

Service manual

BXT3-13

BXT3-16

BXT3-19



Battery-operated hand tool for plastic strapping

Validity:

- BXT3-13 from series no A/17020001
- BXT3-16 from series no B/17020001
- BXT3-19 from series no C/17020001

Manufacturer

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Changes:

Version	Date	Visa	Description
V 03.17	16.03.2017	ak/hp	DRAFT
V 07.17	30.06.2017	ak/hp	1. Version

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1 General information

The purpose of this service manual is to get experienced technicians familiar with the technical features of the tool, in order to be independent in carrying out maintenance and repair work.

The current operating instructions and the document «Parts lists & Exploded drawings» of the tool as well as the respective product information sheets are an integral component of this manual and must be consulted in all cases.

Meaning of warning symbols. representation convections



DANGER

This text describes an extremely dangerous situation in which failure to observe the safety instructions will result in death or serious injury.



WARNING

This text describes a dangerous situation in which failure to observe the safety instructions can result in death or serious injury.



CAUTION

This text describes a dangerous situation in which failure to observe the safety instructions can result in minor injury.



ATTENTION

This text describes a situation that may lead to property damage or adverse operating results.



This text describes useful supplementing information.

- ▶ This symbol indicates handling steps.
 - This symbol indicates results from the handling steps.
- This symbol indicates lists.

1.1 Safety

This manual must be read and understood by all persons who carry out repair and service work on the respective strapping devices.

Use only original parts for repair and service work. Disregarding this may lead to damage to the device or in the worst case, to personal injury.

1.2 Target group

This manual is intended for those technicians that are already familiar with the repair and service work of strapping devices. The manual can also be used for training purposes for new employees.

1.3 Changes

The production lines and the technical design of the strapping devices are permanently optimised.

In case the respective changes have an influence on the device performance, service or spare parts, a product information shall be prepared.

A current version of the operating instructions and the document «Parts lists & Exploded drawings» as well as the respective product informations are a fundamental component of this manual and must also be observed.

2 Periodic maintenance

In order to ensure the highest-possible availability and to avoid subsequent damage caused by insufficient lubrication, periodic maintenance must be carried out in the device according to the following instructions.

The maintenance intervals are orientated according to the degree of usage (see maintenance requirements table 2.2) and the number of strapping cycles carried out. However, we recommend performing a service at least every two years.

In addition, the details in the operating instructions (section 6.1) apply with regard to smaller maintenance work by the customer.

2.1 Implementation

2.1.1 Cleaning

- Cleaning the tensioning and sealing area of the device from strap particles (with compressed air).
- Removal of excess contamination on other components of the device.

2.1.2 Visual check

- Is there any visible damage to the housing, base plates and other components that is relevant for its functioning?
- Are all screws and other components that could be removed present and tight, and are they the original part?
- Does the strap width setting match with the strap in use?
Refer to operating instructions (chapter 5.3).
- Are all original wear parts with correct article number installed?
Refer to operating instructions (chapters 6.4, 6.5 and 6.6).

2.1.3 Function test

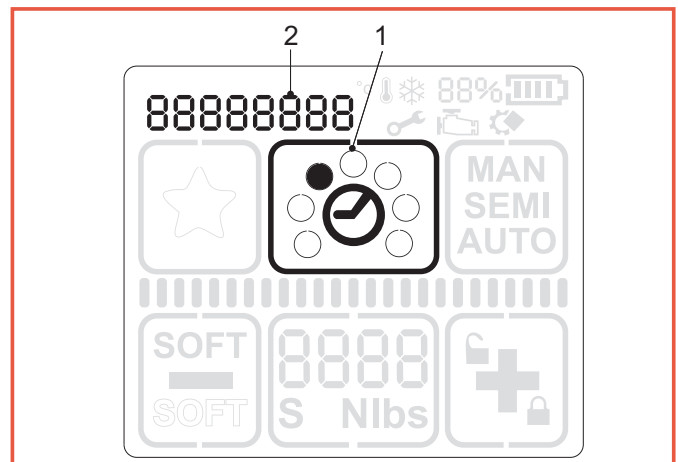
• Inserting the rechargeable battery:	The backlight should illuminate briefly
• Check the user interface function:	Are all buttons functional? Select MAN Mode
• Pull up the rocker lever and hold it:	Rocker opening and strap guide display okay?
• Actuate the tensioning and sealing button:	With the lever pulled up, only one beeping tone sounds per each button?
• Insert and tension the strap:	Is the strap tension range matching the strap size?
• Weld the strap:	End of cooling time display? (green backlight and buzzer)
• Remove the device from the strap	Did any issues occur?
• Check the welding:	Weld quality and strap cutting are okay?

2.1.4 Maintenance

- If an error has occurred during the function test, first continue with rectification according to chapter 3.
- Carrying out maintenance according to chapters 2.2, 2.3, 2.4 and 2.5.

2.1.5 Read out the cycle counter

- ▶ Touch the operating panel, the backlight lights up.
- ▶ Press the «Welding time» button (1) and hold it for two seconds.
- ▶ Raise the rocker lever. Now the number of cycles (2) is displayed at the top of the display.



2.2 Maintenance requirements table

The workload and need for maintenance of the tool may vary strongly depending on the operating environment. The required service work also differs accordingly. The table below should provide a reference for categorising.

	Light applications	Average applications	Heavy applications
Number of strappings	- 1 to 100/day	100 to 500/day	> 500/day
Environment	<ul style="list-style-type: none"> - Indoors - Clean surroundings - Room temperature - No contact with fluids - dry - No abrasive substances present - No corrosion vapours 	<ul style="list-style-type: none"> - Indoors - Industrial environment - Low temperature (<5°C) or strong fluctuation - Increased humidity - No abrasive substances present - No corrosion vapours 	<ul style="list-style-type: none"> - Outdoors, covered - Industrial environment - Low temperature (<5°C) or strong fluctuation - Abrasive substances - High humidity
Typical sectors	<ul style="list-style-type: none"> - General logistics - Paper industry - Cardboard box 	<ul style="list-style-type: none"> - Food - Panel wood - 	<ul style="list-style-type: none"> - Construction industry (brick production, cement factories, etc.) - Sawmills
Recommended accessories	<ul style="list-style-type: none"> - If required, hanging bracket 	<ul style="list-style-type: none"> - If required, hanging bracket - If required, second rechargeable battery. 	<ul style="list-style-type: none"> - If required, hanging bracket - If required, second rechargeable battery - If required, optional protection plate set - If required, optional protection cover set
Special measures:	<ul style="list-style-type: none"> - None 	<ul style="list-style-type: none"> - Avoid strong temperature fluctuations. For example, when using in a refrigerated warehouse, leave the device in the cold area, and remove the rechargeable battery for charging at ambient temperatures. 	<ul style="list-style-type: none"> - Avoid strong temperature fluctuations. For example, when using in a refrigerated warehouse, leave the device in the cold area, and remove the rechargeable battery for charging at ambient temperatures. In wet areas, remove the battery from the tool as soon as it is no longer needed. - Dry the tool before the next use if it will be exposed to moisture at the next use.
Maintenance recommendations (see also chapter 2.3)	<ul style="list-style-type: none"> - Cleaning the tool as required (compressed air). - Lubricate the welding unit with grease every six months (see operating instructions, chap. 6.3.) - Every 2 years, service by a specialist unit. 	<ul style="list-style-type: none"> - Cleaning the tool as required (compressed air). - Lubricate the welding unit with grease every six months (see operating instructions, chap. 6.3.) - Annual service by specialist unit. 	<ul style="list-style-type: none"> - Cleaning the device as required (Caution! Abrasive dusts should not be blown into the tool using compressed air). - Lubricate the welding unit monthly with grease (see operating instructions, chap. 6.3). - Six-monthly service by specialist unit.

2.3 Maintenance table

Description	Parts list pos.	Action	Light applications (Cycles*)	Average applications (Cycles*)	Heavy applications (Cycles*)	Remarks
Tensioning wheel	46	Replace		As required		Wear part (see operating instructions)
Tooth plate	53	Replace		As required		Wear part (see operating instructions)
Knife	166	Replace		As required		Wear part (see operating instructions)
Shaft	180	Check	120'000	100'000	80'000	Only for tool BXT3-19
Welding shoe	158	Check	120'000	100'000	80'000	Check the toothing, ball guides and contact surface of the needle bearing for wear. Replace if necessary.
Swivel bearing	153	Check	120'000	100'000	80'000	Check the ball and knife guide for wear. Replace if necessary.
Sleeve	80	Check	120'000	100'000	80'000	Check the toothing, turn or replace if necessary.
Toothed belt	162	Check Replace	120'000 240'000	100'000 200'000	80'000 160'000	–
Needle bushing	157	Replace as preventive measure	120'000	100'000	80'000	–
Belt pulley cpl.	127	Replace as preventive measure	120'000	100'000	80'000	A defective or contaminated idle-run may damage the motor axle.
Bevel pinion cpl.	132	Replace as preventive measure	120'000	100'000	80'000	A defective or contaminated idle-run may damage the motor axle.
Pressure springs	81, 83, 170	Replace as preventive measure	240'000	200'000	160'000	–

* For the read out of the cycle counter, see chap. 2.1.5.

2.4 Clean the tool



ATTENTION!

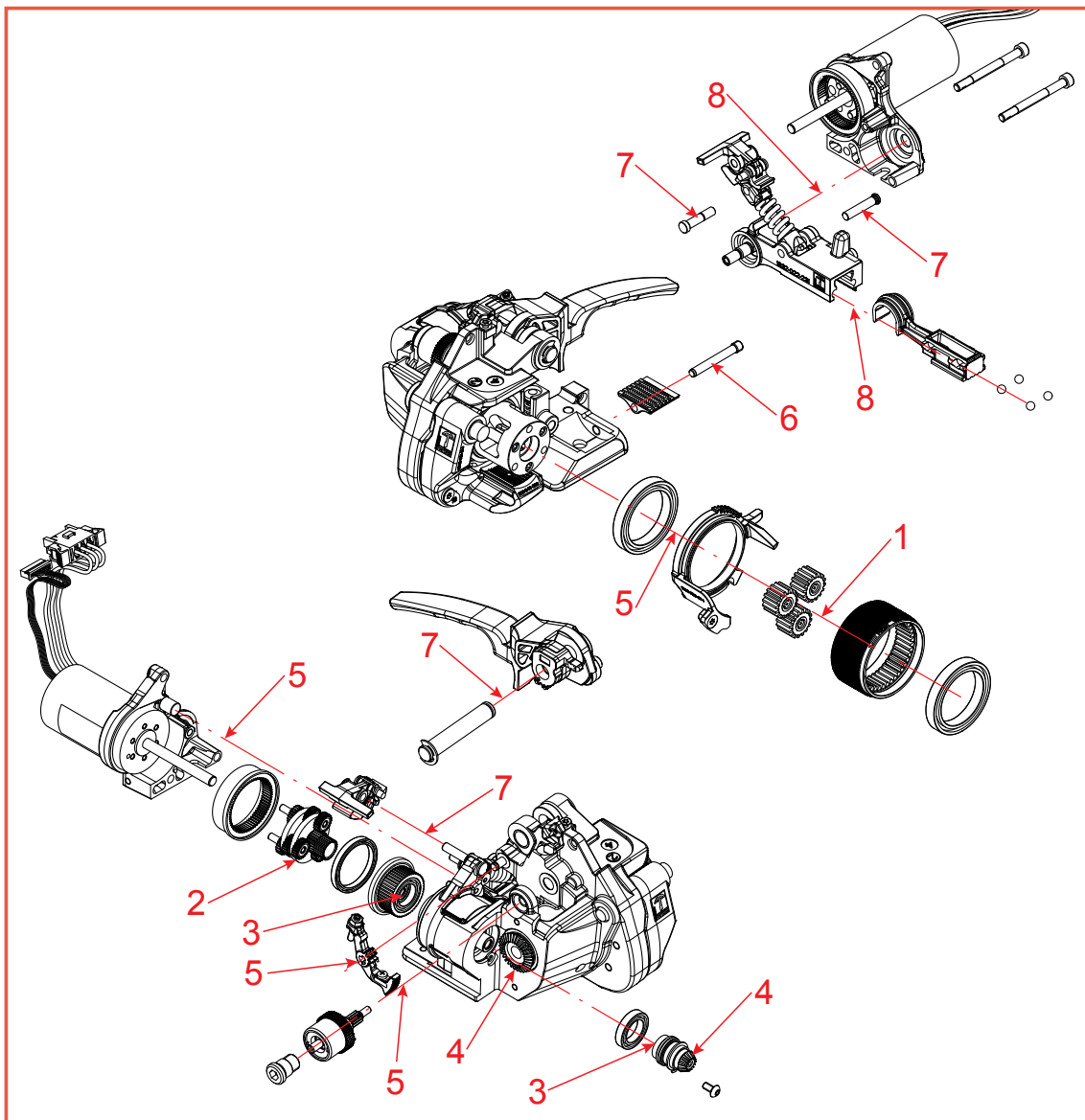
Do not use water or other solvent to clean.
See operating instructions, chap. 6.2.

2.5 Lubrication plan

Re-lubricate the device, see operating instructions (Manual), chap. 6.2 and 6.3.

	Description	Recommended lubricants	Interval*
1	Drive train, planetary gear	Klüber Microlube GBU-Y 131	80,000 cycles
2	Switchover gear (Attention: exclusive free wheel!)	Klüber Microlube GBU-Y 131	80,000 cycles
3	Freewheel (Attention: no grease!)	Universal oil, e.g. WD 40	80,000 cycles
4	Angular gear	Klüber Microlube GBU-Y 131	80,000 cycles
5	Cam disk, resetting lever, coupling shaft	Klüber Microlube GBU-Y 131	80,000 cycles
6	Tooth plate, threaded rod	Klüberpaste 46 MR 401	80,000 cycles
7	All moving parts such as axles, joints, strap guides, etc.	High-pressure resistant adhesive lubricant oil, e.g. Würth HHS 2000	80,000 cycles
8	Ball guides on the welding shoe, eccentric shaft, knife guide	High-pressure resistant adhesive lubricant oil, e.g. Würth HHS 2000	25,000 cycles (see manual, chap. 6.3)

* see also maintenance table 2.3.



3 Problem identification



Unexpected start-up in case of problem resolution, possible injuries.

Before any work on the tool, remove the rechargeable battery.

