PFAFF® Industrial

2483-3/03-980/..

plusline

ADJUSTMENT MANUAL

This instruction manual applies to machines from the serial number **2 809 573** and software version **0307/010** onwards.

296-12-19 275/002
adjustment Manual engl. 05.16

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15 Adjustment

Observe and comply with all instructions in the operating manual's **chapter 1 Safety**! In particular make sure that all safety covers are installed again correctly after making adjustments, see **chapter 1.06 Operating manual** hazard information!

Unless otherwise stated, the machine must be disconnected from the power supply before all adjustment work!
Risk of injury due to accidental machine start-up!

No screw clamp may be fastened to the needle bar with the PFAFF **2483-980/33**!

This may damage the special needle bar coating.

15.01 Notes on adjustment

All adjustments in this manual are based on a fully assembled machine and may only be carried out by technical staff trained for this purpose. Machine covers, which have to be removed and replaced to carry out checks and adjustments, are not mentioned in the text. The order of the following chapters corresponds to the most logical work sequence for machines that have to be completely adjusted. Both the preceding and following chapters must be observed if only specific individual work steps are carried out. Screws and nuts indicated in brackets ( ) are fastenings for machine parts, which must be loosened before any adjustment and tightened again afterwards.

15.02 Tools, gauges and other accessories

- 1 set of screwdrivers with knife widths of 2 to 10 mm
- 1 set of wrenches with jaw widths from 7 to 14 mm
- 1 set of Allen keys of 1.5 to 6 mm
- 1 feed dog setting gauge (order no. 61-111 639-71)
- 1 setting gauge (order no. 61-111 639-73)
- 1 adjustment pin (5 mm diameter), order no. 13-033 346-05
- 1 metal ruler (order no. 08-880 218-00)
- Thread and testing material

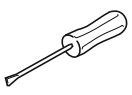
15.03 Abbreviations

t.d.c. = top dead centre
b.d.c. = bottom dead centre

15.04 Explanation of symbols

Activities to be performed or important information in this adjustment manual are emphasised by symbols. The symbols used have the following meaning:

Note, information



Maintenance, repairs, adjustment, service work
(only to be carried out by technical staff)

15.05 Checking and adjustment aid

The adjustment pin **1** (order no. **13-0**33 346-05) and the adjustment gauge **3** (order no. 61-111 639-73) if necessary can be used to fix the required positions during the adjustment.

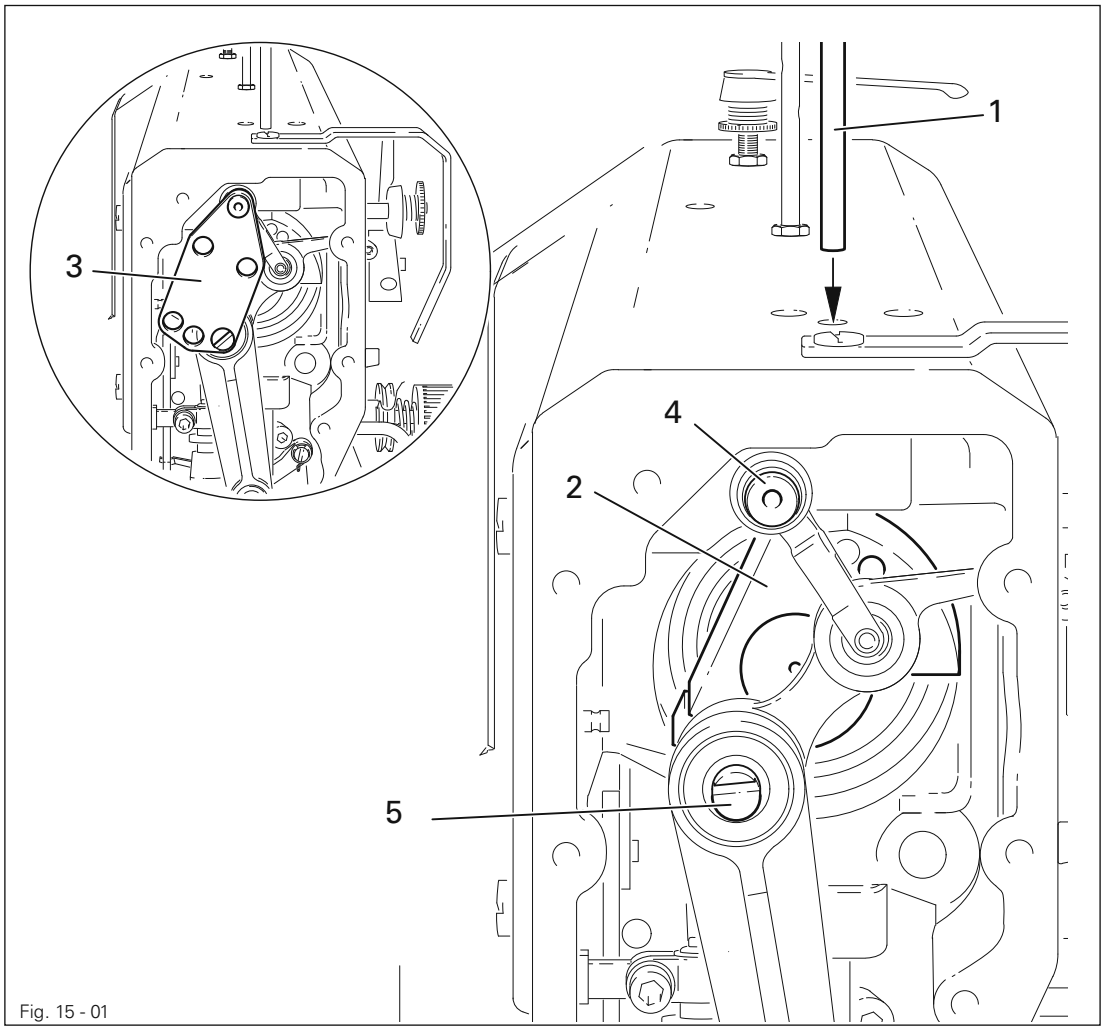


Fig. 15 - 01

Needle bar positioned 1.8 mm after b.d.c.

- Turn the handwheel until the needle bar is approximately in the required position.
- Push the adjustment pin **1 into the hole.**
- **Move the handwheel gently back and forwards until the adjustment pin 1 engages in the crank 2.**

Needle bar positioned 0.6 mm after b.d.c.

- Move the needle bar approximately into the required position.
- Fit the adjustment gauge **3 to the studs 4 and 5 ensuring the right side (for a 30 mm or 36 mm needle bar stroke).**

15.06 Adjusting the basic machine

15.06.01 Machine drive home position

This setting is only required if the toothed belt **2** has been dismantled.

Rule
The markings **3** and **4** should be aligned if the needle bar is positioned **0.6 mm** after b.d.c.

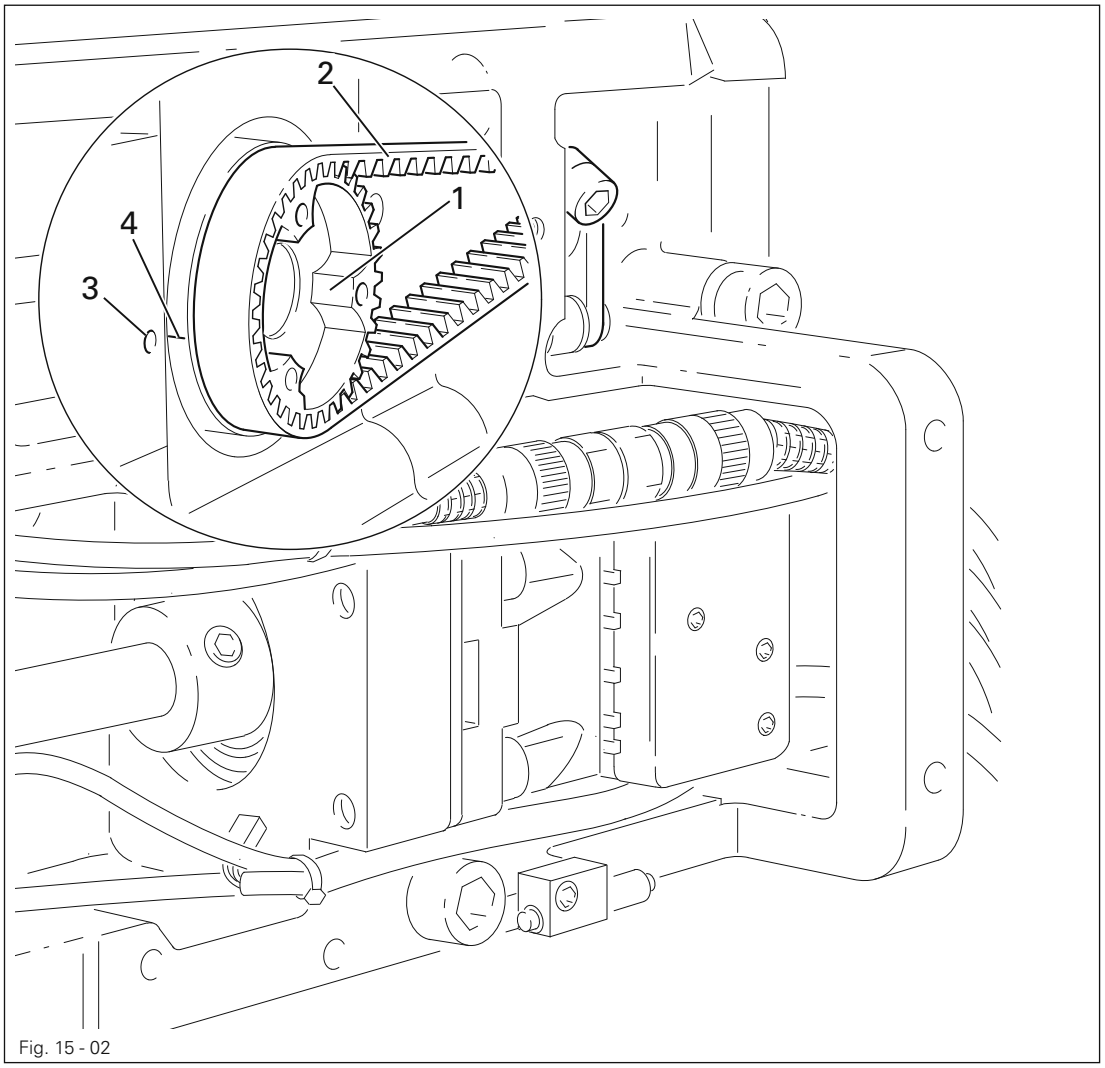


Fig. 15 - 02

- Move the needle bar to **0.6** mm after b.d.c.
- Turn the toothed belt wheel **1** according to the **rule** and slide on the toothed belt **2**.

Make sure that the shaft flange, shock absorber and motor flange are in the right position when installing the motor!

The second toothed belt wheel screw **1** is a balance cup screw

15.06.02 Pre-calibrating needle height

Rule
The marking on the needle bar **1** should be flush with the lower edge of the needle bar frame **3** when the needle bar is positioned **1.8 mm** after b.d.c.

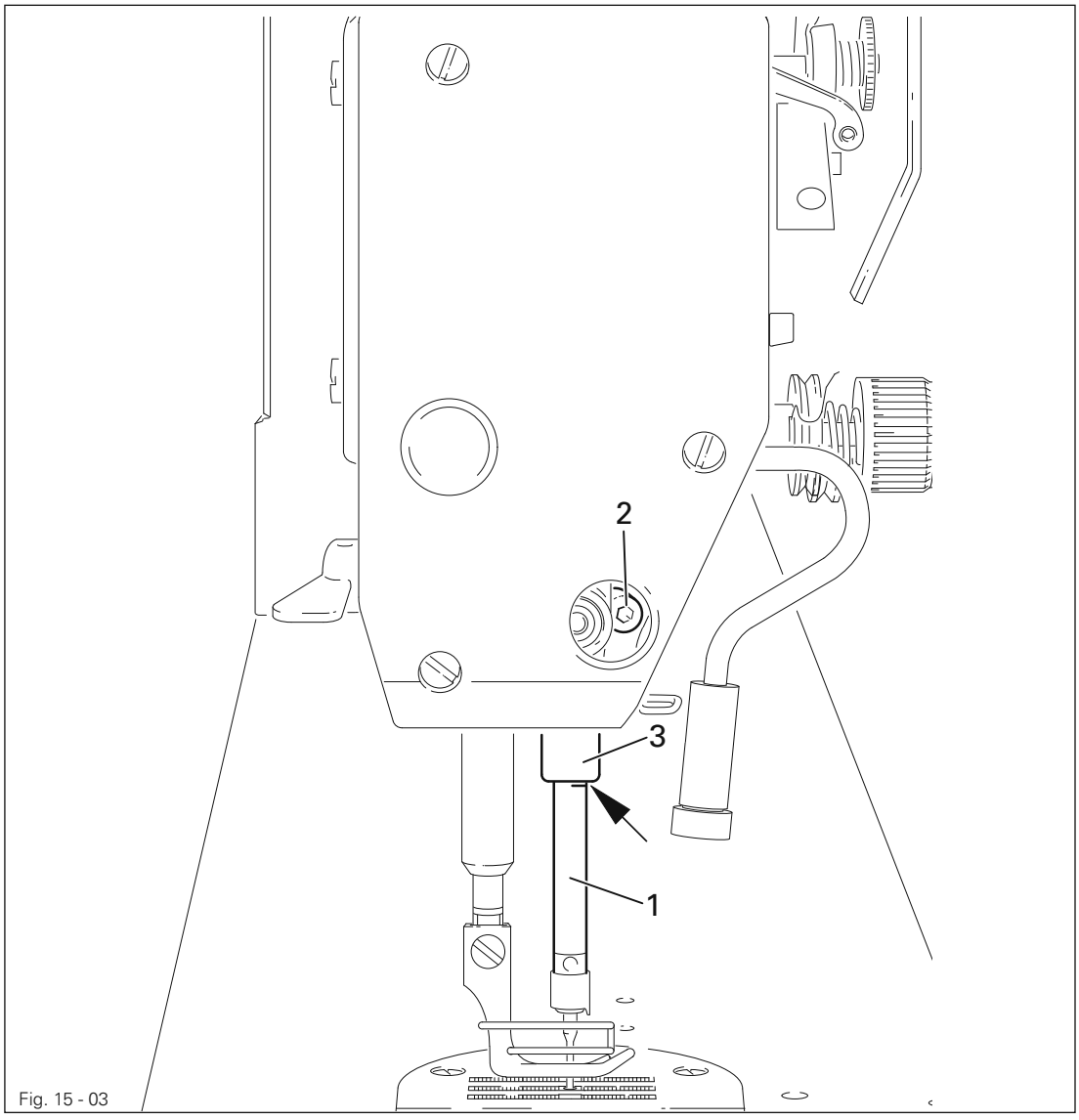
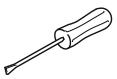


Fig. 15 - 03



- Move the needle bar to **1.8** mm after b.d.c. and fix with the adjustment pin, see **chapter 15.05 Checking and adjustment aid**.
- Adjust the needle bar **1** (screw **2**) without twisting according to the **rule**.

15.06.03 Bottom transporter zero position

Rule

At stitch length setting "**0**"

1. The marking on the toothed segment **1** should be in the centre of the shaft of the gear wheel **3**,
2. The cranks **4** and **6** should be aligned and the bottom transporter should not move when turning the handwheel.

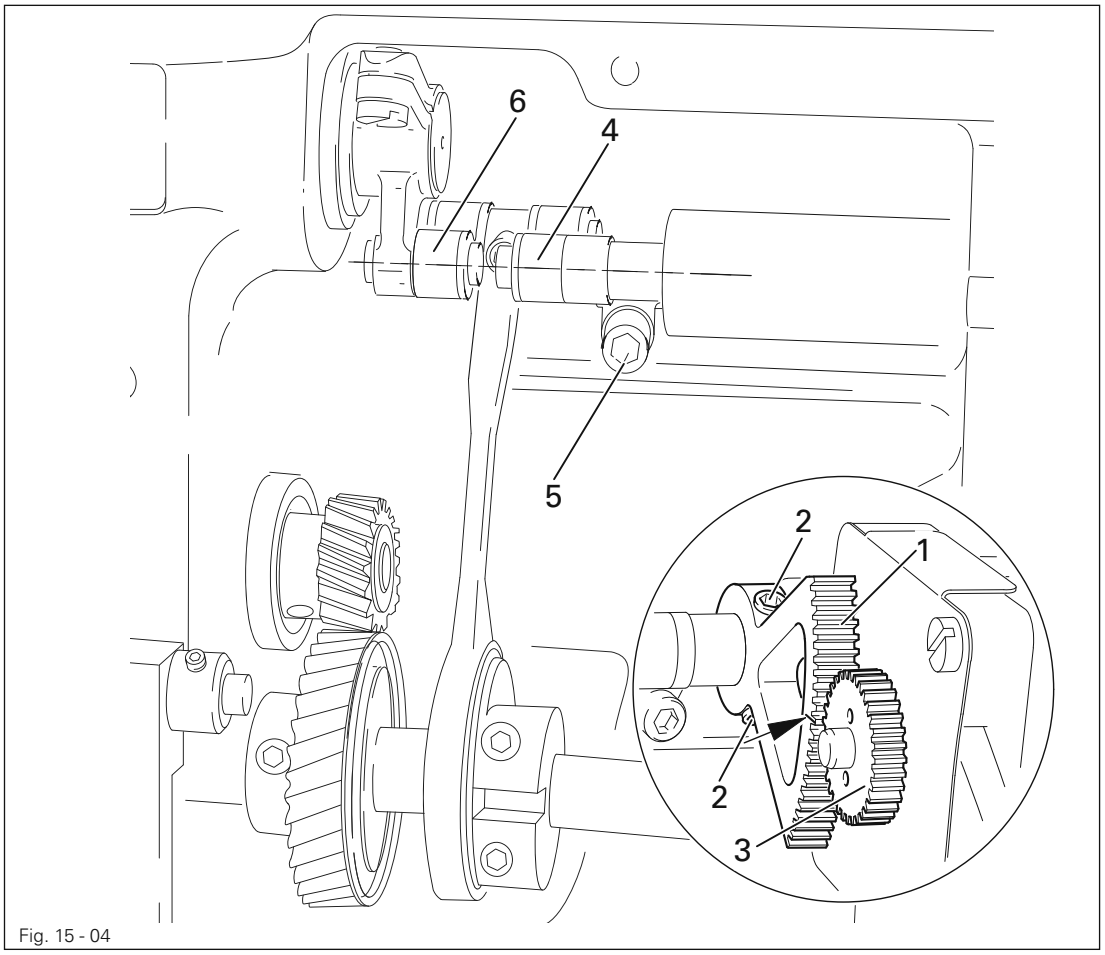
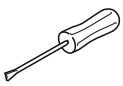


Fig. 15 - 04



- Switch the machine on.

- Set the stitch length to "**0**" using the control panel and turn the handwheel until the feed regulator motor responds.
- Make sure that parameter **834** is set to "**0**", see **chapter 15.11 Parameter settings**.
- Adjust the toothed segment **1** (screws **2**) without the gear wheel **3** according to **rule 1**.
- Turn the crank **4** (screws **5**) according to **rule 2**.
- Switch the machine off.

15.06.04 Bottom transporter sliding movement

Rule
When the needle bar is positioned **0.6 mm after t.d.c.**, the bottom transporter should not move when the shaft **3** is rotated back and forth.

