect the device from the mains supply and wait at least one minute until the power supply unit has discharged.**

Removing the label sensor

1. Remove the Allen key (5) from its retainer.
2. Remove the rear cover of the printer.
3. Unscrew knurled thumb screw (1).
4. Unplug the cable (3) from the plug on the rear end of the label sensor (2).
5. Push the label sensor (2) so deep as possible into the guide profile toward the chassis.
6. Slide out the label sensor assembly (2) toward the back side cover.

Installing the label sensor

1. Push label sensor back toward the print head side of printer so you can see the hole in the label sensor over the long hole in the profile (guide).
2. Connect the cable (3) to the label sensor (2).
3. Attach knurled thumb screw (1).
4. Pull the label sensor (2) via knurled thumb screw (1) so far as possible toward cover side. This prevents the cable (3) from being pinched when installing the rear cover.
5. Install the rear cover of the printer.
6. Insert the Allen key (5) into its retainer.
7. Adjust label sensor ▷ operators manual a4+M.
8. Adjust the label sensor ▷ Configuration Manual.

3 Replacing Assembly Units

3.7 Replacing the PCB CPU



Danger!

Risk of death via electric shock!

- ▶ Before opening the housing cover, disconnect the device from the mains supply and wait at least one minute until the power supply unit has discharged.

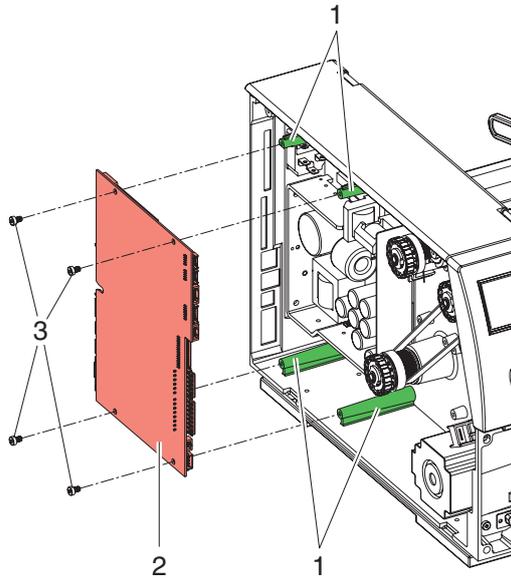


Fig. 16 Removing the PCB CPU

Removing the PCB CPU

1. If possible, save the printer configuration to a Compact-Flash card ▷ Configuration Manual.
2. Unplug the printer from the electrical outlet.
3. Detach all interface cables from the back of the printer.
4. Remove all memory cards from the slots.
5. Screw off the rear cover.
6. Unplug all side plug connections from the PCB CPU (2).
7. Remove the four fixing screws (3) from the PCB CPU.
8. Remove the PCB CPU.

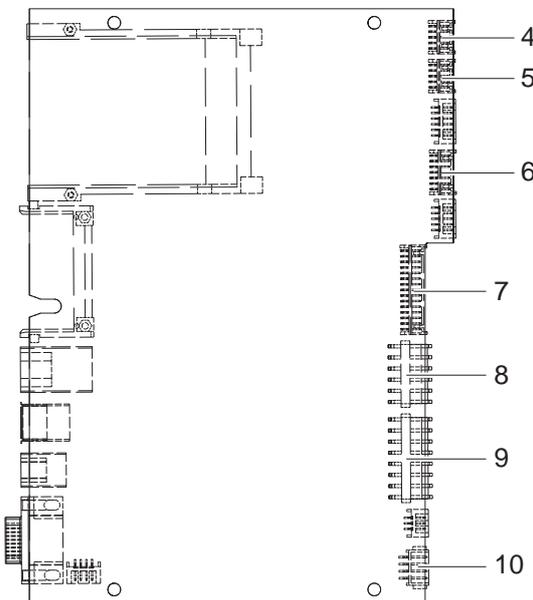


Fig. 17 Used connectors on the PCB CPU

Installing the PCB CPU

1. Place PCB CPU (2) onto the retainers (1).
2. Secure the PCB with four screws (3).
3. Insert all plug connections on the PCB.
4. Pull the label sensor toward the cover side as far as possible and install the rear cover of the printer.
5. Restore all interface connections on the back of the printer.
6. Connect the power cable at the rear of the printer.
7. Update the firmware if necessary.
8. Adjust the label sensor ▷ Configuration Manual.
9. Load the printer configuration from the memory card if possible. Otherwise, set the printer configuration via the control panel ▷ Configuration Manual.

- 4 Control panel
- 5 Peripheral port
- 6 Sensors
- 7 Printhead signals
- 8 Printhead power supply
- 9 Power supply unit
- 10 Stepper motor

3.8 Replacing the Power Supply Unit

**Danger!**

Risk of death via electric shock!

- ▶ Before opening the housing cover, disconnect the device from the mains supply and wait at least one minute until the power supply unit has discharged.

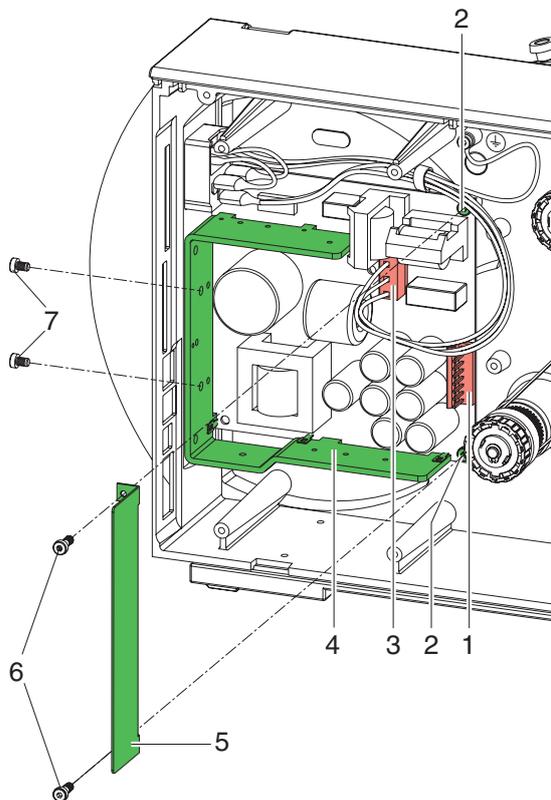


Fig. 17 Replacing the power supply unit

Removing the power supply unit

1. Unplug the printer from the electrical outlet.
2. Remove the PCB CPU ▷ 3.7 on page 15.
3. Remove the two screws (6) of the cover plate (5).
4. Remove the cover plate (5).
5. Unplug the plug at the power supply unit input (3).
6. Unplug the plug at the power supply unit output (1).
7. Remove the two screws on the back of the printer (7).
8. Hold the power supply unit firmly at the metal bracket (4) and remove the two screws (2).
9. Remove the power supply unit.