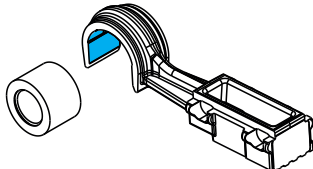
3.1 Diagnosis of mechanical or electro-mechanical faults

3.1.1 Tensioning process

Symptom	Possible cause	Rectification
The strap is not tensioned or is only tensioned with low force although the feed wheel is rotating. This is creating strap particles and dust.	1. The tensioning wheel is contaminated or worn.	– Clean or replace the tensioning wheel (chapter 4.1.1)
	2. The tensioning wheel has been installed in the opposite direction of the arrow.	– Turn the tensioning wheel according to the printed arrow (chapter 4.1.1)
	3. The tool is held too close to the front edge of the package or the package item has a round cross-section.	– Move the device back from the edge of the packed product. Check suitability of package shape and size.
	4. The strap used is less than the specified minimum strap thickness.	– Select a strap thickness according to the specifications in the operating instructions. See operating instructions (chap. 7).
	5. The rocker has hairline cracks.	– Replace the rocker # 50 (chapter 5.8).
The strap is not tensioned. The feed wheel does not turn although the motor is running.	1. The spring clutch does not engage.	– Check the sleeve # 77 for smooth running. (See also chapter 5.7.1) – Check the bearing pins # 61 for tight fit. (See also chapter 5.7.1)
	2. The freewheel pressed into the bevel gear # 132 has a malfunction.	– Replace the bevel wheel with pinion # 12 (chapter 5.9.1).
The strap tension releases again after tensioning. The feed wheel rotates backwards.	1. The freewheel # 13 pressed into the base plate has a malfunction.	– Replace the freewheel.
		– Replace the bevel wheel with pinion # 12 (chapter 5.9.1).
Instead of starting the tensioning process, only a beeping tone sounds.	1. The battery was inserted after inserting the strap.	– Actuate the rocker lever
	2. The signal "Rocker lever closed" is missing.	– The micro switch # 103 is defective or is not inserted.
		– The micro switch # 103 is not actuated for mechanical reasons, e.g. the rocker lever jams.
The tool ends the tensioning process although the strap has not been completely tensioned. In SEMI or AUTO mode, the tool also completes a welding cycle.	1. The strap used is unsuitable for hand-held devices. It causes too high friction when placed on top of another.	– Change to strap types suitable for hand strapping.
	2. There is a problem in the drive train.	– Check the tensioning drive (chapter 5.9.2). –
	3. The current measurement on the PCB supplies incorrect values.	– Replace the PCB.
	4. The motor is defective.	– Replace motor.

The positions # in these tables refer to the positions in the document „Parts Lists & Explosions Drawings“.

3.1.2 Welding and cutting procedure

Symptom	Possible cause	Rectification
The sealing surface has not been welded through completely.	1. The welding time has been set too low	– Increase the welding time. See operating instructions (chap. 4.5).
	2. The strap width setting does not correspond with the strap in use.	– See the operating instructions (chap. 5.3).
	3. The toothed plate # 9 has a tight fit	– Remove contamination, replace the toothed plate and / or bolts if necessary
	4. The ball guide of the swivel bearing # 153 or the welding shoe # 158 are worn.	– Replace the swivel bearing and / or welding shoe
	5. The base plate is bent.	– Replace the base plate.
The welding time must be set extraordinarily high for sufficient welding. Unusual noises during sealing	1. The sliding surfaces of the welding shoe are worn. 	– The sealing shoe and, if necessary, the needle sleeve must be replaced. Ensure to lubricate sufficiently to prevent wear.
The strap is not cutting the strap although the knife has not been worn yet.	1. The welding time is too short	– Increase the welding time. See operating instructions (chap. 4.5).
	2. The spring above the knife is not present or not functional	– Check spring # 168.
	3. The strap thickness is outside the device specification	– Check the strap dimensions. See operating instructions (chap. 5.3).
	4. The knife may be too coarse for very thin and narrow strap.	– Slightly grind the knife with fine emery cloth.
The strap tears during the sealing procedure.	1. The welding time is set too long. The bottom strap, being under tension, is getting affected	– Reduce the welding time.
	2. The strap tension is set too high for the strap used.	– Reduce the tension level
Part of the weld joint is tearing at opening of the tool	1. At the strapping site lubricants could be in use that have contaminated the strap. During the sealing procedure, the lubricant is affecting the welding.	– Query the application.
Instead of the sealing noise, only a quiet rustling of the motor can be perceived. Then an E53 error code appears. Typically, this does not occur for every strapping.	1. The sleeve freewheel installed in the belt wheel has malfunctions and does not transfer the torque correctly. It is probably contaminated with grease or other foreign objects.	– Replace the belt wheel # 126. Attention! No grease may enter the free-wheel. Lubricate only with light oil.

3.1.3 Remove the tool from the packaged goods

Symptom	Possible cause	Rectification
The tool cannot be removed or only poorly from the strap after the welding procedure. The rocker lever cannot be fully lifted.	1. The cam disk # 109 stands in a position that prevents the welding unit from swivelling back.	<ul style="list-style-type: none">– Attention! Do not attempt to pull the lever with brute force.– Perform a tool reset. See chapter 5.10.2
	2. The strap tension is not released. The toothed ring # 19 cannot be turned back.	<ul style="list-style-type: none">– Check # 19 and 57 for smooth running.– Toothed ring # 19 only lubricate with light oil. If necessary, remove grease or foreign parts.

3.2 **Diagnosis of electronic faults**

The tool errors can be divided into the following categories:

3.2.1 **Operating error**

The operator presses a button that is not intended at this moment of operation. Depending on the response of the mechanics to an operating error, these may be further differentiated.

- If the manipulation does not have any direct influence on the mechanics, the error may only be indicated e.g. by a beeping tone (and the current status of the tool controls will be maintained).
- If however it is to be expected that the mechanical components change to another mode (e.g. Tensioning -> Insert strap) when detecting an operating error, this is indicated by a beep tone and the tool control mode changes accordingly.

Signalling example (A1):

- short beep tone (0.4s)
- write Axx in "Application Error Code" object (no display)

3.2.2 **Processing error**

In the process flow, an event is detected that does not belong to the "normal" process (e.g. at a performance limit). A change is accordingly carried out into an alternative tool control mode

Signalling example (A2):

- 2x short beep tones (0.2s, 0.2s Pause, 0.2s)
- write Axx in "Application Error Code" object (no display)

3.2.3 **Temporary system error**

This category of error is detected by the control unit and can be deleted by the operator by, for example, starting a new strapping cycle. In doing so, the current cycle process is cancelled and as a result, is incorrect. If the error recurs, the device should still be checked by the service centre.

Signalling example (E1):

- beep tone (pulsating / medium)
- orange backlight
- (Application) Error Code Exx in Display (medium)
- Axx (is stored in History)

3.2.4 **Static system error**

These errors detected by the control unit cannot be deleted by the operator. Accordingly, the battery must be removed, the error rectified and the device must be reset by reinserting the battery (possibly recharged).

Signalling example (E2):

- pulsating beep tone, long (5s)
- backlight red (or orange)
- Application) Error Code Exx in Display
- Axx (wird in History gespeichert)

3.3 Error lists

The following summary shows the errors to be detected by the strapping device

3.3.1 Tension process error

No.	Process error	System response	Signalling	Rectification
A10	Tension button pressed without releasing the tension	No tensioning	(A1) Short beeping tone	Insert strap
A13	Rocker lever, tension button or welding button pressed during the tensioning process [AUTO]	Cancel tensioning process	(A1) Short beeping tone	
A14	Permissible number of cycles exceeded [MAN]	No (more) tensioning	(A1) Short beeping tone	Weld or insert the strap
A15	Tensioning process timeout	Cancel tensioning process	(A2) 2x short beeping tone	Tension again
A16	Mechanical components limit switch (S4 = 0) during the tensioning process	Cancel tensioning process → State open tensioning process	(A1) Short beeping tone	
A18	Limit performance [MAN, SEMI]	Cancel tensioning process	(A2) 2x short beeping tone	Tension again
A19	Tension button activated with active cam switch	No tensioning	(A1) Short beeping tone	Insert the strap (actuate rocker)



3.3.2 Process error welding / cooling

No.	Process error	System response	Signalling	Rectification
A20	Welding button (S5) activated without welding release	No welding	(A1) Short beeping tone	Insert and tension the strap
A24	Tensioning button (S1) activated during the welding process	No tensioning	(A1) Short beeping tone	
A25	Tensioning button (S1) activated during the cooling process	No tensioning	(A1) Short beeping tone	









3.3.3 Processing error "Insert strap"

No.	Processing error	System response	Signalling	Rectification
A11	Tensioning button (S1) activated while the mechanical components are disassembled	No tensioning	(A1) Short beeping tone	
A21	Welding button (S5) activated while the mechanical components are disassembled	No welding	(A1) Short beeping tone	



3.3.4 Processing error battery









No.	Processing error	System response	Signalling	Rectification
n.a.	Battery temperature too low (derating)	Tensioning level will be reduced	Symbols  &  flash, force display flashes	Increases automatically at higher battery temperature

3.3.5 System error

No.	System error	System response	Signalling	Rectification
E11	Invalid rechargeable battery type Unknown rechargeable battery inserted, invalid – Incorrect rechargeable battery type inserted – Incorrect control print – Control unit defective	No device function	E2) Error Code, red backlight, symbol  flashes, pulsating beep tone, long	– Insert the correct rechargeable battery – Change the control print
E20	Rechargeable battery high temperature limit, temperature limit protection of the rechargeable battery – Rechargeable battery temperature > 60°C	No device function	E2) Error Code, backlight red, symbol  & °C  flashes, pulsating beep tone, long	– Let the rechargeable battery cool down – Replace the rechargeable battery
E23	Rechargeable battery undervoltage, undervoltage limit of the rechargeable battery in operation reached – Rechargeable battery empty – Rechargeable battery too cold	Cancel current process (with controlled positioning) →Tensioning / welding invalid! No device function	(E2) Error Code, red backlight, symbol  flashes, pulsating beep tone, long	– Charge the rechargeable battery – Replace the rechargeable battery.
E24	Rechargeable battery coding error, coding resistance cannot be detected (short-circuit / open) – Rechargeable battery not inserted correctly – Coding resistance in the rechargeable battery faulty – Wiring to the rechargeable battery adapter defective – Control unit defective	No device function	(E2) Error Code, red backlight, symbol  flashes, pulsating beep tone, long	– Insert the rechargeable battery correctly – Replace the rechargeable battery
E25	Rechargeable battery temperature measurement invalid, temperature sensor (NTC) cannot be detected correctly (short-circuit / open) – Rechargeable battery not inserted correctly – Temperature sensor in the rechargeable battery faulty – Wiring to the rechargeable battery adapter defective – Control unit defective	No device function	(E2) Error Code, backlight red, symbol  & °C  flashes, pulsating beep tone, long	– Insert the rechargeable battery correctly – Replace the rechargeable battery
E27	Idle run voltage level not reached – Rechargeable battery empty	No device function	(E2) Error Code, red backlight, symbol  flashes, pulsating beep tone, long	– Let the rechargeable battery cool down – Replace the rechargeable battery

3.3.6 System error hardware

No.	System error	System response	Signalling	Rectification
E32	Internal electronics error ESCON Internal Hardware Error (Error Register Bit6) - control unit defective	No device function	((E2) Error Code, red backlight, symbol  flashes, pulsating beep tone, long	– Replace the control unit.
E33	Electronics high temperature limit ESCON Thermal Overload Error (Error Register Bit3) - control unit too hot - control unit defective	No device function	(E2) Error Code, red backlight, symbol °C  flashes, pulsating beep tone, long	– Let the control unit cool down. – Replace the control unit.

E34	Supply undervoltage ESCON Vcc Undervoltage Error (Error Register Bit1) - Supply only via USB - Very low batter charge - control unit defective	No device function	(E2) Error Code, red backlight, symbol  flashes, pulsating beep tone, long	<ul style="list-style-type: none"> – Let the rechargeable battery cool down – Replace the rechargeable battery – Replace the control unit.
E35	Supply overvoltage ESCON Vcc Overvoltage Error (Error Register Bit0)	Cancel current process	(E1) Error Code, orange backlight, symbol  flashes, pulsating beep tone, average	<ul style="list-style-type: none"> In case of repetition – Replace the control unit
E36	5 V Supply undervoltage ESCON +5V VDC Undervoltage Error (Error Register Bit2) – Motor Hall sensors / Encoder defective – Control unit defective	No device function	(E2) Error Code, red backlight, symbol  &  pulsating beep tone, long	<ul style="list-style-type: none"> – Motor / replace wiring – Replace the control unit
E37	End stage overvoltage ESCON Overcurrent Error (Error Register Bit4) – Wiring to the motor defective – Motor defective – Control unit defective	Cancel current process	(E1) Error Code, orange backlight, symbol  &  pulsating beep tone, average	<ul style="list-style-type: none"> In case of repetition – Motor / replace wiring – Replace the control unit
E38	Hall sensors error ESCON Hall sensor errors (Error Register Bit10, 11, 12) – Wiring to the hall sensors defective – Motor hall sensors defective – Control unit defective	No device function	(E2) Error Code, red backlight, symbol  pulsating beep tone, long	<ul style="list-style-type: none"> – Motor / replace wiring – Replace the control unit
E39	Encoder error ESCON Encoder errors (Error Register Bit16, 17) – Wiring to the encoder defective – Motor encoder defective – Control unit defective	No device function	(E2) Error Code, red backlight, symbol  pulsating beep tone, long	<ul style="list-style-type: none"> – Motor / replace wiring – Replace the control unit
E40	Internal drive software error ESCON Internal Software Errors (Error Register Bit25, 27)	Cancel current process	(E1) Error Code, orange backlight, pulsating beep tone, average	<ul style="list-style-type: none"> In case of repetition – Replace the control unit
E41	Internal software error Internal Application Error (Error Register Bit26?)	Cancel current process	(E1) Error Code, orange backlight, pulsating beep tone, average	<ul style="list-style-type: none"> In case of repetition – Replace the control unit
E42	Display does not detect incorrect display identification – Incorrect display print – Incorrect control print	No device function	(E2) Output not possible! Pulsating beep tone, long	<ul style="list-style-type: none"> – Install correctly Display Print – Install correctly Control Print
E43	Display communication error faulty communication with display – Poor Flexprint display – Display defective – Control unit defective	No device function	(E2) Output not possible! Pulsating beep tone, average	<ul style="list-style-type: none"> – Replace Flexprint display – Replace display – Replace the control unit

3.4 Service interface (PT-Studio)

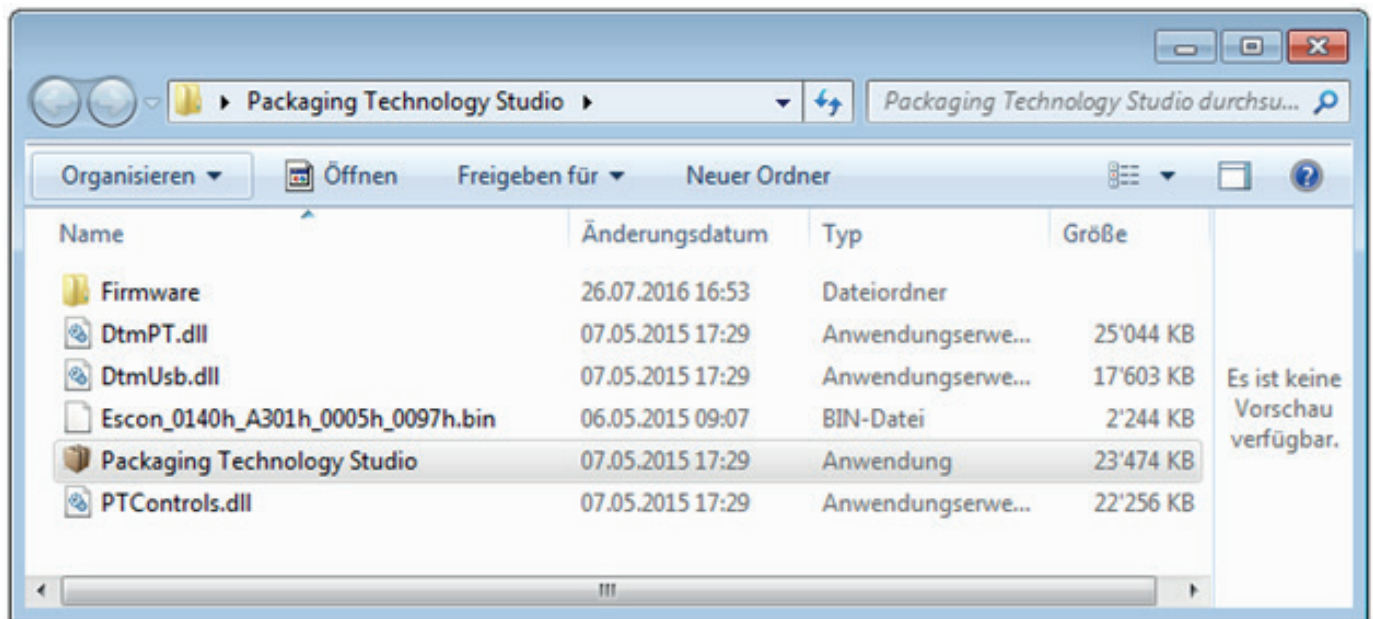
- With the Packaging Technology Studio (PT-Studio), the service technician is provided with a tool that helps to identify problems with the periphery system of the electronics, the electronics themselves and the motor.

