PFAFF

3587-2/01

Instruction Manual

Contents .... Chapter

Contents .... Chapter - Page

Safety

1   Safety

1.01   Directives

This machine was built in accordance with the European regulations stated in the Conformity and Manufacturer's Declaration.
In addition to this Instruction Manual, also observe all generally accepted, statutory and other regulations and legal requirements - also those of the country in which the machine will be operated - and all valid environmental protection regulations!
Applicable local 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 must 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 must only be used for the purpose for which it is intended and must not be operated without its safety devices. All applicable safety regulations must be observed.

● When sewing parts (e.g. needle, presser or bobbin) are exchanged, when the machine is being threaded, when the machine is left unattended and during maintenance work, the machine is to be separated from the power supply by turning off the On/Off switch or removing the plug from the mains!

● Daily maintenance work must only be carried out by appropriately trained personnel!

● Repair work and special maintenance work must only be carried out by specialists or appropriately trained personnel!

● Work on electrical equipment must only be carried out by appropriately trained specialist personnel!

● Work is not permitted on parts and equipment which are connected to the power supply! Exceptions to this are contained in the regulations EN 50110.

● Modifications and alterations to the machine must only be carried out pursuant to all 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 not supplied by us have not been tested and approved by us. The installation and/or use of any such products may result in negative changes to the constructional 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 to operating and specialist personnel!

Warning, electric voltage!

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 a component 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 on 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 at the point of sale.

1.05 Operating and specialist personnel

1.05.01 Operating personnel

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

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

● always observe the Notes on Safety in the Instruction Manual!

● never use any working methods which could reduce the level of safety in using the machine!

● not wear loosely fitting clothing or jewelery 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 user any changes in the machine which may reduce its level of safety!

1.05.02 Specialist personnel

Specialist personnel are persons who have completed expert education/training 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!

● never work on parts and devices which are still connected to the power supply! The only exceptions to this directive are found 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!
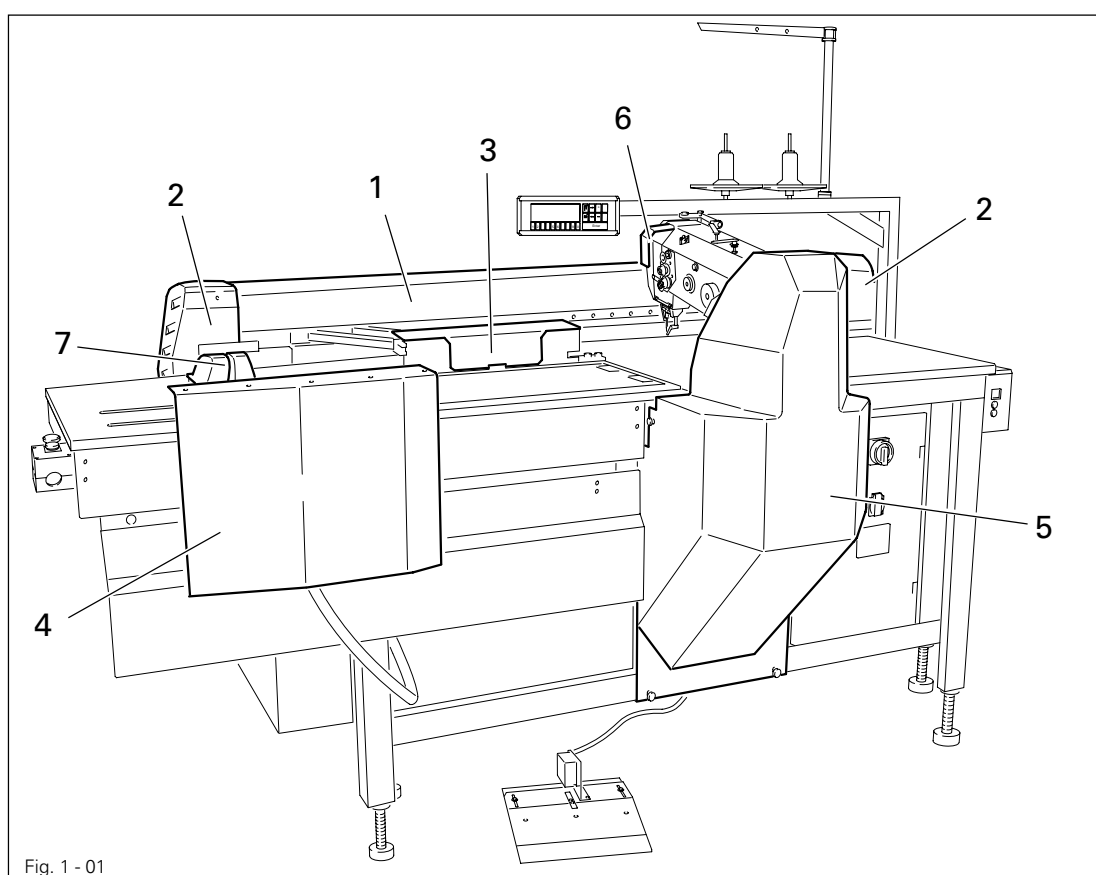Danger of injury by hurled objects!

Fig. 1 - 01

⚠ Do not operate the machine without protective covers **1, 2, 3, 4** and **5**!
Danger of crushing between moving parts of the pneumatic or feed systems!

⚠ Do not operate the machine without take-up lever guard **6**!
Danger of injury by the movement of the take-up lever!

⚠ Do not place hands in the swivel range of the clamp interlock **7**!
Danger of crushing from high pressure forces!

Contents .... Chapter - Page

2 Proper use

The **PFAFF 3587-2/01** is a large panel automatic sewing machine for sewing fancy and assembly seams in the shoe, leather, plastics and motor accessories industries.

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 means that all operational, adjustment, maintenance and repair measures required by the manufacturer are to be observed!

PFAFF

3   Specifications ▲

Sewing machine head: .... PFAFF automatic sewing head with vertical hook

Max. sewing speed: ....3200 s.p.m.
Max. stitch length: .... 6 mm
Stitch type: .... 301 (lockstitch)

Needle system: .... 134-35 KK
Needle size ....80 – 160

Sewing motor: .... See motor service manual
Max. motor speed: .... 3200 r.p.m.
Operating voltage: .... 230 V ± 10 %, 50/60 Hz, A/C
Power requirement: .... 2.2 kW
Leakage current ....5 mA*

Control range: .... 500 x 300 mm
Storage capacity: .... 500.000 stitches

Min. working pressure: .... 6 bar
Air consumption: .... approx. 15l/cycle

Working noise level:
Emission level at workplace at a speed of 3200 s.p.m.: .... 76 dB(A)
Noise measurement according to DIN 45 635-48-A-1)

Machine dimensions:
Length: (with automatic clamp change) .... approx. 2100 (2500) mm
Width: .... approx. 1450 mm
Height: .... approx. 1200 mm
Table height: .... 850 – 1150 mm

Net weight: ....580 kg

▲ Subject to alteration

* Due to the use of network filters there is a nominal leakage current of 5 mA.

4   Disposal of the machine

● The proper disposal of the machine is the responsibility of the customer.

● The materials used for the machine are steel, aluminium, brass and various plastics. The electrical equipment consists of plastics and copper.

● The machine must be disposed of in accordance with applicable local environmental protection regulations. If necessary, a specialist is to be commissioned.

⚠ Special care is to be taken that parts soiled by lubricants are separately disposed of in accordance with the applicable local environmental protection regulations!

5 Transport, packaging and storage

5.01 Transport to the customer's premises

Within Germany, machines are delivered without packaging.
Machines for export 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 location of use.
The machine may only be transported in an upright position.

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, should be protected against corrosion, e.g. by a film of oil.

6   Explanation of the symbols

In this Instruction Manual, tasks to be carried out and important information are drawn to your attention by symbols. The symbols have the following meanings:

Note, information

Cleaning, care

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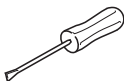
Servicing, repairing, adjustment, maintenance
(only to be carried out by specialist personnel)

PFAFF

Contents .... Chapter - Page

7 Controls

7.01 On/off switch
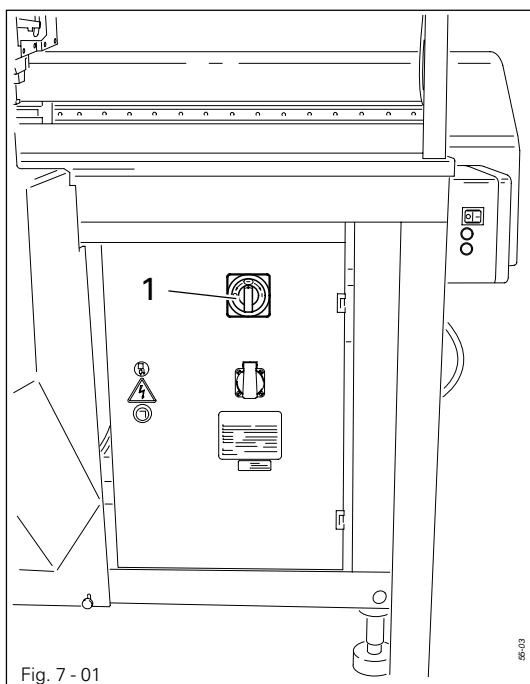
Fig. 7 - 01

● By turning on/off switch **1**, the power supply to the machine is switched on or off.

7.02 Foot switch
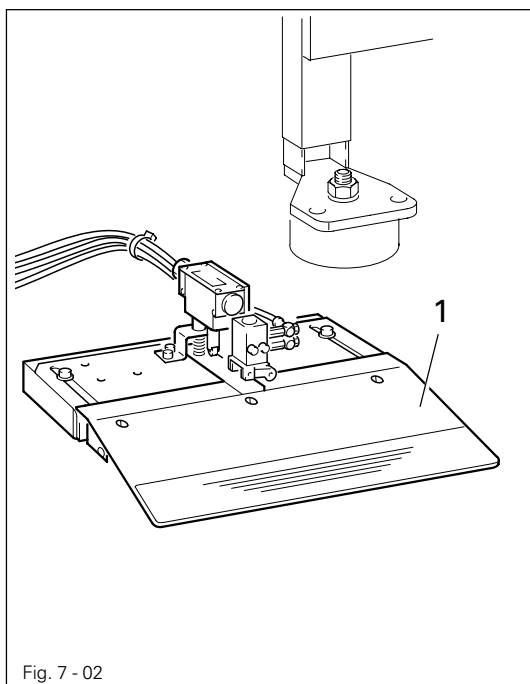
Fig. 7 - 02

● The foot switch can be operated in **2** positions and has the following functions, depending on how it is set.

FLIP-FLOP-mode on

Pos. 1: Clamp is locked in clamp drive. When action is repeated, lock is released.
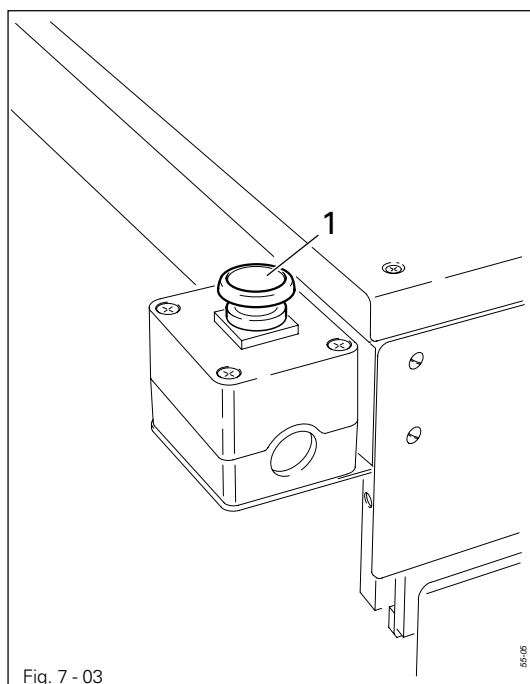
Pos. 2: Work sequence is started.

FLIP-FLOP-mode off

Pos. 1: Clamp is locked in clamp drive. Lock is released immediately after the foot switch is released.

Pos. 2: Work sequence is started.

PFAFF

7.03   Stop/start button (optional)
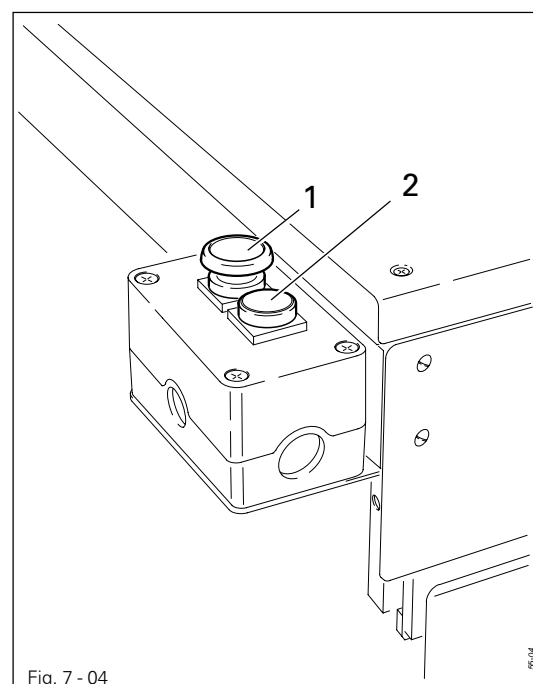
Fig. 7 - 03

Fig. 7 - 04

● The complete program sequence is stopped by pressing stop button **1**.

● On machines with clamp feeder (**Fig. 7.04**) the program sequence can be re-started by pressing button **2**.

● During the program sequence, a pre-start can be activated with button **2** as soon as the second clamp has been loaded. The clamp change is then carried out automatically immediately after the sewing cycle has finished.
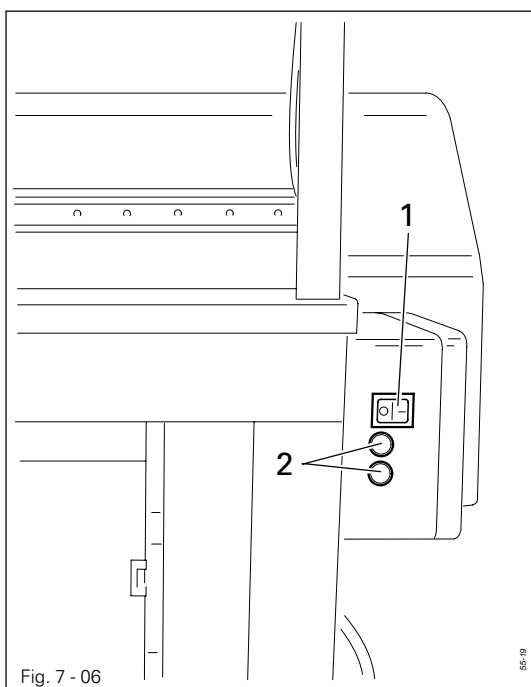
Controls

7.04 Handwheel

Fig. 7 - 05
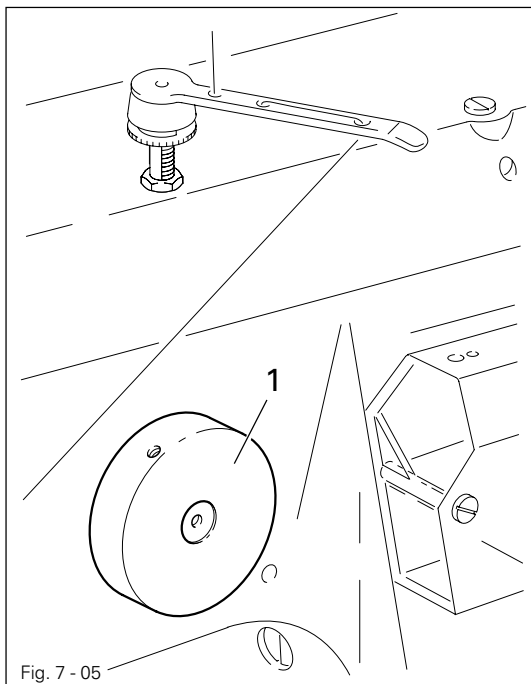
● By turning and simultaneously pushing the handwheel **1** in, the needle bar can be positioned manually as required.

7.05 Buttons for height adjustment (optional)

Fig. 7 - 06

● After the function has been switched on with the flip switch **1**, the table height can be adjusted between 850 – 1150 mm with buttons **2**, when the machine is switched on.

7.06   Graphics control panel

The graphics control panel **1** consists of the display screen and 2 key zones.
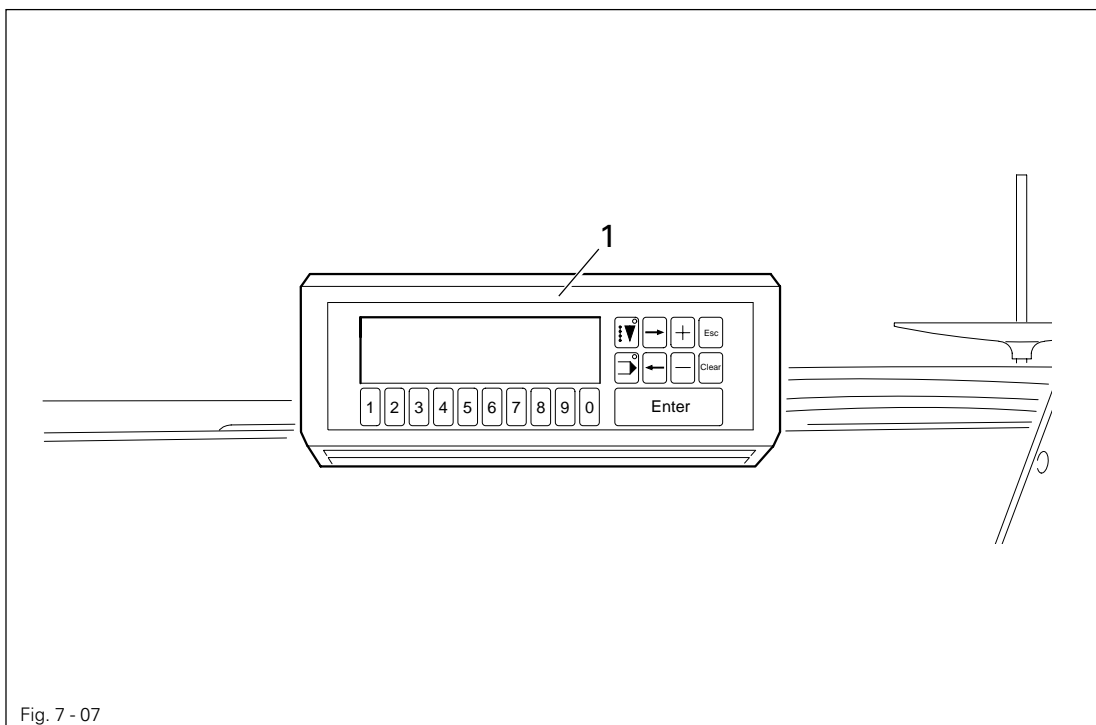

Fig. 7 - 07

7.06.01   Display

In its basic condition the displays on the screen are divided into 3 part sections:

Status bar
The status bar is in the upper section of the display. Here, up to 5 pictograms with their corresponding values can be displayed (see **Chapter 10.01 Status bar**).

Text field
The text field is in the middle section of the screen. Here, messages can be displayed in 2 lines.

Pictogram bar
The pictogram bar is found at the bottom of the display. The functions of the symbols, which appear here, can be called up using the **number keys.** Active functions are shown by a symbol displayed on a dark background.

Controls

7.06.02 Operational mode keys

By pressing the corresponding key, two different modes of operation can be selected.
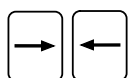The selected mode of operation is indicated by a diode.
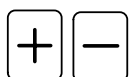
SEWING mode

INPUT mode

7.06.03 Function keys

Arrow keys (right/left)
- To move to another menu page
- To position the cursor when entering several values in one line

Plus/Minus keys
- To select sign for input values
- To raise and lower input values

Esc-key
- Interruption of functions without taking over the input value
- Return to superordinate menu functions
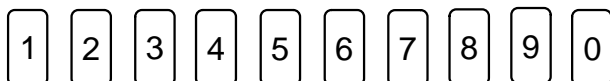
Clear key
- To reset the input value to 0

Enter-key
- To confirm an input value
- To acknowledge an error after an error message

7.06.04 Number keys

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |

Below the display there is a row of number keys (1-0).
Depending on the operating mode, these keys have the following functions:

- Executing a function illustrated by the symbol of the corresponding key
- Entering numerical values
- Selecting functions or menu levels

Contents .... Chapter - Page

8   Mounting and commissioning the machine

After unpacking the machine, check it for any transport damage. In case of damage, inform the shipping company and the responsible PFAFF dealer.

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

8.01   Mounting

At the machine's location, there must be a stable and horizontal surface as well as suitable electricity and compressed air supplies (see **chapter 3 Specifications**).

Fig. 8 - 01
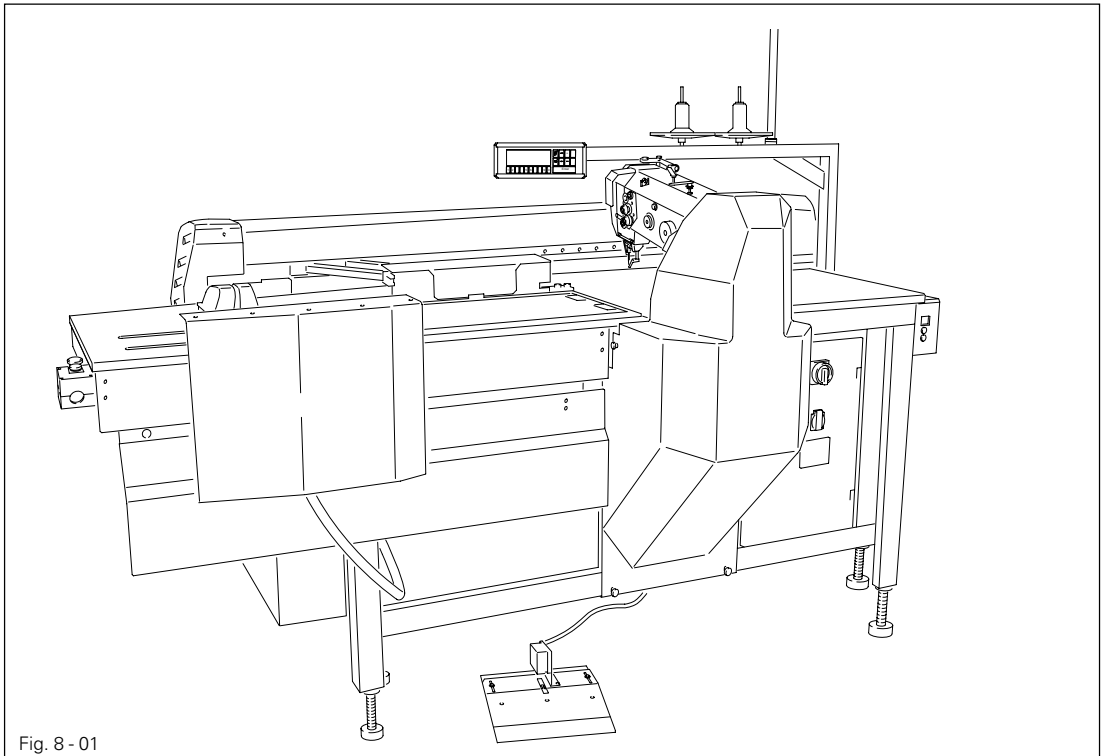
● Lift the machine with a forklift from the shipping pallet.

For machines without vertical adjustment:
● Align the machine horizontally just above the floor and move the four legs accordingly before setting the machine down on the ground.
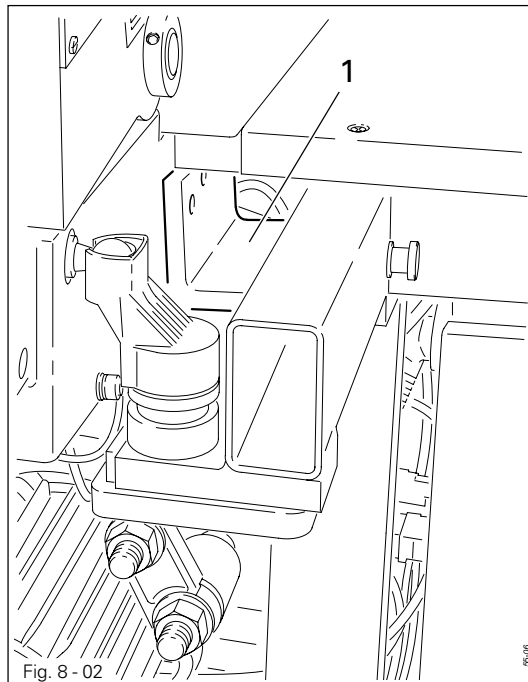
For machines with vertical adjustment:
● Set down the machine on the ground and align it by turning the four spindles.

ℹ️ The vertical adjustment is available as an optional feature.
Fig. 8-01 shows a machine with vertical adjustment.
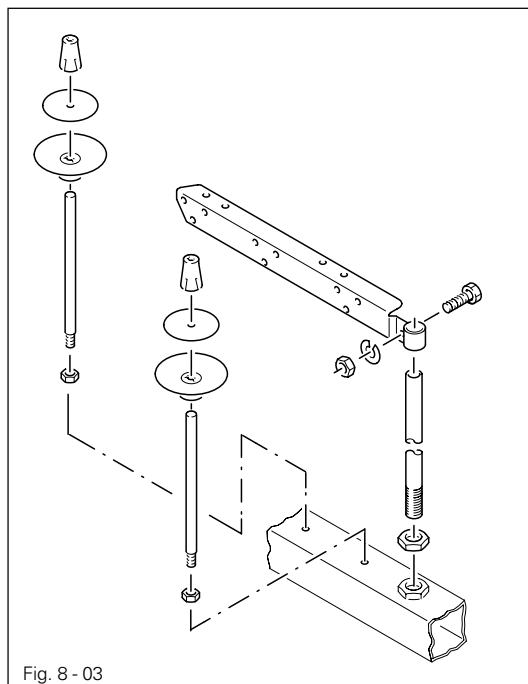
8.02 Removing the transit support bracket

Fig. 8 - 02

⚠️ Before the machine is commissioned, transit support bracket **1** must be removed!

Transit support bracket **1** serves to secure the sewing machine during transit and must not be used during sewing.
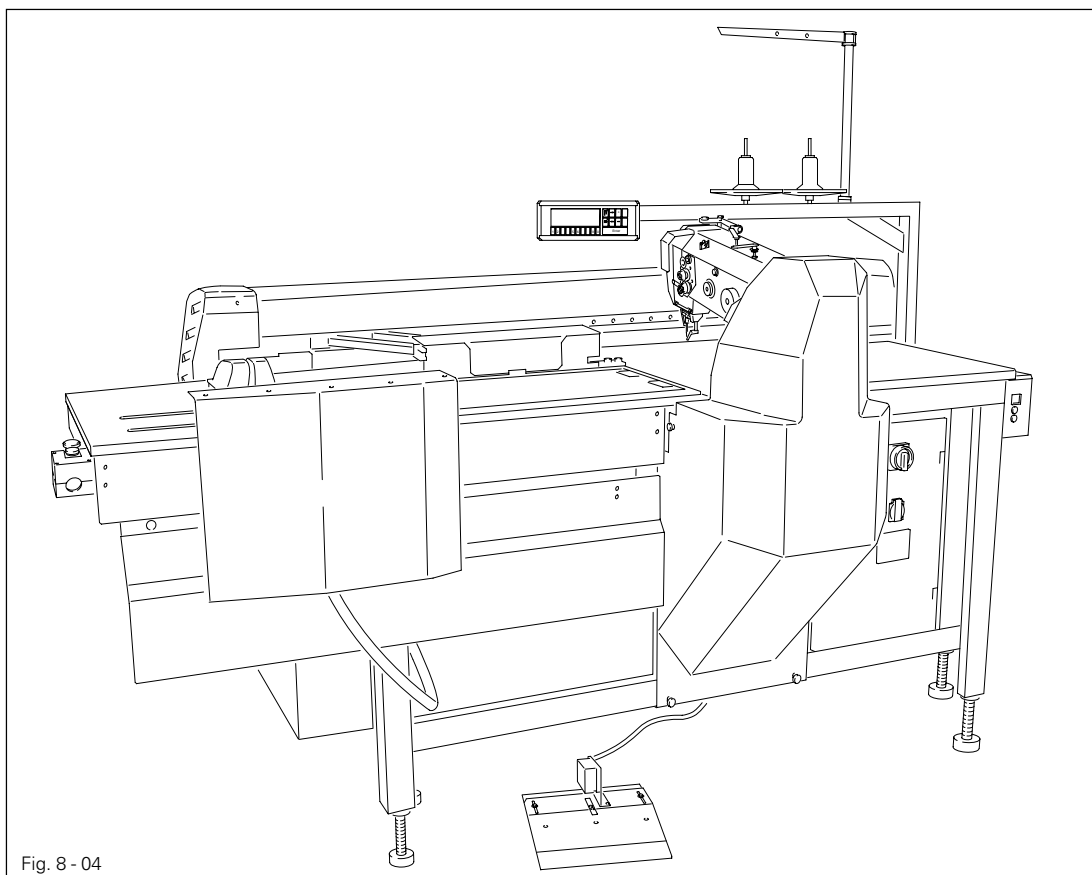
8.03 Mounting the spool holder

Fig. 8 - 03

● Mount the spool holder according to **Fig. 8.03**.

