

PFAFF

2481 *plusline*

Instruction Manual

This instruction manual applies to machines from the following serial numbers onwards:

2210889 →



This Instruction Manual is valid for all models and subclasses listed in the chapter " **Specifications** ".

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Contents		Chapter - Page
1	Safety	1 - 1
1.01	Directives	1 - 1
1.02	General notes on safety	1 - 1
1.03	Safety symbols	1 - 2
1.04	Important points for the user	1 - 2
1.05	Operating and specialist personnel	1 - 3
1.05.01	Operating personnel	1 - 3
1.05.02	Specialist personnel	1 - 3
1.06	Danger	1 - 4
2	Proper use	2 - 1
3	Specifications	3 - 1
3.01	PFAFF 2481	3 - 1
3.02	Work aids for the various models	3 - 2
4	Disposal of machine	4 - 1
5	Transport, packaging and storage	5 - 1
5.01	Transport to the customer's premises	5 - 1
5.02	Transport within the customer's premises	5 - 1
5.03	Disposal of the packaging	5 - 1
5.04	Storage	5 - 1
6	Explanation of the symbols	6 - 1
7	Control elements	7 - 1
7.01	On/off switch	7 - 1
7.02	Keys on the machine head	7 - 1
7.03	Pedal	7 - 2
7.04	Lever for lifting the presser foot	7 - 2
7.05	Knee switch	7 - 3
7.06	Switch for thread wiping device –909/04 (optional)	7 - 3
7.07	Control panel	7 - 4
7.07.01	Displays on the screen	7 - 4
7.07.02	Function keys below the display screen	7 - 4
7.07.03	Further functions	7 - 4
8	Mounting and commissioning the machine	8 - 1
8.01	Mounting	8 - 1
8.01.01	Adjusting the table-top height	8 - 1
8.01.02	Start inhibitor	8 - 2
8.01.03	Connecting the plug connections and earthing wire	8 - 3
8.01.04	Mounting the spool holder	8 - 3
8.02	Commissioning	8 - 4
8.03	Switching the machine on/off	8 - 4
8.04	Table top cutout	8 - 5

Contents		Chapter - Page
9	Preparation	9 - 1
9.01	Inserting the needle	9 - 1
9.02	Winding the bobbin thread, adjusting the thread tension	9 - 2
9.03	Removing/Inserting the bobbin case	9 - 3
9.04	Inserting the bobbin case / Adjusting the bobbin thread tension	9 - 3
9.05	Threading the needle thread / Adjusting the needle thread tension	9 - 4
9.06	Setting the stitch length	9 - 5
9.07	Setting the edge guide distance	9 - 5
9.07.01	Mechanically adjustable edge guide	9 - 5
9.07.02	Electrically adjustable edge guide (for manual sewing)	9 - 6
9.08	Selecting the seam program	9 - 6
10	Sewing	10 - 1
10.01	Manual sewing	10 - 1
10.02	Programmed sewing	10 - 2
11	Input	11 - 1
11.01	Entering seam programs	11 - 1
11.02	Example of how to enter a seam with rectangular edges	11 - 2
11.03	Approximate values for the seam depth of corner stitches	11 - 6
11.04	Example of how to enter a seam with corner stitches	11 - 7
12	Care and Maintenance	12 - 1
12.01	Cleaning the machine	12 - 1
12.02	Topping up the oil tank	12 - 2
13	Adjustment	13 - 1
13.01	Notes on adjustment	13 - 1
13.02	Tools, gauges and other accessories for adjusting	13 - 1
13.03	Abbreviations	13 - 1
13.04	Control and adjustment aids	13 - 2
13.05	Adjusting the basic machine	13 - 3
13.05.01	Basic position of the machine drive unit	13 - 3
13.05.02	Preadjusting the needle height	13 - 4
13.05.03	Neutral position of the bottom feed dog	13 - 5
13.05.04	Neutral position of the needle feed dog	13 - 6
13.05.05	Feeding motion of the bottom feed dog	13 - 7
13.05.06	Feeding motion of the needle feed dog	13 - 8
13.05.07	Needle in needle hole centre	13 - 9
13.05.08	Lifting stroke of the bottom feed dog	13 - 10
13.05.09	Height of the bottom feed dog	13 - 11
13.05.10	Hook shaft bearing and backlash	13 - 12
13.05.11	Hook lubrication	13 - 13
13.05.12	Needle rise, hook-to-needle clearance, needle height and bobbin case position finger ..	13 - 14

Contents		Chapter - Page
13.05.13	Thread check spring and slack thread regulator	13 - 16
13.05.14	Sewing foot clearance	13 - 17
13.05.15	Adjusting the stitch length	13 - 18
13.05.16	Bobbin winder	13 - 19
13.05.17	Stitch length limitation	13 - 20
13.05.18	Presser foot pressure	13 - 21
13.05.19	Modifying the needle bar stroke	13 - 22
13.06	Adjusting the thread trimming device	13 - 23
13.06.01	Setting the solenoid	13 - 23
13.06.02	Lateral alignment of the thread catcher	13 - 24
13.06.03	Knife position	13 - 25
13.06.04	Front point of reversal of the thread catcher	13 - 26
13.06.05	Manual trimming check	13 - 27
13.06.06	Needle thread tension release	13 - 28
13.06.07	Readjusting the control cam	13 - 29
13.07	Adjusting the thread wiper -909/04	13 - 30
13.07.01	Thread wiper movement	13 - 30
13.07.02	Thread wiper position	13 - 31
13.08	Adjusting the sensor	13 - 32
13.08.01	Distance of the sensor from the needle	13 - 32
13.08.02	Setting the sensor	13 - 33
13.09	Adjusting the electric edge guide	13 -
34		
13.10	Parameter settings	13 - 35
13.10.01	Selecting and altering parameters	13 - 35
13.10.02	List of parameters	13 - 36
13.11	Error messages	13 - 39
14	Wearing parts	14 - 1
15	Reference list for the circuit diagrams	15 - 1

1 Safety

1.01 Directives

This machine is constructed in accordance with the European regulations contained in the conformity and manufacturer's declarations.

In addition to this Instruction Manual, also observe all generally accepted, statutory and other regulations and legal requirements and all valid environmental protection regulations!

The regionally valid regulations of the social insurance society for occupational accidents or other supervisory organizations are to be strictly adhered to!

1.02 General notes on safety

- This machine may only be operated by adequately trained operators and only after having completely read and understood the Instruction Manual!
- All Notes on Safety and Instruction Manuals of the motor manufacturer are to be read before operating the machine!
- The danger and safety instructions on the machine itself are to be followed!
- This machine may only be used for the purpose for which it is intended and may not be operated without its safety devices. All safety regulations relevant to its operation are to be adhered to.
- When exchanging sewing tools (e.g. needle, roller presser, needle plate and bobbin), when threading the machine, when leaving the machine unattended and during maintenance work, the machine is to be separated from the power supply by switching off the On/Off switch or by removing the plug from the mains!
- Everyday maintenance work is only to be carried out by appropriately trained personnel!
- Repairs and special maintenance work may only be carried out by qualified service staff or appropriately trained personnel!
- Work on electrical equipment may only be carried out by appropriately trained personnel!
- Work is not permitted on parts and equipment which are connected to the power supply! The only exceptions to this rule are found in the regulations EN 50110.
- Modifications and alterations to the machine may only be carried out under observance of all the relevant safety regulations!
- Only spare parts which have been approved by us are to be used for repairs! We expressly point out that any replacement parts or accessories which are not supplied by us have not been tested and approved by us. The installation and/or use of any such products can lead to negative changes in the structural characteristics of the machine. We are not liable for any damage which may be caused by non-original parts.

1.03 Safety symbols



Danger!
Points to be observed.



Danger of injury for operating and specialist personnel!



Caution

Do not operate without finger guard and safety devices. Before threading, changing bobbin and needle, cleaning etc. switch off main switch.

1.04 Important points for the user

- This Instruction Manual is an integral part of the machine and must be available to the operating personnel at all times.
- The Instruction Manual must be read before operating the machine for the first time.
- The operating and specialist personnel is to be instructed as to the safety equipment of the machine and regarding safe work methods.
- It is the duty of the user to only operate the machine in perfect running order.
- It is the obligation of the user to ensure that none of the safety mechanisms are removed or deactivated.
- It is the obligation of the user to ensure that only authorized persons operate and work on the machine.

Further information can be obtained from your PFAFF agent.

1.05 Operating and specialist personnel

1.05.01 Operating personnel

Operating personnel are persons responsible for the equipping, operating and cleaning of the machine as well as for taking care of problems arising in the sewing area.

The operating personnel is required to observe the following points and must:

- always observe the Notes on Safety in the Instruction Manual!
- never use any working methods which could adversely affect the safety of the machine!
- not wear loose-fitting clothing or jewelry such as chains or rings!
- also ensure that only authorized persons have access to the potentially dangerous area around the machine!
- always immediately report to the person responsible any changes in the machine which may limit its safety!

1.05.02 Specialist personnel

Specialist personnel are persons with a specialist education in the fields of electrics, electronics and mechanics. They are responsible for the lubrication, maintenance, repair and adjustment of the machine.

The specialist personnel is obliged to observe the following points and must:

- always observe the Notes on Safety in the Instruction Manual!
- switch off the On/Off switch before carrying out adjustments or repairs, and ensure that it cannot be switched on again unintentionally!
- wait until the luminous diode on the control box is no longer blinking or on before beginning adjustment or repair work.
- never work on parts which are still connected to the power supply! Exceptions are explained in the regulations EN 50110.
- replace the protective coverings and close the electrical control box after all repairs or maintenance work!

1.06

Danger



A working area of 1 meter is to be kept free both in front of and behind the machine while it is in operation so that it is always easily accessible.



Never reach into the sewing area while sewing! Danger of injury by the needle!



Never leave objects on the table while adjusting the machine settings! Objects can become trapped or be slung away! Danger of injury!

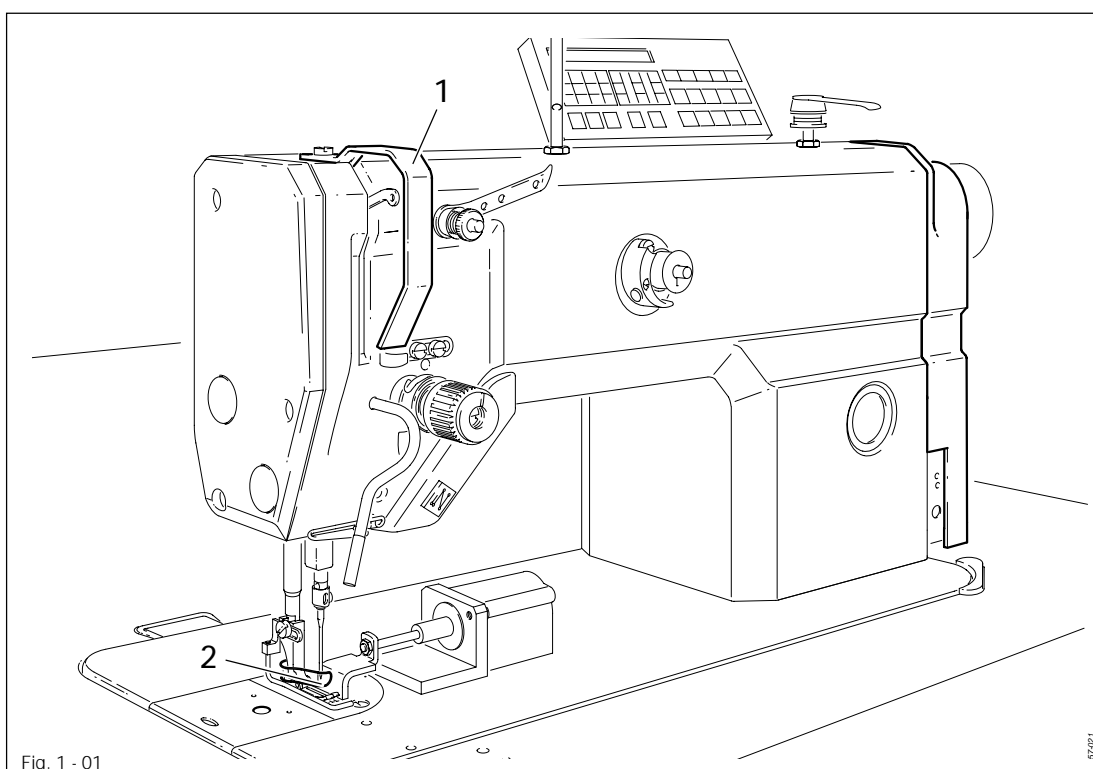


Fig. 1 - 01



Do not operate the machine without its take-up lever guard 1!
Danger of injury due to the motion of the take-up lever!



Do not operate the machine without the finger guard 2!
Danger of injury by the needle!

2

Proper use

The PFAFF 2481 is an ultra high-speed, single-needle sewing machine with needle and bottom feed, as well as sensor control for recognising the material edge.

The machines are used in industry for sewing lockstitch seams.



Any and all uses of this machine which have not been approved of by the manufacturer are considered to be inappropriate! The manufacturer cannot be held liable for any damage caused by the inappropriate use of the machine! The appropriate use of the machine includes the observance of all operational, adjustment, maintenance and repair measures required by the manufacturer!

3 Specifications ▲

3.01 PFAFF 2481

Stitch type: 301 (lockstitch)

Needle system: 134 KK

Needle size in 1/100 mm:

Model A: 60 - 70

Model B: 80 - 100

Handwheel eff. dia.: 65 mm

Presser foot clearance: 9 - 13 mm

Clearance width: 260 mm

Clearance height: 125 mm

Bed plate dimensions: 476 x 177 mm

Sewing head dimensions:

Length: approx. 550 mm

Width: approx. 180 mm

Height (above table): approx. 300 mm

Max. speed:

Model N 3.5 3.5 mm

Model N 4.5 mm

Max. speed:

with 30 mm needle bar stroke: 4500 s.p.m. ♦

with 36 mm needle bar stroke: 3800 s.p.m. ♦

Needle bar stroke: 30 or 36 mm

Connection data:

Operating voltage: 190 - 240 V 50/60 Hz, single phase

Max. power consumption: 400 VA

Fuse protection: 1 x 16 A, inert

Working noise level:

Emission level at workplace at a speed of 3200 spm.: 81 dB(A)

(Noise measurement in accordance with DIN 45 635-48-A-1)

Net weight of sewing head: approx. 30 kg

Gross weight of sewing head: approx. 38 kg

▲ Subject to alteration

♦ Depending on the stitch length, the maximum speed is automatically reduced within the range of the max. pre-set value.

Specifications

3.02 Work aids for the various models

Model A: for sewing with fine materials

Model B: for sewing medium-weight materials

Work aids:

Sub-class -909/04 Thread wiping device

4 Disposal of machine

- The proper disposal of the machine is the responsibility of the customer.
- The materials used in the machines are steel, aluminium, brass and various plastics. The electrical equipment consists of plastics and copper.
- The machine is to be disposed of in accordance with the locally valid environmental protection regulations. If necessary, a specialist is to be commissioned.



Special care is to be taken that parts soiled with lubricants are separately disposed of in accordance with the locally valid pollution control regulations!

Transport, packaging and storage

5 Transport, packaging and storage

5.01 Transport to the customer's premises

Within Germany, machines with a table are delivered without packaging. Machines without a table (sewing head only) and machines which are to be exported are packaged.

5.02 Transport within the customer's premises

The manufacturer bears no liability for transport within the customer's premises or to the individual locations of use. Make sure that the machines are always transported upright.

5.03 Disposal of the packaging

The packaging of these machines consists of paper, cardboard and VCE fiber. The proper disposal of the packaging is the responsibility of the customer.

5.04 Storage

The machine can be stored for up to 6 months if not in use. During this time it should be protected from dust and moisture.

For longer storage the individual parts of the machine, especially the moving parts, must be protected from corrosion, e.g. by a film of oil.

6 Explanation of the symbols

In the following section of this Instruction Manual, certain tasks or important pieces of information are accentuated by symbols.

The symbols used have the following meanings:



Note, information



Cleaning, care



Lubrication, greasing

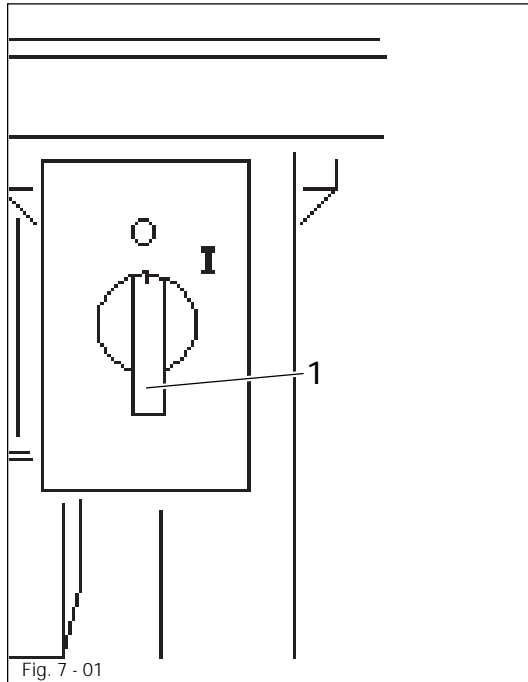


Servicing, repairing, adjustment, maintenance
(only to be carried out by specialist personnel)

Control elements

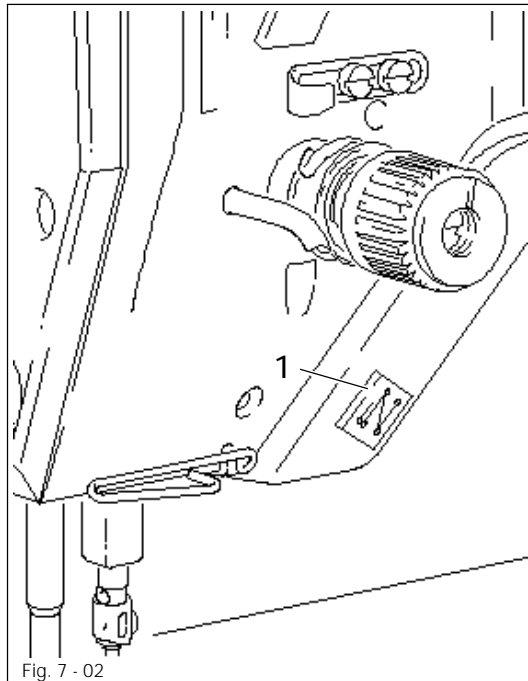
7 Control elements

7.01 On/off switch



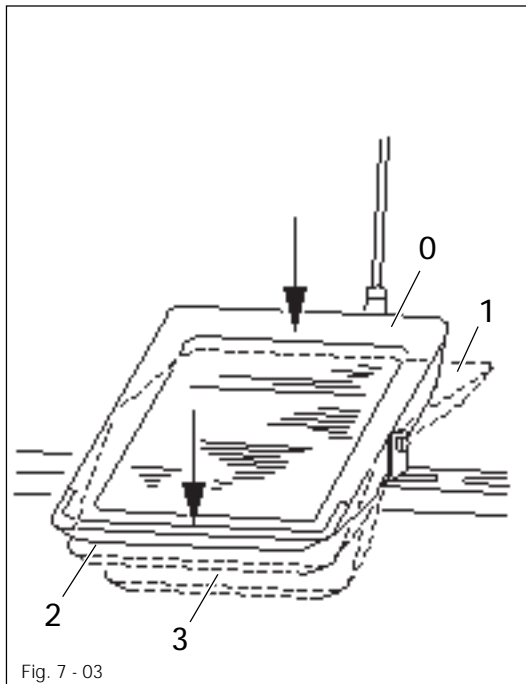
- The machine can be switched on or off by turning the on/off switch 1.

7.02 Keys on the machine head



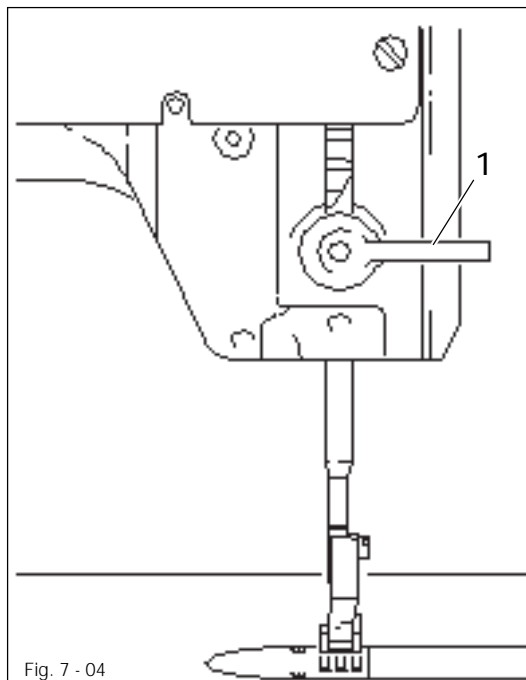
- The machine switches over to reverse sewing when key 1 is operated during sewing.

7.03 Pedal



- 0 = Neutral position
- 1 = Sewing
- 2 = Raise presser foot
- 3 = Trim thread

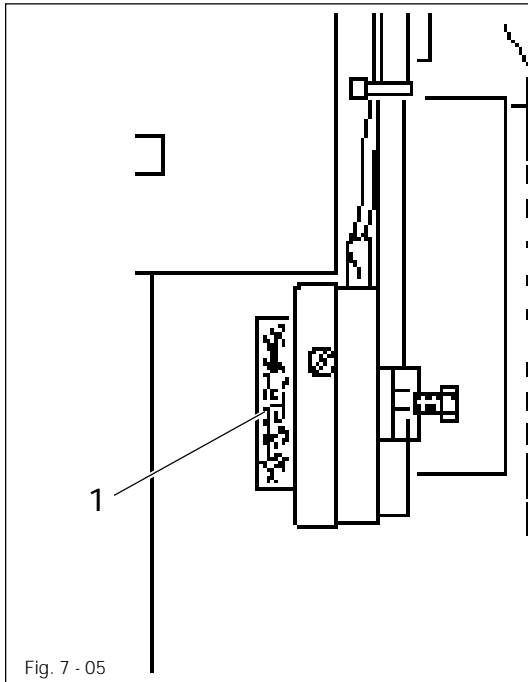
7.04 Lever for lifting the presser foot



- The presser foot is raised by turning lever 1.

7.05

Knee switch



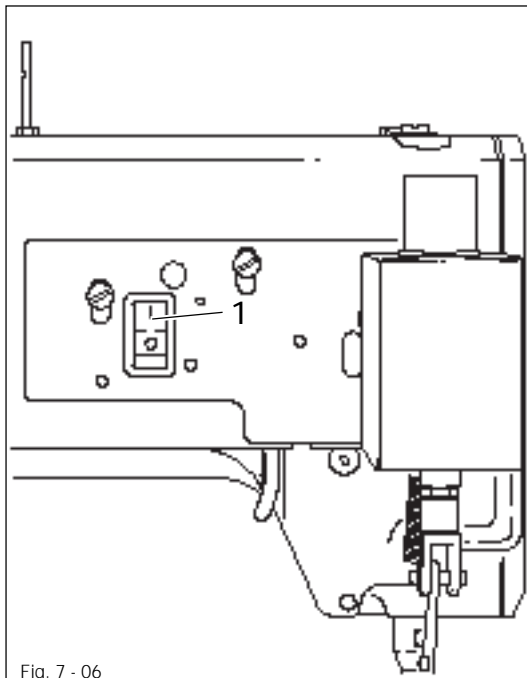
- After operating knee switch 1 one short stitch is sewn.



This short stitch corresponds to 0 – 100 % of the activated stitch length. The setting is carried out using parameter 835, see Chapter 13.10 Parameter settings.

7.06

Switch for thread wiping device –909/04 (optional)



- By activating switch 1, the thread wiping device can be switched on or off.

Pos. 1 : unit switched on

Pos. 0 : unit switched off

7.07 Control panel

The control panel consists of the display 1 and a row of function keys.

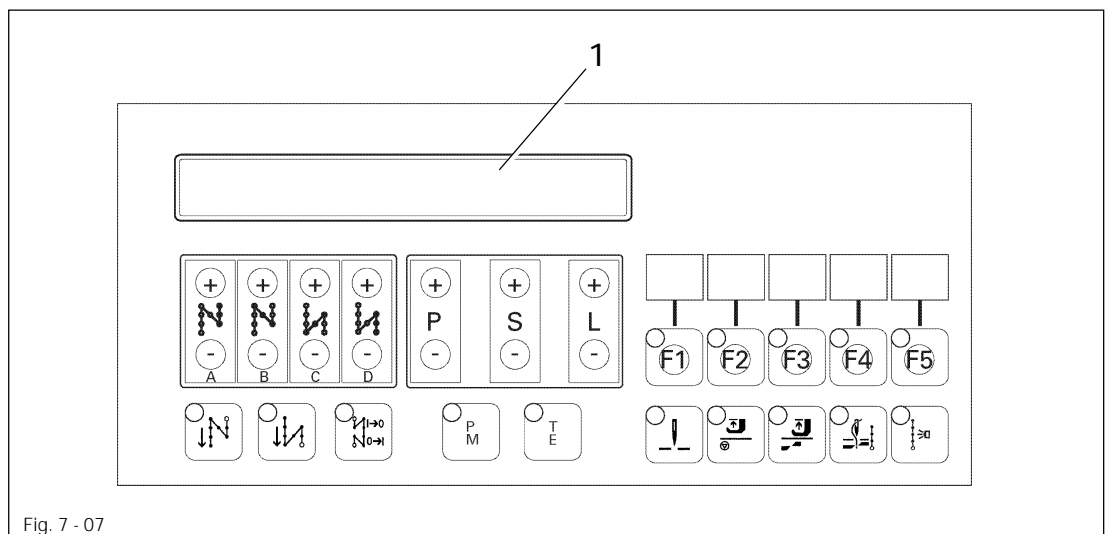
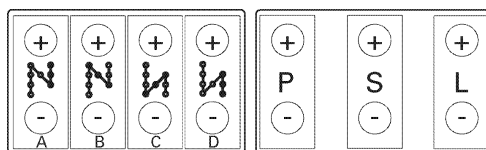


Fig. 7 - 07

7.07.01 Displays on the screen

- In manual sewing mode (LED in the **Seam program** and **Parameter** keys are off) the actual values for the number of backtack stitches and the stitch length are shown on the screen when the corresponding function keys are operated.
- In the programmed sewing mode (LED in the **Seam program** key is on) the actual values for edge guide distance, seam depth, program number, seam section and stitch length are shown on the screen when the corresponding function keys are operated.
- When parameters are entered (LED in the **Parameter** key is on) the selected parameter with its corresponding value are shown when the corresponding function keys are operated.

7.07.02 Function keys below the display screen



With these function keys the value above the corresponding function key can be altered. Just as the values displayed on the screen change according to the operational mode of the machine, the function of the function keys change too.

7.07.03 Further functions



With the keys described below, which each have an LED, further functions can be selected. When the LED lights up, the corresponding function is activated.



Starttack stitches on/off

- The starttack is switched on or off.



Endtack stitches on/off

- The endtack can be switched on or off.



Backtack suppression

- Press the key **once**: starttacks are not sewn.
- Press the key **twice**: start- and endtacks are not sewn



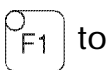
Seam program

- After this function has been activated, you are in the programmed sewing mode and you can select, enter or edit seam programs, see **Chapter 11.01 Entering seam programs**. After this function has been switched off, you return to the manual sewing mode.



Parameters

- After this function has been activated you are in the parameter input function, see **Chapter 13.10 Parameter input**. After the function has been switched off, you return to sewing mode.



Keys F1 – F5

- These keys have no function.



Needle position

- The needle position can be selected.
When the function is switched on: The needle positions at t.d.c. when sewing stops
When the function is switched off : The needle positions at b.d.c. when sewing stops.



Presser foot position when sewing stops

- The position of the presser foot when sewing stops is selected.
When the function is switched on: The presser foot is raised when sewing stops.
When the function is switched off: The presser foot is lowered when sewing stops.



Presser foot position after thread trimming

- The position of the presser foot after thread trimming is selected.
When the function is switched on: The presser foot is raised after thread trimming.
When the function is switched off: The presser foot is lowered after thread trimming.



Thread trimmer on/off

- The thread trimmed is switched on or off.
When this function is activated, the thread can be trimmed with the pedal function in the manual sewing mode.
In the programmed sewing mode, the thread is trimmed automatically when this function is activated.



Sensor on/off

- The sensor is switched on or off.
In the programmed sewing mode, when this function is switched off, the number of stitches sewn appears on **keys C and D** instead of the seam depth.

8 Mounting and commissioning the machine



The machine must only be mounted and commissioned by qualified personnel!
All relevant safety regulations are to be observed!



If the machine is delivered without a table, be sure that the frame and the table top which you intend to use can hold the weight of the machine and the motor. It must be ensured that the supporting structure is sufficiently sturdy, even during sewing operations.

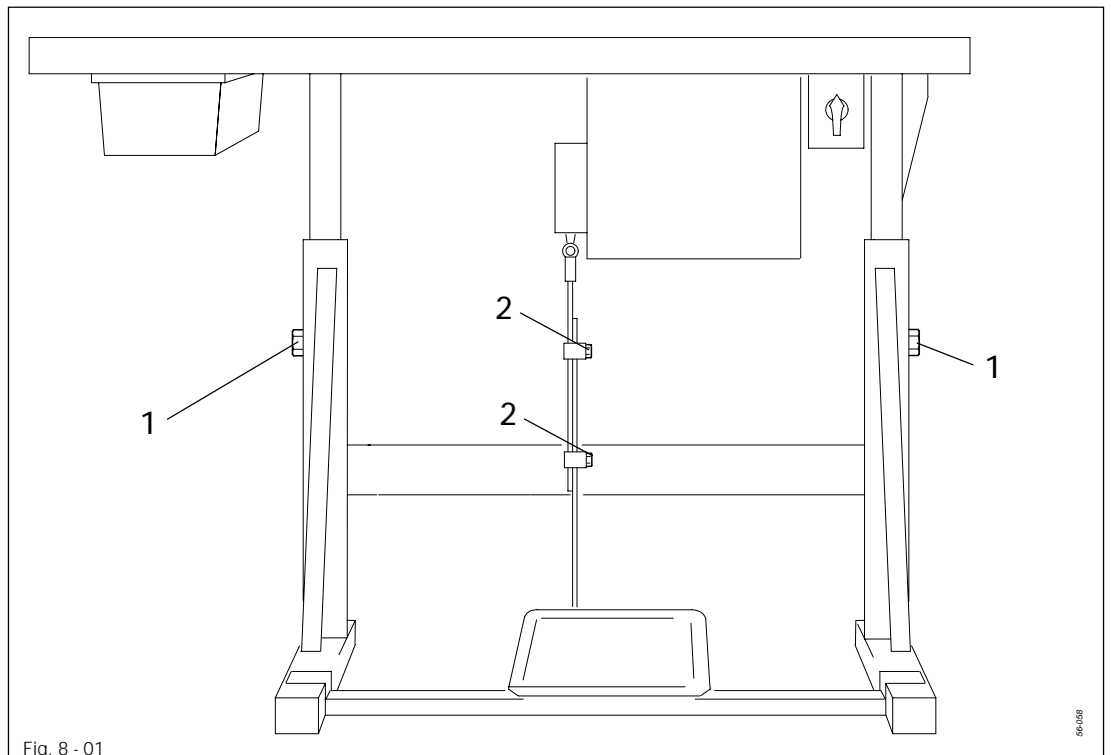
8.01 Mounting

The necessary electricity supply must be available at the machine's location. Also, a stable and horizontal surface as well as adequate lighting are required at the location.



Depending on the type of table, the method of packaging used may require that the table top be lowered for transport. The following is a description of how to adjust the height of the table top.

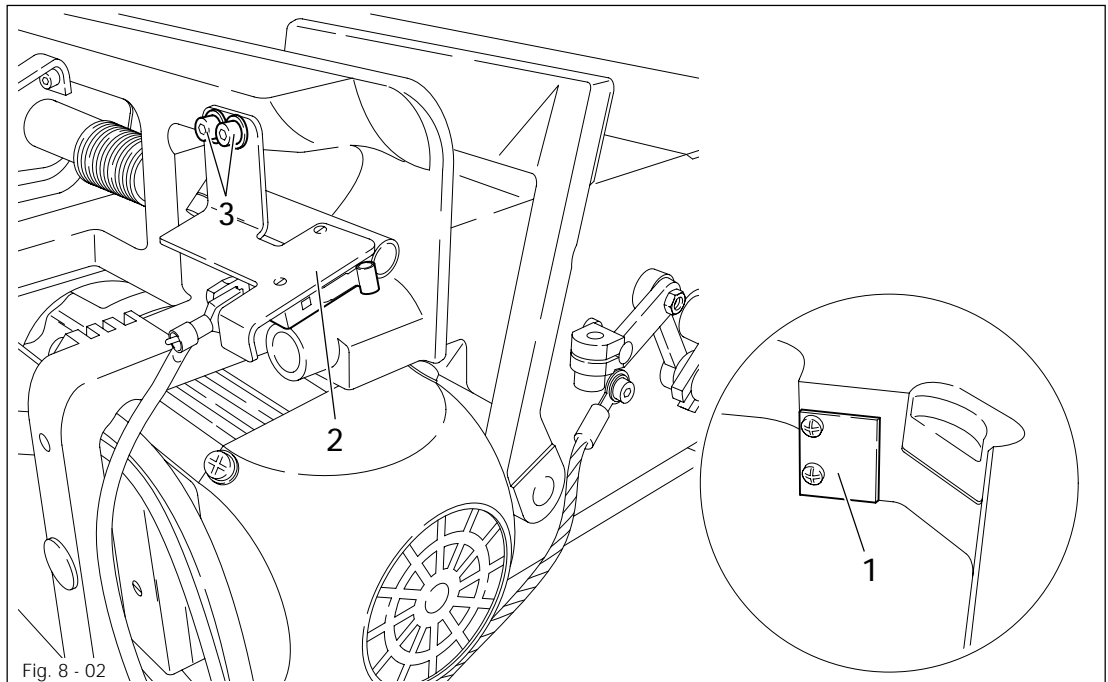
8.01.01 Adjusting the table-top height



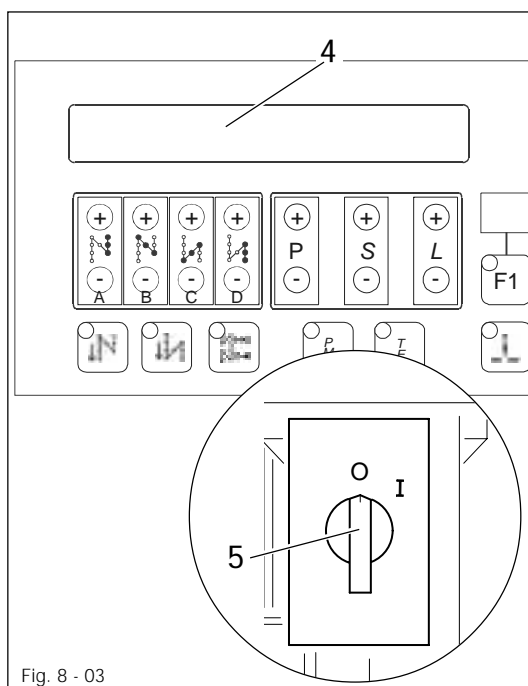
- Loosen screws 1 and 2 and set the desired table-top height
- Tighten screws 1 well.
- Adjust the pedal to the desired position and tighten screw 2.