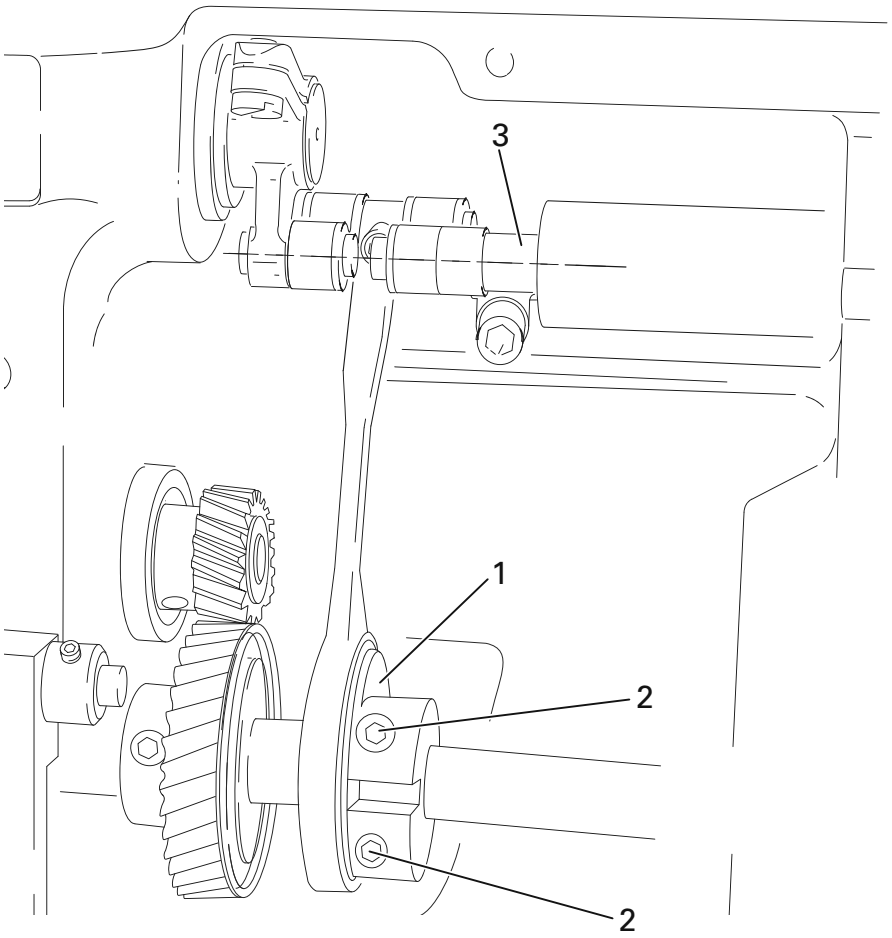


Fig. 15 - 05

- Move the needle bar to a position **0.6** mm after t.d.c.
- Turn the eccentric **1** (screws **2**), without moving it sideways according to the **rule**.

15.06.05 Bottom transporter stroke movement

Rule

When the needle bar is positioned **0.6 mm** after t.d.c. and with stitch length regulation "**0**"

1. the bottom transporter should be in its upper turning point and
2. the control cam **3** should abut the feed lifting eccentric **1**.

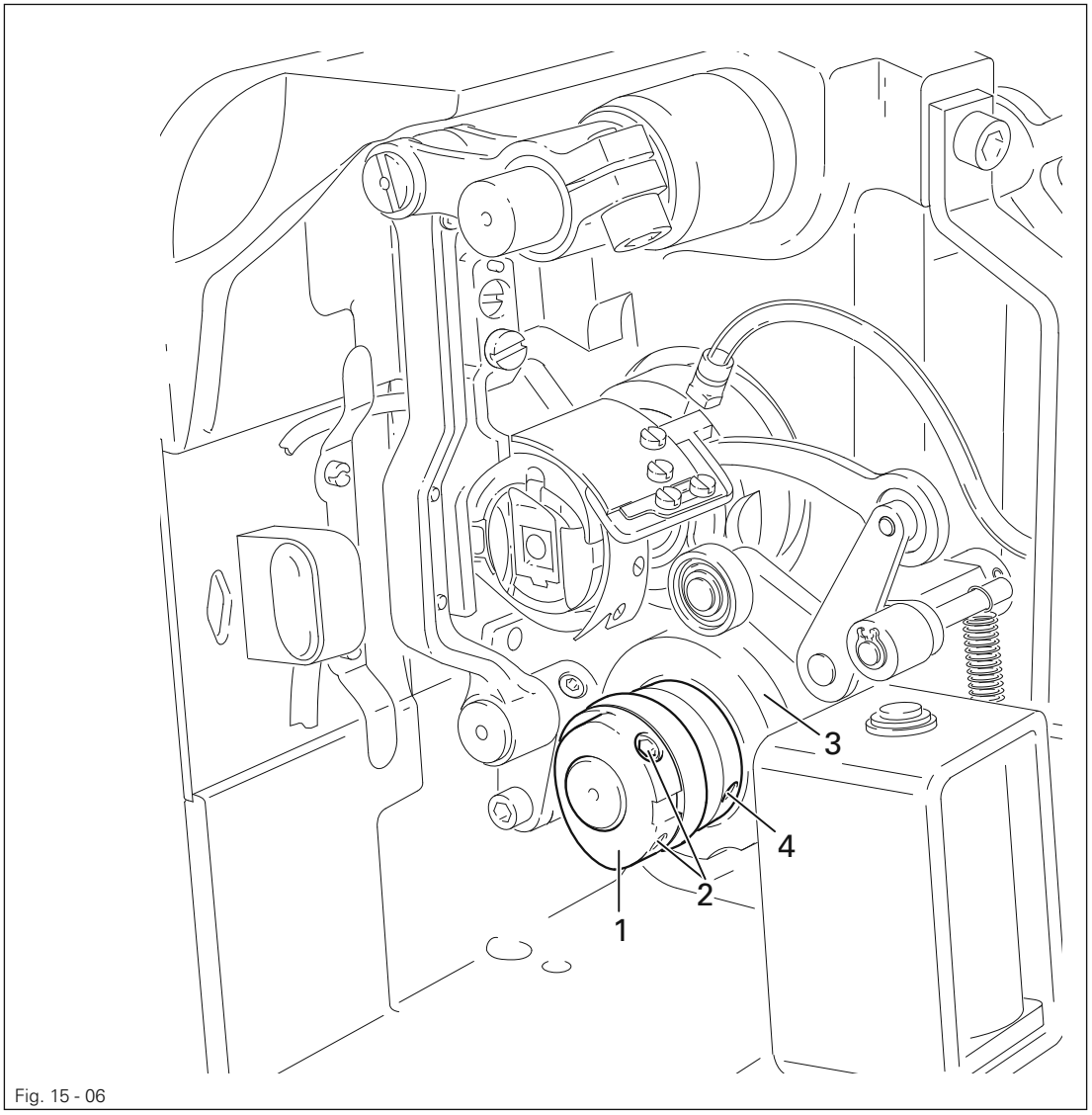
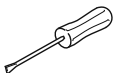


Fig. 15 - 06



- Switch the machine on.

- Set the stitch length to "**0**" and move the needle bar to a position **0.6** mm after t.d.c.
- Turn the handwheel until the feed regulator motor responds.
- Turn the eccentric **1** (screws **2**) according to **rule 1**.
- Adjust the control cam **3** (screws **4**) according to **rule 2** and switch off the machine.

15.06.06 Bottom transporter height / position in needle plate cutout

Rule

In its upper turning point and with stitch length regulation "**0**" the bottom transporter **1** should

1. be in the centre of the needle plate cutout looking from the side and in the feeding direction and
2. abut the feed dog setting gauge **2** along its entire length.

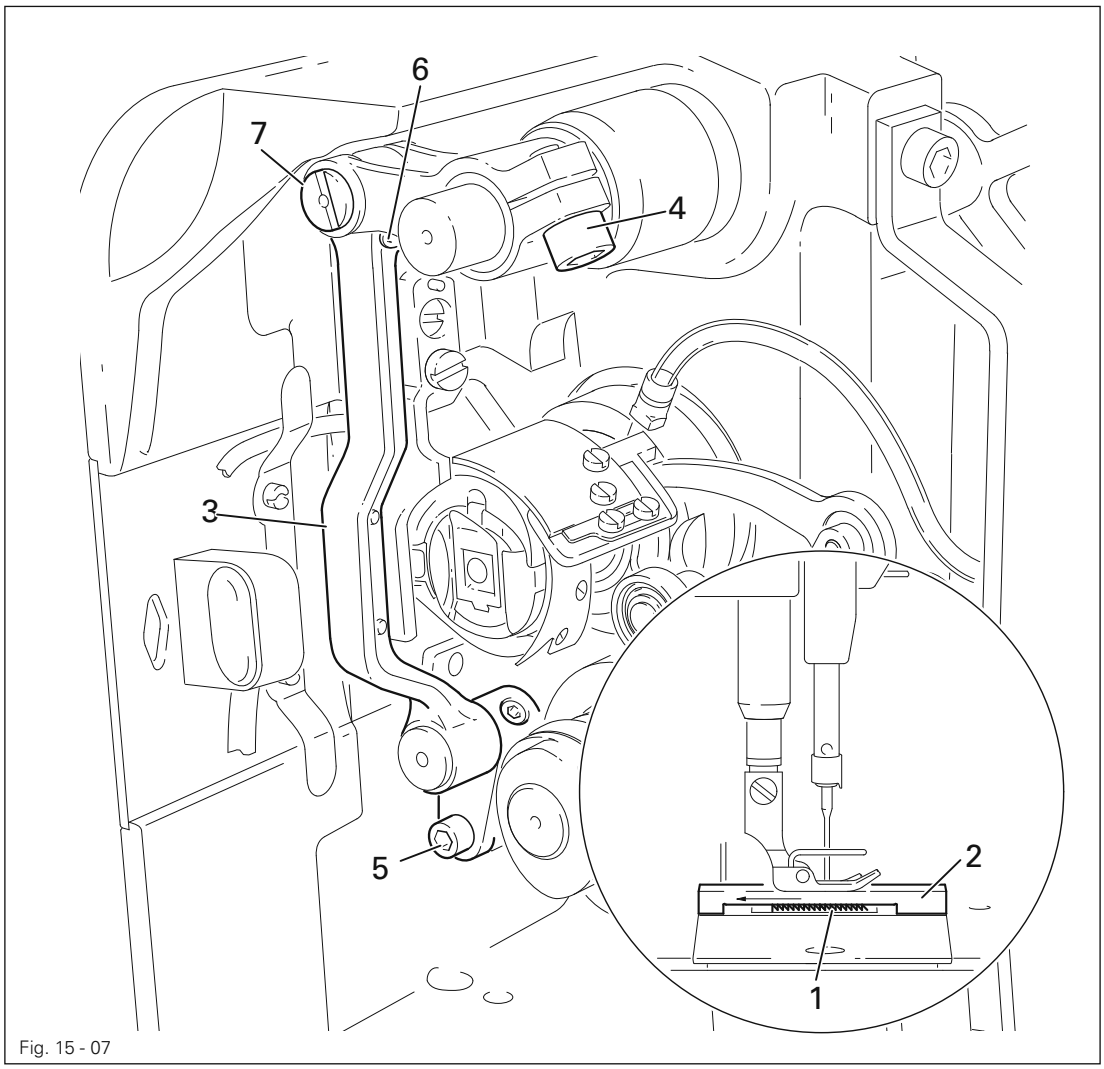


Fig. 15 - 07

- Turn on machine and set the stitch length to "**0**".
- Turn the handwheel until the feed regulator motor responds.
- Move the bottom transporter **1** to its upper turning point.
- Raise the sewing foot, move the feed dog setting gauge **2** over the needle plate cut-out with the arrow in the sewing direction and the front edge flush with the needle plate edge and lower the sewing foot.
- Adjust the bottom transporter carrier **3** (screw **4**) according to **rule 1**.
- Loosen the screws **5** and **6**
- Adjust the bottom transporter carrier **3** and eccentric **7** according to **rule 2**.
- Tighten the screws **5** and **6**
- Switch the machine off.

15.06.07 Needle in needle hole centre

Rule
The needle should pierce the centre of the needle hole exactly.

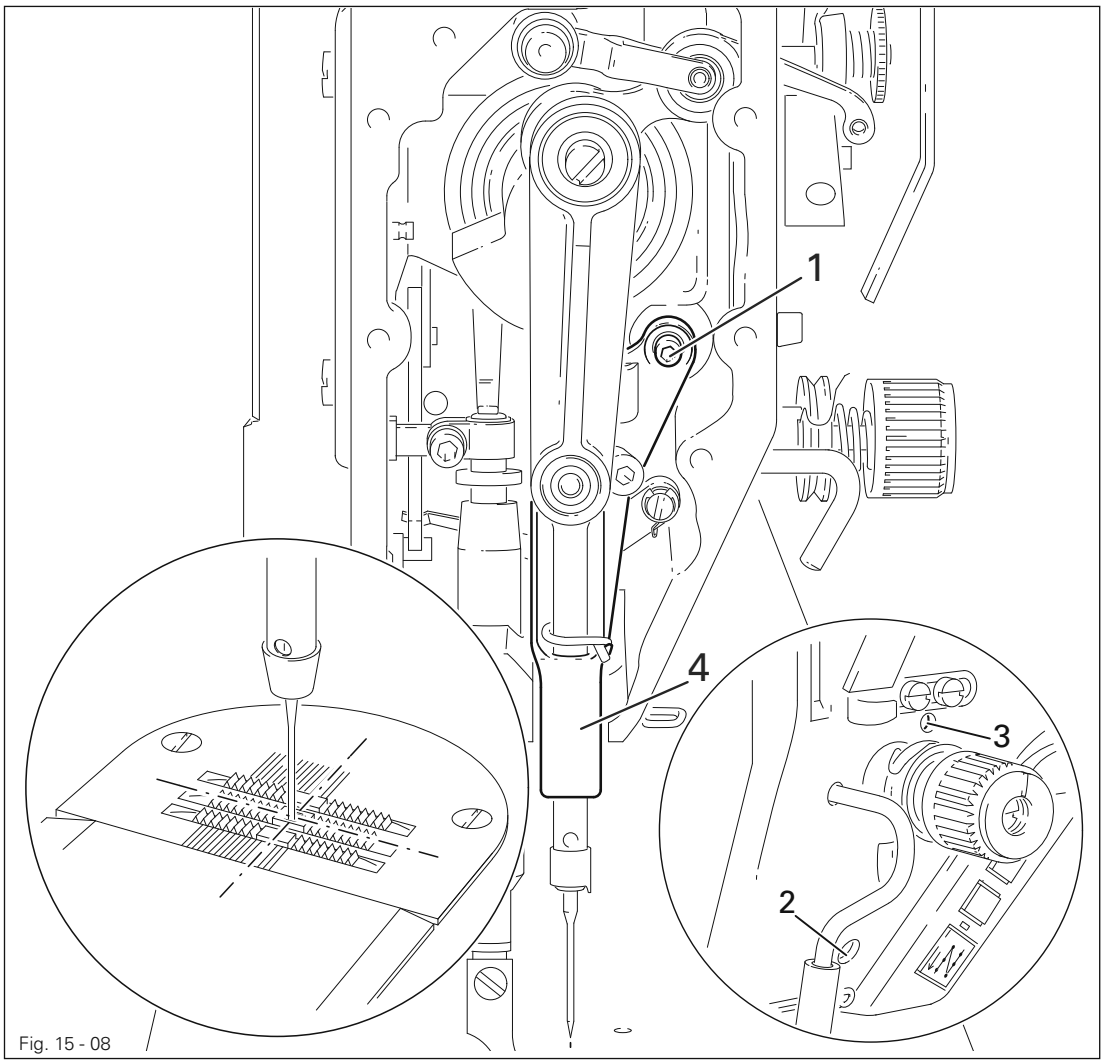
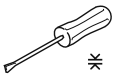


Fig. 15 - 08



- Switch the machine on.

- Set the stitch length to "0" using the control panel and turn the handwheel until the feed regulator motor responds.
- Insert the needle into the needle hole by turning the handwheel.
- Loosen the screws 1,2 and 3
- Adjust the needle bar frame 4 according to the rule.
- Tighten the screw 2 and gently tighten the screw 3.
- Use the screw 1 to pull the internal guide pin up to the eye of the needle bar frame 4 and tighten it.
- Turn the handwheel a few turns so that the needle bar frame 4 is not under tension.
- Tighten the screw 3.
- Switch the machine off.

15.06.08 Hook shaft bearing and spur gear clearance

Rule

1. The front edge of the hook shaft **5** should be **14.5 mm** away from the needle midpoint; the groove in the hook shaft bearing **1** (see arrow) should be parallel to the bed plate and point away from the sewing direction.
2. There should be minimal yet noticeable play between the plastic pinion **3** and the steel wheel **4**. This play should be approximately the same for a **360°** turn.
3. The steel wheel 4 should align with the plastic pinion **3**.

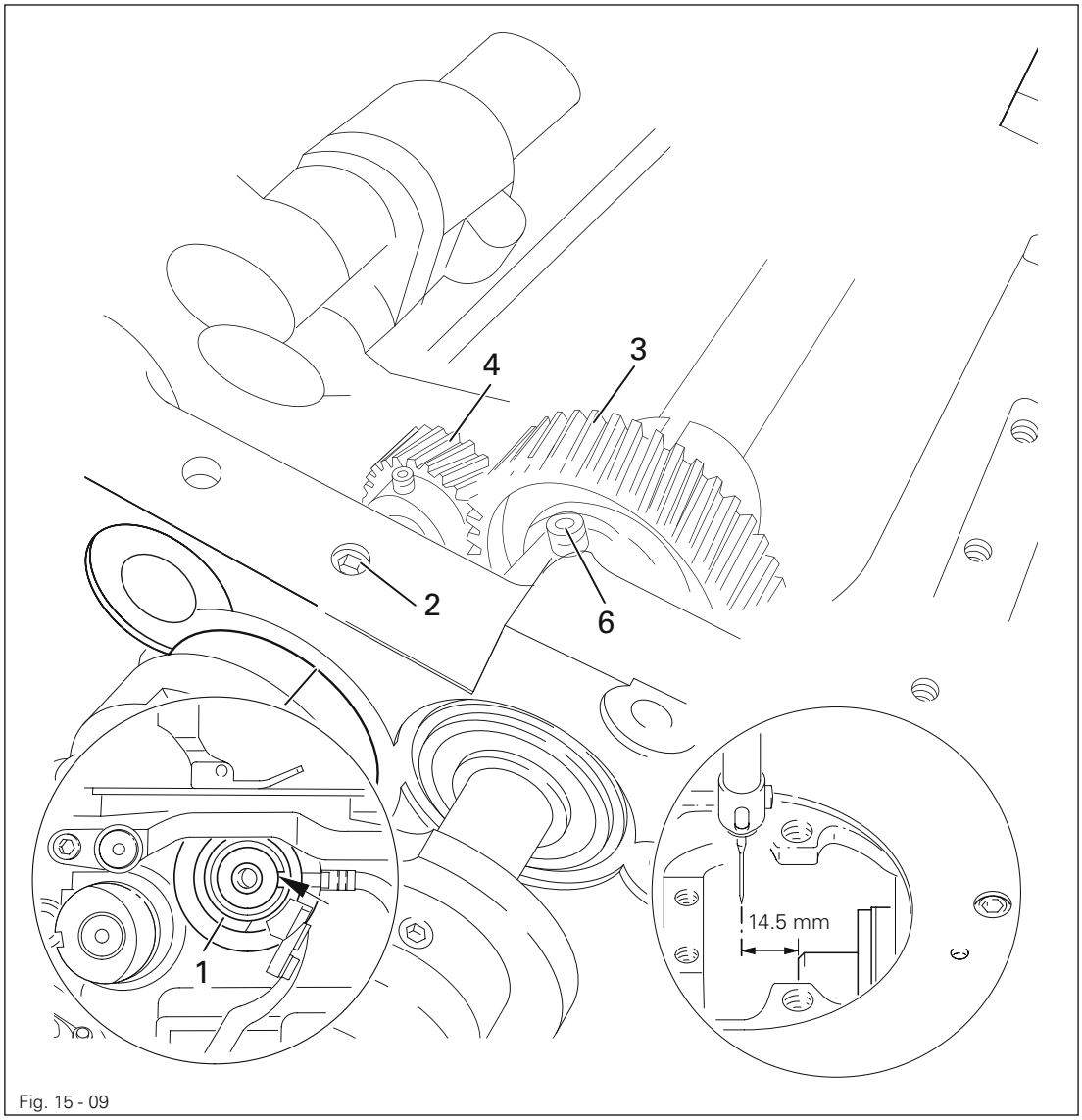


Fig. 15 - 09

- Align the hook shaft bearing **1** (screw **2**) according to **rule 1**.
- Set the steel wheel **4** with the eccentric bush of the hook shaft bearing **1** according to rule **2** and tighten the screw **2**.
- Adjust the plastic pinion **3** (screws **6**) according to **rule 3** and tighten the screws **6**.

15.06.09 Hook lubrication

Rule

1. The centrifugal disc **1** should be **1.5 mm** in front of the oil distributor ring **3**.
2. A light oil strip should appear on a paper strip held over the needle plate cutout after approximately **10 seconds** when the machine is running at full speed.