Mounting and commissioning the machine

8.04   Commisioning

Fig. 8 - 04

● Clean the whole machine thoroughly and check the electrical leads and pneumatic connecting tubes for any damage.

● Make sure that the mains voltage corresponds to the connection voltage of the machine (see **chapter 3 Specifications**). If the mains voltage and the connection voltage differ, the machine must not be operated under any circumstances.

● Have specialists connect the machine to the mains.

● Oil the machine and/or fill with oil (see **chapter 12 Care and maintenance**).

● Connect machine to the compressed air system. The manometer on the air filter/lubricator unit must display a pressure of **6 bar**. If necessary, set to the correct value (see **chapter 12.04 Checking / regulating air compression**).
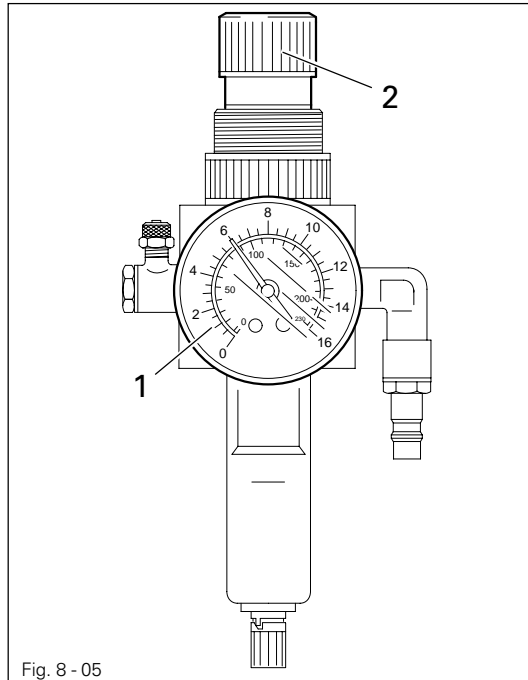
8.05 Switching the machine on/off

Fig. 8 - 05
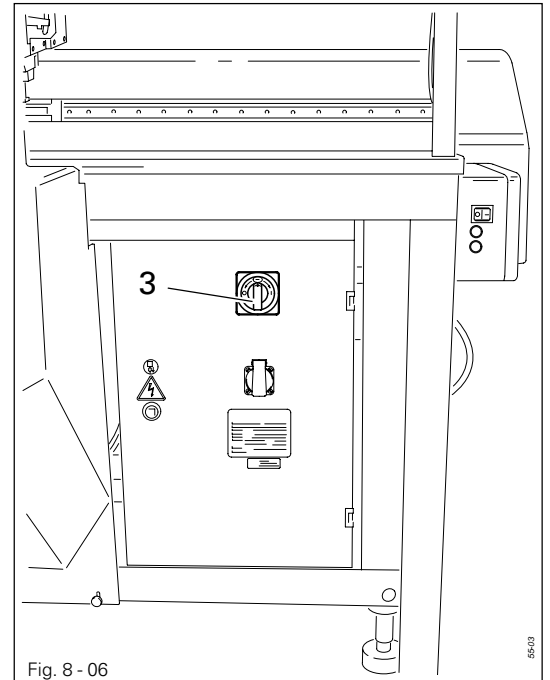
Fig. 8 - 06

● Check air pressure on pressure gauge **1** and, if necessary, adjust air pressure with adjusting knob **2**.

● Turn main switch **3** to position "I".

⚠️ When the machine is commissioned, the zero points must be checked or adjusted (see **Chapter 8.07 Check/adjust zero points**).

● To switch off the machine, turn main switch **3** to position "0".

8.06 Disk drive and PC interface

Fig. 8 - 07

● Disk drive **1** can be used to read in seam programs and operating software.

● Socket **2** is for connecting the programming system OSCA.

ℹ️ With OSCA existing CAD data records can be used to generate seam programs.

Mounting and commissioning the machine

8.07 Check/adjust zero points

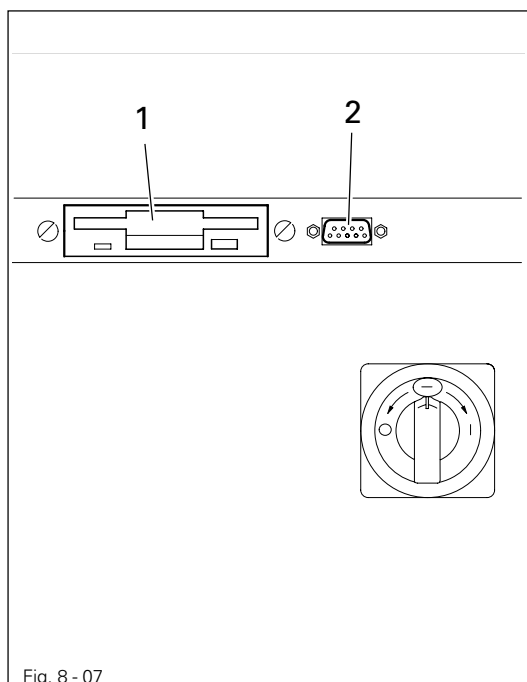⚠ Before commissioning the machine, or after changing the controller or one of the initiators of the clamp drive, it is necessary to set the zero points.

ℹ On machines with clamp feeder (optional), this must be switched off when checking the zero points.

● Select **INPUT** mode.

● Select **input menu** function (number key 0).

6 ● Select SERVICE function.

5 ● Select ADJUST ZERO POINTS function.

● Enter code number with the **number keys.**

ℹ The four-digit code number (factory setting: 3587) can be changed with the menu functions, see **Chapter 11.03 Summary of the service functions** and **11.05 Functions in the INPUT mode.**

Enter ● Press **Enter.**
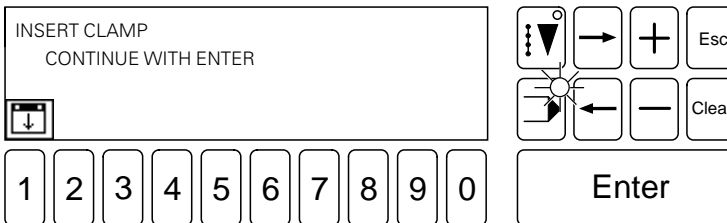
```
INSERT CLAMP
    CONTINUE WITH ENTER
```
[↓]

▼ → + Esc
← − Clear

1 2 3 4 5 6 7 8 9 0   Enter

Enter ● Insert clamp and press **Enter.**

```
1 - CARRIAGE POSITION
2 - NEEDLE POSITION
3 - FEEDER HAND OVER POSITION
4 - FEEDER TAKE OVER POSITION
5 - INCREMENT-CORRECTION MOTOR 1:        10
6 - INCREMENT-CORRECTION MOTOR 2:        10
```

▼ → + Esc
← − Clear

1 2 3 4 5 6 7 8 9 0   Enter
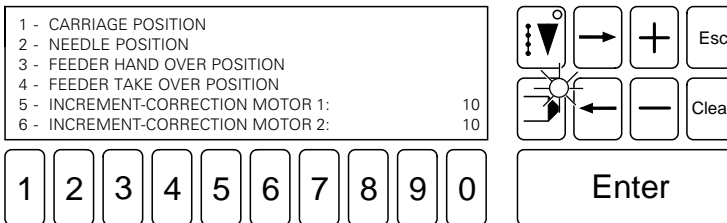
Carriage Position

1 ● Select function CARRIAGE POSITION.

```
TRAVEL TO CARRIAGE POSITION

    START WITH + KEY
```

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | Enter |
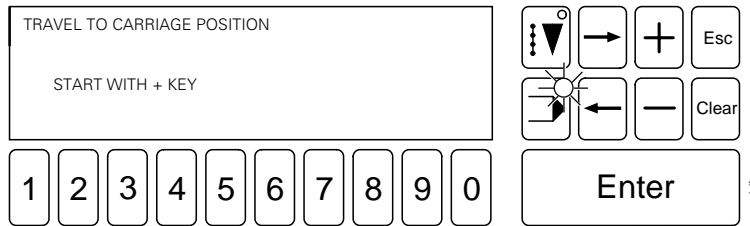
+ ● Press **+ Key** to bring clamp drive into carriage position.

Fig. 8 - 08
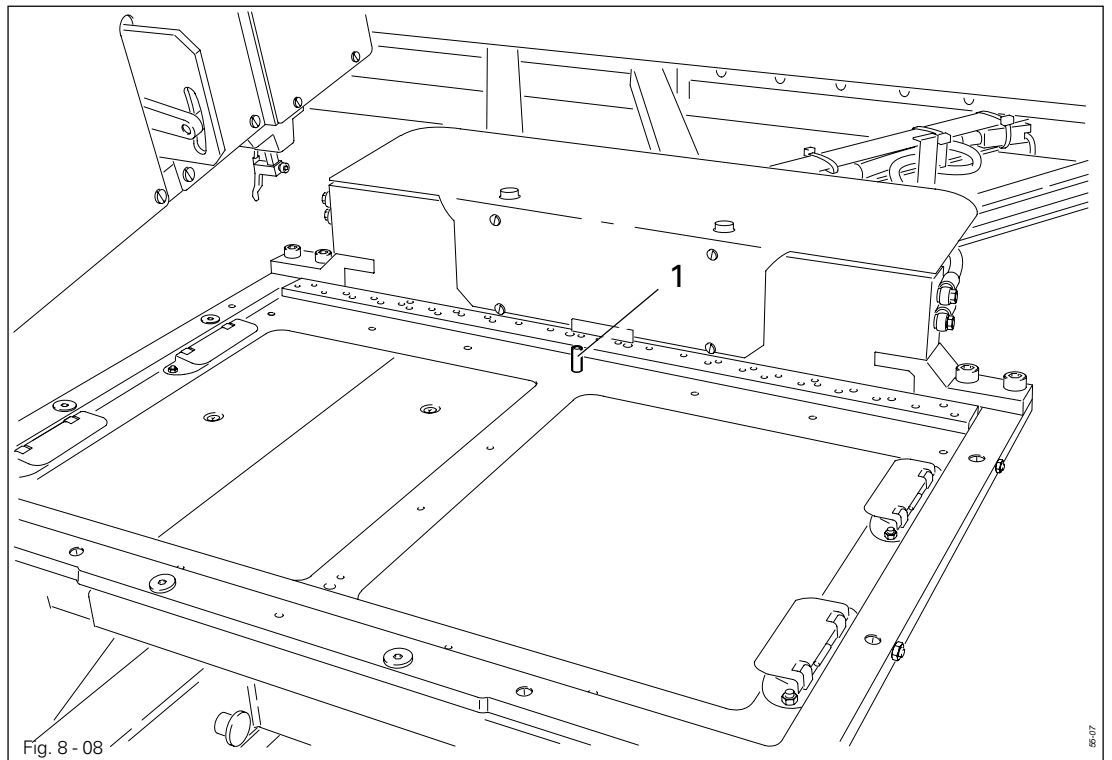
● With the clamp in this position, check whether adjustment pin **1** can be fitted in the holes in the clamp and table.
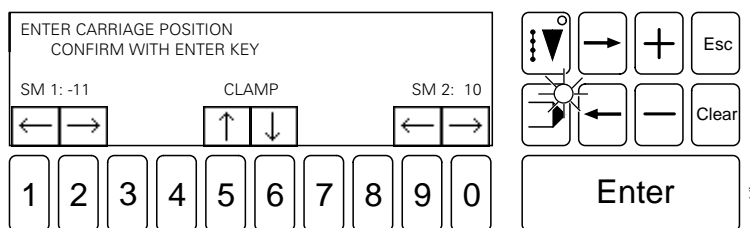
```
ENTER CARRIAGE POSITION
     CONFIRM WITH ENTER KEY

SM 1: -11            CLAMP            SM 2: 10
 ←  →                ↑   ↓             ←  →
```

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | Enter |

● If necessary, correct the position of the clamp using the **number keys** (in accordance with the functions shown on the display).

Enter ● Confirm adjustment with **Enter** and remove adjustment pin **1** from the holes.

Mounting and commissioning the machine

```
1 - CARRIAGEPOSITION
2 - NEEDLE POSITION
3 - FEEDER HAND OVER POSITION
4 - FEEDER TAKE OVER POSITION
5 - INCREMENT-CORRECTION MOTOR 1:        10
6 - INCREMENT-CORRECTION MOTOR 2:        10
```

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |

Enter

Needle Position

2

● Select function NEEDLE POSITION.

+

● Press **+ Key** to bring clamp drive into needle position.

Fig. 8 - 09

● With screw **2** fasten adjustment pin **1** in the needle bar.
● By turning balance wheel **3** check whether the adjustment pin **1** can be guided into the clamp adjustment hole.

```
ENTER NEEDLE POSITION
    CONFIRM WITH ENTER KEY

    X: 2        Y: 4
```

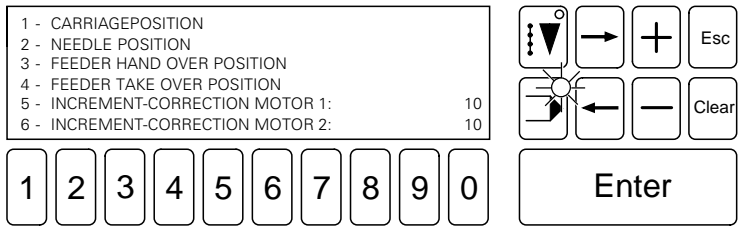| ← | → | ↑ | ↓ |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |

Enter

● If necessary, correct the position of the clamp using the **number keys** (in accordance with the functions shown on the display).

Enter

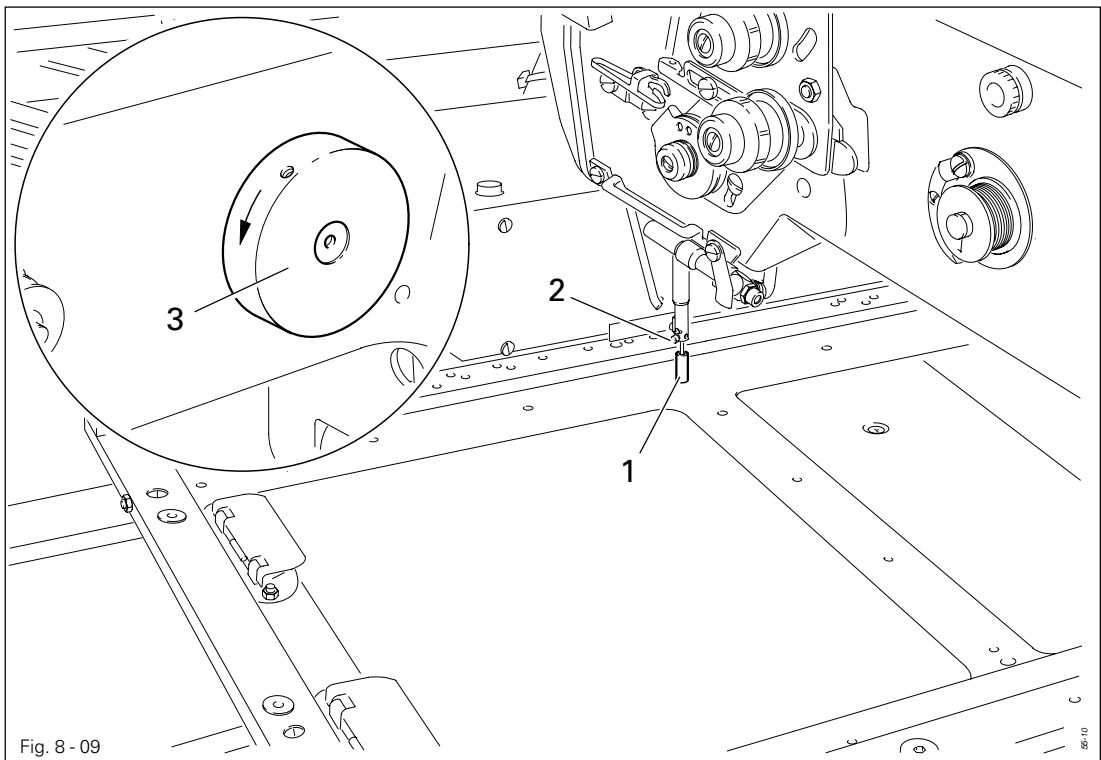● Confirm adjustment with **Enter,** loosen screw **2** and remove adjustment pin **1**.

```
1 - CARRIAGE POSITION
2 - NEEDLE POSITION
3 - FEEDER HAND OVER POSITION
4 - FEEDER TAKE OVER POSITION
5 - INCREMENT-CORRECTION MOTOR 1:      10
6 - INCREMENT-CORRECTION MOTOR 2:      10
```

```
1  2  3  4  5  6  7  8  9  0        Enter
```
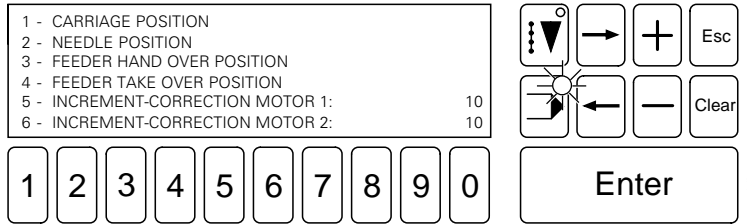
Feeder Hand Over Position

ℹ️ The feeder hand over position must only be checked if a clamp feeder is attached.

3 ● Select FEEDER HAND OVER POSITION function.

+ ● Press **+ key** to bring the clamp drive into hand over position.
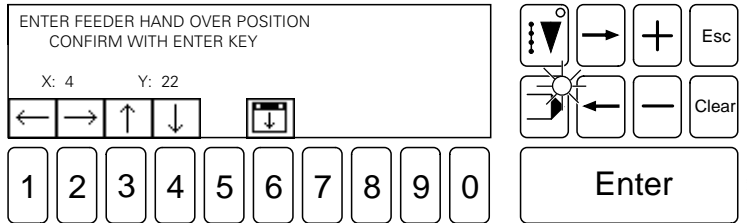
```
ENTER FEEDER HAND OVER POSITION
   CONFIRM WITH ENTER KEY

X:  4        Y:  22
←  →  ↑  ↓        ⊡
```
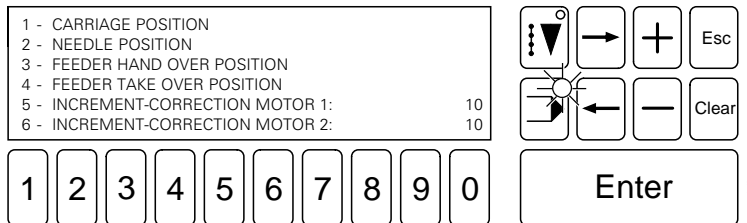
```
1  2  3  4  5  6  7  8  9  0        Enter
```

● Using the **Open/close clamp** function, switch the clamp indexing to and fro between clamp feeder and clamp drive.
When changing the indexings, the clamp must not move.

● If necessary, correct the clamp position using the **number keys** (in accordance with the functions shown on the display).

Enter ● Confirm adjustment with **Enter.**

```
1 - CARRIAGE POSITION
2 - NEEDLE POSITION
3 - FEEDER HAND OVER POSITION
4 - FEEDER TAKE OVER POSITION
5 - INCREMENT-CORRECTION MOTOR 1:      10
6 - INCREMENT-CORRECTION MOTOR 2:      10
```

```
1  2  3  4  5  6  7  8  9  0        Enter
```

Feeder Take Over Position

4 ● Select FEEDER TAKE OVER POSITION function.

+ ● Press **+ key** to bring the clamp drive into take over position.

```
ENTER FEEDER TAKE OVER POSITION
   CONFIRM WITH ENTER KEY

X:  1        Y:  19
←  →  ↑  ↓        ⊡
```

```
1  2  3  4  5  6  7  8  9  0        Enter
```

Mounting and commissioning the machine

● Using the **Open/close clamp** function, switch the clamp indexing to and fro between clamp drive and clamp feeder.
When changing the indexings, the clamp must not move.

● If necessary, correct the clamp position using the **number keys** (in accordance with the functions shown on the display).

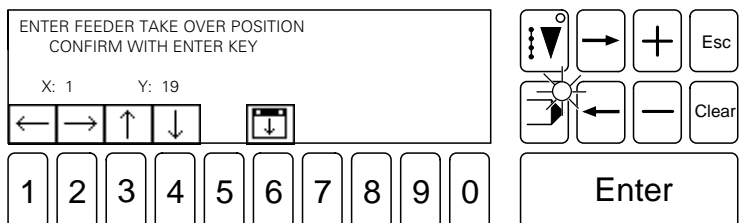● Confirm adjustment with **Enter.**

Enter

● Select **SEWING** mode

> If no seam program has been entered and selected (see chapter **9.06 Selecting seam program**), an error message will appear.

● Select **Starting position** function**.**
(The machine is ready for operation.)

Contents .... Chapter - Page

Preparation

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!

9.01   Inserting the needle

Fig. 9 - 01
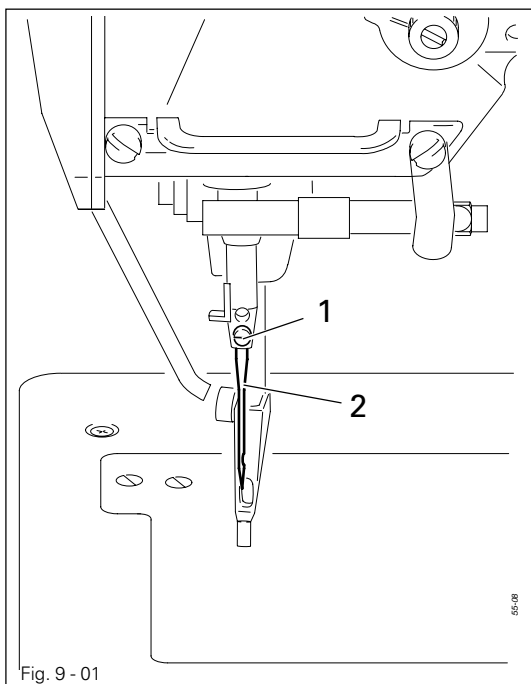
⚠ Turn the machine off!
Danger of injury if the machine starts up suddenly!

Only use needles from the 134-35 KK system.

● Raise the needle bar with the balance wheel.
● Loosen screw **1** and insert needle **2** as far as possible into the needle bar.
● Align needle **2** so that the long needle groove is facing the carriage guide, and tighten screw **1**.

9.02 Winding the bobbin thread / adjusting the thread tension
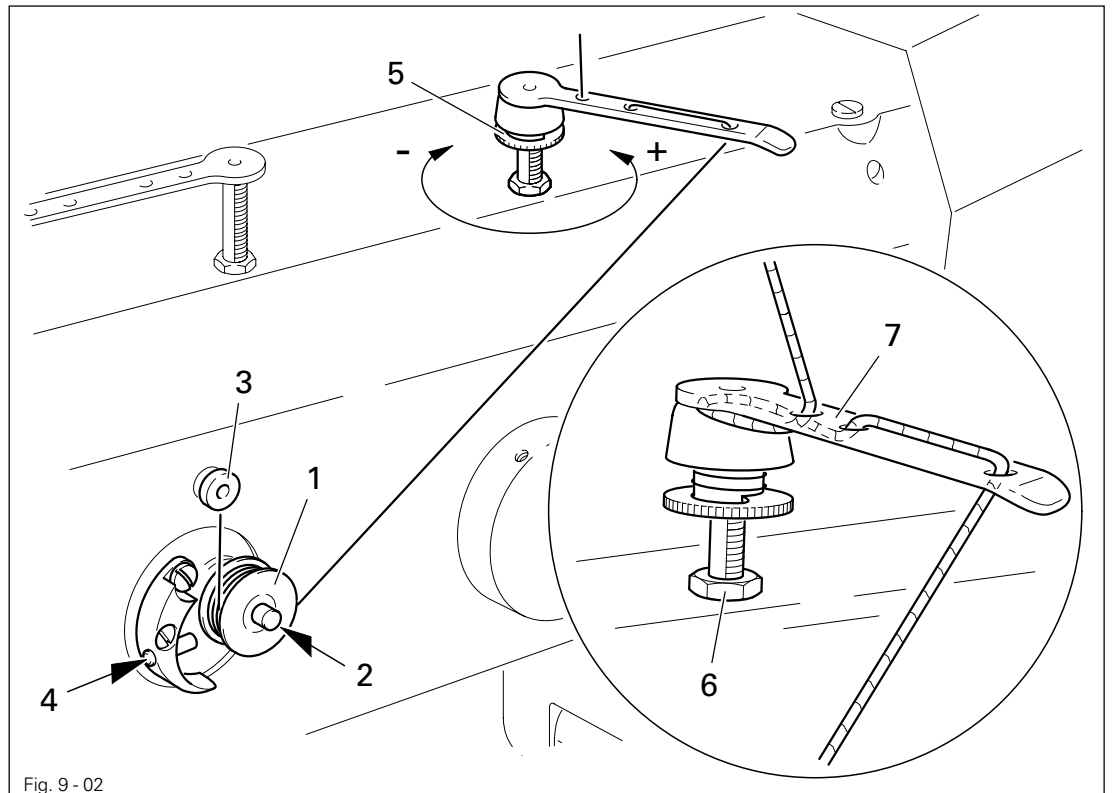
Fig. 9 - 02

- ● Place an empty bobbin **1** onto shaft **2**.
- ● Thread the bobbin in accordance with **Fig. 9-02** and wind it clockwise around bobbin **1** a few times.
- ● Cut thread end using thread cutter **3**.
- ● Switch on the bobbin winder by pressing the spindle **2** and cam **4** simultaneously.

> ℹ️ The bobbin **1** fills up while you are sewing.

- ● The thread tension on bobbin **1** can be adjusted with screw **5**.
- ● The bobbin winder stops automatically when bobbin **1** is full.

> ℹ️ To adjust the filling amount, see **chapter 13.05.23 Bobbin winder.**

If the thread is wound unevenly:
- ● Loosen nut **6**.
- ● Turn thread guide **7** accordingly.
- ● Tighten nut **6**.