Installing the power supply unit

1. Insert the power supply unit and secure the PCB with two screws (2).
2. Secure the metal bracket (4) of the power supply unit to the back of the printer with two screws (7).
3. Connect the power supply unit cable to the power supply output (1).
4. Insert the power input cable (3).
5. Insert the cover plate (5) and secure it with the two screws (6).
6. Install the PCB CPU.

4.1 Measuring and Adjusting the Winding Torques

The rewinder for the transfer ribbon and the internal rewinder are coupled to slipping clutches in the main drive. The supply hub of the transfer ribbon is braked with a slipping clutch during printing.

The correct setting of the torques of these slipping clutches is necessary for:

- precise conveyance of the transfer ribbon during label transport
- the prevention of wrinkles in the feed path of the transfer ribbon
- sufficiently tight peel-off tension of the liner and thus easy peeling off of labels in peel-off mode
- a sufficiently tightened label strip

The winding axes of the rewinder are not actively driven by the belts during label backfeed, but rather solely by the pull of the print roller. The torque required to disengage the rewinder from the belt drive is implemented via a brake in the winding reel, which works in both directions. The measured clockwise torque is the sum of the coupling torque and the torque of the brake. Only the torque of the brake is measured when the winding axis is rotating counter-clockwise. For this reason, measurement of the torques at the rewinders are required in both directions.

The method of measurement differs for the various types of slipping clutches:

- measurement of the winding torques at the transfer ribbon take up and supply hub ▷ page 17.
- measurement of the winding torque at the internal rewinder ▷ page 19.

If the winding torque differs from the set value, it must be adjusted. The procedures for adjusting the winding torques of the transfer ribbon winders and the internal rewinder are identical ▷ 4.1.2 on page 20.

4.1.1 Measuring the Winding Torques

Transfer ribbon take up and supply hub

Measurement of the winding torque at the transfer ribbon take up and supply hub occurs by determining the pulling forces on a test collar attached to the winder.

The physical relation between the torque and the pulling force is:

$$F = M / r$$

F: Pulling force [N],

M: Winding torque [Ncm],

r: Radius of the test collar (30 mm)

The set values for the winding torque and the resulting pulling force at the test collar are:

Slipping clutch on	Direction of rotation	Printer	Winding torque M	Pulling force F
Ribbon take up hub	clockwise	A2+ A4+, A4.3+, A6+ A8+	10.2 - 10.8 Ncm 13.5 - 14.4 Ncm 17.7 - 18.1 Ncm	3.4 - 3.6 N 4.3 - 4.8 N 5.9 - 6.1 N
	counterclockwise	all	2.1 - 3.0 Ncm	0.7 - 1.0 N
Ribbon supply hub	any	A2+, A4+, A4.3+, A6+ A8+	3.6 - 4.5 Ncm	1.2 - 1.5 N
			4.5 - 5.1 Ncm	1.5 - 1.7 N

Table 1 Winding torques at the transfer ribbon hubs

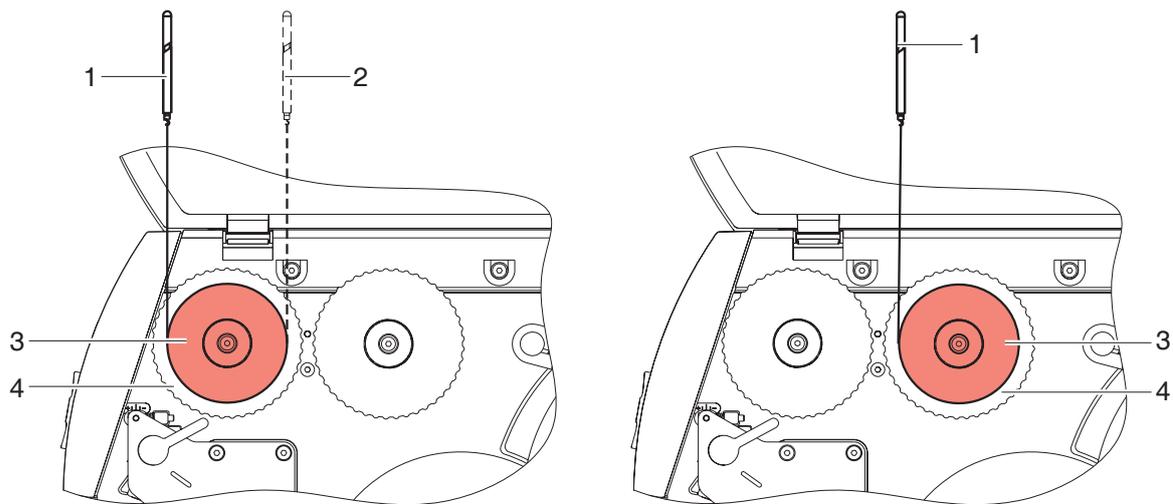


Fig. 19 Measuring the winding torque at the transfer ribbon take up hub (left) and supply hub (right)



Danger!

Risk of death via electric shock!

- Before opening the housing cover, disconnect the device from the mains supply and wait at least one minute until the power supply unit has discharged.

1. Unplug the printer from the electrical outlet.
2. Remove the rear cover.
3. Remove the transfer ribbon from the printer.
4. Attach the test collar (3) to the winder (4).
5. Turn the knurled nut counterclockwise to clamp the test collar.
6. Wind the cord attached to the test collar around the test collar several times.
7. Secure spring scale [10 N] (1) at the end of the cord.
8. Move the spring scale upward vertically until the winder begins turning.
9. If the drive belt at the rewinder is also moving, hold it in place during the measurement. Otherwise, the measurement is not accurate.
10. Allow the cord to unwind from the test collar at least one full turn and read the pulling force F on the spring scale at the same time.
11. Determine the pulling force at the transfer ribbon take up hub in the same manner, except in the opposite rotation direction (2).
12. If the winding torque differs from the set value, it must be adjusted ▷ 4.1.2 on page 20.

Internal rewinder

Measurement of the winding torque at the internal rewinder occurs by determining the pulling forces with a cord wrapped around the rewinder.