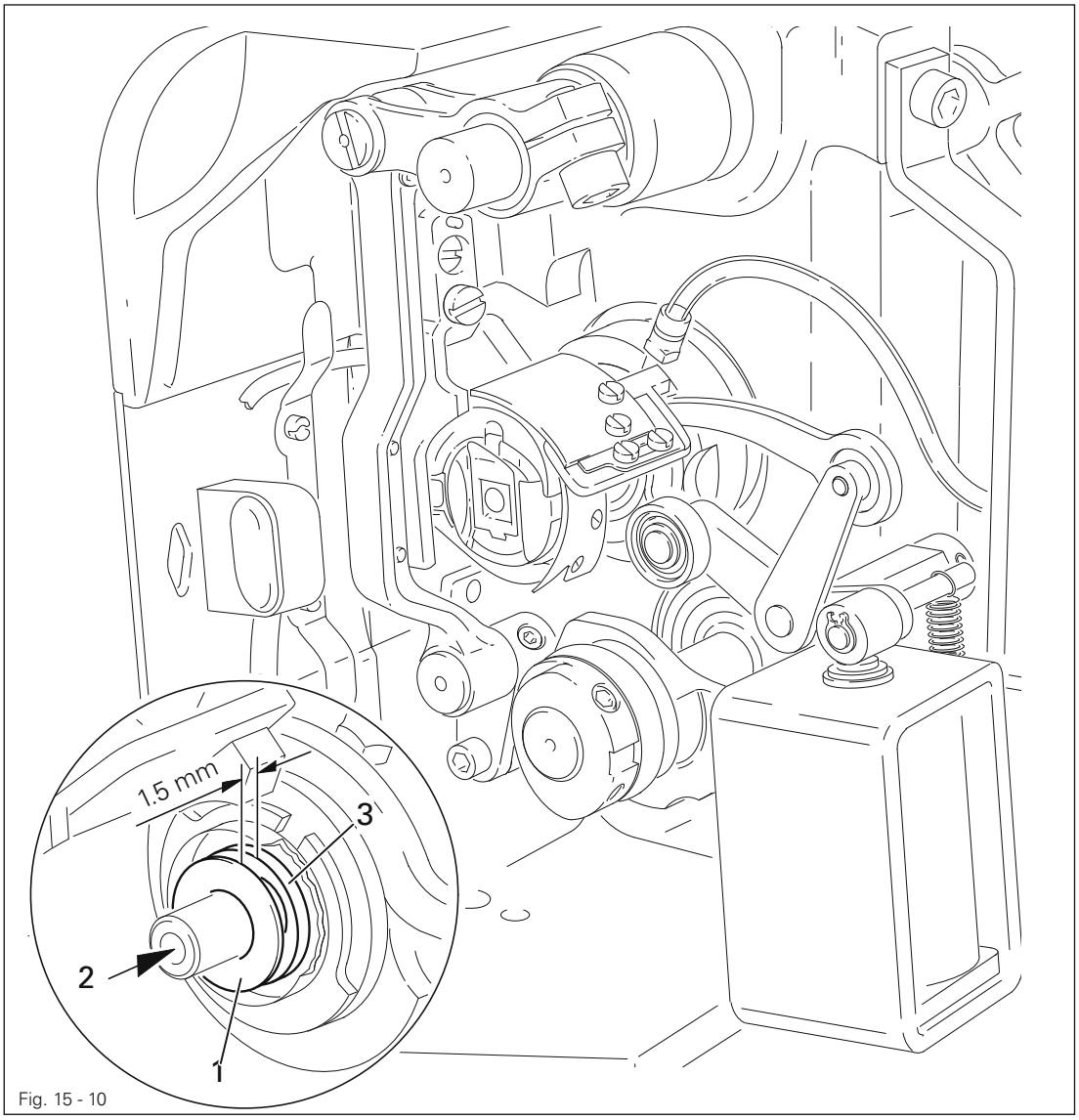


Fig. 15 - 10

The setting is only required if the wick is replaced.

Make sure that the new wick is impregnated with oil when replacing the wick.

- Adjust the centrifugal disc **1** (screw **2**) according to **rule 1**.
- **Check rule 2** and adjust the centrifugal disc **1** if necessary.

15.06.10 Needle bar rise, hook-to-needle clearance, needle height and bobbin case position finger

Rule

When the needle bar is positioned 1.8 mm after b.d.c.,

1. The tip of the hook **6** should be at the needle midpoint and be a distance of **0.05 mm - 0.1 mm** from the fillet of the needle and
2. The upper edge of the eye of the needle should be **0.8 mm** under the tip of the hook.
3. There should be a clearance of **0.5 mm** between the lug of the bobbin case position finger **4** and the base of the stop groove.

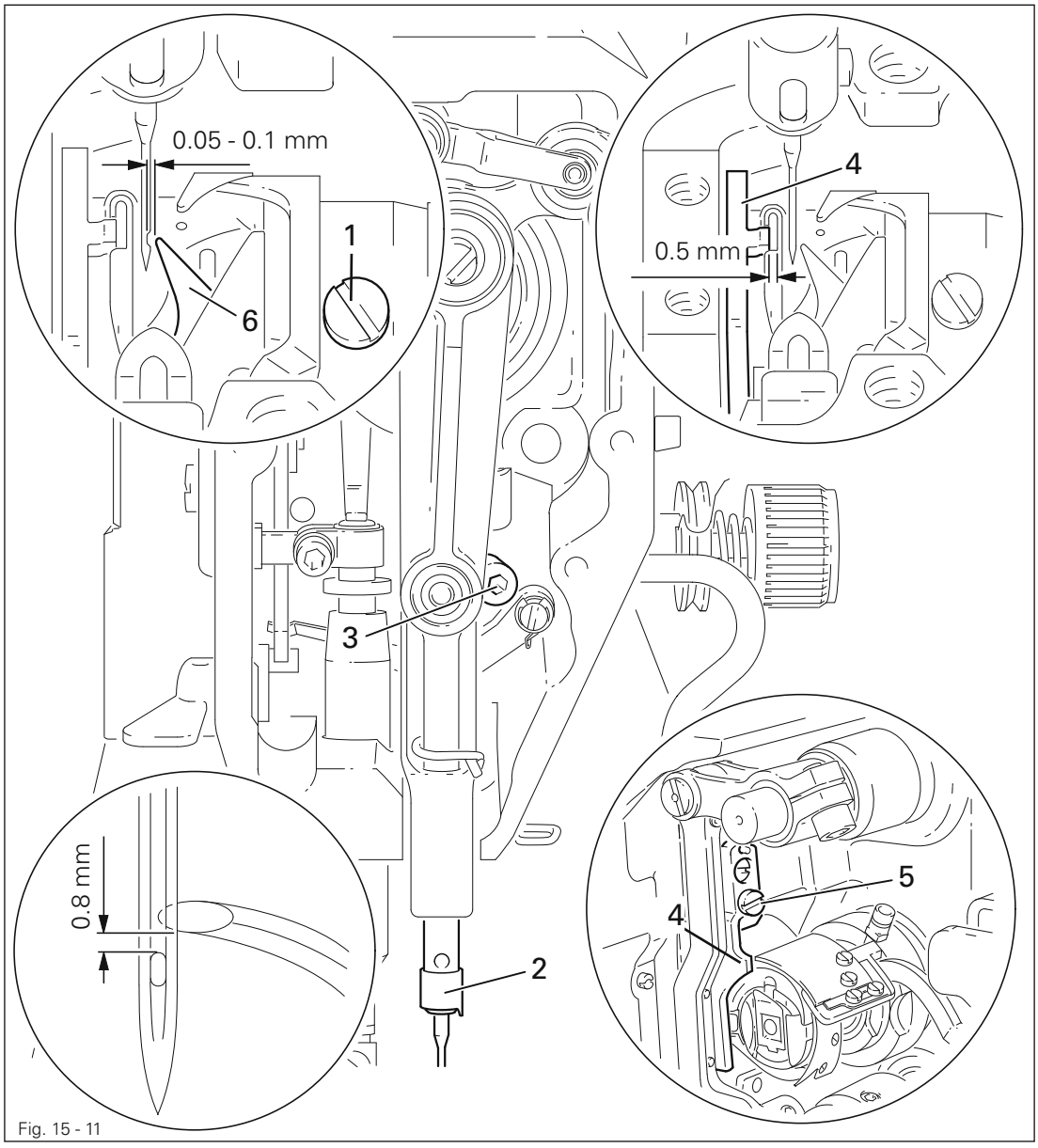


Fig. 15 - 11

- Switch the machine on.

* - Set the stitch length to "**0**" using the control panel and turn the handwheel until the feed regulator motor responds.
- Switch the machine off.

- Use the adjustment pin to move the needle bar to **1.8** mm after b.d.c.
- Adjust the hook according to **rule 1**
- Tighten the screws **1**.
- Adjust the needle bar **2** (screw **3**), without twisting according to **rule 2**.
- Align the bobbin case position finger **4** (screw **5**) according to **rule 3**.

15.06.11 Thread check spring and slack thread regulator

Rule

1. The movement of the thread check spring should be finished when the needle point punctures the material (spring deflection: approx. **7 mm**).
2. The thread check spring should have moved approx. **1 mm** when forming the maximum thread loop while passing the thread around the hook.

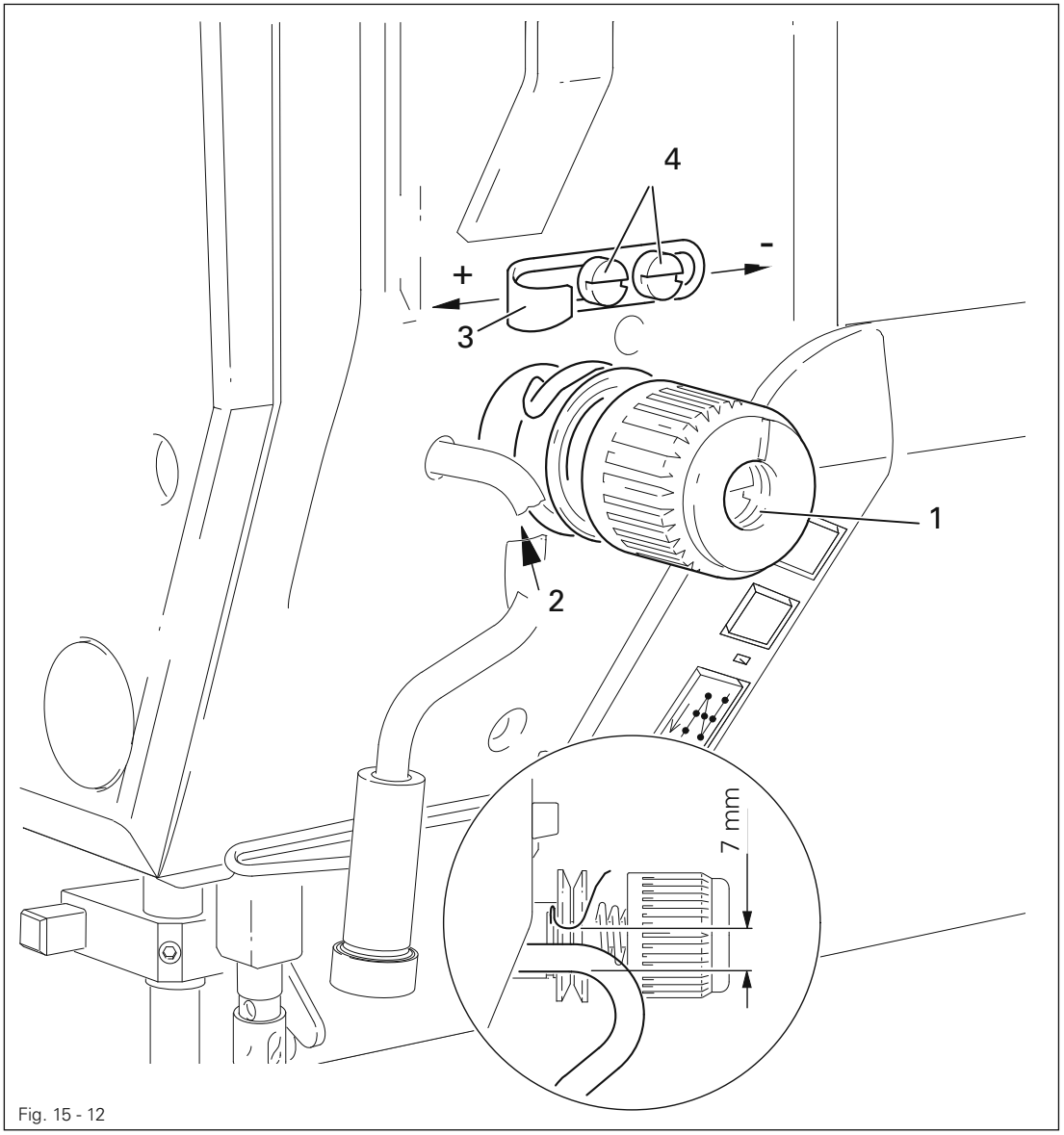


Fig. 15 - 12

- Turn the thread tension **1** (screw **2**) according to **rule 1**.
- Adjust the slack thread regulator **3** (screws **4**) according to **rule 2**.

It may be necessary to deviate from the specified spring deflection for reasons relating to the sewing technology.

Adjust the slack thread regulator **3** (screw **4**) by " **+** " (= more thread) or " **-** " (= less thread).

15.06.12 Passage under sewing foot

Rule

1. When the automatic presser foot lift is activated, the clearance between the sewing foot and needle plate should be should be **7** mm.
2. When the hand lever is raised, the clearance between the sewing foot and needle plate should be should be 5 mm.

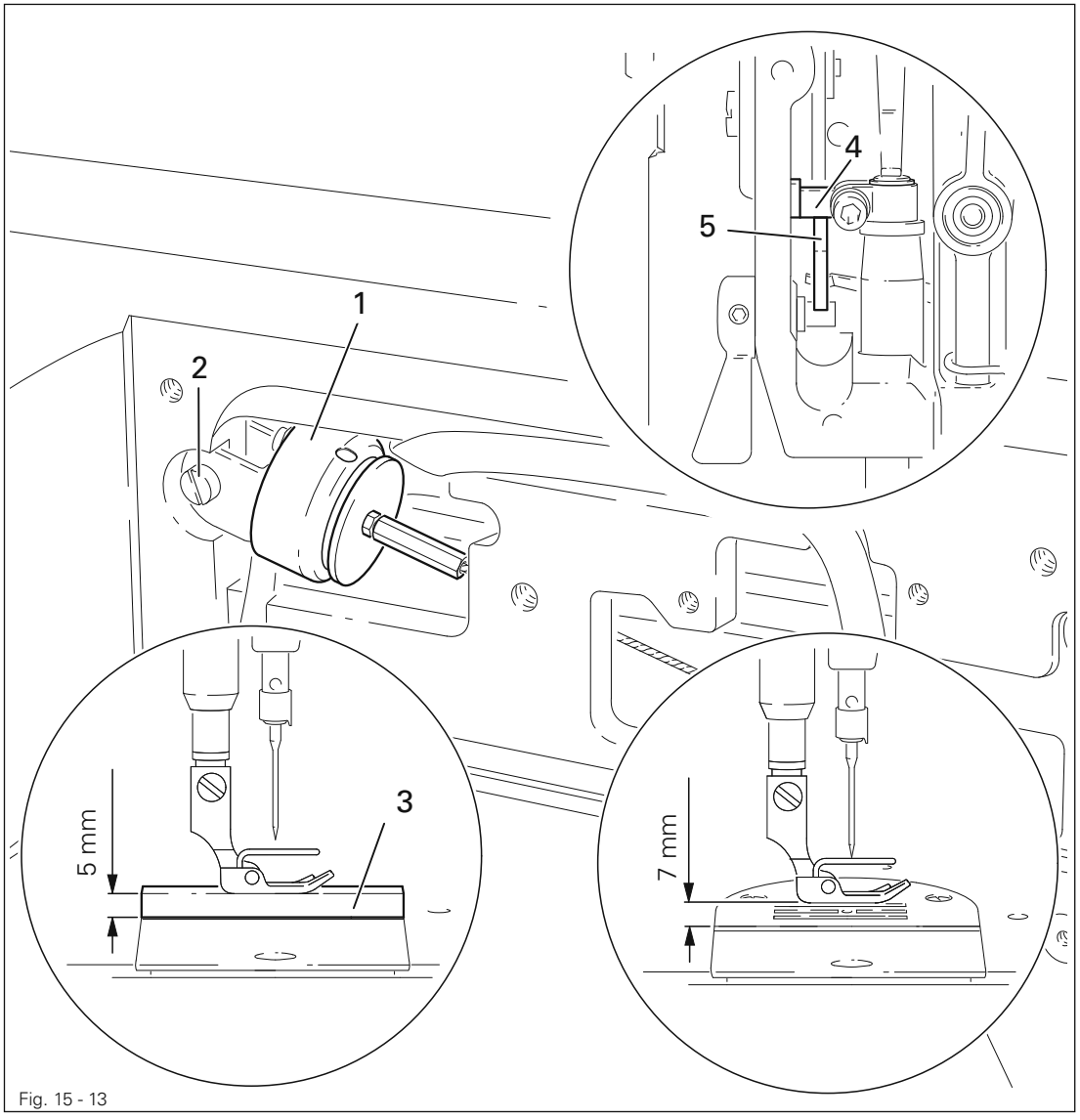


Fig. 15 - 13

- Adjust the solenoid **1** (screw **2**) according to **rule 1**.
- Raise the hand lever and place the adjustment gauge **3** (order no. **61-111 639-73**) under the sewing foot according to **rule 2**.
- Move the presser bar lifting lever **4** so that it touches the lift piece **5**.

Make sure that the needle is positioned in the middle of the needle foot.

15.06.13 Adjusting feed regulator zero position

Rule
The needle should always puncture the material at the same position at maximum speed (**4500** min^{-1}) with stitch length regulation "**0**".

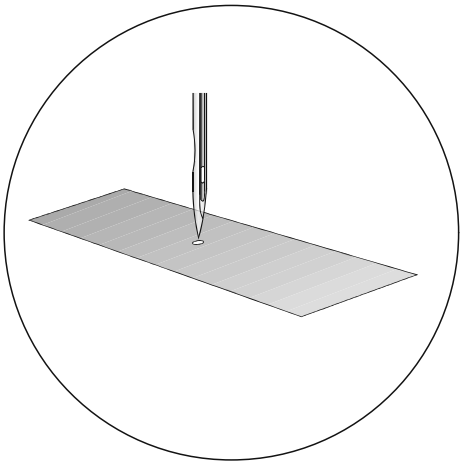


Fig. 15 - 14

- Unthread the machine.
- Switch the machine on.
- Place the workpiece under the sewing foot.
- Sew with the machine at max. speed and check the **rule**.
  (Workpiece must not move.)
- Change the value for parameter **834** within the permissible values according to the **rule**.

The permissible values for parameter **834** are "**-1**", "0" or "1".

If the feed regulator zero position cannot be set by selecting the permissible values, the mechanical setting must be checked or corrected, see **chapter 15.06.03 Bottom transporter zero position**.

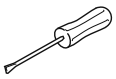
The zero position of the feed regulator is always identifiable in a range of **3** values. The middle value must be selected when making the adjustment.

- Switch the machine off.

Further information about selecting and changing parameters and explanations (functions) about the individual parameters can be found in **chapter 15.11 Parameter settings**.

15.06.14 Stitch length adjustment forwards and backwards

Rule
The stitch length selected on the control panel should not deviate from the actual stitch length when sewing forwards and backwards at a maximum speed of **400** min^{-1}.



- Thread the machine.
- Switch the machine on.
- Select the stitch length to be used via the control panel.
- Limit the max. speed to **400** min^{-1} via parameter **607**.
- Set the value for parameter **846** to **100**.
- Place the workpiece under the sewing foot.
- Sew a seam with at least **20** stitches.
- Measure the length of the seam over **20** stitches and determine the actual stitch length.
- The value for parameter **846** must be corrected if the deviation over **20** stitches is greater than +/- **0.5** mm.
- Take the value for parameter **846** from the table or calculate it using the formula:

$$\frac{\text{Set stitch length}}{\text{Actual stitch length}} \times 100$$

Stitch length 2.5 mm		Stitch length 2.0 mm		Stitch length 1.5 mm	
Length over 20 stitches	Value for parameters 846 / 847	Length over 20 stitches	Value for parameters 846 / 847	Length over 20 stitches	Value for parameters 846 / 847
48.5	103	38.5	104	28.5	105
49.0	102	39.0	103	29.0	103
49.5	101	39.5	101	29.5	102
50.0	**100**	**40.0**	**100**	**30.0**	**100**
50.5	99	40.5	99	30.5	98
51.0	98	41.0	97	31.0	97
51.5	97	41.5	96	31.5	95
52.0	96	42.0	95	32.0	94
52.5	95	42.5	94	32.5	92
53.0	94	43.0	93		
53.5	93	43.5	92		
54.0	93				
54.5	92				

- Select the determined value for parameter **846** and switch off the machine.

The stitch length adjustment backwards is performed under parameter "**847**" according to the work steps mentioned above; the key for reverse sewing must be pressed, see **chapter 7.02 Keys on the machine head**. Further information about selecting and changing parameters and explanations (functions) about the individual parameters can be found in **chapter 15.11 Parameter settings**.