Preparation

9.03   Changing the bobbin / adjusting the bobbin thread tension

Fig. 9 - 03

- After the number of stitches entered previously under the BOBBIN THREAD PRESELECT function (see **Chapter 11.05 Functions in the INPUT m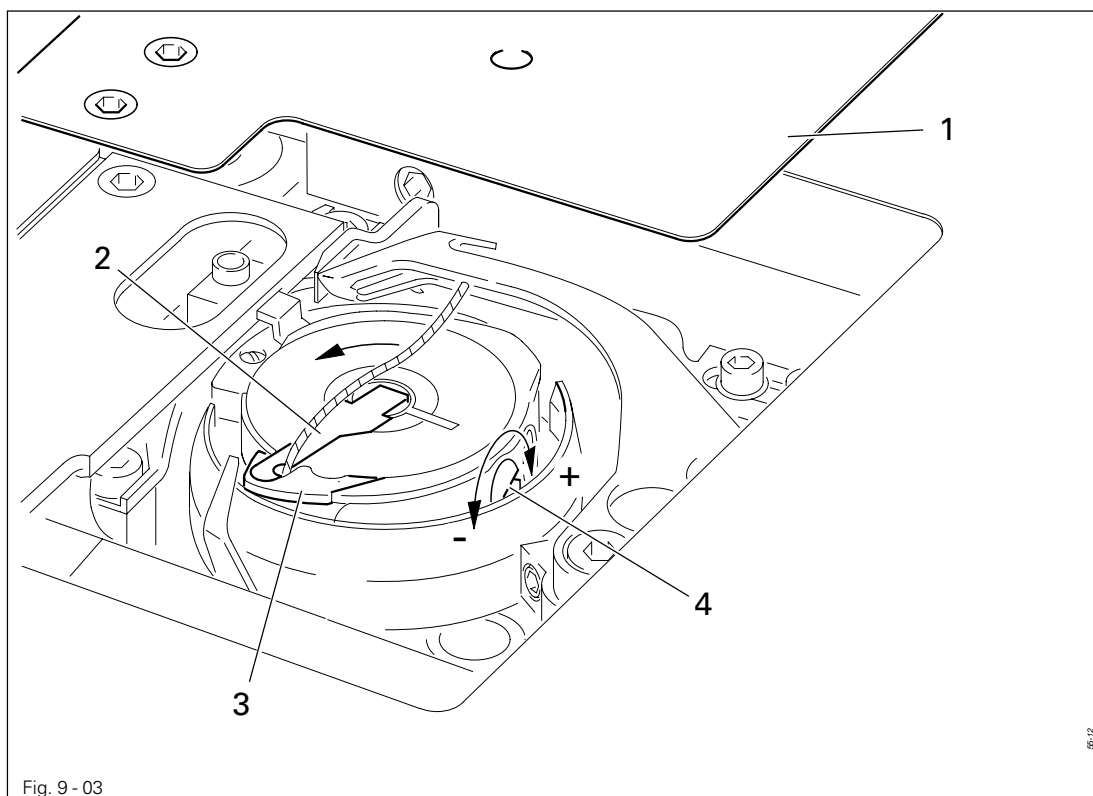ode**) have been carried out, or if the **Change bobbin** function (number key 6) is selected, the clamp returns automatically to the starting position, hook compartment cover **1** opens.
- Raise latch **2** and remove empty bobbin.
- Insert full bobbin into the hook so that it turns in the direction of the arrow when the thread is pulled out.
- Close latch **2**.
- First feed the thread through the groove and then around the horn of the bobbin case **3** and into the recess of latch **2**.
- Adjust the bobbin thread tension by turning screw **4**

Enter

- Confirm bobbin change with **Enter.**

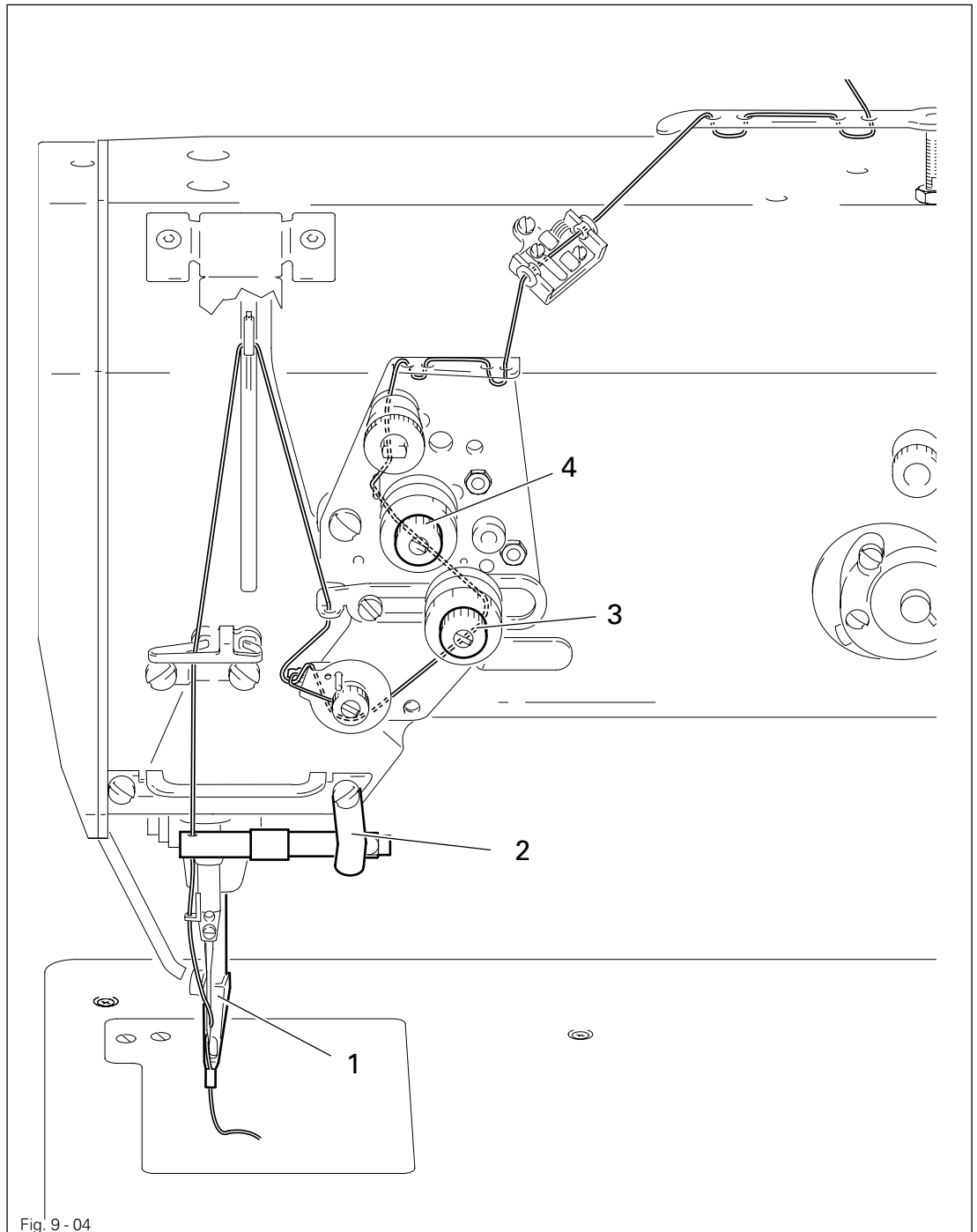9.04   Threading the needle thread / adjusting the needle thread tension

Fig. 9 - 04

- ● Lower presser foot **1** (number key 8).
  (Thread nipper **2** opens)
- ● Thread needle thread as illustrated above.
- ● Adjust needle thread tension by turning knurled screw **3**.
- ● Raise presser foot **1** (number key 8).
  (Thread nipper **2** closes)

The secondary tension can be adjusted by turning knurled screw **4**.

Preparation

9.05 Selecting a language

● Select **INPUT** mode by pressing the respective key.

> Depending on the setting and configuration of the machine the displayed status bar may differ from the following example.
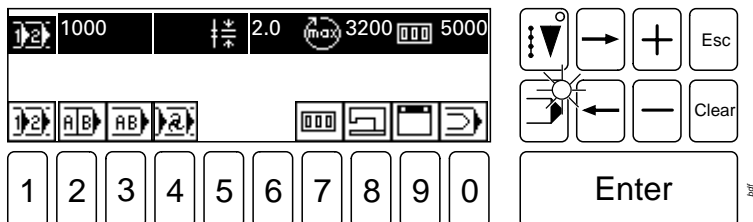
● Select the **input menu** function (number key 0).

4 ● Select the SWITCH FUNCTIONS function with **number key 4**.

2 ● Select the LANGUAGES function with **number key 2**.

1 to **6** ● Select the desired language with the **number keys 1 - 7**:

    1   =   D

    2   =   GB

    3   =   F

    4   =   E

    5   =   I

    6   =   CN

    7   =   P

● The language selected is assumed immediately once the corresponding number has been entered.

9.06 Selecting a seam program

When changing the seam program please make sure that the clamp matches the new seam program!
The wrong combination of clamp and seam program can cause severe damage to the machine!

● By pressing the key, call up **INPUT** mode.

Depending on the setting and configuration of the machine, in particular the status bar may differ from the following example.

● Using the **Program number selection** (number key 1), **Sequence number selection** (number key 2) or **Merged program number selection** (number key 3) function, select the required menu.

● Using the **number keys** select a previously entered seam program.

Enter ● Complete selection with **Enter.**

Seam programs can be transferred from a disk to the machine memory (see **Chapter 8.06 Disk drive and interface to PC**). To do so the READ / WRITE PROGRAM function must be selected (see **Chapter 11.05 Functions in INPUT mode).**

The CREATE/MODIFY PROGRAM function (see **Chapter 11.05 Functions in INPUT mode**) is used to create a seam program on the control panel.
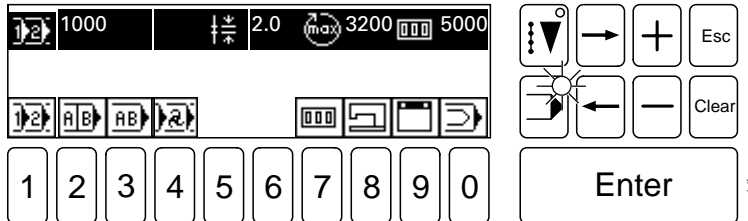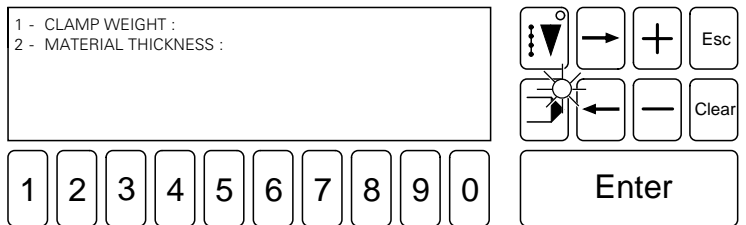
Preparation

### 9.07 Configure clamp

● By pressing the key, call up **INPUT** mode.

> ℹ Depending on the setting and configuration of the machine, in particular the status bar may differ from the following example.

1·2	1000	⇳ 2.0	(max) 3200	▦ 5000

1·2 A B A B 1·2   ▦ ↰ ▭ ⇥

1 2 3 4 5 6 7 8 9 0   Enter

● Select the **Configure clamp** function (number key 9).

```
1 - CLAMP WEIGHT :
2 - MATERIAL THICKNESS :
```

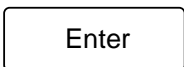1 2 3 4 5 6 7 8 9 0   Enter

1 ● Select CLAMP WEIGHT function.

● Adjust clamp weight according to the clamp used.
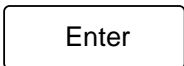
Enter ● Confirm input with **Enter**.

2 ● Select MATERIAL THICKNESS function.

● Adjust material thickness according to the material used.

Enter ● Confirm input with **Enter**.

9.08   Clamp monitoring (optional)

To monitor the clamp this is given a code by attaching magnets. With additional equipment the code can be read by the controller.

This avoids needle breakage due to the wrong combination of seam program and clamp.

If the optional equipment is used, to work with clamp monitoring, the **CLAMP MONITORING** function must be switched on, and a clamp code must be entered in the seam program.
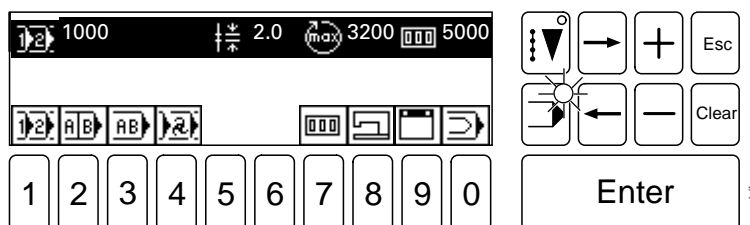
9.08.01   Switch on clamp monitoring

● By pressing the key, call up **INPUT** mode.

ⓘ   Depending on the setting and configuration of the machine, in particular the status bar may differ from the following example.

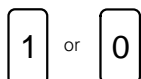● Select the **Input menu** function (number key 0).

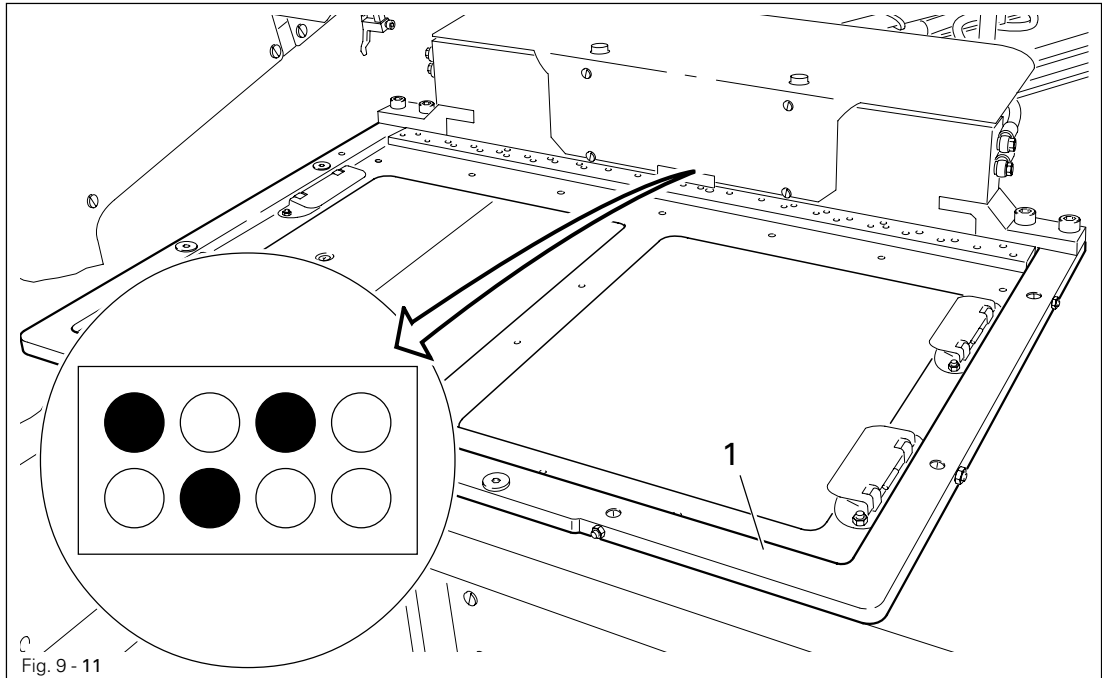**4** ● Select SWITCH FUNCTIONS function.

3 ● Select OPTIONS function.

1 ● Select CLAMP MONITORING function.

1 or **0** ● Switch the function on or off using the **number keys 1** or **0**.

Preparation

9.08.02 Determining a clamp code

Fig. 9 - 11

To monitor the clamp, clamp **1** is equipped with a code by attaching magnets. The controller can read the code and prevents sewing with a wrong combination of seam program and clamp.

The CLAMP MONITORING function must be switched on and a clamp code must be entered in the seam program as a decimal value (0-99) or binary value (0-254).

The code is created on the clamp as a BCD-number or binary number with a group of up to 8 solenoids.

Examples of the bit assignment for the BCD-code

(the decimal value of the corresponding bits is written inside the circle)
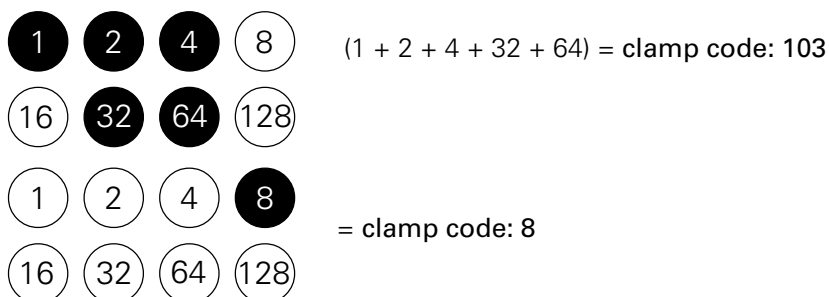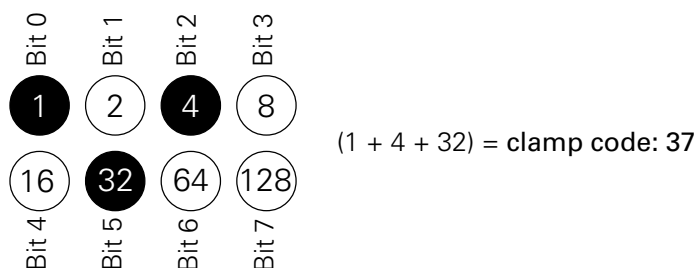
● occupied by a magnet   ○ free

(1 + 20 + 4) = **clamp code: 25**

(1 + 2 + 20 + 4 + 40) = **clamp code: 67**

= **clamp code: 8**

PFAFF
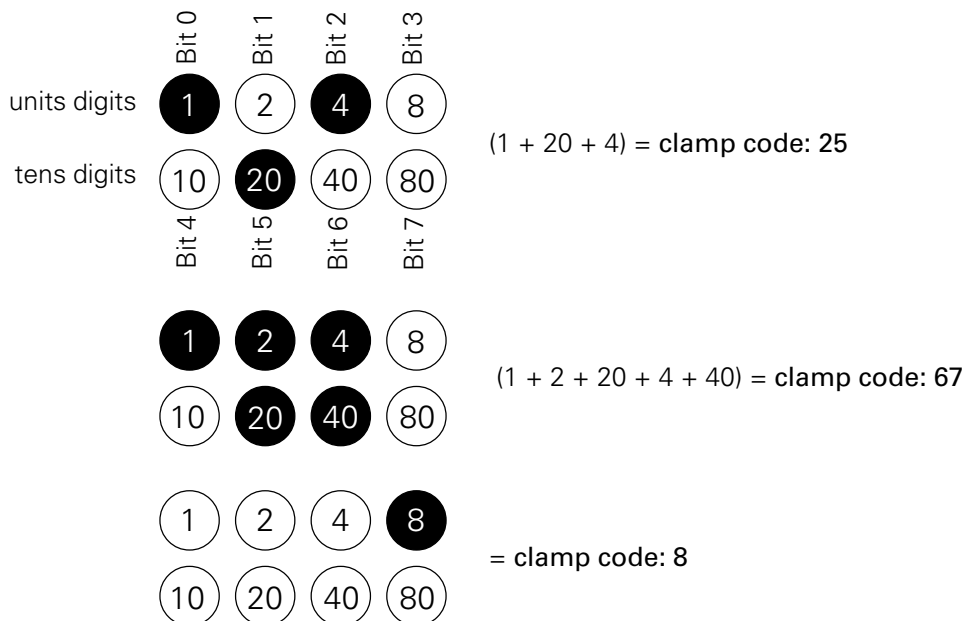
Examples of the bit assignment for the binary code

(the decimal value of the corresponding bits is written inside the circle)

● occupied by a magnet   ○ free

Bit 0 Bit 1 Bit 2 Bit 3

(1) (2) (4) (8)

(16) (32) (64) (128)   (1 + 4 + 32) = **clamp code: 37**

Bit 4 Bit 5 Bit 6 Bit 7

(1) (2) (4) (8)   (1 + 2 + 4 + 32 + 64) = **clamp code: 103**

(16) (32) (64) (128)

(1) (2) (4) (8)

(16) (32) (64) (128)   = **clamp code: 8**

9.08.03   Determining a program number

● The program number is coded on the clamp magnetically (as described in Chapter 9.08.02).

● If several programs are sewn alternately when working with automatic program number selection, [⟨a⟩]   care must be taken to ensure that the program codes differ by more than one magnet.

● All programs, which are not being sewn currently, should not be in the machine memory.

[ⓘ]   These measures prevent the selection of a different program, which is also in the machine memory, if one position is read incorrectly (e.g. in the case of a cable fault)

[⚠]   If the wrong program is recognised, the jig could be damaged.

Contents .... Chapter - Page

10 Sewing

In the **SEWING** mode functions are available for production and production preparation. By pressing the corresponding key on the control panel, the operational mode can be selected.

10.01 Status bar

In the upper section of the display screen information is shown about the current machine status. For this purpose symbols are displayed with corresponding values.
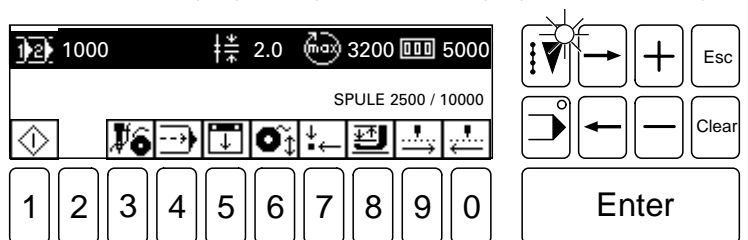
Explanation of the status bar symbols.

Program number

The number of the current program selected appears after the symbol for the program number.

Program type

At this point in the status bar, depending on the type of program, the relevant symbol with the corresponding program number is shown. No symbol is displayed for standard programe.

Sequence program with corresponding program number.

Merged program with relevant merged program number

Stitch length

The value of the stitch length for the selected seam program is shown after this symbol.

Maximum speed

The maximum speed of the machine is shown after this symbol.

Piece counter

The actual number of pieces is shown after this symbol.

10.02   Machines with clamp feeder

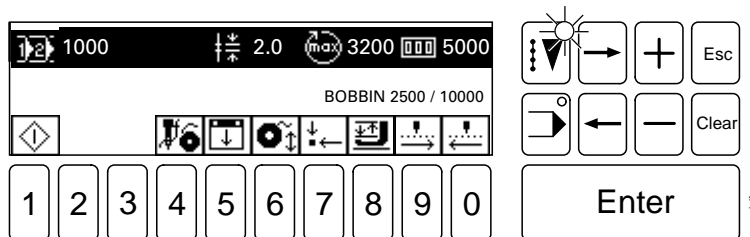After the machine has been switched on and the workpiece loaded, the program sequence can be started

● by pressing the start button (see **Chapter 7.03 Stop/start button**) or

● by selecting the **Start** function on the graphics control panel.

Depending on the condition of the sequence and the machine configuration various symbols (functions) then appear on the display screen.

Starting position of the machine

```
1)2)  1000          ‡± 2.0   (max) 3200  5000
                                 BOBBIN 2500 / 10000
◇      ⬚ ⬚ ⬚ ⬚ ⬚ ⬚

1  2  3  4  5  6  7  8  9  0        Enter
```

Explanation of the symbols in the pictogram bar.

Start (number key 1)
Direct function for starting the program sequence.

Threading aid (number key 3)
This function is used to remove the feeder and the clamps from the machine head. The bobbin cover and the thread trapper are opened, the presser foot is lowered.

Single step (number key 4)
With this function the clamp feeder can be moved step by step.

Open/close clamp (number key 5)
Direct function for opening or closing the clamp interlock on the clamp feeder or clamp drive.

Bobbin change (number key 6)
After this function has been selected, it is possible to change the bobbin.

Starting position (number key 7)
Direct function to bring the clamp feeder, sewing station and clamp drive into the starting position.

Presser foot up/down (number key 8)
Direct function to raise or lower the presser foot, as well as to close or open the thread nipper.

Step-by-step forwards (number key 9) **/ step-by-step backwards** (number key 0)
With this function the seam pattern can be traced forwards or backwards step by step; in combination with the **Start** function, the entire seam pattern is traced automatically, if the **Start** function is activated in addition to the activated function **Step-by-step forwards/ backwards**

Machine running
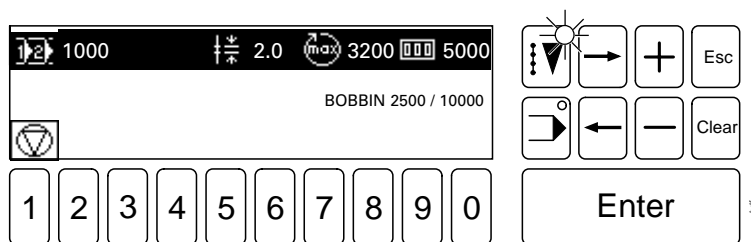
Explanation of the symbols in the pictogram bar

Stop (number key 1)
Direct function to stop the entire program sequence
(see Chapter 10.06 Program interruption)

10.03 Machines without clamp feeder

When the machine is in its basic position, the functions shown by the symbols on machines without clamp feeder are different to those on machines with clamp feeder.
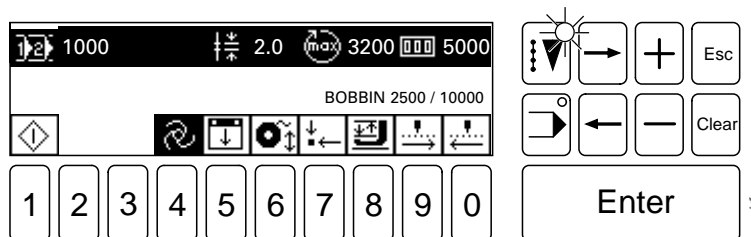
Automatic start (number key 4)
When loaded the clamp closes automatically and the sewing cycle is then started. By calling up the function (pressing the number key 4), it is possible to change into the Manual Start mode
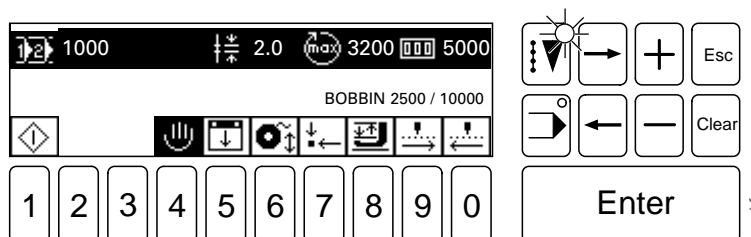
Manual start (number key 4)
By activating the presser foot switch or by selecting the Open/close clamp (number key 5) Start (number key 1) functions, the clamp is closed and the sewing cycle started. By switching off the Manual start function (number key 4), it is possible to change into the Automatic start mode.

10.04 Sewing with sequence programs and merged programs

In sequence programs or merged programs separate programs can be combined and saved under one program number.

The selection of a sequence or merged program can be recognised by the corresponding symbol in the status bar.

Sequence program
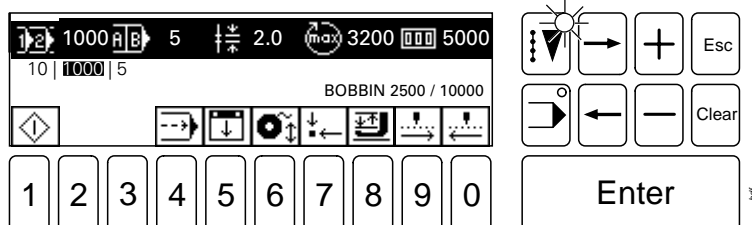
In the text line it is possible to see which programs make up the sequence (10, 1000, 5). The program number displayed on a dark background indicates which part must be loaded next. With the help of the cursor keys the next program can be selected. When the sequence is running, the programs are processed after each other i.e. after the 1st program has been sewn, the clamp is removed, than the clamp is inserted with the parts from the 2nd program and these are sewn etc.

Merged programs
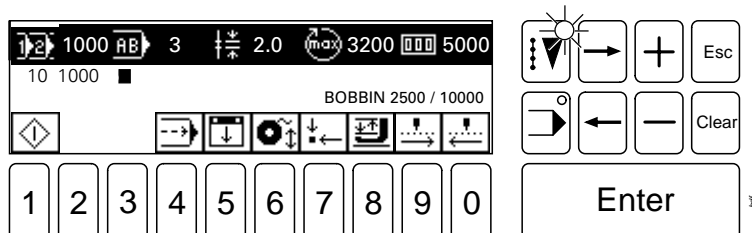
In the text line it is possible to see of which programs the merged program consists (10, 1000, 5). The program number displayed on a dark background indicates, which part will be sewn next.

The arrangement of the merged programs differs to that of the sequence by the fact that **all** programs are sewn in **one** clamp. After the 1st program has been completed, the clamp drive moves to the starting point of the 2nd program and carries out this program etc.

10.05 Error messages

If an error occurs on the machine, the current operation is interrupted and an error message sent. Depending on the gravity of the error shown, it is possible to achieve interference-free running through adjustment, control, different handling or similar actions. If necessary, individual components must be exchanged.

The following is an example of an error occurring when an output is connected:

```
1|2} 1000 AB} 5      ⁺≡ 2.0  (max) 3200 |III| 5000
ERROR:     Y1 (1)
CAUSE:     E8 (1)
```
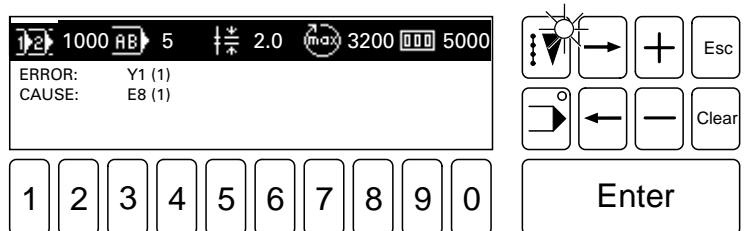
The error must be eliminated before operation continues!
The error may only be eliminated by skilled personnel (see **Chapter 14.02 Error description**).

10.06 Program interruption

A program sequence can be interrupted
● by pressing the stop button (see Chapter 7.03 Stop/start buttons) or
● by activating the **Stop** function on the control panel.

When a program is interrupted, the following appears on the display screen

```
1|2} 1000           ⁺≡ 2.0  (max) 3200 |III| 5000
                                    BOBBIN 2500 / 10000
◇  | ♠ |   |→| |⊤| |O| |⁺←| |⊞| |...| |...|
```
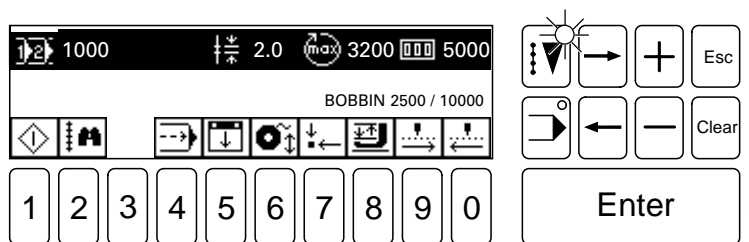
If the machine is stopped in this way, the sewing unit and the clamp drive are **not** in their starting position!

● The program sequence can be continued by activating the **Start** function (number key 1).

● If the search function is activated (number key 2) the machine head is raised and with the aid of the keys the clamp can be moved near to the desired point.

11 Input

This chapter lists and describes the functions in the **INPUT** mode. This operational mode includes the functions for program management, language selection, machine setting and configuration, as well as for service and adjustment work. However this chapter does not describe how to create a seam program. For Information on how to create seam programs please refer to the relevant instruction manual.