The physical relation between the torque and the pulling force is:

$$F = M / r$$

F: Pulling force [N],

M: Winding torque [Ncm],

r: Radius of the internal rewinder (20 mm)

The set values for the winding torque and the resulting pulling force at the test collar are:

Slipping clutch on	Direction of rotation	Printer	Winding torque M	Pulling force F
Internal rewinder	clockwise	A2+, A4+, A4.3+, A6+	28 - 32 Ncm	14 - 16 N
	counterclockwise	A2+, A4+, A4.3+, A6+	8 - 12 Ncm	4 - 6 N

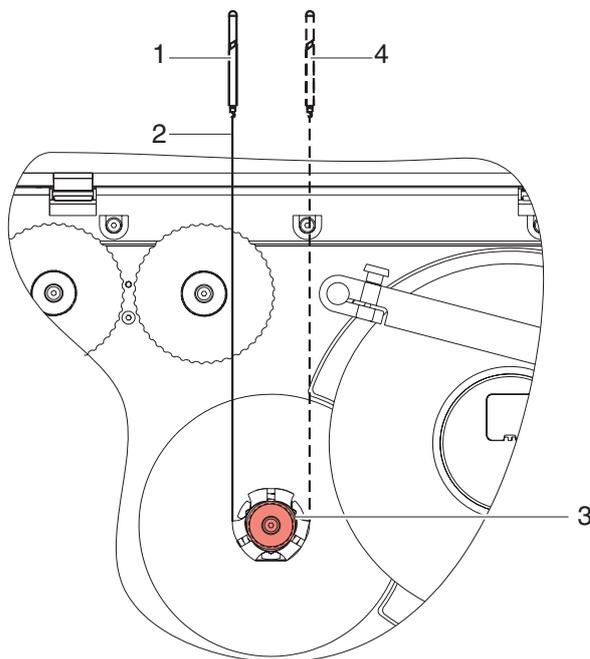
Table 2 Winding torques at the internal rewinder



Danger!

Risk of death via electric shock!

► Before opening the housing cover, disconnect the device from the mains supply and wait at least one minute until the power supply unit has discharged.



1. Unplug the printer from the electrical outlet.
2. Remove the rear cover.
3. Remove the label media from the printer.
4. Push the cord (2) under a bracket of the internal rewinder (3) and wind it around the rewinder.
5. Secure spring scale [25 N] (1) at the end of the cord.
6. Move the spring scale (1) upward vertically until the winder begins turning.
7. If the drive belt is also moving, hold it in place during the measurement. Otherwise, the measurement is not accurate.
8. Allow the cord to unwind from the test collar at least one full turn and read the pulling force F on the spring scale at the same time.
9. Determine the pulling force in the same manner, except in the opposite rotation direction (4).
10. If the winding torque differs from the setpoint, it must be adjusted > 4.1.2 on page 20.

Fig. 20 Measuring the winding torque at the internal rewinder

4.1.2 Adjusting the Winding Torques

The winding torque of a winder can be changed at the knurled ring of the respective slipping clutch. The numbers on the knurled ring stand for the value of the winding torque:

- 1: Lowest winding torque
- 7: Highest winding torque

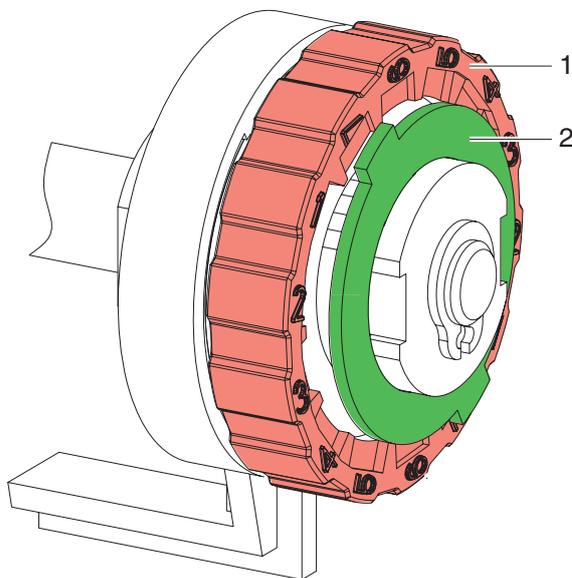
The current value is indicated by the number located at the positions of the two locking tabs.



Danger!

Risk of death via electric shock!

- ▶ Before opening the housing cover, disconnect the device from the mains supply and wait at least one minute until the power supply unit has discharged.



1. Unplug the printer from the electrical outlet.
2. Remove the rear cover.
3. Press the knurled ring (1) of the slipping clutch toward the housing wall.
The lock (2) of the knurled ring is released.
4. Turn the knurled ring while pushing it and release it in the desired position.
5. Ensure that the tabs of the lock are located completely in the grooves of the setting value.
Transfer ribbon hubs ▷ page 17
Internal rewinder ▷ page 19
7. Repeat the adjustment until the measured winding torque is within the tolerance range.
8. Pull the label sensor toward the cover side as far as possible and install the rear cover of the printer.

Fig. 21 Adjusting the winding torque

4.2 Adjusting the Printing Mechanism

Major adjustment of the printing mechanism beyond format-based settings is only required if the printhead assembly has been removed or parts in this area have been replaced. Excluded from this is the replacement of the printhead, after which readjustment is generally not required.

The following print quality imperfections may indicate maladjustment of the printing mechanism:

- Print image too light
- Print image is spotty
- Print image lighter on one side
- Horizontal lines not parallel to the horizontal label edges
- Clear lateral drift of the transfer ribbon



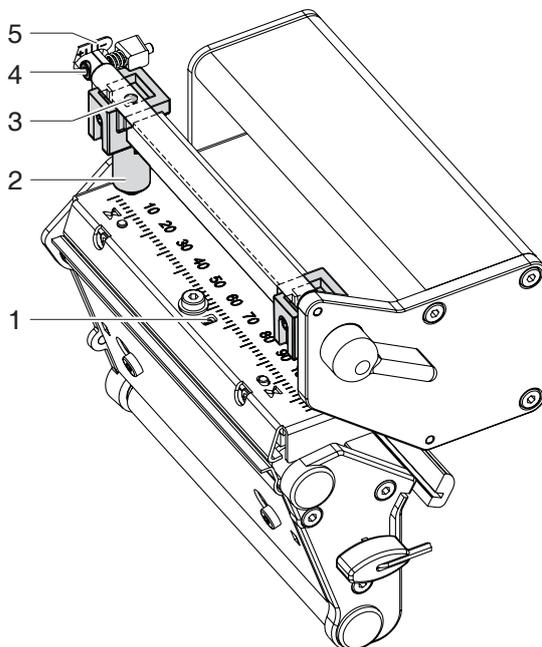
Notice!