Mounting and commissioning the machine

8.01.02 Start inhibitor

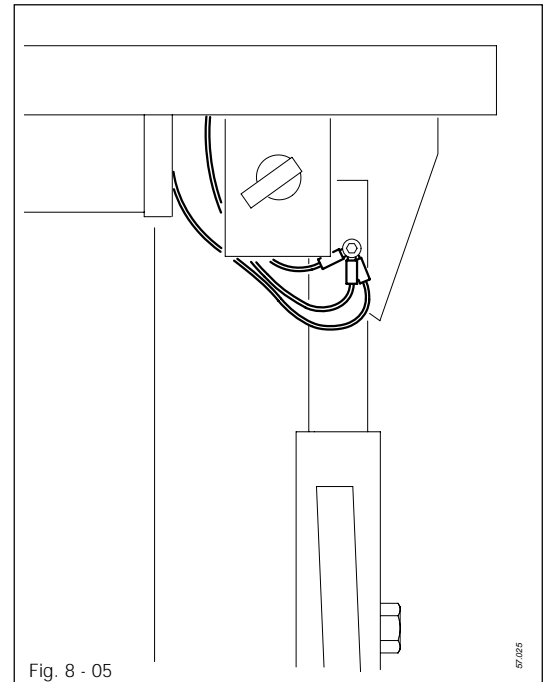
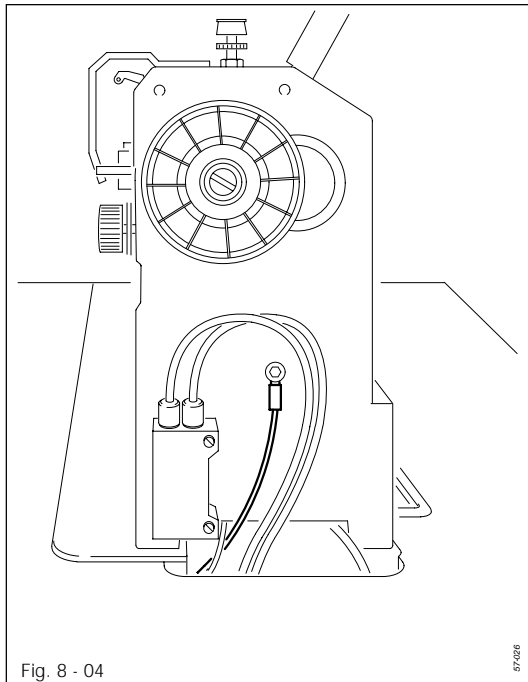


- For machines delivered without a table, the metal plate 1 included with the accessories must be mounted so that it is flush with the lower edge of the table top and with the left edge of the table top cutout (see Fig. 8.0.2).
- Insert the machine in the table top.
- After loosening screws 3, push switch 2 forwards until it touches the plate 1.
- In this position tighten screws 3.



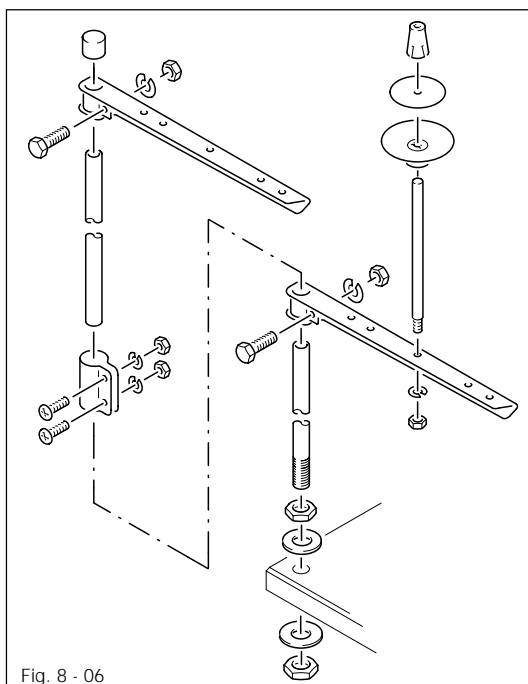
- If the machine is tilted backwards, switch 2 prevents the motor from starting accidentally. "ERROR 92" appears on display 4.
- After the machine has been placed in an upright position, switch off the motor with switch 5.
- When the motor is switched on again with switch 5, the machine is ready for operation.

8.01.03 Connecting the plug connections and earthing wire



- Insert all plug connections from the machine in the control box as designated.
- Attach the earthing wire as shown in Fig. 8-04 and 8.05.

8.01.04 Mounting the spool holder



- Mount the spool holder as shown in Fig. 8-06.
- Insert the spool holder into the hole in the table top and fasten it with the nuts enclosed.

8.02 Commissioning

- Check the machine, in particular the electric leads, for any damage.
- Clean the machine thoroughly (also see **Chapter 12 Care and Maintenance**).
- Have mechanics ensure that the machine's motor can be operated with the available electricity supply and that it is connected correctly.



If the machine is not connected correctly, do not operate it under any circumstances.

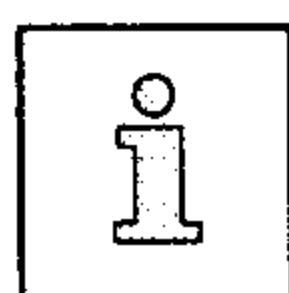


The machine may only be connected to earthed sockets.

8.03 Switching the machine on/off



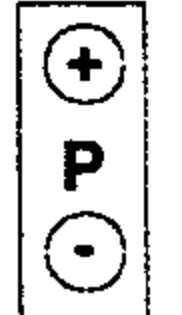
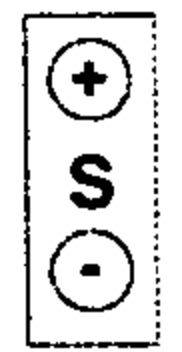
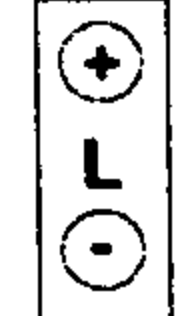

- Switch the machine on or off (see **Chapter 7.01 On/off switch**).
- Carry out a test run.

Basic stitch length setting



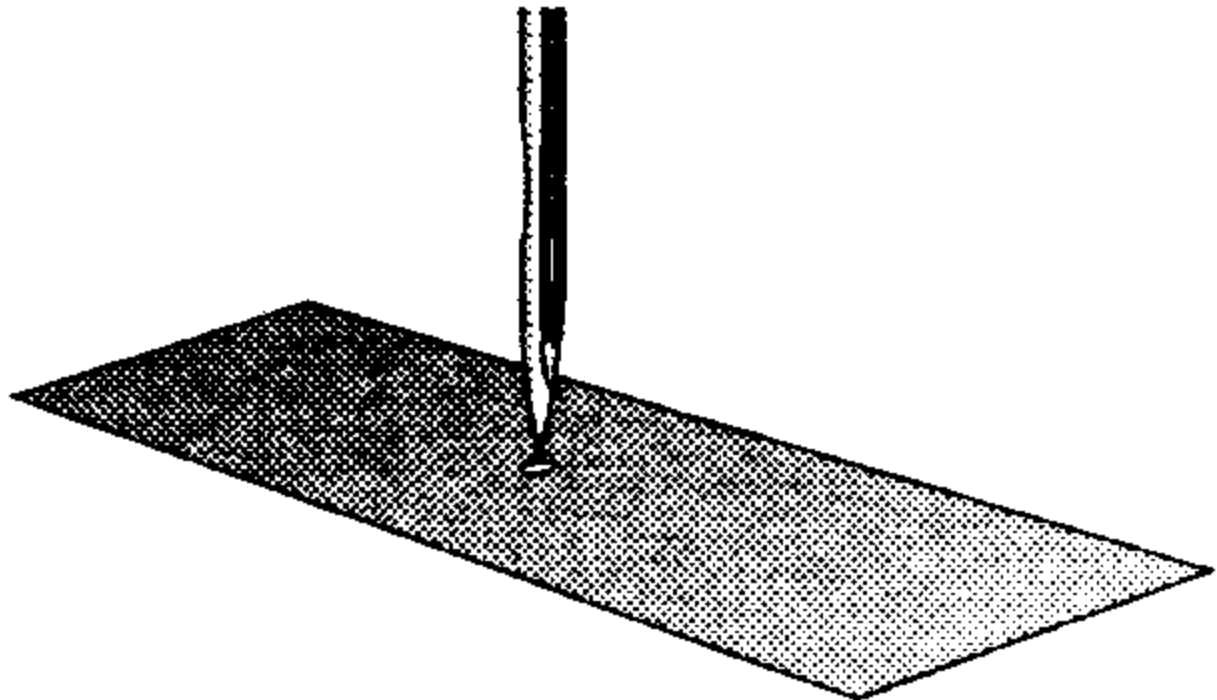
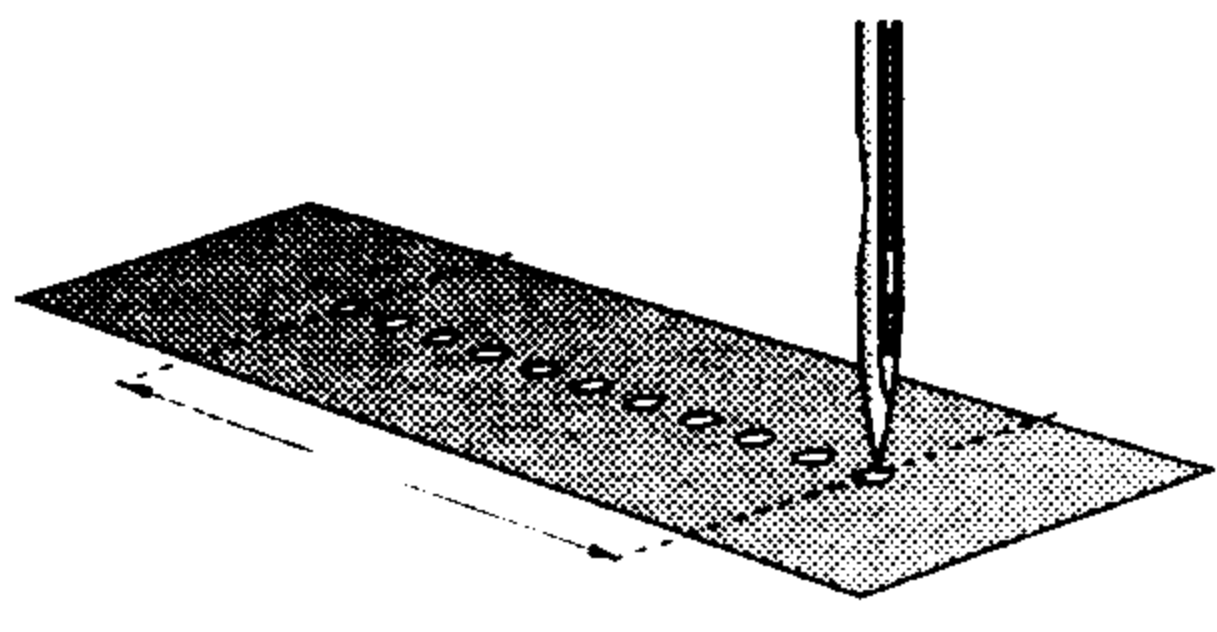
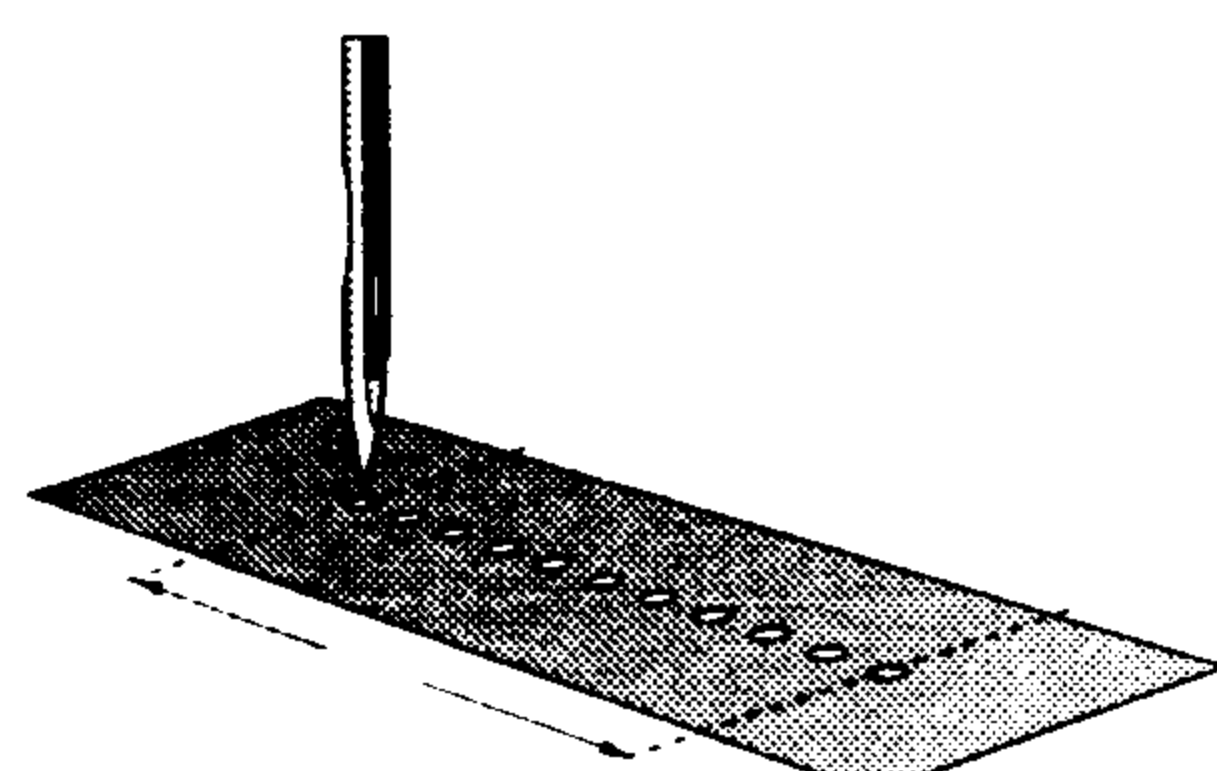
The correct setting of all mechanical machine parts must be ensured before beginning with this basic setting, see Chapter 13 "Adjustment" of the Instruction Manual for the PFAFF 2481.

Selecting and altering the parameters

Action	Screen information
 <ul style="list-style-type: none"> ● Simultaneously press and hold the Parameter and Seam program input keys and switch on the machine. 	
 <ul style="list-style-type: none"> ● Press the parameter input key (LED is on). 	<div style="border: 1px solid black; padding: 5px; text-align: center; width: fit-content; margin: 0 auto;">105</div> <div style="display: flex; justify-content: center; gap: 10px; margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; text-align: center;">+</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">P</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">-</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">+</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">S</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">-</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">+</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">L</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">-</div> </div>
 <ul style="list-style-type: none"> ● Press +/- on the P key to select the required group, e.g. 800. 	<div style="border: 1px solid black; padding: 5px; text-align: center; width: fit-content; margin: 0 auto;">832</div> <div style="display: flex; justify-content: center; gap: 10px; margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; text-align: center;">+</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">P</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">-</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">+</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">S</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">-</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">+</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">L</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">-</div> </div>
 <ul style="list-style-type: none"> ● Press +/- on the S key to select the required parameter, e.g. 834. 	<div style="border: 1px solid black; padding: 5px; text-align: center; width: fit-content; margin: 0 auto;">834 0</div> <div style="display: flex; justify-content: center; gap: 10px; margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; text-align: center;">+</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">P</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">-</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">+</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">S</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">-</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">+</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">L</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">-</div> </div>
 <ul style="list-style-type: none"> ● Press +/- (L key) to set the required value (stitch length- zero position correction). 	<div style="border: 1px solid black; padding: 5px; text-align: center; width: fit-content; margin: 0 auto;">834 0</div> <div style="display: flex; justify-content: center; gap: 10px; margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; text-align: center;">+</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">P</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">-</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">+</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">S</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">-</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">+</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">L</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">-</div> </div>
 <ul style="list-style-type: none"> ● Save input by ending parameter input (LED is off). 	

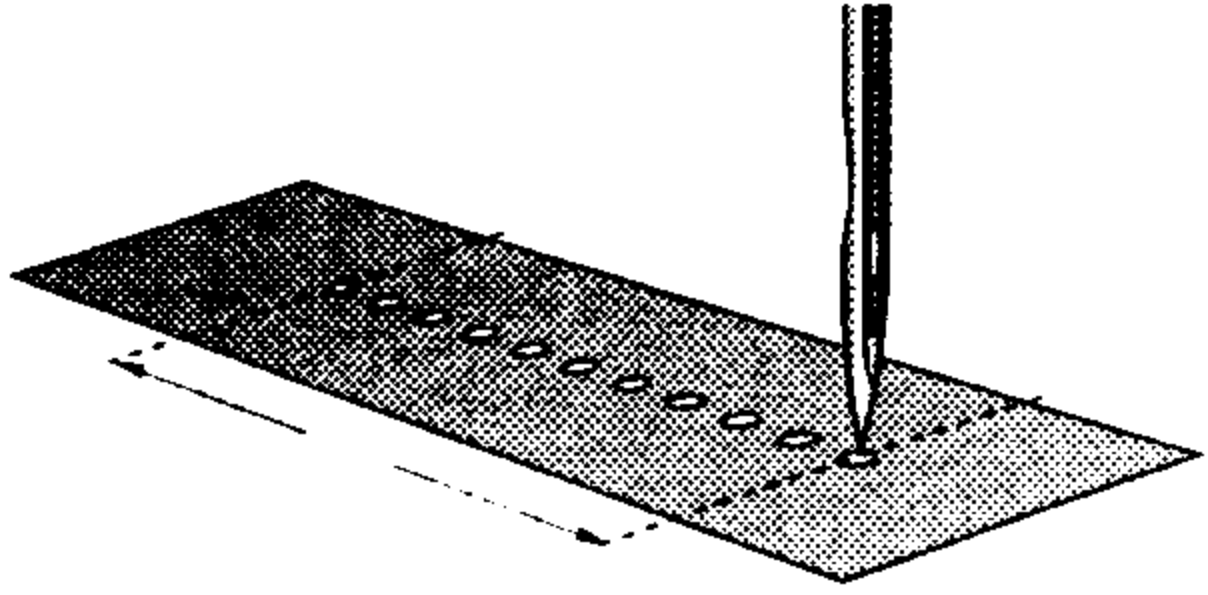
Short instructions for the PFAFF 2481

Stitch length adjustment

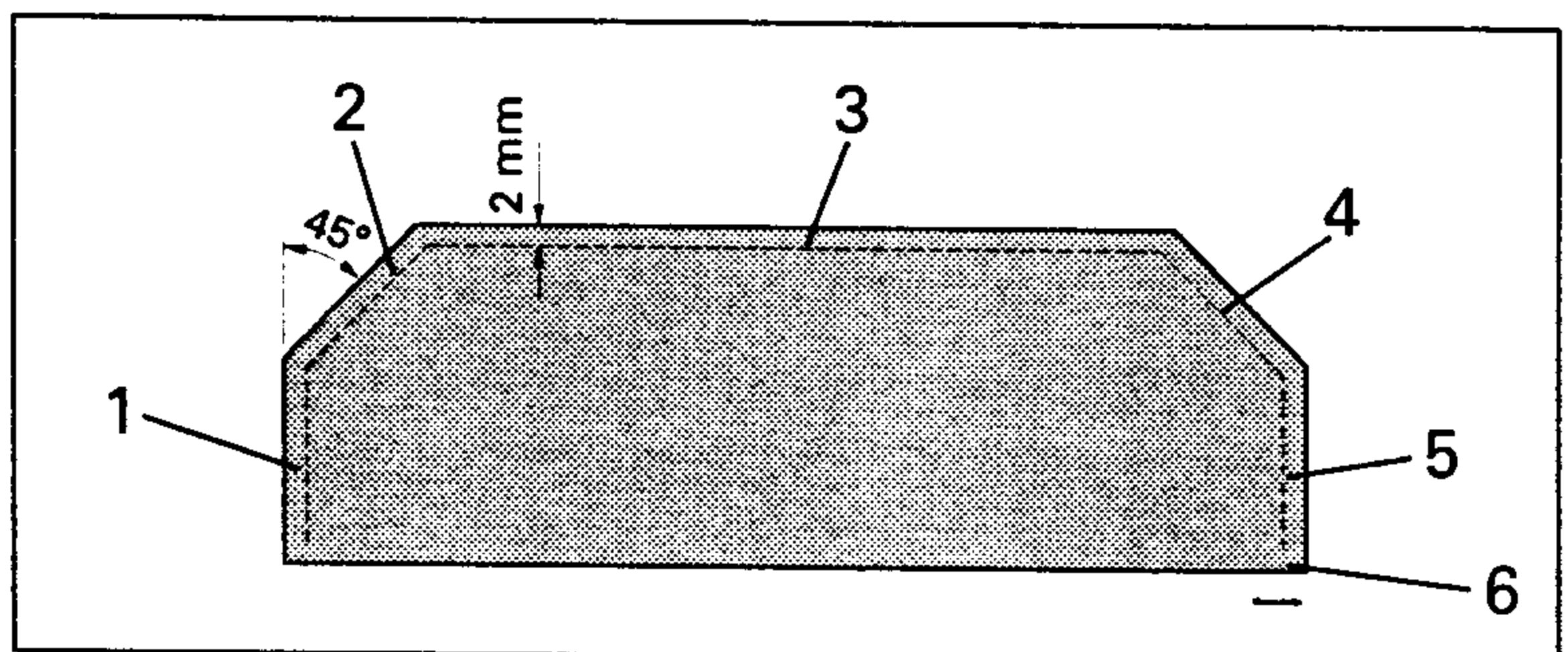
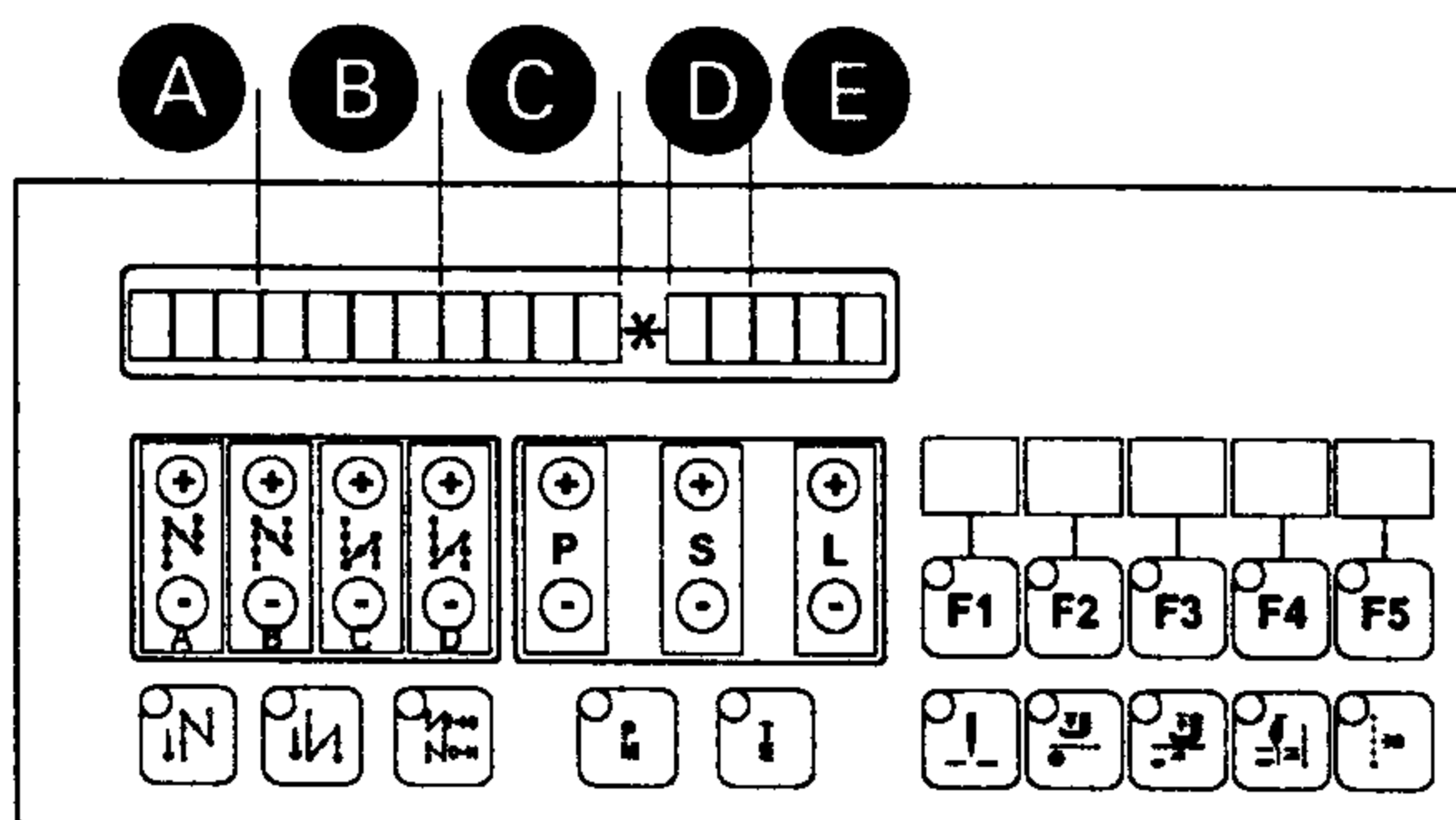
Action	Screen information
<div style="display: flex; gap: 10px;"> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;">P</div> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;">E</div> </div> <ul style="list-style-type: none"> ● Simultaneously press and hold the Parameter and Seam program input keys and switch on the machine. 	
<div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;">P</div> <ul style="list-style-type: none"> ● Press the seam program input key (LED must be off). 	
<div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; flex-direction: column; align-items: center; justify-content: center;"> <div style="border: 1px solid black; border-radius: 50%; width: 10px; height: 10px; display: flex; align-items: center; justify-content: center;">+</div> <div style="border: 1px solid black; border-radius: 50%; width: 10px; height: 10px; display: flex; align-items: center; justify-content: center;">L</div> <div style="border: 1px solid black; border-radius: 50%; width: 10px; height: 10px; display: flex; align-items: center; justify-content: center;">-</div> </div> <ul style="list-style-type: none"> ● Set the stitch length at "0". 	<div style="border: 1px solid black; padding: 5px; display: flex; justify-content: space-between; align-items: center;"> 00 </div>
<ul style="list-style-type: none"> ● Unthread the machine. ● Place the workpiece under the presser foot. ● Let the machine sew at max. 4500 spm, checking whether the needle always penetrates the workpiece at the same spot. 	
<ul style="list-style-type: none"> ● Alter the value for parameter 834, until the needle always penetrates the workpiece at the same spot. 	<div style="border: 1px solid black; padding: 5px; display: flex; justify-content: space-between; align-items: center;"> 834 0 </div> <p style="text-align: center; font-size: 12px;">Setting range 0 – 255</p>
<div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; flex-direction: column; align-items: center; justify-content: center;"> <div style="border: 1px solid black; border-radius: 50%; width: 10px; height: 10px; display: flex; align-items: center; justify-content: center;">+</div> <div style="border: 1px solid black; border-radius: 50%; width: 10px; height: 10px; display: flex; align-items: center; justify-content: center;">L</div> <div style="border: 1px solid black; border-radius: 50%; width: 10px; height: 10px; display: flex; align-items: center; justify-content: center;">-</div> </div> <ul style="list-style-type: none"> ● Set the stitch length (e.g. 2.0 mm). 	<div style="border: 1px solid black; padding: 5px; display: flex; justify-content: space-between; align-items: center;"> 20 </div>
<ul style="list-style-type: none"> ● Thread the machine. ● Place the workpiece under the presser foot. ● Sew a seam with max. 400 spm and at least 20 stitches. ● Compare the required and the actual length over a length of 20 stitches, whereby the max. tolerance may be +/- 0.5 mm. 	
<ul style="list-style-type: none"> ● Alter the value for parameter 846 until the tolerance is within +/- 0.5 mm. 	<div style="border: 1px solid black; padding: 5px; display: flex; justify-content: space-between; align-items: center;"> 846 100 </div> <p style="text-align: center; font-size: 12px;">Setting range 80 - 120</p>
<ul style="list-style-type: none"> ● With the reverse feed key pressed sew a seam with max. 400 spm and at least 20 stitches (reverse sewing). ● Compare the required and the actual length over a length of 20 stitches, whereby the max. tolerance may be +/- 0.5 mm. 	
<ul style="list-style-type: none"> ● Alter the value for parameter 847 until the tolerance is within +/- 0.5 mm. 	<div style="border: 1px solid black; padding: 5px; display: flex; justify-content: space-between; align-items: center;"> 847 100 </div> <p style="text-align: center; font-size: 12px;">Setting range 80 - 120</p>

Short instructions for the PFAFF 2481

(Stitch adjustment continued)

Action	Screen information
<ul style="list-style-type: none"> ● Place the workpiece under the presser foot. ● Sew a seam with max. 4500 spm and at least 20 stitches. ● Compare the required and the actual length over a length of 20 stitches, whereby the max. tolerance may be +/- 0.5 mm. 	
<ul style="list-style-type: none"> ● Alter the value for parameter 845 until the tolerance is within +/- 0.5 mm. 	<div style="border: 1px solid black; padding: 5px; text-align: center;"> 845 5 </div> <p style="text-align: center;">Setting range 0 - 10</p>
<ul style="list-style-type: none"> ● Set parameter 844 according to the distance between sensor and needle (20 mm or 28 mm) (whereby from software version /008 on the value "200" corresponds to 20 mm) 	<div style="border: 1px solid black; padding: 5px; text-align: center;"> 844 200 </div> <p style="text-align: center;">Setting range 80 - 300</p>

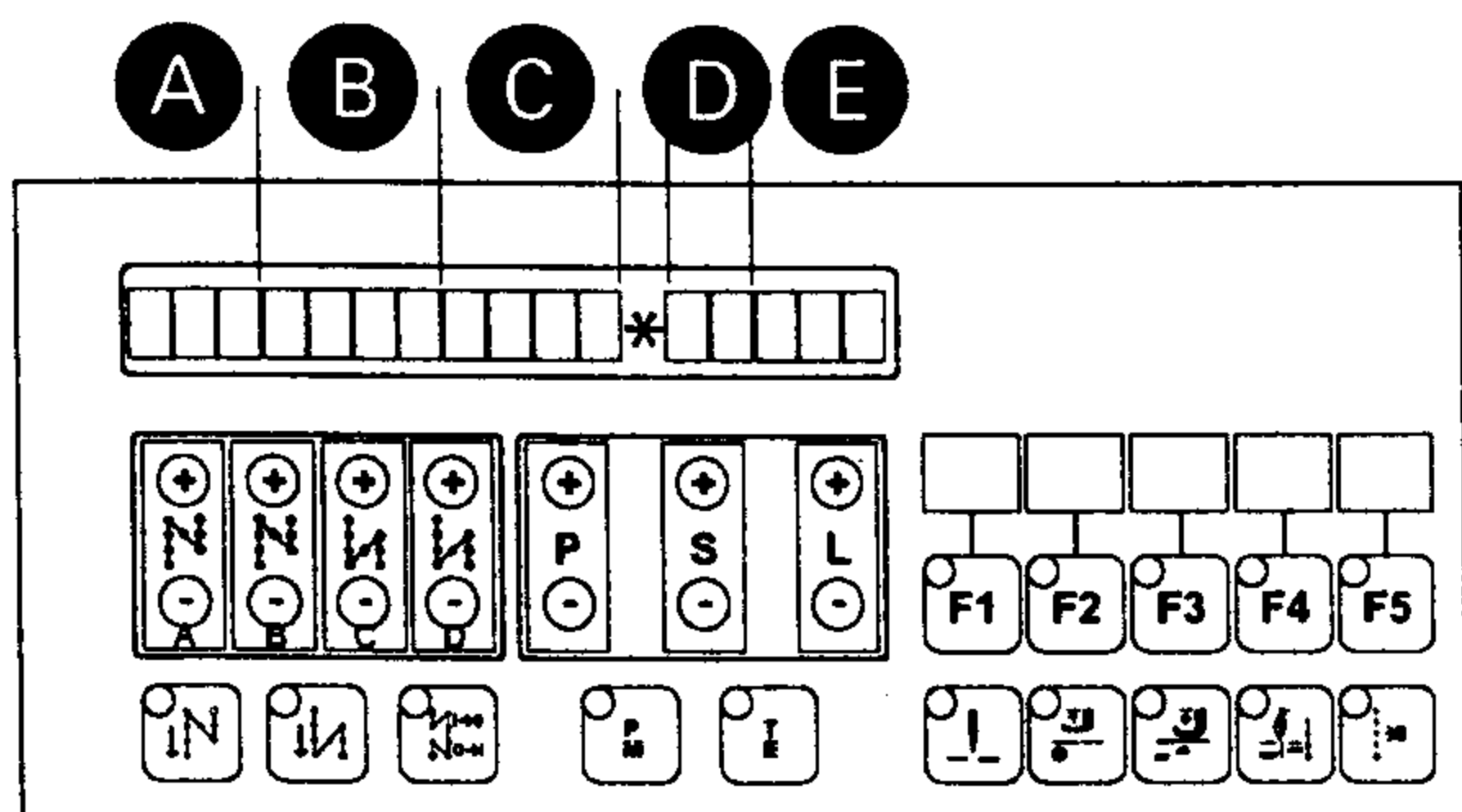
Recording a program using a cuff as an example



Seam section	Edge guide	Seam width	Program	Seam section	Stitch length					Seam combination	Autom. speed	Seam in reverse	Manual seam in the Program
	A	B	C	D	E					F1	F2	F3	F4
1	020	025	7	00	20	●	-	-	-	-	-	-	-
2	020	025	7	01	20	●	-	-	-	-	-	-	-
3	020	015	7	02	20	●	-	-	-	-	-	-	-
4	020	025	7	03	20	●	-	-	-	-	-	-	-
5	020	065	7	04	20	●	●	-	-	-	-	-	-
6			7	05	00	●	-	-	-	-	-	-	-
7													
8													
9													
10													

Short instructions for the PFAFF 2481

Formblatt zur Aufzeichnung von Programmen



Seam section	Edge guide	Seam width	Program	Seam section	Stitch length					Seam combination	Autom. speed	Seam in reverse	Manual seam in the Program
	A	B	C	D	E					F1	F2	F3	F4
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													

9

Preparation



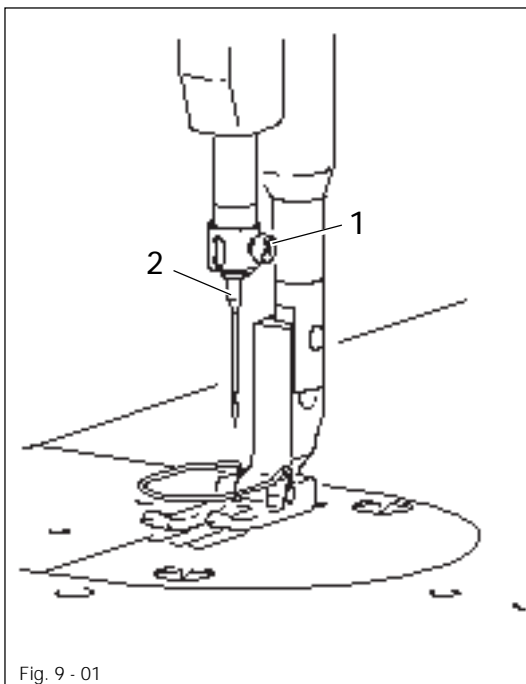
All regulations and instructions in this Instruction Manual are to be observed!
Special attention is to be paid to the safety regulations!