11.01 Summary of the functions in the INPUT mode

INPUT mode

Program number selection

Sequence program number selection

Merged program number selection

Automatic program number selection

Bobbin thread functions

    1 - RESET STITCH COUNTER
    2 - BOBBIN-THREAD PRESELECT

Sewing head functions

    1 - STANDARD STITCH LENGTH
    2 - MAXIMUM SPEED
    3 - REDUCED SPEED
    4 - SLOW START SPEED

Clamp configuration

    1 - CLAMP WEIGHT
    2 - MATERIAL THICKNESS

Input menu (see Chapter 11.02 Summary of the functions in the input menu)

    1 - PROGRAM MANAGEMENT
    2 - CREATE/MODIFY PROGRAM
    3 - COUNTER
    4 - SWITCH FUNCTIONS
    5 - TIMES
    6 - SERVICE (see CHAPTER 11.03 SUMMARY OF THE SERVICE FUNCTIONS)

Input

11.02   Summary of the functions in the input menu

Mode **INPUT**

Input menu

1 - PROGRAM MANAGEMENT
- 1 - DIRECTORY
  - 1 - DIRECTORY OF MEMORY
  - 2 - DIRECTORY OF DISK
- 2 - READ/WRITE PROGRAM
  - 1 - READ ONE PROGRAM FROM DISK
  - 2 - READ ALL PROGRAMS FROM DISK
  - 3 - WRITE ONE PROGRAM ON DISK
  - 4 - WRITE ALL PROGRAMS ON DISK
- 3 - DELETE PROGRAMS
  - 1 - DELETE ONE PROGRAM IN MEMORY
  - 2 - DELETE ALL PROGRAMS IN MEMORY
  - 3 - DELETE ONE PROGRAM ON DISK
  - 4 - DELETE ALL PROGRAMS ON DISK
- 4 - FORMAT DISK
- 5 - STATISTICAL PROGRAM DATA
- 6 - DATA TRANSFER WITH PC

2 - CREATE/MODIFY PROGRAM (SEE **CHAPTER 11.06 CREATING/MODIFYING SEAM PROGRAMS**)

3 - COUNTERS
- 1 - RESET PIECE COUNTER
- 2 - THREAD MONITOR
  - 1 - SUPPRESSED STITCHES NEEDLE THREAD MONITOR
  - 2 - SUPPRESSED STITCHES BOBBIN THREAD MONITOR
  - 3 - STITCH REVERSAL
  - 4 - REACTION TIME THREAD MONITOR
- 3 - NUMBER OF SLOW START-STITCHES
- 4 - CARRIAGE START (NIS)
- 5 - START FOR THREAD TRIMMING
- 6 - RELEASE THREAD TENSION / CUT

4 - SWITCH FUNCTIONS
- 1 - THREAD MONITOR
  - 1 - NEEDLE THREAD MONITOR
  - 2 - BOBBIN THREAD MONITOR
- 2 - LANGUAGE SELECTION
  - 1 - GERMAN
  - 2 - ENGLISH
  - 3 - FRENCH
  - 4 - SPANISH
  - 5 - ITALIAN
  - 6 - CHINESE
  - 7 - PORTUGUESE
- 3 - OPTIONS
  - 1 - CLAMP MONITOR
  - 2 - FEEDER
- 4 - LOCK/RELEASE FUNCTIONS
- 5 - OTHER FUNCTIONS
  - 1 - AUTOMATIC CLAMP RELEASE
  - 2 - FOOT SWITCH FLIP-FLOP MODE

5 - TIMES
- 1 - TIME FOR THREAD NIPPER OPEN
- 2 - TIME FOR THREAD WIPER
- 3 - TIME FOR NEEDLE COOLING

6 - SERVICE (see **CHAPTER 11.03 SUMMARY OF SERVICE FUNCTIONS**)

11.03   Summary of the service functions

Mode **INPUT**

Input menu

6 - SERVICE

1 - SEWING DRIVE FUNCTIONS
- 1 - TURN SEWING MOTOR
- 2 - THREAD TRIMMING PROCEDURE
- 3 - CUTTING SPEED – PRESELECT

2 - STEPPING MOTOR FUNCTIONS
- 1 - STEPPING MOTOR 1
- 2 - STEPPING MOTOR 2
- 3 - MOVE CARRIAGE
- 4 - TEST CARRIAGE

3 - SWITCH OUTPUTS
4 - DISPLAY INPUTS/OUTPUTS
5 - ADJUST ZERO POINT
- 1 - CARRIAGE POSITION
- 2 - NEEDLE POSITION
- 3 - FEEDER HAND OVER POSITION
- 4 - FEEDER TAKE OVER POSITION
- 5 - INCREMENT-CORRECTION MOTOR 1
- 6 - INCREMENT-CORRECTION MOTOR 2

6 - CONFIGURE MACHINE
- 1 - THREAD WIPER
- 2 - CLAMP MONITOR
- 3 - FEEDER
- 4 - SHORT END THREAD CUTTER

7 - ADJUSTMENTS READ/WRITE
- 1 - READ MACHINE DATA FROM DISK
- 2 - WRITE MACHINE DATA TO DISK
- 3 - READ CONFIGURATION/ZERO POINTS FROM DISK
- 4 - WRITE CONFIGURATION/ZERO POINTS TO DISK

8 - OTHER FUNCTIONS
- 1 - CARRY OUT COLD START
- 2 - DISPLAY SOFTWARE STATUS
- 3 - CONTRAST SETTING OF DISPLAY
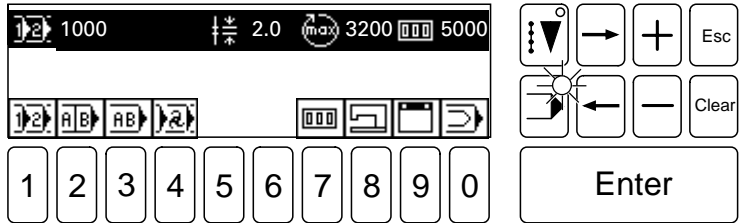- 4 - CHANGE CODE NUMBER
- 5 - INSTALL OPERATING SYSTEM

The service functions are explained in **Chapter 11.05 Functions in the INPUT mode.**

Input

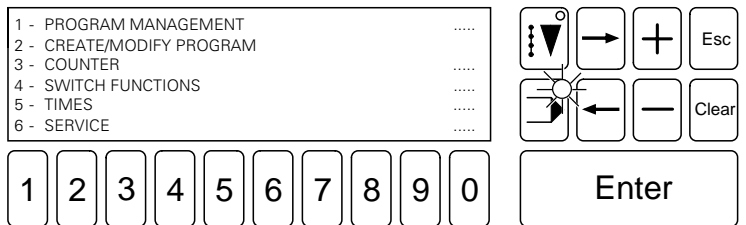## 11.04 Selecting functions from the menu

An example is designed to show how to move about within menu levels.
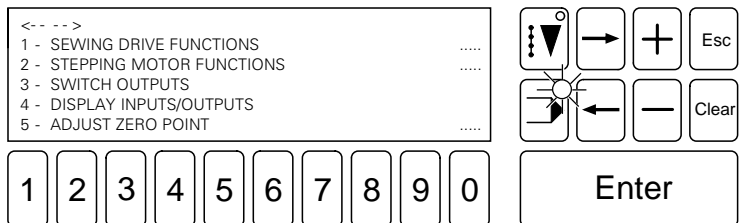Contrast setting of display:

● By pressing the corresponding key, select **INPUT** mode (LED in key lights up)
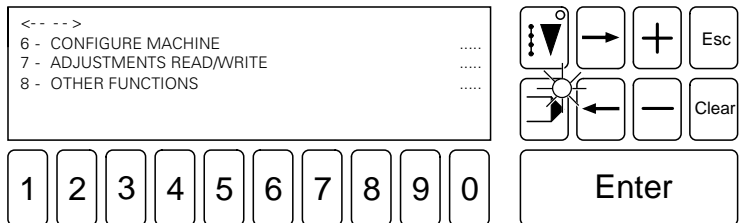
```
1 2  1000        2.0  max 3200  5000
1 2  AB  AB  2            000
```

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | Enter |

● Select **input menu** function (press number key 0)

```
1 - PROGRAM MANAGEMENT        .....
2 - CREATE/MODIFY PROGRAM
3 - COUNTER                   .....
4 - SWITCH FUNCTIONS          .....
5 - TIMES                     .....
6 - SERVICE                   .....
```

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | Enter |

6 ● By pressing **number key 6**, call up the SERVICE function.

```
<- - - ->
1 - SEWING DRIVE FUNCTIONS    .....
2 - STEPPING MOTOR FUNCTIONS  .....
3 - SWITCH OUTPUTS
4 - DISPLAY INPUTS/OUTPUTS
5 - ADJUST ZERO POINT         .....
```

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | Enter |

● By pressing the **right arrow key** scroll to the next page

```
<- - - ->
6 - CONFIGURE MACHINE         .....
7 - ADJUSTMENTS READ/WRITE    .....
8 - OTHER FUNCTIONS           .....
```

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | Enter |

8 ● With **number key 8** select OTHER FUNCTIONS.

The menu item can also be selected directly, without scrolling the page, by pressing the corresponding number key.

```
1 - CARRY OUT COLD START
2 - DISPLAY SOFTWARE STATUS
3 - CONTRAST SETTING OF DISPLAY
4 - CHANGE CODE NUMBER
5 - INSTALL OPERATING SYSTEM
```

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | Enter |
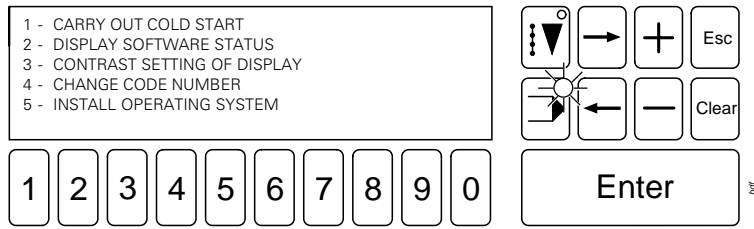
3 ● Select the CONTRAST SETTING OF DISPLAY function (number key 3)

```
CONTRAST SETTING:

  ADJUST WITH +, - KEYS
```

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | Enter |
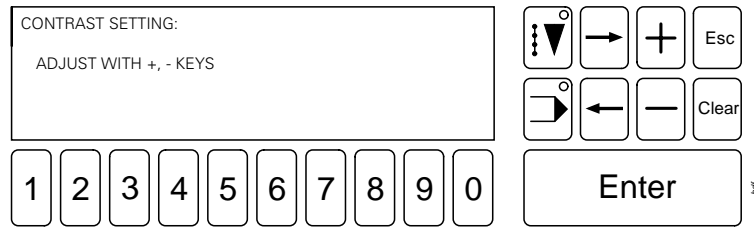
The contrast setting is changed immediately when the key is pressed and does not have to be confirmed with Enter. On no account may the contrast be reduced to such an extent that it is no longer possible to read the display!
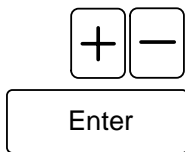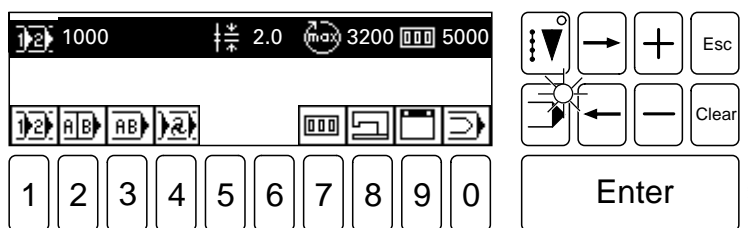
+ − ● The contrast can be changed as required using the **plus/minus keys.**

Enter ● Press **Enter** to exit the function.

Summary of the function selections

INPUT mode

0 Input menu function (number key 0)

— **1** - PROGRAM MANAGEMENT....

— **2** - CREATE/MODIFY PROGRAM

— **3** - COUNTER....

— **4** - SWITCH FUNCTIONS....

— **5** - TIMES....

6 — **6** - SERVICE —— **1** - SEWING DRIVE FUNCTIONS....

— **2** - STEPPING MOTOR FUNCTIONS....

— **3** - SWITCH OUTPUTS

— **4** - DISPLAY INPUTS/OUTPUTS

— **5** - ADJUST ZERO POINT....

— **6** - CONFIGURE MACHINE....

— **7** - ADJUSTMENTS READ/WRITE....

8 — **8** - OTHER FUNCTIONS —— **1** - CARRY OUT COLD START

— **2** - DISPLAY SOFTWARE STATUS

3 — **3** - CONTRAST SETTING OF DISPLAY

— **4** - CHANGE CODE NUMBER

— **5** - INSTALL OPERATING SYSTEM

11.05 Functions in the INPUT mode

Initial state in the INPUT mode

Explanation of the symbols on the display

Program number selection (number key 1)
This function is for the selection of the desired program number.

Sequence program number selection (number key 2)
With this function it is possible both to select the sequence program number, and to program a sequence. When a sequence program number is selected, the sequence saved under this number is displayed.

Merged program number selection (number key 3)
With this function it is possible to select the merged program number and also to program the program sequence.

Automatic program number selection (number key 4)
With the aid of the clamp monitoring unit, this function is used for the automatic selection of the program number.

Bobbin thread functions (number key 7)
This function opens a menu for selecting various bobbin thread functions:
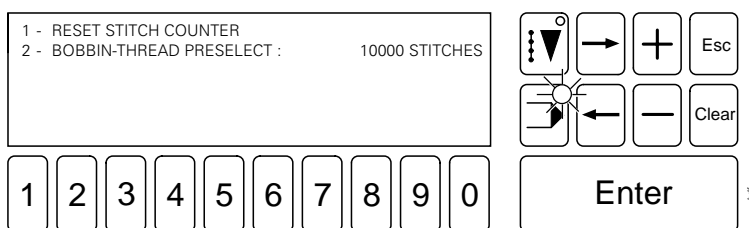
1 RESET STITCH COUNTER
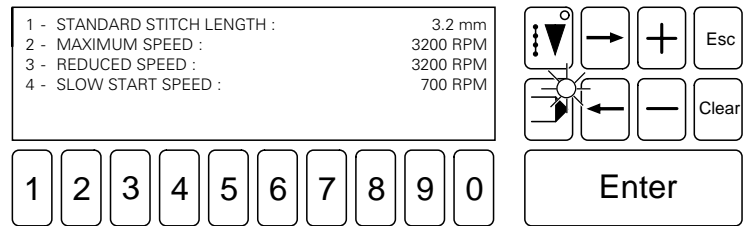This function resets the stitch counter to "0", e.g. after an unplanned bobbin change.

2 BOBBIN THREAD PRESELECT
This function is used to enter the number of stitches, after which the machine stops automatically for a bobbin change.

Sewing head functions (number key 8)

The function opens a menu for the selection of various sewing head functions:
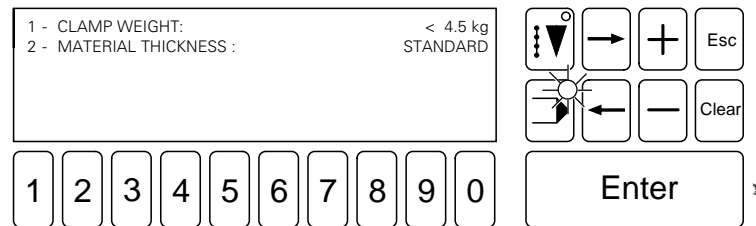
```
1 - STANDARD STITCH LENGTH :          3.2 mm
2 - MAXIMUM SPEED :                   3200 RPM
3 - REDUCED SPEED :                   3200 RPM
4 - SLOW START SPEED :                 700 RPM
```

1 2 3 4 5 6 7 8 9 0   Enter

1 STANDARD STITCH LENGTH

This function is used to enter the standard stitch length of the current seam program.

2 MAXIMUM SPEED

The function is used to enter the maximum speed.

3 REDUCED SPEED

The function is used to enter the reduced speed.

4 SLOW START SPEED

This function is used to enter the speed for the slow starting stitches.

Clamp configuration (number key 9)

The function opens a menu for entering various clamp parameters.

```
1 - CLAMP WEIGHT:                     < 4.5 kg
2 - MATERIAL THICKNESS :              STANDARD
```

1 2 3 4 5 6 7 8 9 0   Enter

1 CLAMP WEIGHT

The function is used for entering the clamp weight (< or > 4.5 kg)

The large clamp weight leads to a reduction in speed.

2 MATERIAL THICKNESS (number key 2)

The function is used to enter the material thickness (standard or thick).

If thick material is selected, during sewing the clamp remains still longer; the speed is reduced.

Input

Input menu (number key 0)

This functions opens a menu for selecting various functions from other menu levels.

```
1 -  PROGRAM MANAGEMENT       .....
2 -  CREATE/MODIFY PROGRAM
3 -  COUNTER                  .....
4 -  SWITCH FUNCTIONS         .....
5 -  TIMES                    .....
6 -  SERVICE                  .....
```

[1] PROGRAM MANAGEMENT

This functions opens a menu for organizing seam programs:

```
1 -  DIRECTORY                    .....
2 -  READ/WRITE PROGRAM           .....
3 -  DELETE PROGRAMS              .....
4 -  FORMAT DISK
5 -  STATISTICAL PROGRAM DATA
6 -  DATA TRANSFER WITH PC
```

[1] DIRECTORY

This function opens a menu with functions for listing the directories of the memory:

```
1 -  DIRECTORY OF MEMORY
2 -  DIRECTORY OF DISK
```

[1] DIRECTORY OF MEMORY

This function displays the contents of the machine memory.

[2] DIRECTORY OF DISK

Displays the contents of a disk. Program numbers valid for this machine are displayed.

[2] READ/WRITE PROGRAM

This functions opens a menu for transferring seam programs:

```
1 -  READ ONE PROGRAM FROM DISK
2 -  READ ALL PROGRAMS FROM DISK
3 -  WRITE ONE PROGRAM ON DISK
4 -  WRITE ALL PROGRAMS ON DISK
```
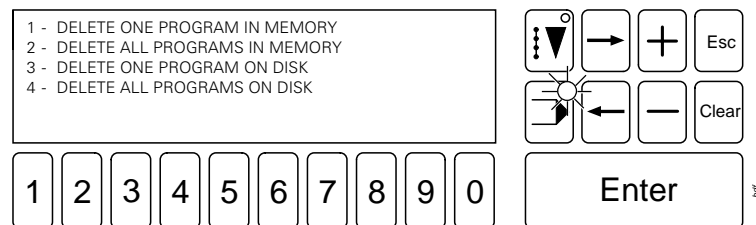
|1| READ ONE PROGRAM FROM DISK

A selected program is read from a disk into the machine memory.

|2| READ ALL PROGRAMS FROM DISK

All the programs on a disk are read into the machine memory.

|3| WRITE ONE PROGRAM ON DISK

A selected program is written from the machine memory onto a disk.

|4| WRITE ALL PROGRAMS ON DISK

Starting with the start number entered in the machine memory, all programs are written on a disk.

|3| DELETE PROGRAMS

The function opens a menu for deleting seam programs:

```
1 -  DELETE ONE PROGRAM IN MEMORY
2 -  DELETE ALL PROGRAMS IN MEMORY
3 -  DELETE ONE PROGRAM ON DISK
4 -  DELETE ALL PROGRAMS ON DISK
```

[keypad: ▼ → + Esc / ← − Clear]   [1][2][3][4][5][6][7][8][9][0]   Enter

|1| DELETE ONE PROGRAM IN MEMORY

A selected program is deleted in the machine memory.

|2| DELETE ALL PROGRAMS IN MEMORY

All the programs in the machine memory are deleted.

|3| DELETE ONE PROGRAM ON DISK

A selected program is deleted on a disk.

|4| DELETE ALL PROGRAMS ON DISK

All the programs on a disk are deleted.

|4| FORMAT DISK

Formats a disk and names it "K3587".

⚠ When you format a disk, all files on the disk are deleted!

|5| STATISTICAL PROGRAM DATA

This function displays the following program data:

- Program number
- Clamp code
- Number of stitches
- Stitch length
- Number of bytes

|6| DATA TRANSFER WITH PC

With this function the machine can communicate directly with a Personal Computer using the software OSCA (more detailed information is available in the OSCA manual).
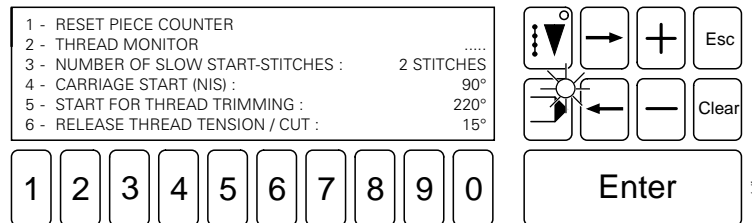
Input

|2| CREATE/MODIFY PROGRAM

After this function has been selected, seam programs can be entered or modified with the use of the control panel (see **Chapter 11.06 Creating/modifying seam programs).**

|3| COUNTER
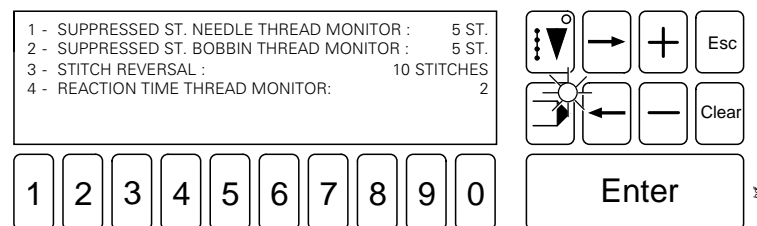
This function opens a menu for customizing the counters:

```
1 - RESET PIECE COUNTER
2 - THREAD MONITOR                          .....
3 - NUMBER OF SLOW START-STITCHES :      2 STITCHES
4 - CARRIAGE START (NIS) :                   90°
5 - START FOR THREAD TRIMMING :             220°
6 - RELEASE THREAD TENSION / CUT :           15°
```

[1] [2] [3] [4] [5] [6] [7] [8] [9] [0]   [Enter]

[▼] [→] [+] [Esc]   [←] [−] [Clear]

|1| RESET PIECE COUNTER

With this function the piece counter is set at "0" for the daily production.

|2| THREAD MONITOR

The function opens a menu for changing the thread monitor counters:

```
1 - SUPPRESSED ST. NEEDLE THREAD MONITOR :    5 ST.
2 - SUPPRESSED ST. BOBBIN THREAD MONITOR :    5 ST.
3 - STITCH REVERSAL :                     10 STITCHES
4 - REACTION TIME THREAD MONITOR:              2
```

[1] [2] [3] [4] [5] [6] [7] [8] [9] [0]   [Enter]

[▼] [→] [+] [Esc]   [←] [−] [Clear]

|1| SUPPRESSED STITCHES NEEDLE THREAD MONITOR

Changes the number of stitches, for which the needle thread monitor is not active during sewing.

|2| SUPPRESSED STITCHES BOBBIN THREAD MONITOR

Changes the number of stitches, for which the bobbin thread monitor is not active during sewing.

|3| STITCH REVERSAL

Changes the number of stitches which the machine automatically traces back, if a needle thread disturbance occurs.

|4| RESPONSE TIME, NEEDLE THREAD MONITOR

With this function the sensitivity of the needle thread monitor is changed (1 = quick response, max. sensitivity).

|3| SLOW START-STITCHES

Changes the number of stitches, which are to be sewn at reduced speed when sewing on a section of the workpiece.

|4| CARRIAGE START (NIS)

This function changes the time for starting the motors of the clamp drive. (º = degree after t.d.c. needle bar, see **Fig. 11-01**).

Fig. 11 - 01
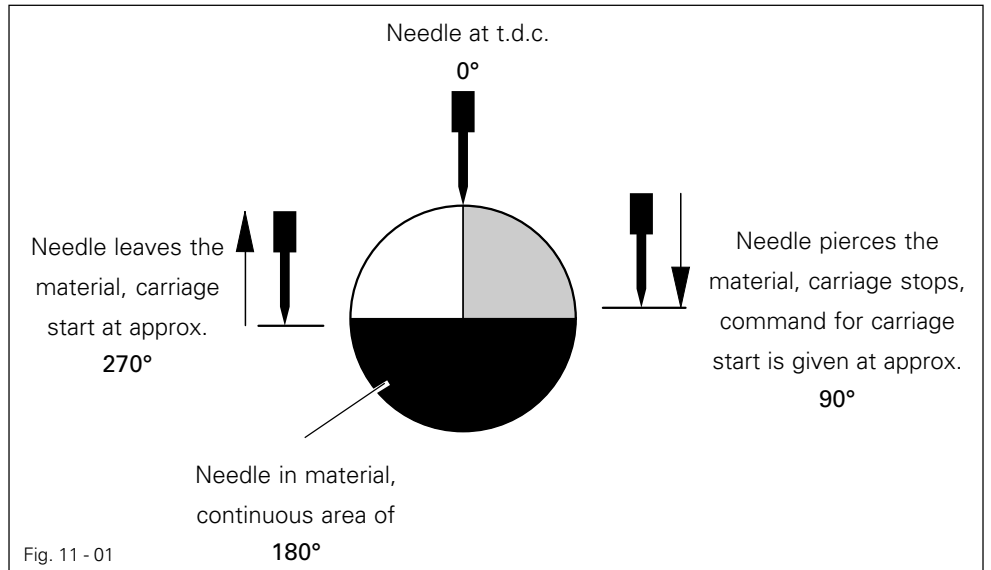
The command for the carriage start is given when the needle pierces the material. The carriage, however, starts half a revolution later (180º), when the needle leaves the material.
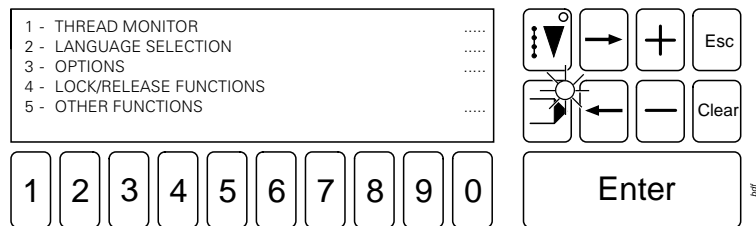
⚠️ Under certain circumstances the stitch formation can be influenced by the setting.

5 START FOR THREAD TRIMMING
Changes the time at which the impulse to start thread trimming is sent to the thread trimming valve (º = degree after t.d.c. needle bar).

6 RELEASE THREAD TENSION / CUT
This function is used to change the moment during trimming when the thread tension is released (° = degrees after t.d.c. needle bar)

4 SWITCH FUNCTIONS
This function opens a menu for switching machine functions on or off.

```
1 - THREAD MONITOR            .....
2 - LANGUAGE SELECTION        .....
3 - OPTIONS                   .....
4 - LOCK/RELEASE FUNCTIONS
5 - OTHER FUNCTIONS           .....
```

1 2 3 4 5 6 7 8 9 0   Enter

1 THREAD MONITOR
This function opens a menu for selecting thread monitors:

```
1 - NEEDLE THREAD MONITOR :        ON
2 - BOBBIN THREAD MONITOR :        S.0
```

1 2 3 4 5 6 7 8 9 0   Enter
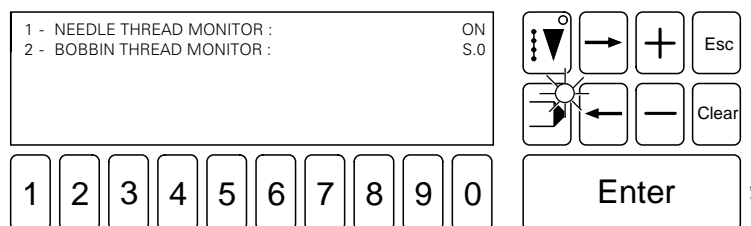
|1| NEEDLE THREAD MONITOR

With this function the needle thread monitor is switched on or off.

|2| BOBBIN THREAD MONITOR

With this function the bobbin thread monitor is switched on, to
sensorfunction or off.

|2| LANGUAGE SELECTION

This function opens a menu for the selection of the languages displayed (see
Chapter 9.05 Language selection):

```
LANGUAGE SELECTION :
1 - GERMAN
2 - ENGLISH
3 - FRENCH
4 - SPANISH
5 - ITALIAN
```

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | Enter
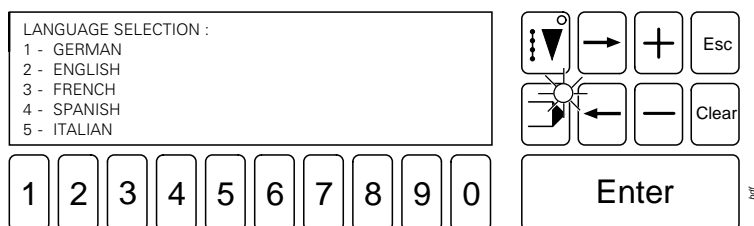
|3| OPTIONS

This function opens a menu for switching the optional equipment on or off:

```
1 - CLAMP MONITOR
2 - FEEDER
```

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | Enter
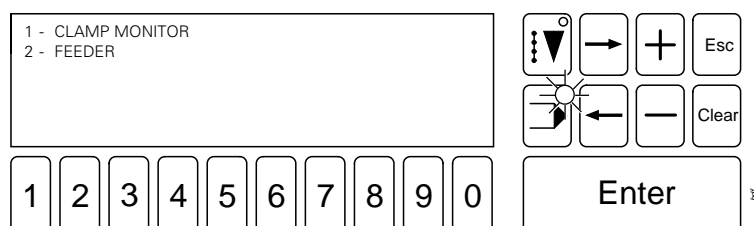
|1| CLAMP MONITOR

If the machine is equipped with the optional clamp monitor, this can be
switched on and off with this function.

|2| FEEDER

If the machine is equipped with the optional feeder, this can be switched on
and off with this function.

|4| LOCK/RELEASE FUNCTIONS

With this function all functions in the **INPUT** mode can be released, secured with
a code number and made accessible to authorized personnel only by means of a
key.