Print image errors can also arise from wrinkling of the transfer ribbon. This is why you should check the transfer ribbon feed path and the head locking system for correct adjustment before making adjustments to the printing mechanism ▷ Operator's Manual.

Adjustment of the printing mechanism comprises the following procedures in the order specified:

1. Prepare the label printer for adjustment ▷ 4.2.1 on page 21.
2. Adjust the position of the printhead ▷ 4.2.2 on page 24.
3. Adjust the printhead pressure ▷ 4.2.3 on page 25.
4. Adjust the transfer ribbon feed path ▷ 4.2.4 on page 26.
5. Perform a final test ▷ 4.2.5 on page 26.

4.2.1 Preparing the Printer for Adjustment



1. Load labels and transfer ribbon which extend across the entire printing width.
2. In the printer configuration, set the `Heat level` parameter to -5 and the `Print speed` parameter to 100 mm/s..
3. Move the transfer ribbon deflection to the central position (5) with the screw (4).
4. Position the plungers (2) in such a way that the adjustment screws are accessible through the holes (3) of the square axis.
5. Not at A2+ : Loosen the screw (1) for the printhead bowing with an Allen key (1.5 mm) and turn it counterclockwise until turning becomes perceptibly easier. This should occur after a maximum of a half a rotation.
6. Continue with the adjustment of the printhead position ▷ 4.2.2 on page 24.

Fig. 22 Preparing the printer for adjustment

4.2.2 Adjusting the Printhead Position

In order to achieve the best possible print image the following printhead settings are necessary:

- Align the heating line with the highest point of the print roller. Density of the print image is the greatest at this point.
- Set the parallelism of horizontal lines with the edge of the label.

Attention!

The printhead assembly can be damaged.

Attempting to adjust the printhead when the fixing screws (3) are tight can lead to defects at the printhead assembly.

► Always loosen the fixing screws (3) before adjusting the printhead.

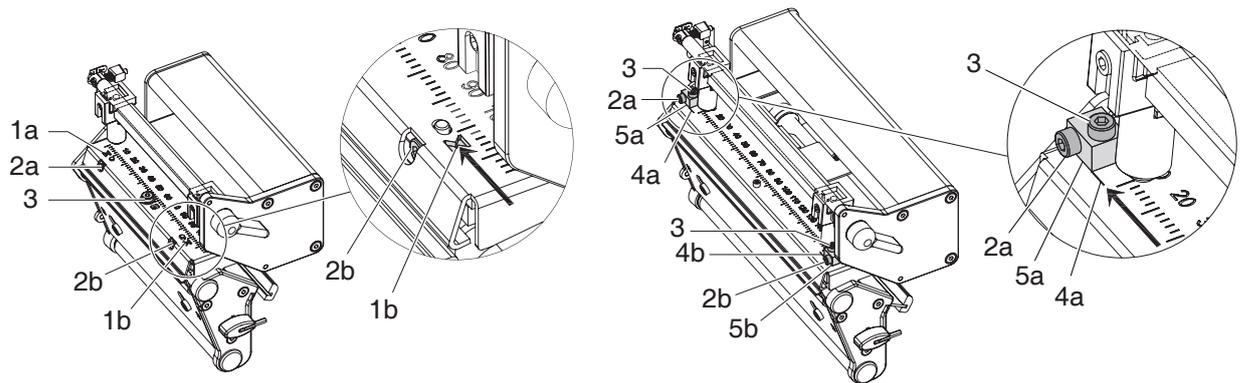


Fig. 23 Adjusting the printhead position (left side A2+, A4+, A4.3+ / right side A6+, A8+)

Notice!

► Open and close the printhead lock after each step of the adjustment.

1. Check the alignment of the printhead A2+, A4+, A4.3+ in the adjustment windows (1), at A6+, A8+ at the slides (5).
2. If the printhead is not aligned properly, loosen the screw (3) about one quarter turn.
3. If the printhead is not aligned properly, use the screws (2) to align at A2+, A4+, A4.3+ the lines on the printhead with the tips of the grooves, at A6+, A8+ the lines on the printhead mounting bracket with the front edge of the slides (5).
 - Screw (2a) effects the inner half of the printhead, and screw (2b) the outer half.
 - Turning clockwise moves the printhead at A2+, A4+, A4.3+ forward, at A6+, A8+ backward.
4. Create print samples with the test function `Test grid` (▷ Configuration Manual) or a similar print pattern.
5. If the horizontal lines in the test grid are not parallel with the label edges, adjust the parallelism with the screws (2).
6. Set the best possible image quality by maintaining parallelism via turning the screws (2a) and (2b) in an alternating fashion.

Differences in the density between the two sides are still permissible.
7. Tighten the screws (3).
8. When the parallelism of the printhead is set, continue with the adjustment of the printhead pressure

▷ 4.2.3 on page 25.

4.2.3 Adjusting the Printhead Pressure

The printhead pressure can be changed with the screws (1a) and (1b) at the inside and outside of the printhead. Increasing the head contact pressure leads to an improvement of the print image density on the corresponding side and to a shifting of the ribbon feed path in the corresponding direction.

Notice!

► At A8+ also use the screw on the middle plunger for the adjustment.

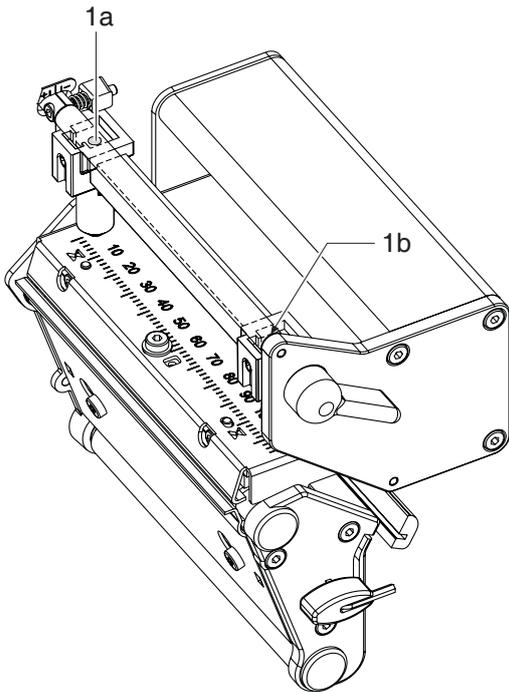


Fig. 24 Adjusting the printhead pressure

1. Turn the adjustment screws (1) counterclockwise until turning becomes perceptibly easy.
2. The heat level is to be reduced in the printer configuration until the print image is only barely recognizable. Under these conditions, inaccuracies become clearly visible during adjustment.
3. Create print samples with the test function `Test grid` (▷ Configuration Manual) or a similar print pattern.
4. Adjust the adjustment screw (1a or 1b) clockwise in small increments on the side with the weaker print image until the print image is even across the entire width. At A8+ include the screw on the middle plunger to the adjustment. It may happen that you must turn the adjustment screws in an alternating fashion, resulting in a print image which is too light overall.
5. For A4+M printer move the plunger to the A4+M standard position (22 upper graduation ▷ operator's manual) and repeat the test print. Possibly rerun procedure and adjust new.
6. When the print image is set evenly, continue with setting of the transfer ribbon feed path ▷ 4.2.4 on page 26.