All preparation work is only to be carried out by appropriately trained personnel.
Before all preparation work, the machine is to be separated from the electricity supply by removing the plug from the mains or switching off the On/Off switch!

9.01

Inserting the needle



Switch off the machine!
Danger of injury due to
unintentional starting of the
machine!

- Raise needle bar.
- Loosen screw 1 and insert needle 2 until you feel it stop.
- Tighten screw 1.



Use only system 134 KK
needles.



The selection of the correct needle depends on the model of the machine and the material and threads being sewn (see **chapter 3 Specifications**).

9.02

Winding the bobbin thread, adjusting the thread tension

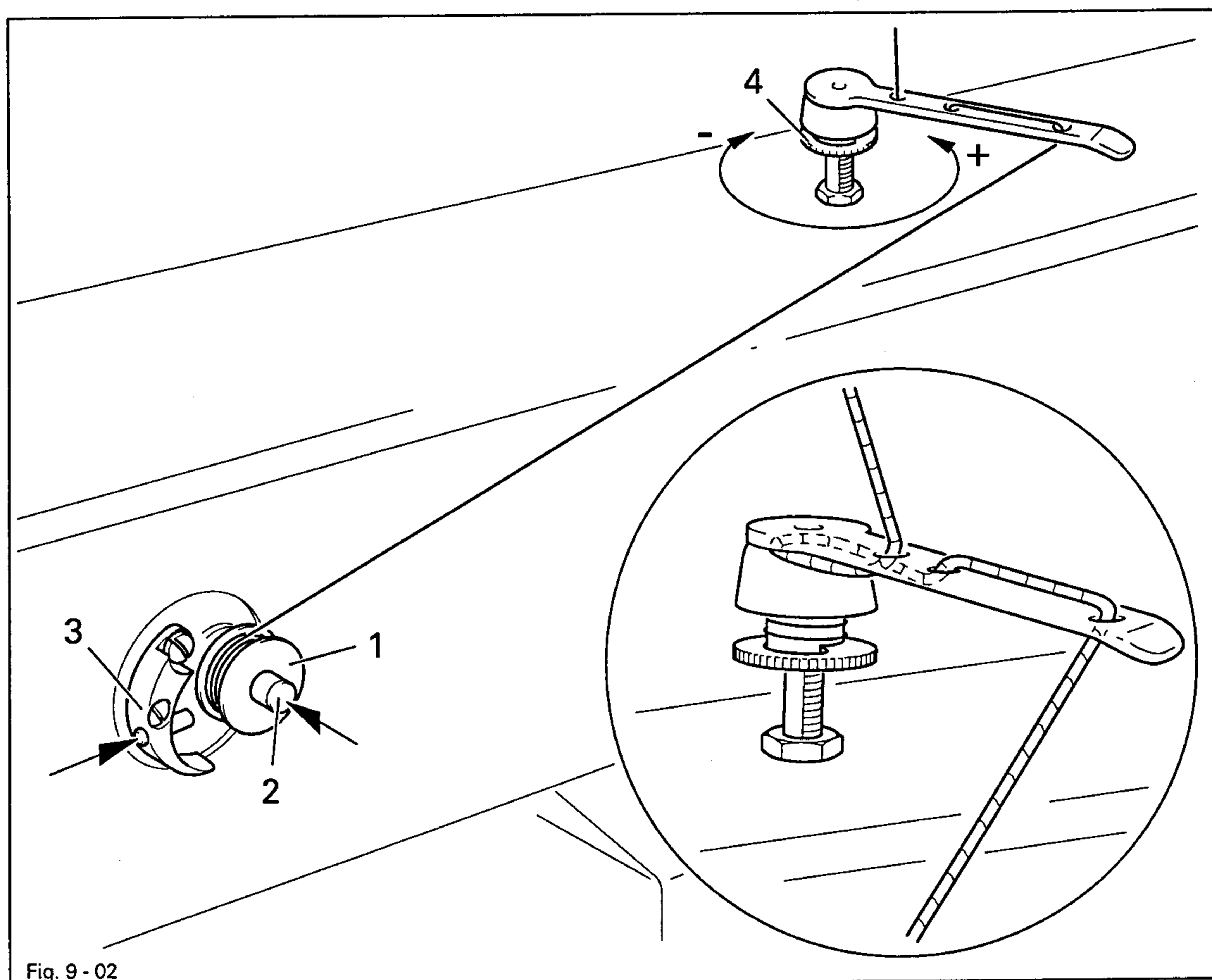
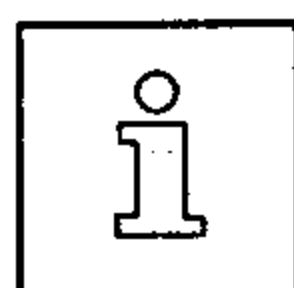


Fig. 9 - 02

- Place an empty bobbin 1 onto bobbin shaft 2.
- Thread the bobbin in accordance with Fig. 9-02 and wind it anti-clockwise around bobbin 1 a few times.
- Switch on the bobbin winder while at the same time pressing bobbin winder spindle 2 and lever 3.



The bobbin fills up during sewing.



If the machine is only run for bobbin winding (without sewing), a hook base must be fitted in the hook.

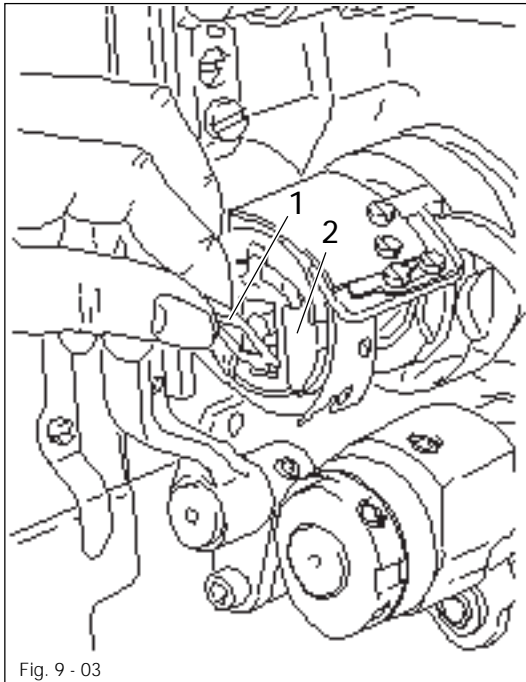
Otherwise a jammed thread may damage the hook!

- The tension of the thread on bobbin 1 can be adjusted with knurled screw 4.
- The bobbin winder stops automatically when bobbin 1 is full.

If the thread is wound unevenly:

- Loosen nut 5.
- Turn thread guide 6 accordingly.
- Tighten nut 5.

9.03 Removing/Inserting the bobbin case



Switch off the machine!
Danger of injury due to
unintentional starting of the
machine!

Removing the bobbin case:

- Tilt back the machine.
- Raise latch 1 and remove bobbin case 2.

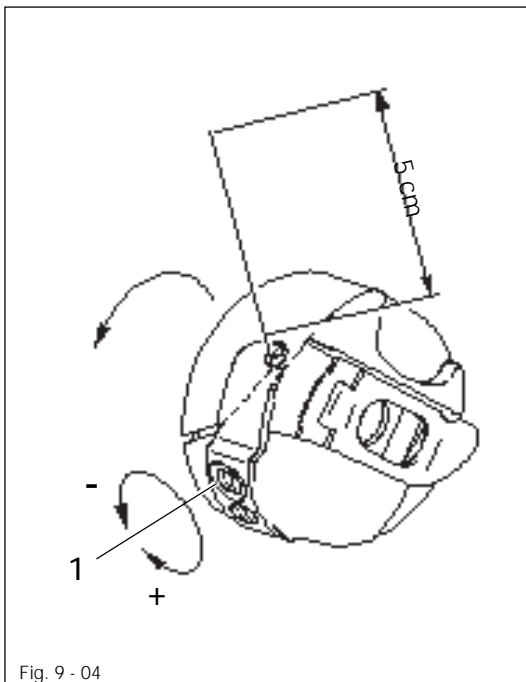
Inserting the bobbin case:

- Press bobbin case 2 until you feel it snap into the bobbin case base.



Return the machine to its
upright position using **both**
hands!
Danger of injury by crushing
between the machine and the
table top!

9.04 Inserting the bobbin case / Adjusting the bobbin thread tension



- Insert the bobbin into the bobbin case.
- Pass the thread through the slot under the spring according to Fig. 9-04.
- Adjust the thread tension by turning screw 1.



When the thread is pulled, the
bobbin must rotate in the
direction of the arrow.

9.05 Threading the needle thread / Adjusting the needle thread tension

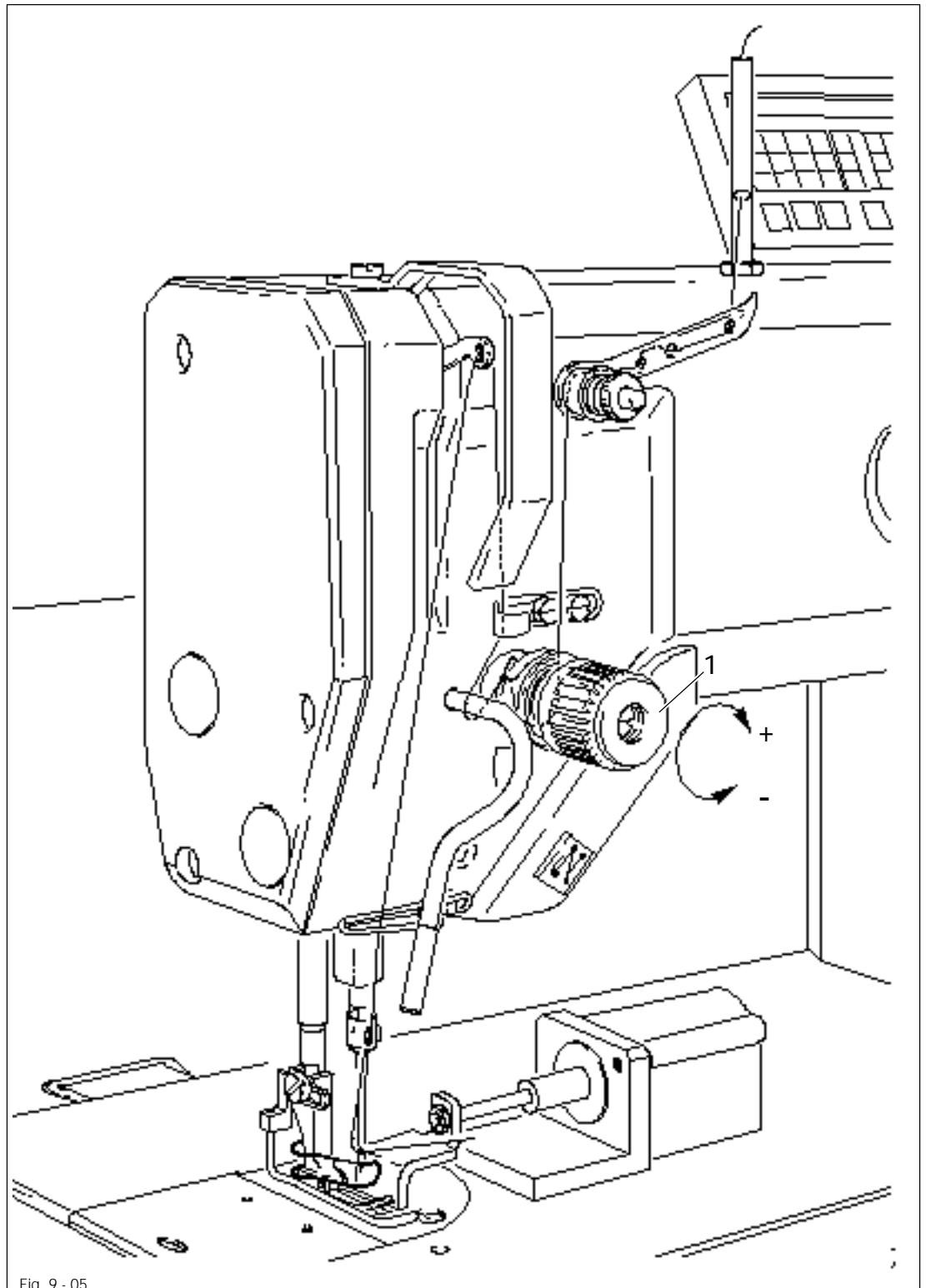


Fig. 9 - 05

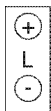
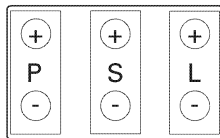
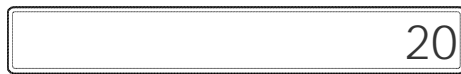


Switch off the machine!
Danger of injury due to unintentional starting of the machine!

- Thread the machine as shown in Fig. 9-05.
- Adjust the needle thread tension by turning disk 1.

9.06 Setting the stitch length

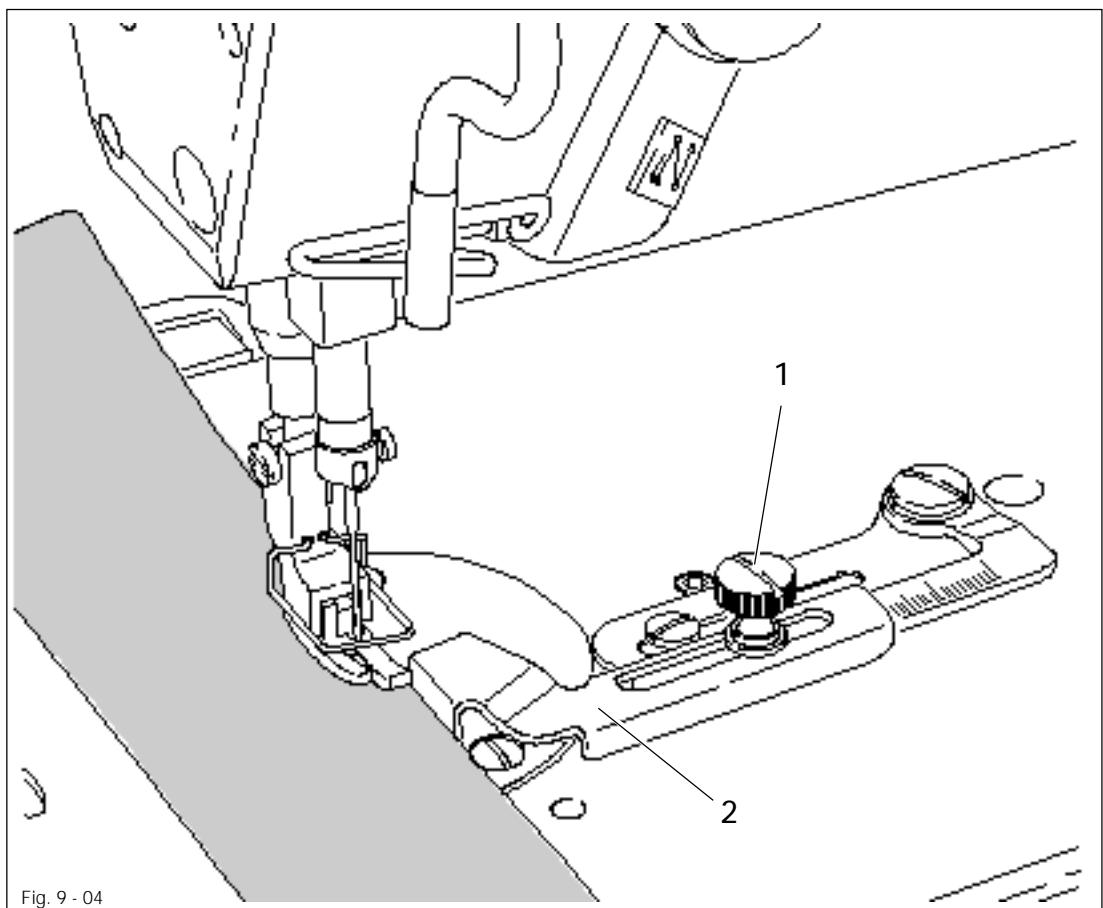
- Switch on the machine.



- By pressing +/- the stitch length can be set in 1/10 mm steps (L key).

9.07 Setting the edge guide distance

9.07.01 Mechanically adjustable edge guide



- Loosen screw 1.
- Move guide stop 2 to the required distance.
- Tighten screw 1.

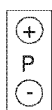
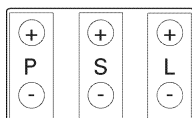
9.07.02 Electrically adjustable edge guide (for manual sewing)

- Switch on the machine.

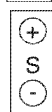


- Press the **Parameter input** key (LED is on).

100

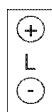
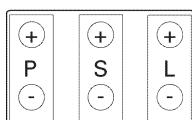


- By pressing the **P** key use +/- to select the "200" group.



- By pressing the **S** key use +/- to select the parameter "299".

299



- Select the desired edge guide distance by pressing +/- (L key).



The seam depth setting ranges from 1.0 mm (display value = 10) to 18.5 mm (display value = 185).



- By ending the parameter input, the input is saved (LED is off).

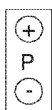
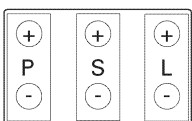
9.08 Selecting the seam program

- Switch on the machine.



- Press the **Seam program** key.

05



- Select the desired seam program by pressing +/- (P key).

10 Sewing

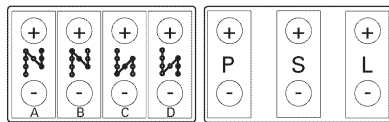
The machine must be installed and connected in accordance with **Chapter 8 Installation and Commissioning**.

The values (and also the functions of the function keys) shown on the display screen are dependent on the type of sewing mode.

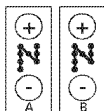
10.01 Manual sewing



To enter the manual sewing mode the **Seam program** and **Parameter** keys must be deactivated (LEDs off).

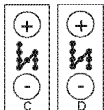


Starttack stitches forwards/in reverse

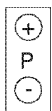


- The number of forward stitches (key A) or reverse stitches (key B) for the starttack can be changed with these keys. The current value is displayed on the screen when the corresponding key is operated.

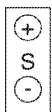
Endtack stitches forwards/in reverse



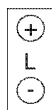
- The number of reverse stitches (key C) or forward stitches (key D) for the endtack can be changed with these keys. The current value is displayed on the screen when the corresponding key is operated.



No function



No function



Stitch length

- With this key the stitch length value can be changed. The current value is displayed on the screen when this key is operated.



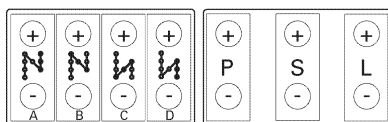
The other functions of the control panel are described in **Chapter 7.07.03 Further functions**.

10.02 Programmed sewing



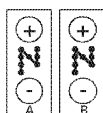
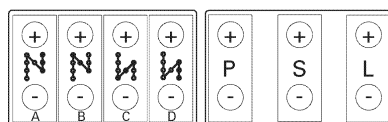
To enter the programmed sewing mode the **Parameter** key must be deactivated (LED off).

3 3 3 3 00*00 25



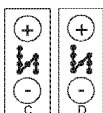
● Select the programmed sewing mode with the **Seam program** key (LED on).

050 80 05*00 20



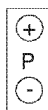
Edge guide distance

● The edge guide distance can be altered with these keys. The tens can be altered with **Key A** and the digits with **Key B**. The current value is displayed on the screen when the keys are operated.



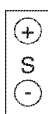
Seam depth

● The seam depth can be altered with these keys. The tens can be altered with **Key C** and the digits with **Key D**. The current value is displayed on the screen when the keys are operated.



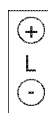
Program number

● The program number can be selected with this key. The current program is displayed on the screen when the key is operated.



Seam segment

● This key is used to display the current seam segment of the seam program. By pressing +/- on the key the seam segments in the seam program can be selected.



Stitch length

● This key is used to alter the stitch length. The current value is displayed on the screen when the key is operated.



The other functions of the control panel are described in **Chapter 7.07.03 Further functions**.

11 Input

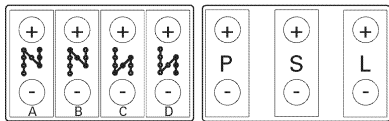
This chapter describes how seam programs and parameters are entered. In addition there are charts for the adjustment values for corner stitches and forms for fixing the program parameters.

11.01 Entering seam programs



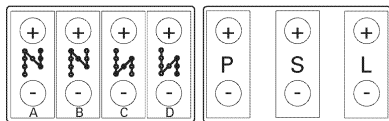
When entering the seam program the **Parameter** key should not be activated (LED off).

3 3 3 3 00*00 25



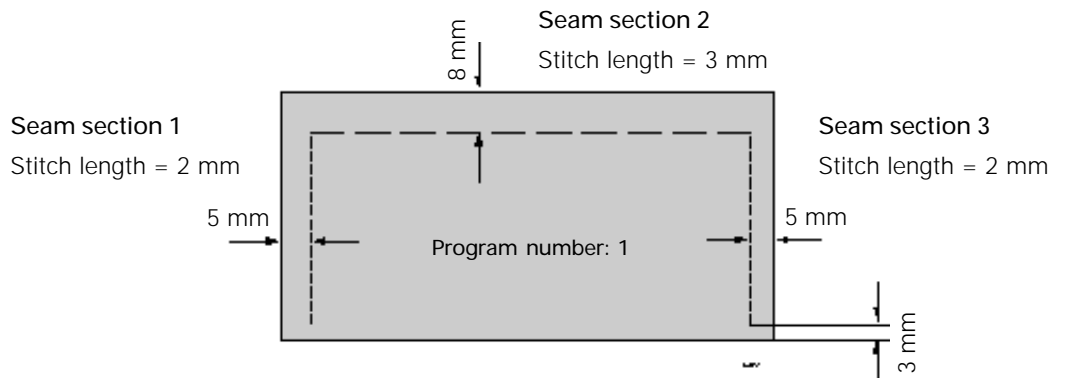
● Select the programmed sewing mode with the **Seam program** key (LED on).

050 80 01*00 20



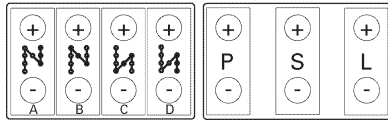
The seam programs are entered after the programmed sewing mode has been selected. The available functions therefore correspond to the functions described in **Chapter 10.02 Programmed sewing**. The following examples describe how to enter the seam program.

11.02 Example of how to enter a seam with rectangular edges



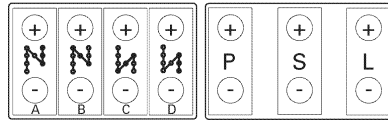
- Switch off the **Parameter** function (LED off).

3 3 3 3 00*00 25

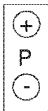


- Select the programmed sewing mode with the **Seam program** key (LED on).

050 80 05*00 20

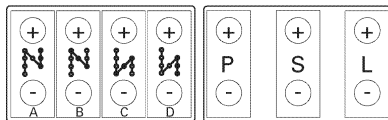


Selecting the program number

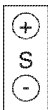


- Press +/- on **Key P**, until the desired program number appears on the screen above the key.

000 00 01*00 30

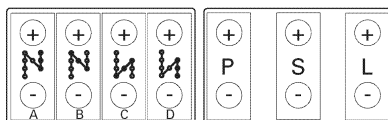


Selecting the seam section



- Press +/- on **Key S**, until the first seam section (01) appears on the screen above the key.

000 00 01*01 30

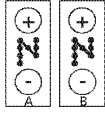




The seam section must always be selected first, if the following values and sewing functions entered are only valid for this seam section.

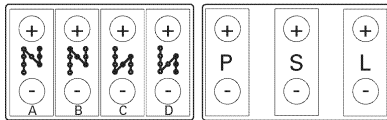
If a value or sewing function is entered in seam section "00", this input is valid for the entire seam program with all seam sections.

Setting the edge guide distance (for the first seam section)

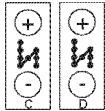


- Press +/- on Key A or Key B, until the value "50" (= 5 mm) appears on the screen above the keys.

050 00 01*01 30

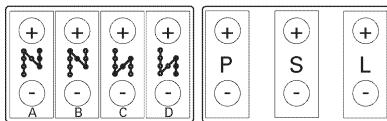


Setting the seam depth (for the first seam section)

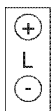


- Press +/- on Key C or Key D, until the value "80" (= 8 mm) appears on the screen above the keys.

050 80 01*01 30

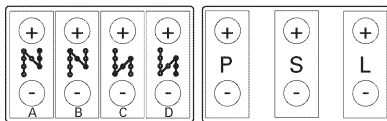


Setting the stitch length (for the first seam section)



- Press +/- on Key L, until the value "20" (= 2 mm) appears on the screen above the key.

050 80 01*01 20



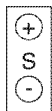
Selecting the sewing functions (for the first seam section)



- Switch on the light guide function (LED on).
The machine stops automatically before the edge of the material (seam depth).

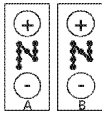
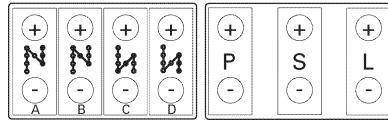


- Switch on the starttack (LED on).



- Select seam section 2 (press + on Key S).

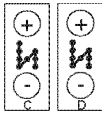
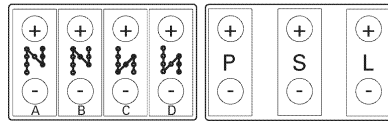
050 80 01*02 20



Setting the edge guide distance (for the second seam section)

- Press +/- on Key A or Key B, until the value "80" (= 8 mm) appears on the screen above the keys.

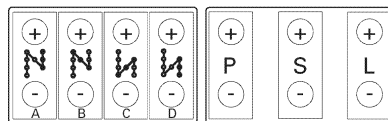
080 80 01*02 20



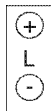
Setting the seam depth (for the second seam section)

- Press +/- on Key C or Key D, until the value "50" (= 5 mm) appears on the screen above the keys.

080 50 01*02 20

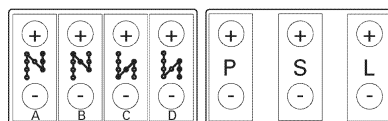


Setting the stitch length (for the second seam section)



- Press +/- on Key L, until the value "30" (= 3 mm) appears on the screen above the key.

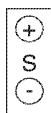
080 50 01*02 30



Selecting the sewing functions (for the second seam section)

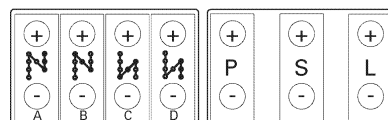


- Switch on the light guide function (LED on).
The machine stops automatically before the edge of the material (seam depth).

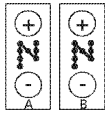


- Select seam section 3 (press + on Key S).

080 50 01*03 30

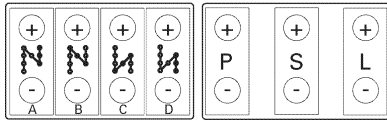


Setting the edge guide distance (for the third seam section)

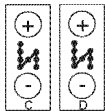


- Press +/- on Key A or Key B, until the value "50" (= 5 mm) appears on the screen above the keys.

050 80 01*03 30

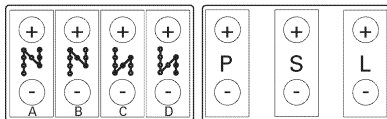


Setting the seam depth (for the third seam section)

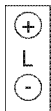


- Press +/- on Key C or Key D, until the value "30" (= 3 mm) appears on the screen above the keys.

050 30 01*03 30

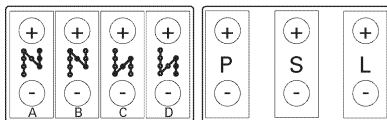


Setting the stitch length (for the third seam section)



- Press +/- on Key L, until the value "20" (= 2 mm) appears on the screen above the key.

080 50 01*03 20



Selecting the sewing functions (for the third seam section)



- Switch on the light guide function (LED on).

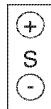


- Switch on thread trimming (LED on)

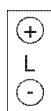


- Switch on endtack (LED on).

Concluding the sewing program



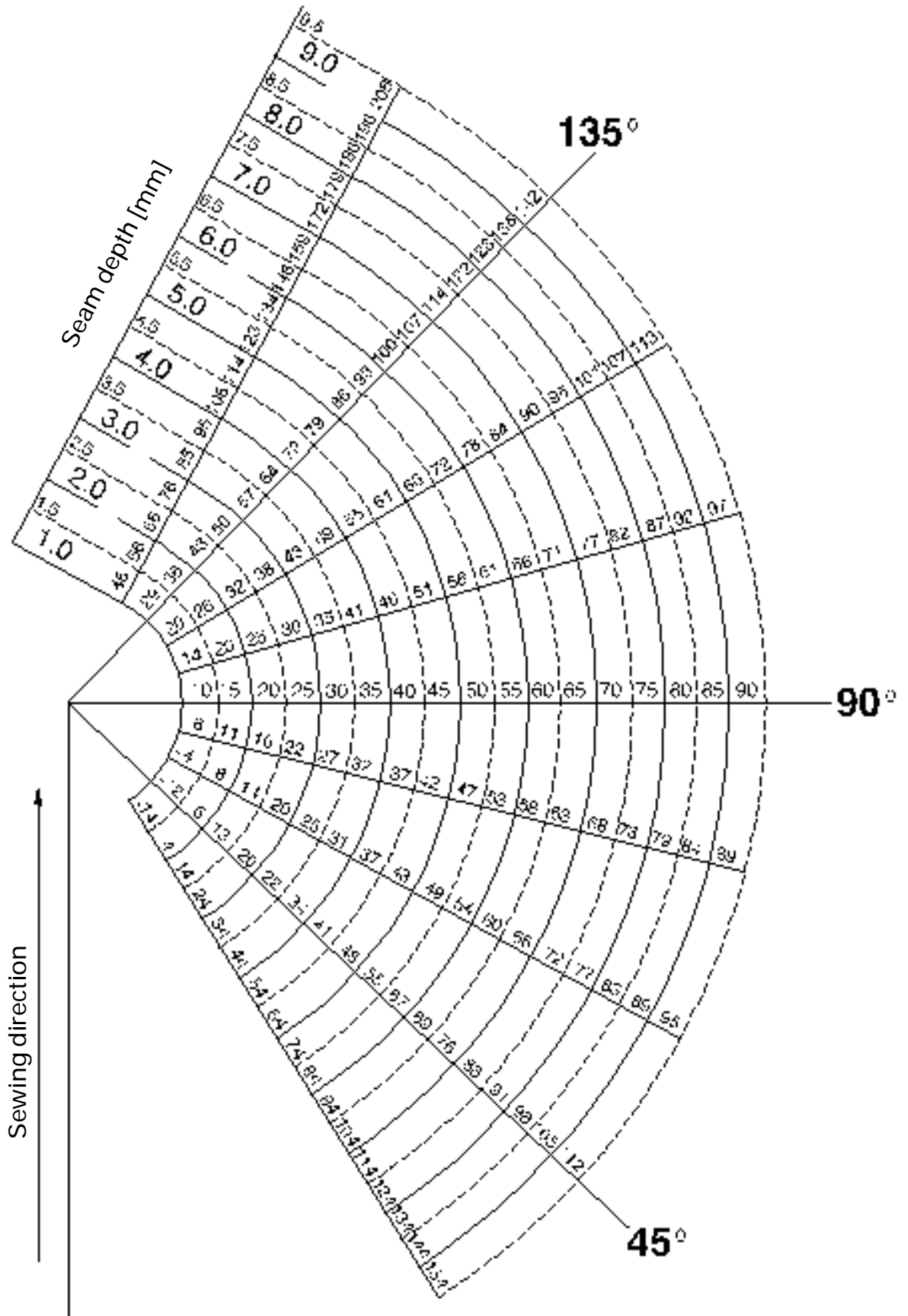
- Press + on Key S, until "04" appears on the screen above the key.



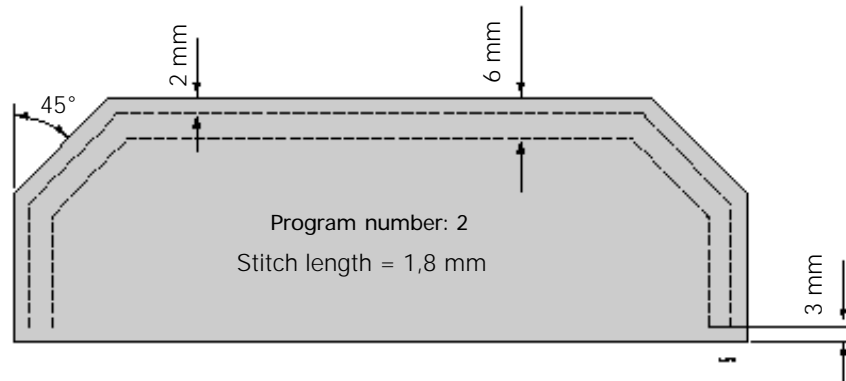
- Using Key L set the stitch length at "00".
By setting the stitch length in the fourth seam section at zero, the third seam section is recognised as the last seam section of the sewing program and the seam program input is concluded.

11.03 Approximate values for the seam depth of corner stitches

The values shown in the diagram are approximate values, which are used for the preliminary setting of the seam depth. The exact values are established with test seams.

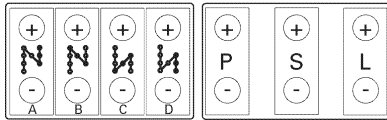


11.04 Example of how to enter a seam with corner stitches



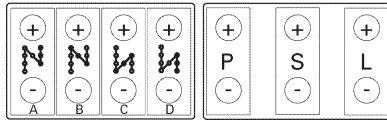
- Switch off the Parameter function (LED off).

3 3 3 3 00*00 25

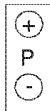


- Select the programmed sewing mode with the **Seam program** key (LED on).

050 80 05*00 20

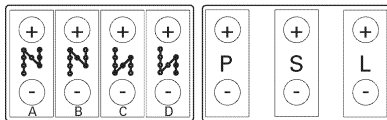


Selecting the program number



- Press +/- on **Key P**, until the desired program number appears on the screen above the key.

000 00 02*00 30

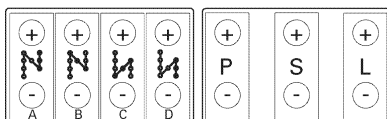


Setting the stitch length (for all seam sections)



- Press +/- on **Key L**, until the value "18" (= 1.8 mm) appears on the screen above the key.