> A table with the code numbers of the individual functions can be
> found in **Chapter 14.03.01 Tables for lock/release functions.**

5 OTHER FUNCTIONS

This function opens a menu for switching the other functions on or off.

```
1 - AUTOMATIC CLAMP RELEASE
2 - FOOT SWITCH FLIP-FLOP-MODE
```

1 2 3 4 5 6 7 8 9 0   Enter
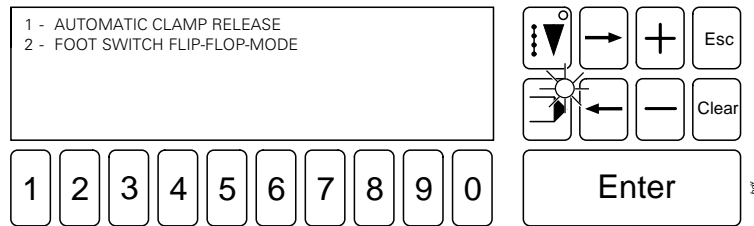
1 AUTOMATIC CLAMP RELEASE

With this function the automatic clamp release is switched on or off at the end of a sewing cycle, or after moving into the start position.

2 FOOT SWITCH FLIP-FLOP-MODE

With this function the foot switch mode can be selected.
The FLIP-FLOP-mode can be switched on or off, see **Chapter 7.02 Foot switch.**

5 TIMES

This function opens a menu for altering the time settings.

```
1 - TIME FOR THREAD NIPPER OPEN
2 - TIME FOR THREAD WIPER
3 - TIMIE FOR NEEDLE COOLING
```

1 2 3 4 5 6 7 8 9 0   Enter
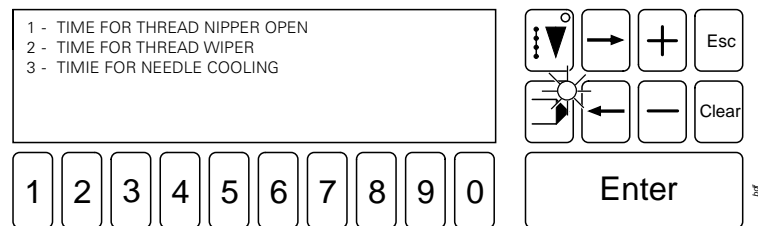
1 TIME FOR THREAD NIPPER OPEN

With this function the reaction time for opening the thread nipper when sewing starts can be altered.

2 TIME FOR THREAD WIPER

With this length the duration for thread wiping can be altered.

3 TIME FOR NEEDLE COOLING

With this function the duration of fan operation for cooling the needle after sewing has stopped can be changed.

6 SERVICE

This functions opens a menu for selecting the service functions:

```
<- - - ->
1 -  SEWING DRIVE FUNCTIONS          .....
2 -  STEPPING MOTOR FUNCTIONS        .....
3 -  SWITCH OUTPUTS
4 -  DISPLAY INPUTS7OUTPUTS
5 -  ADJUST ZERO POINT               .....
```

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | Enter |

```
<- - - ->
6 -  CONFIGURE MACHINE               .....
7 -  ADJUSTMENTS READ/WRITE          .....
8 -  OTHER FUNCTIONS                 .....
```

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | Enter |
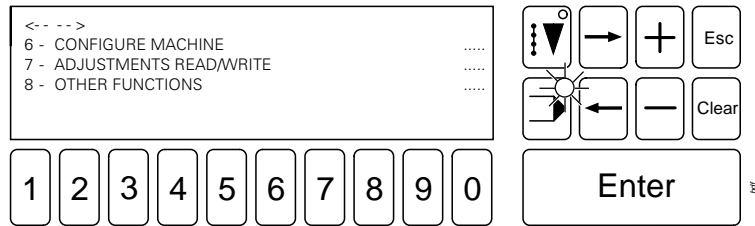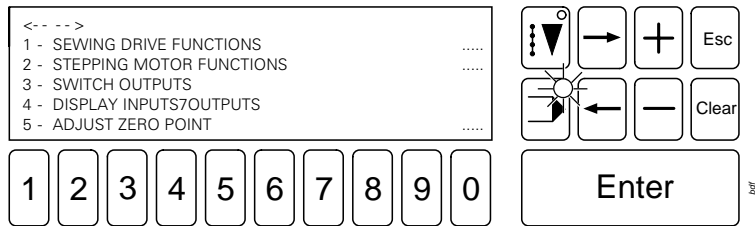
[1] SEWING DRIVE FUNCTIONS

This function opens a menu for checking the sewing motor.

```
1 - TURN SEWING MOTOR
2 - THREAD TRIMMING PROCEDURE
3 - CUTTING SPEED-PRESELECT :              200 RPM
```

1 2 3 4 5 6 7 8 9 0   Esc Clear Enter
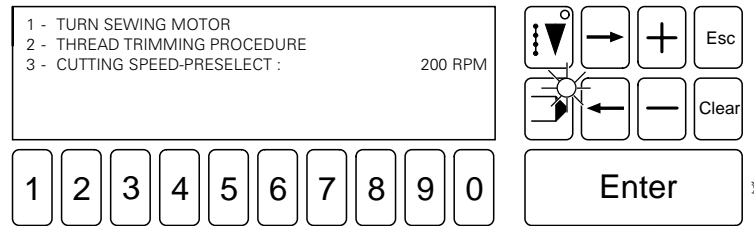
⚠ Before activating the following functions, make sure that the needle can enter the needle hole without any problem!

[1] TURN SEWING MOTOR

With his function the sewing motor can be started and stopped again. The speed can be pre-selected or even altered during running, using the **plus/ minus keys.**

[2] THREAD TRIMMING PROCEDURE

This function starts the thread trimming procedure.

[3] CUTTING SPEED – PRESELECT

This function preselects the positioning speed for thread cutting.

[2] STEPPING MOTOR FUNCTIONS

This function opens a menu for moving the stepping motors.

```
1 - STEPPING MOTOR 1
2 - STEPPING MOTOR  2
3 - MOVE CARRIAGE
4 - TEST CARRIAGE
```

1 2 3 4 5 6 7 8 9 0   Esc Clear Enter
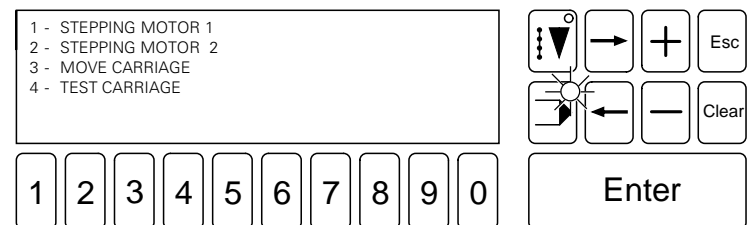
⚠ Before activating the following functions, make sure that the clamp drive can move freely!

[1] STEPPING MOTOR 1

This function moves stepping motor 1.

[2] STEPPING MOTOR 2

This function moves stepping motor 2.

[3] MOVE CARRIAGE

This function moves the clamp drive.

[4] TEST CARRIAGE

This functions is used to test the clamp drive.

Input

|3| SWITCH OUTPUTS

With this function outputs can be set or reset. See **Chapter 14.03.03 Output tables.**

|4| DISPLAY INPUTS/OUTPUTS

After this function has been selected, the states of inputs and outputs are

displayed: **1**   =   Input actuated / output switched

0   =   Input not actuated / output not switched
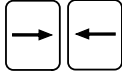
With the **arrow keys** it is possible to toggle between the input and output display.

> There is a table of the inputs and outputs in **Chapter 14.03.04 Table of inputs** or **Chapter 14.03.03 Table of outputs.**

|5| ADJUST ZERO POINT

This function opens a menu for setting various zero points (see **chapter 8.07 Checking / Setting zero points**)

```
1 - CARRIAGE POSITION
2 - NEEDLE POSITION
3 - FEEDER HAND OVER POSITION
4 - FEEDER TAKE OVER POSITION
5 - INCREMENT-CORRECTION MOTOR 1:          10
6 - INCREMENT-CORRECTION MOTOR 2:          10
```

1 2 3 4 5 6 7 8 9 0   Enter
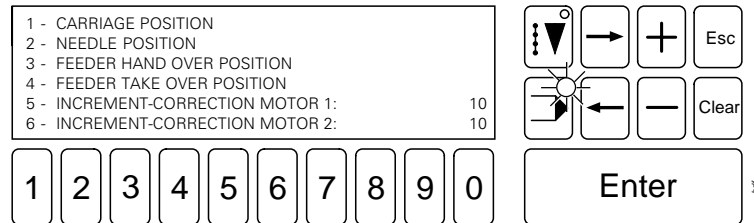
|1| CARRIAGE POSITION

With this function, with the carriage initiators as starting point, the starting position of the steering unit can be set with the aid of the zero point gauge.

|2| NEEDLE POSITION

With this function, with the carriage zero point as starting point, the needle zero point can be set.

|3| FEEDER HAND OVER POSITION

With the carriage initiators as starting point, this function is used to set the feeder hand over position. To do so the automatic clamp feeder is brought into the appropriate position. To control the setting, in this condition it is possible to switch the clamp interlock back and forth between the feeder and the carriage.

|4| FEEDER TAKE OVER POSITION

With the carriage initiators as starting point, this function is used to set the feeder take over position. To do so the automatic clamp feeder is brought into the appropriate position. To control the setting, in this condition it is possible to switch the clamp interlock back and forth between the feeder and the carriage.

|5| INCREMENT-CORRECTION MOTOR 1

With this function the increment of motor 1 can be corrected in 0.0001 mm steps.

|6| INCREMENT-CORRECTION MOTOR 2

With this function the increment of motor 2 can be corrected in 0.0001 mm steps.

|6| CONFIGURE MACHINE

After this function has been selected, a menu is opened where it is possible to see which optional equipment is attached to the machine.

```
1 - THREAD WIPER:                NO
2 - CLAMP MONITOR:               BCD
3 - FEEDER:                      YES
4 - SHORT END THREAD CUTTER:     NO
```
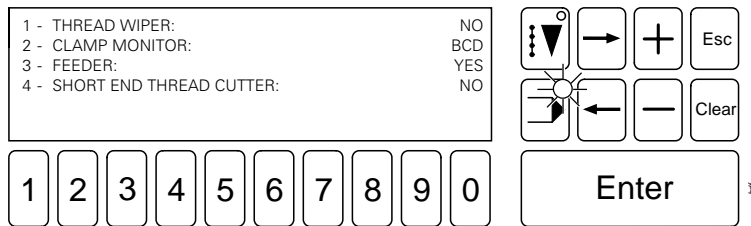
During commissioning or whenever the additional equipment is installed or removed, the setting must be entered or changed accordingly.

|7| ADJUSTMENTS READ/WRITE

After this function has been called up, a menu is opened for entering or copying machine data:

```
1 - READ MACHINE DATA FROM DISK
2 - WRITE MACHINE DATA TO DISK
3 - READ CONFIGURATION/ZERO POINTS FROM DISK
4 - WRITE CONFIGURATION/ZERO POINTS TO DISK
```
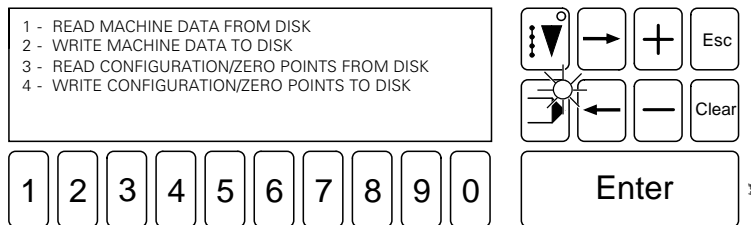
|1| READ MACHINE DATA FROM DISK

With this function it is possible to read machine data, which is stored on a disk, into the machine memory (e.g. after a cold start).

|2| WRITE MACHINE DATA TO DISK

With this function the data for the machine setting (file name: MDAT) can be written on to a disk.

> There is a table of transferable machine data in **Chapter 14.03.02 Table of machine data (MDAT).**

|3| READ CONFIGURATION/ZERO POINTS FROM DISK

With this function it is possible to read the machine configuration and the zero points, which are stored on a disk, into the machine memory (e.g. after a master reset).

|4| WRITE CONFIGURATION/ZERO POINTS TO DISK

With this function it is possible to write the machine configuration and the zero points (File name: KONF) on to a disk.

7 OTHER FUNCTIONS

This function opens a menu with various other functions:

```
1 -  CARRY OUT COLD START
2 -  DISPLAY SOFTWARE STATUS
3 -  CONTRAST SETTING OF DISPLAY
4 -  CHANGE CODE NUMBER
5 -  INSTALL OPERATING SYSTEM
```

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | Enter |
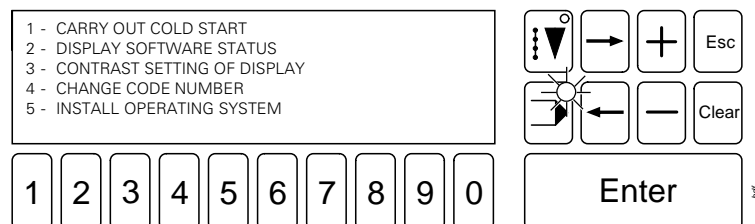
1 CARRY OUT COLD START

With this function a cold start can be carried out.

During this procedure all settings, except the zero point settings and the machine configuration, are returned to the initial load status; all programs in the machine memory are deleted.

2 DISPLAY SOFTWARE STATUS

After this function has been selected, the part numbers of the machine software and the software versions of various controllers are displayed.

3 CONTRAST SETTING OF DISPLAY

⚠ Under no circumstances may the display be adjusted to such an extent, that it is no longer possible to read the display.

With this function the contrast setting of the display can be altered.

4 CHANGE CODE NUMBER

After a cold start, this number is **3587.** This function allows you to select your own code number from 0000 – 9999.

ℹ Functions secured by a code number can only be selected with the respective code.

5 INSTALL OPERATING SYSTEM

With this function, after the boot disk K3587BOOT1 has been inserted, the operating software is loaded for a software update.

(see Chapter **14.04 Installing operating programs**)

11.06 CREATE/MODIFY SEAM PROGRAMS

With the CREATE/MODIFY PROGRAM function seam programs can be processed directly on the machine using the control panel. The data record produced in this way can also be processed by OSCA and vice versa.

A newly created or modified seam program must be carried out step by step on the machine first, to make sure that it matches the clamp!

11.06.01 Seam program structure

Each data record consists of three elements:

Program header
The purpose of this feature is to manage the programs and it contains details of the program number and the length of the program.

Geometrical data record
This consists of elements, so-called sections, which can be divided into two groups:
● Sections, which influence the geometry of the seam pattern
● Sections with machine functions

Stitch data record
This is necessary for the sewing operation and is generated from the geometrical data record by stitch generation. It consists of coordinate pairs and machine commands, and is concluded by the end-of-program command.

11.06.02 Status bar when entering seam programs

When entering seam programs, the status bar is displayed in the first line of the display.
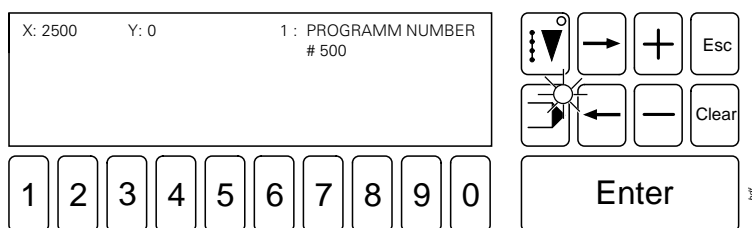
The status bar structure from left to right:

● X-axis coordinate
● Y-axis coordinate
● Section number with section type
   Section parameters belonging to the section type are shown below the section type.
   Sections within a marked block are shown by a symbol on a dark background

Input

11.06.03   Summary of the functions in the initial state (entering seam programs)

It is only possible to enter the CREATE/MODIFY PROGRAM function when the machine is in its basic position. If necessary a code number must be entered, a sewing pattern inserted and the program number selected.

INPUT mode

Input menu

2 - CREATE/MODIFY PROGRAM

Step-by-step forwards

Step-by-step backwards

Presser foot up / down

Search function

Block functions

1 - MARK START OF BLOCK
2 - MARK END OF BLOCK
3 - MANIPULATE BLOCK

1 - SCALE UP FACTOR FOR X-AXIS
2 - SCALE UP FACTOR FOR Y-AXIS
3 - ROTATION ANGLE
4 - MIRROR

4 - MOVE BLOCK
5 - DELETE BLOCK

Pattern functions

1 - MOVE PATTERN
2 - MANIPULATE PATTERN
  (SYMMETRY POINT WITH TRANSFER KEYS)

1 - SCALE UP FACTOR FOR X-AXIS
2 - SCALE UP FACTOR FOR Y-AXIS
3 - ROTATION ANGLE
4 - MIRROR

3 - MANIPULATE PATTERN
  (SYMMETRY POINT WITH NUMERIC KEYS)

1 - SCALE UP FACTOR FOR X-AXIS
2 - SCALE UP FACTOR FOR Y-AXIS
3 - ROTATION ANGLE
4 - MIRROR

Reference point for coordinates

Delete

Modify

Activate insert (see Chapter 11.06.05)

11.06.04   Explanation of the functions in the initial state (when entering seam programs)

```
X: 2500      Y: 0              1 :  PROGRAMM NUMBER
                                    # 500
```
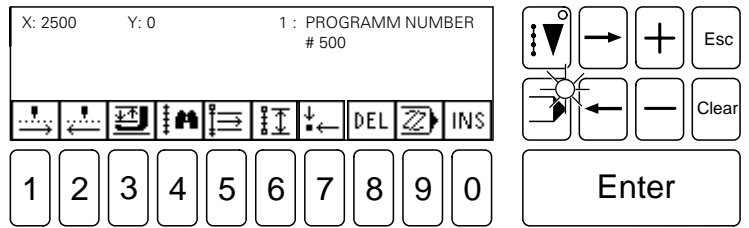
Step-by step forwards (Number key 1)
This functions allows you to trace the seam pattern step by step in a forward direction to the end of the program; by pressing **Enter** at the same time, the entire seam pattern is traced automatically.

Step-by-step backwards (Number key 2)
This functions allows you to trace the seam pattern step by step backwards to the program number; by pressing **Enter** at the same time, the entire seam pattern is traced automatically.

Presser foot up / down (Number key 3)
Allows you to raise and lower the presser foot.

Search function (number key 4)
After the sewing head has been raised, with the positioning keys the carriage can be moved near to the desired point in the seam construction. After the position has been confirmed, the nearest point in the seam is approached.

Block functions (Number key 5)

```
1 - MARK START OF BLOCK
2 - MARK END OF BLOCK
3 - MANIPULATE BLOCK                        .....
4 - MOVE BLOCK
5 - DELETE BLOCK
```

1   MARK START OF BLOCK/MARK END OF BLOCK
After a desired point in the program has been selected by tracing the seam pattern, the function MARK START OF BLOCK allows you to determine the start of a block.
Marking the block must be completed by determining the end of the block. To do so, trace the pattern to the desired point and select the function

2   MARK END OF BLOCK. When tracing the seam pattern, the marked block can be identified by the section number and type, which are shown on a dark background.

3   MANIPULATE BLOCK
This function contains the sub-functions SCALE UP FACTOR FOR X-AXIS, SCALE UP FACTOR FOR Y-AXIS, ROTATION ANGLE and MIRROR.
The functions can be carried out separately or at the same time.
If the ROTATION ANGLE and MIRROR functions are carried out together, the block is first mirrored and then rotated.

```
1 - SCALE UP FACTOR FOR X-AXIS::        1.00
2 - SCALE UP FACTOR FOR Y-AXIS:         1.00
3 - ROTATION ANGLE                        0°
4 - MIRROR                               OUT
```

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |

Enter
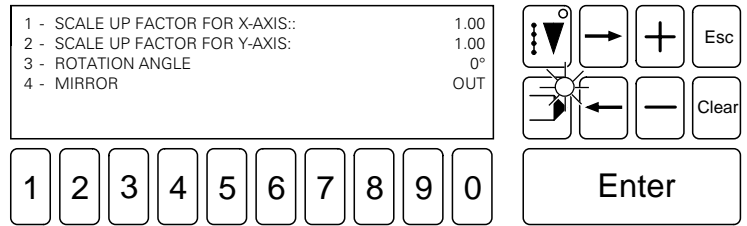
|1| SCALE UP FACTOR FOR X-AXIS

This function is used to enlarge a block.

|2| SCALE UP FACTOR FOR Y-AXIS

This function is used to reduce a block.

|3| ROTATION ANGLE

This function is used to rotate a block.

The block is rotated anti-clockwise around the block starting point.

|4| MIRROR

This function is used to mirror a block. The mirroring takes place on the straight lines running parallel to the Y-axis and through the block starting point.

|4| MOVE BLOCK

After selecting the MOVE BLOCK function, the clamp drive must be moved to a new point. This point is taken over by pressing **Enter**, and the block is moved.

|5| DELETE BLOCK

After selecting the function DELETE BLOCK, the block is deleted.

Pattern functions (number key 6)

```
1 - MOVE PATTERN
2 - MANIPULATE PATTERN
    (SYMMETRY POINT WITH TRANSFER KEYS)    .....
3 - MANIPULATE PATTERN
    (SYMMETRY POINT WITH NUMBER KEYS)      .....
```

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |
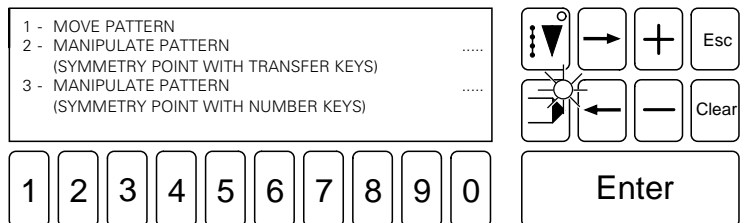
Enter

|1| MOVE PATTERN

After selecting the MOVE PATTERN function, the clamp drive must be moved to a new point. The point is taken over by pressing **Enter,** and the pattern is moved from its current position to the end of the program.

|2| MANIPULATE PATTERN

(SYMMETRY POINT WITH TRANSFER KEYS)

By pressing transfer keys, the symmetry point is located (entered).

|3| MANIPULATE PATTERN

(SYMMETRY POINT WITH NUMBER KEYS)

The symmetry point is determined by entering coordinates with the **number keys**. After the symmetry point has been entered, each of the functions SCALE UP FACTOR FOR X-AXIS, SCALE UP FACTOR FOR Y-AXIS, ROTATION ANGLE and MIRROR are available. For a description of the function compare MANIPULATE BLOCK. All the functions apply to the entire program.

Reference point for coordinates (number key 7)

With this function the coordinates in the display are set at 0, so that a new reference point is created.

Delete (number key 8)

This function deletes the current section.

Modify (number key 9)

After selecting this function, the current section can be modified.

Activate insert (number key 0)

This function is used to switch between the **Insert** and **Initial state** mode**.** When the function is switched off, **Initial state** is active.

Input

The **Activated Insert** function can only be selected in the initial state of entering seam programs after program header has been traced (see **Chapter 11.06.03 Summary of the functions in the initial state (entering seam programs)**.

— INS   Activate Insert

— Insert block

— Insert line

— Insert single stitch

— Insert curve

— Insert fast slew

— F1   Graphic functions

1 - STANDARD STITCH LENGTH
2 - STITCH LENGTH
3 - STITCH WIDTH
4 - CIRCLE
5 - ARC
6 - CURVE END POINT

— Insert Start sewing or   Thread trimming

— Start backtack or   end backtack

FORWARD STITCHES   REVERSE STITCHES
REVERSE STITCHES   FORWARD STITCHES

— F2   Machine functions

1 - 2. LEVEL FOOT
2 - SECONDARY TENSION
3 - REDUCED SPEED
4 - SPEED
5 - SEWING OFF
6 - PROGRAMMABLE OUTPUTS

1 - OUTPUT 1
2 - OUTPUT 2
3 - OUTPUT 3
4 - OUTPUT 4

7 - SEAM INTERRUPTIONS

1 - WAIT FOR INPUT 1
2 - WAIT FOR INPUT 2
3 - WAIT FOR INPUT 3
4 - WAIT FOR INPUT 4
5 - PROGRAMMED STOP
6 - WAIT FOR TIME

— INS   Deactivate Insert (switch to initial state)

11.06.06   Explanation of the insert functions

```
X: 0          Y: 0              5 : ANFANGSPUNKT
```

|⇶| •─── |↕Ⅰ|↻|▫→→▫| F1 |✂|↓↟| F2 | INS |

1 2 3 4 5 6 7 8 9 0   Enter
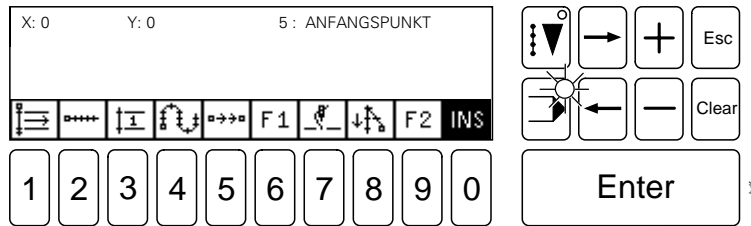
Block (number key 1)
A marked block is inserted from the current position forwards.

Line (number key 2)
A straight line is a direct connection between two points.
To insert a straight line, a stitch length must be defined.

Single stitch (number key 3)
A single stitch or step forward is entered. No stitch length is taken into consideration. The single stitch or step forward can be max. 6 mm.

Curve (number key 4)
Any desired number of points can be entered on the curve. Taking the stitch length into consideration, the controller calculates the run of the curve. These points do not necessarily have to be penetration points. A stitch length must be defined. The greater the number of points inserted, the more exact is the run of the curve.

Fast slew (number key 5)
This serves the purpose of quickly moving the clamp drive. Both axes are moved independently from each other to the end point as quickly as possible. The resulting path travelled is therefore not a straight line (be careful if there are obstacles on the work clamp). To travel an exact path, it is necessary to work with a straight line or curve without sewing.

Graphic functions F1 (number key 6)
Under function key F1 there are graphic functions, which can be displayed and selected via a menu.

```
1 -  STANDARD STITCH LENGTH
2 -  STITCH LENGTH
3 -  STITCH WIDTH
4 -  CIRCLE
5 -  ARC
6 -  CURVE END POINT
```

1 2 3 4 5 6 7 8 9 0   Enter
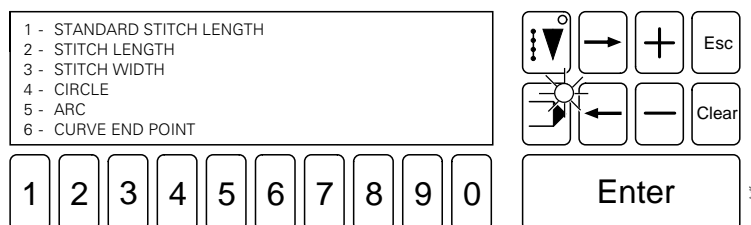
1   STANDARD STITCH LENGTH
With this function the stitch length, which is most often required in the program, is defined. The standard stitch length is displayed in the status bar during sewing and can be modified on the machine with the stitch length modification, without changing into the programming mode.

2 STITCH LENGTH

A stitch length is defined for a certain seam sector.
This stitch length is not displayed in the status bar during sewing and can only be changed in the programming mode.

3 STITCH WIDTH

With this function the clamp drive carries out a zigzag movement on a base line. The stitch length specifies the movement along the base line from one penetration to the next and has to be selected accordingly. The stitch width is performed perpendicular to the base line. The position of the zigzag to the base line must also be defined. To switch off the stitch width, enter the width as 0.0.

4 CIRCLE

To enter a circle, 3 points are required. The first point is automatically the starting point. Both missing points must be entered. A stitch length must be defined.

5 ARC

For the arc the same applies as for the circle. The last point is the end of the arc.

6 CURVE END POINT

With this function a curve point is turned into a curve end point.

Start sewing (number key 7)

With this function sewing is started. All following sections are sewn until the thread trimming function is selected.

Thread trimming (number key 8)

The thread is cut. The sewing function must have been active beforehand.