4.2.4 Adjusting the Transfer Ribbon Feed Path

You can adjust the transfer ribbon feed path by changing the head contact pressure and adjusting the transfer ribbon deflection. Increasing the head contact pressure with the screws (3a) and (3b) shifts the ribbon feed path in the corresponding direction. The skew of the transfer ribbon deflection is used to suppress wrinkles in the transfer ribbon feed path. Wrinkles which cannot be remedied with the skew of the transfer ribbon deflection can be suppressed by bowing the printhead (excepting A2+).

Attention!

The printhead assembly can be damaged when bowing the printhead.

Turning the adjustment screw (1) too hard can cause damage to the printhead assembly.

- ▶ As soon as you perceive clear resistance when turning the adjustment screw (1), you may only continue turning the screw in very small increments, but no more than one eighth of a turn.
- ▶ Only turn the adjustment screw (1) as far as is absolutely necessary.

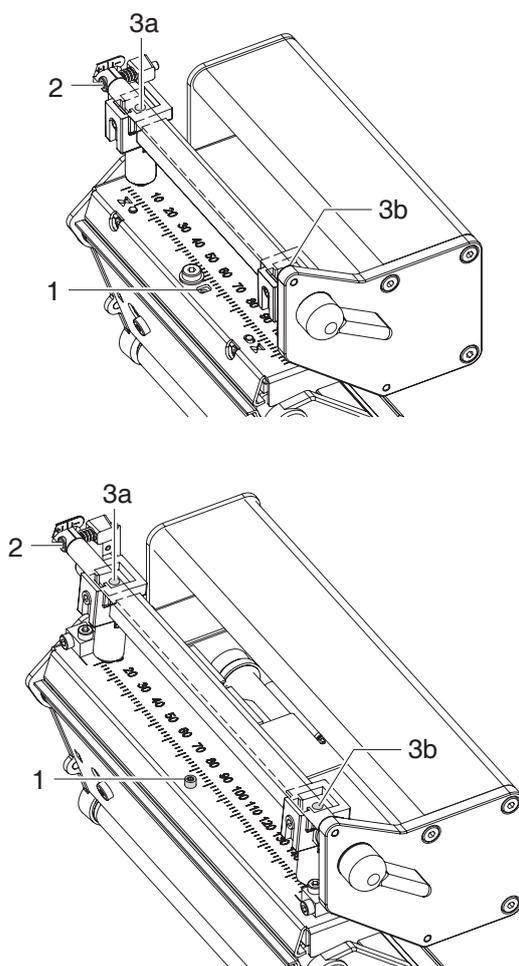


Fig. 25 Adjusting the transfer ribbon feed path

1. Check the transfer ribbon feed path. The wound up ribbon should be the same distance from the disk of the winder as the supply roll is from the disk of the supply hub.
2. If the ribbon runs inward or outward, turn the corresponding screw (3a) or (3b) clockwise in small increments.
3. Wait until the ribbon feed path has stabilized after each step of the adjustment.
4. Check the ribbon feed path for wrinkles.
5. If wrinkles arise on the inside, turn the screw (2) counterclockwise.
6. If wrinkles arise on the outside, turn the screw (2) clockwise.
7. If the wrinkles cannot be remedied (e.g. wrinkles in the center), turn the adjustment screw (1) clockwise **with extreme care** using an Allen key (1.5 mm) and observe the ribbon feed path. When the adjustment screw (1) is tightened, the printhead is bent downward slightly in the center. It is possible that a slight lightening at the edge areas of the print image could occur here.
8. If bowing is not necessary, turn the screw (2) clockwise until the screw is just barely clamping.
9. When the transfer ribbon feed path is set, continue with the final test.

4.2.5 Final Test

- ▶ Reset the `Heat level` to 0 in the printer configuration ▷ Configuration Manual.
 - ▶ Recheck the setting with the test function `Test grid` (▷ Configuration Manual) or a similar print pattern.
- When using standard cab media, the test printout must show lines with sharp contours and black areas without any parts missing.

4 Adjustments

4.3 Adjusting the Belt Tension at the Main Drive Motor



Danger!

Risk of death via electric shock!

- ▶ Before opening the housing cover, disconnect the device from the mains supply and wait at least one minute until the power supply unit has discharged.

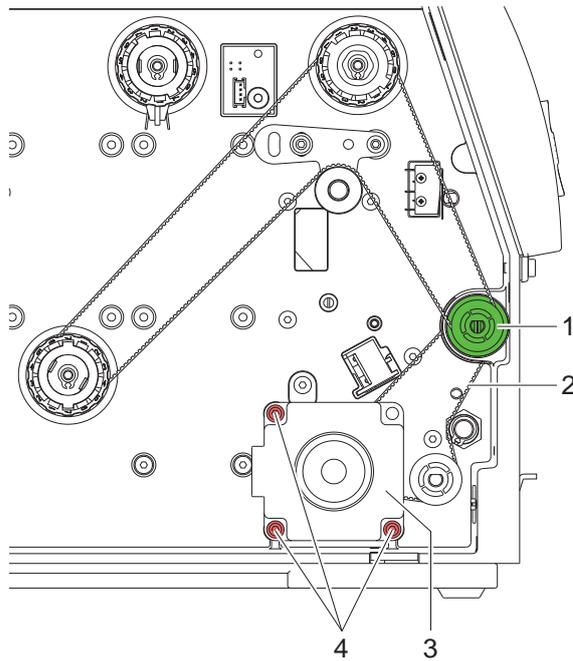


Attention!

The toothed belt could be damaged if adjustment is carried out improperly.