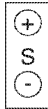
000 00 02*00 18



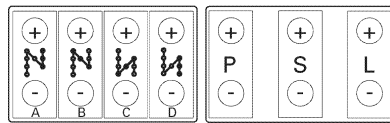
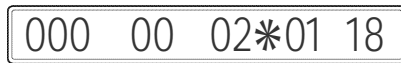


The seam section must always be selected first, if the following values and sewing functions entered are only valid for this seam section.
If a value or sewing function is entered in seam section "00", this input is valid for the entire seam program with all seam sections.

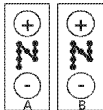
Selecting the seam section / first seam



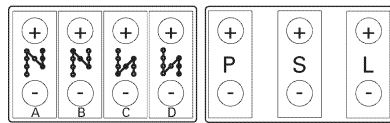
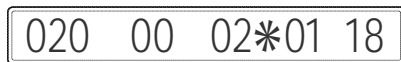
- Press +/- on Key S, until the first seam section (01) appears on the screen above the key.



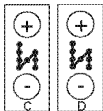
Setting the edge guide distance (for the first seam section)



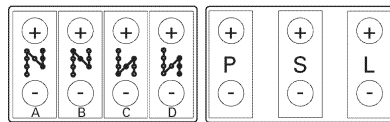
- Press +/- on Key A or Key B, until the value "20" (= 2 mm) appears on the screen above the keys.



Setting the seam depth (for the first seam section)



- Press +/- on Key C or Key D, until the value "43" (taken from the diagram) appears on the screen above the keys.



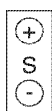
Selecting the sewing functions (for the first seam section)



- Switch on the light guide function (LED on).
The machine stops automatically before the edge of the material (seam depth).

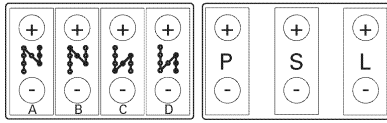


- Switch on the starttack (LED on).



- Select seam section 2 (press + on Key S).

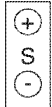
020 43 02*02 18



Selecting the sewing functions (for the second seam section)

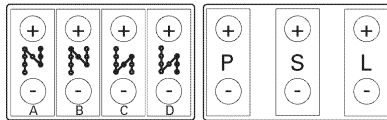


- Switch on the light guide function (LED on).
The machine stops automatically before the edge of the material (seam depth).



- Select seam section 3 (press + on Key S).

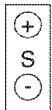
020 43 02*03 18



Selecting the sewing functions (for the third seam section)

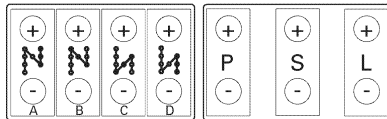


- Switch on the light guide function (LED on).
The machine stops automatically before the edge of the material (seam depth).



- Select seam section 4 (press + on Key S).

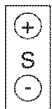
020 43 02*04 18



Selecting the sewing functions (for the fourth seam section)

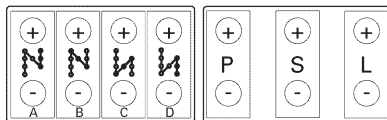


- Switch on the light guide function (LED on).
The machine stops automatically before the edge of the material (seam depth).

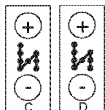


- Select seam section 5 (press + on Key S).

020 43 02*05 18



Setting the seam depth (for the fifth seam section)



- Press +/- on Key C or Key D, until the value "30" (= 3 mm) appears on the screen above the keys.

Selecting the sewing functions (for the fifth seam section)



- Switch on the light guide function (LED on).

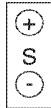


- Switch on thread trimming (LED on).



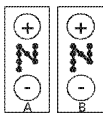
- Switch on endtrack (LED on).

Selecting the seam section / second seam



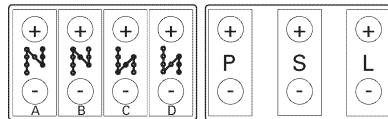
- Select seam section 6 (press + on Key S)

Setting the edge guide distance (for the sixth seam section)

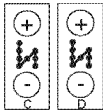


- Press +/- on Key A or Key B, until the value "60" (= 6 mm) appears on the screen above the keys.

060 30 02*06 18

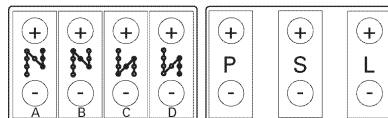


Setting the seam depth (for the sixth seam section)



- Press +/- on Key C or Key D, until the value "100" (taken from the diagram) appears on the screen above the keys.

060 100 02*06 18



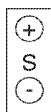
Selecting the sewing functions (for the sixth seam section)



- Switch on the light guide function (LED on).
The machine stops automatically before the edge of the material (seam depth).

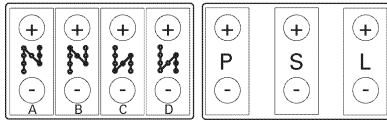


- Switch on the starttack (LED on).



- Select seam section 7 (press + on Key S).

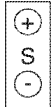
060 100 02*07 18



Selecting the sewing functions (for the seventh seam section)

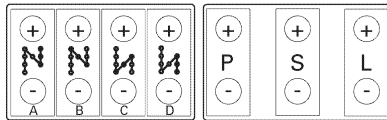


- Switch on the light guide function (LED on).
The machine stops automatically before the edge of the material (seam depth).



- Select seam section 8 (press + on Key S).

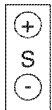
060 100 02*08 18



Selecting the sewing functions (for the eighth seam section)

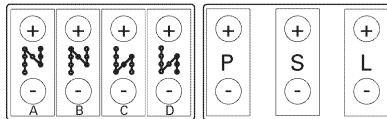


- Switch on the light guide function (LED on).
The machine stops automatically before the edge of the material (seam depth).



- Select seam section 9 (press + on Key S).

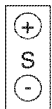
060 100 02*09 18



Selecting the sewing functions (for the ninth seam section)

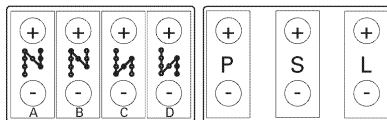


- Switch on the light guide function (LED on).
The machine stops automatically before the edge of the material (seam depth).

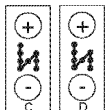


- Select seam section 10 (press + on Key S).

060 100 02*10 18



Setting the seam depth (for the tenth seam section)



- Press +/- on Key C or Key D, until the value "30" (= 3 mm) appears on the screen above the keys.

Selecting the sewing functions (for the tenth seam section)



- Switch on the light guide function (LED on).

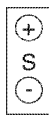


- Switch on thread trimming (LED on)

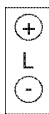


- Switch on endtack (LED on).

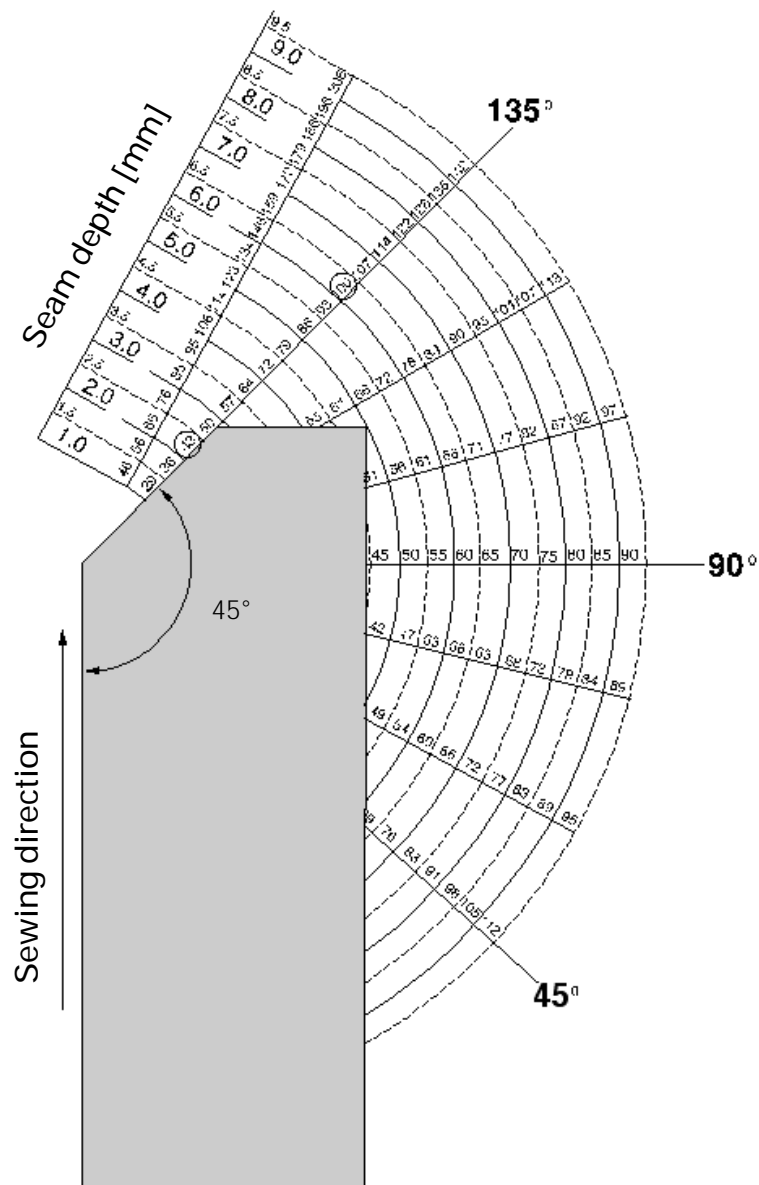
Concluding the sewing program



- Press + on Key S, until "11" appears on the screen above the key.



- Using Key L set the stitch length at "00".
By setting the stitch length in the eleventh seam section at zero, the tenth seam section is recognised as the last seam section of the sewing program and the seam program input is concluded.



12 Care and Maintenance

Cleaning	daily, several times if in continuous operation
Checking the oil level	every 3 months



These maintenance intervals are calculated for the average running time of a single shift operation. If the machine is operated more than this, shorter intervals are recommended.

12.01 Cleaning the machine

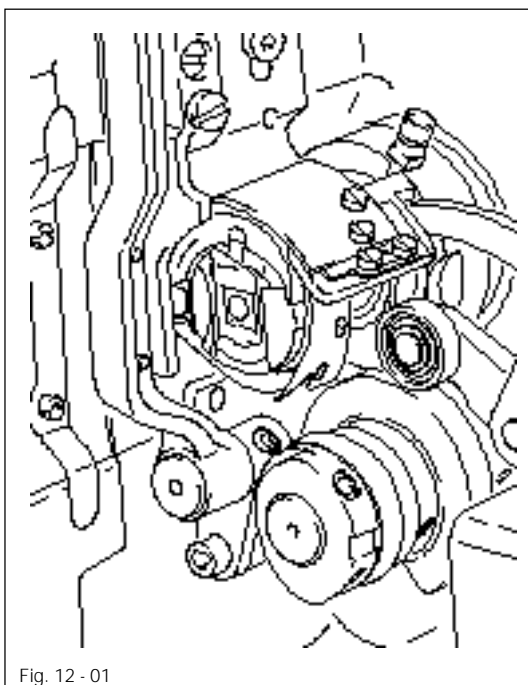


Fig. 12 - 01



Switch off the machine!
Danger of injury due to unintentional starting of the machine!

- Tilt back the machine.
- Clean the hook and hook compartment daily, more often if in continuous operation.



Return the machine to its upright position using **both** hands!
Danger of injury by crushing between the edge of the machine and the table top!

12.02 Topping up the oil tank

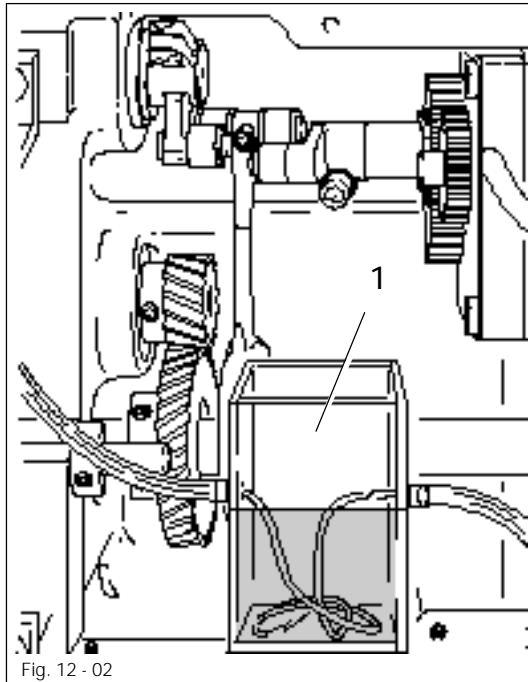


Fig. 12 - 02



The oil reservoir must always have oil in it.

- Whenever it is necessary to refill the reservoir, tilt back the machine and let it rest on the sewing head support.
- Fill oil through hole 1 into the reservoir 2 up to the level of the front edge (see arrow).



Return the machine to its upright position using **both** hands!
Danger of injury by crushing between the machine and the table top!



Only use oil with a mean viscosity of 10.0 mm²/s at 40°C and a density of 0.847 g/cm³ at 15°C.



We recommend PFAFF sewing machine oil, part no. 280-1-120 105.

13 Adjustment



No C-clamp should be fastened to the needle bar of the **PFAFF 2481**.
This could cause damage to the special coating of the needle bar.

13.01 Notes on adjustment

All following adjustments are based on a fully assembled machine and may only be carried out by expert 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 which have to be completely adjusted. If only specific individual work steps are carried out, both the preceding and following chapters must be observed.

Screws, nuts indicated in brackets () are fastenings for machine parts, which must be loosened before adjustment and tightened again afterwards.

13.02 Tools, gauges and other accessories for adjusting

- 1 set of screwdrivers with blade widths from 2 to 10 mm
- 1 set of wrenches with jaw widths from 7 to 14 mm
- 1 set of Allan keys from 1.5 to 6 mm
- 1 metal rule, (Part No. 08-880 218-00)
- 1 feed dog adjustment gauge, Part No. 61-111 639-71
- 1 adjustment pin (5 mm dia.), Part No. 13-033 346-05
- Adjustment gauge, part No. 61-111 639-70
- Sewing thread and test material

13.03 Abbreviations

TDC = top dead center

BDC = bottom dead center

13.04 Control and adjustment aids



The positions required during adjustment can be fixed with the help of adjustment pin 1 (part no. 13-033 346-05) and, if necessary, adjustment gauge 3 (part no. 61-111 639-73).

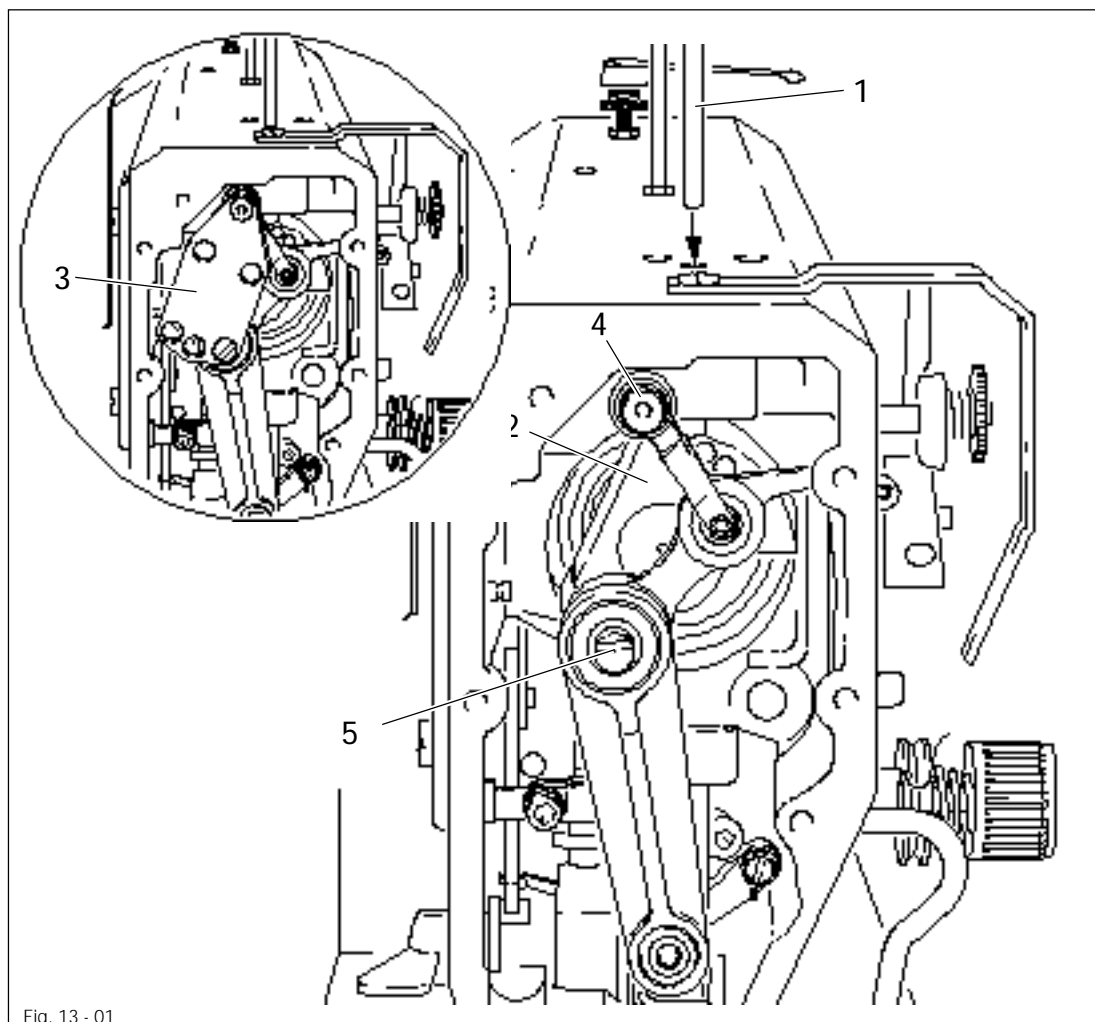


Fig. 13 - 01

**Needle bar position 1.8 mm past b.d.c.**

- Turn the balance wheel until the needle bar is approximately in the required position.
- Insert adjustment pin 1 in the hole.
- Move the balance wheel fractionally to and fro until adjustment pin 1 engages in crank 2.

Needle bar position 0.6 mm past b.d.c.

- Bring the needle bar approximately into the required position.
- Fit adjustment gauge 3 to pins 4 and 5, paying attention to the right side (for 30 mm or 36 mm needle bar stroke).

Adjustment

13.05 Adjusting the basic machine

13.05.01 Basic position of the machine drive unit



This adjustment is only necessary, if toothed belt **2** was removed.

Requirement

When the needle bar is positioned 0.6 mm past b.d.c., the markings **3** and **4** should be in alignment.

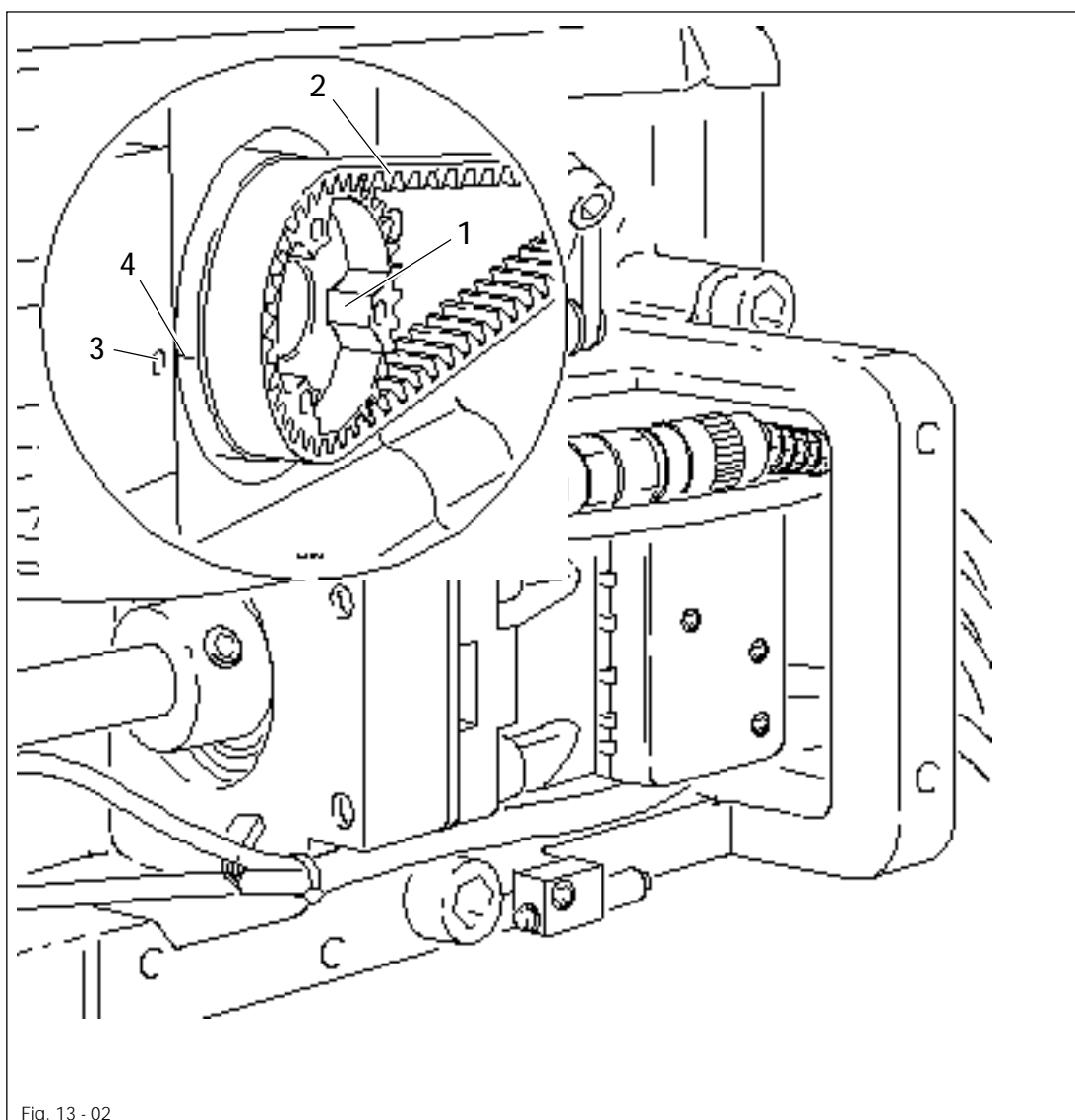


Fig. 13 - 02



- Bring needle bar to 0.6 mm past b.d.c.
- Adjust the toothed belt wheel **1** according to the **requirement** and slide on toothed belt **2**.

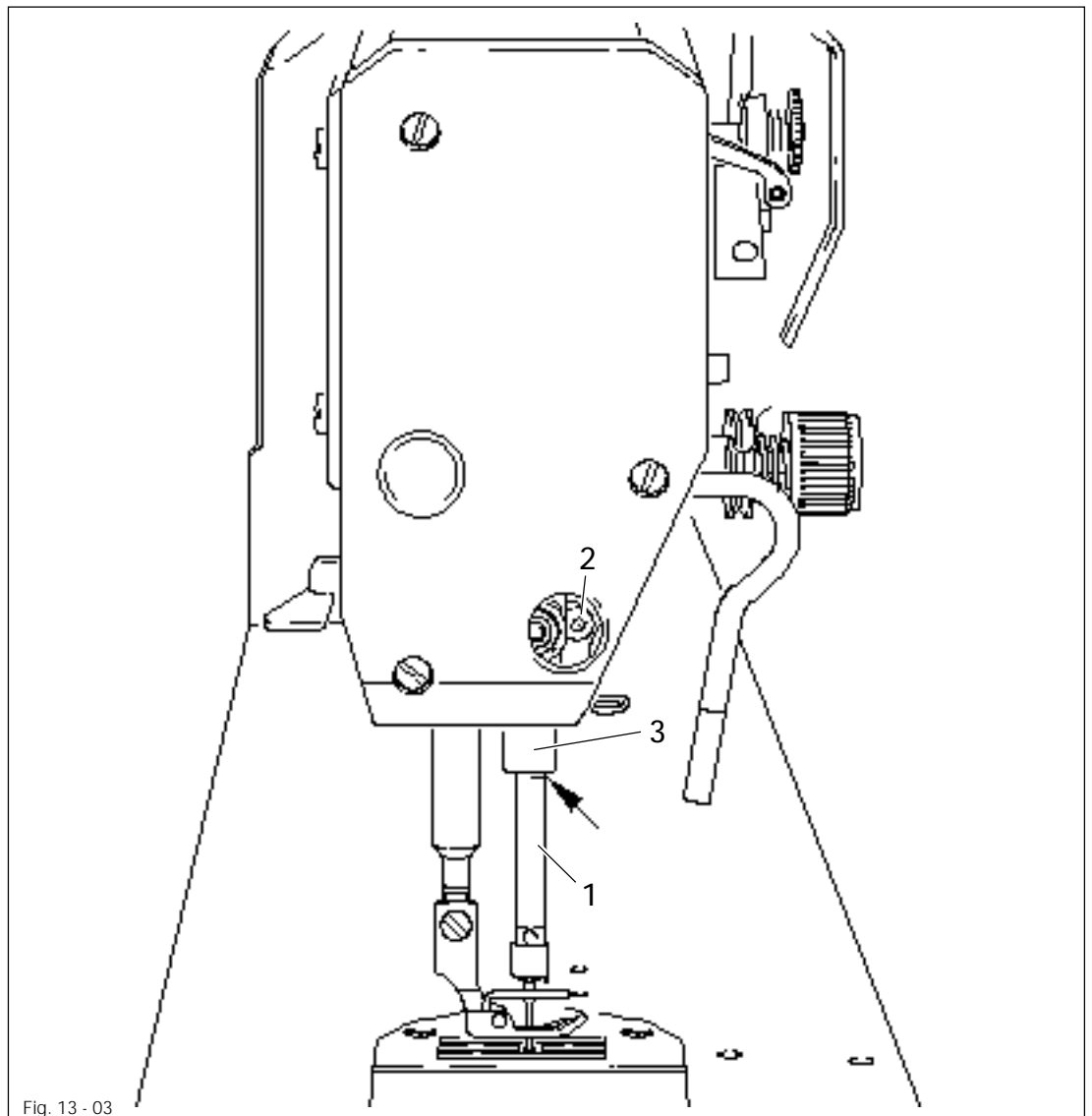


When installing the motor pay attention to the correct position of shaft flange, shock absorber and motor flange!

13.05.02 Preadjusting the needle height

Requirement

When the needle bar is positioned 1.8 mm above BDC, the mark on the needle bar 1 must be flush with the bottom edge of the needle bar frame 3.



- Set needle bar at 1.8 mm past b.d.c. and block machine with blocking pin, see Chapter 13.04 Checking and adjusting aids.
- Move needle bar 1 (screw 2), without turning it, according to the requirement.

Adjustment

13.05.03 Neutral position of the bottom feed dog

Requirement

With the stitch length set at "0"

1. The marking on the toothed segment 1 should be positioned in the centre of the toothed wheel shaft 3.
2. Cranks 4 and 6 should be in alignment and there should be no feeding motion of the bottom feed dog when the balance wheel is turned.

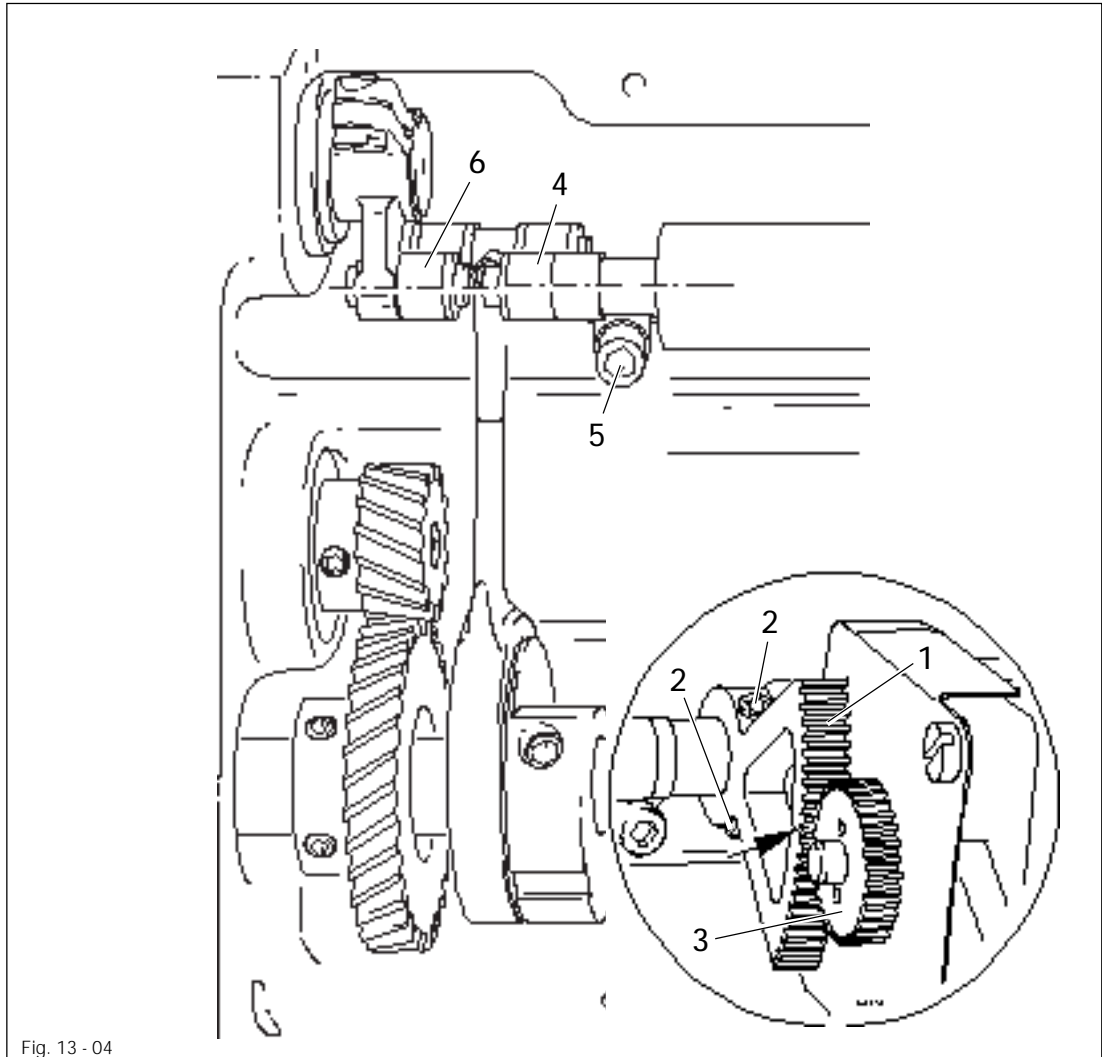
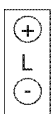


Fig. 13 - 04



Before beginning with the adjustment, remove the pedal rods!
Danger of injury if the machine suddenly starts running!

- Switch on the machine.



- On the control panel set the stitch length at "0" and turn the balance wheel until the stitch length control motor reacts.
- Adjust tooth segment 1 (screws 2) according to **requirement 1**, without turning toothed wheel 3.
- Adjust crank 4 (screws 5) according to **requirement 2**.
- Switch off the machine.

13.05.04 Neutral position of the needle feed dog

Requirement

When the stitch length is set at "0", there should be no feeding motion of the needle bar when the balance wheel is turned.

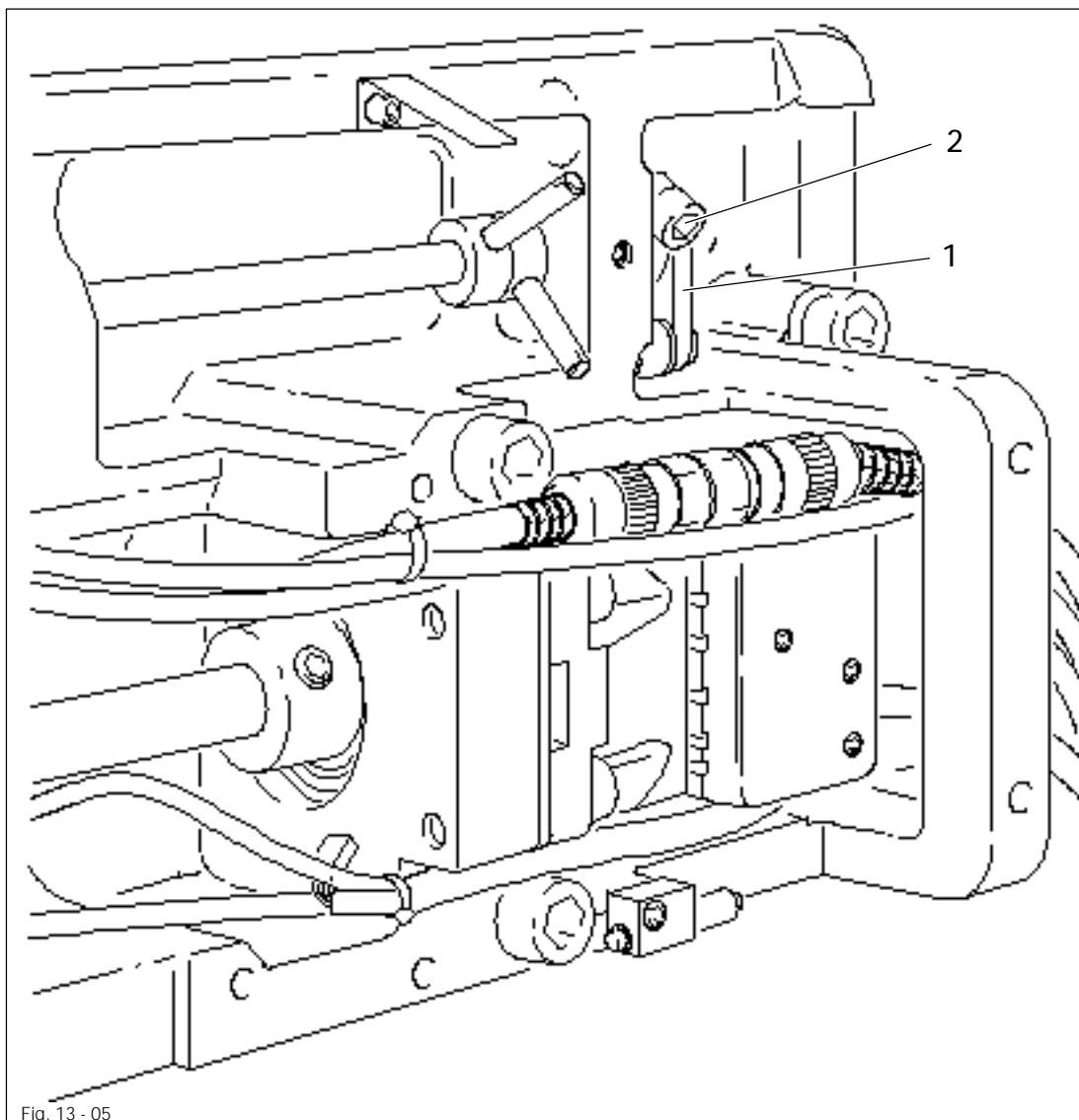
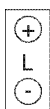


Fig. 13 - 05



Before beginning with the adjustment, remove the pedal rods!
Danger of injury if the machine suddenly starts running!