The scope of the diagnostics includes the following points:

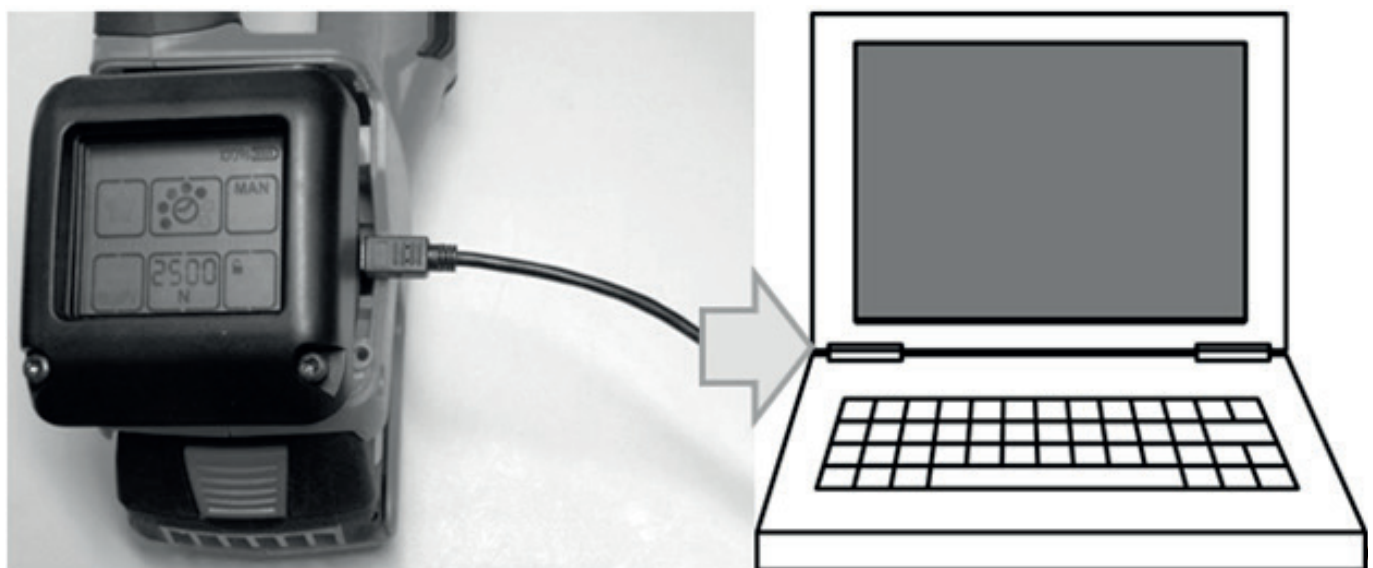
- Motor
- Hall effect sensors (BXT3-13)
- Encoder (BXT3-16 and BXT3-19)
- LCD display
- Switches and connections
- Buzzer

3.4.1 Starting PT-Studio and connecting to the device

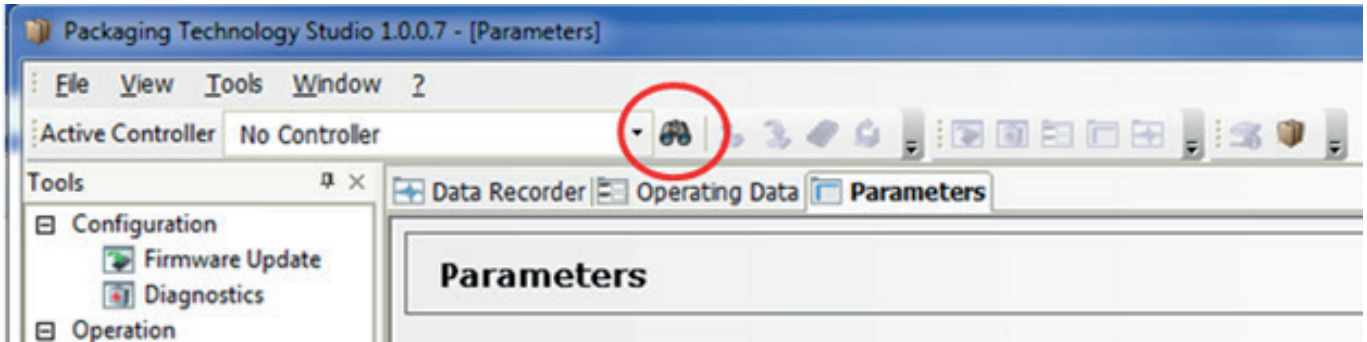
The program does not have to be installed. Execute the File "Packaging Technology Studio" to start.



- ▶ Then remove both screws # 246 of the LCD operating unit. Lift the operating unit to release it and only lift it so far that the Micro USB connector can be accessed.
- ▶ Insert the battery in the tool and then connect to a computer using a USB connecting cable (USB 2.0 connector A - USB 2.0 connector Micro-B).

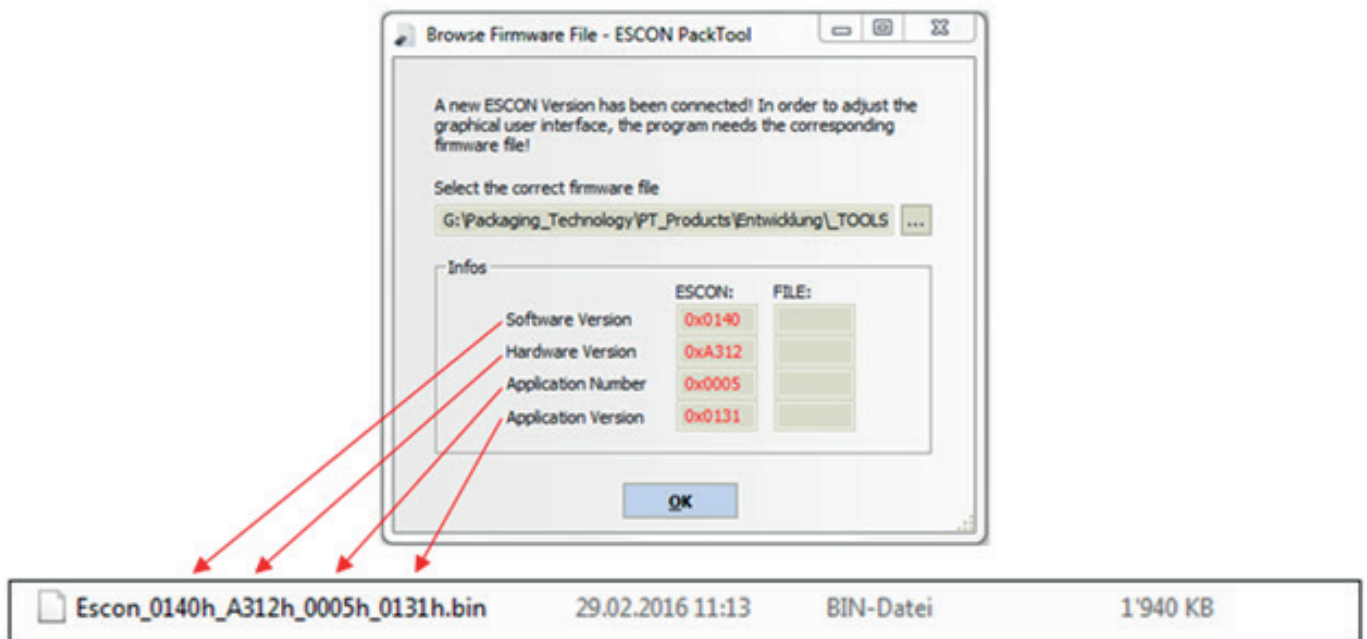


To establish the connection of PT Studio to the tool, click on the icon “Search controller”.



With the first connection, PT Studio requests the firmware file loaded on the tool. This is stored in the “Packaging Technology Studio” folder.

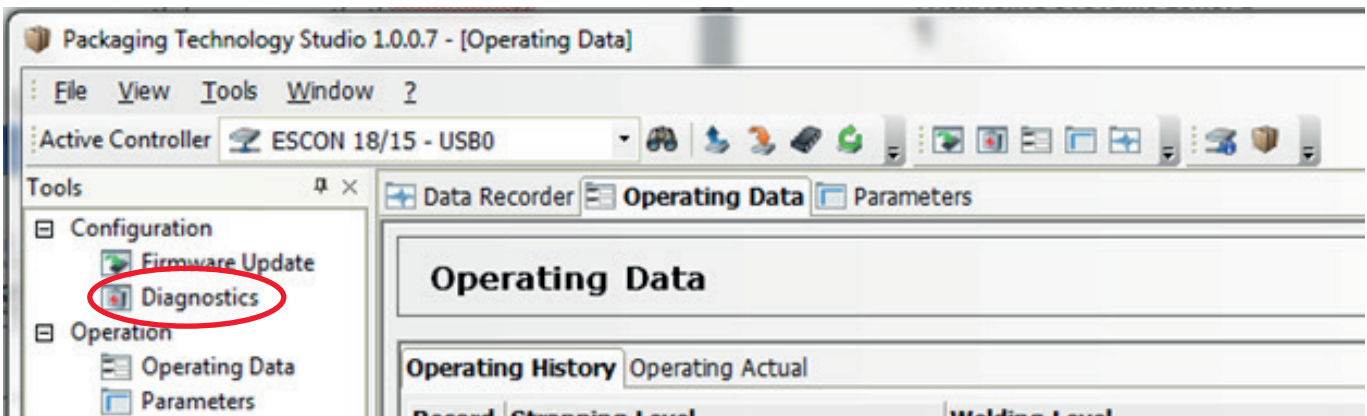
- Using Explorer, highlight the respective file, while observing the version (displayed in red), and confirm with OK.



The connection is being made. Now PT Studio communicates with the device and data is transferred.

3.4.2 Diagnostics

Double click on the “Diagnostics” icon to start the diagnostics.



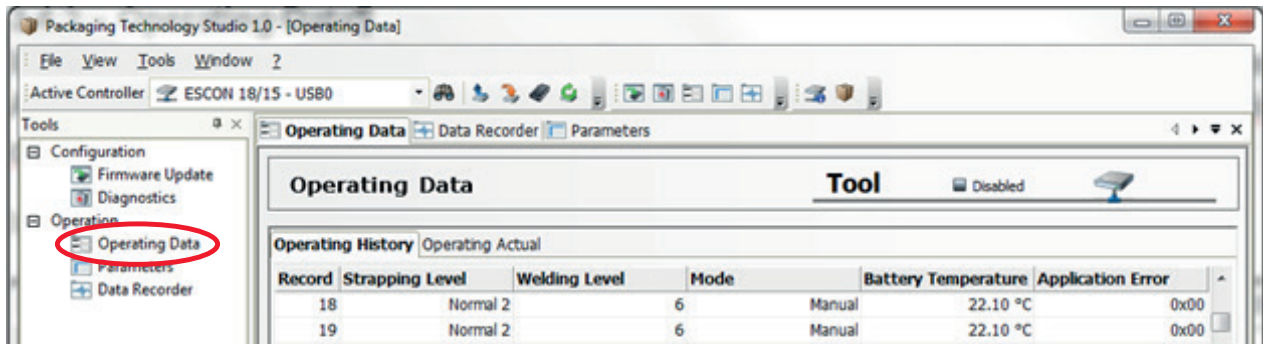
- Follow the instructions in English.

3.4.3 Operating data

In the tool “Operating Data”, there is a tab “**Operating History**” with a detailed list of the last 250 strapping actions.

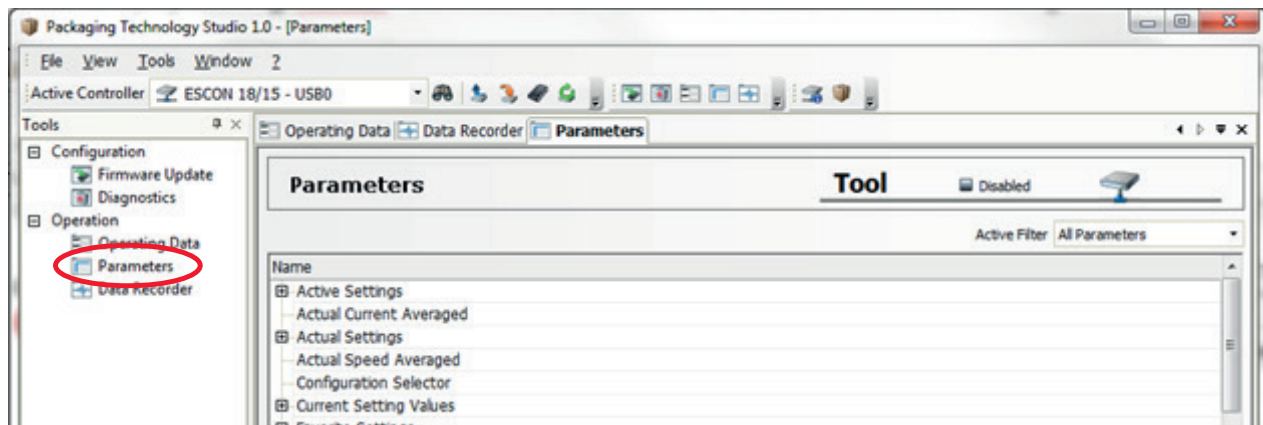
- The history can be exported as csv file by a right-click in the list box.

In the tab “**Operating Actual**”, you can find the current Status Information.