15.06.15 Bobbin winder

Rule

1. When the bobbin winder is switched on, the drive wheel should be moved easily, whereas when the bobbin winder is switched off, the friction wheel **5** must not touch the drive wheel **1**.
2. The bobbin winder should switch off automatically if the thread fill is approx. **1 mm** away from edge of the bobbin.
3. The eccentric stud **3** should be at the centre of the large bobbin chamber.

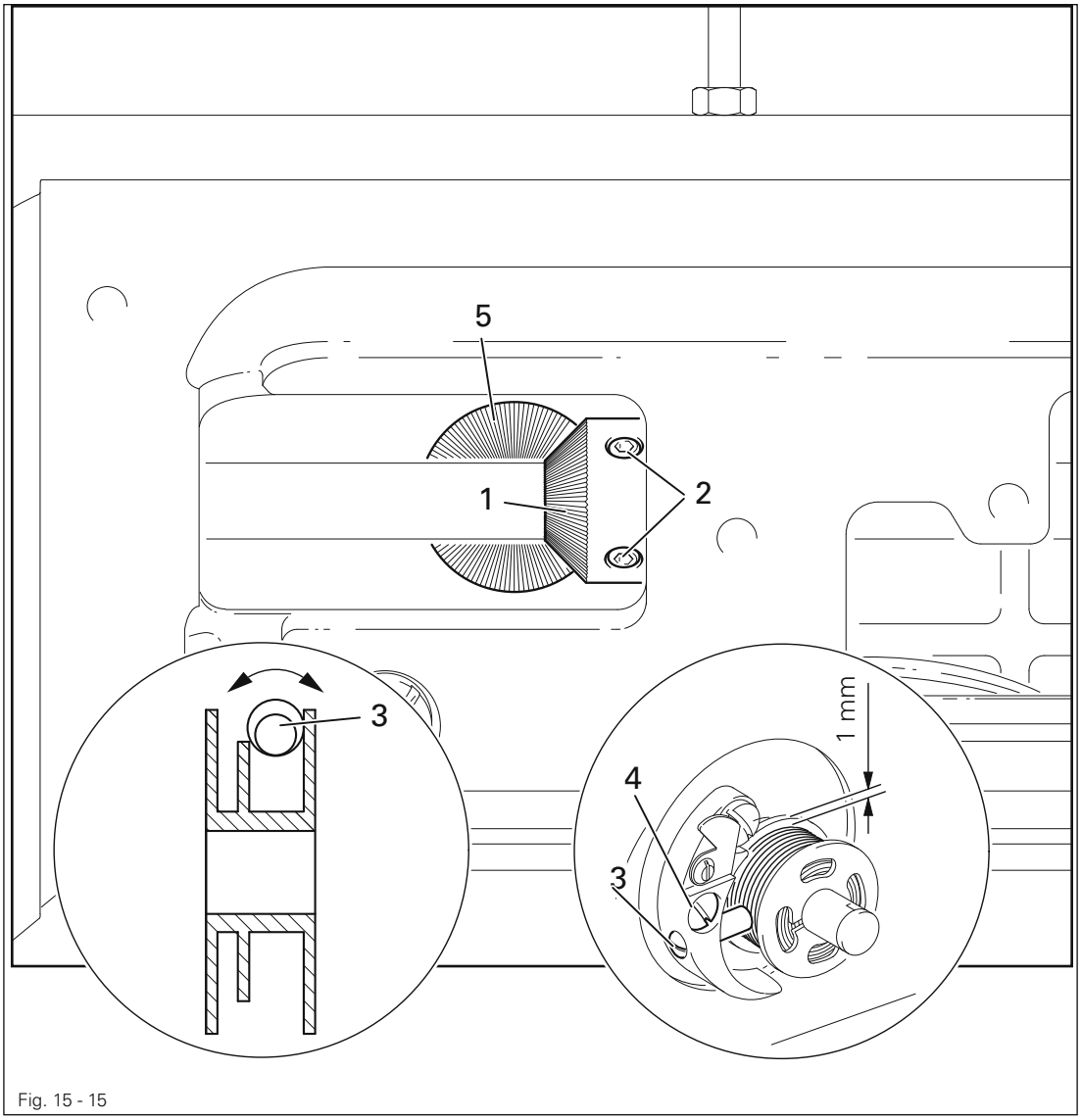


Fig. 15 - 15

- Adjust the drive wheel **1** (screw **2**) according to **rule 1**.
- Place a bobbin on the bobbin winder, thread the bobbin and switch on the bobbin winder.
- Adjust the stud **3** (screw **4**) according to **rule 2** and turn according to **rule 3**.

15.06.16 Mechanical stitch length limitation

Rule

1. The feed dog must not strike against the needle plate cutout when sewing forwards and backwards at max. stitch length.
2. The screws of the stops **1** (forward sewing) and **3** (reverse sewing) should each have a clearance of **0.3 mm** to the corresponding cast edge.

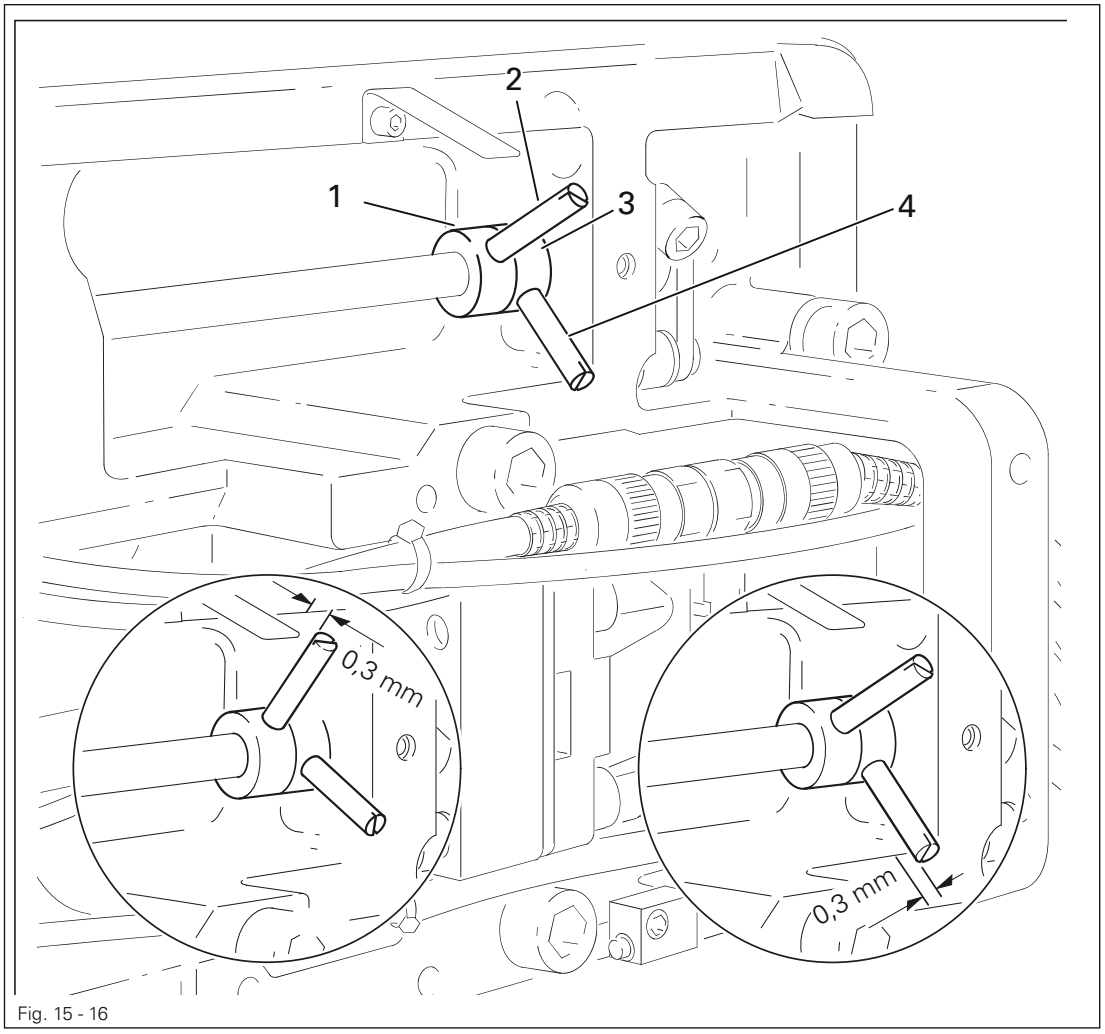


Fig. 15 - 16

- Turn on the machine and adjust parameter **849** according to **rule 1**, see **chapter 15.11 Parameter settings**.

3.5

- Select the maximum stitch via the control panel.
- Turn the stop **1** (screw **2**) according to **rule 2**.
- Sew stitches with the key for reverse sewing **2** pressed, see **chapter 7.02 Keys on the machine head**.
- Turn the stop **3** (screw **4**) according to **rule 2**.
- Switch the machine off.

15.06.17 Sewing foot pressure

Rule
The material should be transported properly at all times; no pressure marks should appear on the material.

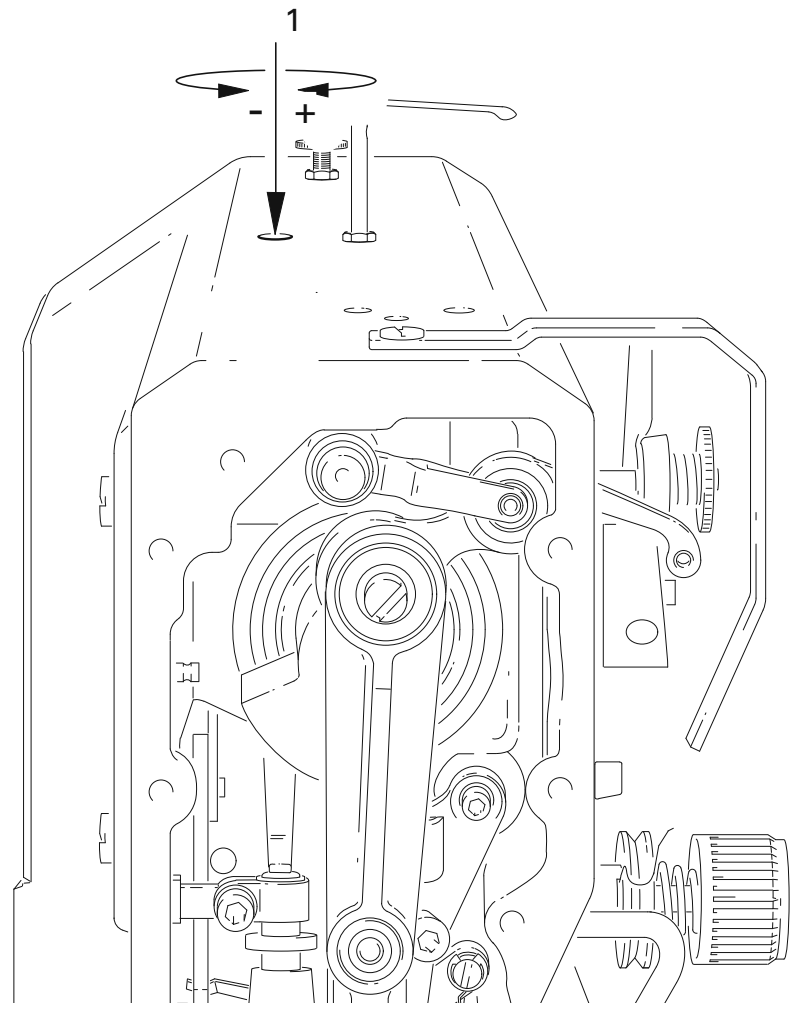
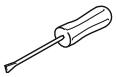


Fig. 15 - 17



● Turn the screw **1** according to the **rule**.

15.07 Adjusting thread trimmer -900/24

15.07.01 Pre-calibrating solenoid setting / control cam

Rule

1. When the solenoid **3** is completely extended, the roller lever **4** should be at the lowest point of the control cam.
2. When the needle bar is positioned 1.8 mm after b.d.c. (needle rise position), the roller lever **4** should engage in the corresponding control cam cutout.

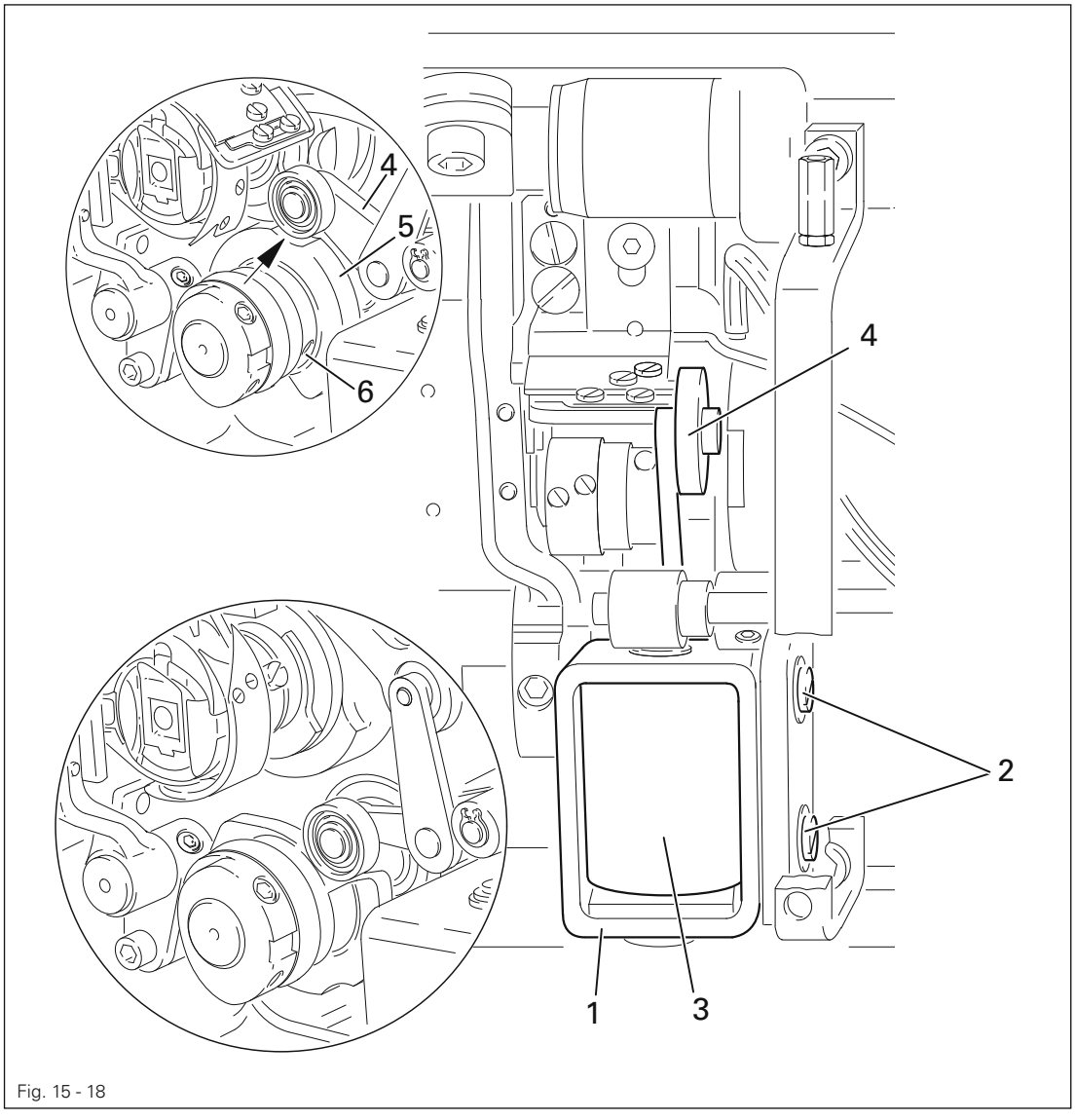
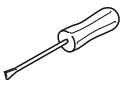


Fig. 15 - 18



- Move the solenoid carrier **1** (screws **2**) according to **rule 1**.
- Turn the control cam **5** (screws **6**) according to **rule 2**.

15.07.02 Aligning thread catcher laterally

Rule

1. The tip of the thread catcher **5** should point exactly at the needle midpoint.
2. The thread catcher **5** should be horizontal and not touch at any position as it moves.

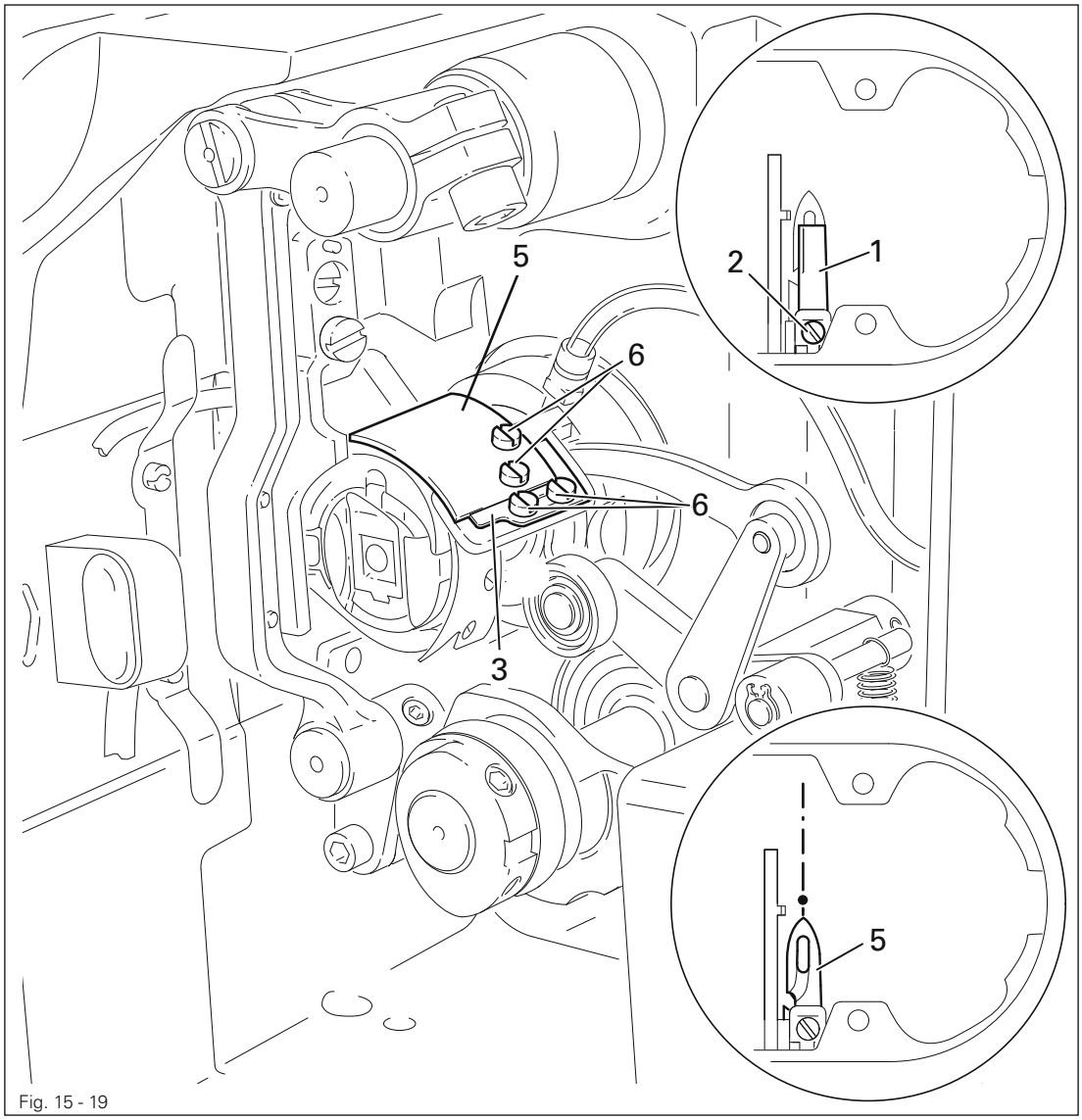
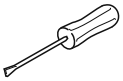


Fig. 15 - 19



- Remove the knife **1** (screw **2**).
- Move the needle bar to b.d.c.
- Loosen the stop **3** (screws **4**).
- Manually position the thread catcher **5** in front of the needle.
- Align the thread catcher **5** (screws **6**) according to the **rules**.

The knife **1** remains dismantled and the stop **3** remains loosened for other settings.

15.07.03 Knife position

Rule

1. There should be a clearance of **4 mm** between the knife edge and the needle.
2. The right edge of the knife **1** should not protrude beyond the right edge of the thread catcher (see arrow).