- Switch on the machine.



- On the control panel set the stitch length at "0" and turn the balance wheel until the stitch length control motor reacts.
- Adjust crank 1 (screw 2) according to the **requirement**.
- Switch off the machine.

Adjustment

13.05.05 Feeding motion of the bottom feed dog

Requirement

With the needle bar positioned **0.6 mm past b.d.c.** the bottom feed dog should not move, when shaft **3** is turned backwards and forwards.

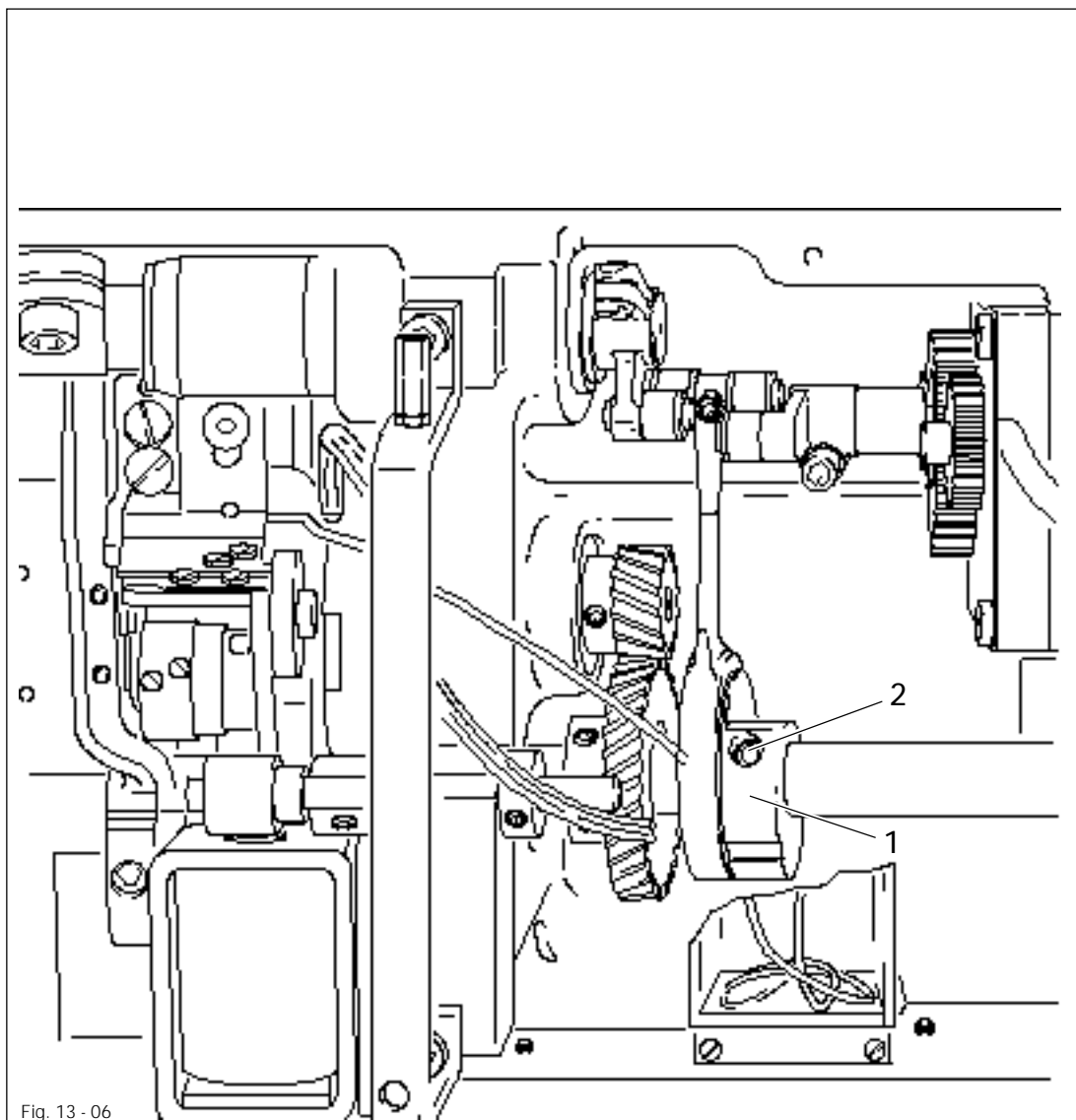


Fig. 13 - 06



- Position the needle bar at 0.6 mm past b.d.c.
- Adjust eccentric 1 (screws 2) according to the requirement, without moving it sideways.

13.05.06 Feeding motion of the needle feed dog

Requirement

With the needle bar positioned 0.6 mm past b.d.c. the needle should not move, when shaft 3 is turned backwards and forwards.

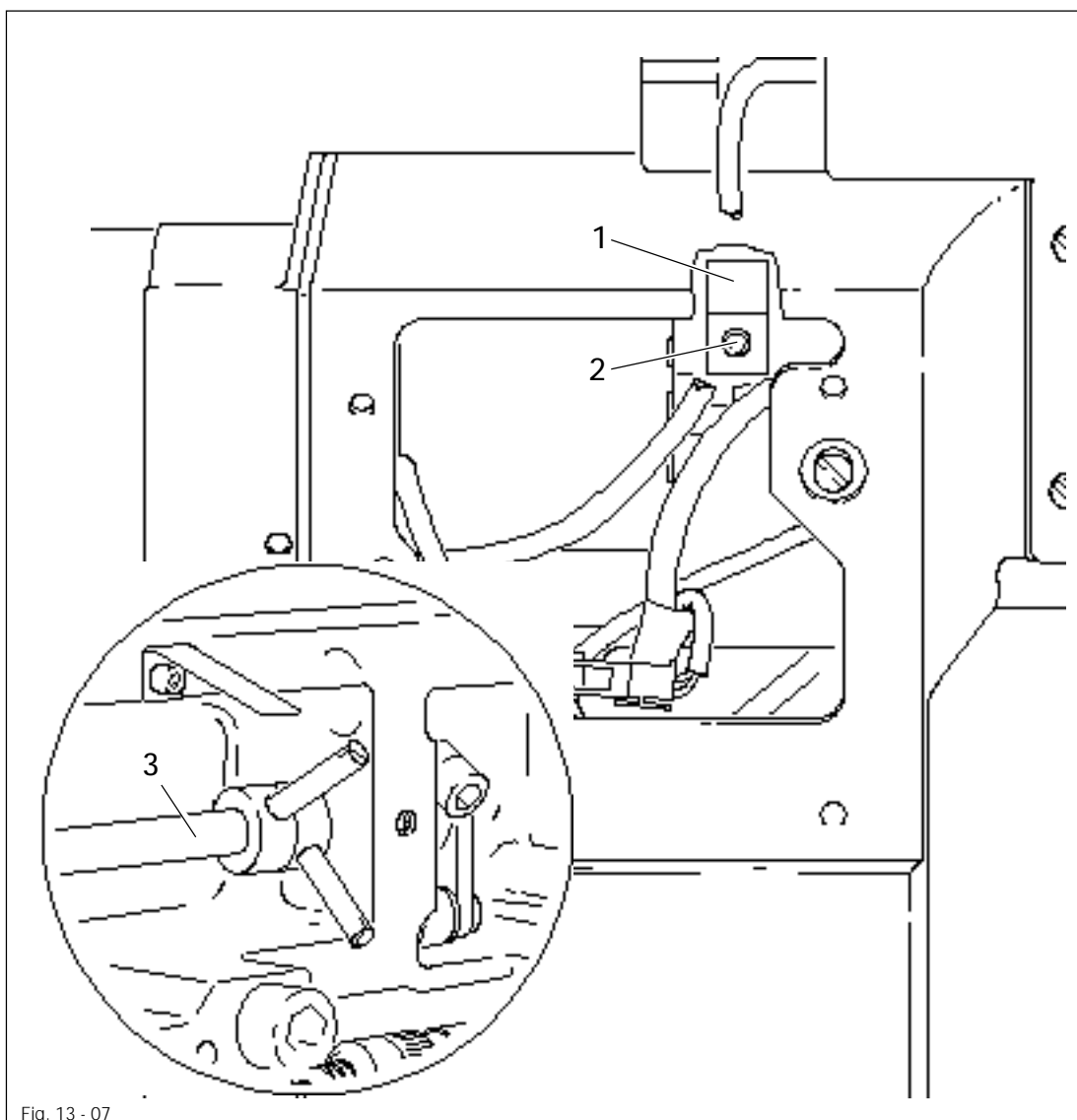


Fig. 13 - 07

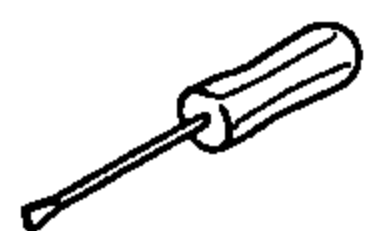
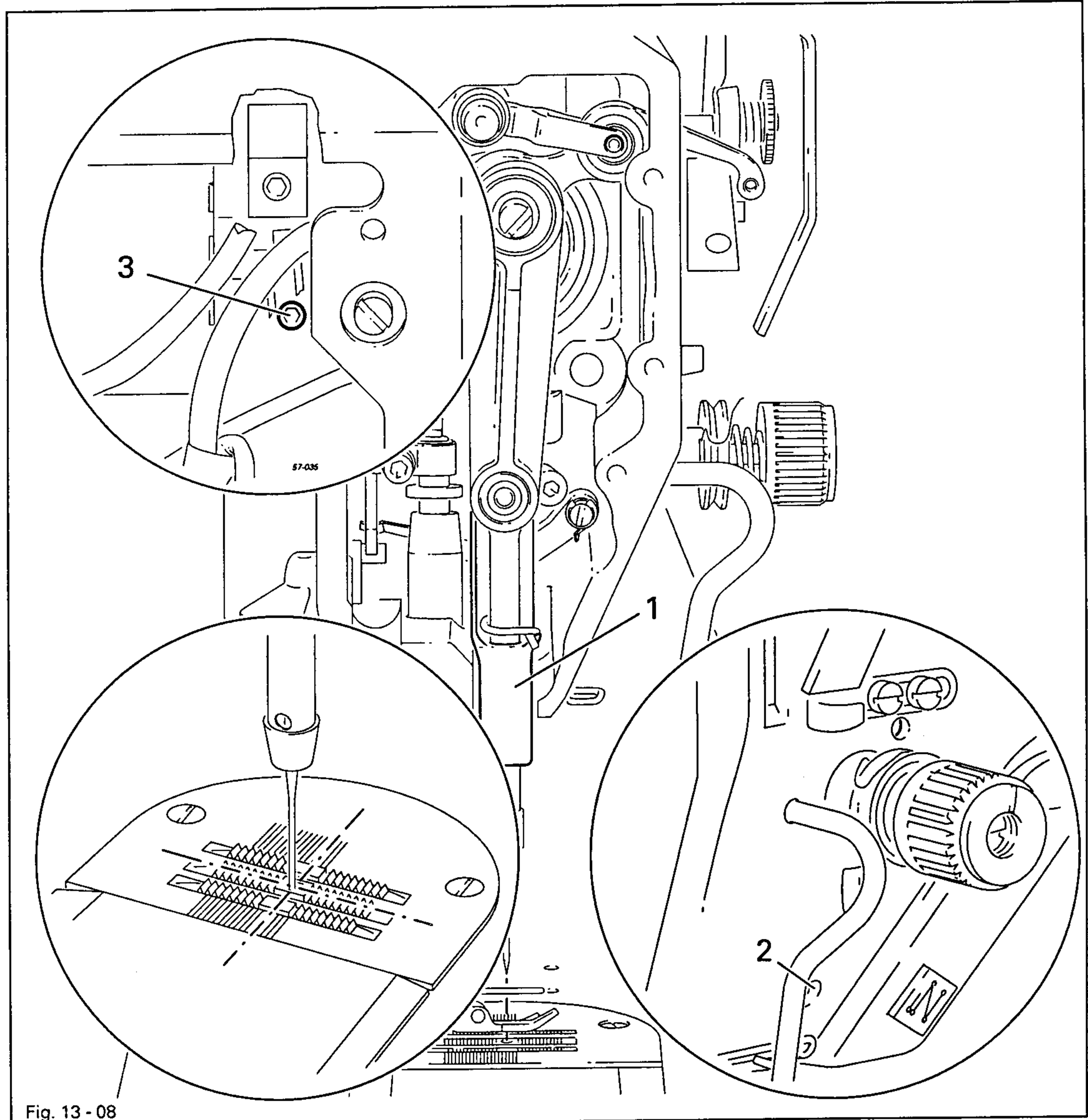


- Position the needle bar at 0.6 mm past b.d.c.
- Adjust eccentric 1 (screws 2) according to the requirement.

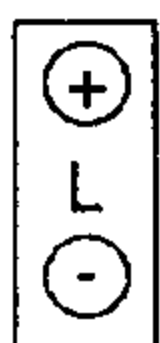
13.05.07 Needle in needle hole centre

Requirement

The needle should enter the needle hole exactly in the centre.



Before beginning with the adjustment, remove the pedal rods!
Danger of injury if the machine suddenly starts running!



- Switch on the machine.
- On the control panel set the stitch length at "0" and turn the balance wheel until the stitch length control motor reacts.
- By turning the balance wheel position the needle in the needle hole.
- Adjust needle bar frame 1 (screws 2 and 3) according to the requirement.
- Switch off the machine.

13.05.08 Lifting stroke of the bottom feed dog

Requirement

When the needle bar is positioned 0.6 mm past b.d.c. and the stitch length is set at "0"

1. The bottom feed dog should be at the top of its stroke and
2. The control cam 3 should be resting on the feed lifting eccentric 1.

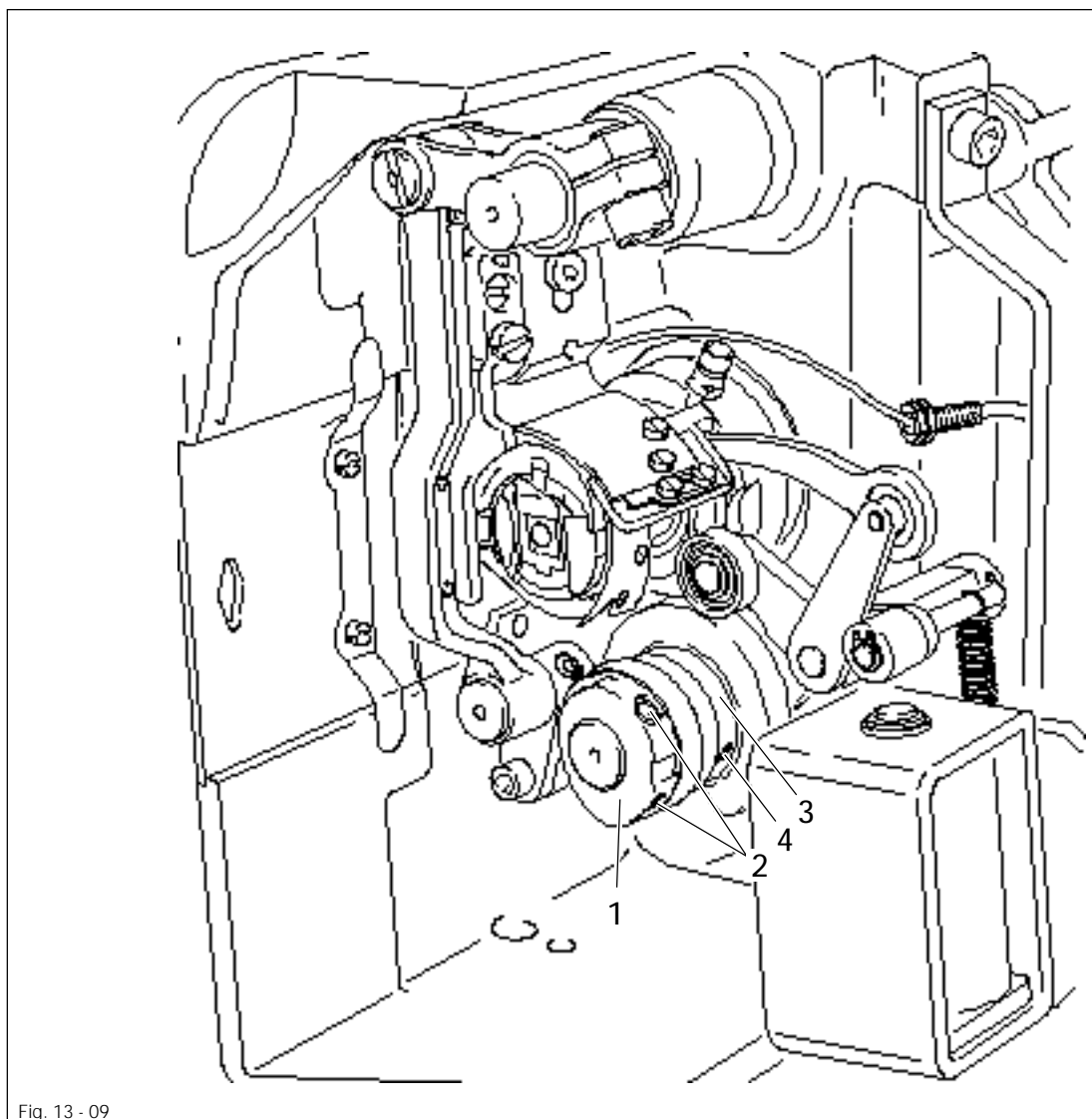
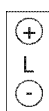


Fig. 13 - 09



Before beginning with the adjustment, remove the pedal rods!
 Danger of injury if the machine suddenly starts running!



- Switch on the machine.
- Set the stitch length at "0" and bring the needle bar to 0.6 mm past b.d.c.
- Turn the balance wheel until the stitch length control motor reacts.
- Adjust eccentric 1 (screws 2) according to requirement 1.
- Adjust control cam 3 (screws 4) according to requirement 2 and switch off the machine.

Adjustment

13.05.09 Height of the bottom feed dog

Requirement

At the top of its stroke, when the stitch length is set at "0", the bottom feed dog 1

1. Should be positioned in the centre of the needle plate cutout as seen from the side and in feeding direction and
2. Rest on the feed dog adjustment gauge 2 over its whole length.

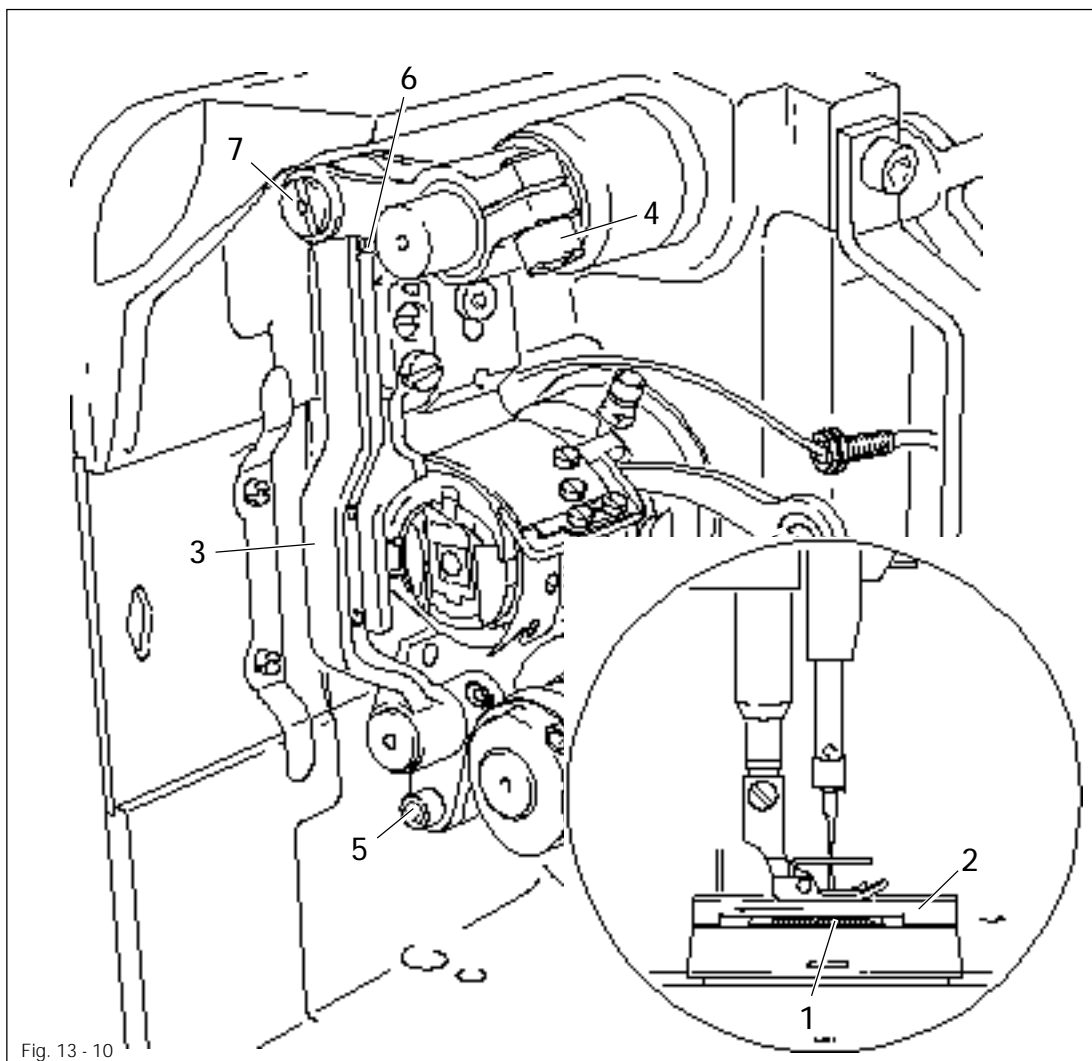
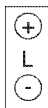


Fig. 13 - 10



Before beginning with the adjustment, remove the pedal rods!
Danger of injury if the machine suddenly starts running!



- Switch on the machine and set the stitch length at "0".
- Turn the balance wheel until the stitch length control motor reacts.
- Bring the bottom feed dog 1 to the top of its stroke.
- Raise the sewing foot, bring the feed dog adjustment gauge 2 above the needle plate cutout with the arrow in the direction of sewing and with the front edge flush to the edge of the needle plate, and lower the sewing foot.
- Adjust bracket 3 (screw 4) according to requirement 1.
- Adjust bracket 3 or eccentric 7 (screws 5 and 6) according to requirement 2.
- Switch off the machine.

13.05.10 Hook shaft bearing and backlash

Requirement

1. The front edge of the hook shaft 6 must be at a distance of 14.5 mm to the needle center. At the same time, the slot in the hook shaft bearing 1 (see arrow) must be parallel to the bedplate and pointing opposite to the direction of sewing.
2. There must be a slight amount of play between the gears 3 and 5.

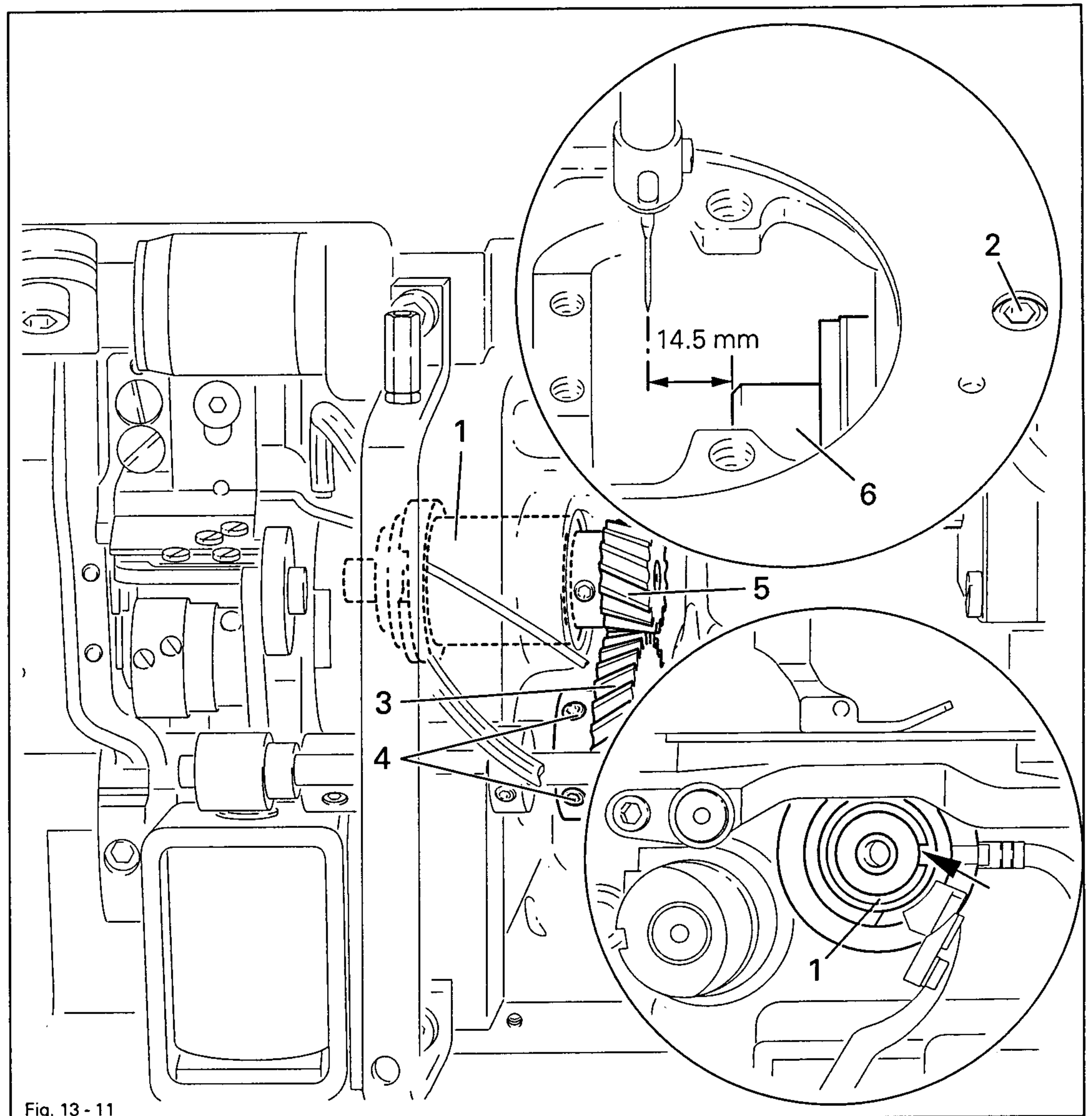
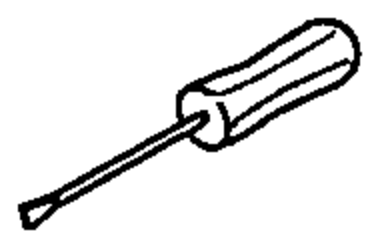


Fig. 13 - 11



- Align hook shaft bearing 1 (screw 2) according to requirement 1.
- Slide gear 3 (screws 4) on to the shaft according to requirement 2.

13.05.11 Hook lubrication

Requirement

1. The centrifugal disk 1 must be positioned 1.5 mm in front of the oil ring 3.
2. When the machine is running at full speed, after approx. 10 seconds a mark should be made by a fine stripe of oil on the strip of paper placed over the needle plate cutout.

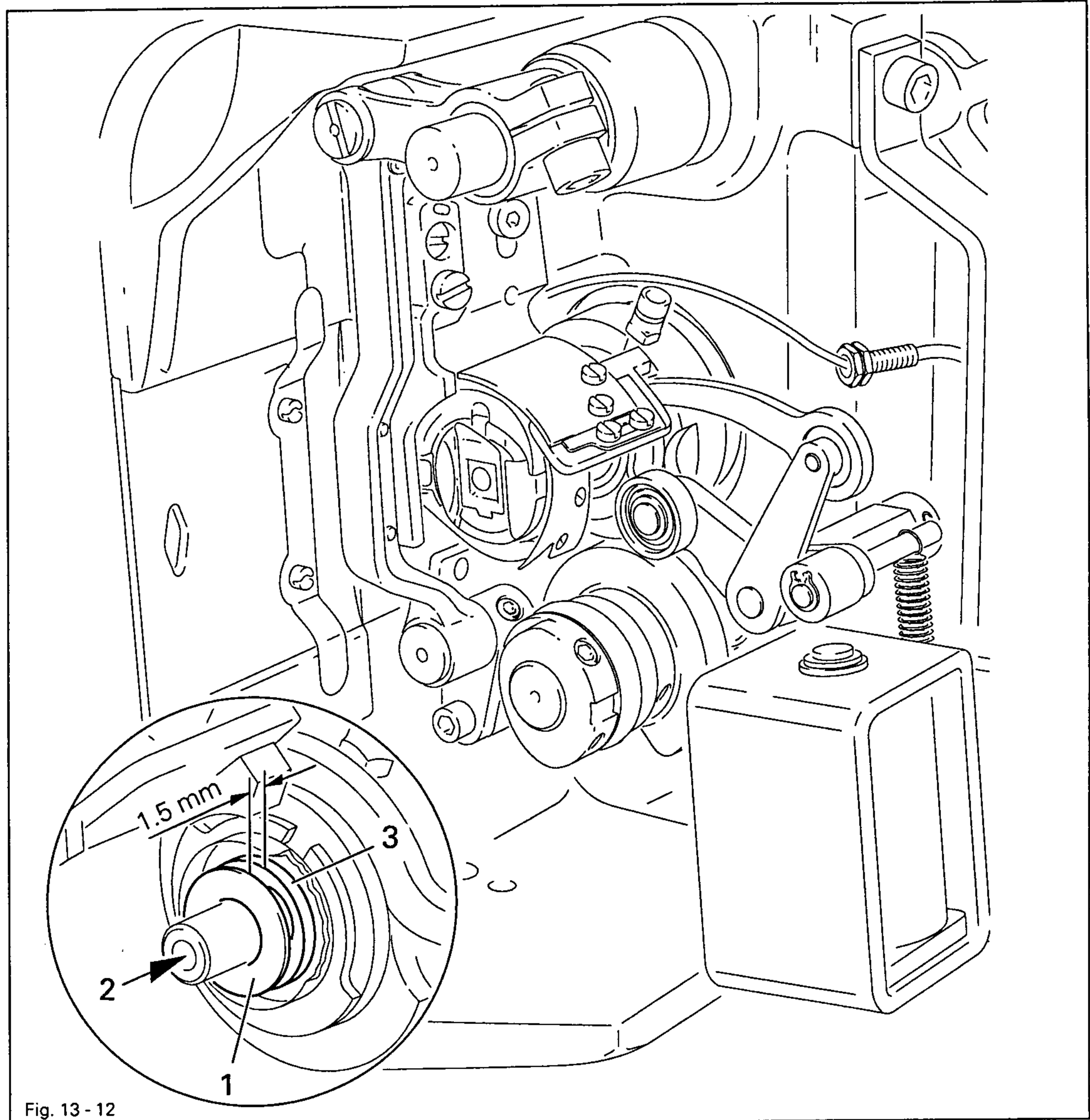
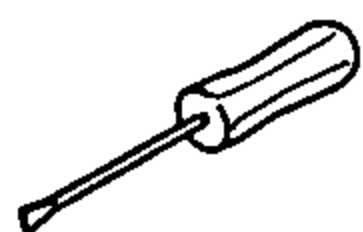


Fig. 13 - 12



The adjustment is only necessary if the wick has been replaced.
When replacing the wick, make sure that the new wick is impregnated with oil.



- Move the centrifugal disk 1 (screw 2) according to requirement 1.
- Check requirement 2. If necessary, move centrifugal disk 1.

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

Requirement

With the needle at 1.8 mm after BDC,

1. the hook point 6 must point to the middle of the needle and be at a distance of 0.05 mm - 0.1 mm to the clearance cut of the needle, and
2. the top edge of the needle eye must be 0.8 mm below the hook point.
3. Between the projection of the bobbin case position finger 4 and the bottom of the retaining groove there should be a distance of 0.5 mm.