Start backtack (number key 8)

With this function sewing is started and a start backtack is inserted automatically.
A menu is opened for entering the number of forwards and reverse stitches and the length of the backtack stitch.

or

End backtack (number key 8)

With this function an end backtack is inserted and the thread is trimmed automatically.
A menu is opened for entering the number of forwards and reverse stitches and the length of the backtack stitch.

```
START BACKTACK

FORWARD STITCHES:     2 <    /      1
REVERSE STITCHES:     2      /      1

[ PERMISSIBLE  0 - 2 ]
```

1 2 3 4 5 6 7 8 9 0   Enter

```
END BACKTACK

REVERSE STITCHES:    2 ◁  /      1
FORWARD STITCHES:    2    /      1

[ PERMISSIBLE  0 - 9 ]
```

`▼` `→` `+` `Esc`
`↘` `←` `−` `Clear`

`1` `2` `3` `4` `5` `6` `7` `8` `9` `0`   `Enter`

`→`
`←`
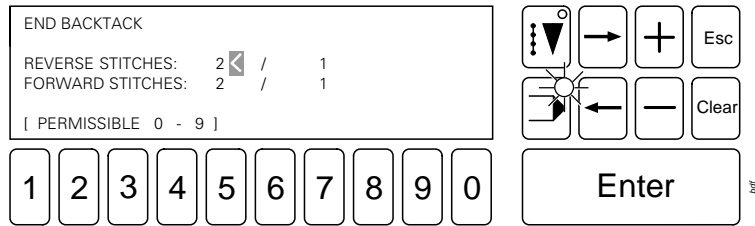
To alter a value (e.g. 2 reverse stitches), the desired value must be selected with the **arrow keys**. The selected value is shown by the cursor to the right of the figure and can be changed with the **number keys**.

```
END BACKTACK

REVERSE STITCHES:    2    /      1 ◁
FORWARD STITCHES:    2    /      1

[ PERMISSIBLE  0 - 4 ]
```

`▼` `→` `+` `Esc`
`↘` `←` `−` `Clear`

`1` `2` `3` `4` `5` `6` `7` `8` `9` `0`   `Enter`
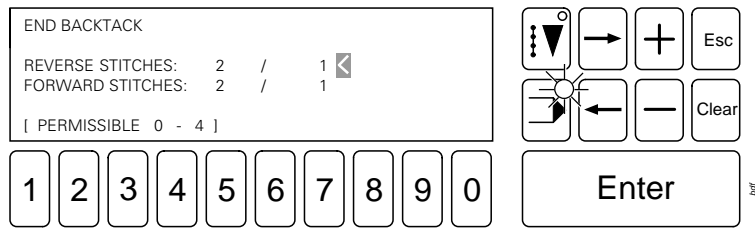
When entering the backtack stitches, the values have the following meaning:

1: Backtack stitch length = $\frac{1}{1}$ stitch length of the seam section
2: Backtack stitch length = $\frac{1}{2}$ stitch length of the seam section
3: Backtack stitch length = $\frac{1}{3}$ stitch length of the seam section
4: Backtack stitch length = $\frac{1}{4}$ stitch length of the seam section
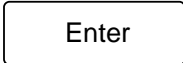
`Enter`

The values are taken over by pressing **Enter**.

`F2`

Machine functions F2 (number key 9)

The machine functions are under this function. These can be displayed and selected via a menu. All machine functions are allocated an adjustment parameter, with which it is possible to move the function 99 stitches in front of or behind the current position.

```
<- - - ->
1 -  2. LEVEL FOOT
2 -  SECONDARY TENSION
3 -  REDUCED SPEED
4 -  SPEED
5 -  SEWING OFF
```

`▼` `→` `+` `Esc`
`↘` `←` `−` `Clear`

`1` `2` `3` `4` `5` `6` `7` `8` `9` `0`   `Enter`

```
<- - - ->
6 -  PROGRAMMABLE OUTPUTS          .....
7 -  SEAM INTERRUPTIONS            .....
8 -  SEWING HEAD LIFT
```

`▼` `→` `+` `Esc`
`↘` `←` `−` `Clear`

`1` `2` `3` `4` `5` `6` `7` `8` `9` `0`   `Enter`

Input
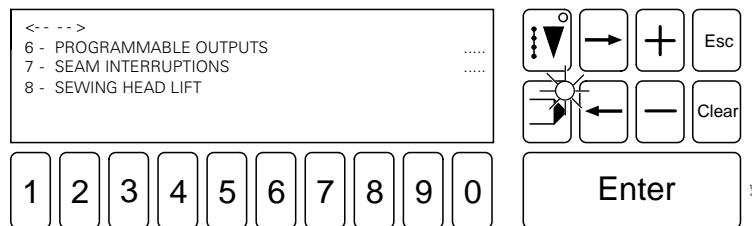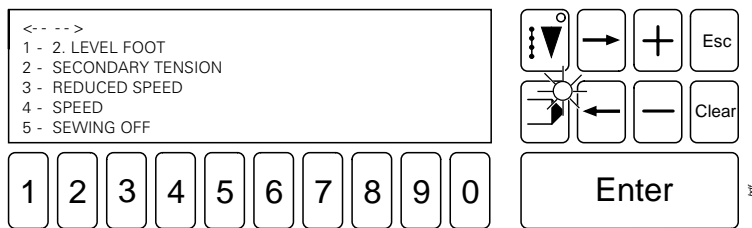
1	**2. LEVEL FOOT**

It is possible to enter a sector, where the second foot level is switched on.

2	**SECONDARY TENSION**

It is possible to enter a sector, where the secondary tension is switched on.

3	**REDUCED SPEED**

It is possible to enter a sector, where sewing takes place at a reduced speed. The reduced speed value is selected on the machine, see **Chapter 11.05 Functions in the INPUT mode.**

4	**SPEED**

A fixed speed is entered in the program.

5	**SEWING OFF**

With this function the sewing head is stopped without cutting the thread. The following feed movements are carried out without sewing. To restart sewing, the function sewing must be programmed.

6	**PROGRAMMABLE OUTPUTS**

Via a menu a choice of outputs can be selected.

1	OUTPUT 1
2	OUTPUT 2
3	OUTPUT 3
4	OUTPUT 4

7	**SEAM INTERRUPTIONS**

The program procedure is interrupted. If this function is selected, a menu is displayed, where the type of interruption can be selected.

1	WAIT FOR INPUT 1

The program procedure is interrupted until the input has reached the appropriate level.

2	WAIT FOR INPUT 2
3	WAIT FOR INPUT 3
4	WAIT FOR INPUT 4

5	PROGRAMMED STOP

A stop has been programmed in the program.

By calling up the **Start** function, the procedure is continued.

6	WAIT FOR TIME

The program procedure is stopped until the programmed time has elapsed.

PFAFF

| 8 | SEWINGHEAD LIFT

With this function a sector can be selected, in which the carriage is transported with raised sewing head.

INS Deactivate **Insert** (number key 0)

This function is used for switching between **Insert** and **Initial state mode.**

When this function is switched on (symbol is shown on a dark background) **Insert** is activated.

ℹ️ The CREATE/MODIFY PROGRAM function can be ended at any time by activating the operational mode keys **(INPUT/SEW).** Normally the function ought to end with stitch generation, as only complete programs, i.e. programs with stitch data record, can be sewn. It is, however, possible to end the program without stitch generation so that faulty or incomplete programs can be saved.

11.06.07   An example for programming a seam

Below is an example describing how to enter a seam program.

A seam sketch serves as a model. This is put into the gauge frame and digitised with a needle.

⚠️ A prerequisite for the use of the seam program is that it matches the clamp.
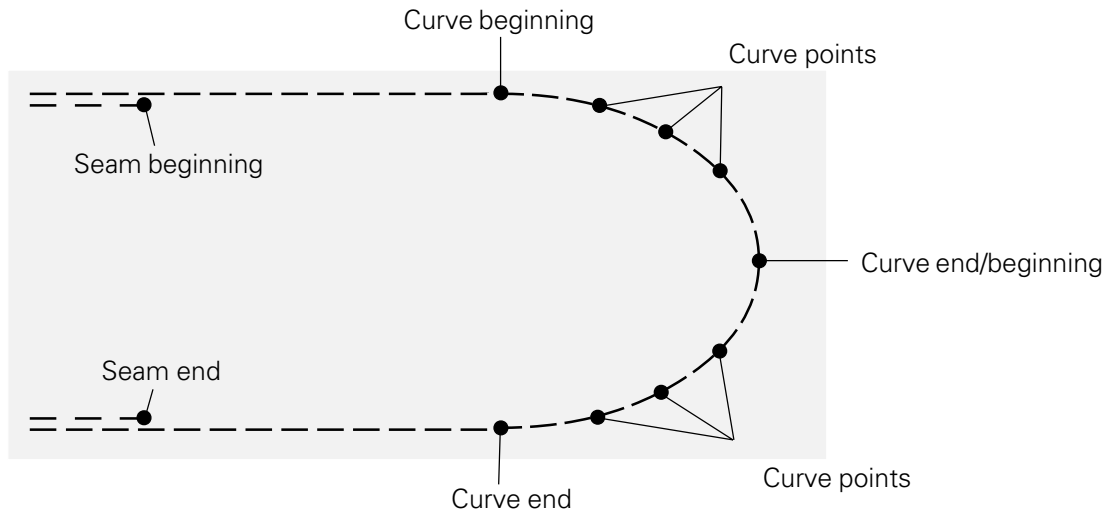
● Select INPUT mode.

● Select Input menu function (number key 0).

2 ● Select CREATE/MODIFY PROGRAM function.

● If necessary enter the relevant code with the number keys.

Enter ● Press Enter.
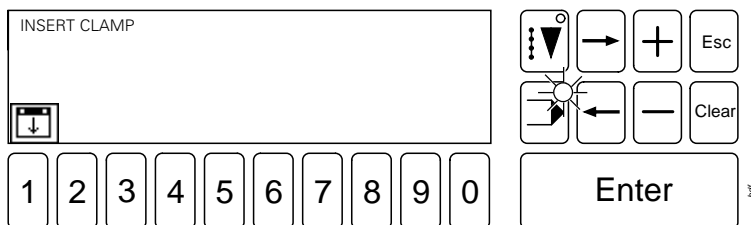
● Select Open/close clamp function (number key 1).

Enter ● Press Enter.

PROGRAM-NUMBER :   999

[PERMISSIBLE   0 - 9999   ]

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |

Esc

Clear
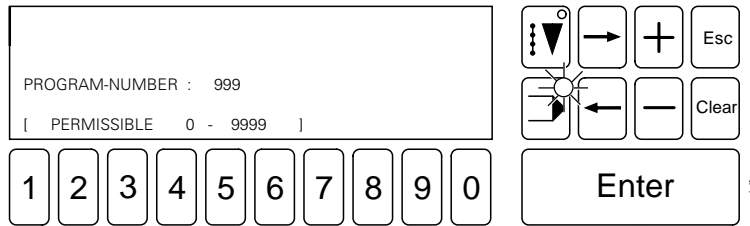
Enter

1 ● Using the **number keys** enter the desired program number (e.g. 1 to create a new seam program).
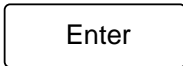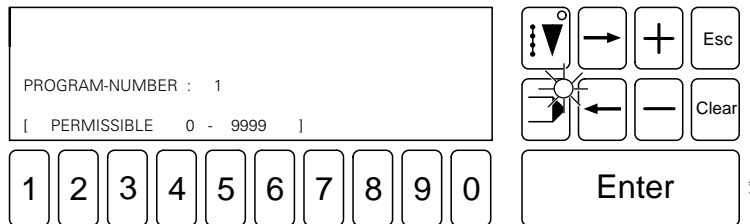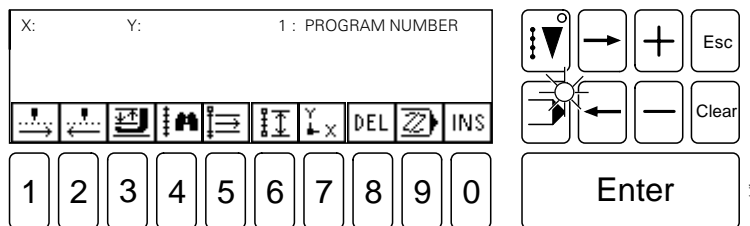
PROGRAM-NUMBER :   1

[PERMISSIBLE   0 - 9999   ]

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |

Esc

Clear

Enter

Enter ● Confirm with **Enter.**

X: Y: 1 : PROGRAM NUMBER

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |

Esc

Clear

Enter

● Select **Move forward step by step** function (number key 1)

X: Y: 2 : CLAMP CODE

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |

Esc

Clear
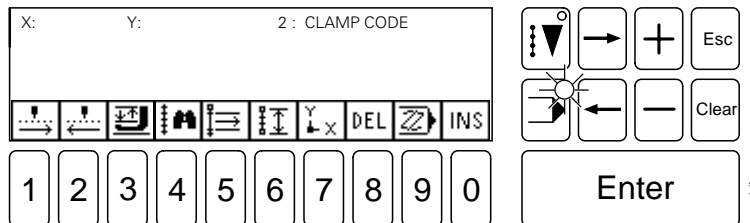
Enter

● Select **Modify** function (number key 9) to change the clamp code setting.

1 ● Press **Number key 1** to switch on the clamp code.

→ ● Press **Right arrow key** to be able to enter clamp code number.
(The cursor in the display moves behind CODE NUMBER:—.)

9 9 ● Using the **Number keys** insert the clamp code number (e.g. 99).

Enter ● Confirm input with **Enter.**

Input

```
X:          Y:              2 : CLAMP CODE
                                # 99
```
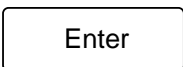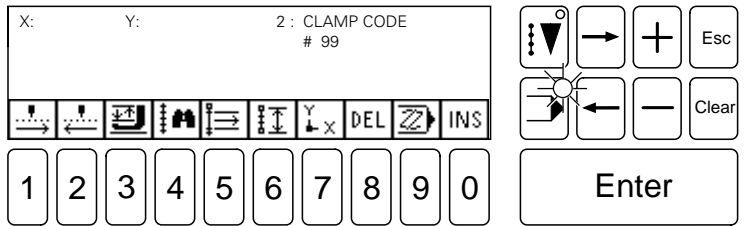
● Select **Move forward step by step** function (number key 1), clamp moves to starting point.

● Press **plus key**, the sewing head is lowered.

```
X: 0        Y: 0            5 : STARTING POINT
```
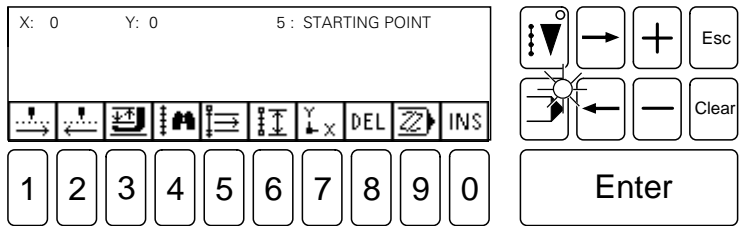
● Select **Modify** function (number key 9) to enter starting point.

● Using the **number keys 1 – 4** move to the starting point and control this on the sketch with the needle.

Enter   ● Confirm input with **Enter.**

```
X: 982      Y: -1013        5 : STARTING POINT
```
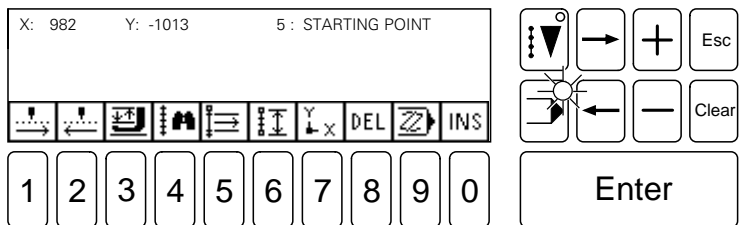
● Select **Activate insert** (number key 0).

```
X: 982      Y: -1013        5 : STARTING POINT
```
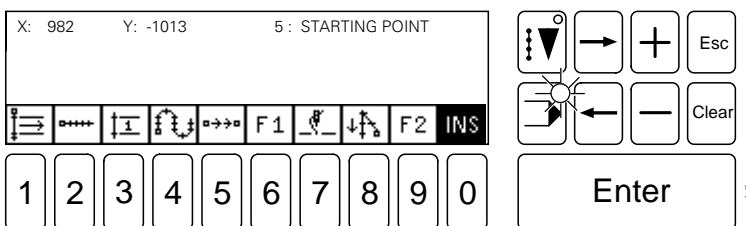
● Enter **Sewing** function (number key 7).

```
X: 982      Y: -1013        5 : SEW
```
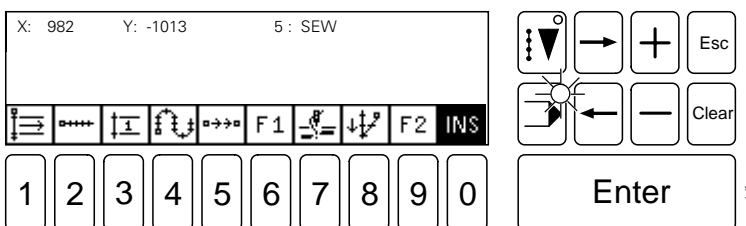
F 1 ● Select Graphic functions (number key 6).

```
1 - STANDARD STITCH LENGTH
2 - STITCH LENGTH
3 - STITCH WIDTH
4 - CIRCLE
5 - ARC
6 - CURVE END POINT
```

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | Enter |

1 ● Select function STANDARD STITCH LENGTH

```
STANDARD STITCH LENGTH :

  3,00 мм

[   PERMISSIBLE  0.10  -   6.00  мм  ]
```

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | Enter |

3 4 0 ● Enter value for standard stitch length (e.g. 3.40 mm) using the number keys.

Enter ● Confirm with Enter.

```
X:  982        Y: -1013          7 : STANDARD STITCH
                                     3.4 mm

⇶  ⊷  ⊥  ⏧  □→→□  F1  ✂_  _✂_  F2  INS
```

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | Enter |

⊷ ● Select Line function (number key 2) to enter a straight line.

```
X:  982        Y: -1013          7 : STANDARD STITCH

LINE END POINT ( X : 982        Y : -1013 )

←  ↑  ↓  →  ⊞                              INS
```

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | Enter |

● Using the number keys 1 – 4 move to the end of the straight line.

Enter ● Press Enter to confirm input.

```
X:  982        Y: -1013          8 : LINE

LINE END POINT ( X : 900        Y : -1013 )

←  ↑  ↓  →  ⊞                              INS
```

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | Enter |

● Using the number keys 1 – 4 move to the next line end point.

Input

Enter

● Press **Enter** to confirm input.

X: 982	Y: -1013	9 : LINE

LINE END POINT (X : 1550   Y : -1013)

← ↑ ↓ → ⬒ ▮ INS

1 2 3 4 5 6 7 8 9 0   **Enter**

INS   ● Select **Insert** function (number key 0)

X: 1550	Y: -1013	9 : LINE

▮ ▮ ⬒ ▮M ▮ ⬚ ▮×ₓ DEL ▮ INS

1 2 3 4 5 6 7 8 9 0   **Enter**

INS   ● Select **Insert** function (number key 0)

X: 1550	Y: -1013	9 : LINE

▮ ▮ ▮ ▮ ▮ F 1 ▮ ▮ F 2 INS

1 2 3 4 5 6 7 8 9 0   **Enter**

● Select **Curve** function (number key 4).

● Using the **number keys 1 – 4** move to the first curve point.

Enter   ● Press **Enter** to confirm input.

X: 1642	Y: -1031	10 : CURVE POINT

CURVE POINT (X : 1642   Y : -1031)

← ↑ ↓ → ⬒ INS

1 2 3 4 5 6 7 8 9 0   **Enter**
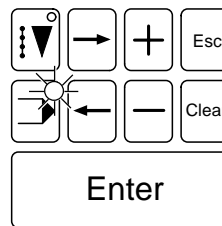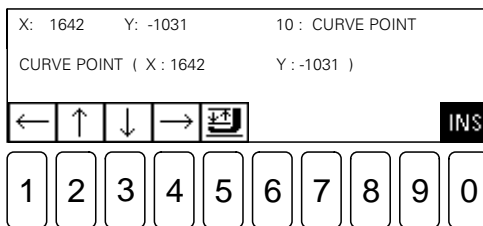
● Using the **number keys 1 – 4** move to the second curve point.

Enter   ● Press **Enter** to confirm input.

X: 1700	Y: -1071	11 : CURVE POINT

CURVE POINT (X : 1700   Y : -1071)

← ↑ ↓ → ⬒ INS

1 2 3 4 5 6 7 8 9 0   **Enter**

PFAFF
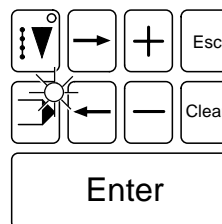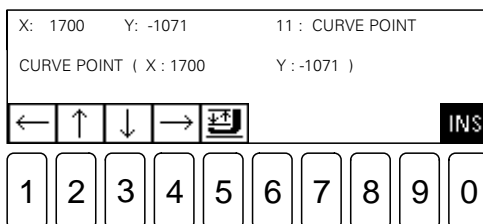
● Using the **number keys 1 – 4** move to the third curve point.

| Enter | ● Press **Enter** to confirm input. |

```
X:  1750      Y:  -1123         12 :  CURVE POINT

CURVE POINT  ( X : 1750          Y : -1123 )

←   ↑   ↓   →   ⬏                              INS
```
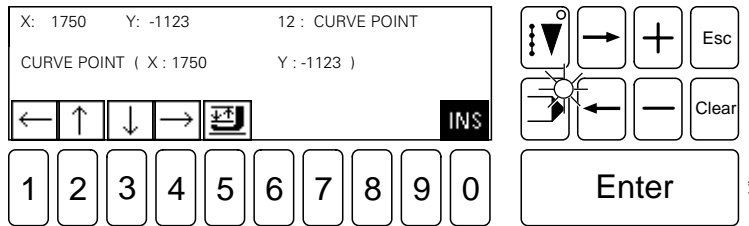
● Using the **number keys 1 – 4** move to the curve end point.

| Enter | ● Press **Enter** to confirm input. |

```
X:  1775      Y: -1187         13 :  CURVE POINT

CURVE POINT  ( X : 1775          Y : -1187 )

←   ↑   ↓   →   ⬏                              INS
```
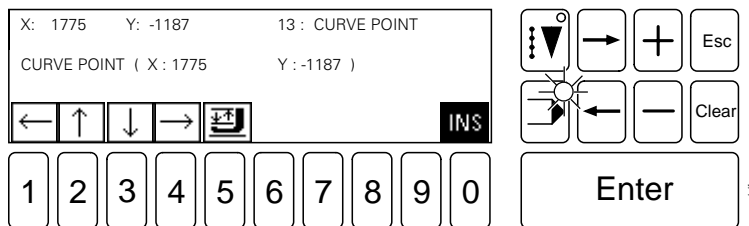
INS ● By selecting the **Insert** function (number key 0) the curve end point is saved.

```
X: 1775      Y:  -1187          13 :      CURVE END POINT
```
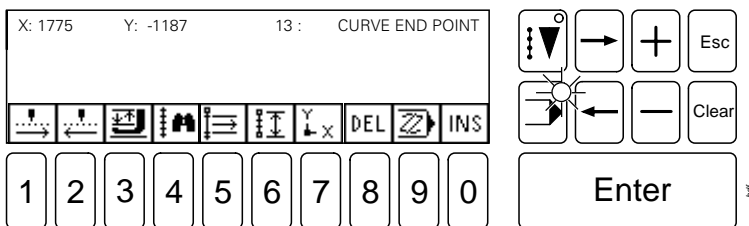
INS ● Select **Insert** function (number key 0).

● Select **Curve** function (number key 4).

| Enter | ● Using the **number keys 1 – 4** move to the next curve points and confirm each one by pressing **Enter.** |

INS ● When the curve end point has been reached, this is saved by calling up the **Insert** function.

```
X: 1550      Y:  -1373          17 :      CURVE END POINT
```
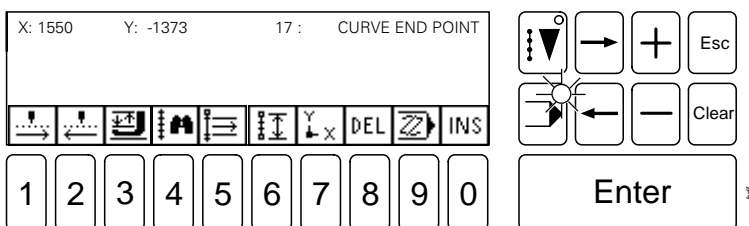
INS ● Select **Insert** function **(**number key 0)

Input

◻ ● Select **Line** function (number key 2).
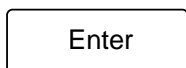
Enter ● Using the **number keys 1 – 4** move to the line end points and confirm each one with Enter.

INS ● Select **Insert** function (number key 0).

INS ● Select **Insert** function (number key 0).

```
X:  984      Y: -1373        19 :  LINE


≡⇒ ⊶ ⊥̄ ↻⟳ ⊶⊶ F1 ⌇ ↓⅄ F2 INS
```

1 2 3 4 5 6 7 8 9 0   Enter

⌇ ● Switch on **Thread trimming** (number key 7).

⬚ ● Select INPUT mode to end seam programming input.
(The seam program is loaded in the machine memory.)

ℹ Stitch generation must be carried out in order to to sew with the newly created or modified seam program. Incomplete or faulty programs can be ended without stitch generation. In this case when the seam program is called up in the **SEWING** mode, the respective error message appears.

```
GENERATE STITCHES ?

0- NO
1- YES
```

1 2 3 4 5 6 7 8 9 0   Enter
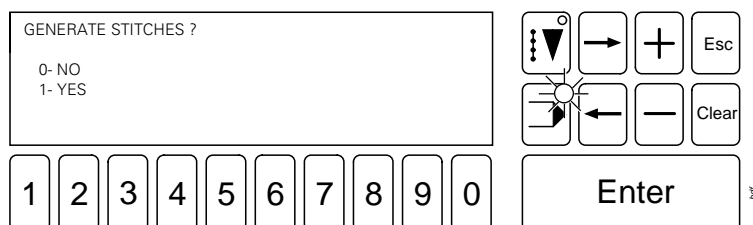
1 ● Carry out stitch generation.

⚠ Go through a newly created or modified seam program step by step on the machine first, to make sure that it matches the clamp!

⬚ ● After entering the respective program number, the created seam program can be sewn in the **SEWING** mode.

Contents .... Chapter - Page

Contents .... Chapter - Page

12   Care and maintenance

Clean the entire machine .... once a week

Clean the hook compartment .... several times a day

Check the oil level of the sewing head lubrication unit .... daily, before use

Lubricate clamp guides .... every 2 months

Lubricate presser foot drive eccentric .... every 2 months

Check air pressure .... daily, before use

Clean air filter of air filter/lubricator .... Clean air filter of air filter/lubricator

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

Care and maintenance

12.01 Cleaning the machine

The cleaning cycle required for the machine depends on following factors:

● Single or multi-shift operation
● Amount of dust resulting from the workpiece

It is therefore only possible to stipulate the best possible cleaning instructions for each individual case.
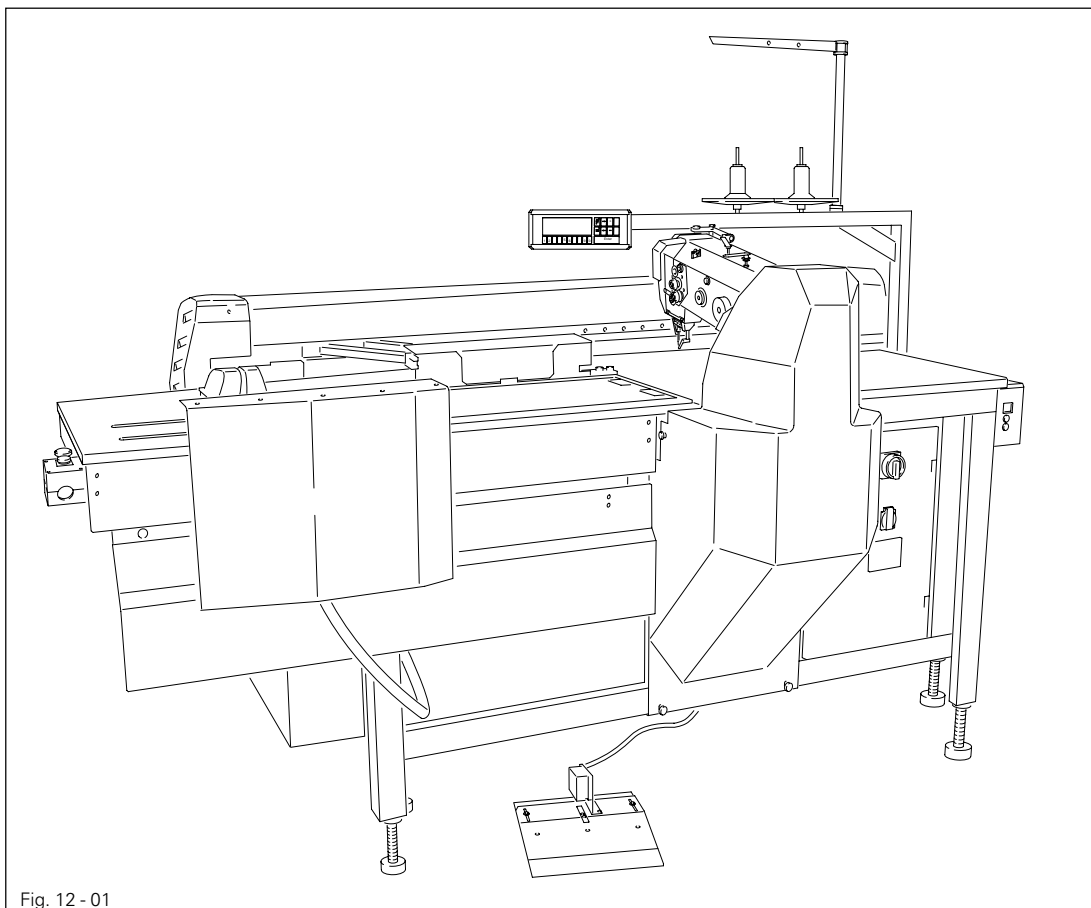

Fig. 12 - 01

To avoid breakdowns, the following cleaning work is recommended for single shift operation:
● Clean hook compartment and needle area of sewing head several times daily.
● Clean the entire machine at least once a week.