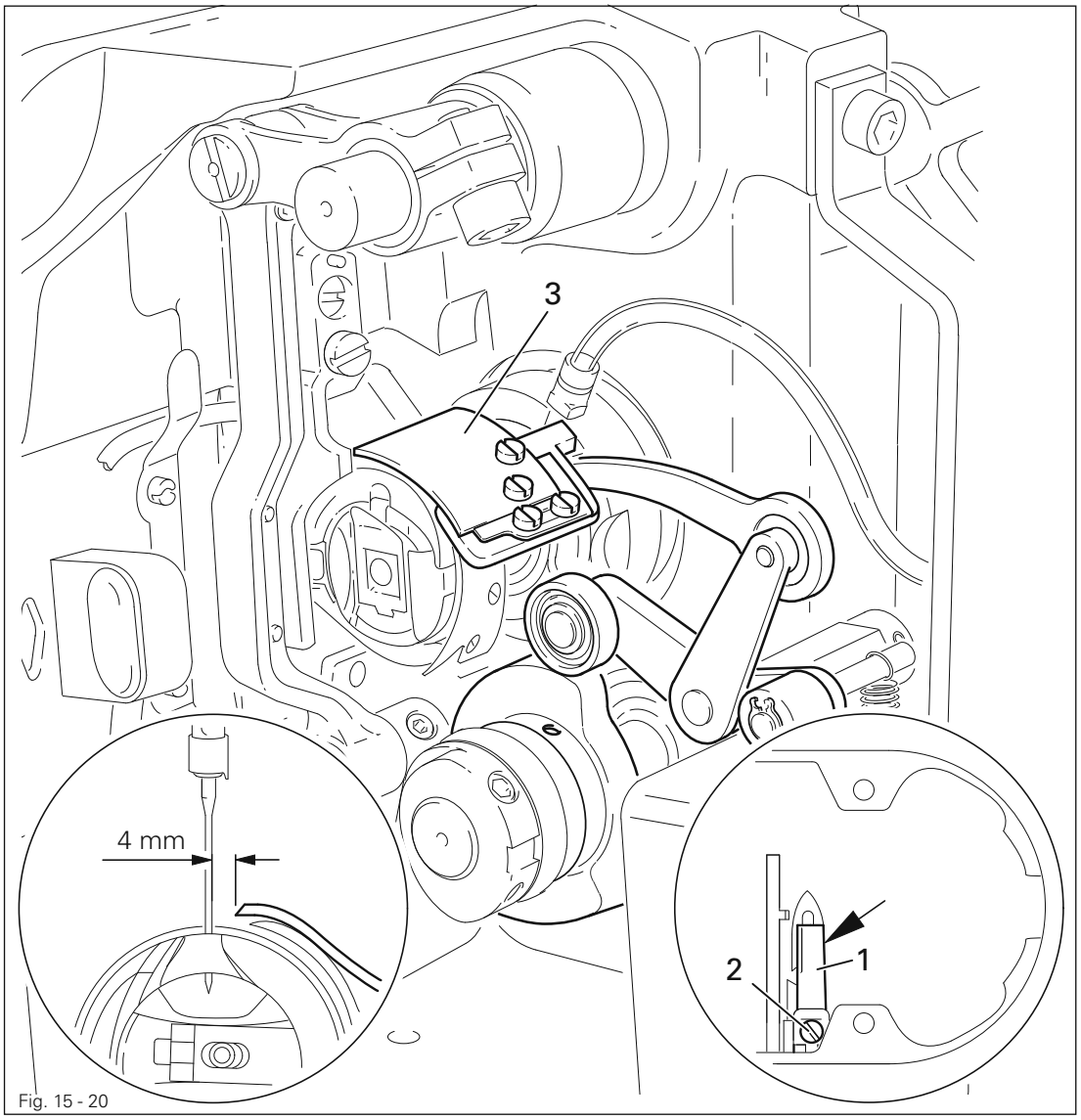


Fig. 15 - 20

- Move the needle bar to b.d.c.
- Slide the knife **1** under the locking tab and align according to **rule 1**.
- Gently tighten the screw **2**.
- Manually adjust the thread catcher carrier **3** until the cutting tip in the thread catcher is positioned just in front of the knife edge.
- Align the knife **1** according to **rule 2** and tighten the screw **2**.

15.07.04 Front turning point of thread catcher

Rule
When the thread catcher **4** is in the front turning point, the tip of the thread catcher cutout should be **1 mm** in front of the bobbin case position finger **5.**

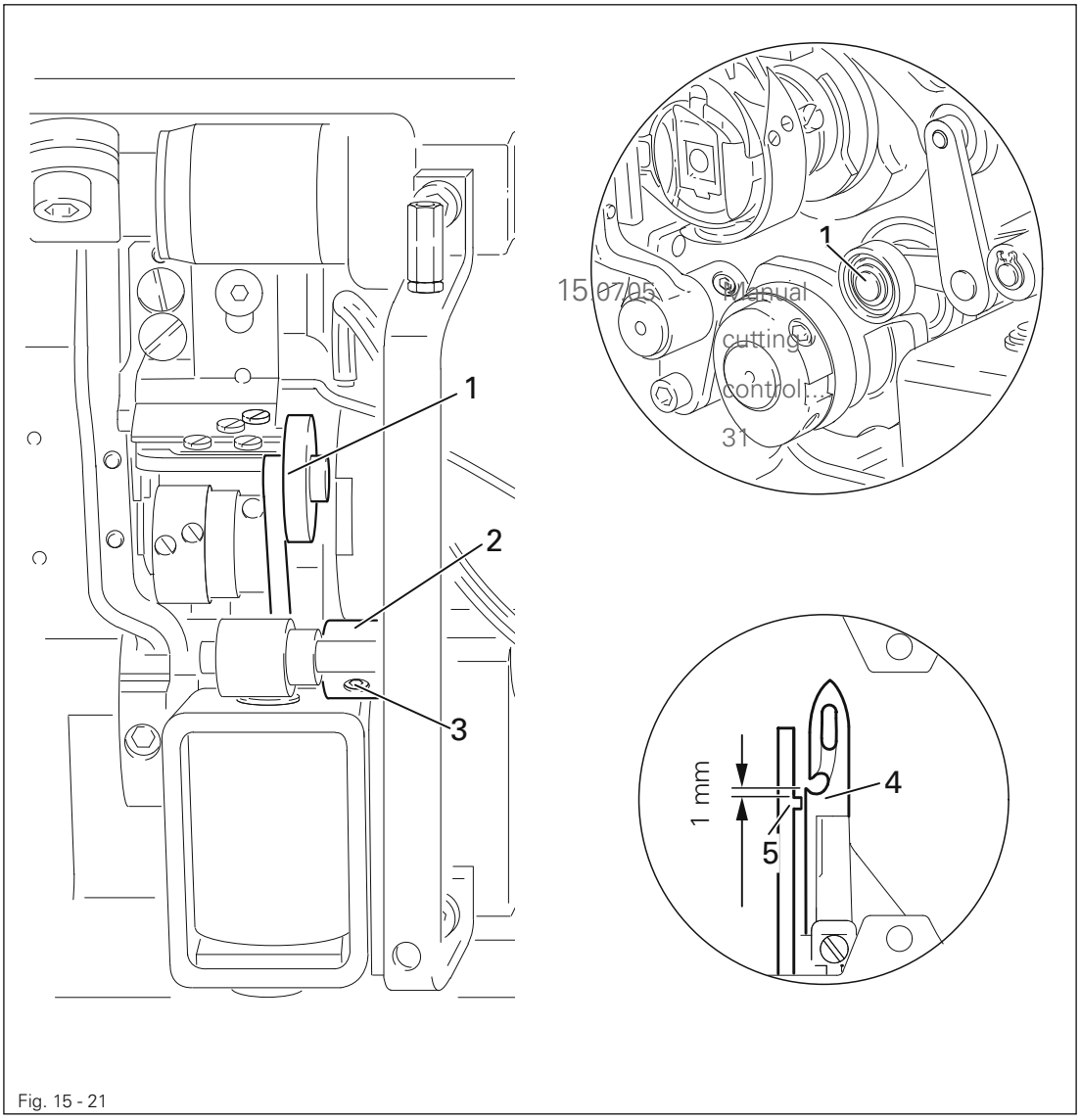


Fig. 15 - 21

- Swivel the roller lever **1** to the lowest point of the control cam.
- Turn the lever **2** (screws **3**) according to the **rule**.

15.07.05 Manual cutting control

Rule
Two threads must be cut cleanly on both the left and right in the thread catcher cutout **1.**

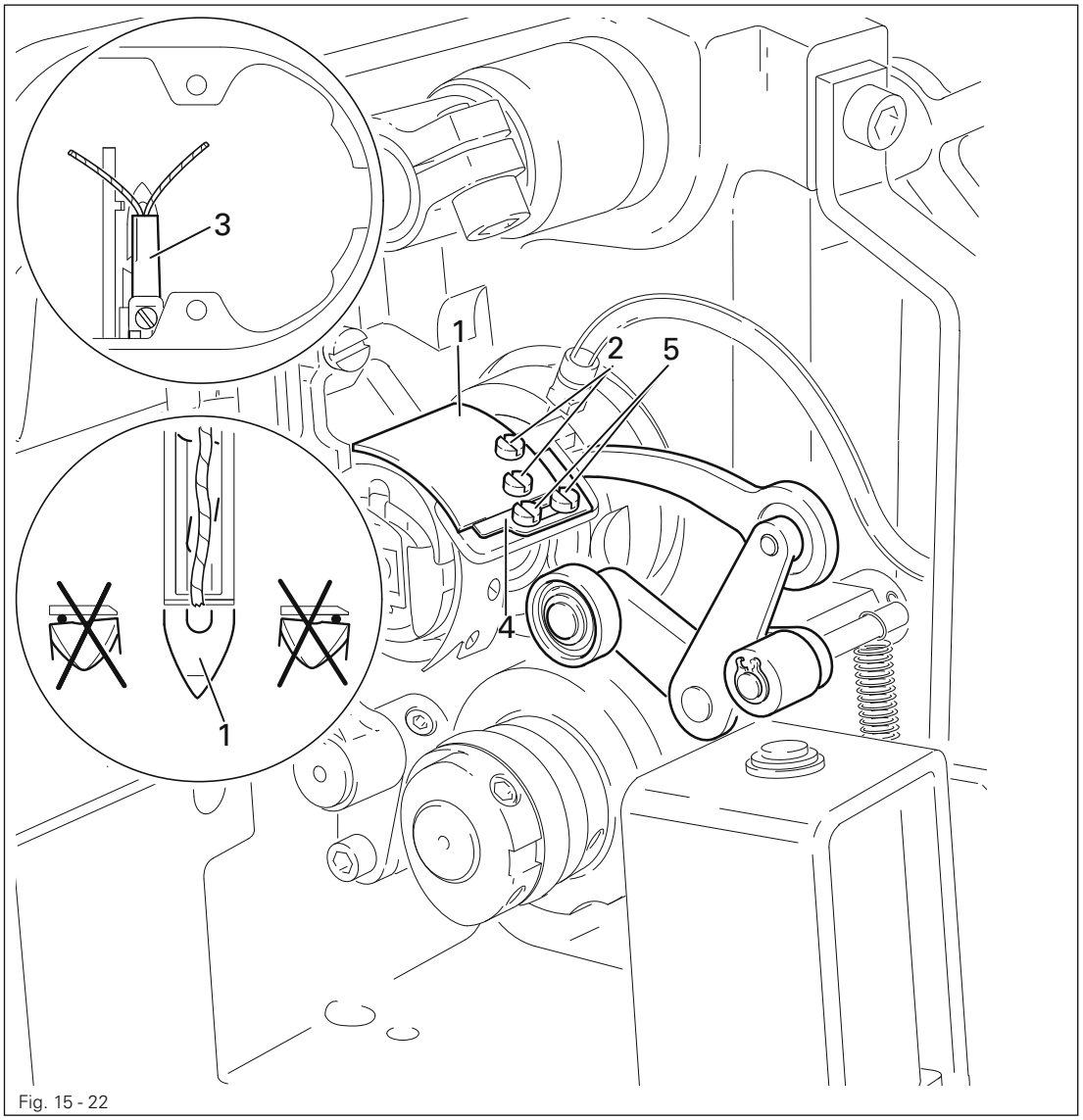


Fig. 15 - 22

- Manually move the thread catcher **1** to its front turning point.
- Pull a double-up length of thread and hook it in the thread catcher cutout.
- Carry out the cutting operation manually.
- If the threads are not cut according to the **rule**, align the thread catcher **1** (screws **2**) to the knife **3** accordingly.
- Move the stop **4** until it abuts the thread catcher **1** and tighten the screws **5**.
- **Chapter 15.07.02 Aligning thread catcher laterally**, check and adjust if necessary.

15.07.06 Needle thread tension release

Rule

1. The magnet lift should be **1.5 mm**.
2. When the solenoid **5** is operated manually, there should be a clearance of at least **0.5 mm** between the tension discs 6.

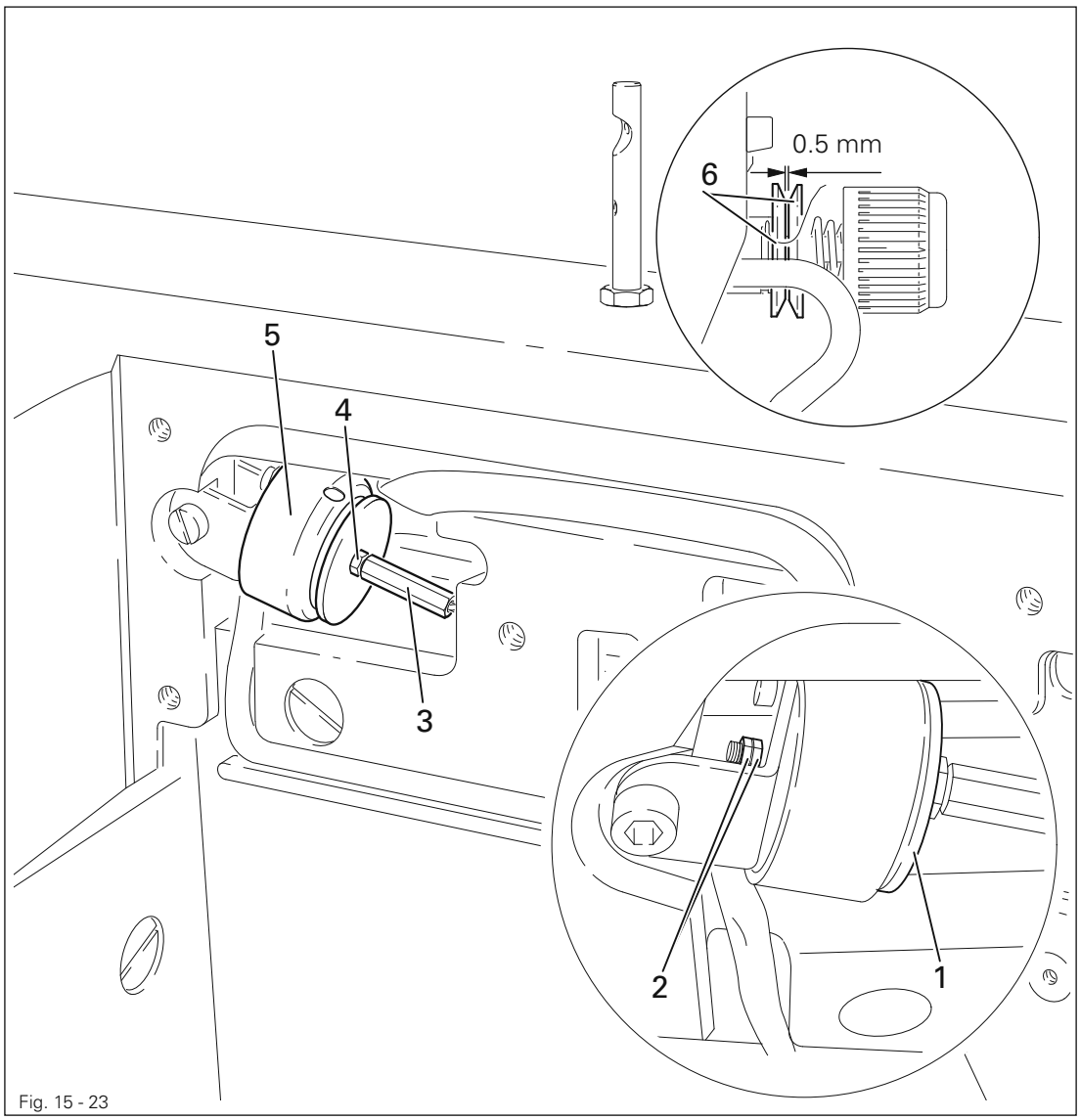


Fig. 15 - 23

- Turn the disc **1** (nuts **2**) according to **rule 1**.
- Turn the screw **3** (nut **4**) according to **rule 2**.

15.07.07 Re-calibrating control cam

Rule
When the needle bar is at t.d.c., the control cam **1** should have controlled the thread catcher **3.**

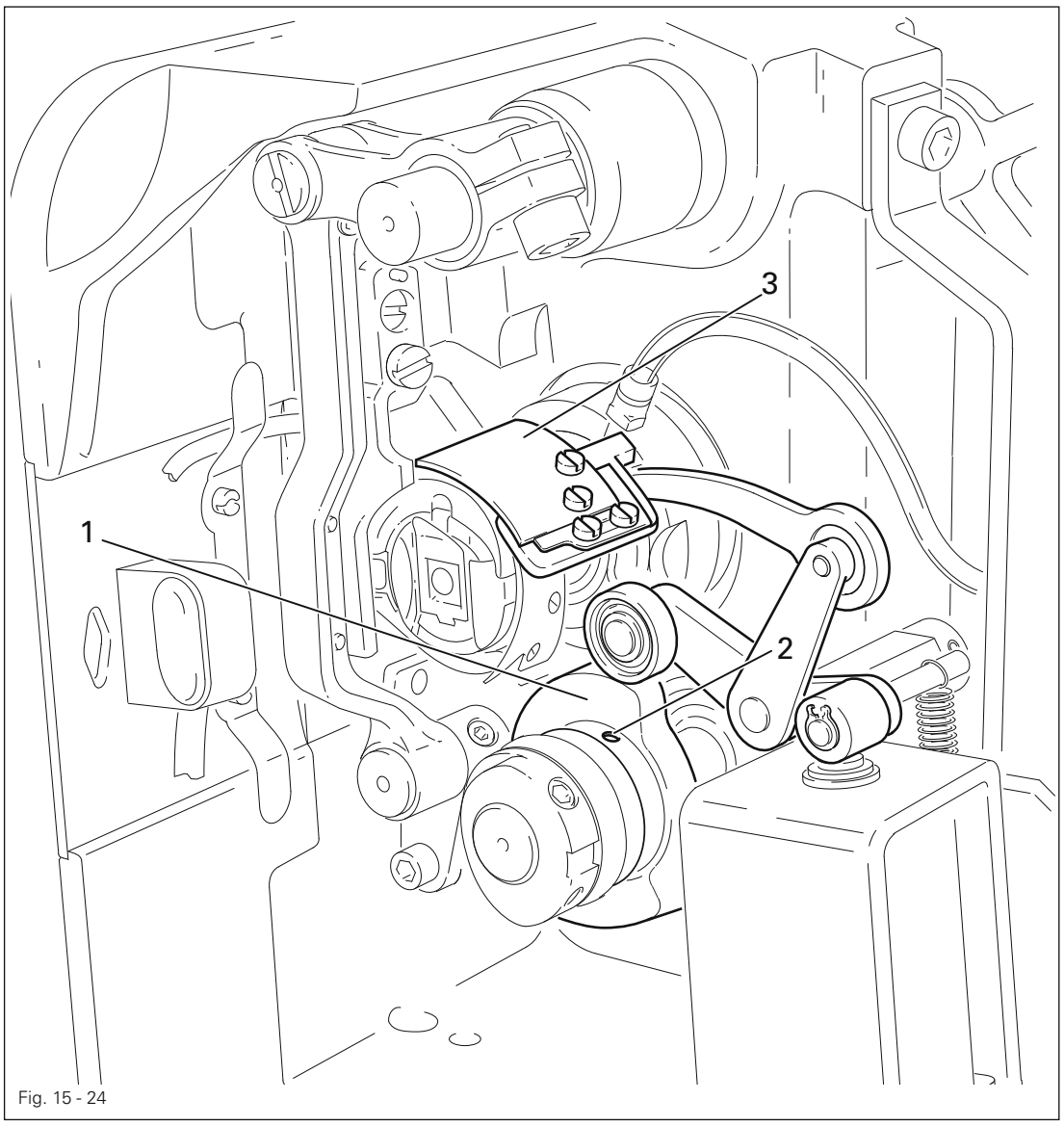


Fig. 15 - 24

● Turn the control cam **1** (screws **2**) according to the **rule**.