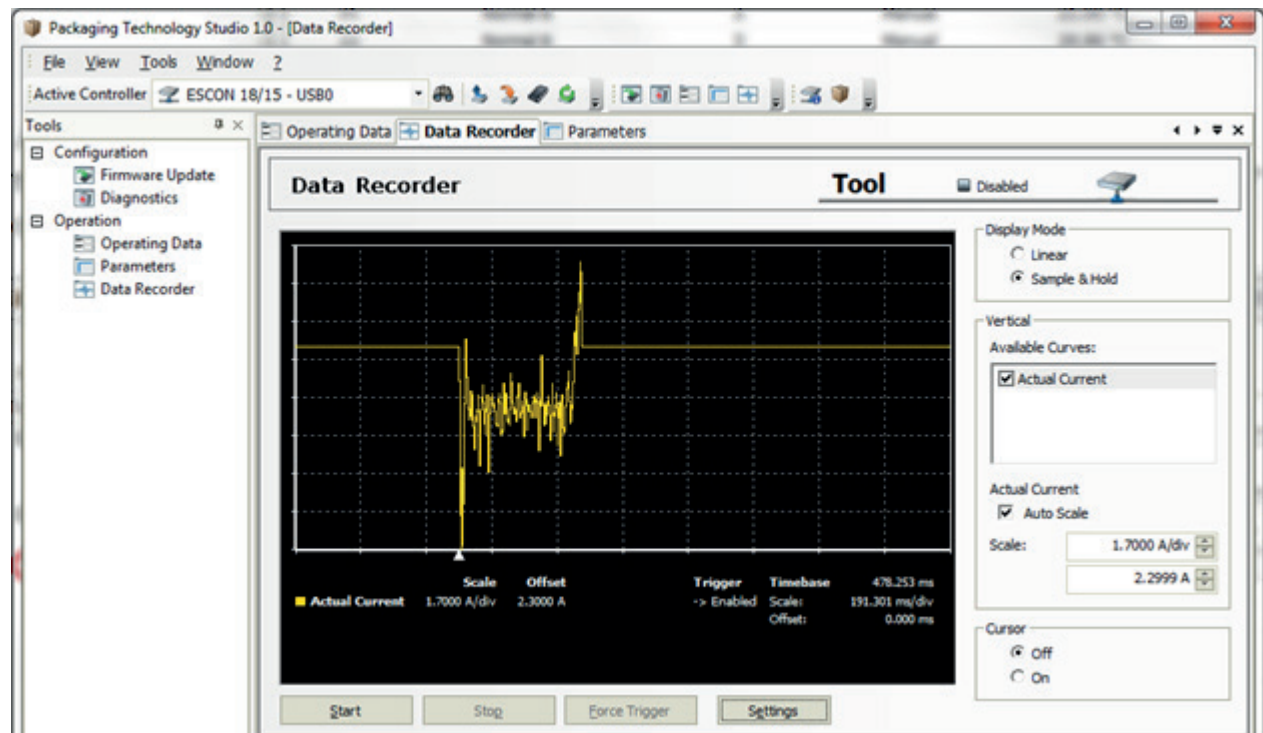
3.4.4 Parameters

The current parameter settings are represented in the tool “**Parameter**”. Those marked with “RW” settings can be changed via PT Studio.



3.4.5 Data recorder

PT Studio is equipped with a “**Data Recorder**” for more detailed diagnostics. This tool offers the function of a 4-channel oscilloscope.



4 Preventive maintenance work (wear parts)



WARNING

Unexpected startup during maintenance work, injuries possible.

Always remove the battery before performing cleaning or preventive and corrective maintenance work.

4.1 Replacing tension wheel, tooth plate and knife

4.1.1 Replacing the tension wheel

Dismantling

- ▶ Remove battery from tool. Remove four cylinder screws Torx (4), strap guide rear (5) and side cover (3).
- ▶ Carefully pull out tension wheel (1).
- ▶ Remove ball bearing (2) from tension wheel.



WARNING

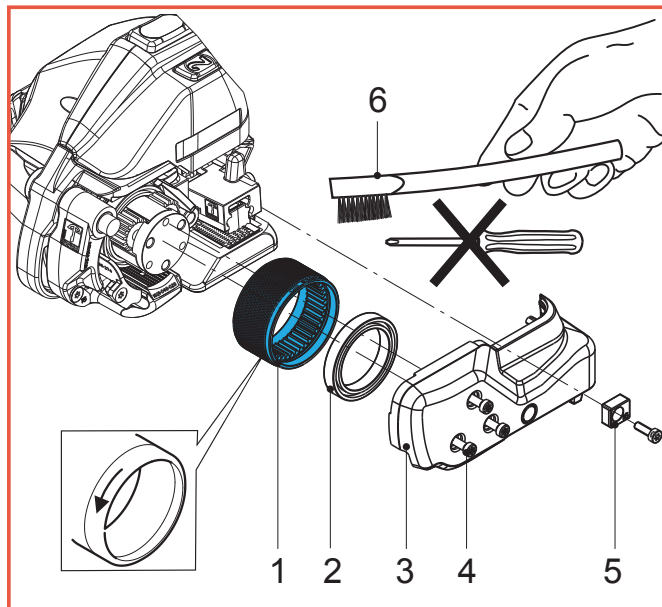
Wear eye protection when cleaning with compressed air!

- ▶ Clean tension wheel (1) with compressed air.
- ▶ In the case of heavy soiling of the tothing: Carefully clean tension wheel with enclosed wire brush (6).
- ▶ Check tension wheel for worn teeth. If teeth are worn, replace tension wheel.



Attention

The tension wheel must not be cleaned while it is rotating. Risk of tooth breakage!



BXT3-19

Fitting

- ▶ Fitting is performed in reverse order. Observe the direction of rotation of the tension wheel, see arrow.
- ▶ Lightly lubricate the inner teeth of the tension wheel with Klüber grease GBU Y 131 (Microlube).
- ▶ Tighten cylinder screws Torx (4) with a torque of 1.0 Nm.

4.1.2 Replacing the tooth plate

Dismantling

- ▶ Remove battery from tool.
- ▶ Remove counter-sunk screw Torx (1).
- ▶ Lift rocker lever towards the handle, remove tooth plate (2).



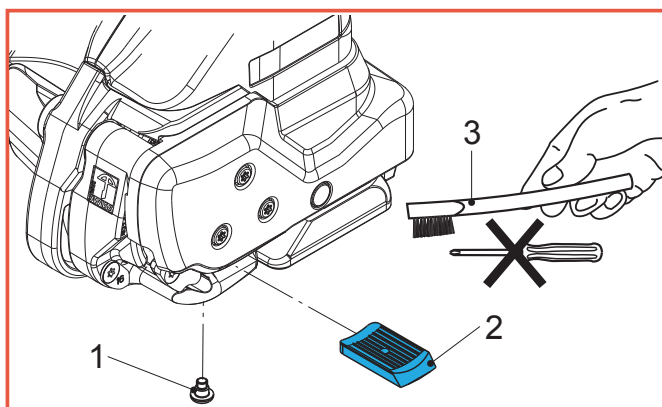
WARNING

Wear eye protection when cleaning with compressed air!

- ▶ Clean tooth plate (2) with compressed air.
- ▶ In the case of heavy soiling of the teeth: Carefully clean tooth plate with enclosed wire brush (3).
- ▶ Check tooth plate for worn teeth. If several teeth are worn, replace tooth plate.

Fitting

- ▶ Fitting is performed in reverse order. Secure counter-sunk screw (1) with Loctite 222.
- ▶ The tooth plate (2) must sit freely movable in the rocker.
- ▶ Tighten counter-sunk screw Torx (1) with a torque of 1.0 Nm.



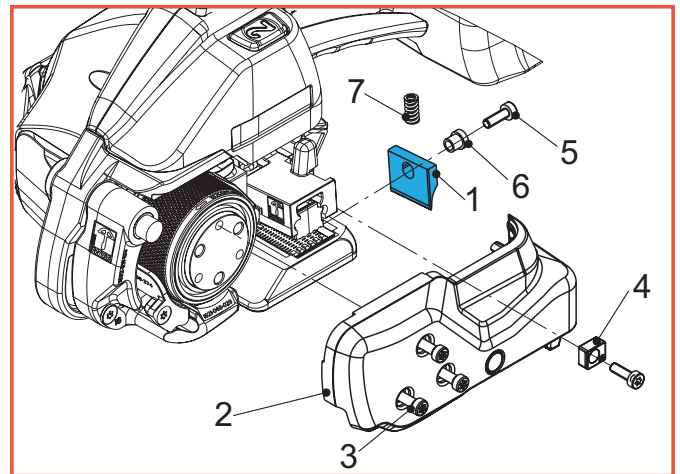
4.1.3 Replacing the knife

Dismantling

- ▶ Remove battery from tool.
- ▶ Remove four cylinder screws Torx (3), strap guide rear (4) and side cover (2).
- ▶ Remove cylinder screw Torx (5) and knife (1) with flanged bushing (6). Replace knife.

Fitting

- ▶ Fitting is performed in reverse order.
- ▶ Before fitting the knife (1), check whether the pressure spring (7) above the knife is inserted.
- ▶ Secure cylinder screw (5) with Loctite 222 and tighten it with a torque of 3.0 Nm.
- ▶ Tighten cylinder screws Torx (3) with a torque of 1.0 Nm.



BXT3-19

5 Corrective maintenance work



WARNING

Unexpected startup during maintenance work, injuries possible.

Always remove the battery before performing cleaning or preventive and corrective maintenance work.

5.1 Electronics components

5.1.1 Removing the LCD operating unit

Dismantling

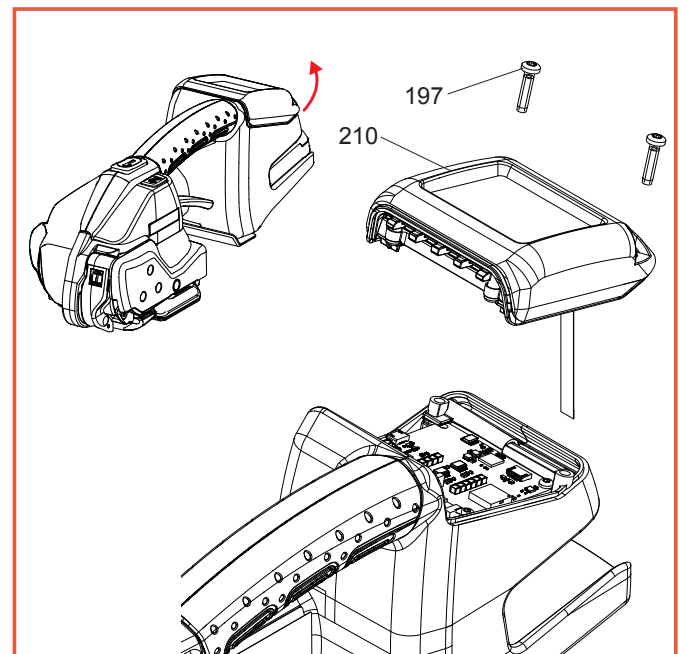
- ▶ Remove the PT-screws # 197.
- ▶ Lift up the LCD operating unit complete # 210 from the rear, lift and pull out the housing at the front.
- ▶ Disconnect the ribbon cable by carefully pulling on it.

Fitting

- ▶ Carry out assembly in the reverse order.
- ▶ Tighten PT-screws # 197 with a torque of 1.0 Nm.



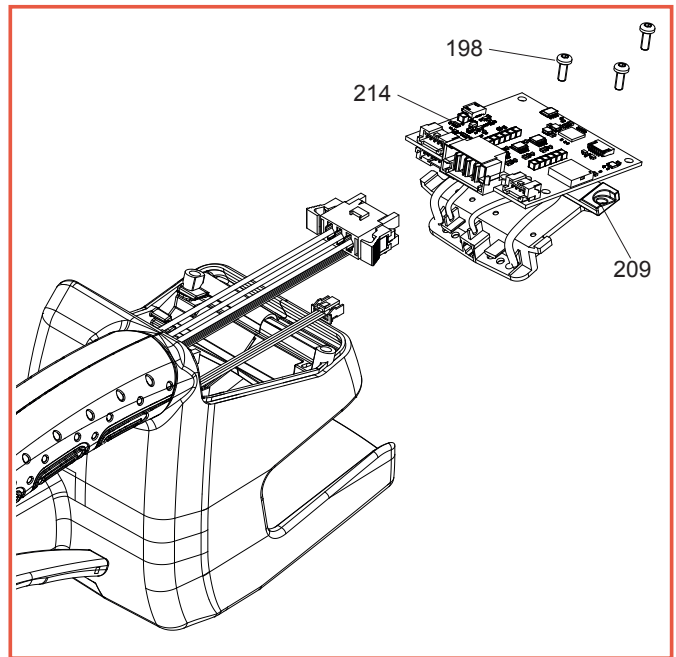
The tool cannot be put into operation without connected UI. The tool sends an acoustic error message for a few seconds.



5.1.2 Replacing the electronics

Dismantling

- ▶ Remove the LCD operating unit (chapter 5.1.1).
- ▶ Remove the three PT-screws # 198 that hold the Control Board # 214 and the hold-down device # 209.
- ▶ Lift the control board slightly on its side and free it out of the guides of the right body side by pulling it to the left.
- ▶ Also lift the hold-down device # 209 on its side and pull to the left out of the guides.
- ▶ Pull the control board as far as possible to the rear out of the housing and release all plug connectors one by one separately.
- ▶ Press the rear battery contact plate upwards with your finger from the battery bay and remove the entire Control Board unit to the rear out of the device.



Fitting

- ▶ Carry out the assembly in reverse order.
- ▶ Tighten PT-screws # 198 with a torque of 0.4 Nm.

5.2 Housing parts

On many repair and service jobs, sufficient access to the mechanical components is already created by removal of the right housing shell half.

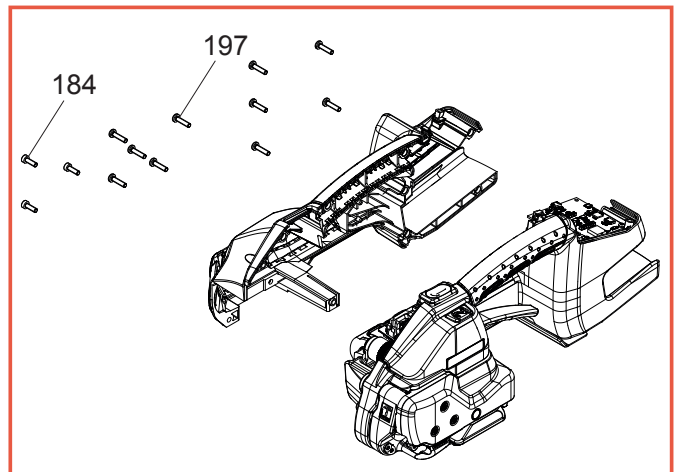
5.2.1 Removing the right housing part

Dismantling

- ▶ Remove the UI (chapter 5.1.1)
- ▶ Loosen three cylinder screws # 184 and nine PT-screws # 197 and remove them.
- ▶ Remove the housing from the battery compartment by hand and remove the right housing shell.

Fitting

- ▶ Carry out assembly in the reverse order. Observe the correct position of the wiring! (Chapter 5.11).
- ▶ Tighten cylinder screws # 184 and PT-screws # 197 with a torque of 1.0 Nm.



5.2.2 Removing the left housing part

The left housing part only has to be removed in case of fundamental work on the mechanical components or wiring.