Improper adjustment or insufficient tension of the toothed belt could cause it to rub against the label sensor during printing, which would damage the belt.

- ▶ Tension the toothed belt in such a way that it cannot rub against the label sensor.



1. Unplug the printer from the electrical outlet.
2. Remove the rear cover.
3. Loosen the three fixing screws (4) of the main drive motor (3).
4. Swivel the main drive motor (3) in such a way that the toothed belt (2) is tensioned tightly between the motor and the print roller (1).
5. Tighten the fixing screws (4) in this position of the motor.
6. Pull the label sensor toward the cover side as far as possible and install the rear cover of the printer.

Fig. 26 Adjusting the belt tension

4.4 Adjusting the Head Switch

The head switch prevents printing from occurring when the printhead is open.

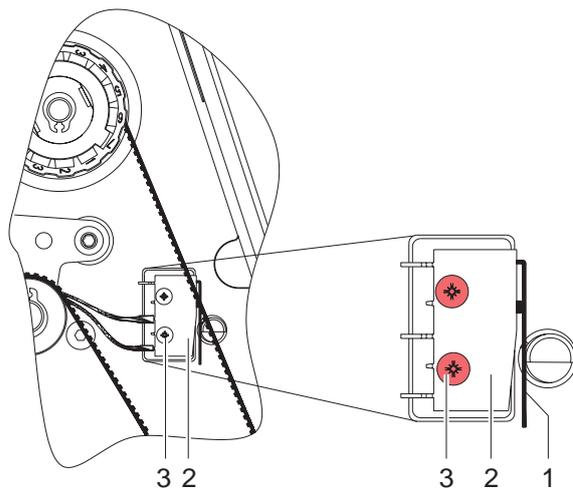
Adjust the head switch if the error message `Head open` appears in the display even though the printhead is locked.



Danger!

Risk of death via electric shock!

► **Before opening the housing cover, disconnect the device from the mains supply and wait at least one minute until the power supply unit has discharged.**



1. Unplug the printer from the electrical outlet.
2. Remove the rear cover.
3. Lock printhead.
4. Slightly loosen the fixing screws (3) of the head switch (2).
5. Move the head switch housing and switching lever (1) to a parallel position (see magnified cutout).
6. Screw down the head switch in this position.
7. Check whether the `Head open` message is still shown in the display. If this is the case, replace the switch with cable.
8. Pull the label sensor toward the cover side as far as possible and install the rear cover of the printer.

Fig. 27 Adjusting the head switch

5.1 Failure of Device Functions

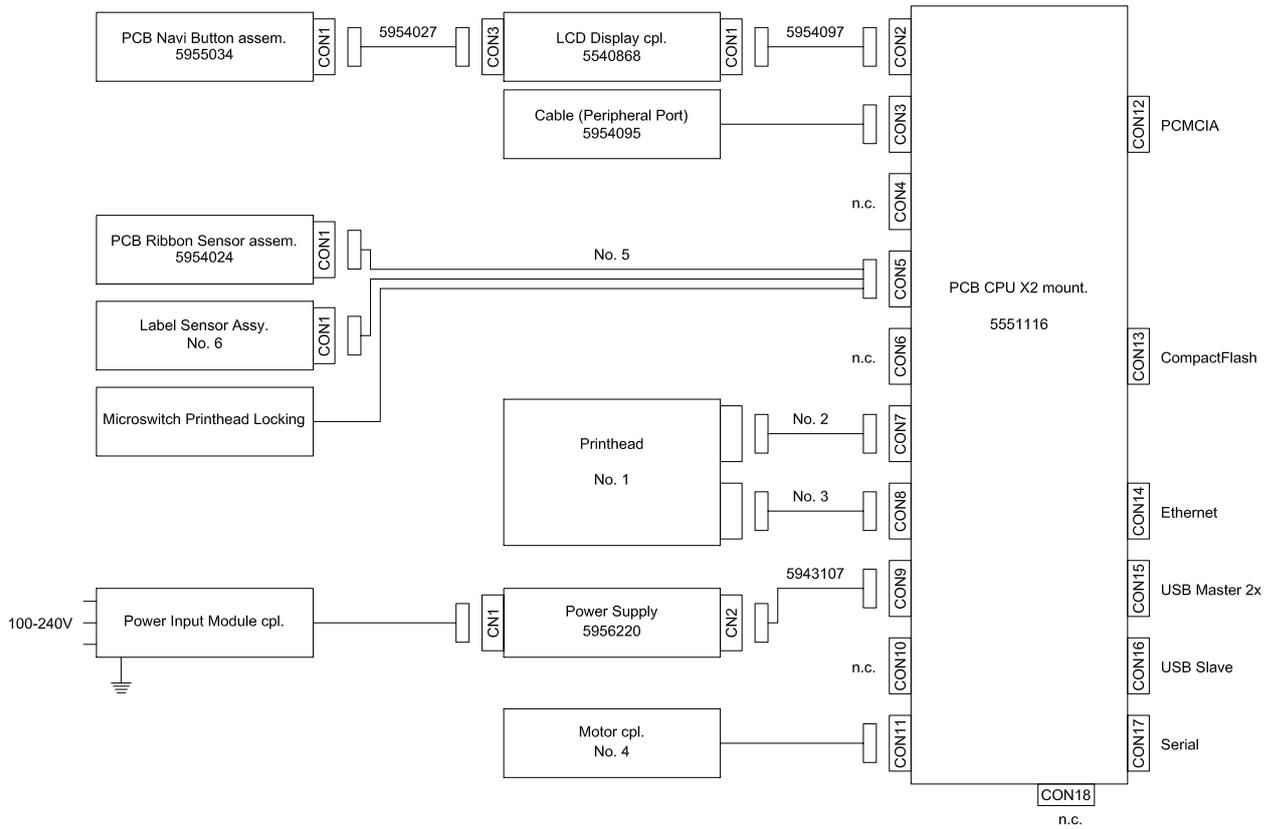
Functional error	Possible remedy	
Medium is not transported	Check electrical connections between PCB CPU and motor	
	Check drive mechanism	
	Replace the PCB CPU	
	Replace the motor	
No print image with medium transport	Check plug connections at the printhead	
	Examine printhead cable for damage and replace if necessary	
	Replace the printhead	
	Replace the PCB CPU	
Display and navigator pad are not functioning	Check whether LED1 (green) is illuminating on the PCB CPU ▷ Fig. 29 on page 32: <ul style="list-style-type: none"> • LED1 is not illuminating: The power supply unit or CPU PCB is defective. Replace PCB CPU or Power supply unit. • LED1 flashes: Firmware update unsuccessful. Reload the firmware ▷ Configuration Manual 	
	Check cable connection between PCB CPU and control panel	
	Check whether the correct voltages are active at the 3,3 V and 5 V measurement points on the PCB CPU ▷ Fig. 30 on page 33 <ul style="list-style-type: none"> • No voltage at either measurement point: The power supply unit may be defective. Replace the power supply unit • No voltage at one measurement point: The PCB CPU may be defective. Replace the PCB CPU. 	
	Replace LCD Display cpl.	
	Replace PCB Navi Button assem.	
	The display is not functioning, but the navigator pad is functioning	Replace LCD Display cpl.
	The navigator pad is not functioning, but the display is functioning	Check the cable connection between LCD Display cpl. and PCB Navi Button assem. and replace if necessary
Replace PCB Navi Button assem.		
Replace LCD Display cpl.		
Communication via an interface is not functioning	Check whether the interface configurations of the printer and computer match	
	For an Ethernet connection, check the validity of the IP address and the subnet mask	
	Check the interface cable and replace it if necessary	
	If all functionality of the interface has been lost, replace the PCB CPU	
A peripheral device is not functioning	Check whether the peripheral device is activated via programming	
	Check the USB cable of the peripheral device and replace it if necessary	
	Check the peripheral device	
	Replace the PCB CPU	