15.08 Aligning transmitted light transmitter

Rule
The receivers PS2 and PS1 should show the same value (same signal strength) when the sewing material is in place.

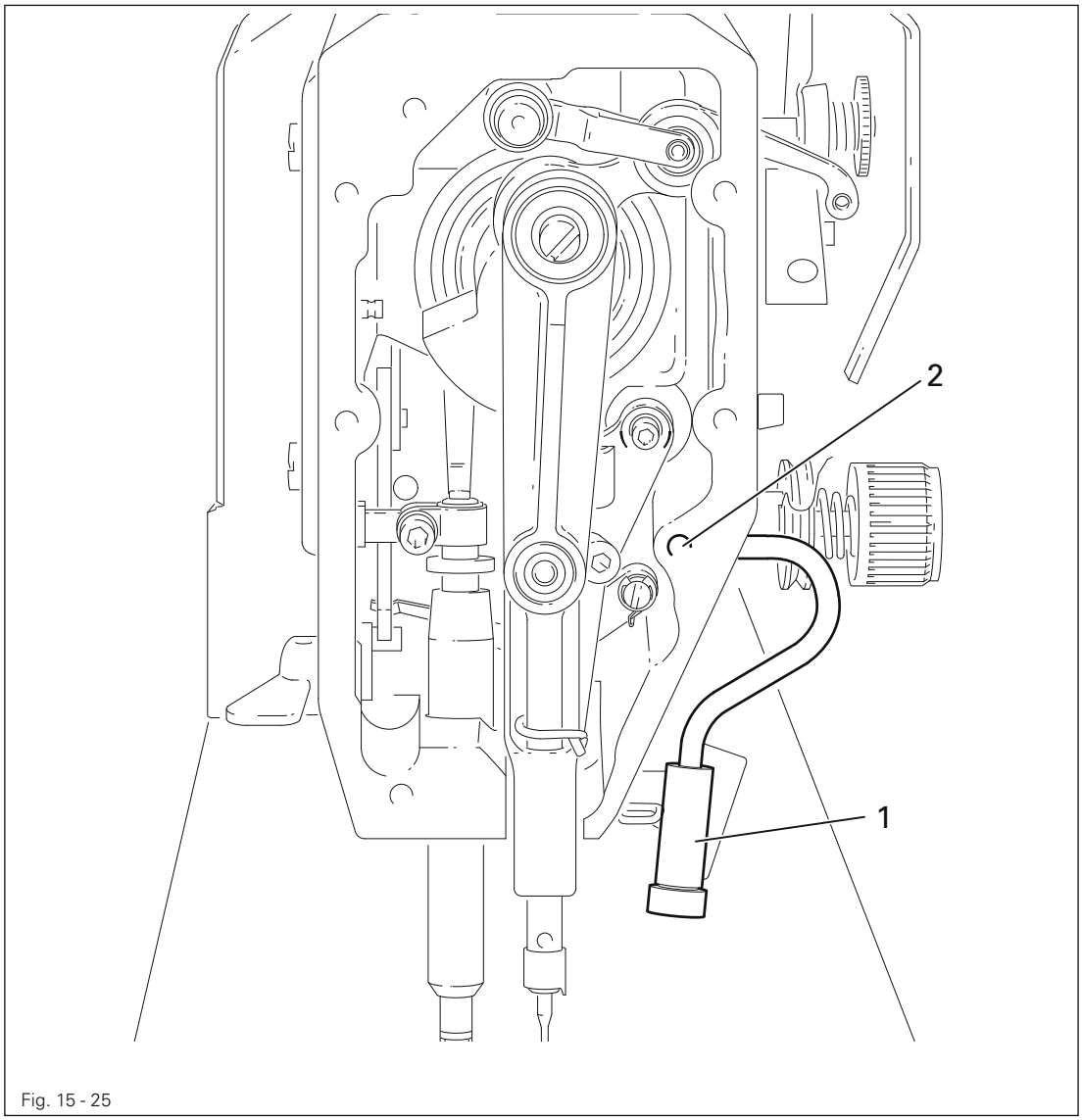
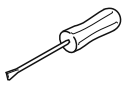


Fig. 15 - 25



- Switch the machine on.
- Call up function "PS" from the **service menu**, see **chapter 15.14 Service menu**.
- Adjust the transmitted light transmitter **1** (screw **2**) according to the **rule**.
- Switch the machine off.

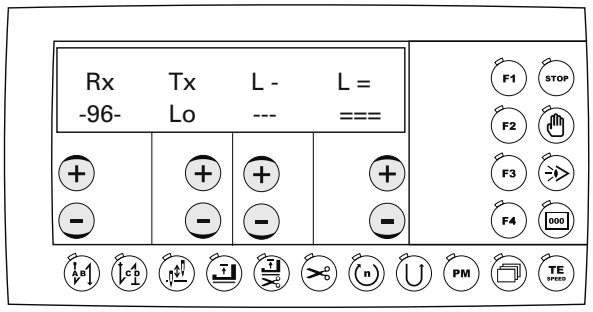
15.09 Adjusting transmitted light sensors

Rule
The difference between one and more material layers should be reliably detected.

- Switch the machine on.

F3

- Press the F3 key to call up the menu to adjust the transmitted light sensors.



- Place a single material layer under the sensors.

L -

- Press "+" using the corresponding +/- key to start the adjustment for the single material layer.
- Briefly move the material layer back and forth under the sensors.

L -

- Press "-" using the corresponding +/- key to end the adjustment for the single material layer.

- Place a double material layer under the sensors.

L =

- Press "+" using the corresponding +/- key to start the adjustment for the double material layer.
- Briefly move the material layers back and forth under the sensors.

L =

- Press "-" using the corresponding +/- key to end the adjustment for the double material layer.

Tx

- Increase or decrease the transmission power if necessary using the corresponding +/- key.

Rx

- Displays the transmission power of the upper sensor.

F3

- Press the F3 key and carry out a test seam.

- Switch the machine off.

15.10 Functional check of bobbin thread monitor

Rule
The value under "Rx" must switch between "ON" and "OFF" when the thread is drawn off (perfect transmission of the bobbin thread sensor receiving signal).

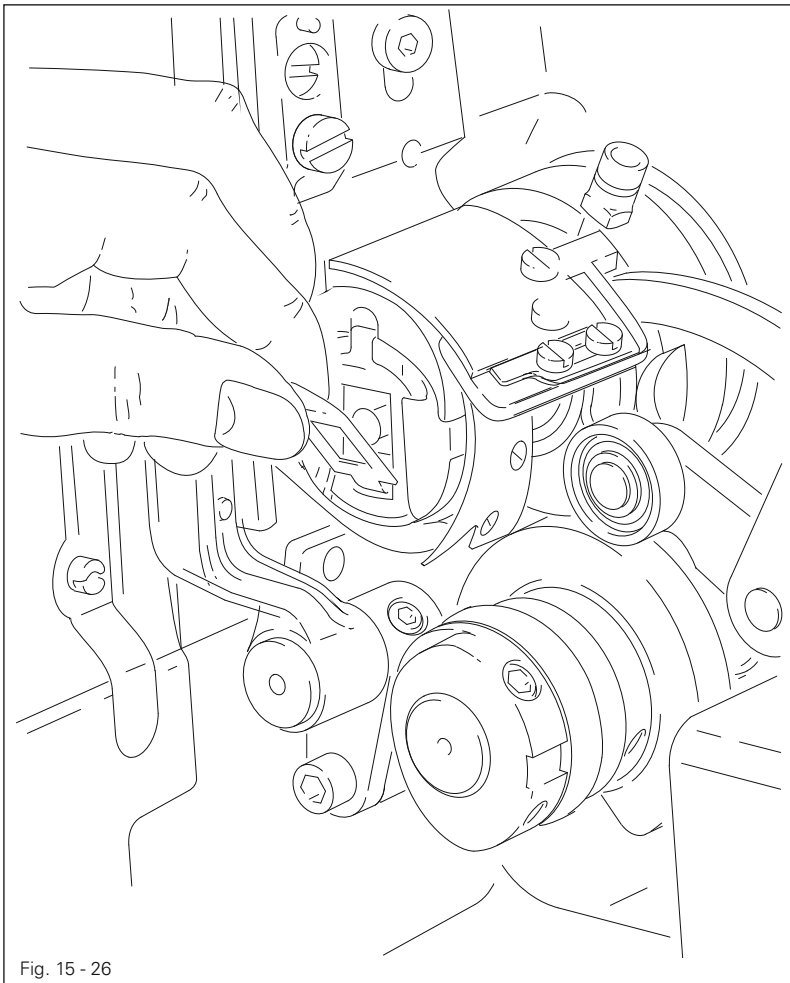
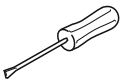


Fig. 15 - 26



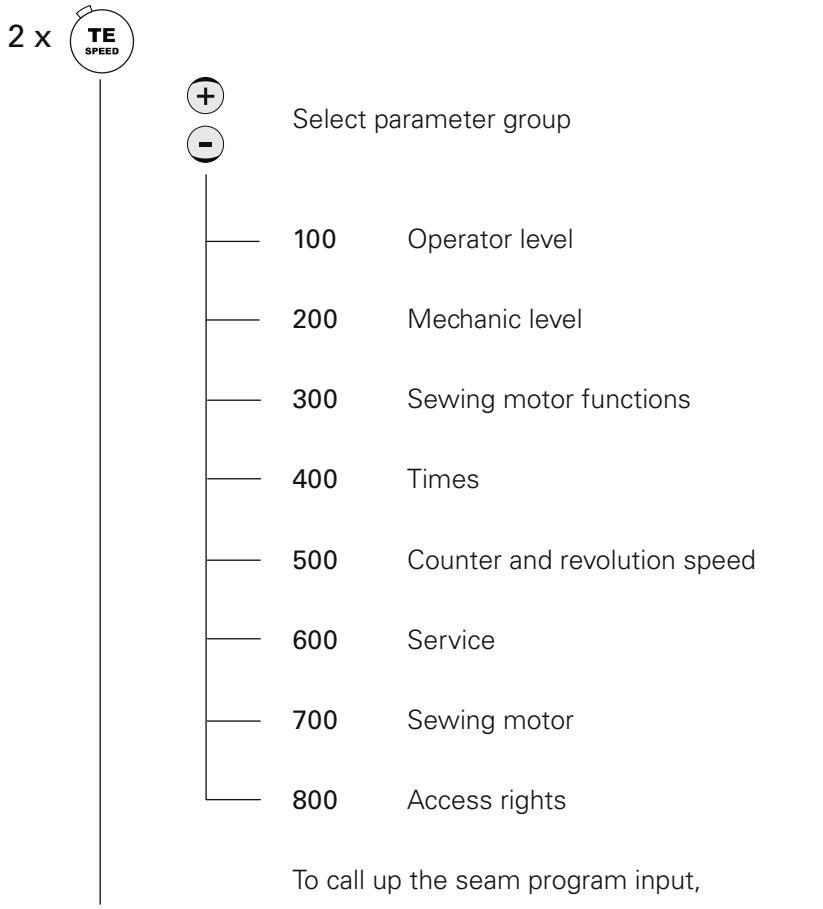
- Insert the bobbin into the bobbin case and insert the bobbin case into the hook.
- Switch the machine on.
- Call up function "**TM**" from the service menu, see **chapter 15.14 Service menu**
- Remove the thread by hand and check the **rule**.

Tx
- Increase or decrease the transmission power if necessary using the corresponding **+/- key**.
- Switch the machine off.

15.11 Parameter settings

15.11.01 Overview of parameter functions

After switching on the machine, call up the input mode in which the individual parameters can be called up by pressing the corresponding function. All parameter groups or also individual ones can be protected by a code against unauthorised access.



For a more detailed description of parameter functions,

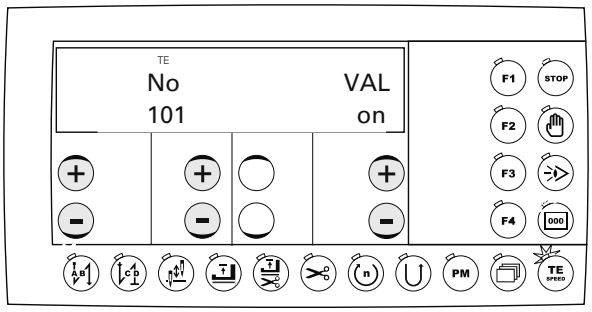
see chapter **15.11.04 List of parameters.**

15.11.02 Example of a parameter entry

- Switch the machine on.

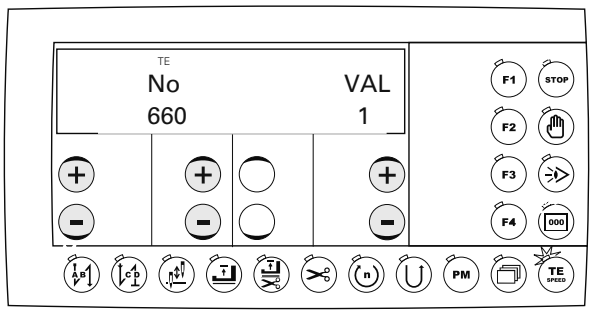
2 x TE SPEED

- Press the **TE/Speed** key twice to access the parameter entry function.
  The status text "TE" appears on the display and the pedal functions are locked to prevent an accidental start-up of the machine.



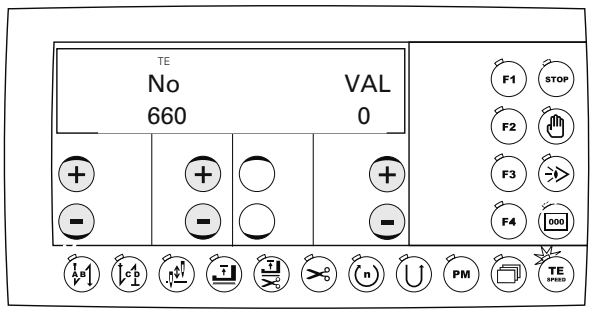
No

- Select the desired parameter, e.g. "**660**" bobbin thread monitor, by pressing the corresponding **+/-** keys.



VAL

- Set the desired value for the parameter, e.g. "**0**" to switch off the bobbin thread monitor, by pressing the corresponding **+/-** key.



TE SPEED

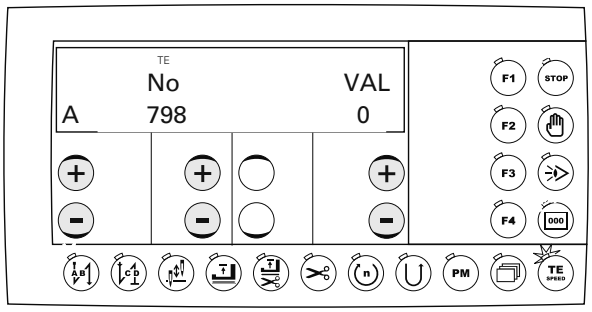
- The value is taken over and the machine switches to sewing mode by pressing the **TE/Speed** key.

15.11.03 Selecting user level

- Switch the machine on.

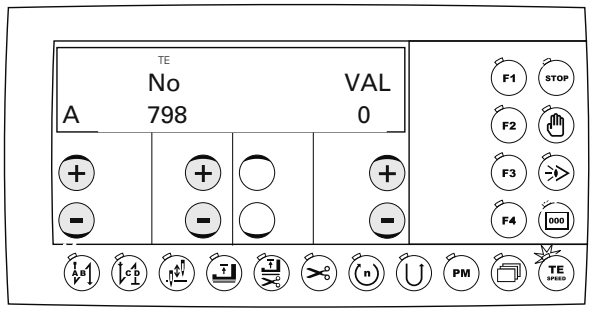
2 x TE SPEED

- Press the **TE/Speed** key twice to access the parameter entry function.
  The status text "TE" appears on the display and the pedal functions are locked to prevent an accidental start-up of the machine.



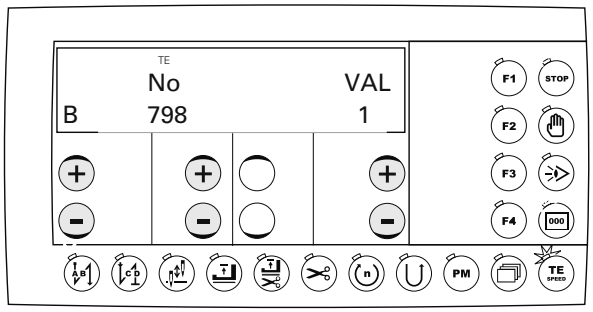
No

- Press the corresponding **+/- keys** to select Parameter "**798**".



VAL

- The standard set value is "0" (= operator level "A"). Select the desired user level by pressing the corresponding +/- keys.



"**0**" = Operator level **A**
"**1**" = Mechanic level **B**
"**11**" = Service level **C**

The user level chosen is shown by the parameter number.

TE SPEED

- Conclude the parameter input. The changed values are saved and the control unit switches to sewing mode.

After turning the main switch off and on again, it will automatically change back to operator level "**A**".

15.11.04 List of parameters

Group	Parameter	Description	User level	Setting range	Set value
0	10	Bobbin thread monitor current level	C	8 - 16	12
	11	Bobbin thread monitor stitch counter (Start value)	C	0 - 255	32
1	100	Control panel contrast [%]	A	90 - 110	100
	101	Control panel key response signal 0=tone off / 1=tone on	A	0 - 1	1
	102	Start backtack stitches forwards	C	0 - 9	3
	103	Start backtack stitches in reverse	C	0 - 9	3
	105	Start backtack speed	B	100 - 1500	900
	106	Start backtack speed: ON = pedal-controlled OFF = set with param. “105”	C	OFF - ON	OFF
	107	Pedal-controlled start backtack speed: ON = limited with parameter “105” OFF = limited with parameter “607”	C	OFF - ON	OFF
	108	End backtack stitches in reverse	C	0 - 9	3
	109	End backtack stitches forwards	C	0 - 9	3
	110	End backtack speed	B	100 - 1500	1000
	111	Stitch count of bright light barrier to seam end in manual sewing	A	1 - 255	6
	113	Start with light barrier ON = only when light barrier is dark OFF = also when light barrier is bright	B	OFF - ON	ON
	114	After light barrier or stitch counting: ON = stop OFF = autom. end backtacks and seam end	C	OFF - ON	OFF
	116	Soft starting stitches (soft start)	A	0 - 10	1
	117	Speed for soft starting stitches	B	180 - 1200	400
	148	Start backtacks ON = double / OFF = single	A	OFF - ON	ON
	149	End backtacks ON = double / OFF = single	A	OFF - ON	ON

Group	Parameter	Description	User level	Setting range	Set value
1	199	Speed for light barrier compensation stitches [min^{-1}]	B	300 - 1500	1200
2	206	Seam interrupt with pedal -2	C	OFF - ON	OFF
	220	Speed level 12 (poti-reserve) [min^{-1}]	A	300 - 5000	4500
	221	Speed limit for seam programs [min^{-1}]	B	300 - 5000	4500
	222	Speed constant for seam programs [min^{-1}]	B	300 - 5000	3000
	298	Number of reduced stitches	A	1 - 3	1
	299	Edge guide position in "manual sewing" [1/10 mm]	A	10 - 185	185
3	323	Min. edge guide position [1/10 mm]	B	10 - 50	10
	325	Max. edge guide position [1/10 mm]	B	165 - 185	185
	347	Bobbin changer 0= OFF / 1= ON	B	OFF - ON	0
	348	Bobbin changer (pick-up time in 10 ms)	B	0 - 100	20
	349	Bobbin changer (hold bobbin, activate in 10 ms)	B	0 - 100	10
	350	Bobbin changer (hold bobbin, deactivate in 10 ms)	B	0 - 100	10
4	419	Bartacks: ON = inverted OFF = suppressed	C	OFF - ON	ON
	478	Corner stitch ON = accurate OFF = quick (faster cycle time at the expense of accuracy)	C	OFF - ON	ON
	492	Number of seam programs	B	1 - 99	99
	493	Number of seam sections per seam program	B	1 - 15	25
	494	Max. number of sequences	B	1 - 15	3
	495	Max. number of program entries in the sequence	B	3 - 15	5
5	554	Presser foot after seam section with pedal forwards: ON = raised / OFF = lowered	C	OFF - ON	ON
	584	Interlock mechanism: ON = fourfold / OFF = normal	C	OFF - ON	OFF
6	601	Cutting: ON = on / OFF = off	B	OFF - ON	ON
	602	ON = Cutting with pedal -1 OFF = Cutting with pedal -2	C	OFF - ON	OFF
	603	ON = Pedal stops after cutting OFF = immediate start after seam end	C	OFF - ON	ON