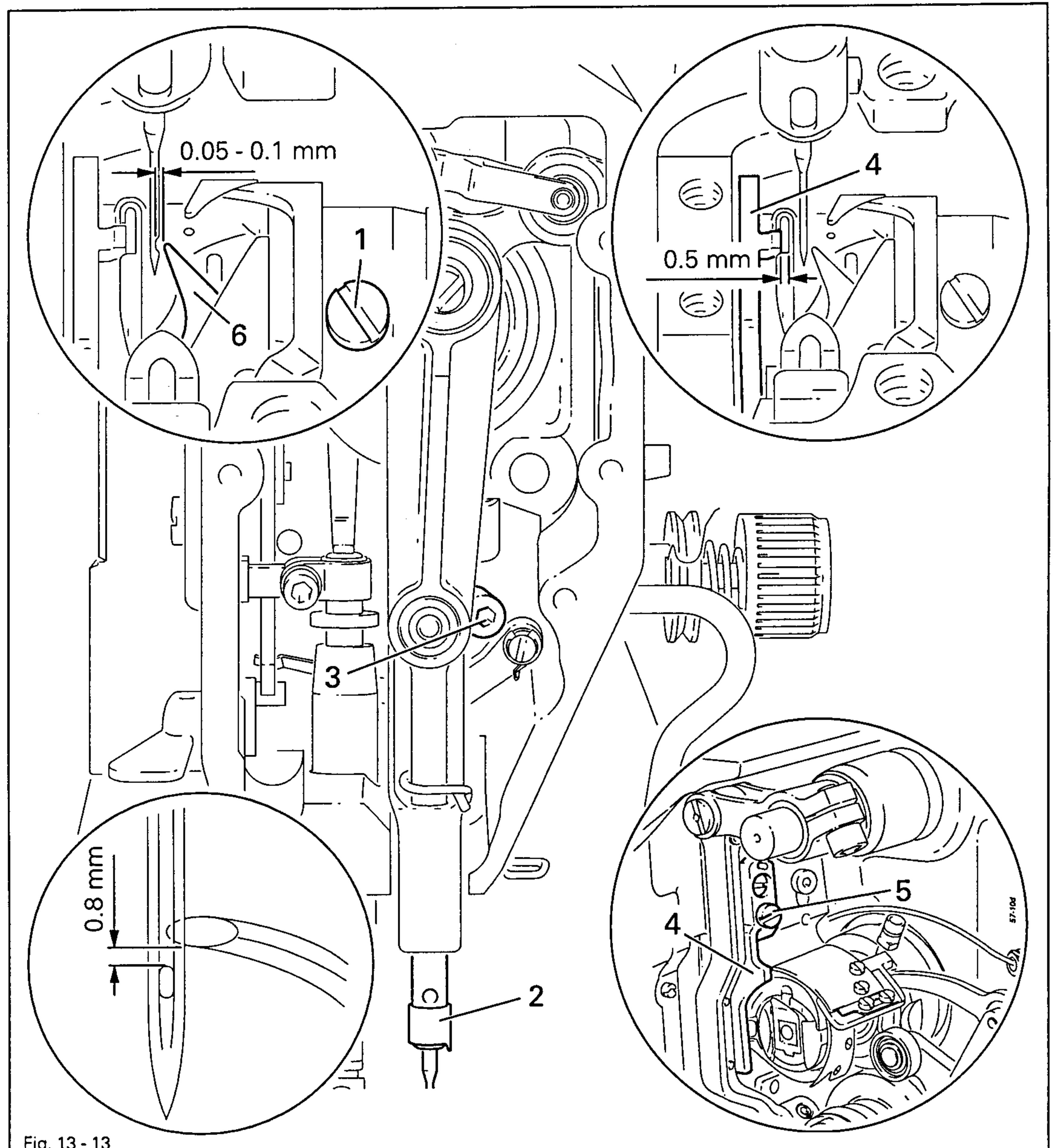
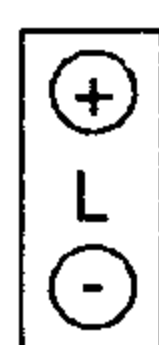
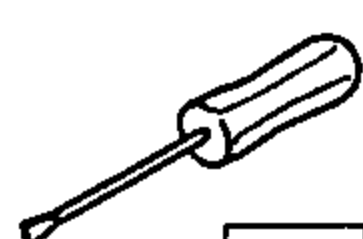
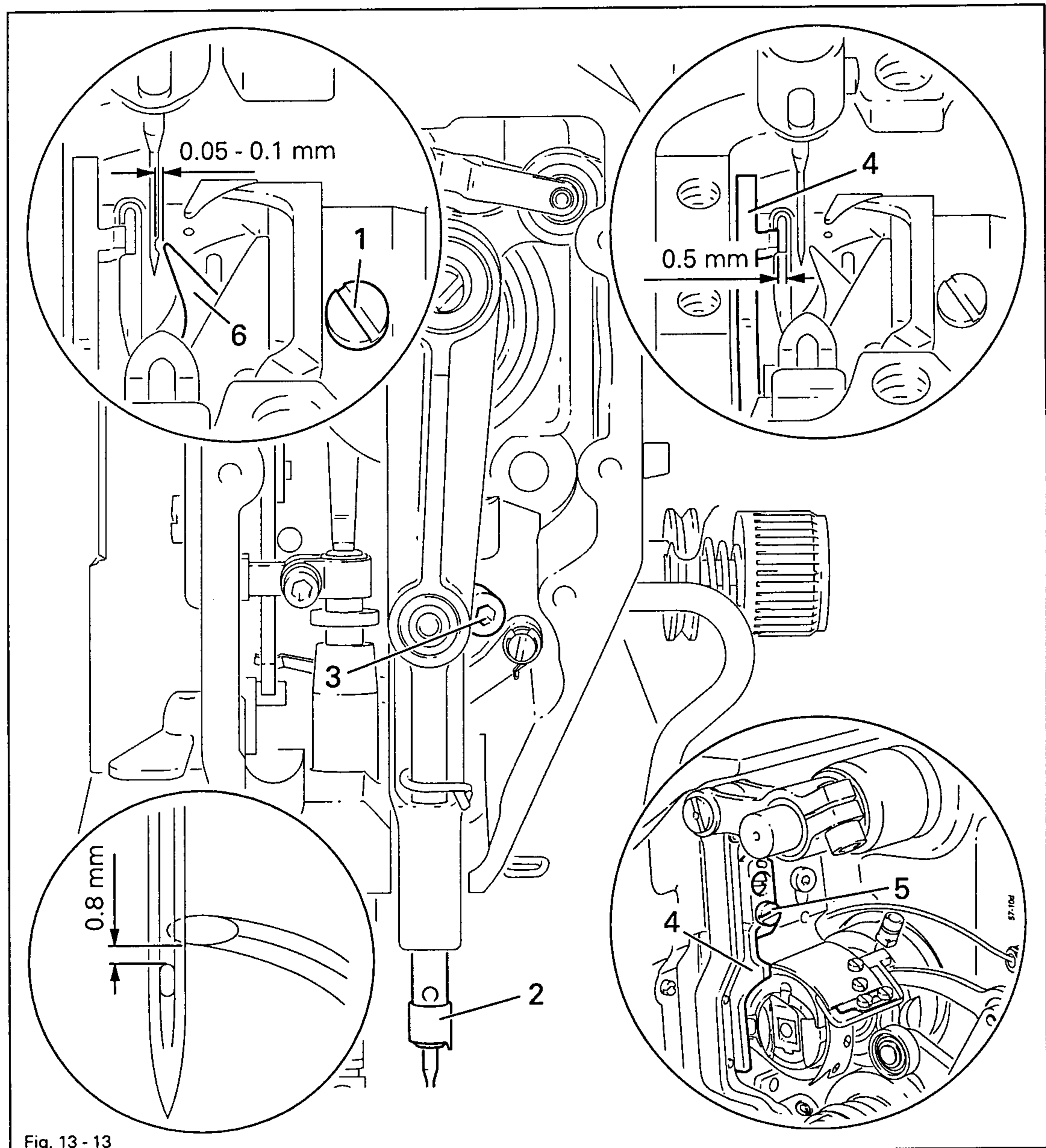


Fig. 13 - 13



- Switch on the machine.
- On the control panel set the stitch length at "0" and turn the balance wheel until the stitch length control motor reacts.
- Switch off the machine.



- Using the adjustment pin, position the needle bar at 1.8 mm after BDC.
- Adjust the hook according to requirement 1.
- Tighten screw 1.
- Move needle bar 2 (screw 3) without turning it according to requirement 2.
- Align bobbin case position finger 4 (screw 5) according to requirement 3.

13.05.13 Thread check spring and slack thread regulator

Requirement

1. The motion of the thread check spring must be completed when the needle point enters the material (spring stroke approx. 7 mm).
2. When the thread loop is at its largest when going around the hook, the thread check spring must have moved by approx. 1 mm.

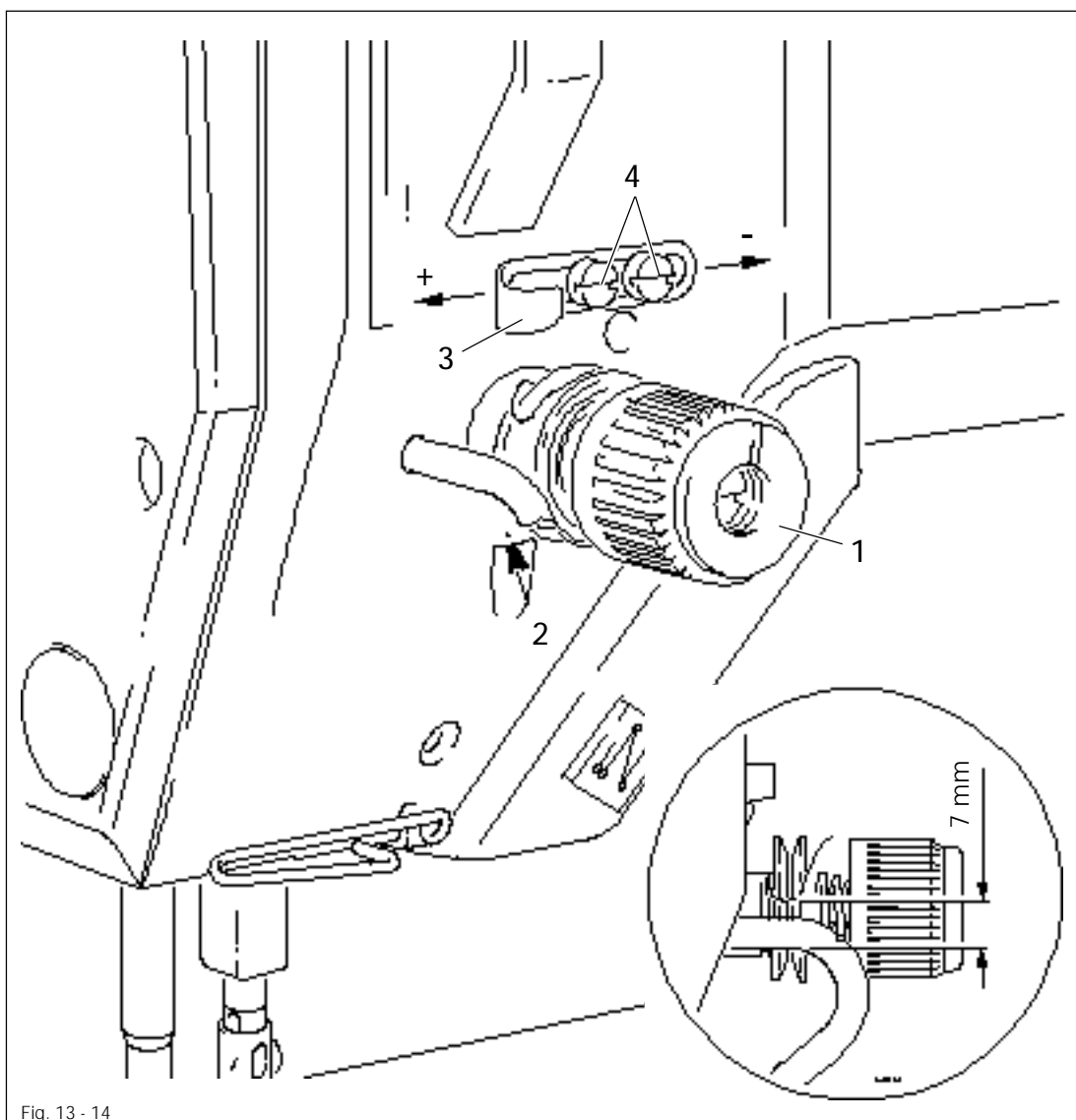


Fig. 13 - 14



- Turn thread tension 1 (screw 2) according to requirement 1.
- Turn thread tension 3 (screw 4) according to requirement 2.



Due to technical sewing reasons it may be necessary to deviate from the spring stroke indicated above.

Move the slack thread regulator 3 (screw 4) toward the "+" (= more thread) or toward the "-" (= less thread)

13.05.14 Sewing foot clearance

Requirement

The clearance x between the sewing foot and the needle plate should be

1. 7 mm (small needle bar stroke) or 11 mm (large needle bar stroke) when the automatic foot lift is activated and
2. 5 mm when the hand lever is raised.

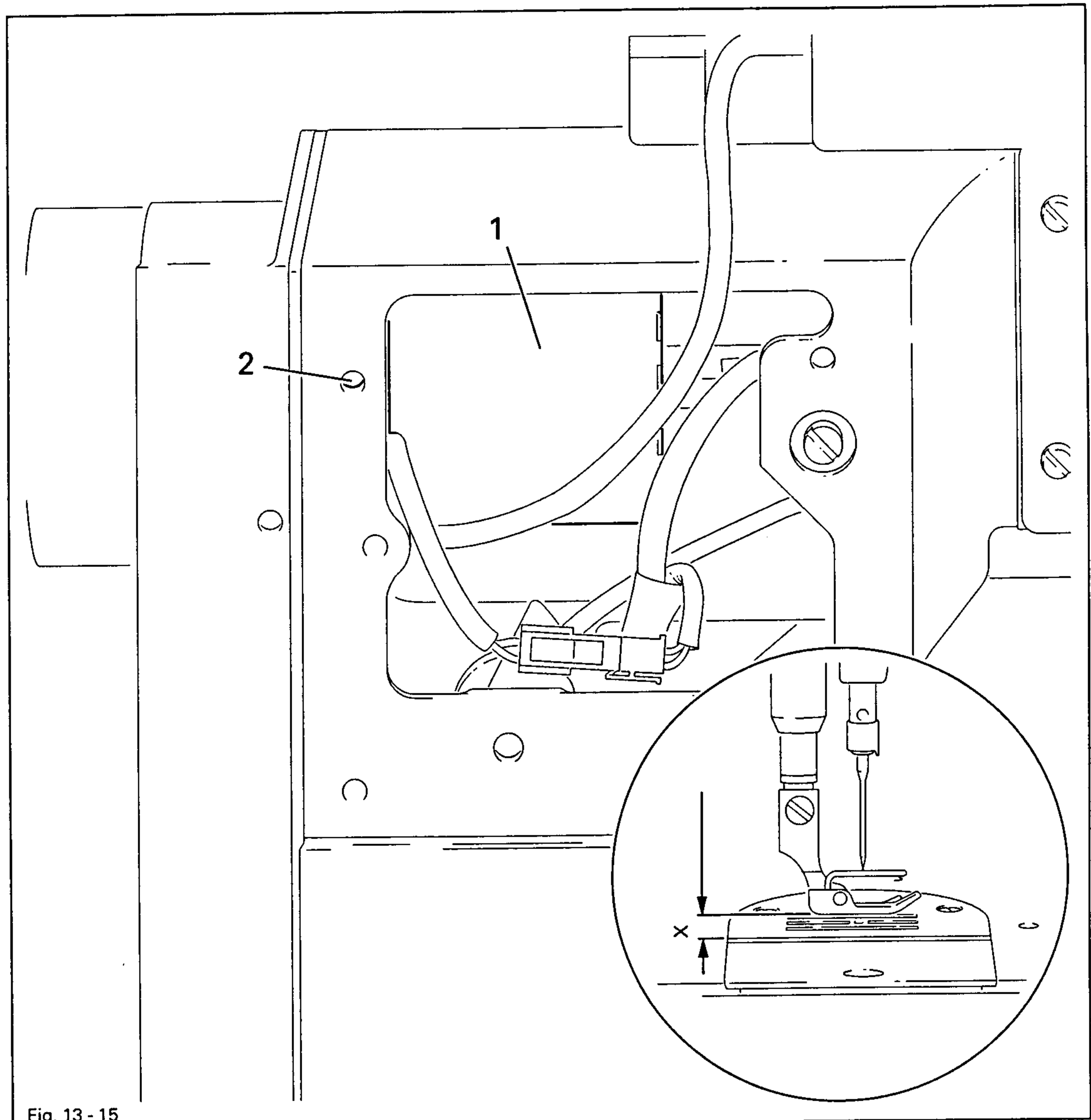
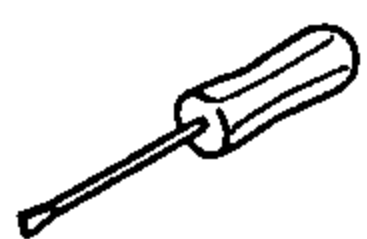


Fig. 13 - 15



- Adjust solenoid 1 (screw 2) according to the requirements.

13.05.15 Adjusting the stitch length

Requirement

1. When the stitch length is set at " 0 " , at maximum speed (4000 spm) the needle should always penetrate at the same point.
2. When the stitch length is set at " 2.5 " and at a maximum speed of 400 spm, the stitch length should be exactly 2.5 mm when sewing forwards or in reverse.
3. When the stitch length is set at " 2.5 " the stitch length should be identical when sewing at 400 spm and 4000 spm.

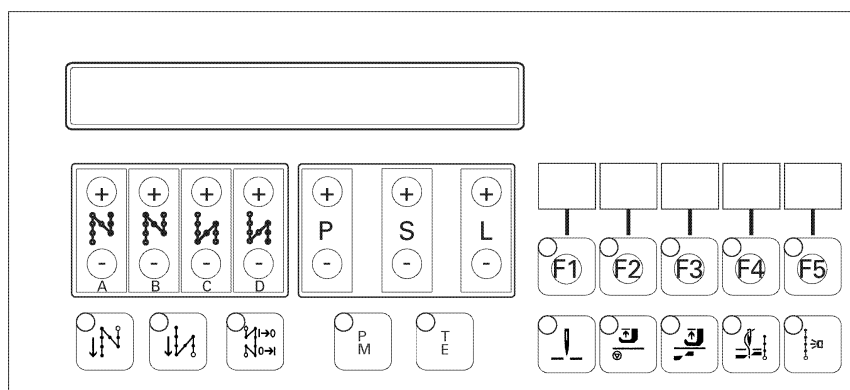


Fig. 13 - 16



- Switch on the machine.
- Set the stitch length at " 0 " and with parameter " 607 " the maximum speed at 4000 spm.
- Adjust parameter " 834 " according to **requirement 1**.
- Set the stitch length at " 2.5 " and with parameter " 607 " the maximum speed at 400 spm.
- Adjust parameter " 846 " (sewing forwards) and parameter " 847 " (sewing in reverse) according to **requirement 2**.
- Compare the stitch length at a speed of 400 spm and at a speed of 4000 spm and adjust parameter " 845 " according to **requirement 3**.
- Switch off the machine.



More detailed information about the selection and alteration of parameters and explanations (functions) about the individual parameters can be found in **Chapter 13.10 Parameter Settings**.

Requirement

1. With the bobbin winder on, the drive wheel 1 must engage reliably.
2. With the bobbin winder off, the friction wheel 5 must not be driven by the drive wheel 1.
3. The bobbin winder must turn off automatically when the thread level is approx. 1 mm from the edge of the bobbin.

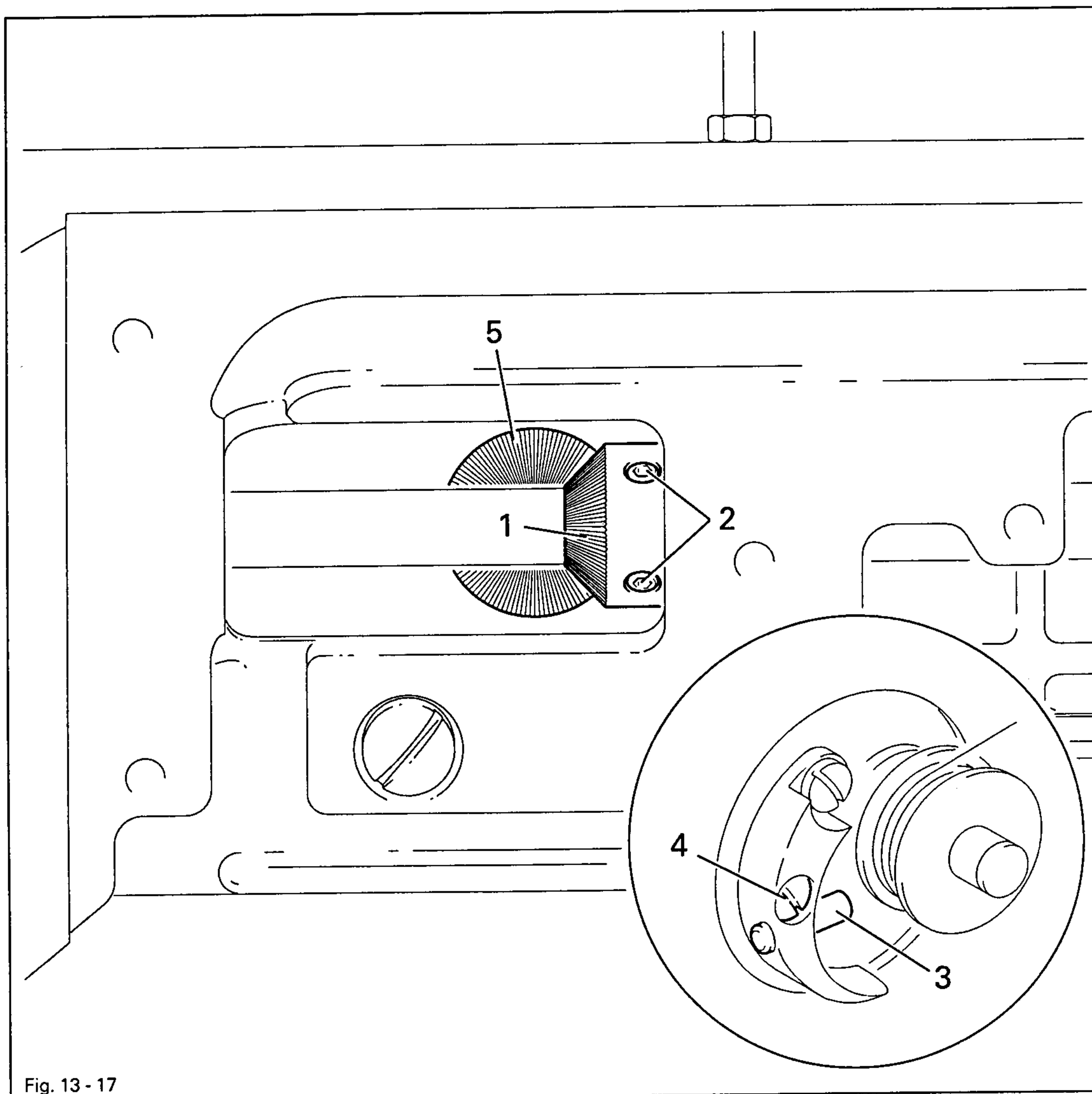
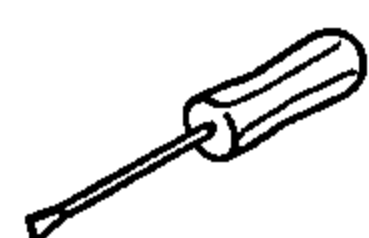


Fig. 13 - 17



- Move drive wheel 1 (screws 2) in accordance with requirement 1 and 2.
- Move bolt 3 (screw 4) in accordance with requirement 3.

13.05.17 Stitch length limitation

Requirement

When the maximum stitch length is (3.5 or 4.5 mm, depending on the model) set, the needle should not make contact in the recess of the sewing foot when sewing forwards or in reverse.

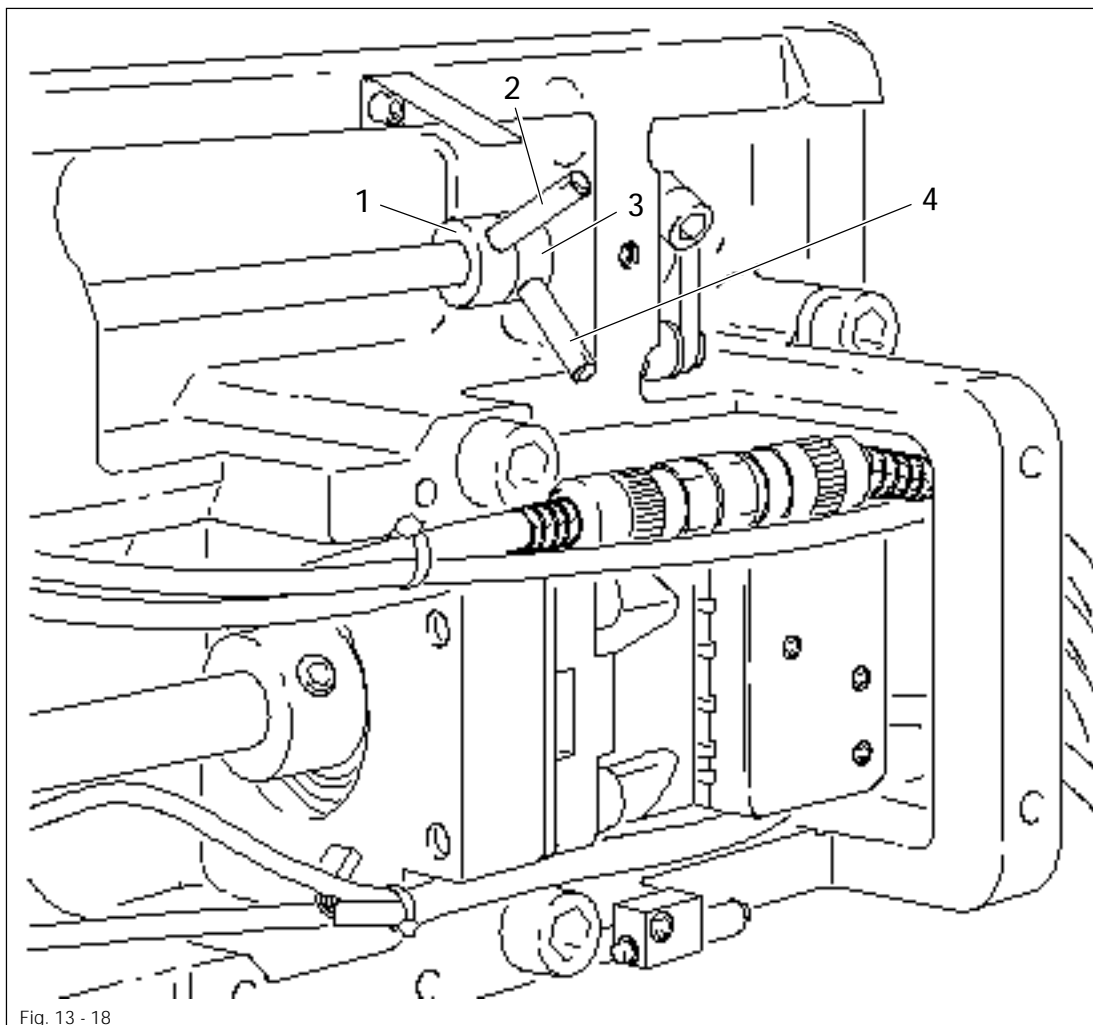
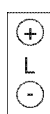


Fig. 13 - 18



Before beginning with the adjustment, remove the pedal rods!
 Danger of injury if the machine suddenly starts running!



- Switch on the machine, and set parameter 849 (see chapter 13.10.02).
- On the control panel set the maximum stitch length according to the requirement (pay attention to the specifications).
- Position stop 1 (screw 2) on the corresponding edge of the casting.
- Press the key on the machine head and sew 2 stitches (in reverse).
- Position stop 3 (screw 4) on the corresponding edge of the casting according to the requirement.
- Switch off the machine.

Adjustment

13.05.18 Presser foot pressure

Requirement

The material must be fed reliably. In the process, pressure marks on the material must not be made.

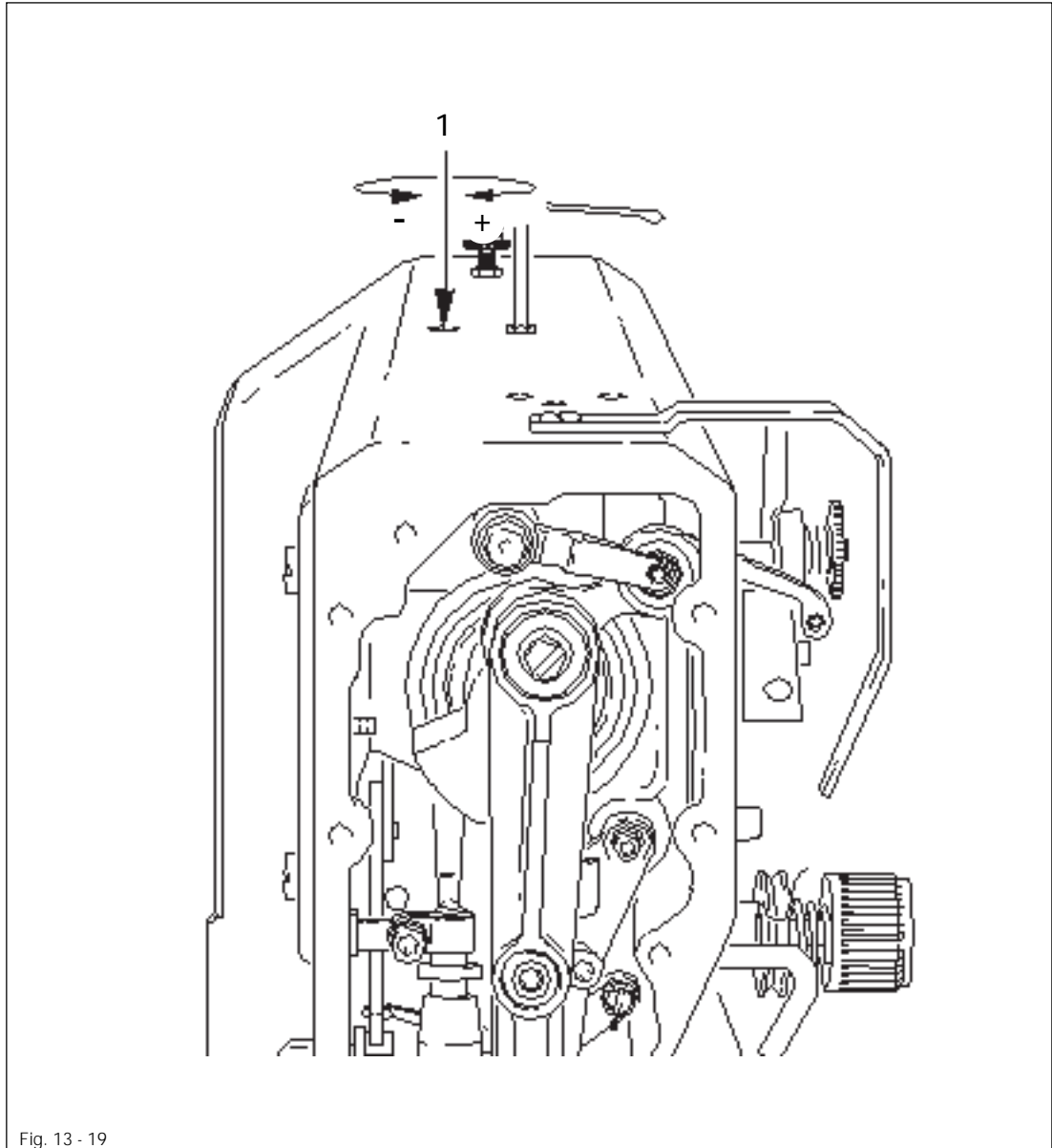
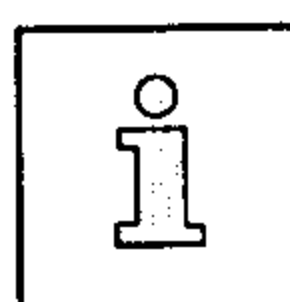


Fig. 13 - 19

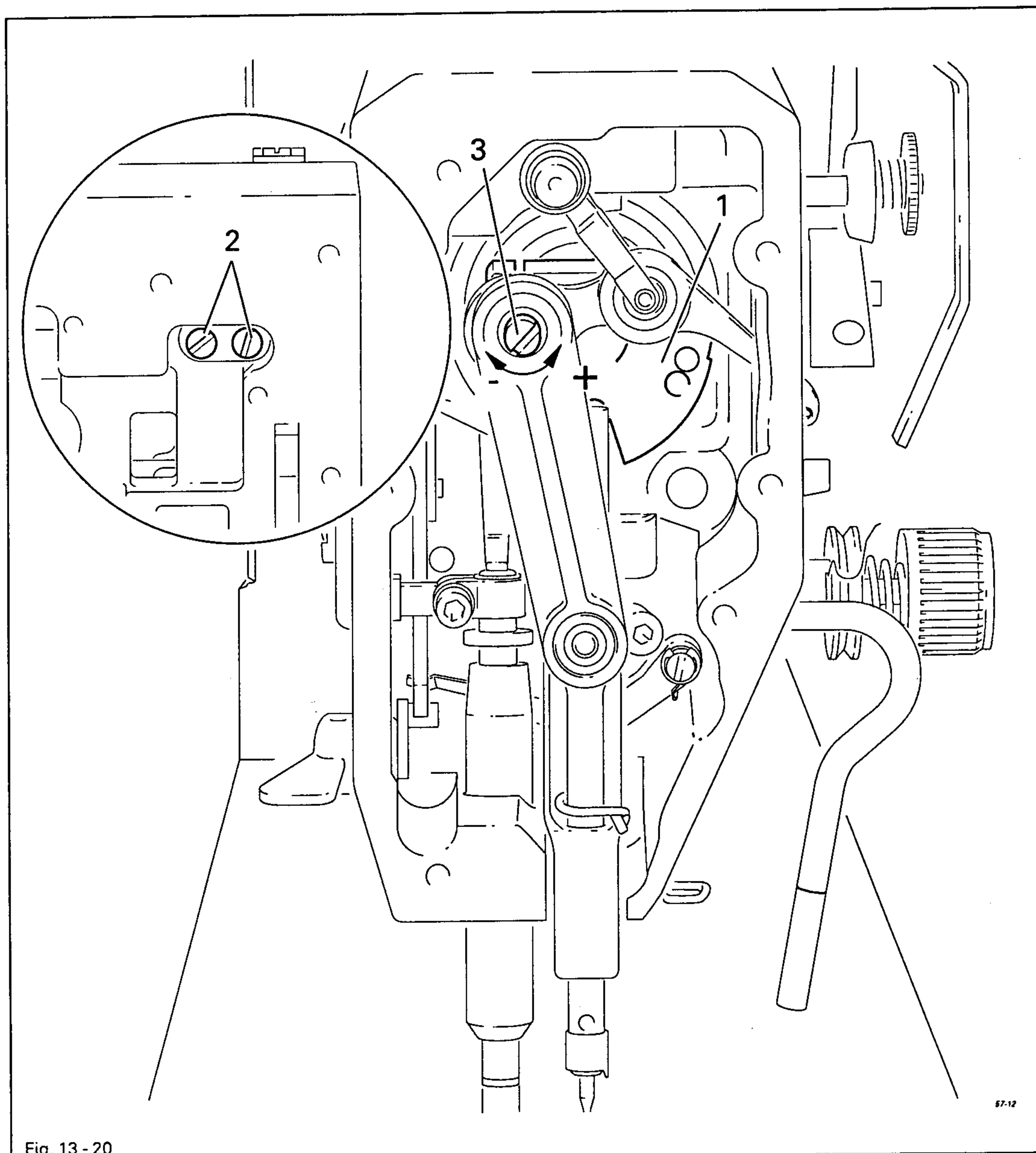


- Turn screw 1 in accordance with the requirement.

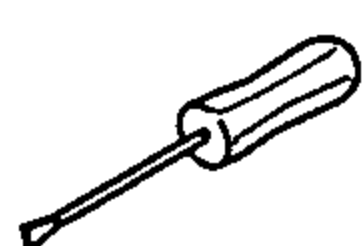
13.05.19 Modifying the needle bar stroke



The needle bar stroke is preset in the factory according to requirement. The needle bar stroke can be modified later if specific operating conditions make it necessary to do so.



When the needle-bar stroke has been changed, it is imperative to adjust the needle height! Also, the max. sewing speed must be limited to 3,800 s.p.m.



- Via the hand wheel, turn crank 1 until the screws 2 can be accessed from the side opening of the housing.
- Turn eccentric 3 (screws 2) as far as possible toward "+" (= large needle bar stroke) or toward "-" (= small needle bar stroke).
- Adjust needle height (see chapter 11.05.02 Preadjusting the needle height and/or chapter 13.05.12 Needle rise, hook-to-needle clearance, needle height and bobbin case position finger).