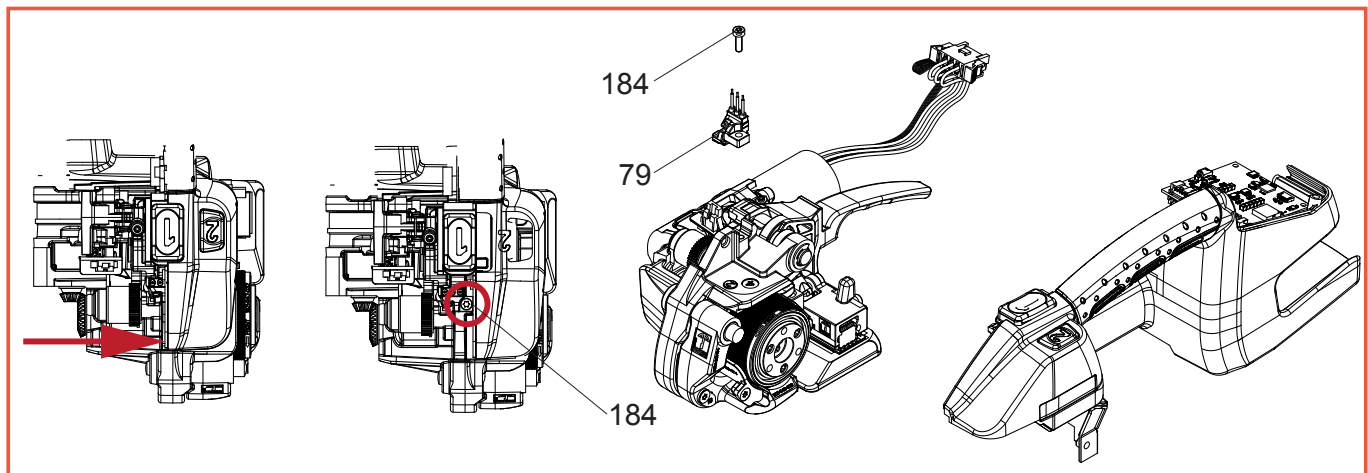
Dismantling

- ▶ Right housing form is removed (Chapter 5.2.1)
- ▶ Disconnect the motor plug connections (motor phases and encoder / Hall sensor) from the electronics.
- ▶ Disconnect the connection from the micro switch # 106 to the wiring harness # 103.
- ▶ Remove the side cover (see also chapter 4.1.1)
- ▶ Raise the housing part in the area of the type plate, pull it over the stop in the base plate and push it away as far as possible (see red arrow), so that the cylinder screw (Torx) # 184 is accessible.
- ▶ Remove the cylinder screw #184 which holds the holder # 79 in position.

- ▶ Pull on the rocker lever and remove the left housing part.

Fitting

- ▶ Carry out assembly in the reverse order. Observe the correct position of the wiring! (Chapter 5.11).
- ▶ Tighten cylinder screws # 184 with a torque of 1.0 Nm.



5.3 Wiring components and switches

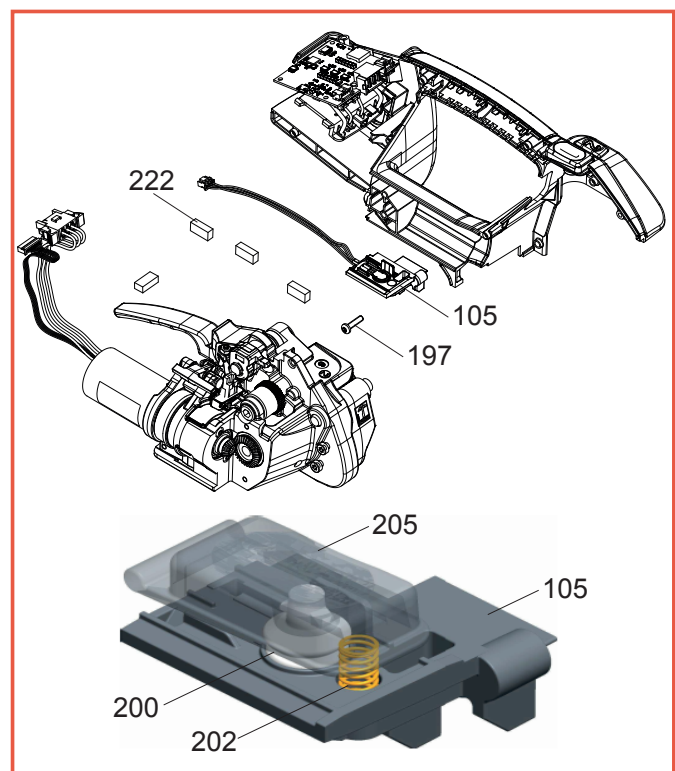
5.3.1 Replacing the housing wiring harness (tensioning and welding button)

Dismantling

- ▶ Remove the left housing part of the tool (Chapter 5.2.2).
- ▶ Remove the plastic clamping pieces # 222.
- ▶ Disconnect the 4-pin connector of the wiring harness # 105 from the control board.
- ▶ Remove the PT-screw # 197.
- ▶ Now the wiring harness # 105 can be removed along with the plastic support piece
- ▶ Remove tensioning button # 205 together with actuator # 200 and pressure spring # 202.

Fitting

- ▶ Carry out assembly in the reverse order. Observe the correct position of the wiring! (Chapter 5.11).
- ▶ Insert the pressure spring # 202 into the cable harness # 105. When the tensioning button # 205 is installed, make sure that the actuator # 200 is completely in the recess of the cable harness.
- ▶ Tighten PT-screw # 197 with a torque of 1.0 Nm.



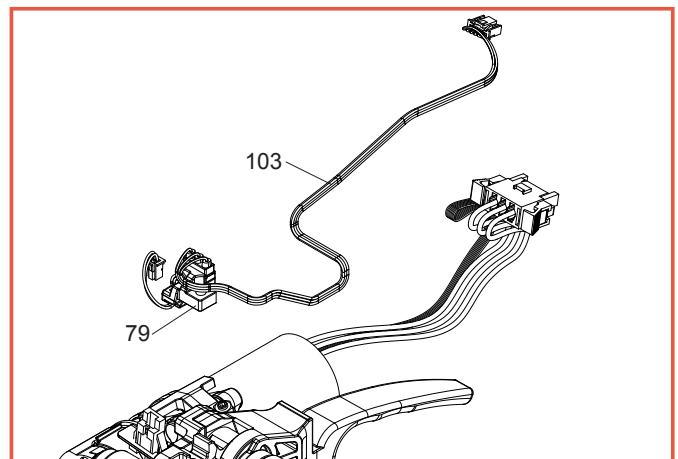
5.3.2 Replacing the rocker lever wiring harness

Dismantling

- ▶ Remove the form wiring harness (Chapter 5.3.1)
- ▶ Disconnect the 5-pin connector of the wiring harness # 103 from the control board and support # 79.
- ▶ Remove the wiring harness # 103.

Fitting

- ▶ Carry out the assembly in reverse order.



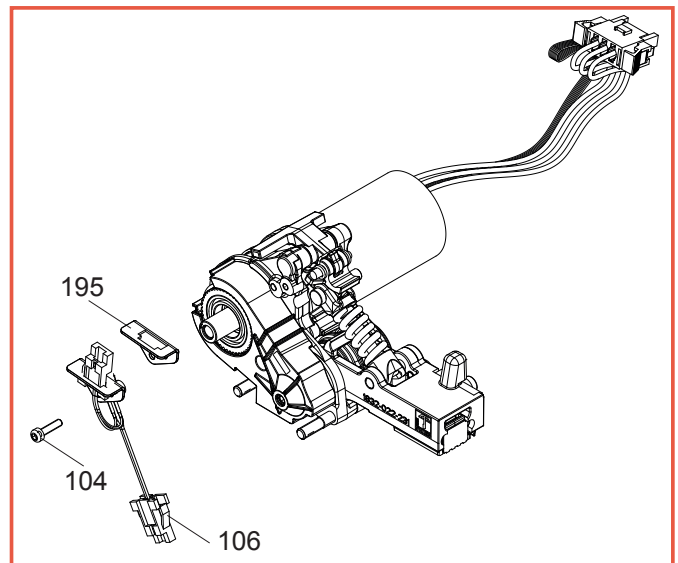
5.3.3 Replacing the welding mechanism wiring harness

Dismantling

- ▶ Remove the welding mechanism from the base plate (Chapter 5.4.1).
- ▶ By removing cylinder screw # 104, loosen the assembly bracket # 195.
- ▶ Now the connector can be removed from the assembly bracket by unlocking the barbed hook.
- ▶ Remove connector from wiring harness # 106 from control board.

Fitting

- ▶ Carry out assembly in the reverse order. Observe the correct position of the wiring! (Chapter 5.11).
- ▶ Tighten cylinder screw # 104 with a torque of 0.6 Nm.




5.4 Mechanical components

5.4.1 Disassembly of the welding mechanism

Dismantling

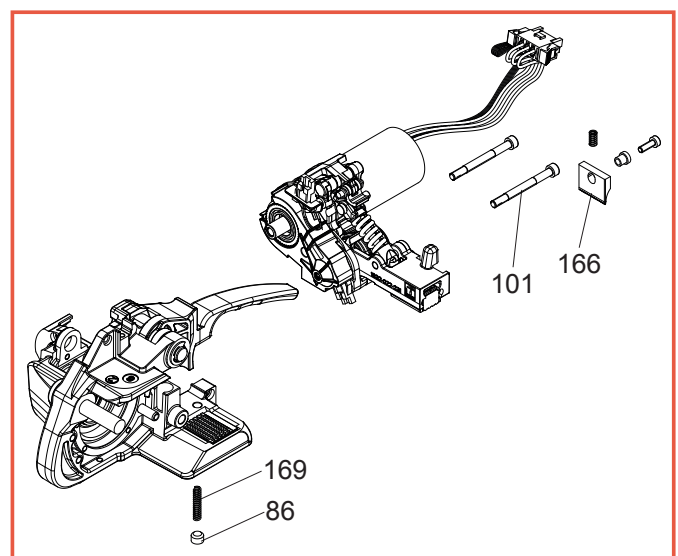
- ▶ Remove both housing parts (chapter 5.2).

 **WARNING**
Risk of injury! Remove the knife # 166 (chapter 4.1.3).

- ▶ Remove the threaded pin # 86 with spring # 169.
- ▶ Remove two centring screws # 101.
- ▶ Hold the welding unit on the motor and remove to the rear. In doing so, lift lever.

Fitting

- ▶ Carry out assembly in the reverse order.
- ▶ Tighten centring screws # 101 with a torque of 6.0 Nm.
- ▶ Screw the threaded pin # 86 until it flushes with the base plate.



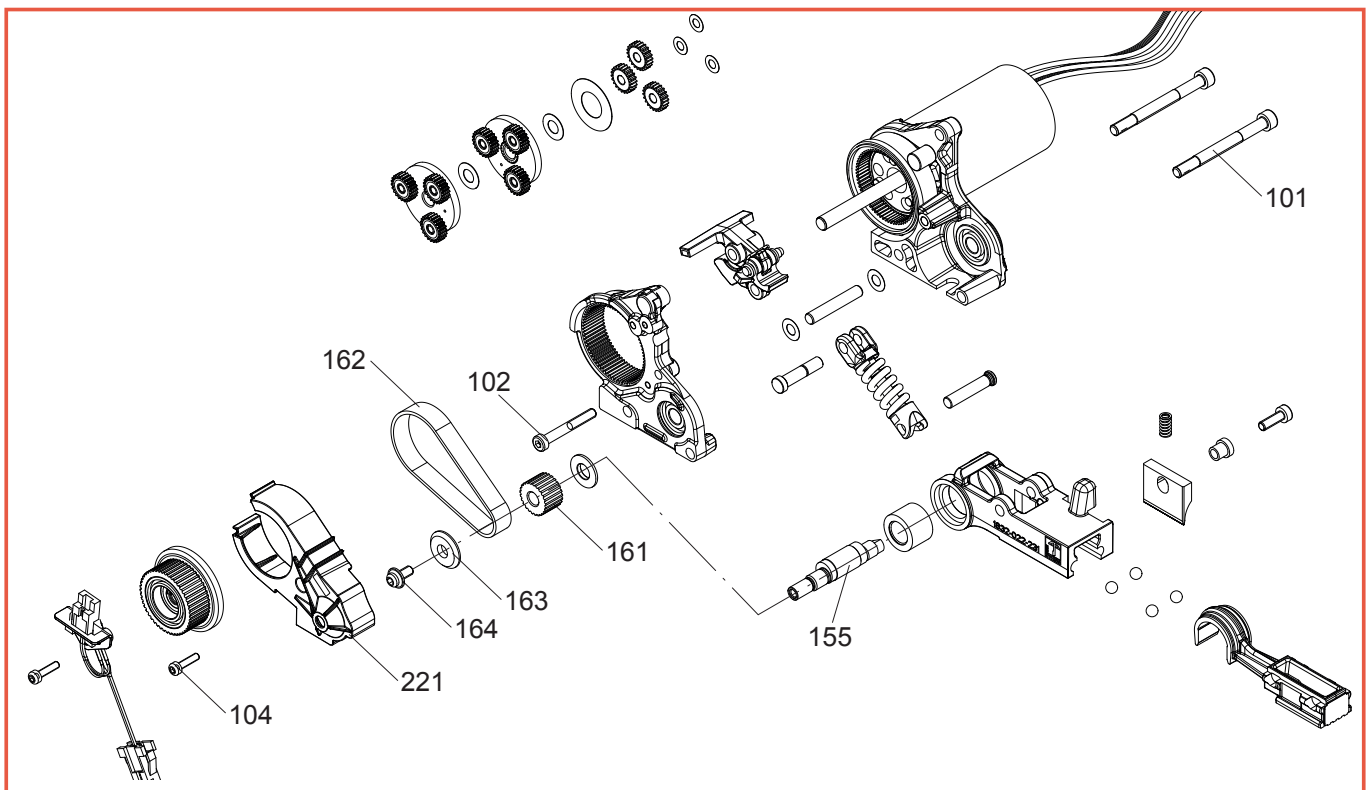
5.4.2 Dismantling the welding mechanism

Dismantling

- ▶ Disassemble the welding mechanism from the base plate (chapter 5.4.1).
- ▶ Undo cylinder screw # 104 and remove the belt guard # 221.
- ▶ Remove the cylinder screw # 164. For this purpose, hold the eccentric shaft # 155 on the opposite side using a 5 mm open-ended spanner.
- ▶ Remove the toothed belt # 162 along with washer # 163 and pinion # 161.
- ▶ Remove the cylinder screw # 102.
- ▶ The entire unit can now be disassembled easily according to the exploded drawing.

Fitting

- ▶ Carry out assembly in the reverse order. However, before the cylinder screw # 104 is tightened, the centring screw # 101 must be positioned in order to ensure for the correct positioning.
- ▶ Tighten centring screws # 101 with a torque of 6.0 Nm.
- ▶ Tighten the cylinder screw # 164 with a torque of 4.3 Nm, the cylinder screw # 102 with 1.3 Nm and the cylinder screw # 104 with a torque of 0.6 Nm.