Group	Parameter	Description	User level	Setting range	Set value
6	604	Cutting: ON = forwards after semi end backtack OFF = in reverse too	C	OFF - ON	ON
	605	Speed display: ON = on / OFF = off	B	OFF - ON	OFF
	606	Speed level 1 (min.) [min^{-1}]	B	30 - 550	180
	607	Speed level 12 (max.) [min^{-1}]	B	300 - 5000	4500
	609	Cutting speed [min^{-1}]	B	60 - 500	180
	618	Reverse turning angle ON = on / OFF = off	B	OFF - ON	OFF
	624	Start inhibitor: ON = on / OFF = off	C	OFF - ON	ON
	642	Presser foot time from switch-on to tension reduction (timing)	C	10 - 50	50
	651	Automatic lowering of presser foot: ON = on / OFF = off	C	OFF - ON	ON
	660	Bobbin thread monitor: 0 = off, 1 = on 2 = bobbin thread reverse counter on	A	0 - 2	1
	668	Thread wiper = 1, Thread clamp = 2, 0 = off	B	0 - 2	2
7	700	Logical zero mark [increments]	B	0 - 127	0
	702	Needle position (needle lowered)	B	0 - 30	15
	703	Needle position (take-up lever raised)	B	100 - 127	113
	705	Needle position (end of cutting signal)	B	80 - 127	98
	706	Needle position (start of cutting signal)	B	40 - 80	68
	707	Needle position (start thread tension release)	B	40 - 80	70
	710	Needle position (needle raised without cutting)	B	80 - 127	106
	715	Operating time of thread wiper [ms]	B	0 - 2550	120
	718	Moment of standstill brake (rest brake)	B	0 - 100	0

Group	Parameter	Description	User level	Setting range	Set value
7	719	Sewing foot holding current	B	0 - 50	40
	720	Cutting holding current	B	0 - 50	40
	721	Feed converter holding current	C	0 - 50	40
	722	Acceleration ramp: 1 = flat / 50 = steep	C	1 - 50	50
	723	Brake ramp: 1 = flat / 50 = steep	C	4 - 50	50
	729	Start delay after lowering the sewing foot [ms]	B	0 - 2550	120
	730	Lift delay for sewing foot after seam end [ms]	B	0 - 2550	0
	731	Stitch count delay for end backtacks	C	0 - 2550	70
	732	Holdoff time for cutting after simple end backtack [ms]	C	0 - 2550	30
	733	Holdoff time from switch-on feed reverse to speed start [ms]	C	0 - 200	30
	739	Holdoff time for speed after start backtack or stitch condensation [ms]	C	0 - 2550	200
	740	Stitch count delay for end backtacks [ms]	C	0 - 2550	60
	760	Stitch count to bobbin thread monitor (machine stop in needle lowered position)	A	0 - 50000	1000
	761	Extension of thread tension release/ thread tensioning [ms]	B	0 - 2550	0
	791	Stitch count delay for start backtacks [ms]	C	0 - 2550	30
	797	Hardware test: ON = on / OFF = off	B	OFF - ON	OFF
	798	User level: 0 = Operator level A 1 = Mechanic level B 11 = Service level C	A	0 - 255	0

Group	Parameter	Description	User level	Setting range	Set value
7	799	Machine class: 1 = 2481 (2 to 4 = other machine classes)	C	1 - 4	1
8	800	Rotating direction of motor	C	OFF - ON	ON
	801	Reverse turning angle (618 = ON)	C	5 - 106	16
	831	Start delay for stepping motor 2 [increments]	B	0 - 10	5
	832	Needle position (feed start)	B	0 - 127	15
	833	Needle position (feed end)	B	0 - 127	67
	834	Feed regulator balance [1 semi-step = 5/100mm]	B	-5 - 5	0
	835	Reduced single stitch [%]	A	0 - 100	50
	843	Distance sensor 1 to sensor 2 [1/10 mm]	B	75 - 85	80
	844	Distance sensor 1 to needle [2/10 mm]	B	80 - 300	200
	845	Speed-controlled stitch length adjustment [% pro 1000 min^{-1}]	B	0 - 3	1
	846	Feed regulator characteristic line adjustment for forward stitch length [%]	A	80 - 110	▲
	847	Feed regulator characteristic line adjustment for reverse stitch length [%]	A	80 - 110	▲
	849	Maximum stitch length [1/10 mm]	A	0 - 60	25
	862	Current for stepping motor axis 1	C	16 - 63	32
	863	Current for current reduction of stepping motor axis 1	C	8 - 63	32
	864	Stepping motor axis 1 Standstill duration of edge guide (pause between 2 movements in ms)	B	0 - 2500	20

▲ = factory set

Group	Parameter	Description	User level	Setting range	Set value
8	880	Starting current main drive	C	1 - 10	8
	881	Filter parameter for position controller	C	0 - 12	5
	884	Proportional amplification of speed control (general)	C	1 - 50	25
	885	Integral amplification of speed control	C	0 - 50	35
	886	Proportional amplification of position controller	C	1 - 50	30
	887	Differential amplification of position controller	C	1 - 50	30
	889	Time for position control (0 = always)	C	0 - 2550	200
	890	Proportional amplification of higher ranking speed controller for standstill brake (rest brake)	C	1 - 50	25
	891	Proportional amplification of subordinate speed controller for standstill brake (rest brake)	C	1 - 50	20
9	901	Cutting release speed	C	180 - 500	400
	956	Current for stepping motor axis 2	B	30 - 63	56
	957	Current for current reduction of stepping motor axis 2	B	15 - 48	39
	958	Current reduction time stepping motor axis 2	B	0 - 2500	2000
	978	Current reduction time stepping motor 2	C	0 - 99	0
	979	Current reduction time stepping motor 1	C	0 - 99	0
	985	Position for thread clamp on	B	0 - 127	34
	986	Position for thread clamp off	B	0 - 127	103

15.12 Error messages and description

Error	Description
ERROR: 1	Pedal not at neutral position
ERROR: 3	SM 1 Edge guide (for reference)
ERROR: 4	SM 2 Feed regulator (for reference)
ERROR: 5	Control panel
ERROR: 6	OTE
ERROR: 7	Can node missing (if bobbin changer can node is missing)
ERROR: 8	Zig-zag sensor
ERROR: 9	Starting lock-out at standstill
ERROR: 10	Wrong machine class
ERROR: 20	Incorrect software version on BDF - P1
ERROR: 27	SD card
ERROR: 40	Transmitted light sensors
ERROR: 45	Bobbin thread monitor
ERROR: 46	Bobbin changer if timeout
ERROR: 47	Bobbin changer empty (if magazine is empty)
ERROR: 48	Bobbin changer error with can node suberror
ERROR: 60	Power supply 24 V too low
ERROR: 61	Power supply 24 V too high
ERROR: 62	Short circuit 24 V
ERROR: 63	Overload switch power supply
ERROR: 92	Start inhibitor when motor running
ERROR: 97	SM 1
ERROR: 98	SM 2
ERROR: 100	Non-maskable interrupt
ERROR: 151	System
ERROR: 155	Sewing motor
ERROR: 156	Timeout communication
ERROR: 157	Stepping motor ramps
ERROR: 158	Stepping motor frequency

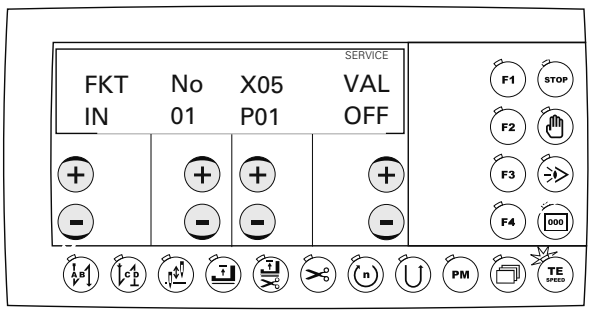
15.13 Sewing motor errors

Error	Description
ERROR: 34	Brake path too short
ERROR: 35	Communication
ERROR: 64	Mains monitor
ERROR: 65	Excess current directly after mains on
ERROR: 66	Short circuit
ERROR: 67	Mains off
ERROR: 68	Excess current during operation
ERROR: 69	No increments
ERROR: 70	Motor blocked
ERROR: 71	No incremental encoder connector
ERROR: 73	Faulty motor operation
ERROR: 75	Control locked
ERROR: 170	Transmission invalid
ERROR: 171	Zero mark invalid
ERROR: 173	Motor blocked in 1st stitch
ERROR: 175	Internal starting error
ERROR: 222	Dead man monitoring

15.14 Service menu

The service functions provide assistance during troubleshooting and commissioning. After calling up the input mode using the **TE/Speed** key, call up the menu for selecting the service functions by pressing the **F1** key if you have the appropriate authorisation (access level G or C). The status text "Service" appears in the display after calling up the service functions.

- Switch the machine on.
- Press the **TE/Speed** key to call up the input mode.
- Press the **F1** key within **5** seconds to call up the service functions.



FCT The individual service functions are displayed under "**FCT**" and can be selected using the corresponding **+/- key**.

Overview of the service functions

FCT	Explanation
IN	Read inputs The number of the input "No" can be selected using the corresponding **+/- key**.
OUT	Set/reset outputs The number of the output "No" can be selected and set accordingly "VAL" (ON/OFF) using the corresponding **+/- keys**.
PED	Read pedal nominal value transmitter
POS	Read main drive position
SM1	Move stepping motor SM1 (edge guide) Positions the edge guide in the position entered by selecting the type "POS" and entering the desired value using the corresponding **+/- keys**. The edge guide is moved to the reference position by selecting the type "REF" and confirming the selection using the corresponding **+/- keys**.

FCT	Explanation
SM2	Move stepping motor SM2 (feed regulator) Positions the feed regulator in the position entered by selecting the type "POS" and entering the desired value using the corresponding +/- keys. The feed regulator is moved to the reference position by selecting the type "REF" and confirming the selection using the corresponding +/- keys.
DM	Set main drive Positions the main drive in the position entered by selecting the type "POS" and entering the desired value using the corresponding +/- keys. The value for the speed is changed accordingly by selecting the type "SPD" and entering the desired value using the corresponding +/- keys. The value for the stitch count is changed accordingly by selecting the type "SC" and entering the desired value using the corresponding +/- keys.
RES	Perform a reset The values for all parameters are reset (master reset) by selecting the type "PAR" and confirming the selection using the corresponding +/- keys. All seam programs are deleted by selecting the type "PRG" and confirming the selection using the corresponding +/- keys.
TM	Set bobbin thread monitor The transmission power of the bobbin thread monitor "Tx" can be changed using the corresponding +/- key.
PS	Set transmitted light sensors The transmission power of the transmitted light sensors "Tx" can be changed (Lo/Hi) using the corresponding +/- key.
VER	Display software version

15.15 Internet update of machine software

The machine software can be updated using PFAFF flash-programming. The PFP-boot program as well as the corresponding control software for the machine type must be installed on a PC for this purpose. The PC and machine control unit must be connected to an appropriate null modem cable (order no. **91-291 998-91**) to transmit data to the machine.

The PFP-boot program and the control software for the machine type can be downloaded from the PFAFF-homepage using the following path:

www.pfaff-industrial.de/pfaff/de/service/downloads

Proceed as follows to update the machine software:

No set-up, maintenance or adjustment work on the machine must be carried out whilst updating the machine software!

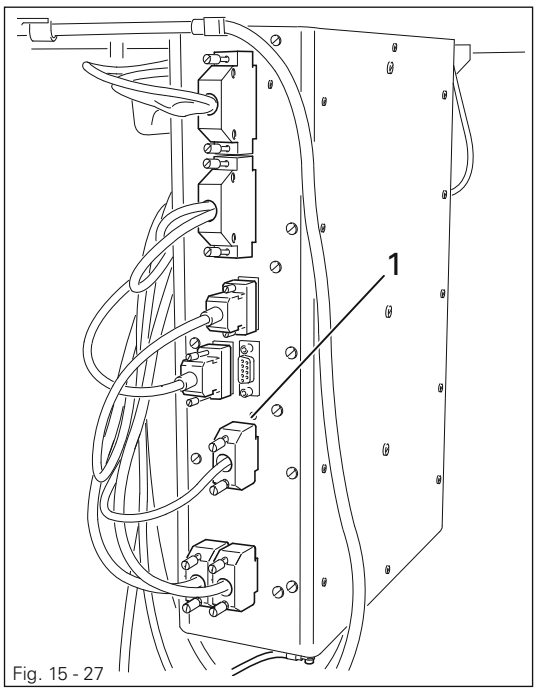


Fig. 15 - 27

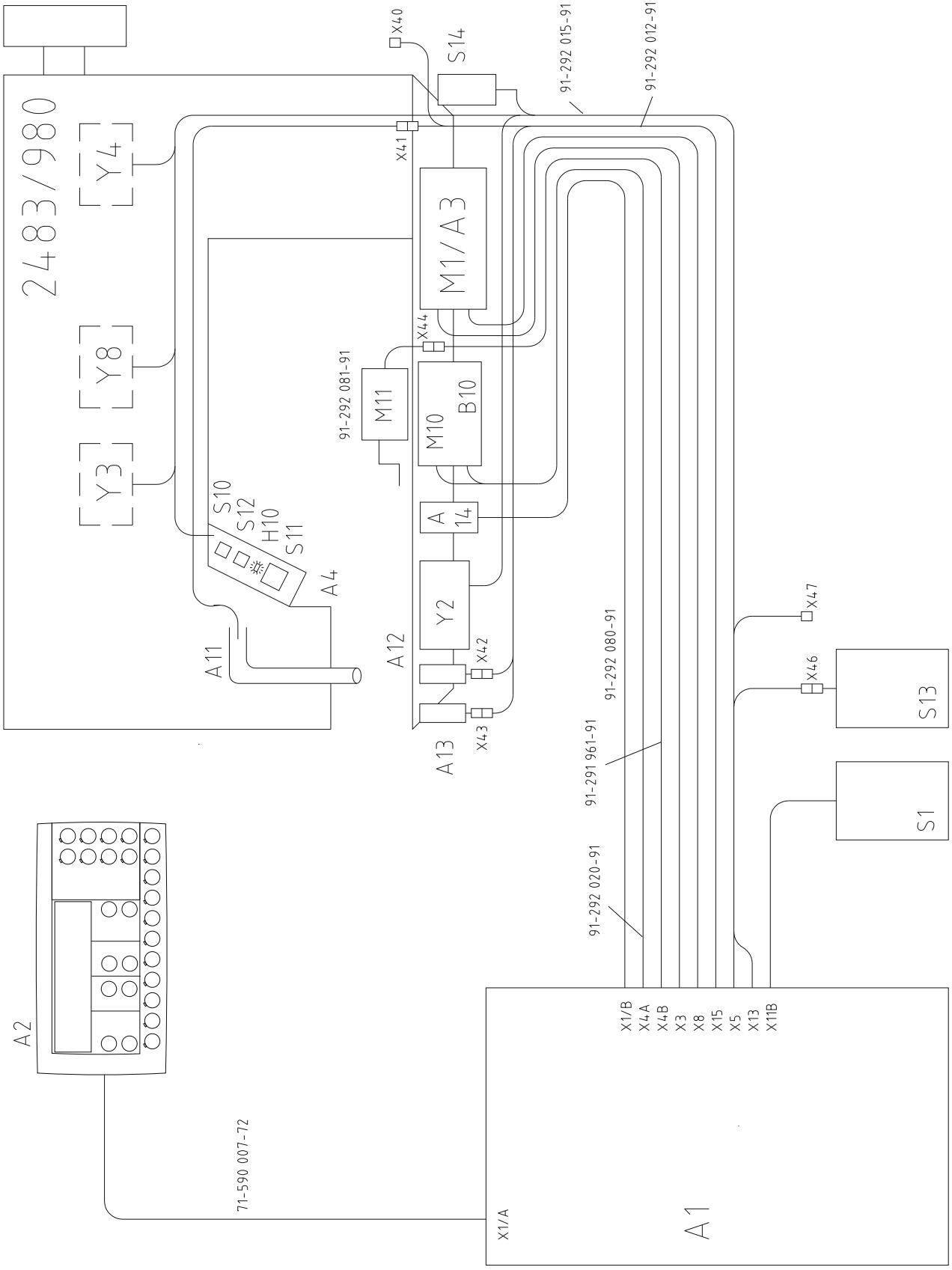
- Switch the machine off.
- Establish a connection between the PC (serial interface or corresponding USB adapter) and the machine control unit (RS**232**) by loosening the control panel connector. Switch on the PC and start the PFP-boot program.
- Select the machine type.
- Press the "Programming" button.
- Press and hold the boot key **1** and switch on the machine.
- Press the "OK" button.
  The software update is conducted and the progress of the update can be determined from the bar graph display of the PFP-boot program.

- The machine must not be switched off during the update.
- Switch off the machine and end the PFP-boot program when the update is completed.
- Release the plug-in connection between the PC and machine control unit and plug the control panel back into the machine control unit.
- Switch the machine on.
  Perform a plausibility check and carry out a cold start if necessary.

Further information and assistance can be found in the file "PFPHILFE.TXT", which can be called up by pressing the "Help" button from the PFP-boot program.