Table 3 Failure of device functions

5.2 Hardware Faults

Error message	Cause	Fault recovery
ADC malfunction	Fault on the PCB CPU	Replace the PCB CPU
FPGA malfunction	Fault on the PCB CPU	Replace the PCB CPU
Invalid setup	Fault on the PCB CPU	Replace the PCB CPU
Voltage error		
V_{BAT}	Voltage of the battery on the PCB CPU is too low	Replace the PCB CPU
V_{MOT}	Motor voltage is too low	<p>Check motor voltage at the measurement point V_{mot}</p> <p>▷ Fig. 30 on page 33:</p> <ul style="list-style-type: none"> • Voltage too low: Replace the power supply unit • Voltage is correct: Replace the PCB CPU
24 V	24 V too low	<p>Check voltage at measurement point +24V</p> <p>▷ Fig. 30 on page 33:</p> <ul style="list-style-type: none"> • Voltage too low: Replace the power supply unit • Voltage is correct: Replace the PCB CPU
24 V ext.	24 V at peripheral connection too low	<p>Disconnect peripheral device</p> <ul style="list-style-type: none"> • Fault still exists: Replace the PCB CPU • Fault remedied: Repair or replace peripheral device
5 V ext.	<p>5 V at Centronics connection too low</p> <p>Interface converter with excessive power consumption may be connected</p>	<p>Disconnect interface converter</p> <ul style="list-style-type: none"> • Fault still exists: Replace the PCB CPU • Fault remedied: Replace interface converter

Table 4 Hardware faults



Printer	Type	Nr. 1	Nr. 2	Nr. 3	Nr. 4	Nr. 5	Nr. 6
A2+	all	5954105	5954293	5954292	5946203	5954098	5954090
A4+	200, 200P	5954081	5954067	5954066	5946206	5954098	5954090
	300, 300P	5954072	5954067	5954066	5946206	5954098	5954090
	300M	5954072	5954067	5954066	5946208	5954099	5958670
	600, 600P	5954077	5954067	5954066	5946208	5954098	5954090
	600M	5954077	5954067	5954066	5946208	5954099	5958670
A4.3+	200, 200P	5954085	5954087	5954086	5946206	5954098	5954090
	300, 300P	5954089	5954087	5954086	5946206	5954098	5954090
A6+	all	5954106	5954259	5954258	5946206	5954098	5954090
A8+	all	5954107	5958531	5958530	5946206	5954098	5954090