5.5 Motor

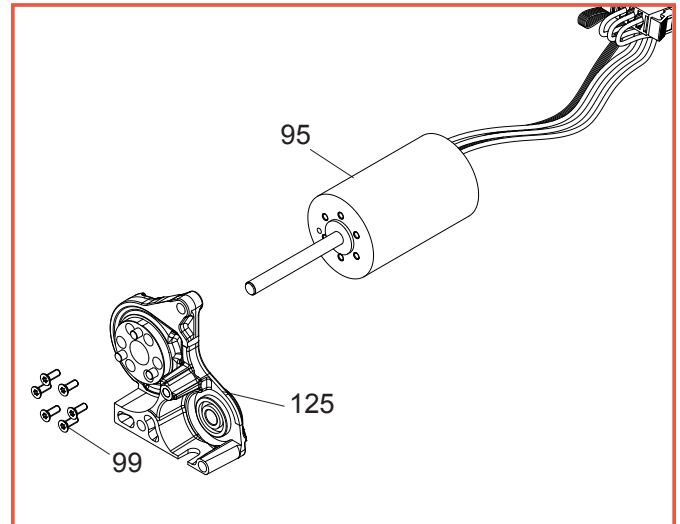
5.5.1 Disassemble motor BXT3-16 and BXT3-19

Dismantling

- ▶ Disassemble the welding mechanism (chapter 5.4.2) in order to gain access to the motor screw connection.
- ▶ Pre-heat six motor screws # 99 to max. 80°C using a hot air gun. Loosen the motor screws using the respective Torx screwdriver.
- ▶ Remove the motor # 95 from bearing support # 125.

Fitting

- ▶ For the installation of the motor, use the original (pre-coated) screws # 99.
- ▶ Position the motor on the motor bearing and align. The thick white cable is located at the top.
- ▶ Position the six screws and tighten them cross-wise to 1.2 Nm.



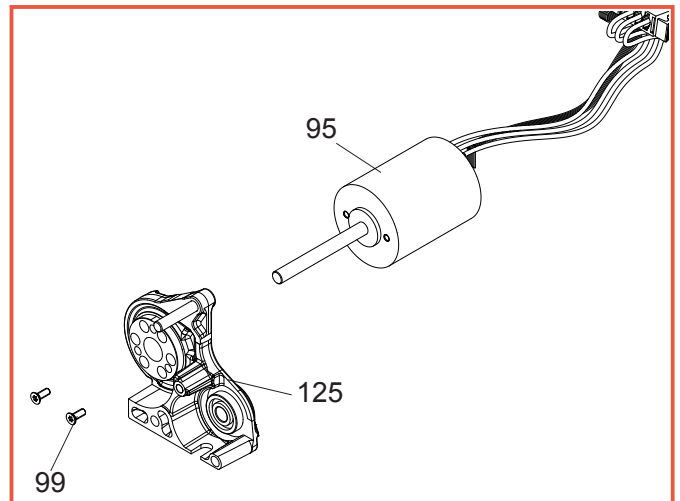
5.5.2 Disassembling motor BXT3-13

Dismantling

- ▶ Disassemble the welding mechanism (chapter 5.4.2) in order to gain access to the motor screw connection.
- ▶ Pre-heat two motor screws # 99 to max. 80°C using a hot air gun. Loosen the motor screws using the respective Torx screwdriver.
- ▶ Remove the motor # 95 from bearing support # 125.

Fitting

- ▶ For the installation of the motor, use the original (pre-coated) screws # 99.
- ▶ Position the motor on the motor bearing and align. The thick white cable is located at the top.
- ▶ Position the two screws and tighten them in alternating order to 1.2 Nm.



5.6 Rocker lever

5.6.1 Disassemble the rocker lever and connecting parts

Dismantling

- ▶ Remove both housing parts (chapter 5.2).
- ▶ Remove the retaining washer # 66 resting against the blocking lever # 65.
- ▶ Secure the blocking lever # 65 with your thumb and press the bolt # 66 through the hole towards the arrow.

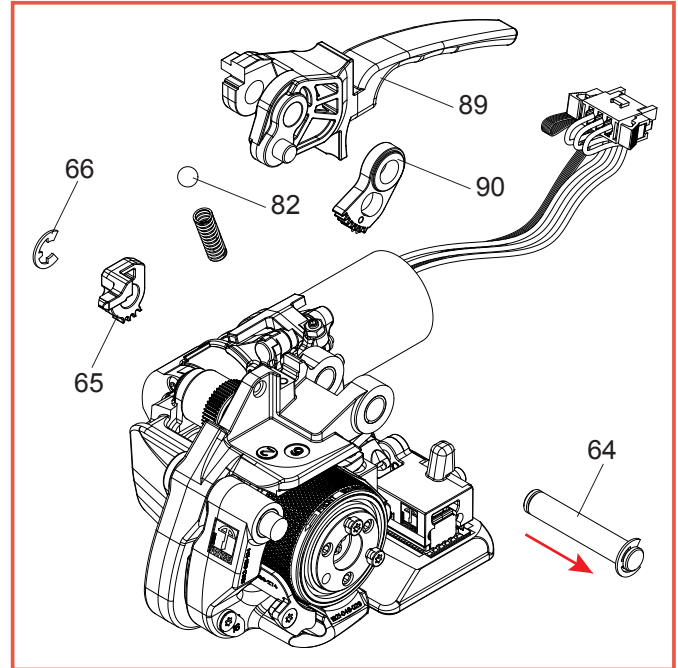
Attention

The ball # 82 located below the blocking lever # 65 is spring-loaded.

- ▶ Remove toothed segment # 90 from rocker lever # 89.

Fitting

- ▶ First hang the toothed segment # 90 into the lever, guide both into position and ensure for the correct intermesh of the teeth in the cam disk # 44.
- ▶ Carry out assembly in the reverse order.



5.7 Wrap spring clutch unit

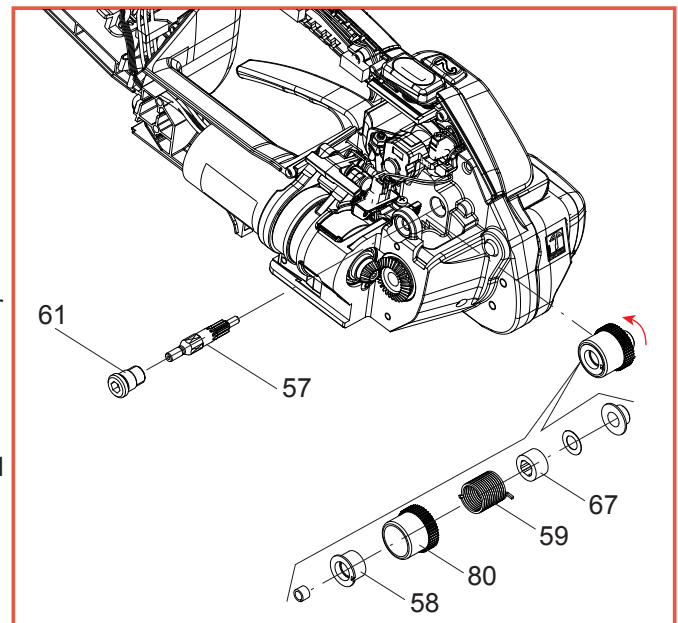
5.7.1 Disassemble the wrap spring / clutch shaft

Dismantling

- ▶ Right housing part is removed (Chapter 5.2.1).
- ▶ Using your hand, hold the sleeve # 80 from rotating, loosen the bearing bolt # 61 and remove.
- ▶ Hold the clutch shaft # 57 tight with the long nose plier and pull out completely.
- ▶ Turn the sleeve # 80 approx. 90° counter-clockwise so that the **spring carrier points to the rear**. Now press the sleeve to the front out of the guide using your thumb, and remove the sleeve.

Fitting

- ▶ Carry out assembly in the reverse order. Before tightening the bearing bolt # 61, the sleeve must be rotated in such a manner that the **spring carrier is located in a 2 o'clock position**. Check that the sleeve # 80 can be rotated springy.
- ▶ Tighten bearing bolt # 61 with a torque of 4.0 Nm.



5.7.2 Disassembly of the resetting lever cpl.

Dismantling

- ▶ Disassemble the welding mechanism from the base plate (chapter 5.4.1).
- ▶ Remove retaining ring # 78 and remove the resetting lever # 72.



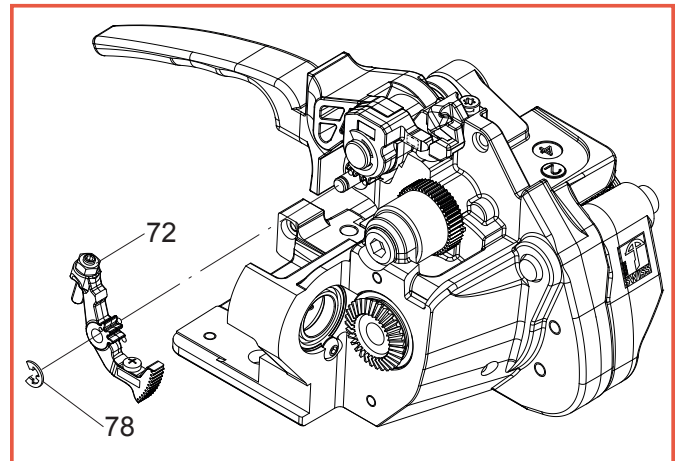
ATTENTION

The resetting lever may not be dismantled any further!

- ▶ If bolt # 70 on exploded drawing has to be removed as well, first remove the rocker lever (chapter 5.6.1).

Fitting

- ▶ Carry out assembly in the reverse order. Observe the correct position of the tothing. Check that the sleeve # 80 can be rotated springy.

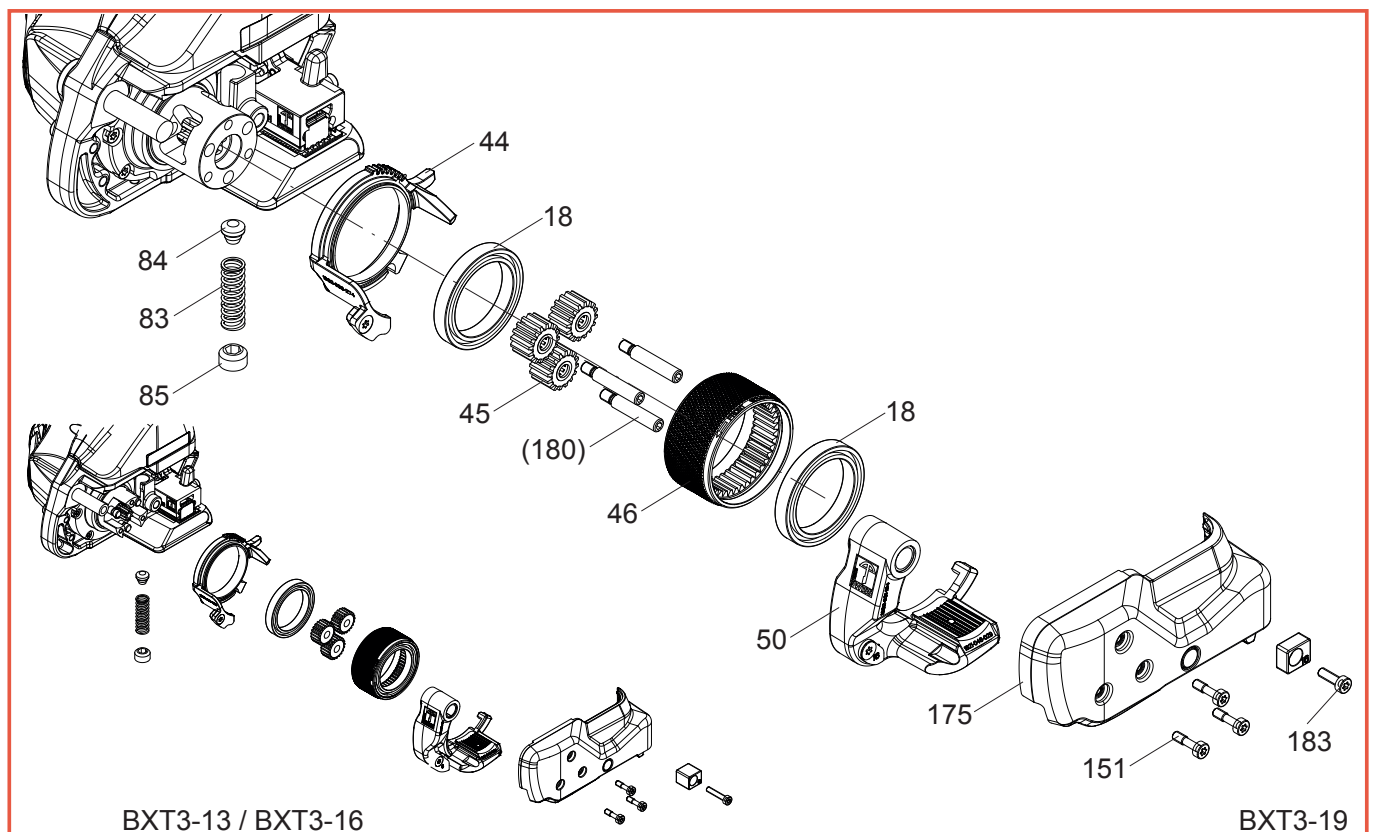


5.8 Tensioning system

5.8.1 Disassembly tensioning system BXT3-13 and BXT3-16

Dismantling

- ▶ Loosen the set screw # 85 and remove it from the base plate together with the pressure spring # 83 and pusher # 84.
- ▶ Remove the side cover # 175 by loosening the three cylinder screws # 151 and cylinder screw # 183.
- ▶ Lift the rocker lever # 89 on exploded drawing, far enough so that the rocker # 50 can be pulled off to the outside.
- ▶ The tensioning wheel # 46, the planet gear # 45, both ball bearings # 18 as well as the cam disk # 44 can now be removed to the outside one by one in this order.



Fitting

- ▶ Carry out assembly in the reverse order. Ensure for the correct positioning of the teeth between the cam disk # 44 and tooth segment # 90 on exploded drawing.
- ▶ Tighten the cylinder screw # 151 and the cylinder screw #183 with a torque of 1.0 Nm.
- ▶ Screw the threaded pin # 86 until it flushes with the base plate.

5.8.2 Disassembly tensioning system BXT3-19

Dismantling

- ▶ Loosen the set screw # 85 and remove it from the base plate together with the pressure spring # 83 and pusher # 84.
- ▶ Remove the side cover # 175 by loosening the three cylinder screws # 151 and cylinder screw # 183.
- ▶ Lift the rocker lever # 89 on exploded drawing, far enough so that the rocker # 50 can be pulled off to the outside.
- ▶ Remove the tensioning wheel # 46 together with outer ball bearing #18.
- ▶ Remove the shafts # 180. Then pull planet gears # 45 sideways out of the flange.
- ▶ The remaining ball bearing # 18 as well as the cam disk # 44 can now be removed to the outside one by one in this order.

Fitting

- ▶ Carry out assembly in the reverse order. Ensure for the correct positioning of the teeth between the cam disk # 44 and tooth segment # 90 on exploded drawing.
- ▶ Tighten the cylinder screw # 151 and the cylinder screw # 183 with a torque of 1.0 Nm.
- ▶ Screw the threaded pin # 86 until it flushes with the base plate.