To do so:

● Select **SEWING** mode.

● Select **bobbin change** function (number key 6)
   (Hook compartment is opened.)

Enter ● After cleaning press **Enter.**
   (Hook compartment is closed.)

PFAFF

12.02   Cleaning the hook

Fig. 12 - 02
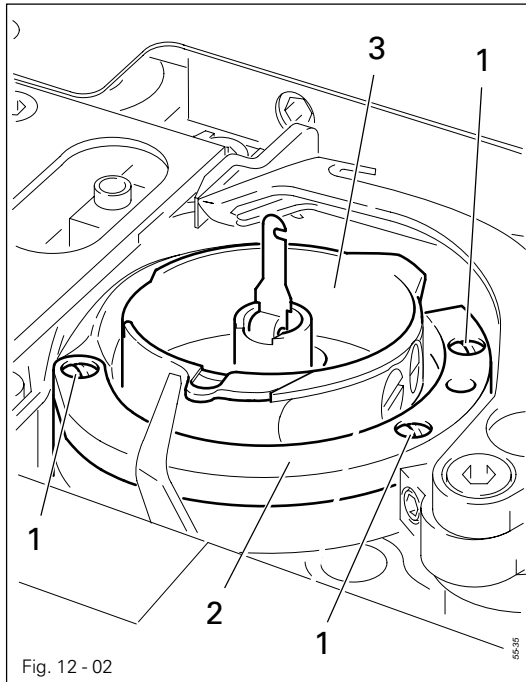
- ● Remove screws **1**.
- ● Remove hook gib **2**.
- ● Turn the balance wheel until the edge of the bobbin case is located vertically below the bobbin opener.
- ● Remove bobbin case **3**.
- ● Clean hook race.
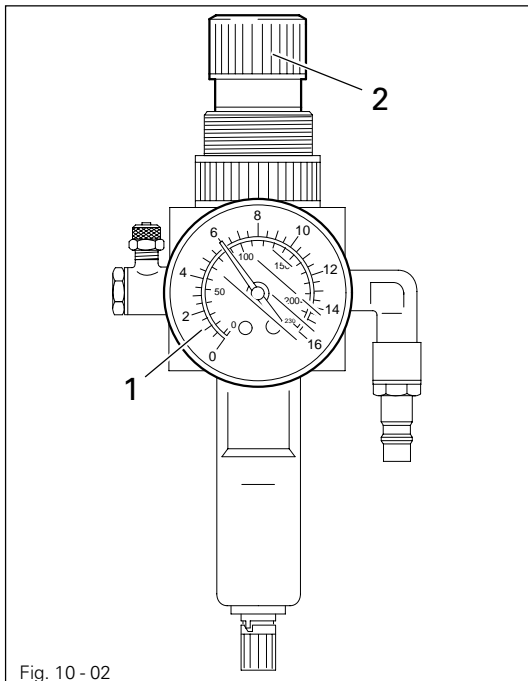- ● Insert bobbin case **3**.
- ● Screw hook gib **2** back into place.

12.03   Clean fan air filter

Fig. 12 - 03
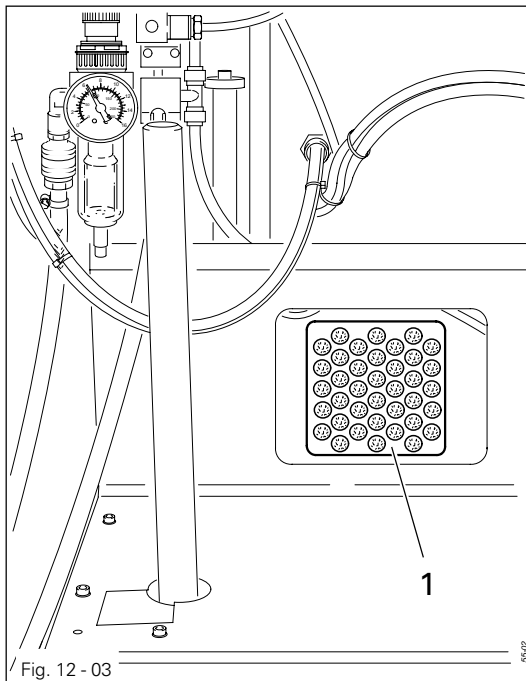
- ● Remove cover **1**.
- ● Remove the filter unit and blast clean with compressed air.
- ● Insert the clean filter unit and replace cover **1**.

Care and maintenance

12.04 Checking/adjusting the air pressure

Fig. 10 - 02

- Before operating the machine, always check the air pressure on gauge **1**.
- Gauge **1** must show a pressure of **6 bar**.
- If necessary adjust to this reading.
- To do so, pull knob **2** upwards and turn it so that the gauge shows a pressure of **6 bar**.

12.05 Cleaning the air filter of the air-filter/lubricator

Fig. 10 - 03
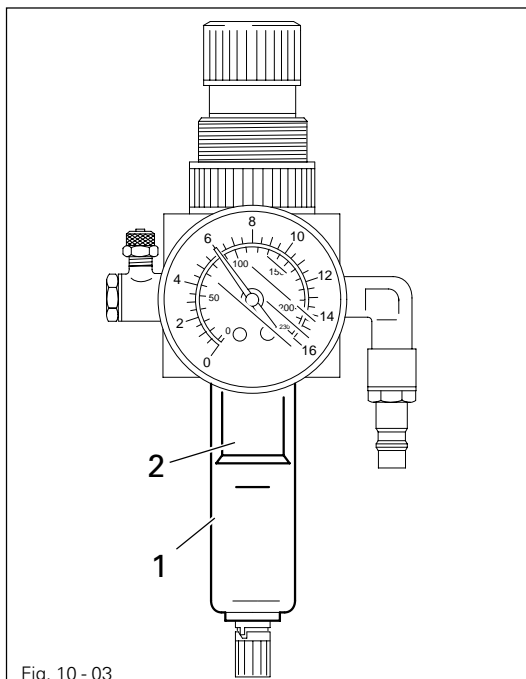
Switch the machine off! Disconnect the air hose at the air-filter/lubricator.

To drain water bowl **1**:
- Water bowl **1** drains itself automatically when the compressed-air hose is disconnected from the air-filter/lubricator.

Cleaning filter **2**:
- Unscrew water bowl **1**.
- Take out filter **2**.
- Clean filter **2** with compressed air or isopropyl alcohol (part No. 95-665 735-91).
- Screw in filter **2** and screw on water bowl **1**.

12.06 Checking the oil level of the sewing head lubrication

Fig. 12 - 06
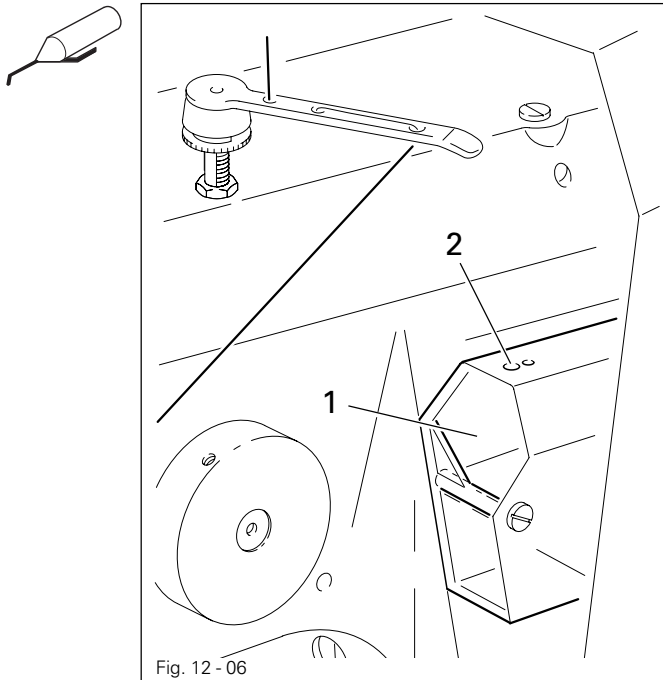
● The oil level in drum **1** must be checked daily before use of the machine.
● The oil level must be between the upper and lower markings of drum **1**.
● When necessary, pour oil through hole **2**.

⚠️ Only use oil with a mean viscosity of 22.0 mm^2/s at 40°C and a density of 0.865 g/cm^3 at 15°C.

● Before the machine is first operated or whenever the machine has been at a standstill for a longer period of time, also add a few drops of oil to the hook race.
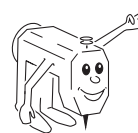
We recommend PFAFF sewing machine oil, part no. 280-1-120 144.

12.07 Lubricate presser foot drive eccentric

Fig. 12 - 07
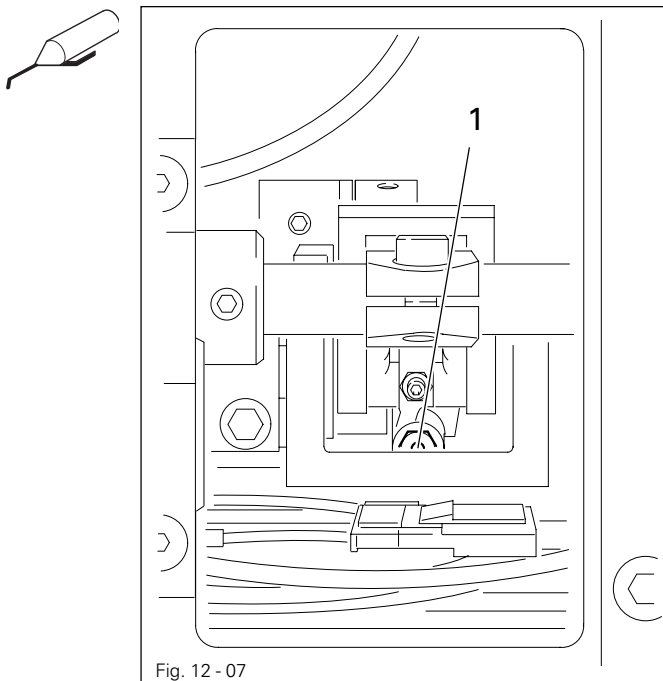
⚠️ Switch off the machine and take precautionary measures to ensure that it is not switched on again!
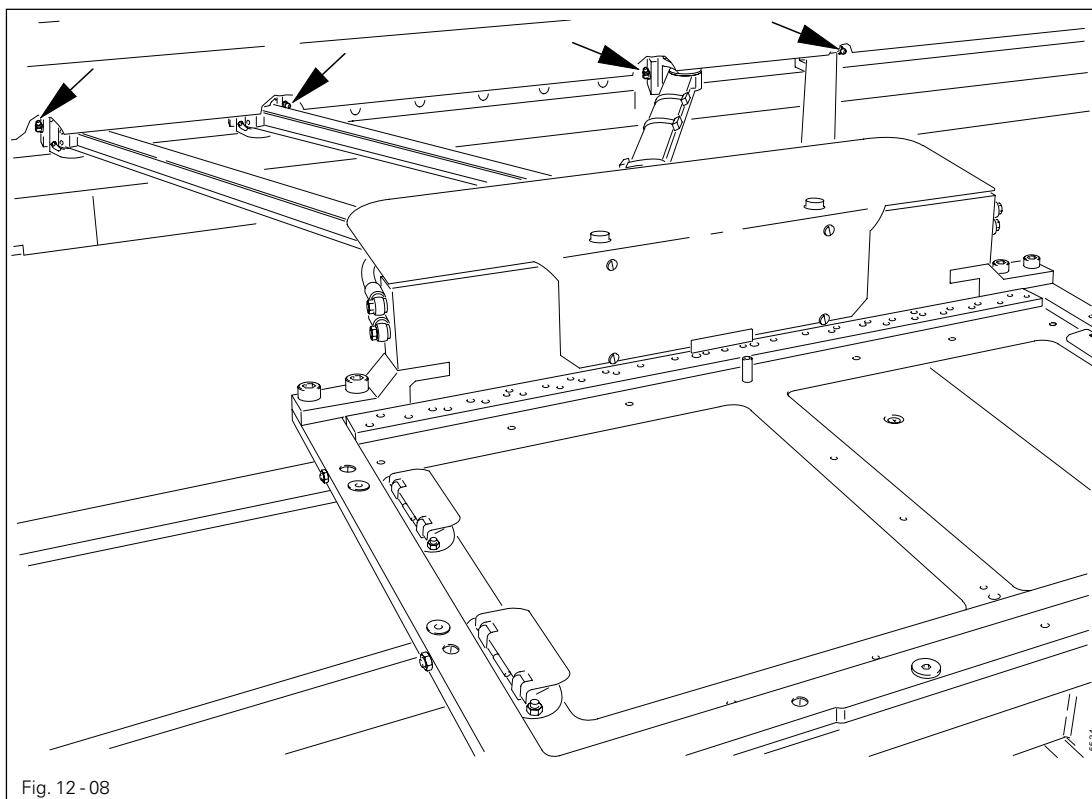Turn off compressed air!

⚠️ Only use Isoflex Topas L32 high-performance grease, part no. 280-1-120 210.

● Unscrew cover at the rear of the sewing head.
● With lubricating nipple **1,** using a grease gun, lubricate the eccentric every 2 months for single shift operation, and once a month for double shift operation.
● Screw cover back on.

Care and maintenance

12.08   Lubricate clamp guide

Fig. 12 - 08

Switch off the machine and take measures to prevent it being switched on again!

Only use Isoflex Topas L32 high-performance grease, part no. 280-1-120 210.

● Unscrew the cover of the clamp drive.
● With the appropriate lubricating nipple, using a grease gun, lubricate the guide units every 2 months for single shift operation, and once a month for double shift operation.
● Screw cover back on.

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13 Adjustment

⚠️ Before beginning any adjustment work, take note of the safety regulations found in **chapter 1 Safety** of this instruction manual!

13.01 Notes on adjustments

All adjustments in these adjustment instructions are based on a completely assembled machine and must only be carried out by appropriately trained specialists. Covers on the machine which have to be removed for checks and adjustment work and later remounted are not mentioned. The parts in () are for securing machine parts and must be loosened before the adjustment and retightened after all adjustments are carried out.

13.02 Tools, gauges and other accessories

- 1 set of screwdrivers with blade widths from 2 to 10 mm
- 1 set of wrenches with jaw widths from 6 to 22 mm
- 1 set of Allan keys from 1.5 to 6 mm
- 1 universal screwdriver with interchangeable blades
- 1 metal ruler
- 1 adjustment pin (zero point adjustment)
- 1 adjustment gauge (for sewing head adjustments)
- 1 adjustment gauge (for adjustments to feed)
- 1 needle rise gauge, part no. 61-111 600-01
- 1 adjustable clamp, part no. 08-880 137 00
- 1 adjustment sleeve (foot bar adjustment), part no. 95 778-090-15
- Sewing thread and test material
- Needles

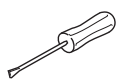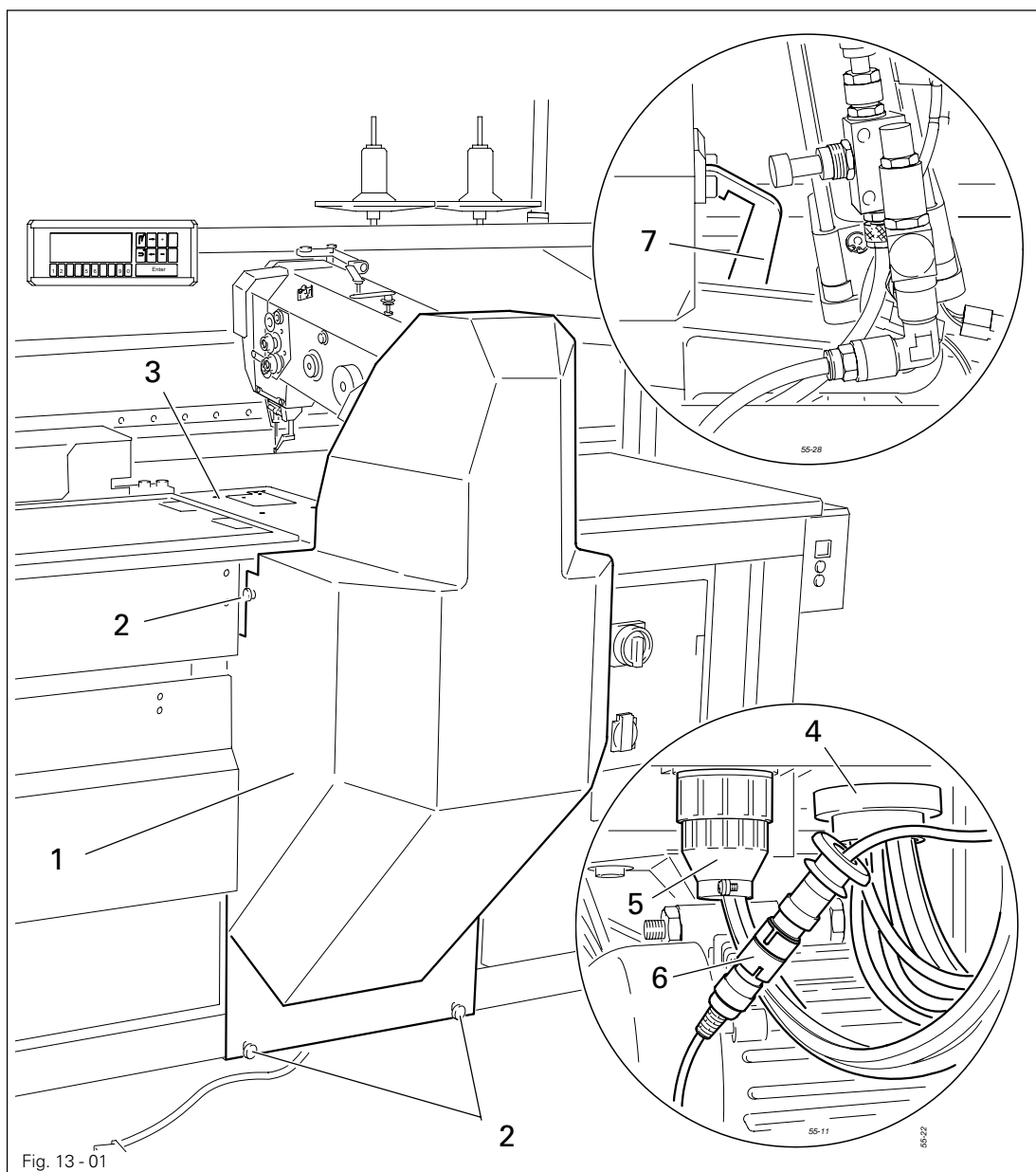### 13.03 Abbreviations

TDC = top dead center
BDC = bottom dead center

Adjustment

Tilting the sewing head

Turn off the compressed air!
Switch off the machine and take measures to prevent it being switched on again!

Fig. 13 - 01

- To tilt the sewing head remove protective cover **1** (screws **2**).
- Detach cover plate **3**.
- Disconnect the pneumatic power supply **4**, electrical power supply **5** and plug **6**.
- Unhinge lock **7** and tilt down sewing head.
- Remove V-belt from pulley on the motor.
- Remove ground cable of machine sewing head.
- Tip back sewing head.
- To replace the sewing head, carry out the above procedure in the reverse order.

13.05 Adjusting the sewing head

13.05.01 Spacing between sewing head and bed plate

> **Requirement**
> When the sewing head is lowered, the distance between the lower edge of the shaft **1** and the bed plate should be **132.8 mm.**
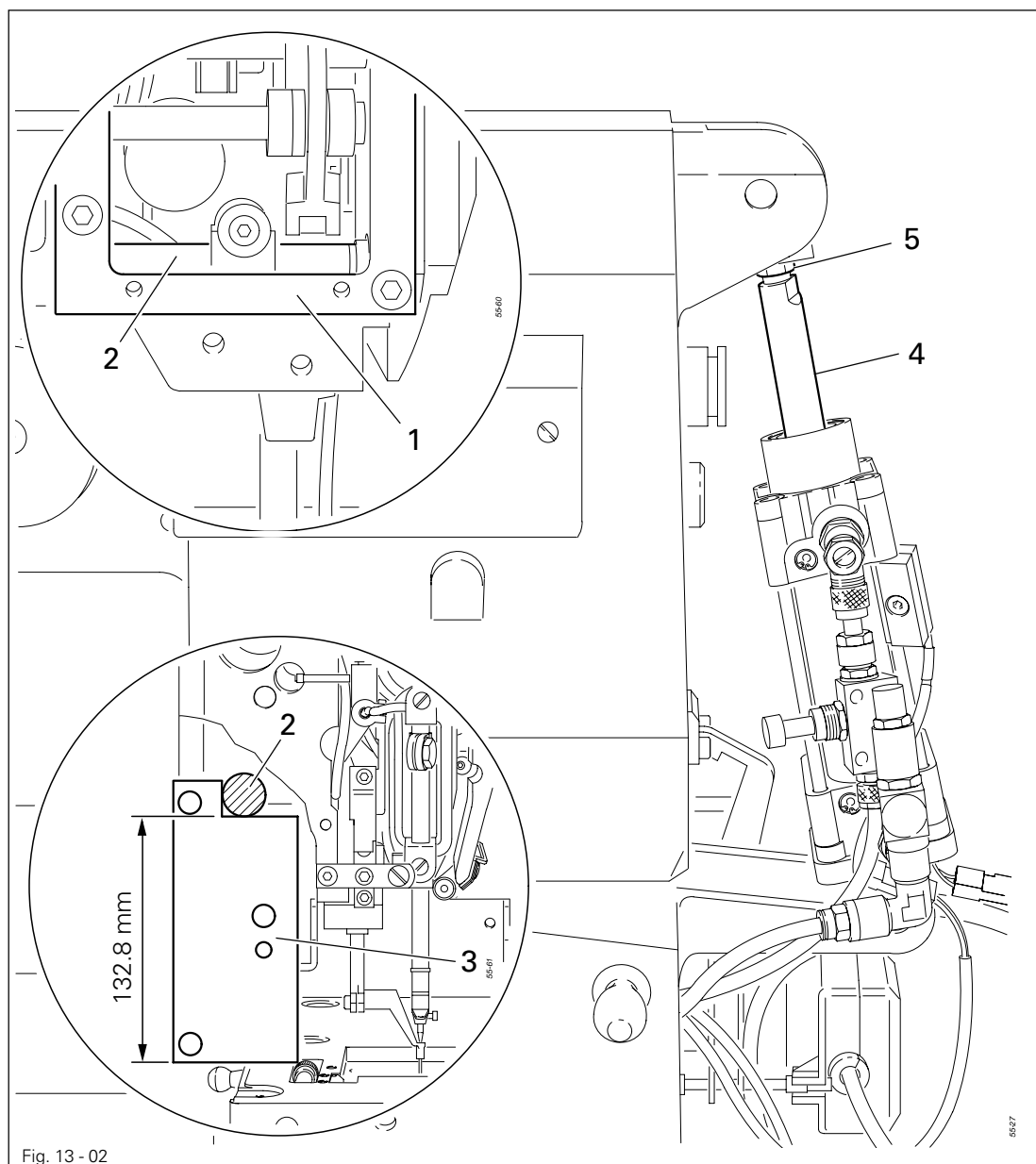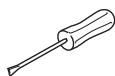

Fig. 13 - 02

- ● Remove hook compartment cover.
- ● Unscrew frame **1**.
- ● Check distance between shaft **2** and bed plate using adjustment gauge **3**.
- ● If necessary adjust plunger **4** (nut **5**) according to the **requirement.**
- ● Reattach frame **1**.

Adjustment

Position of the sewing head in relation to the bed plate

> **Requirement**
>
> When the sewing head is lowered, the presser bar **4** with adjustment sleeve **3** should slide exactly into the appropriate hole of adjustment gauge **1**.
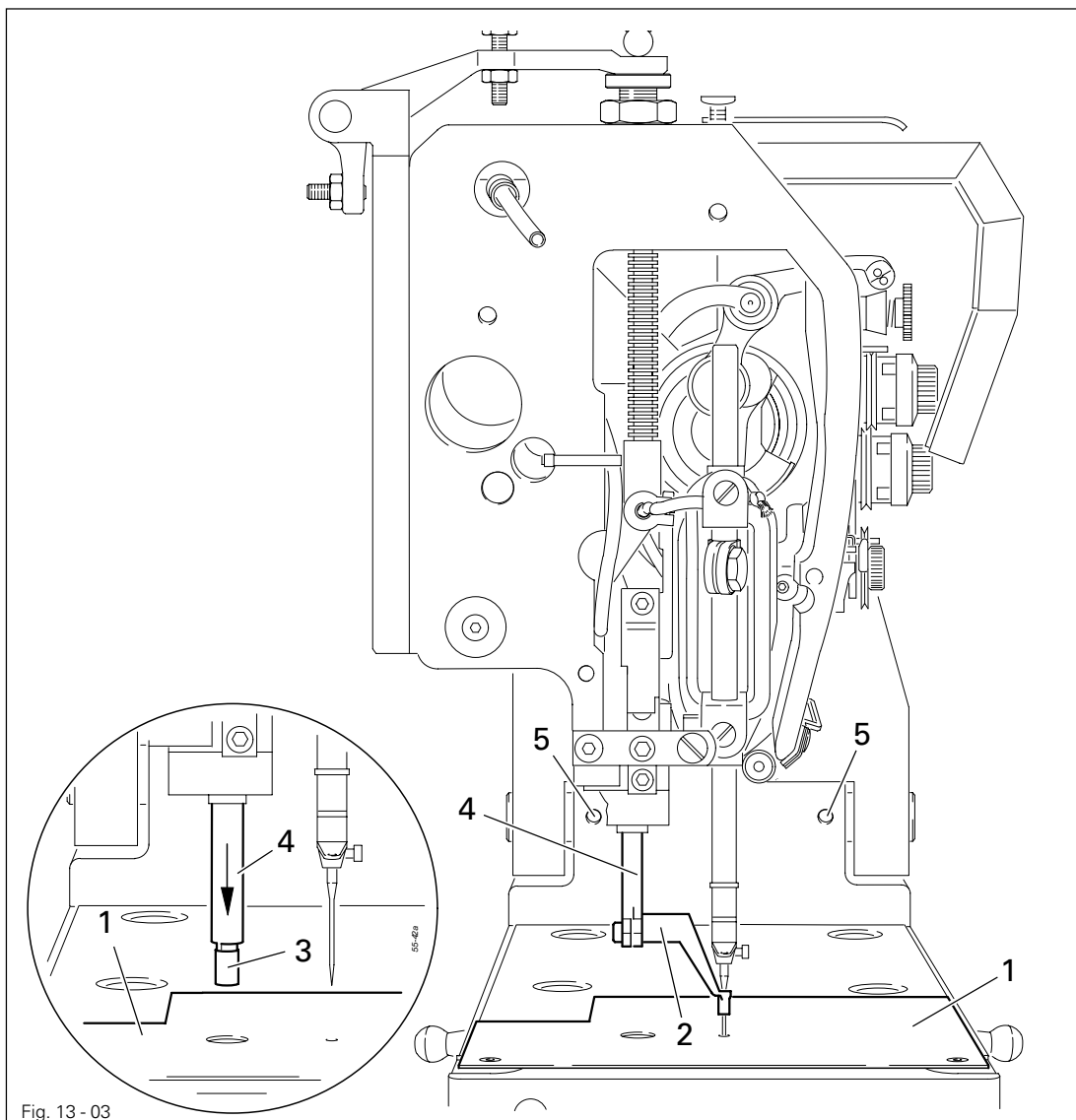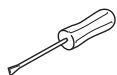

Fig. 13 - 03

- ● Unscrew needle plate and counter presser.
- ● Screw on adjustment gauge **1**.
- ● Remove presser foot **2**.
- ● Fit adjustment sleeve **3** to presser bar **4**.
- ● Check **requirement** by turning the balance wheel, and if necessary adjust sewing head (screws **5**) according to the **requirement.**

> ℹ The adjustment gauge **1** remains in place for further adjustments.
>
> The exact setting of the presser bar **4** is described in **Chapter 13.05.21 Presser foot height.**