16 Circuit Diagrams

16.01 Block diagram of PFAFF 2483 with control unit P322 ED

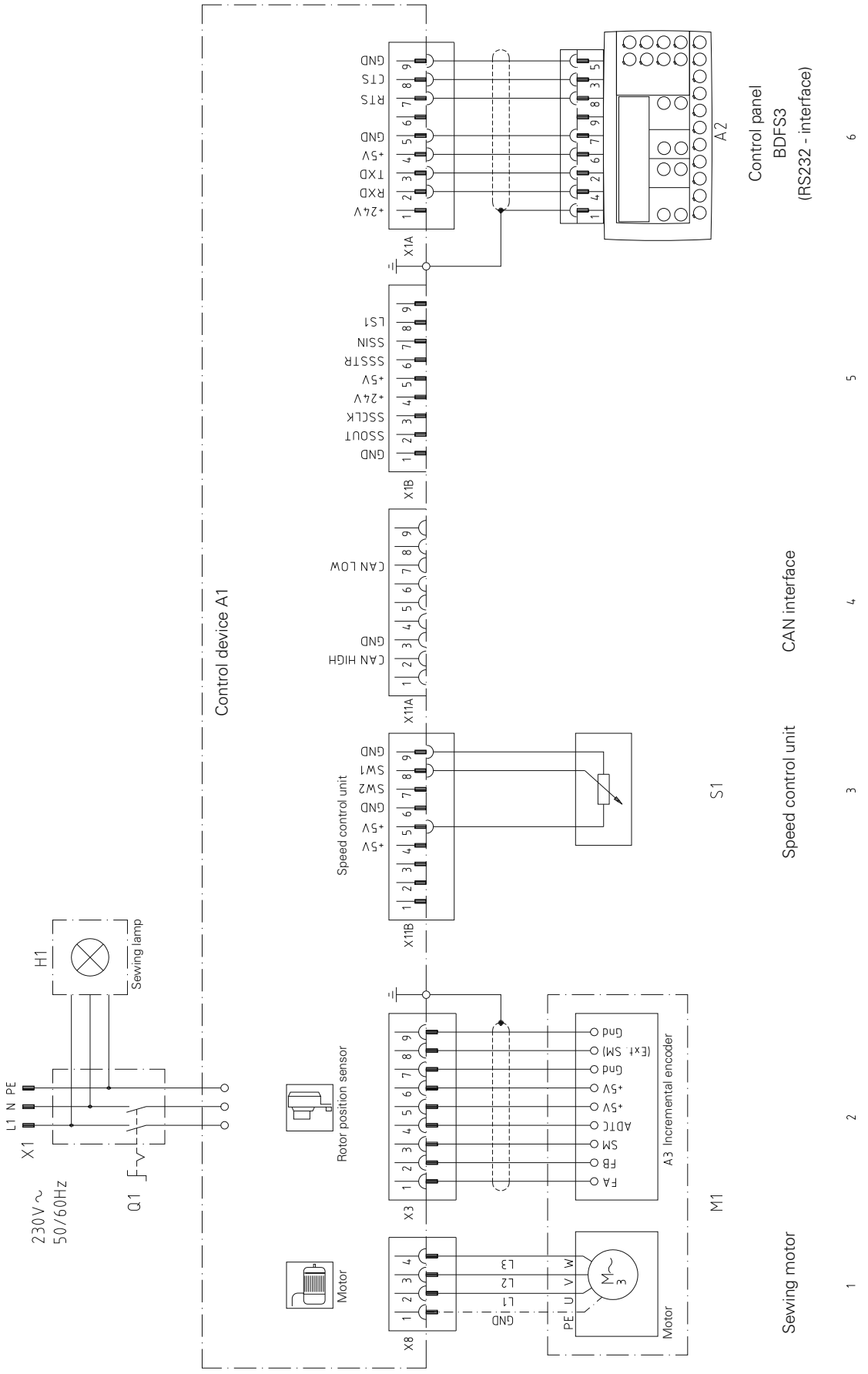


16.02 Circuit diagrams

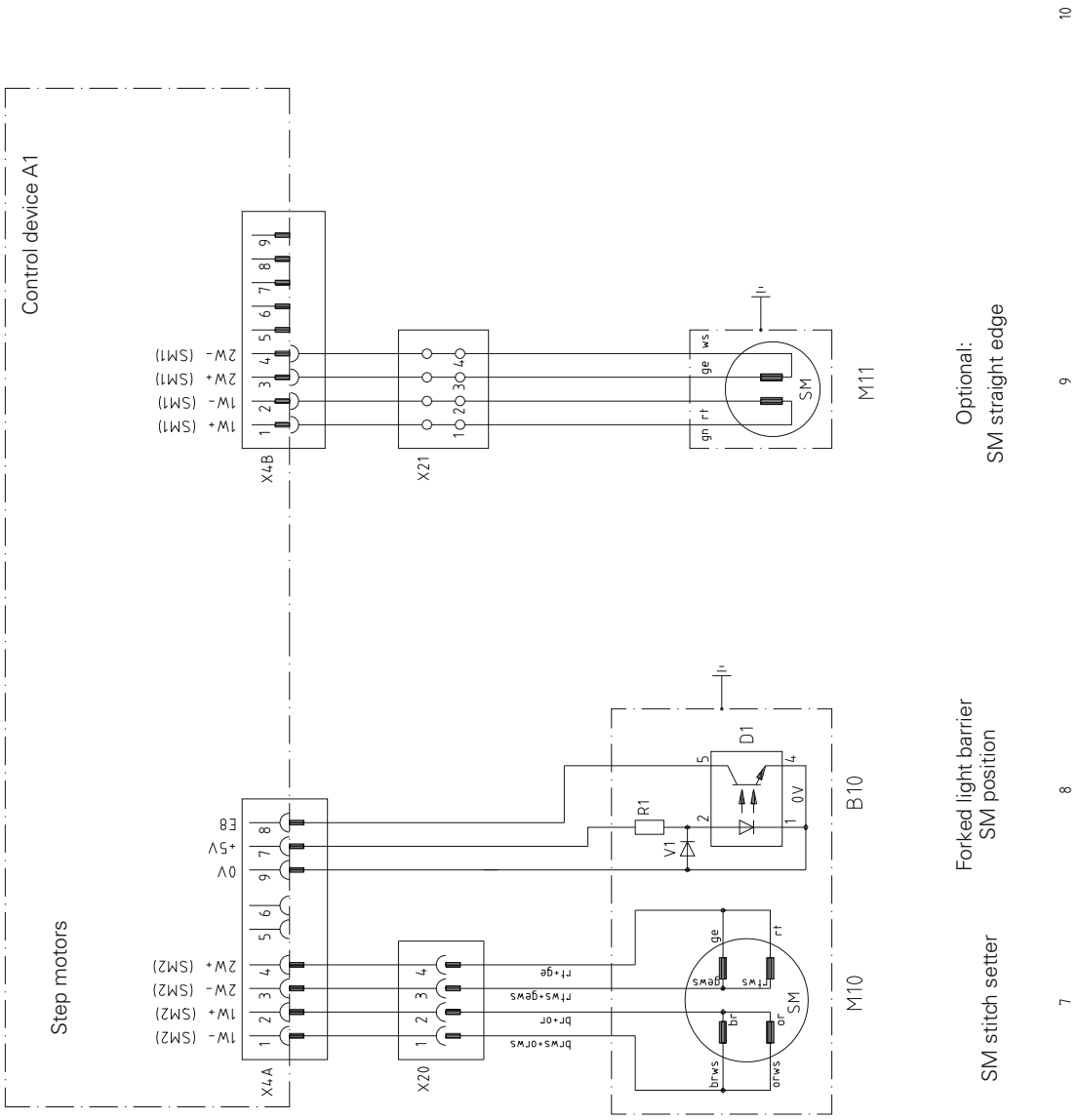
Reference list for circuit diagrams 91-191 454-95

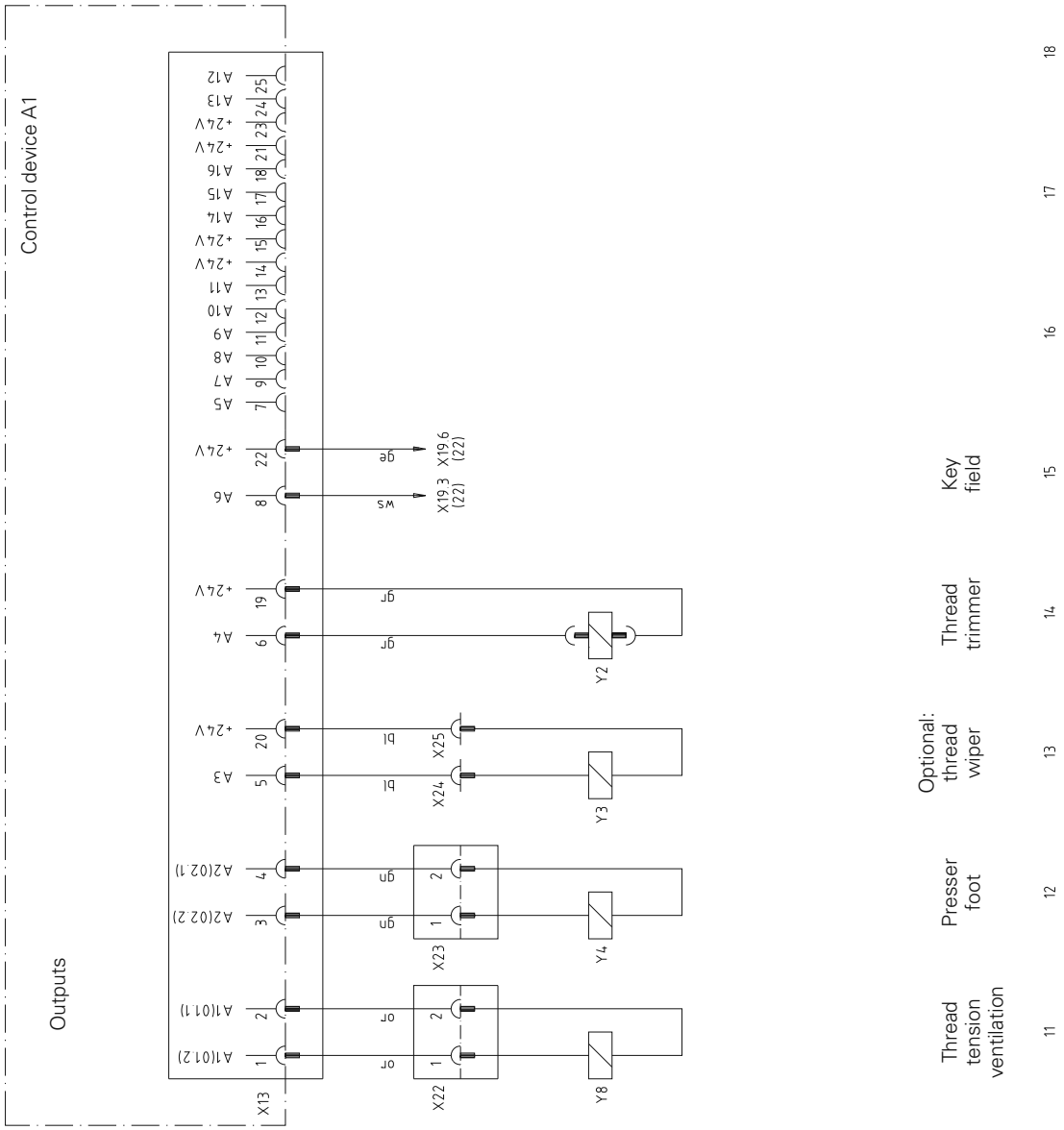
A1	Control device P322 ED
A2	Operating panel BDF S3
A3	Incremental encoder (included in M1)
A4	Key field
A11	Transmitted light transmitter
A12	Transmitter light receiver
A13	Bobbin thread monitor
A14	Sewing head detection
S1	Nominal value transmitter
S10	Single stitch (included in A4)
S11	Hand operation front (bartack) (included in A4)
S12	Needle position (included in A4)
S13	Knee switch (single stitch)
S14	Starting lock-out
S15	Knee switch 2
H1	Sewing lamp
H10	Bobbin thread alarm (included in A4)
Q1	Main switch
M1	Sewing motor
M10	Stepping motor (feed regulator)
M11	Stepping motor (edge guide)
B10	Forked light barrier (included in M10)
Y2	900 (Thread trimmer)
Y3	WI (Thread wiper device)
Y4	PFA (Presser foot)
Y8	FSL (Thread tension ventilation)
X40	Zig-zag sensor
X41	DLS - Transmitted light transmitter
X42	DLE - Transmitted light receiver
X43	UFW - Bobbin thread monitor

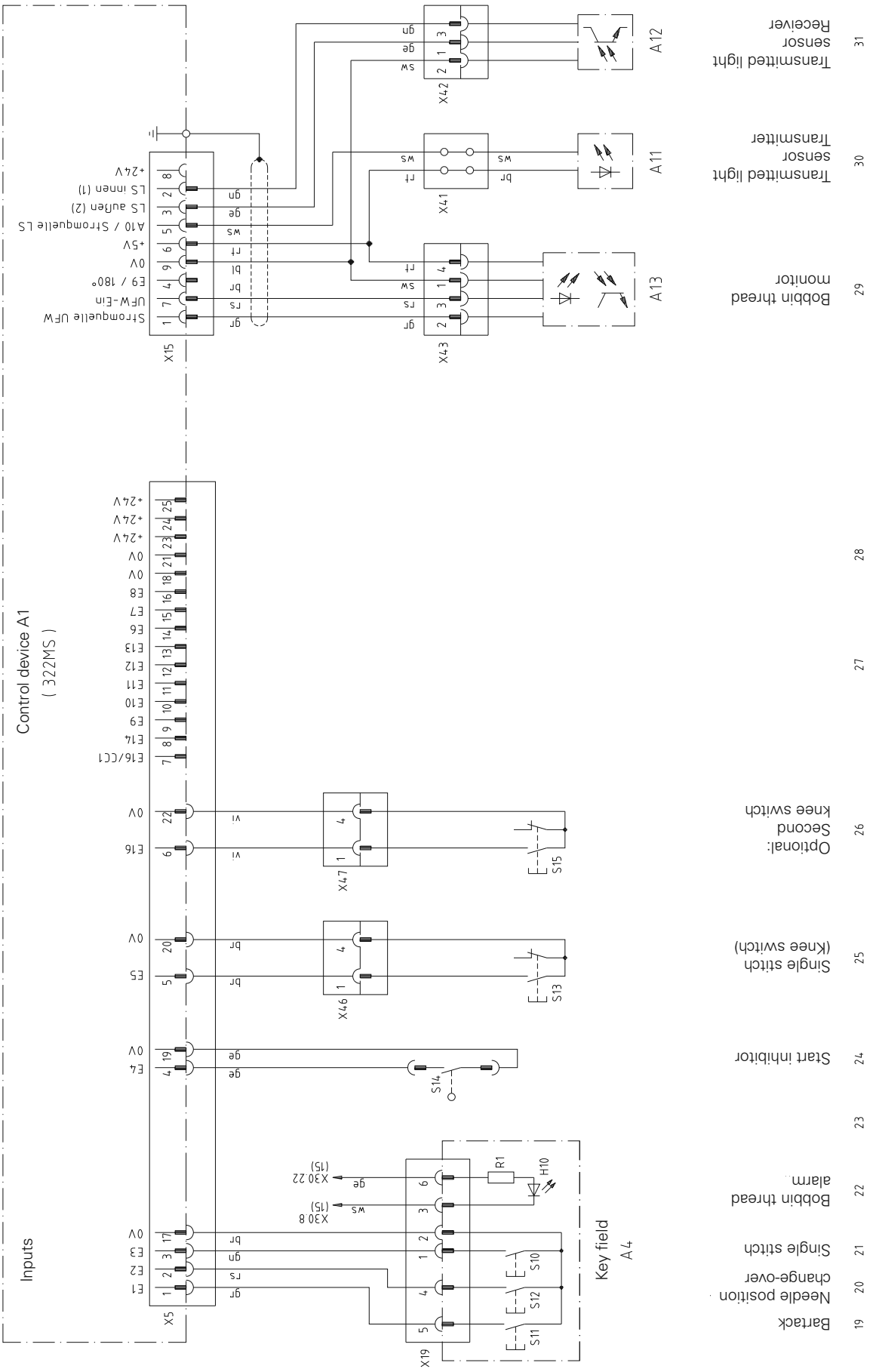
91-191 454-95 Part 1 Version 11/05/2016 Circuit diagram



Circuit diagram Version 11/05/2016 91-191 454-95 Part 2




Control device A1
Outputs
X13
A12
A13
+24V
+24V
A16
A15
A14
+24V
+24V
A11
A10
A9
A8
A7
A5
+24V
A6
+24V
A4
+24V
A3
A2(02 1)
A2(02 2)
A1(01 1)
A1(01 2)
X22
X23
X24
X25
Y2
Y3
Y4
Y8
X19.3 (22)
X19.6 (22)
Key field
Thread trimmer
Optional: thread wiper
Presser foot
Thread tension ventilation
11
12
13
14
15
16
17
18


Control device A1
(322MS)
Inputs
X5
X15
X19
X41
X42
X43
X46
X47
A4
Key field
A11
A12
A13
S10
S11
S12
S13
S14
S15
R1
H10
Stromquelle UFW
UFW-Ein
E9 / 180°
0V
+5V
A10 / Stromquelle LS
LS außen (2)
LS innen (1)
+24V
E1
E2
E3
E4
E5
E6
E7
E8
E9
E10
E11
E12
E13
E14
E16/CC1
E16
Transmitted light sensor Receiver
Transmitted light sensor Transmitter
Bobbin thread monitor
Optional: Second knee switch
Single stitch (Knee switch)
Start inhibitor
Bobbin thread alarm
Single stitch
Needle position change-over
Bartack
19
20
21
22
23
24
25
26
27
28
29
30
31

16.03 Plug connections

CAN

Pin no.	Comment	Function	Connector name	Signal name
X11A.2	CAN	CAN-	CAN_HIGH	CAN_TxD
X11A.3	CAN			Gnd
X11A.7	CAN	CAN+	CAN_LOW	CAN_RxD

Nominal value transmitter

Pin no.	Comment	Function	Connector name	Signal name
X11B.4	Pedal			+5V
X11B.5	Pedal			+5V
X11B.6	Pedal			Gnd
X11B.7	Pedal 2	Setpoint		SW2 (analog)
X11B.8	Pedal 1	Setpoint		SW1 (analog)
X11B.9	Pedal			Gnd

Sensors

Pin no.	Comment	Function	Connector name	Signal name
X15.1	Sensors	Power source UFW		P7.3
X15.2	Sensors	DLS external (LS2)		P5.3 (analog)
X15.3	Sensors	DLS internal (LS1)		P5.6 (analog)
X15.4	Sensors	Zig-zag sensor 2438	E9	E9/Port_E9
X15.5	Sensors	Power source DLS	A10/PortA10	O10
X15.6	Sensors		+5V	+5V
X15.7	Sensors	UFW-Out		UFW_MESS
X15.8	Sensors		+24V	+24V
X15.9	Sensors		0V	0V

RS232

Pin no.	Comment	Function	Connector name	Signal name
X1A.1	BDF-S3		+24V	+24V
X1A.2	BDF-S3		RxD	RxD
X1A.3	BDF-S3		TxD	TxD
X1A.4	BDF-S3		+5V	+5V
X1A.5	BDF-S3		Gnd	Gnd
X1A.6	BDF-S3		-	
X1A.7	BDF-S3		RTS	RTS
X1A.8	BDF-S3		CTS	CTS
X1A.9	BDF-S3		Gnd	Gnd

OTE

Pin no.	Comment	Function	Connector name	Signal name
X1B.1	OTE			Gnd
X1B.2	OTE	SSI-Out (TxD)		SSOut
X1B.3	OTE	SSI-Clock		SSClk
X1B.4	OTE			+24V
X1B.5	OTE			+5V
X1B.6	OTE	SSI-Strobe (Mode)		SSStr
X1B.7	OTE	SSI-In (RxD)		SSIn
X1B.8	OTE	(Light barrier 1)		(LS1)
X1B.9	OTE			

Incremental encoder

Pin no.	Comment	Function	Connector name	Signal name
X3.1	IncrEncod	Track A 256Incr/rev.		FA_MINI
X3.2	IncrEncod	Track B 256Incr/rev.		FB_MINI
X3.3	IncrEncod	SyMa 360°/256		
X3.4	IncrEncod	Autodetect		ADTC
X3.5	IncrEncod			+5V
X3.6	IncrEncod			+5V
X3.7	IncrEncod			Gnd
X3.8	IncrEncod	Ext. SyMa 180°		EXTSM_MINI
X3.9	IncrEncod			Gnd

Stepping motor 1 (edge guide)

Pin no.	Comment	Function	Connector name	Signal name
X4B.1	SM1/FSL	Phase A.2	A11	
X4B.2	SM1/FSL	Phase A.1	A12	
X4B.3	SM1	Phase B.2	A21	
X4B.4	SM1	Phase B.1	A22	
X4B.5	SM1			
X4B.6	SM1			
X4B.7	SM1	+5V (with 120R?)		
X4B.8	SM1	Reference SM1	SM_REF1	SM_REF1
X4B.9	SM1	Gnd		

Stepping motor 2 (stitch length)

Pin no.	Comment	Function	Connector name	Signal name
X4A.1	SM2	Phase A.2	B11	
X4A.2	SM2	Phase A.1	B12	
X4A.3	SM2	Phase B.2	B21	
X4A.4	SM2	Phase B.1	B22	
X4A.5	SM2			
X4A.6	SM2			
X4A.7	SM2	+5V (with 120R?)		
X4A.8	SM2	Reference SM2	SM_REF2	SM_REF2
X4A.9	SM2	Gnd		

Outputs

Pin no.	Comment	Function	Connector name	Signal name
X13.01	PWM	FSL-solenoid(Y8)	A1	O1.1
X13.02		FSL-solenoid(Y8+)	A1	O1.2
X13.03	PWM	PFH-solenoid(Y4)	A2	O2.1
X13.04		PFH-solenoid(Y4+)	A2	O2.2
X13.05		WI-solenoid(Y3)	A3	O3
X13.06	PWM	SN-solenoid(Y2)	A4	O4
X13.07			A5	O5
X13.08		RAFI-LED(H1)	A6	O6
X13.09			A7	O7
X13.10			A8	O8
X13.11			A9	O9
X13.12	(from DX)	Power source DLS	A10/PortA10	O10
X13.13			A11	O11
X13.14			+24V	+24V
X13.15			+24V	+24V
X13.16			A14	O14
X13.17			A15	O15
X13.18			A16	O16
X13.19		SN-solenoid(Y2+)	+24V	+24V
X13.20		WI-solenoid(Y3+)	+24V	+24V
X13.21			+24V	+24V
X13.22		RAFI-LED(H1+)	+24V	+24V
X13.23			+24V	+24V
X13.24			A13	O13
X13.25			A12	O12

Inputs

Pin no.	Comment	Function	Connector name	Signal name
X5.01		TUM switch-key(S1)	E1	E7
X5.02		NPW switch-key(S2)	E2	E8
X5.03		EST switch-key(S2)	E3	E2
X5.04		ANLSP switch(S14)	E4	E4
X5.05		EST knee switch(S13)	E5	E5
X5.06		Knee switch 2	E15	E15
X5.07			E16	E16
X5.08			E14	E14
X5.09	(from DX)	Zig-zag sensor 2438	E9	E9/Port_E9
X5.10			E10	E10
X5.11			E11	E11
X5.12			E12	E12
X5.13			E13	E13
X5.14			E6	E6
X5.15			E7	E1
X5.16			E8	E3
X5.17		S1-S2-S3(Gnd)	0V	0V
X5.18			0V	0V
X5.19		ANLSP switch(Gnd)	0V	0V
X5.20		EST knee switch(Gnd)	0V	0V
X5.21			0V	0V
X5.22			0V	0V
X5.23			+24V	+24V
X5.24			A16	Output_A16
X5.25			+24V	+24V

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