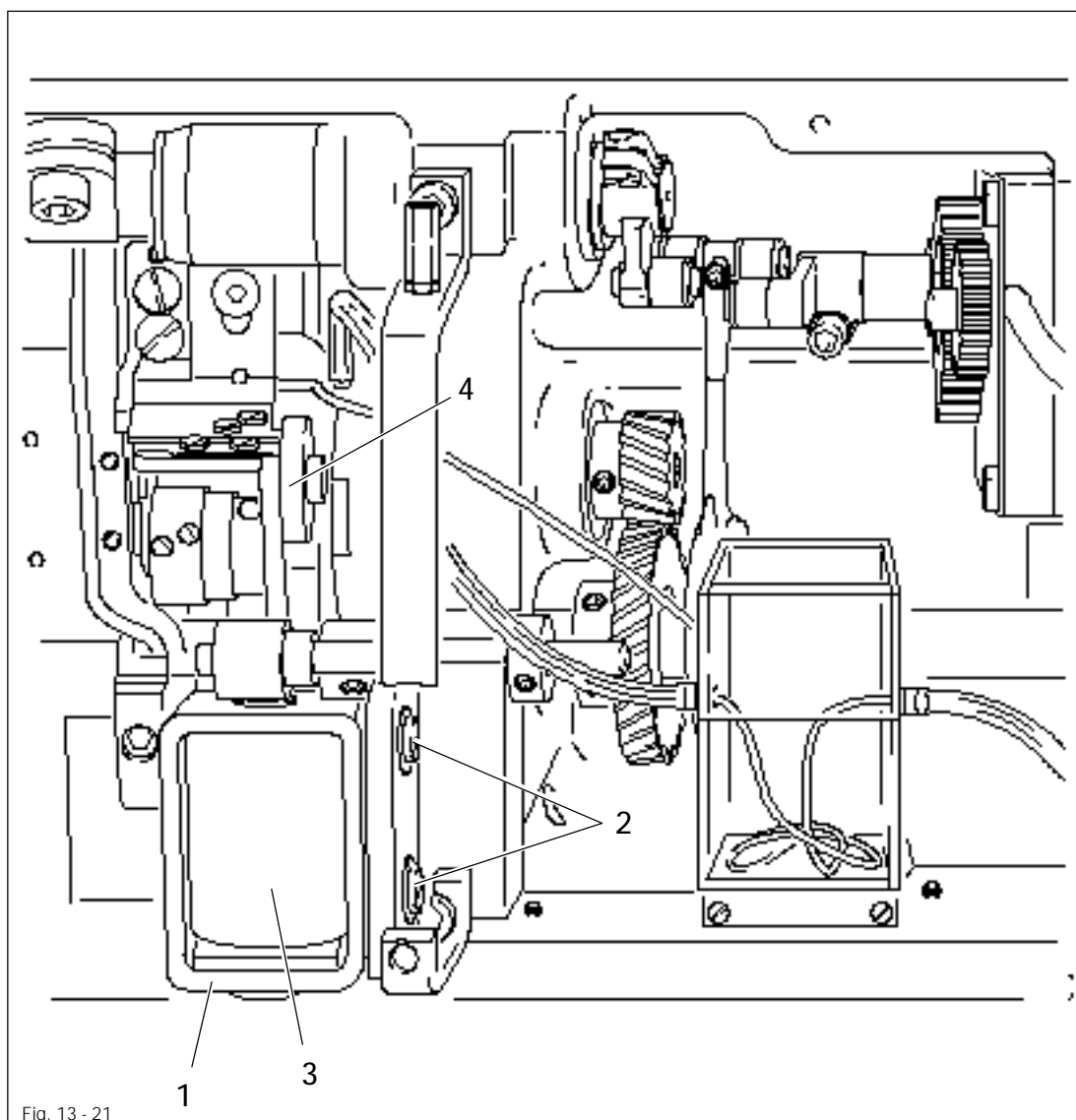
Adjustment

13.06 Adjusting the thread trimming device

13.06.01 Setting the solenoid

Requirement

When solenoid 3 is completely extended, the roller lever 4 should be at the lowest point of the control cam.



- Adjust solenoid holder 1 (screws 2) according to the requirement.

13.06.02 Lateral alignment of the thread catcher

Requirement

1. The tip of the thread catcher 5 must point exactly to the center of the needle.
2. The thread catcher 5 must be horizontal. It must not graze anything when it is operating.

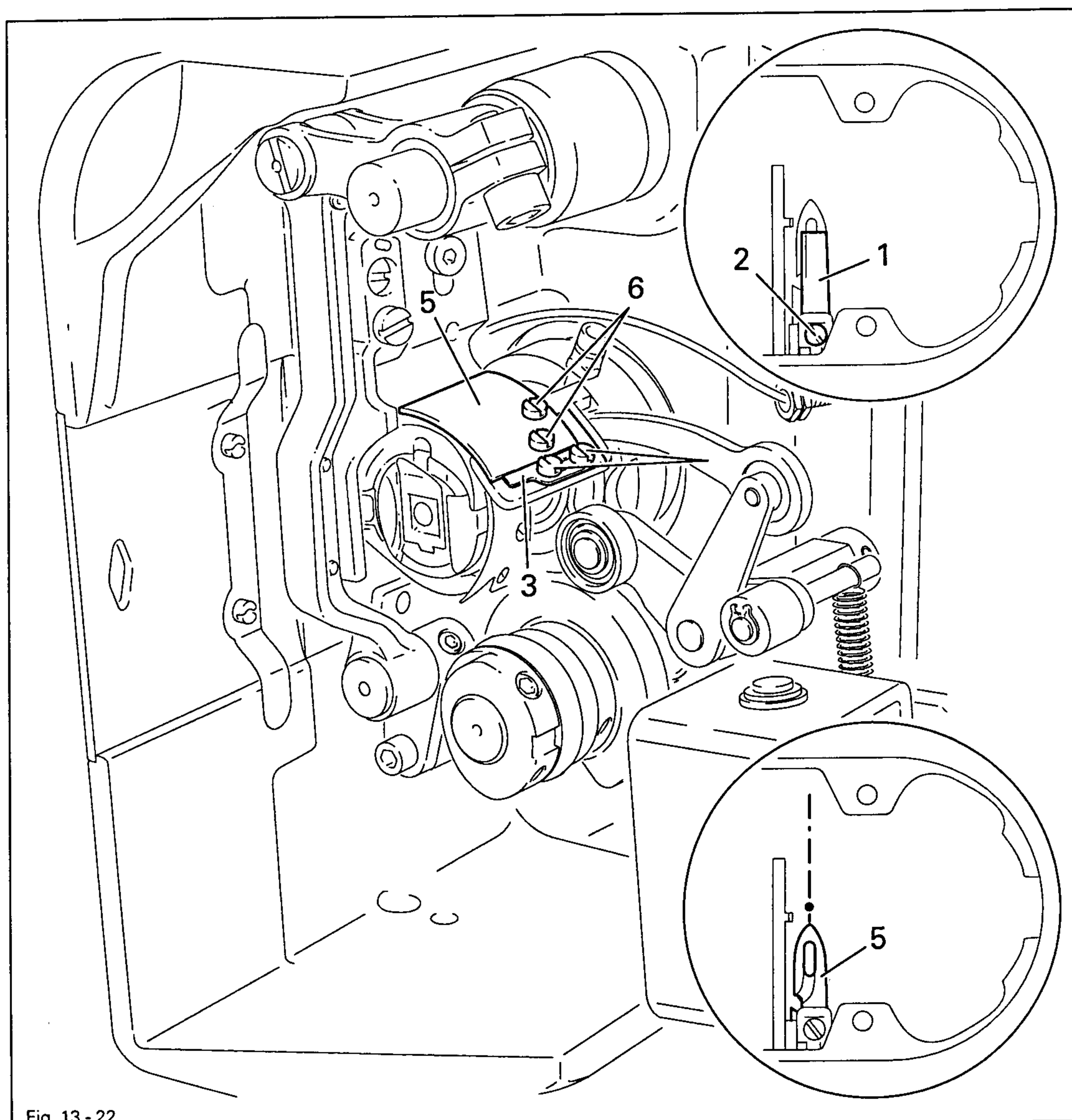
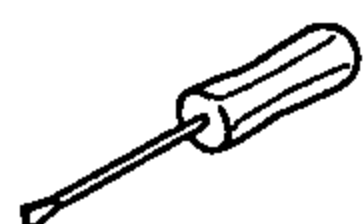
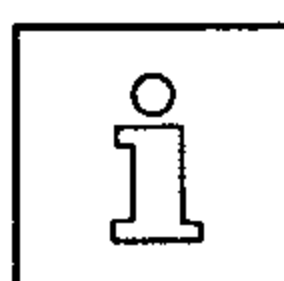


Fig. 13 - 22



- Remove knife 1 (screw 2).
- Move needle bar to its BDC.
- Loosen stop 3 (screws 4).
- Position thread catcher 5 (screw 6) manually in front of the needle.
- Align thread catcher 5 (screws 7) according to the requirements.

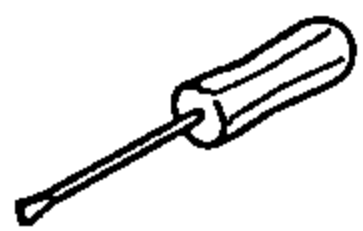
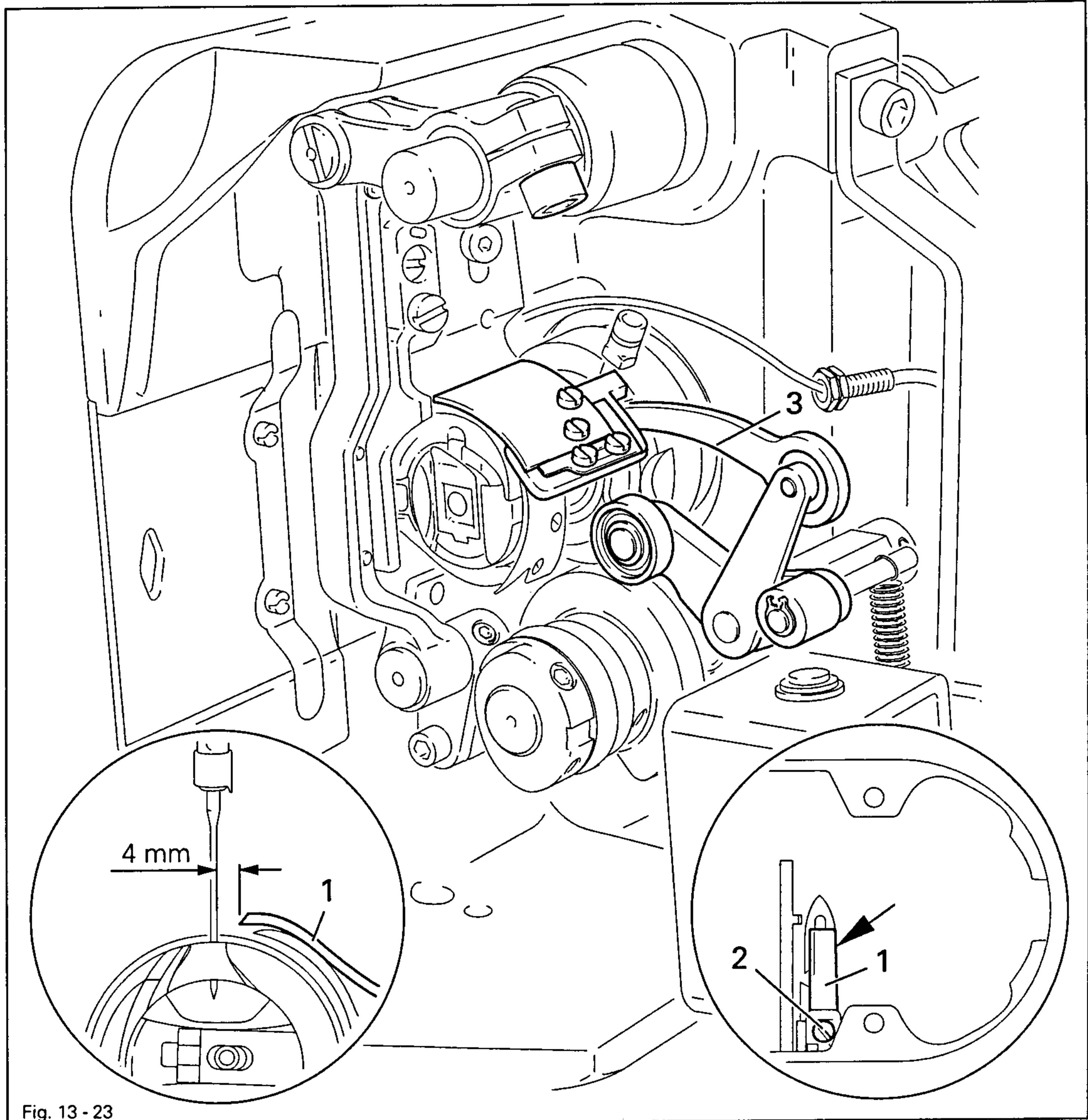


For further adjustments, leave knife 1 removed and stop 3 loosened.

13.06.03 Knife position

Requirement

1. There must be a distance of 4 mm between the cutting edge of the knife and the needle.
2. The right edge of the knife 1 must not extend beyond the right edge of the thread catcher (see arrow).



- Bring the needle bar to BDC.
- Slide knife 1 under the locking tab and align according to requirement 1.
- Tighten screw 2 lightly.
- Adjust thread catcher carrier 3 by hand until the wedge point in the thread catcher is positioned just in front of the cutting edge of the knife.
- Align knife 1 according to requirement 2 and tighten screw 2.

13.06.04 Front point of reversal of the thread catcher

Requirement

When thread catcher 4 is at its front point of reversal, the rear edge of the thread catcher cutout should be 1 mm in front of the bobbin case position finger 5.

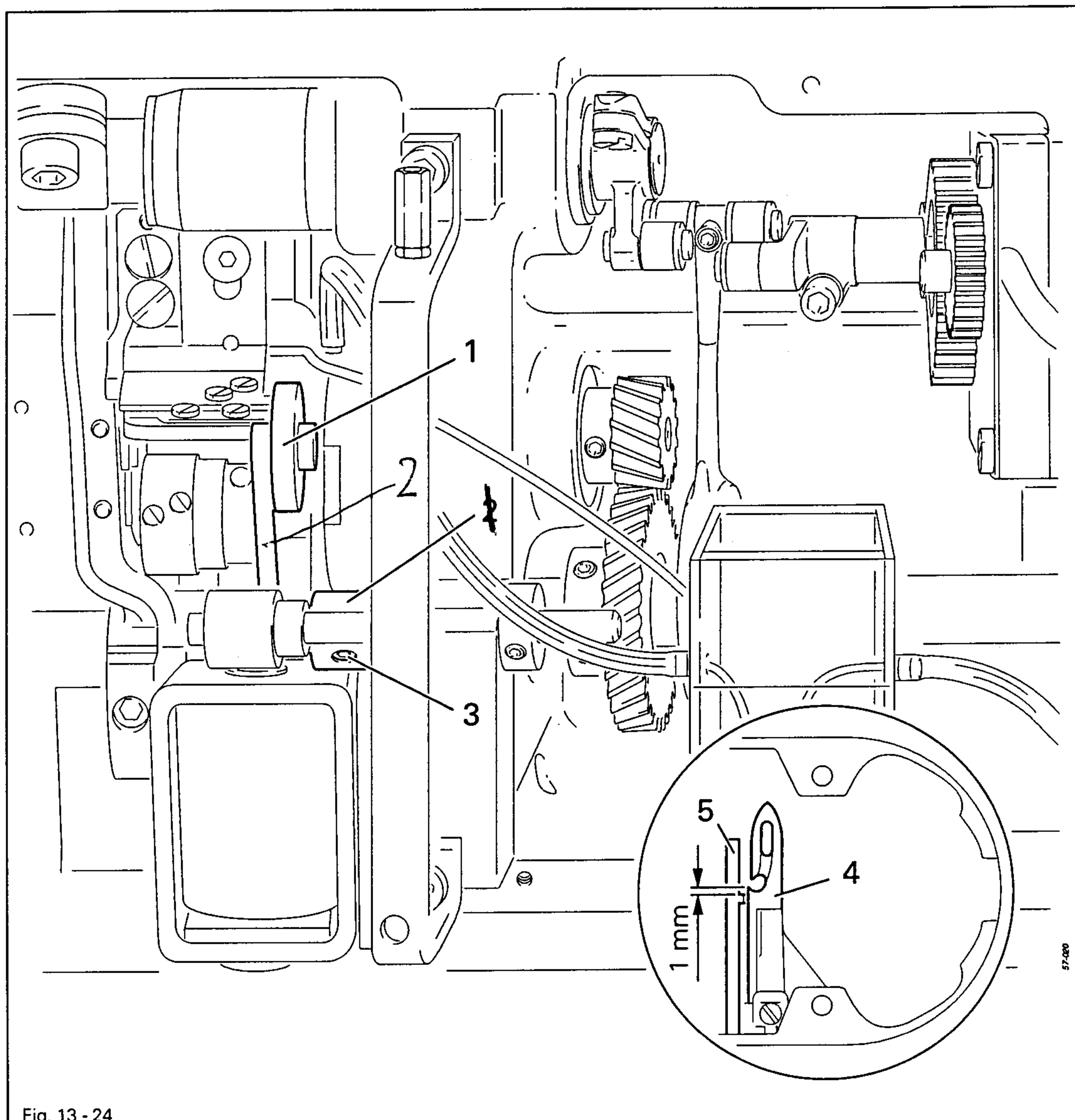
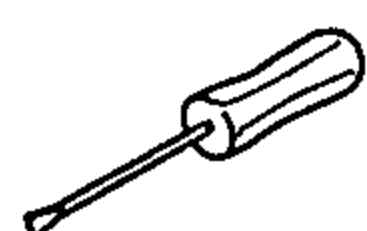


Fig. 13 - 24

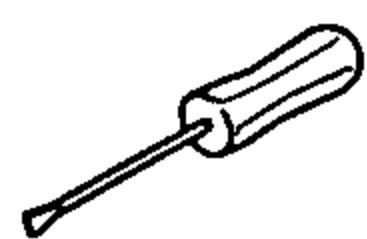
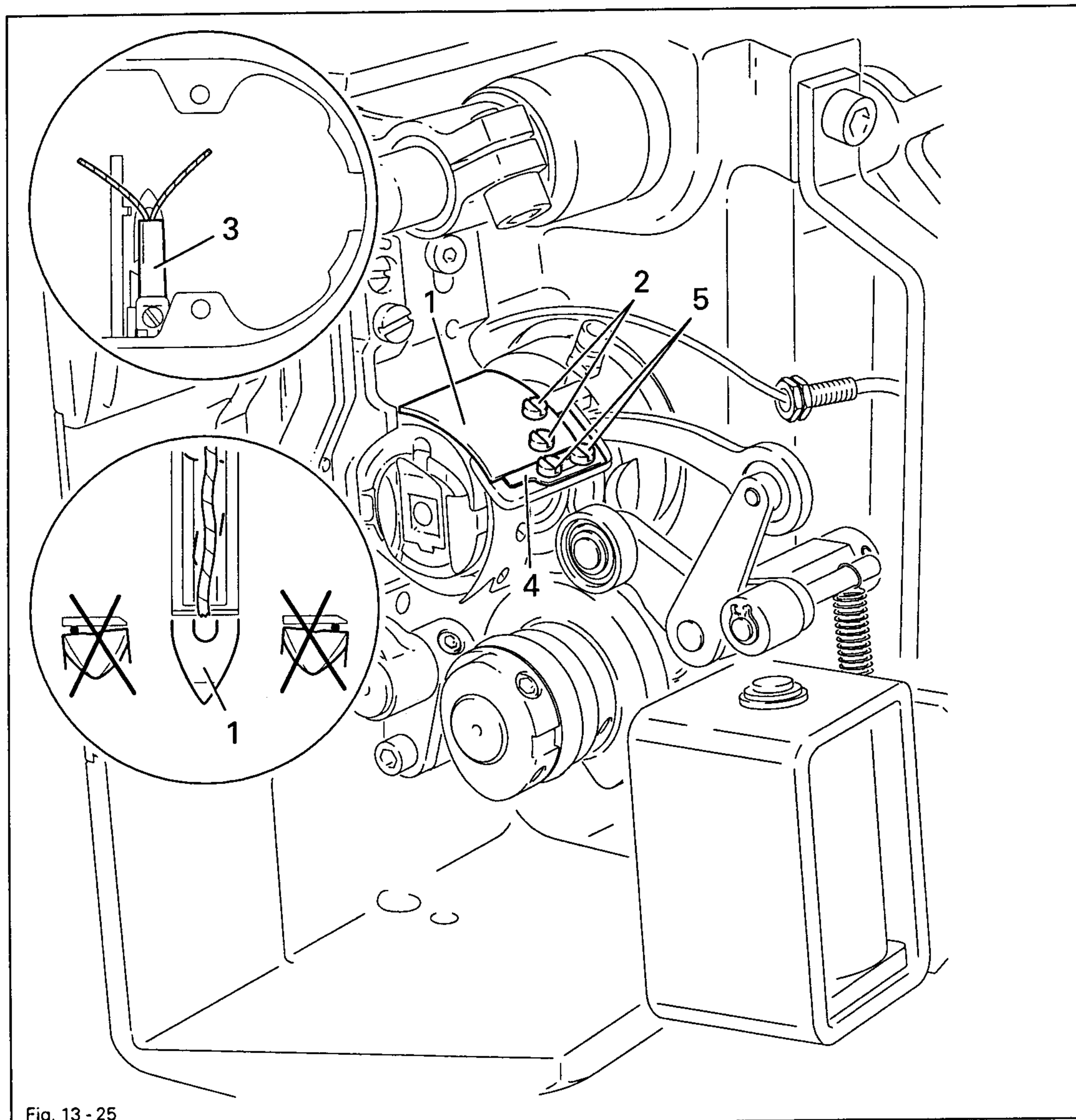


- Position roller lever 1 at the lowest point of the control cam.
- Adjust lever 2 (screws 3) according to the requirement.

13.06.05 Manual trimming check

Requirement

Two threads must be cut perfectly both left and right in the cutout of thread catcher 1.



- Move thread catcher 1 by hand to its front point of reversal.
- Double the thread and insert into catcher cutout.
- Carry out trimming operation manually.
- If the threads are not cut according to the requirement, align thread catcher 1 (screws 2) with knife 3 accordingly.
- Move stop 4 against thread catcher 1 and tighten screws 5.
- Check chapter 13.06.02 Lateral alignment of the thread catcher, and readjust if necessary.

13.06.06 Needle thread tension release

Requirement

With solenoid 3 is activated, there should be a distance of at least 0.5 mm between the tension discs 4.

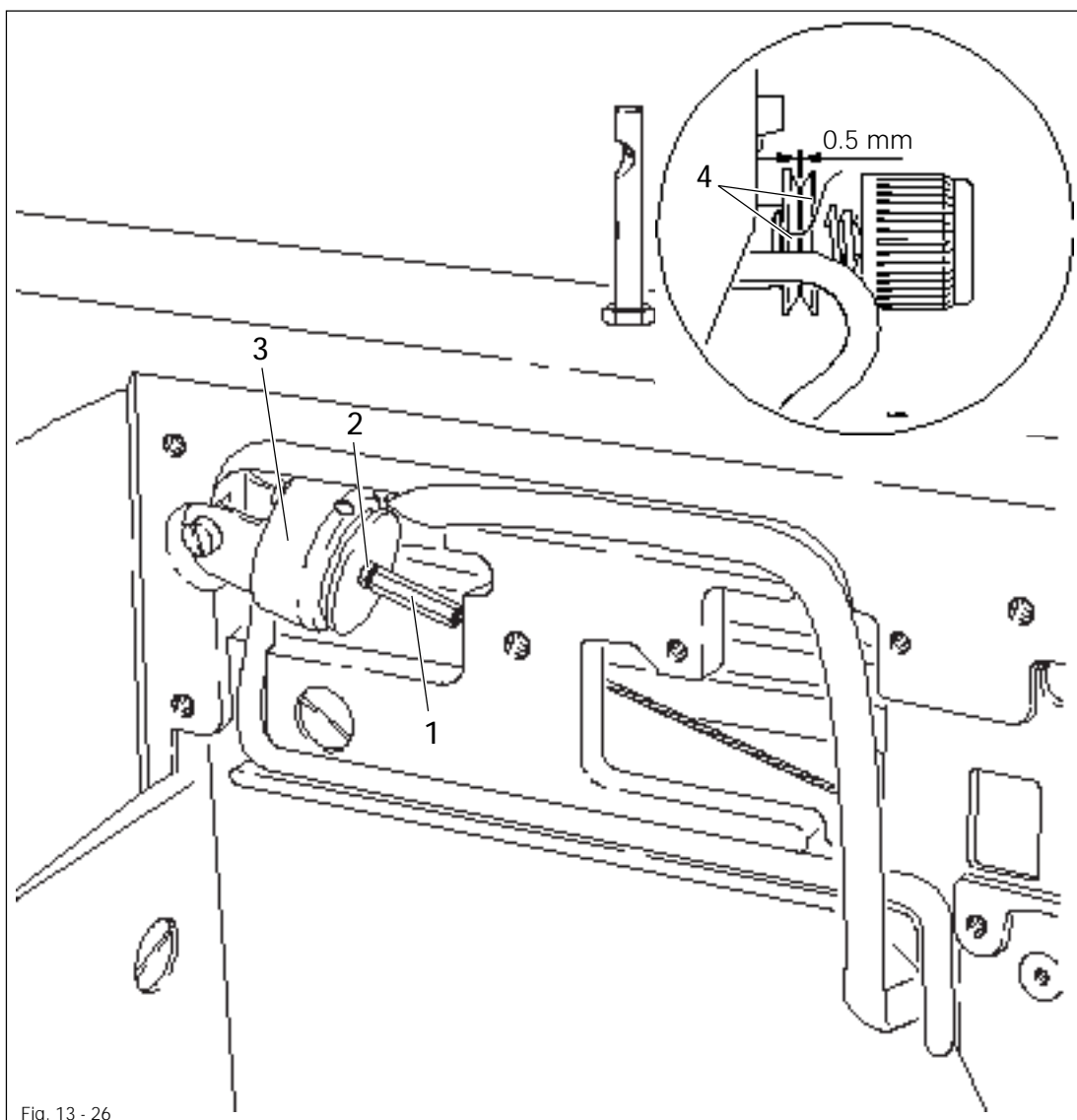


Fig. 13 - 26



- Adjust screw 1 (nut 2) according to the requirement.

Adjustment

13.06.07 Readjusting the control cam

Requirement

With the take-up lever at t.d.c., the highest point of the control cam 1 should be touching roller lever 3.

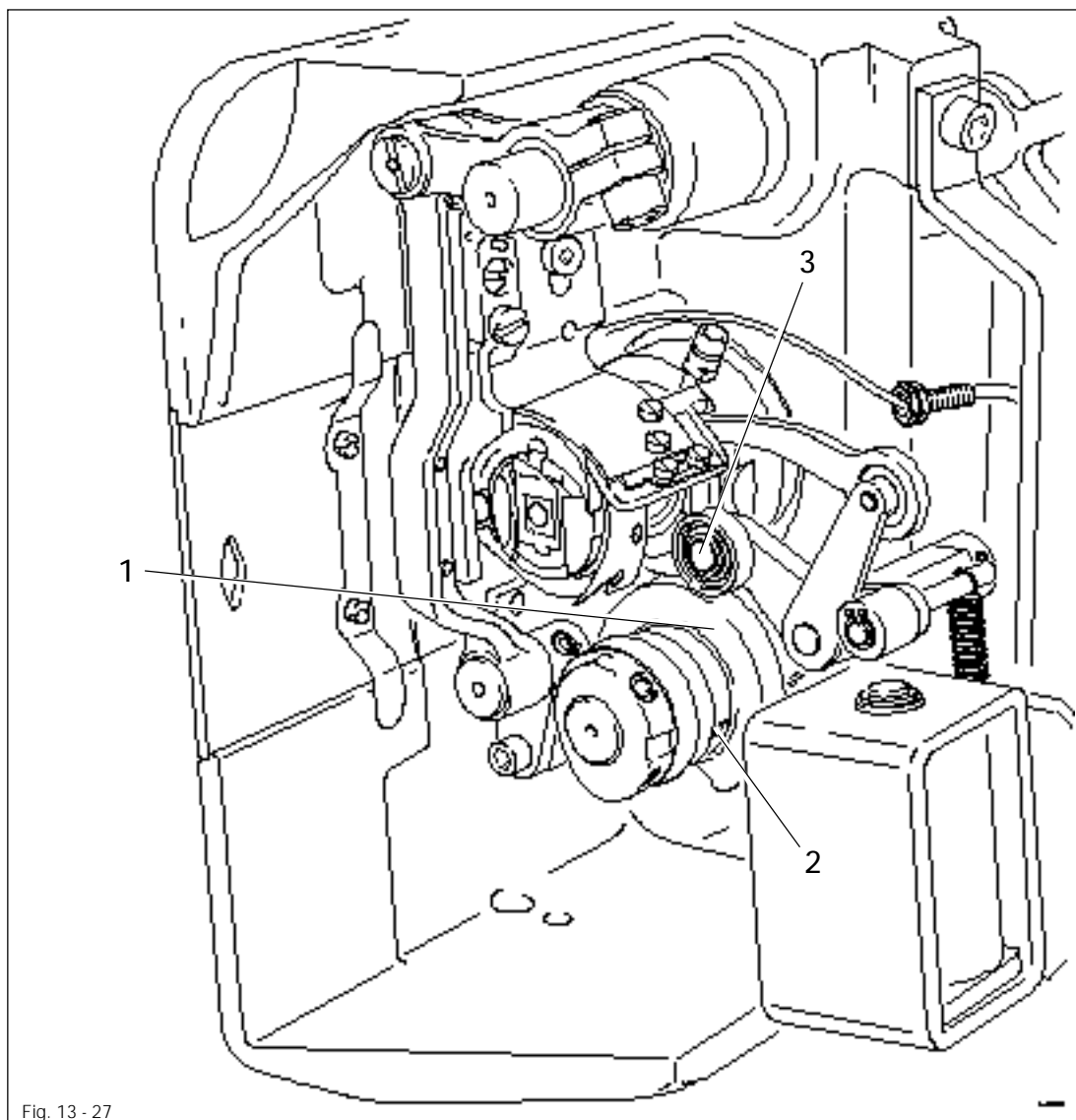


Fig. 13 - 27



- Adjust control cam 1 (screws 2) according to the requirement.

13.07 Adjusting the thread wiper -909/04

13.07.01 Thread wiper movement

Requirement

1. The thread wiper 5 must not strike against anything when it is moving.
2. When the take-up lever is at TDC, the thread wiper 5 is to move under the needle point and clear it by approx. 1 mm when the engaging solenoid 2 is operated.

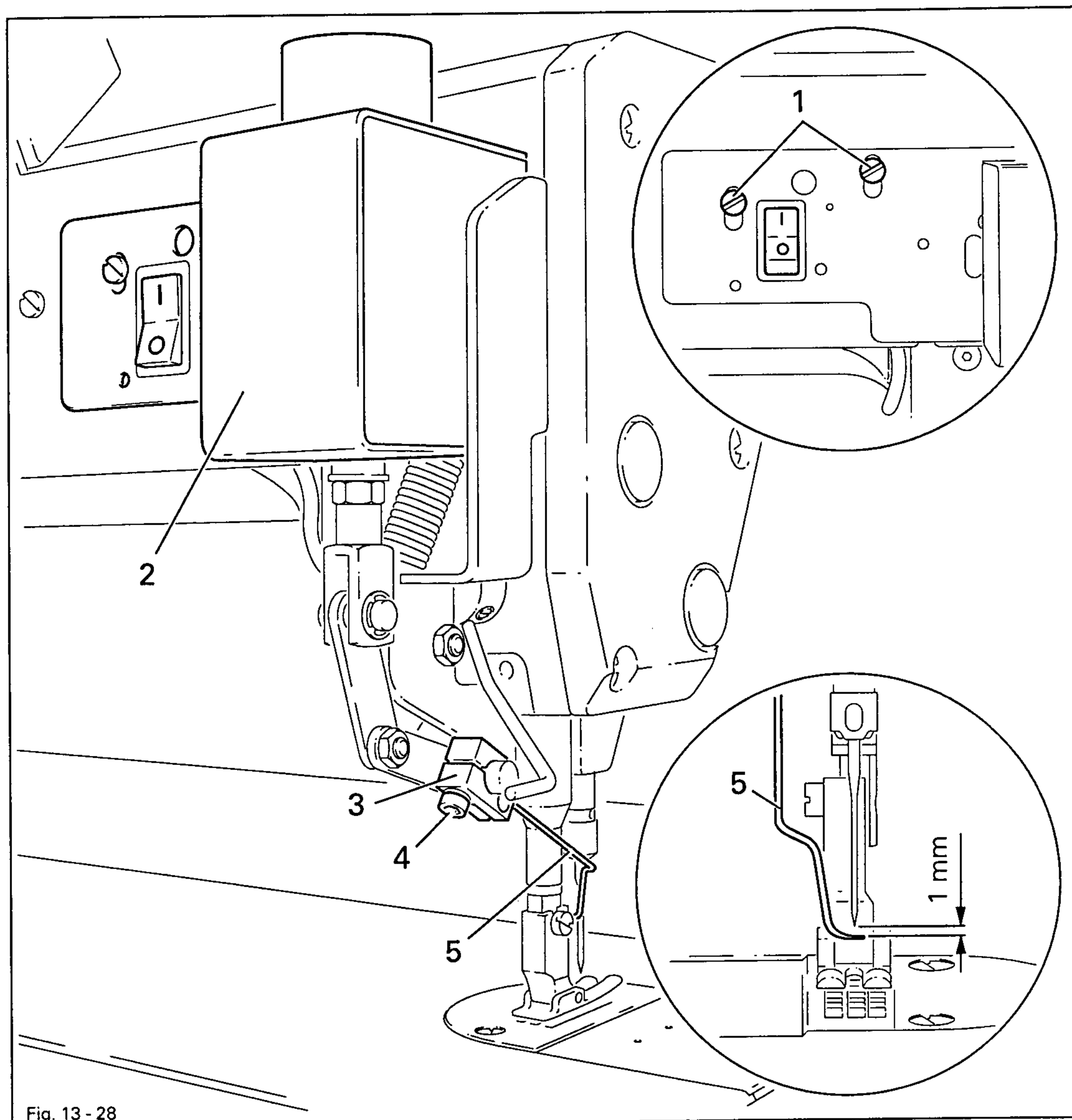
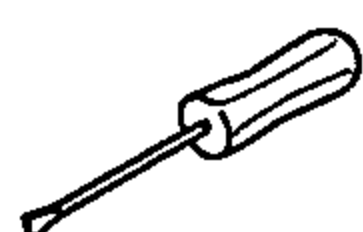


Fig. 13 - 28



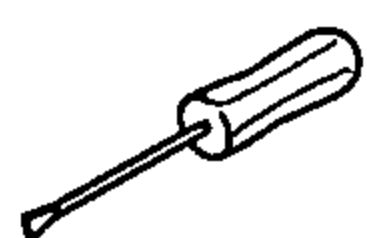
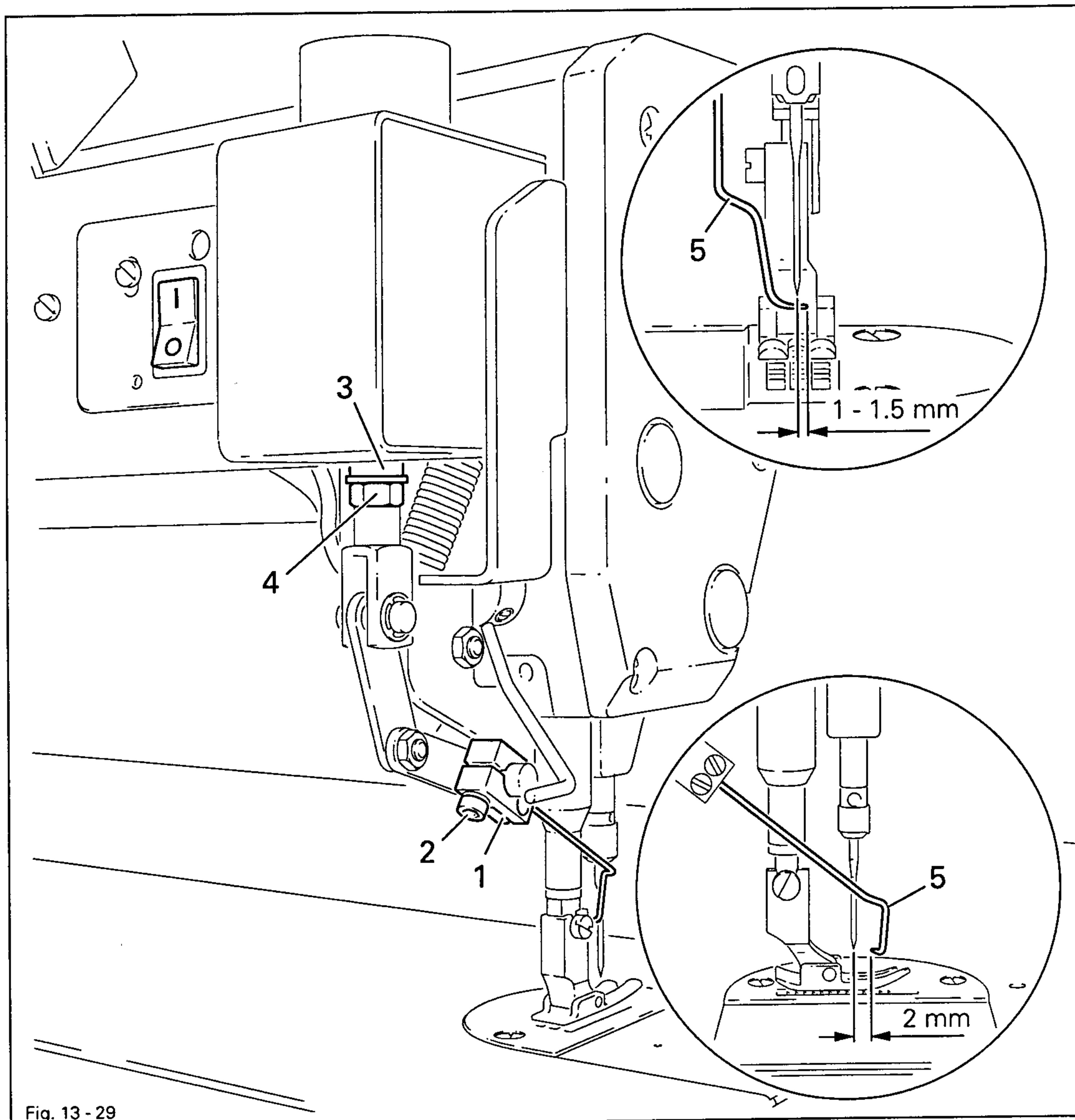
- Bring the take-up lever to TDC.
- Loosen screws 1.
- Push thread wiper 2 parallel to the bedplate to the very top and tighten screws 1 slightly.
- Turn bracket 3 (screw 4) according to requirement 1.
- Move thread wiper 2 parallel to the bedplate according to requirement 2.
- Tighten screws 1.