Fig. 28 Block diagram

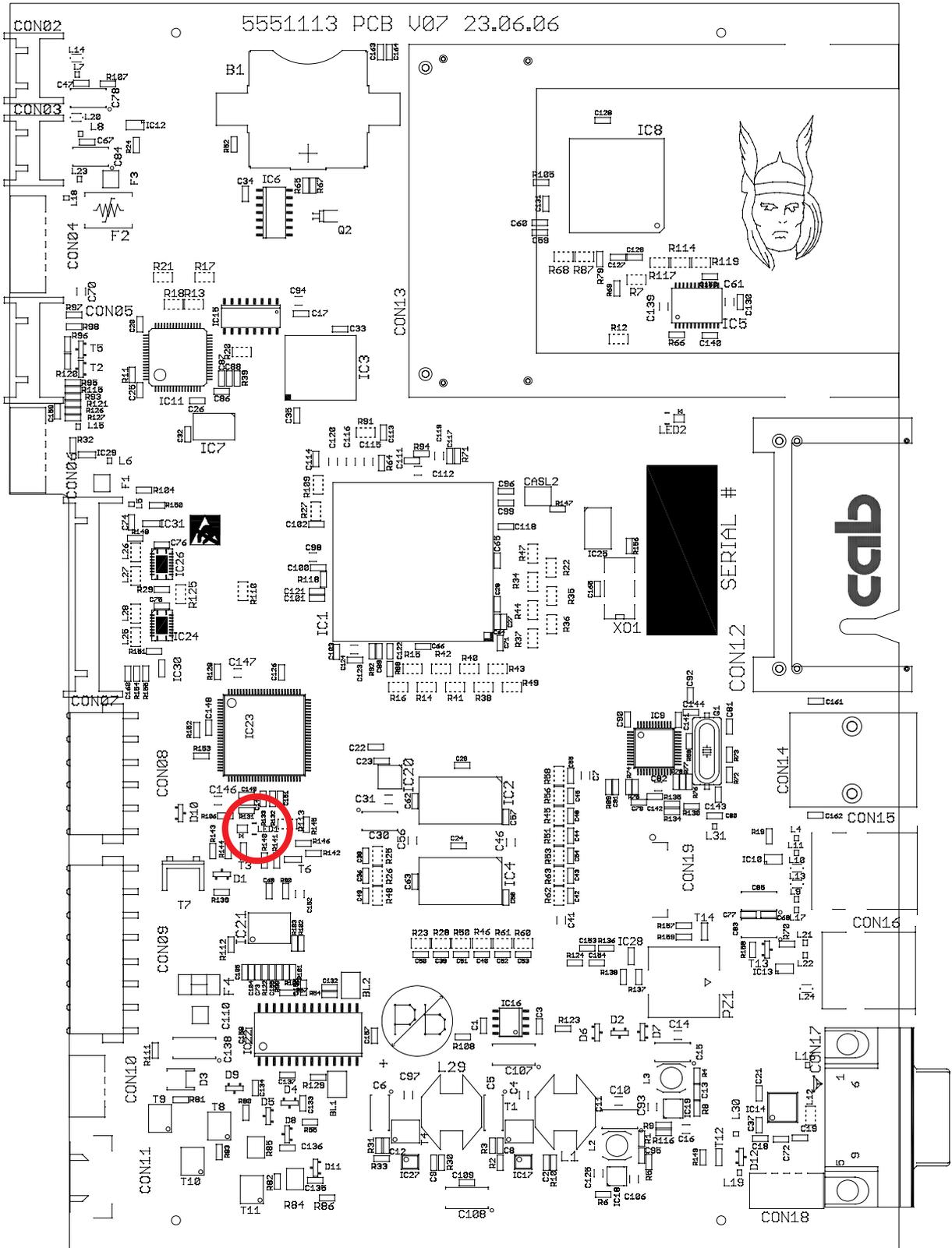


Fig. 29 Layout diagram PCB CPU - components side

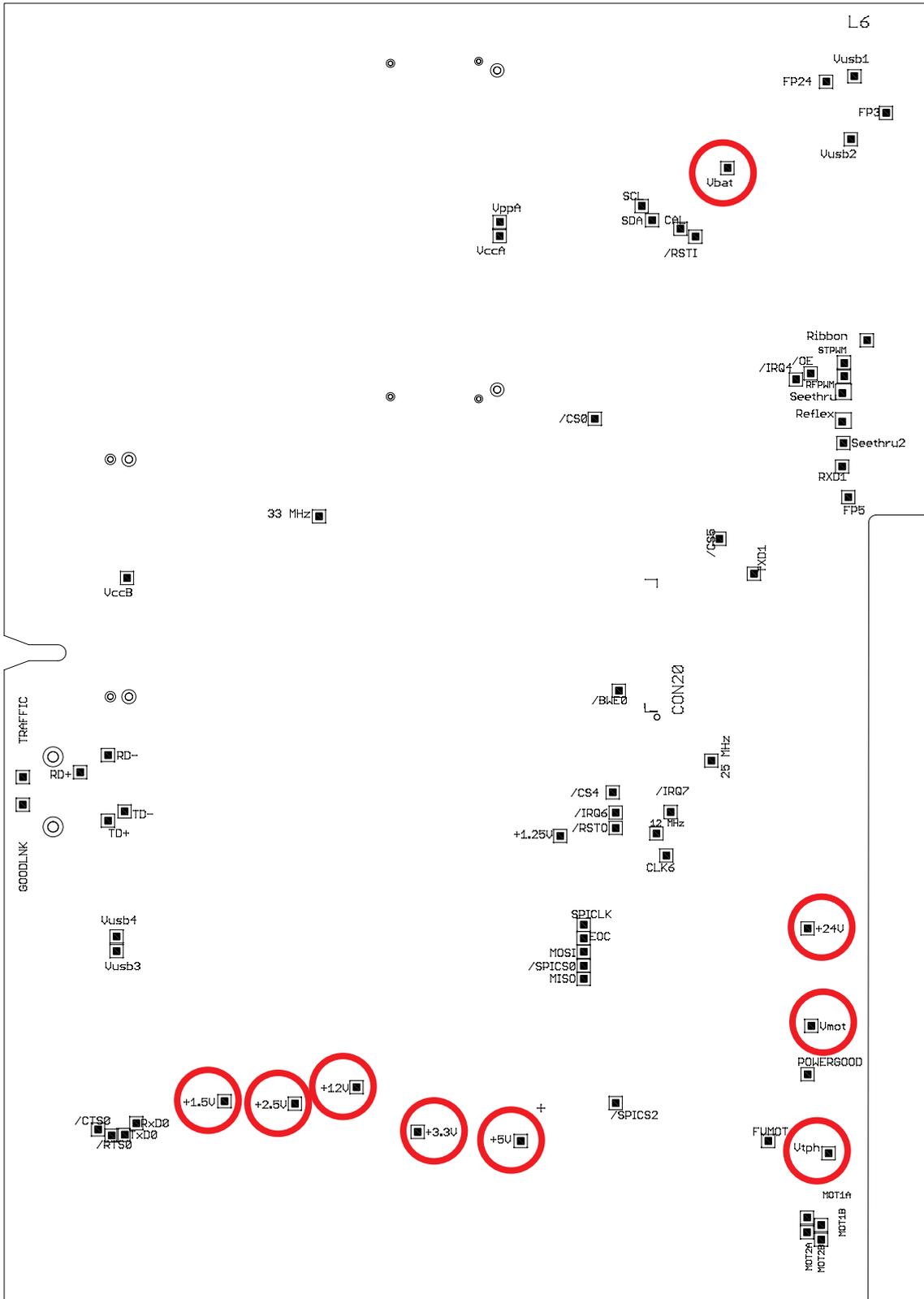


Fig. 30 Layout diagram PCB CPU - soldering side

A		S	
Adjusting the belt tension	27	Slipping clutch	
Adjusting the head switch.....	28	replacing	13
Adjusting the printhead position	24	winding torque	20
Adjusting the printhead pressure.....	25	T	
Adjusting the printing mechanism.....	23	Tools	8
Adjusting the ribbon feed path.....	26	Torque.....	19, 21
B		Transfer ribbon hubs	
Block diagram.....	31	winding torque	20
C		Troubleshooting.....	29
Cleaning		V	
by the operator.....	6	Voltages, exposed	5
label sensor A6+, A8+	6, 7	W	
E		Winding torque	
Error treatment	29	adjusting	22
F		internal rewinder	21
Failure of device functions.....	29	measuring.....	19
G		transfer ribbon hubs.....	20
General safety instructions	4		
H			
Handling electricity	5		
Hardware faults	30		
I			
Internal rewinder			
winding torque	21		
L			
Label sensor			
cleaning	6, 7		
replacement.....	15		
Layout diagram PCB CPU.....	32		
M			
Maintenance work	5		
P			
Printhead, replacing.....	9		
Procedure in case of accidents	5		
Protective devices	4		
Pulling force.....	19, 21		
R			
Removing the plastic cover	8		
Replacing the label sensor	15		
Replacing the PCB CPU.....	17		
Replacing the power supply unit.....	18		
Replacing the printhead.....	9		
Replacing the print roller.....	12		
Replacing the rewind assist roller.....	12		