5.9 Gear

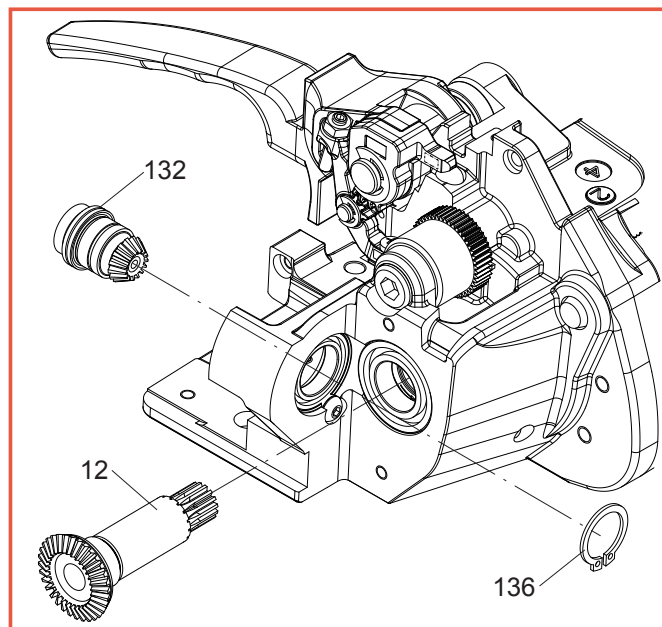
5.9.1 Disassembly of the bevel pinion

Dismantling

- ▶ Disassemble the welding mechanism from the base plate (chapter 5.4.1).
- ▶ Remove the retaining ring # 136 from the bevel pinion # 132 and remove the bevel pinion to the rear.
- ▶ Pull the bevel wheel with pinion # 12 from the base plate.

Fitting

- ▶ Carry out assembly in the reverse order.



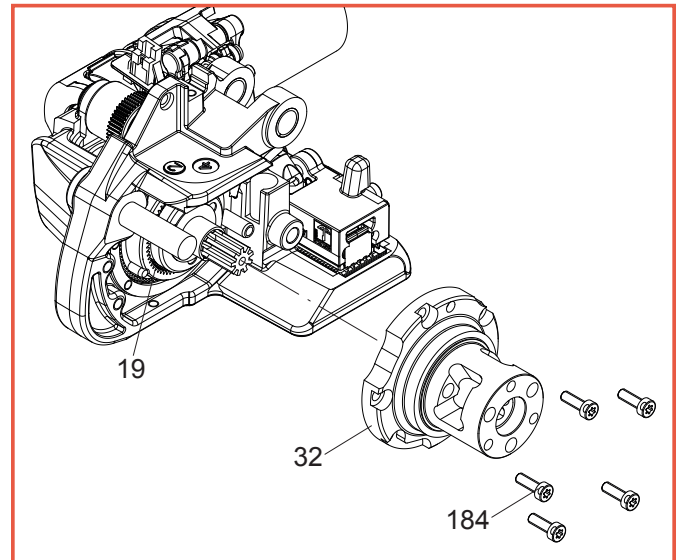
5.9.2 Disassembly of the planetary gear

Dismantling

- ▶ Disassemble the rocker lever and then the connecting parts (chapter 5.6.1).
- ▶ Disassemble the tensioning system (chapter 5.8.1 or 5.8.2).
- ▶ Remove the five cylinder screws # 184 from flange # 32 and remove these from the base plate.
- ▶ Now the gear can be removed from the flange without any problem.

Fitting

- ▶ Carry out assembly in the reverse order.
- ▶ The toothed ring # 19 must be very easy to turn, especially with tool BXT3-19. Lubricate the outside of the toothed ring with light oil only.
- ▶ Tighten cylinder screws # 184 with a torque of 3.0 Nm.



5.10 Blocking of the welding mechanism



ATTENTION

In exceptional cases, it may occur that the welding mechanism can no longer be returned to the initial position. The rocker lever is jammed.

Never pull on the rocker lever using force!

5.10.1 Cause

Cause for this is the position of the cam disk # 109 whose cams are positioned precisely under the roller # 143 while the welding mechanism is lowered. As a result, this prevents the welding mechanism from swinging back. As the position of this cam is generally monitored by the electronics, this can only occur under the following circumstances:

- Power failure during the welding procedure caused by a loose contact or removing the rechargeable battery during the welding procedure.
- The mechanism is blocked. The nominal position of the cam disk cannot be approached as a result of this. The device outputs an E37 error message. (E50 when pulling the rocker lever shortly before reaching the cam zero point).
- Micro switch # 103 has a defect → The electronics have missed the zero point for determining the cam position. The device outputs an E 53 error message.
- The power transmission from the motor to the cam disk is completely interrupted or has significant slippage. Depending on the degree of interruption, an E53 error message can be given.

5.10.2 Rectification

The blockage can be solved in the following manner. After this, the root problem must be identified according to the preceding list and corrected accordingly.

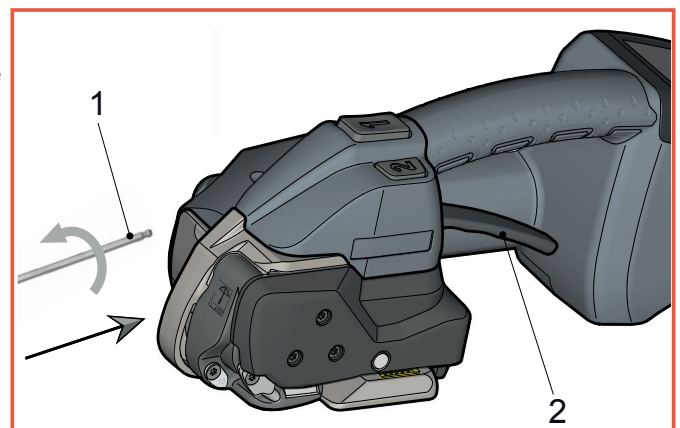


ATTENTION

The tool reset may only be performed if the rocker lever is blocked.

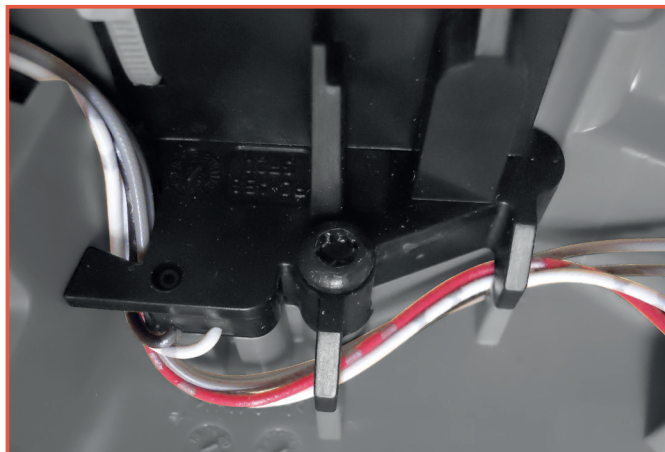
Never attempt to lift the rocker lever by force!

- ▶ Place the enclosed 3 mm hex. socket-head key (1) through the bore hole in the base plate directly onto the cylinder screw located underneath (see arrow).
- ▶ **Perform ten full rotations in the counter-clockwise direction.** This requires a little physical effort.
- ▶ Lift rocker lever (2).
 - The welding mechanism should now pivot upwards.

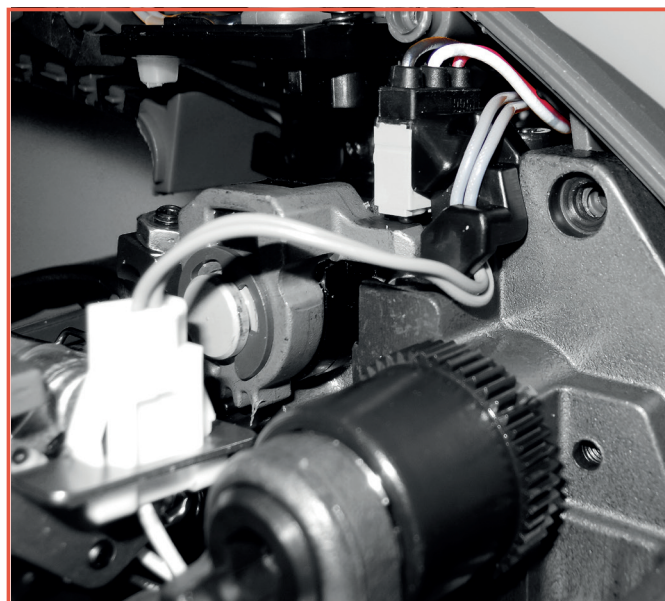


5.11 **Wiring**

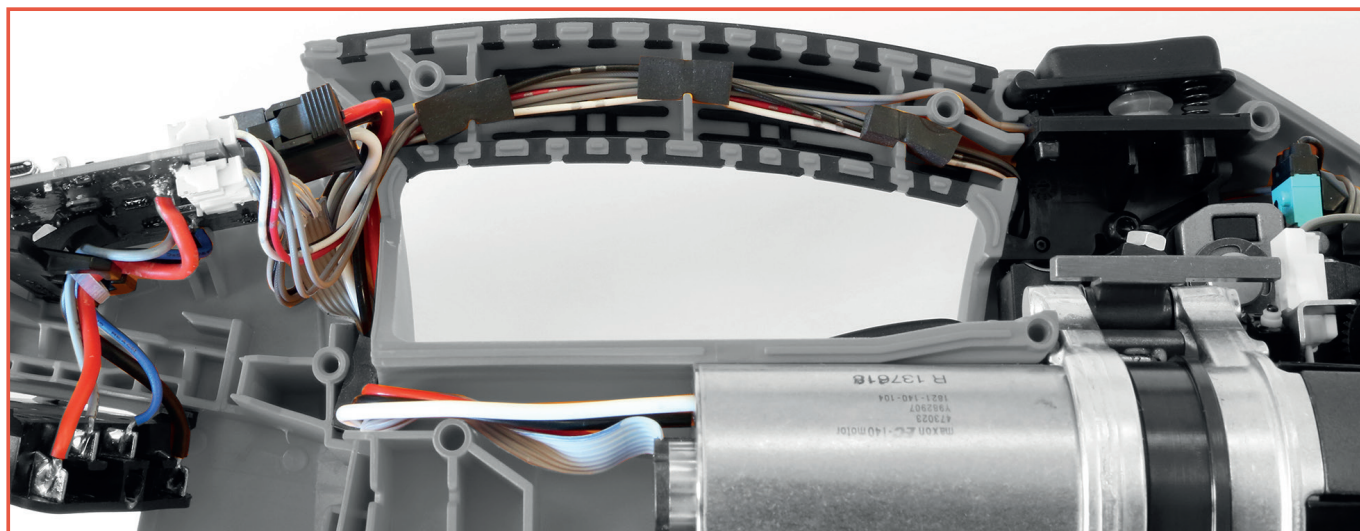
5.11.1 **Area of the button holder**



5.11.2 **Area of the rocker and cam switch**



5.11.3 **Area of the handle**

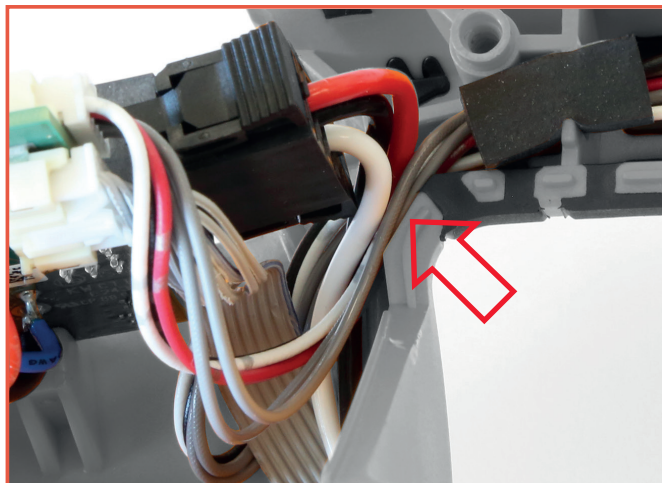


5.11.4 Plug connectors for the electronics



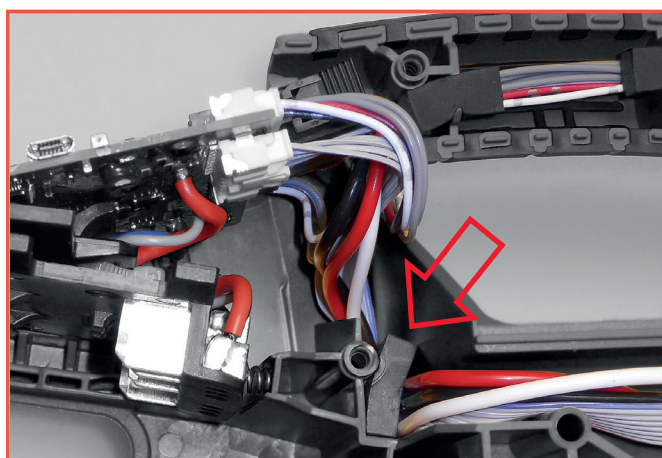
ATTENTION

Take care that the cable in the marked area does not get pinched..

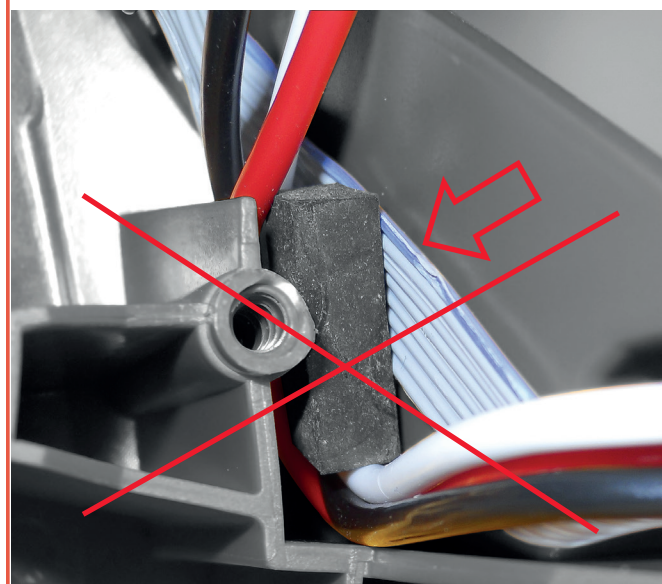


5.11.5 Motor cable

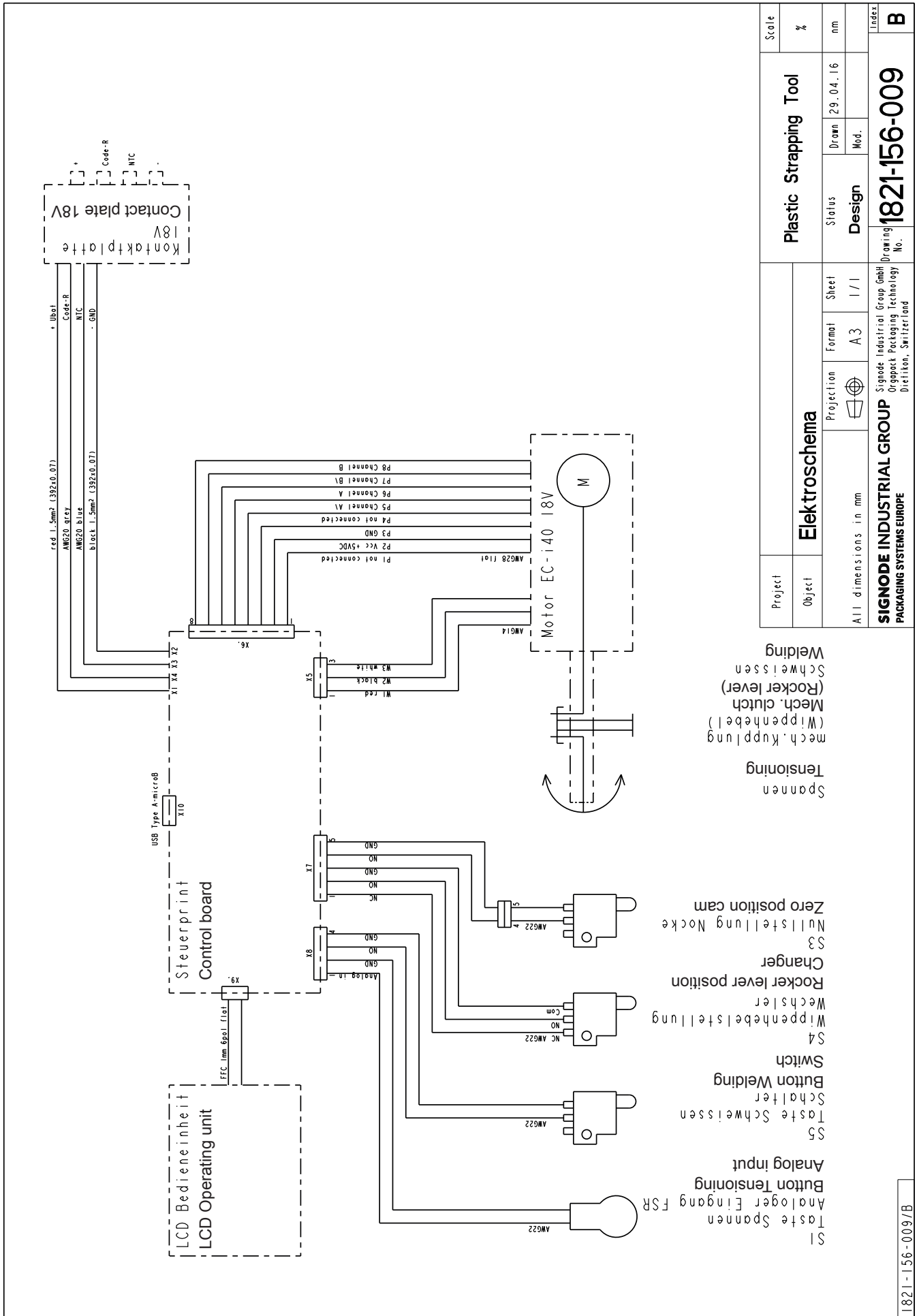
The cable coming from the motor must be routed exactly as shown in the figure. The encoder cable is routed under the screw dome.