13.07.02 Thread wiper position

Requirement

Seen from the direction of sewing

1. The point of the thread wiper 5 must be approx. 1-1.5 mm to the right of the needle, and
2. The thread wiper 5 must be approx. 2 mm in front of the needle in its foremost position.



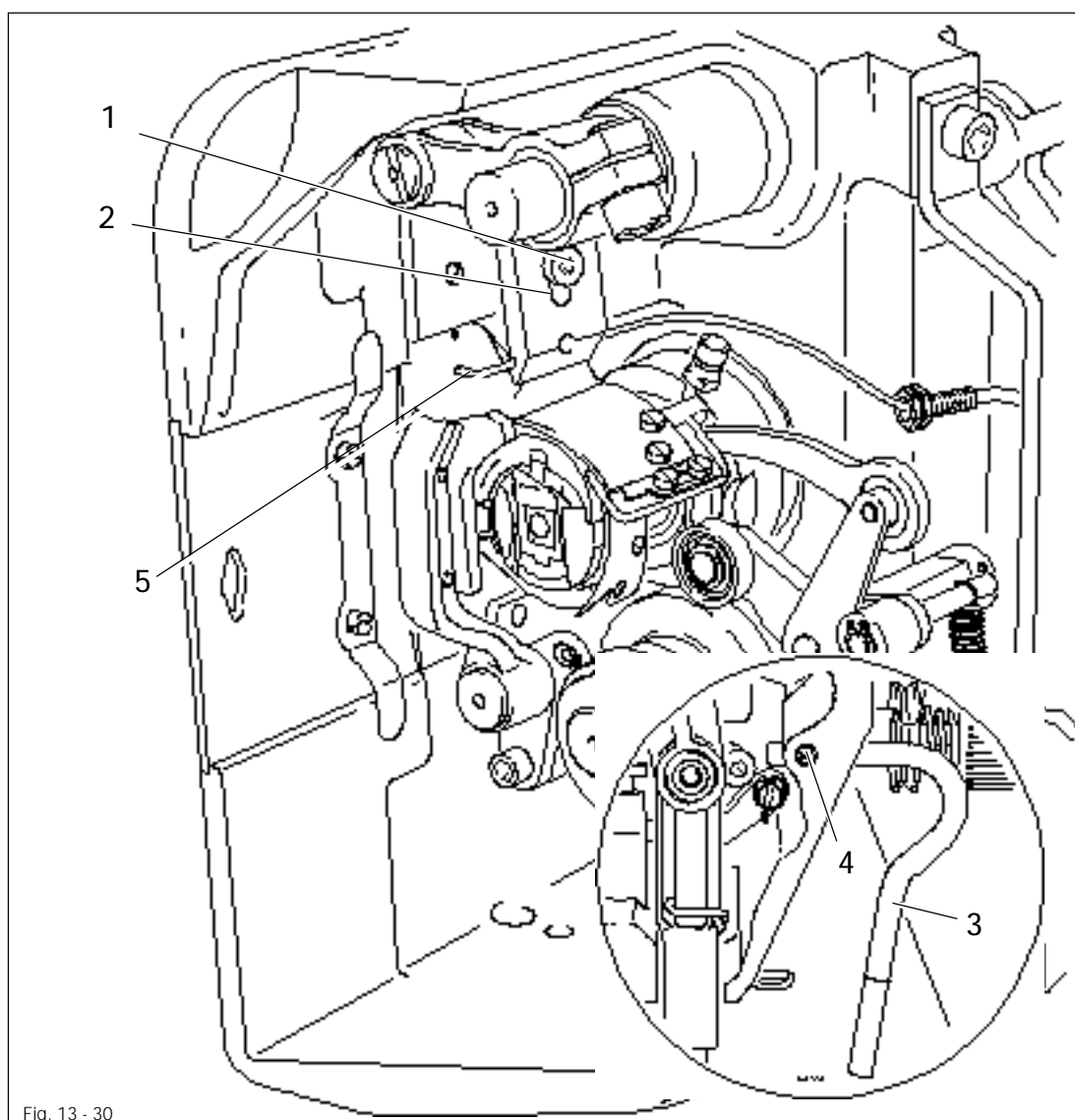
- Slide bracket 1 (screw 2), without turning it, on the shaft according to requirement 1.
- Turn rod 3 (nut 4) according to requirement 2.

13.08 Adjusting the sensor

13.08.01 Distance of the sensor from the needle

Requirement

1. Up to a stitch length of 3.0 mm the light guide 5 should be at a distance of 20 mm from the needle (lower hole).
2. From a stitch length of 3.5 mm on the light guide 5 should be at a distance of 28 mm from the needle (upper hole).

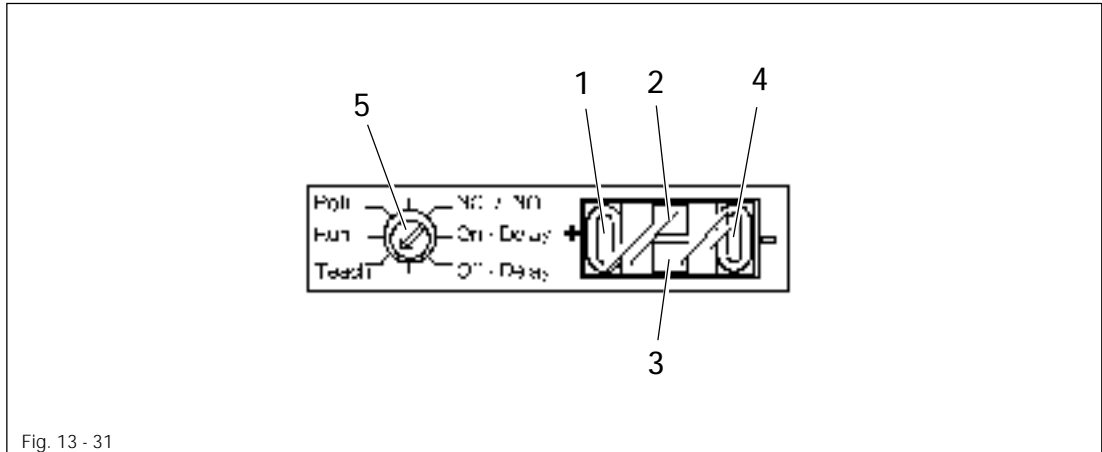


- Screw on retainer 1 (screw 2) according to the requirement.
- Adjust bar 3 (screw 4) to match the light guide 5.

13.08.02 Setting the sensor

Requirement

1. "On-Delay" and "Off-Delay" must be set at the value **0 ms**
(Display for **0 ms** = minus key 4 LED on).
2. "NC/NO" must be set at "**make contact**" (display = plus key 1 LED on).
3. The optimum switch interval must be set for the material to be recognized.
4. Switch 5 must stand at "Run" for normal operation.



- Set switch 5 to "On-Delay" .
- Press minus key 4, until the display appears according to the **requirement 1**.
- Set switch 5 to "Off-Delay" .
- Press minus key 4, until the display appears according to the **requirement 1**.
- Set switch 5 to "NC/NO" .
- Press plus key 1.
(Display appears according to **requirement 2**.)
- Set switch 5 to "Teach" , the yellow LED 2 and the red LED 3 light up.
- Place workpiece under the light spot on the needle plate (LED 2 off).
- Press plus key 1 (plus key 1 lights up).
- Press plus key 1 again (plus key 1 goes off).
The optimum switch interval is set and saved automatically. If the key is not pressed for the second time within 40 seconds, the Teach procedure is concluded without being saved.
- Set switch 5 to "Run" , to select normal operation.



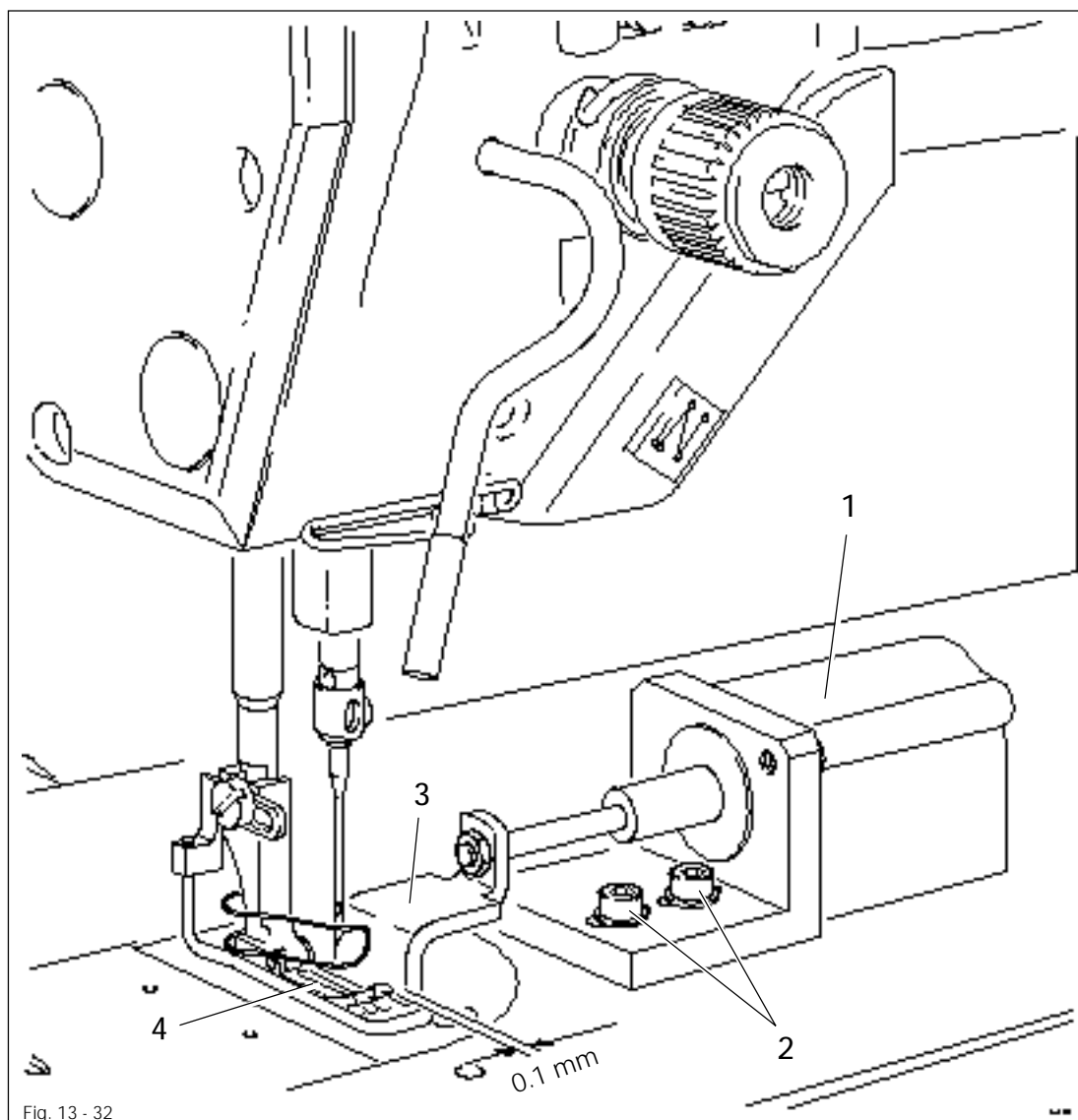
During normal operation keys 1 and 4 are locked.

When the light guide is soiled the red LED 3 flashes, the yellow LED 2 indicates the switch condition.

13.09 Adjusting the electric edge guide

Requirement

When a seam depth of 1.0 mm is selected (using the control panel), guide unit 3 should be at a distance of **approximately 0.1 mm** from sewing foot 4.



- Switch on the machine.
- Set the seam depth to 1.0 mm (display value 10), see Chapter 9.07.02 Electrically adjustable edge guide (for manual sewing).
- Adjust edge guide 1 (screws 2) according to the requirement.
- Switch off the machine.

Adjustment

13.10 Parameter settings

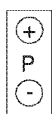
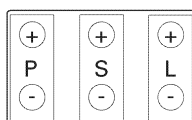
13.10.01 Selecting and altering parameters

- Switch on the machine.



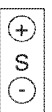
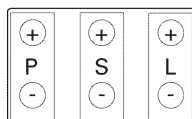
- Press the **Parameter input** key (LED on).

100



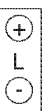
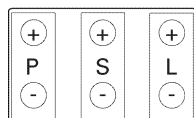
- By pressing +/- on the **P** key select the desired group, e.g. "200".

200



- By pressing +/- on the **S** key select the desired parameter, e.g. "299".

299



- Set the desired value (e.g. seam depth) by pressing +/- (L key).



- Save the input by ending the parameter input (LED off).

13.10.02 List of parameters

Group	Parameter	Meaning	Access level	Setting range	Standard value
1	105	Starttack speed	B,C	100 - 800	800
	110	Endtack speed	B,C	100 - 800	800
	111	Manual sewing: No. of stitches from bright photoelectric beam to end of seam	A,B,C	1- 255	6
	113	Start with photoelectric beam I = only when photoelectric beam is dark II = when photoelectric beam is bright too	B,C		I
	116	Soft start stitches	A,B,C	0 - 255	2
	117	Speed for soft start stitches	B,C	30 - 550	400
	148	Starttack I = double II = single	A,B,C		I
	149	Endtack I = double II = single	A,B,C		I
	199	Speed for photoelectric beam compensating stitches	B,C	300 - 1000	800
2	221	Speed limit for sewing programs	B,C	300 - 5000	4000
	298	Number of reduced stitches	A,B,C	1 - 3	1
	299	Edge guide distance for manual sewing [1/10 mm]	A,B,C	10 - 185	185
6	601	Trimming I = yes II = no	B,C		I
	605	Speed display I = yes II = no	B,C		II
	606	Speed: stage 1 (min.)	B,C	30 - 550	180
	607	Speed: stage 12 (max.)	B,C	300 - 5000	4000
	609	Trimming speed	B,C	60 - 300	180
	624	Start inhibitor (input E4) I = yes II = no	B,C		II

Adjustment

Group	Parameter	Meaning	Access level	Setting range	Standard value
6	653	Bearing position before sewing I = yes II = no	B,C		II
	665	Running lock/stop I = contact closed II = contact open	B,C		I
	668	Thread wiper/thread blast I = yes II = no	B,C		I
7	702	Needle position 1 (needle lowered)	B,C	0 - 127	15
	703	Needle position 2 (take-up lever raised)	B,C	0 - 127	113
	705	Needle position 5 (end of trimming signal)	B,C	0 - 127	98
	706	Needle position 6 (start of trimming signal)	B,C	0 - 127	68
	707	Needle position 9 (start thread tension release/start thread catcher)	B,C	0 - 127	70
	710	Needle position 3 (needle raised)	B,C	0 - 127	106
	715	Switch time (ms) for thread wiper	B,C	0 - 2550	120
	718	Standstill brake cycle (0 = brake off)	B,C	0 - 100	0
	719	Presser foot cycle output A4	B,C	0 - 100	40
	729	Start delay after lowering the presser foot	B,C	0 - 2550	120
	730	Lifting delay for presser foot after end of seam	B,C	0 - 2550	50
	761	Extension thread tension release	B,C	0 - 2550	0
	789	Needle position 10 (bearing position)	B,C	0 - 127	120
	797	Hardware test I = yes II = no	B,C		II
798	Programming level C I = yes II = no	B,C		II	

Group	Parameter	Meaning	Access level	Setting range	Standard value
7	799	Machine class 1 = 2481 2 = 2483			1
8	834	Stitch length - zero point compensation	B,C	0-255	0
	835	Reduced single stitch [%] (knee switch)	A,B,C	0 - 100	50
	844	Distance sensor-needle [mm]	A,B,C	1 - 99	20
	845	Speed controlled stitch length adjustment [% per 1000 RPM]	B,C	0 - 10	5
	846	Stitch length control characteristic adjustment for positive stitch length [%]	B,C	80 - 120	100
	847	Stitch length control characteristic adjustment for negative stitch length [%]	B,C	80 - 120	100
	849	Stitch length limitation	A,B,C	0 - 60	35

13.11 Error messages

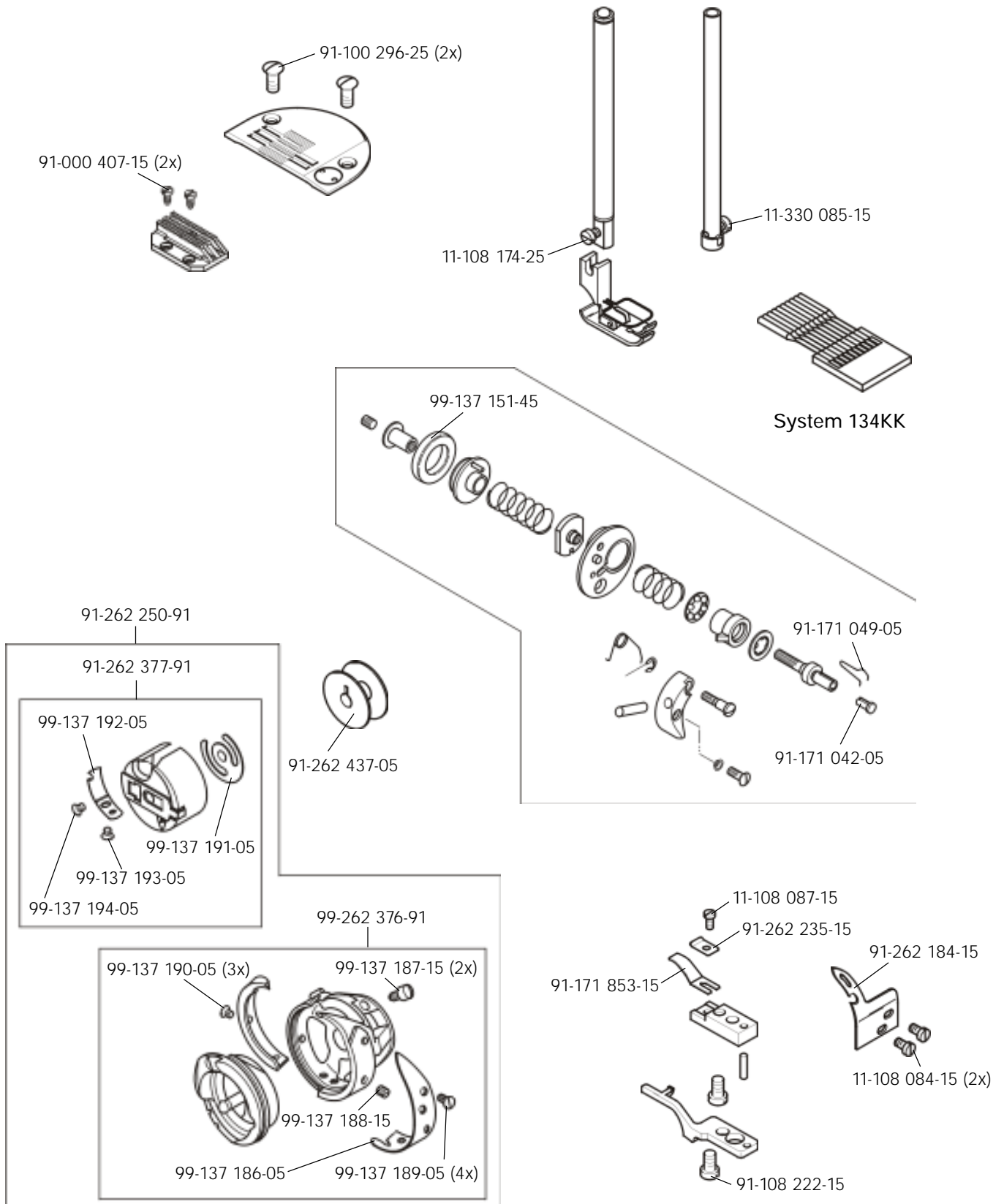
Error 1:	Pedal not in neutral position
Error 3:	Reference position stitch length control not achieved
Error 10:	Incorrect machine class
Error 62:	Short circuit 24 V
Error 63:	Overload switching power unit
Error 64:	System monitoring
Error 65:	Power electronics
Error 66:	Earth fault
Error 67:	Power off
Error 68:	Interference cut-off power electronics
Error 69:	No increments
Error 70:	Motor blocks
Error 72:	Incremental transmitter plug connected incorrectly
Error 73:	Motor not running properly
Error 75:	Main drive controller locked
Error 90:	No EEPROM
Error 91:	EEPROM error
Error 92:	Starting lock
Error 97:	SM-axis 1
Error 98:	SM-axis 2
Error 99:	Memory error

14 Wearing parts



This list indicates the most important wearing parts.

You can request a detailed parts list for the complete machine under parts number 296-12-18 356.



Reference list for the circuit diagrams

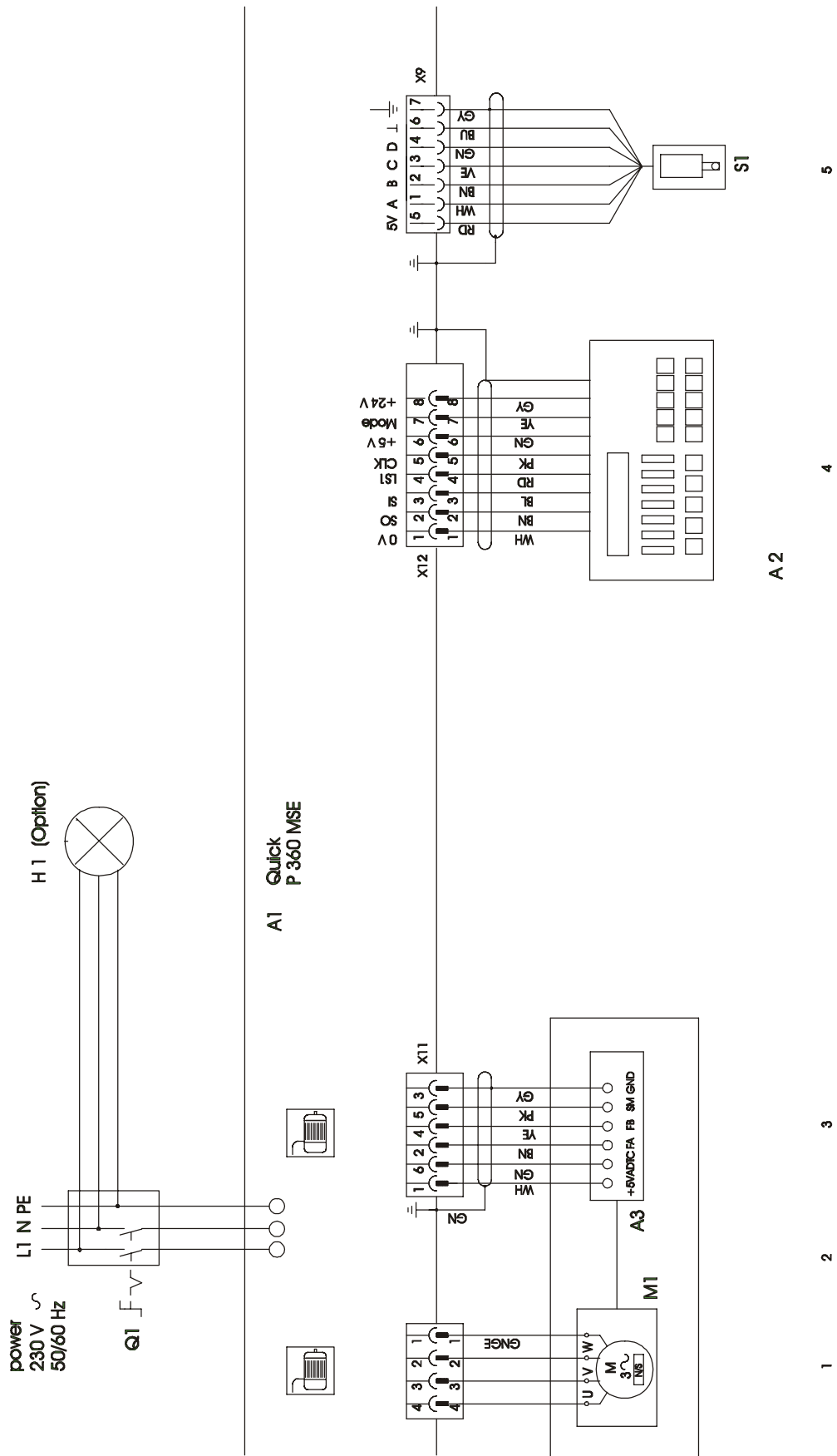
A1	Controller
A2	Control panel
A3	Incremental transmitter (included in M1)
S1	Set value transmitter
M1	Sewing motor
M11	Stepping motor for edge guide (optional)
M10	Stepping motor for stitch length controller
B10	Electronic beam for stepping motor M10 (reference position)
B11	Electronic beam for material edge recognition
H1	Sewing lamp (optional)

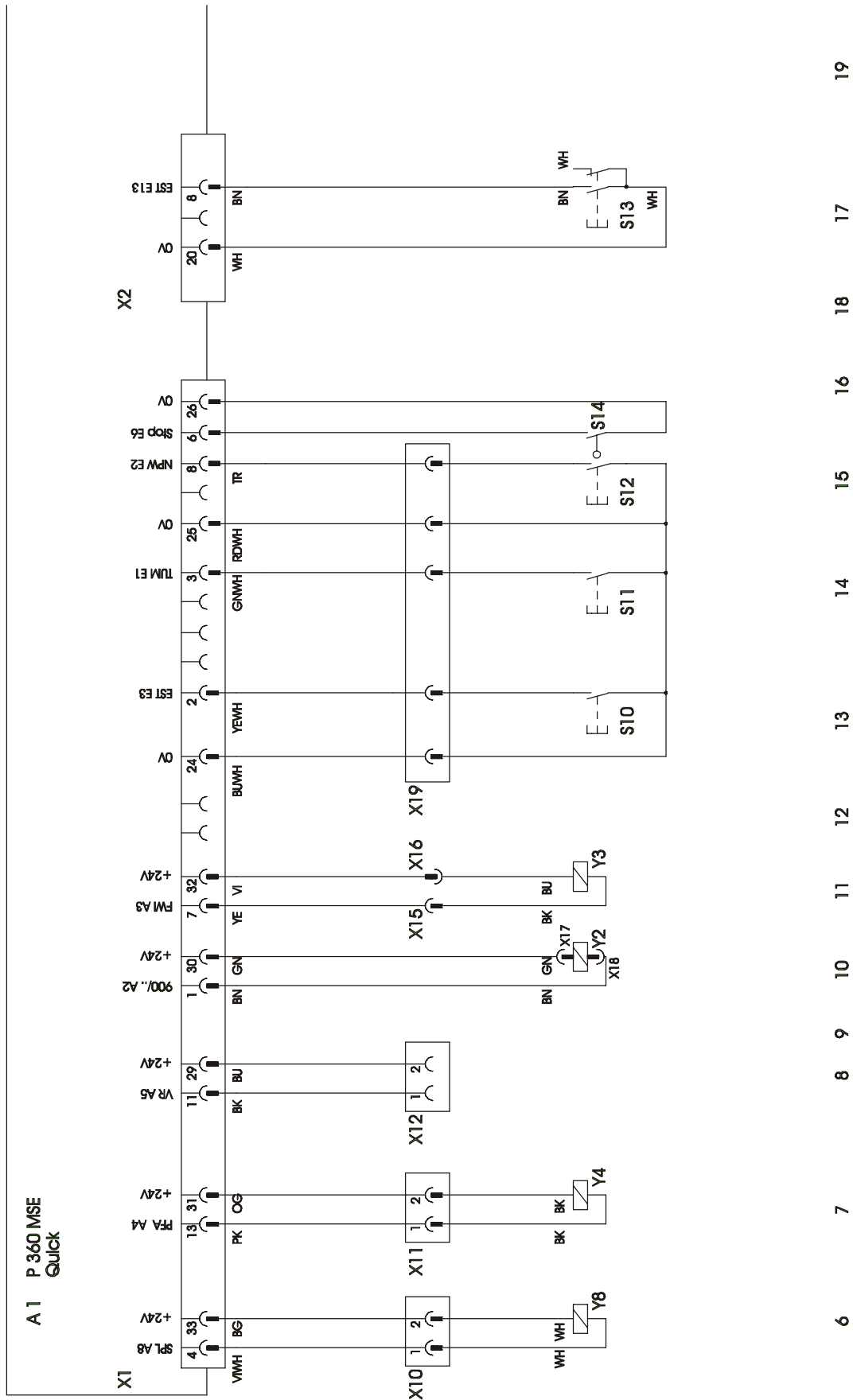
Outputs

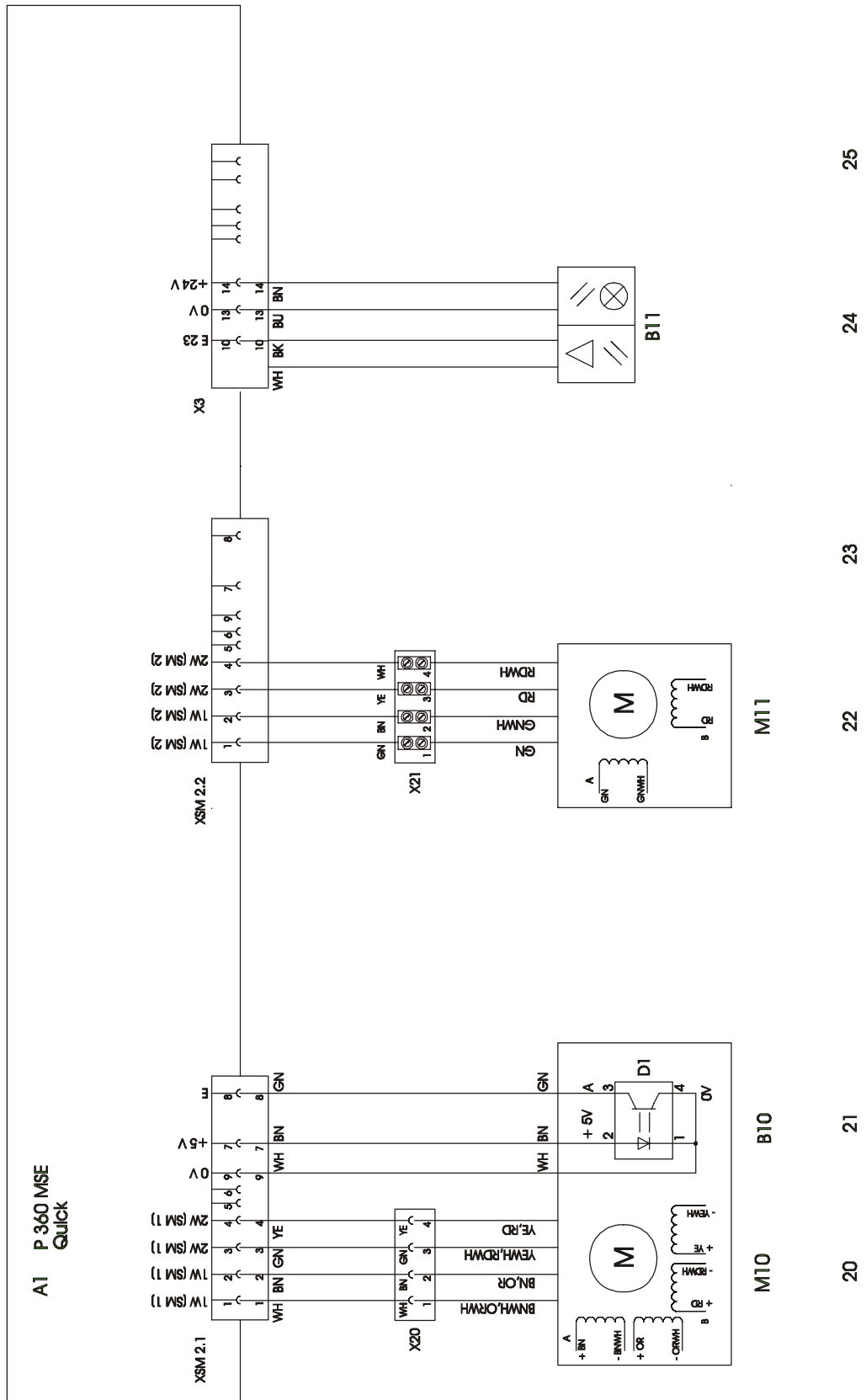
Y 2	Thread trimmer
Y 3	Thread wiper
Y 4	Presser foot
Y 8	Thread tension release

Inputs

S10	Single stitch
S11	Bartacks
S12	Change of needle position
S13	Single stitch (knee switch)
S14	Starting lock







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