Cable routed incorrectly. The encoder cable may get pinched.



6 Electric diagram

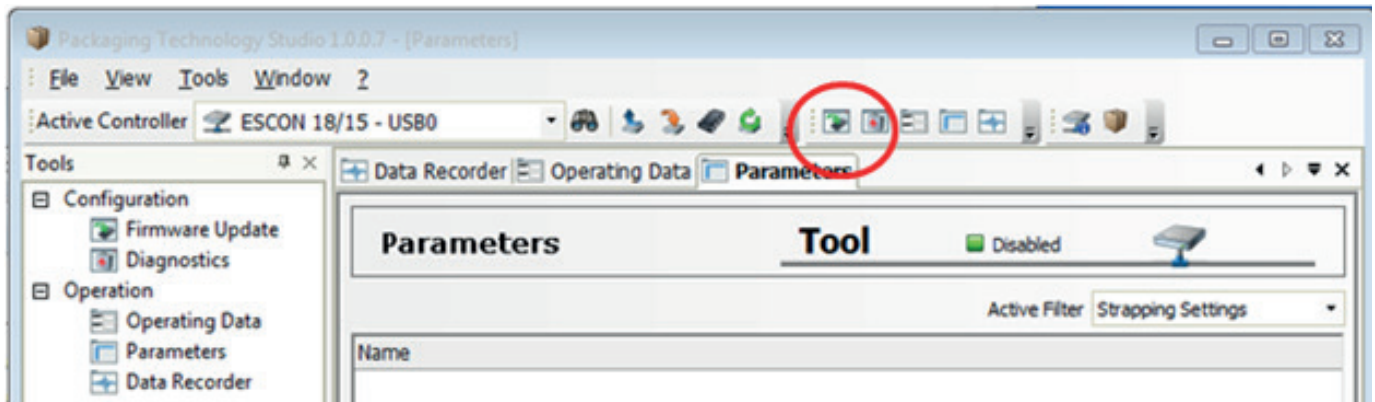


7 Firmware-update

As long as the manufacturer has a new firmware version available, the service technician can carry out the update by himself, using PT Studio.

Start PT-Studio

Start PT Studio and connect the device with the computer via the USB interface (see chapter 3.4.1). The firmware update routine is then started by clicking on the “**Firmware Update**” icon.



Update warning

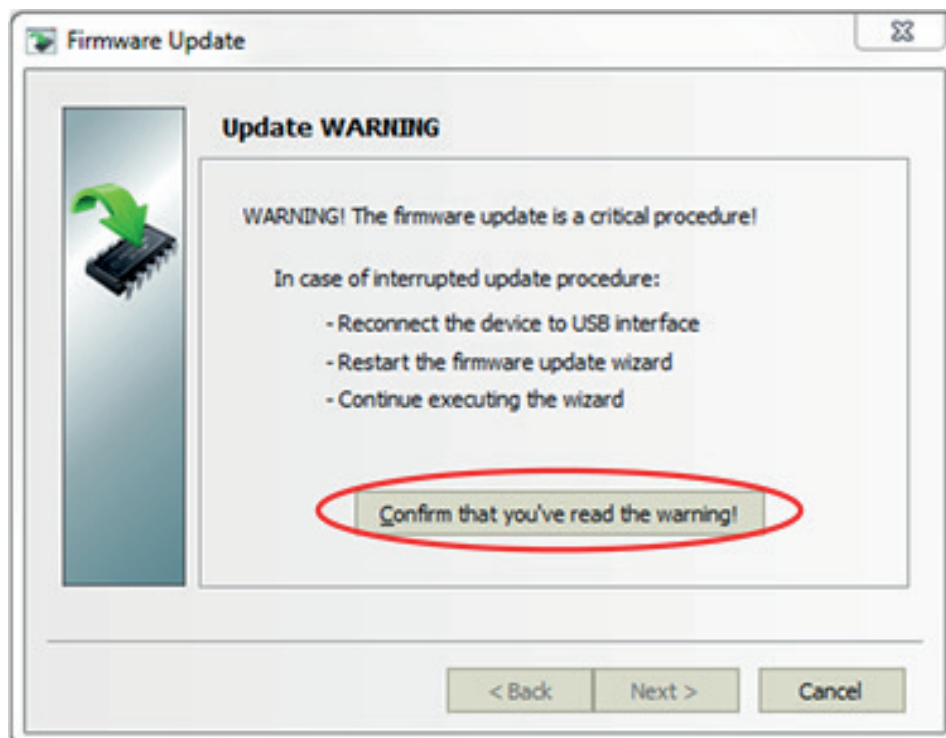


Warning!

The firmware update is a critical process. In case of an interruption during the update:

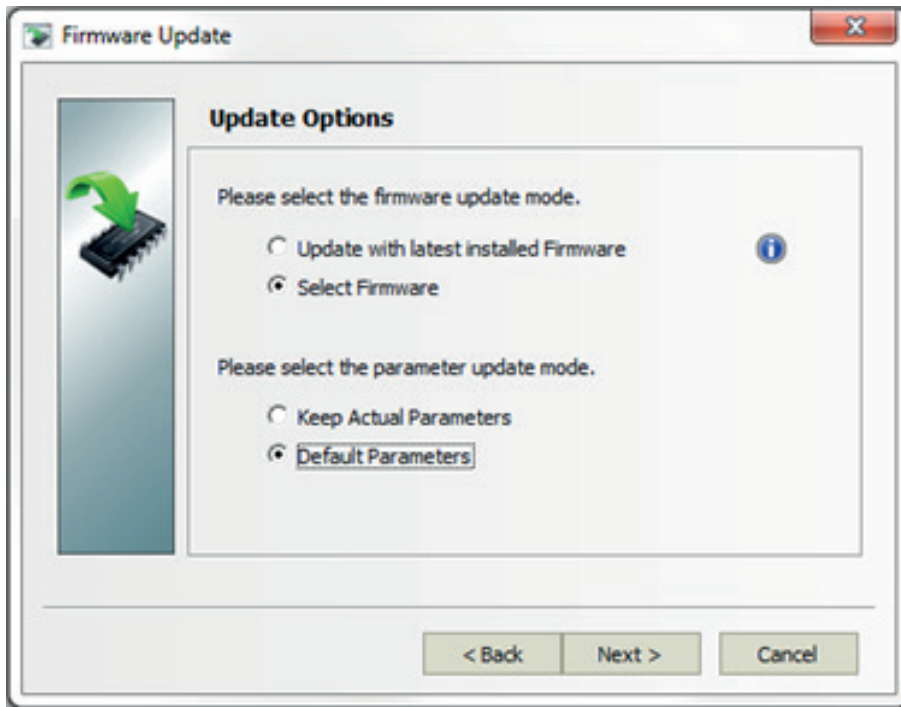
- reconnect the device with the USB interface.
- restart the firmware update wizard
- continue executing the firmware wizard.

Confirm reading the warning by clicking on the highlighted pushbutton.



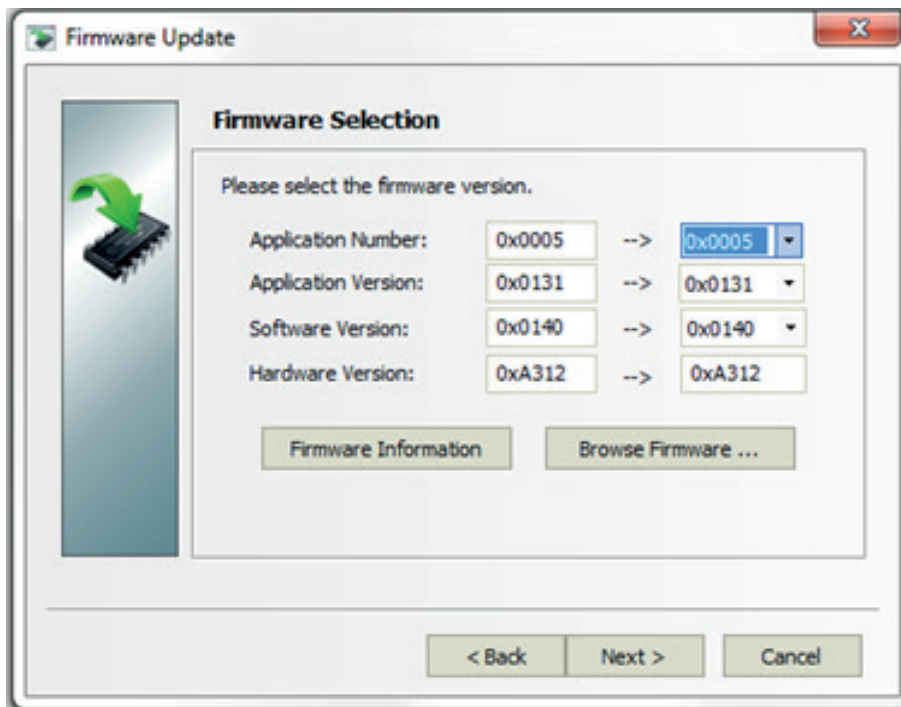
Update options:

Make a selection below and confirm with "Next>":



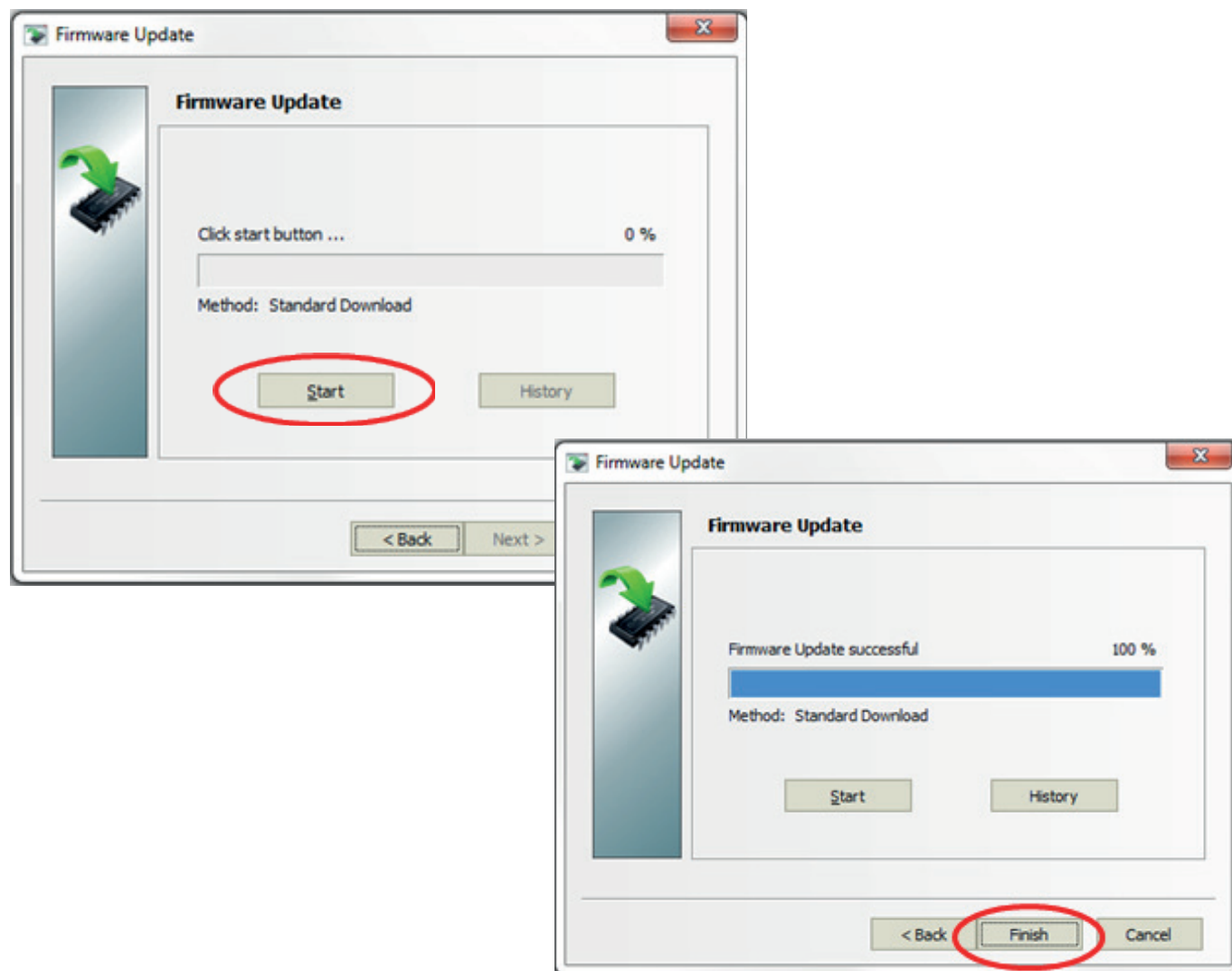
Firmware selection:

Highlight the new saving location of the new firmware on the browser.



Firmware update:

Start the update. After the update, exit with "Finish".



8 Product information

During its lifecycle, his product is actively managed, and continuously further improved, and developed. Relevant changes shall be communicated in product information. Please inform yourself of the current status.

9 Contact

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