PFAFF

13.05.03   Upper and lower toothed belt guards

Requirement
The upper and lower toothed belt guards must be positioned as close as possible over the toothed belt sprockets without touching them.
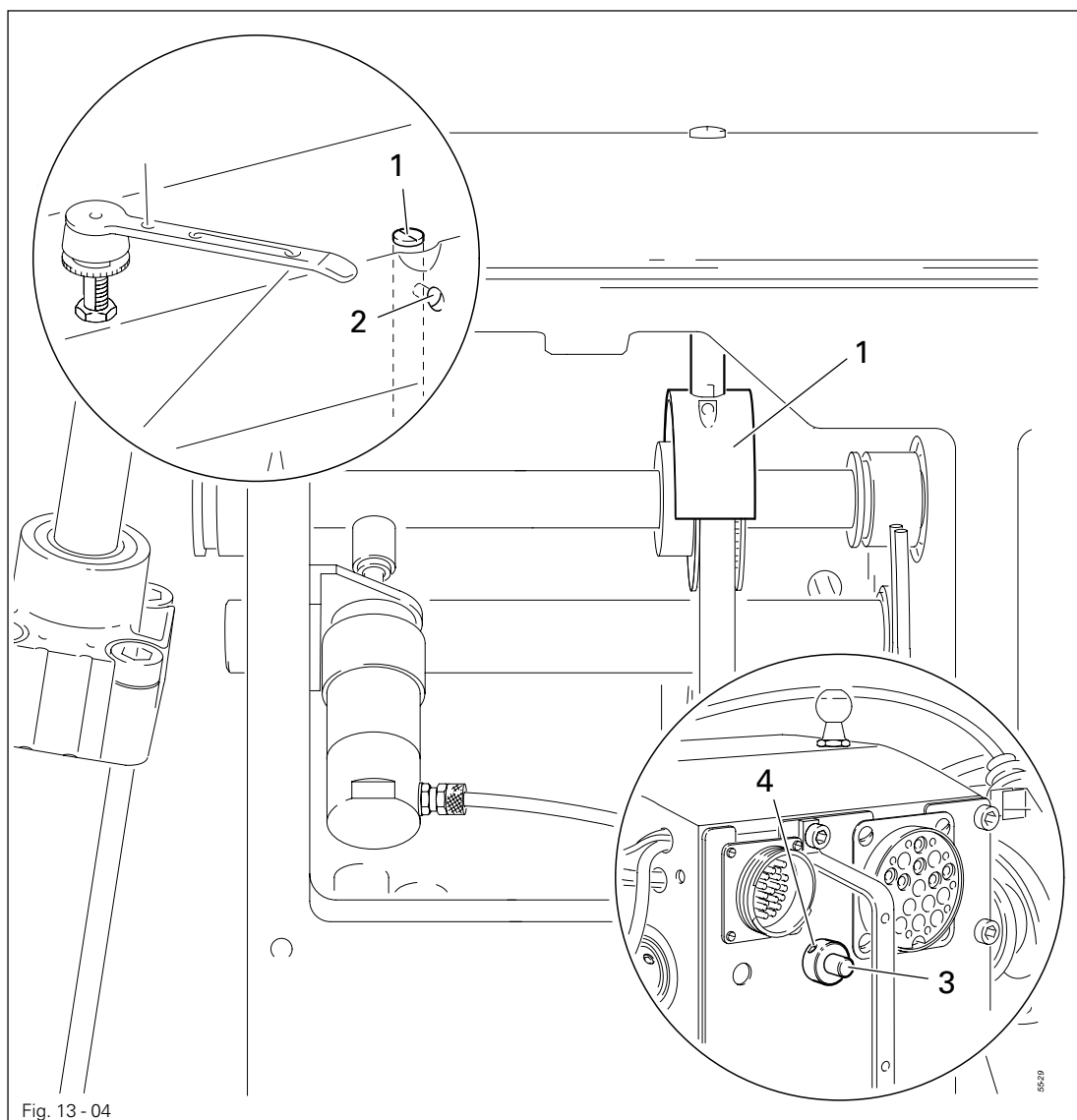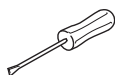

Fig. 13 - 04

● Move the upper **1** (screw **2**) and lower toothed belt guards **3** (screws **4**) at the underside of the sewing head according to the **requirement.**

Carry out the adjustment carefully!
Otherwise, when the sewing head is raised up, the toothed belt could disengage!
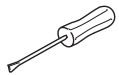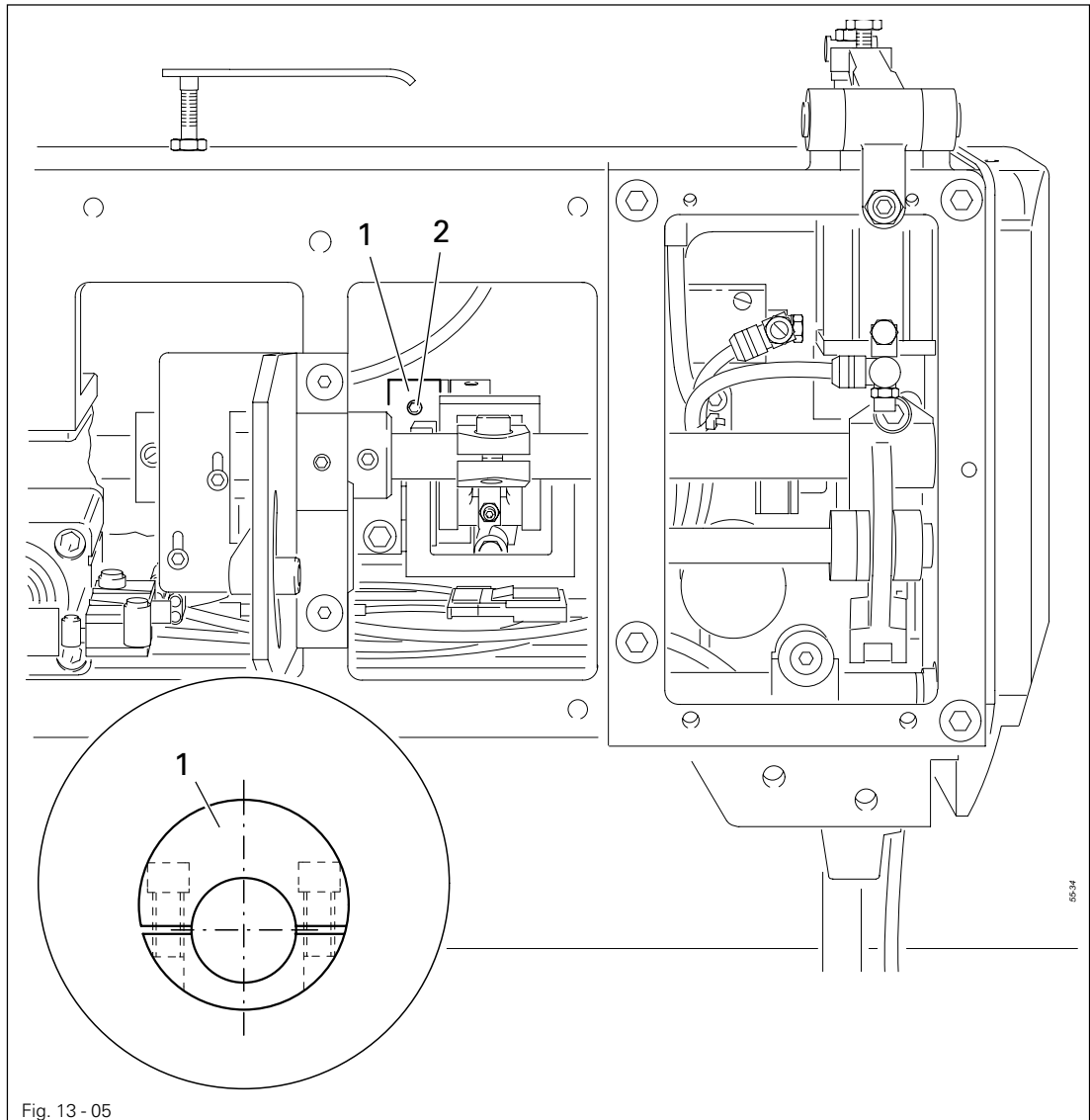
Adjustment

13.05.04 Counterweight

Requirement

In needle bar position BDC the largest eccentricity of the counterweight **1** must be at the top.

Fig. 13 - 05
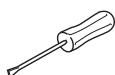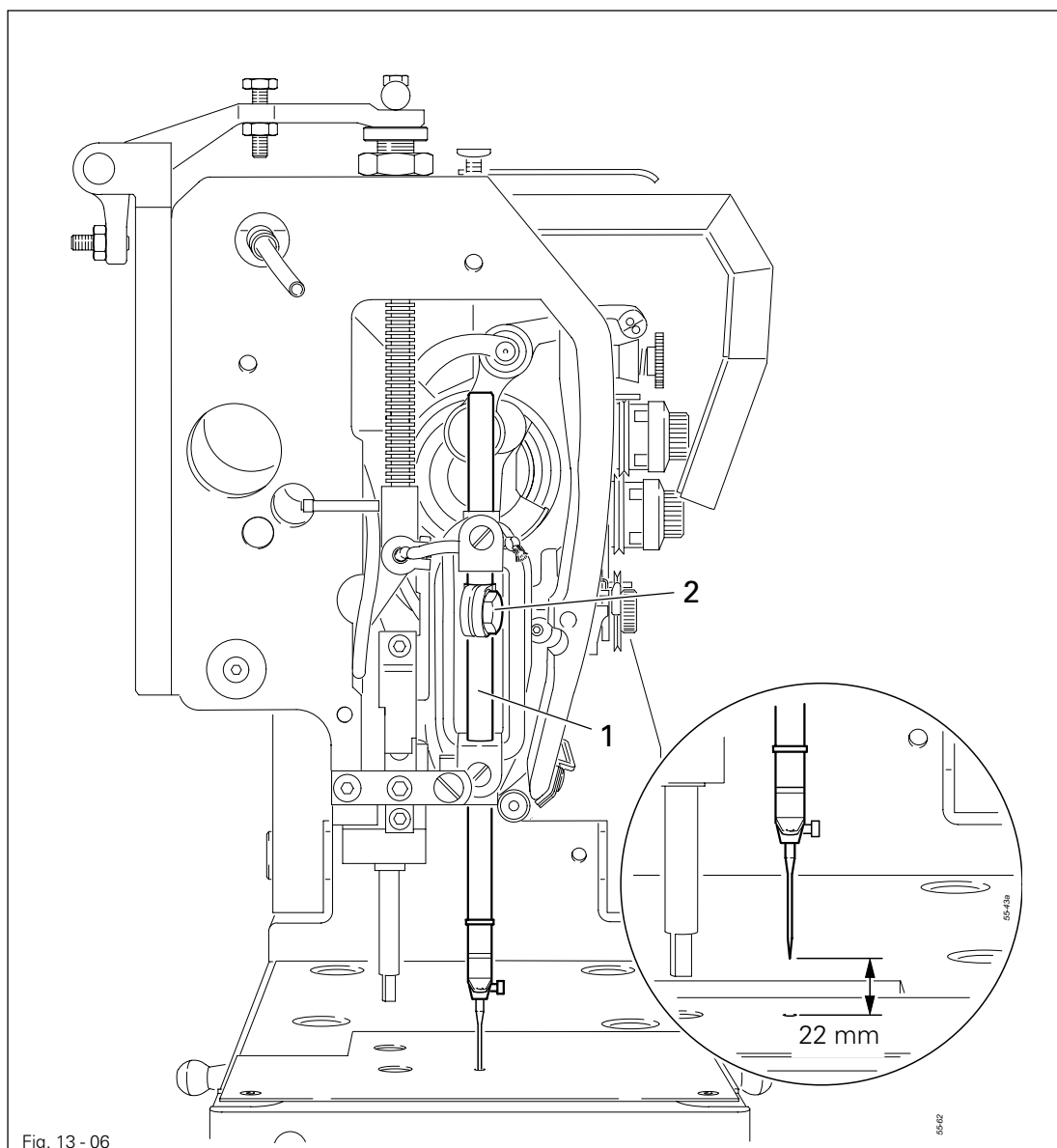
● Move needle bar to BDC.
● Turn counterweight **1** (screws **2**) according to the **requirement.**

13.05.05 Preadjusting the needle height

Requirement

At needle bar position TDC, the distance between the needle point and the adjustment gauge must be approx. **22 mm.**

Fig. 13 - 06

● Move needle bar **1** (screws **2**) without twisting it according to the **requirement.**

Adjustment

13.05.06   Centering the needle in the needle hole

Requirement
The adjustment pin **1** must fit precisely into the corresponding adjustment hole of the adjustment gauge **6**.
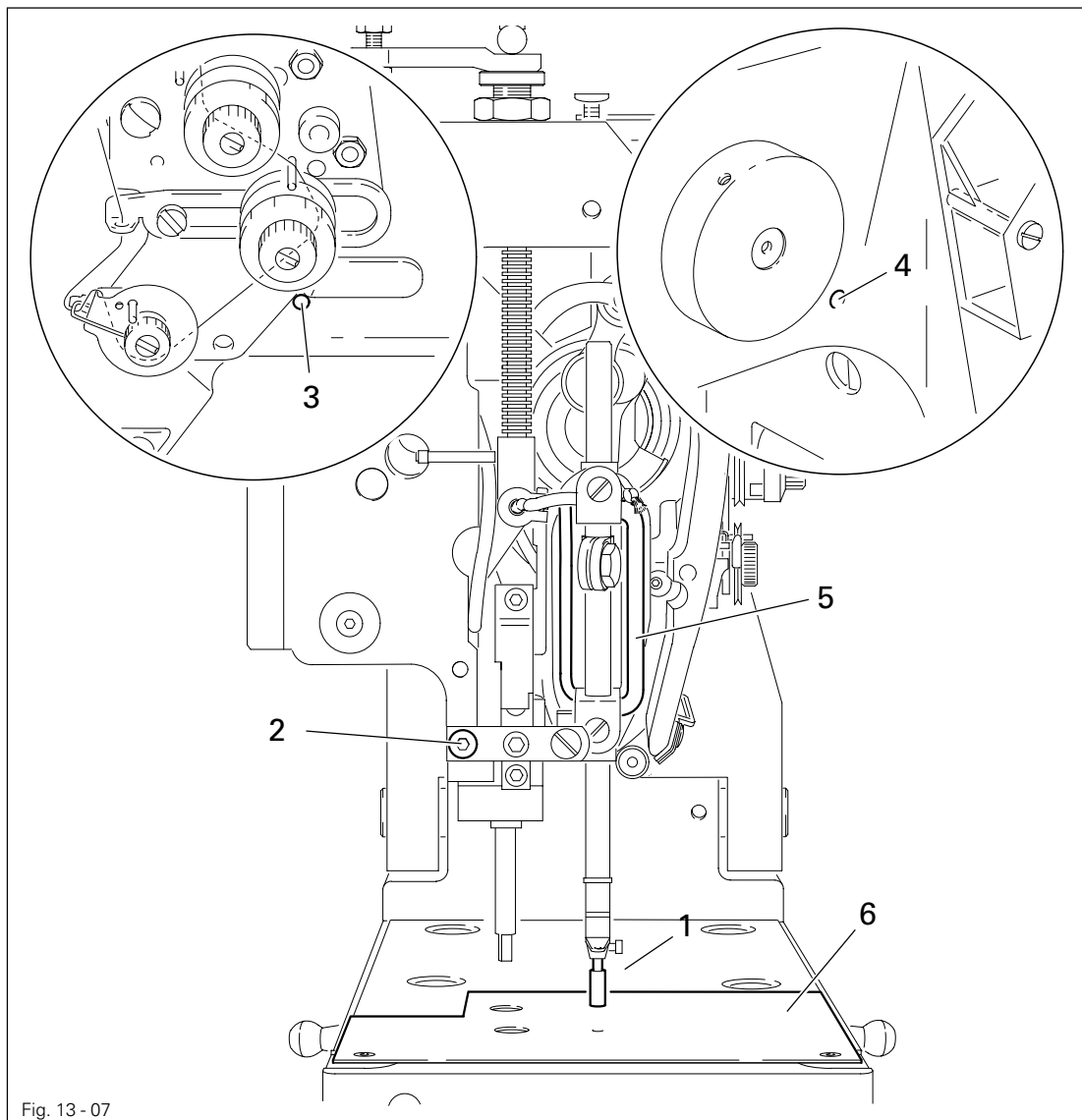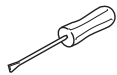

Fig. 13 - 07

● Insert adjustment pin **1** into the needle bar and screw tight.

● Loosen screws **2**, **3** and **4.**

● Move needle bar frame **5** according to the **requirement.**

● Tighten screws **2**, **3** and **4**.

● Unscrew adjustment gauge **6** and adjustment pin **1**.

13.05.07   Needle rise, needle height, hook clearance and needle guard

> **Requirement**
>
> With the needle bar in position 2.2 after b.d.c. (needle rise)
>
> 1. The top edge of the needle eye should be **1.0 mm** below the tip of the hook,
> 2. The hook tip should be **0.05 – 0.1 mm** from the needle and point at **needle centre** and
> 3. Needle guard **5** should touch the needle lightly.
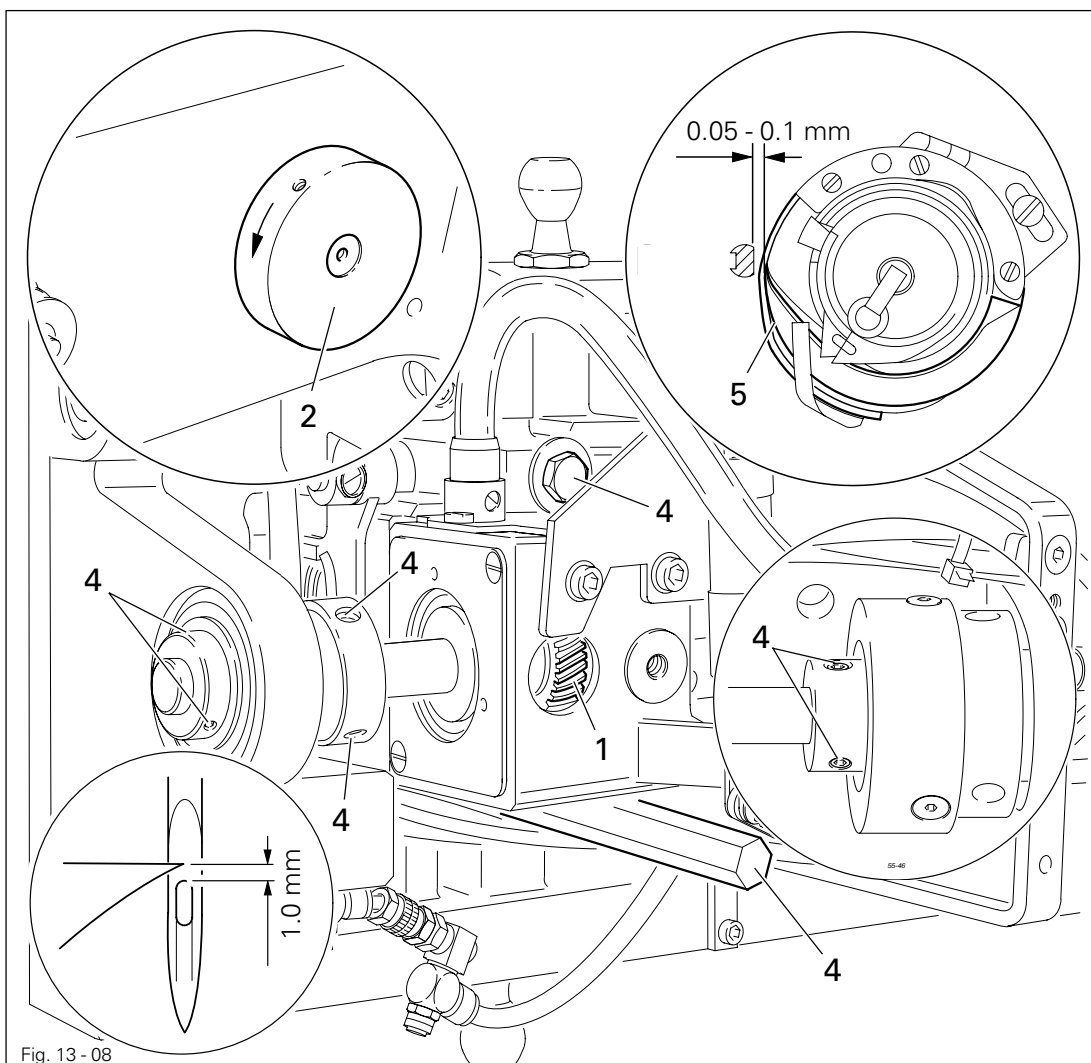
Fig. 13 - 08
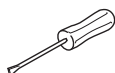
Needle rise

● Loosen screws of the bevel gear **1**.

● Bring needle bar to b.d.c.

● In this position, push the 2.2 mm thick feeler gauge of the needle rise gauge directly under the needle bar bearing.

● Position adjustable clamp (part no. 08-880 137 00) on feeler gauge and screw it to the needle bar.

● Remove feeler gauge and turn balance wheel **2** in the direction of the arrow, until the adjustable clamp is in position.

● Point hook tip towards needle centre and tighten the screws of bevel gear **1**, taking the backlash into consideration.
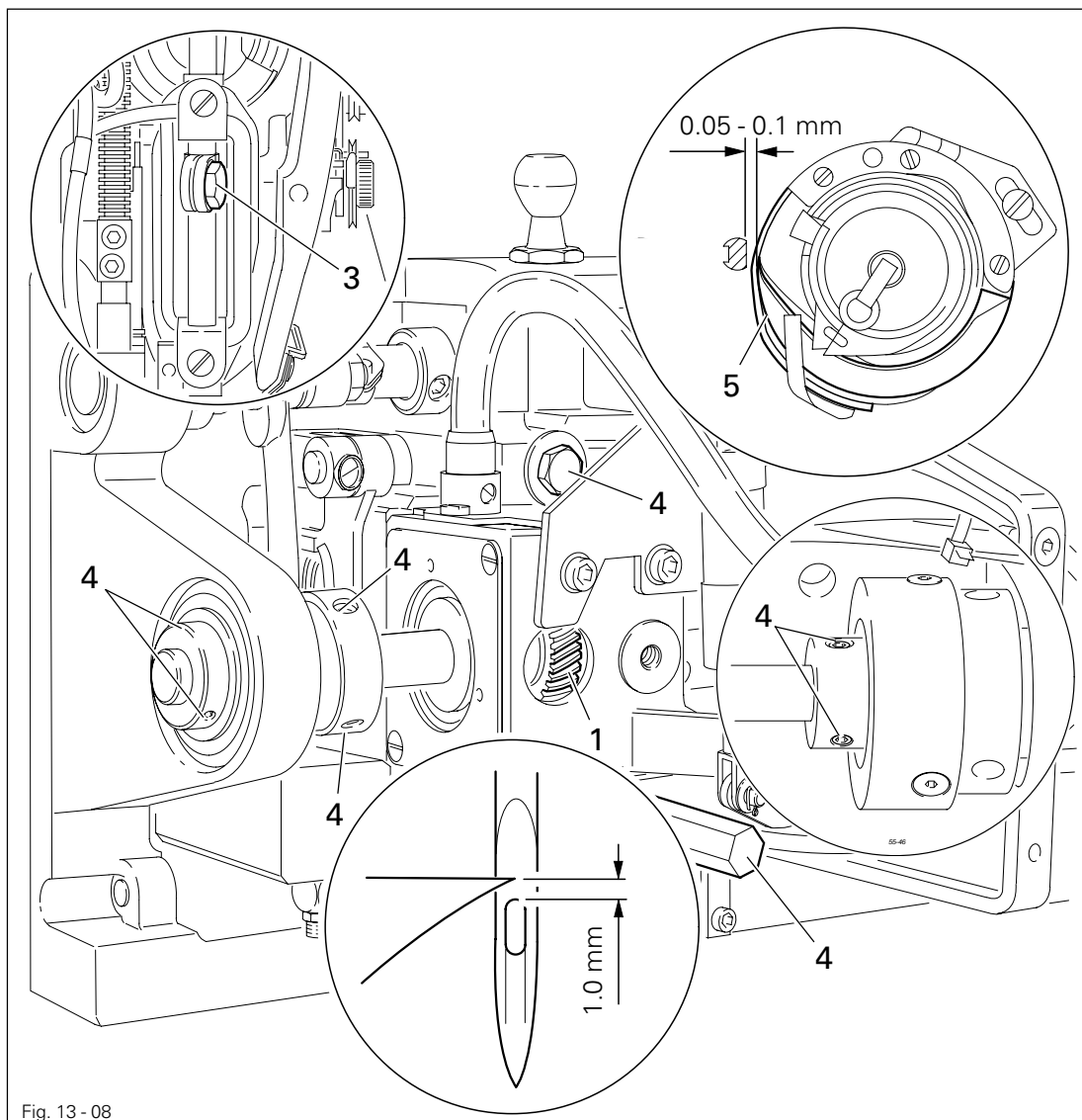
Fig. 13 - 08
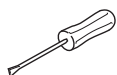
Needle height

● Without twisting it adjust needle bar (screw **3**) according to **requirement 1.**

Hook-to-needle clearance

● Adjust hook bearing (screws **4**) according to **requirement 2**, taking care that the needle is not deflected by needle guard **5**.

● Check the movement of the feed lifting eccentric.

Needle guard

● By turning balance wheel **2**, bring the needle bar into needle rise position.

● Align needle guard **5** according to **requirement 3.**

13.05.08   Bobbin-case opener stroke

Requirement
When the bobbin-case opener is at its foremost position, the catch **3** of the bobbin-case should be far enough away from the edge of the needle plate opening **4** to allow the thread to pass through without difficulty.

Fig. 13 - 09
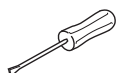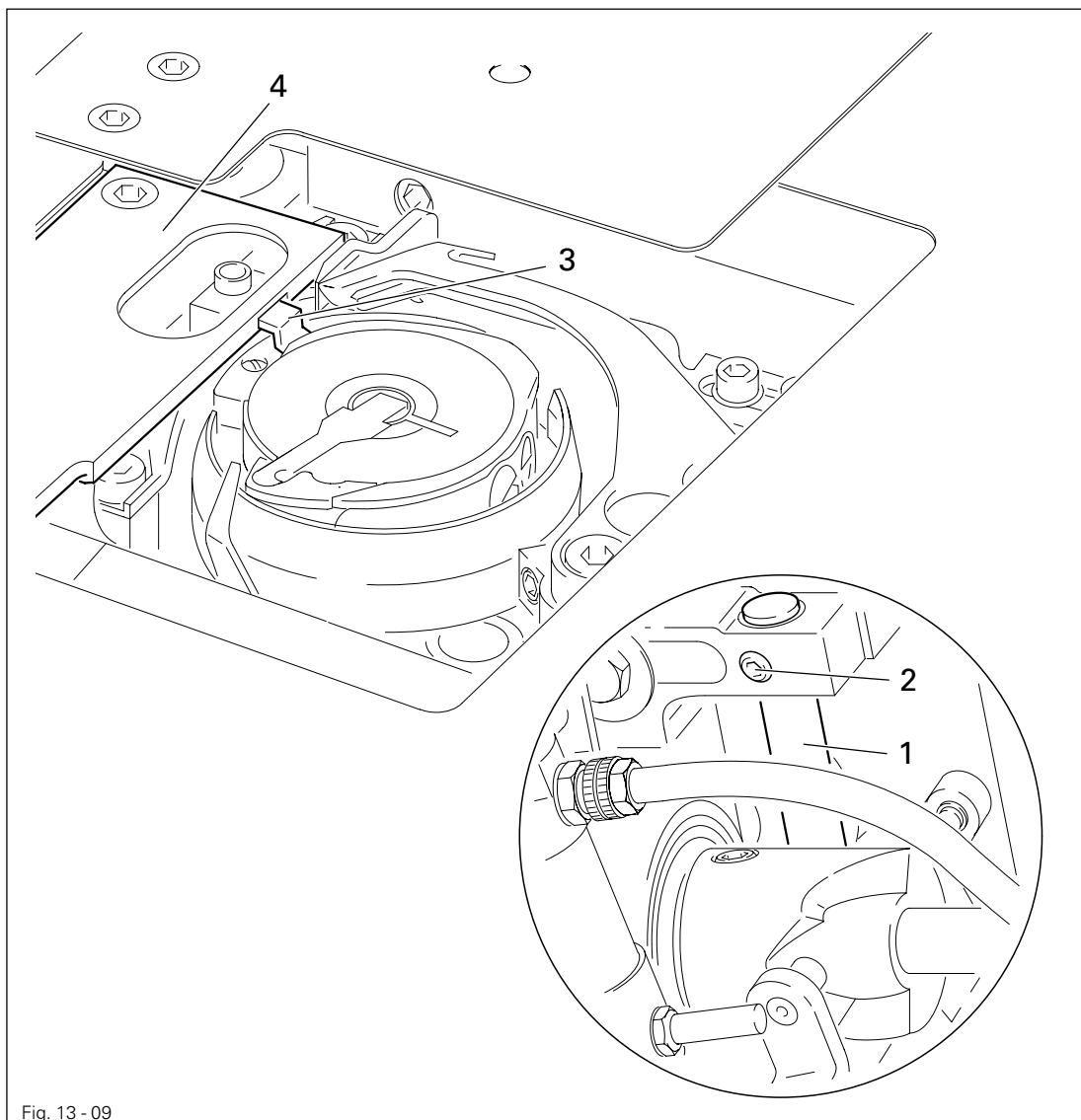
● Adjust shaft **1** (screw **2**) according to the **requirement.**

Adjustment

13.05.09 Counter presser lifting stroke

Requirement

With the needle bar at b.d.c., the counter presser **3** should be at the top of its stroke.

Fig. 13 - 10
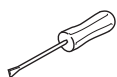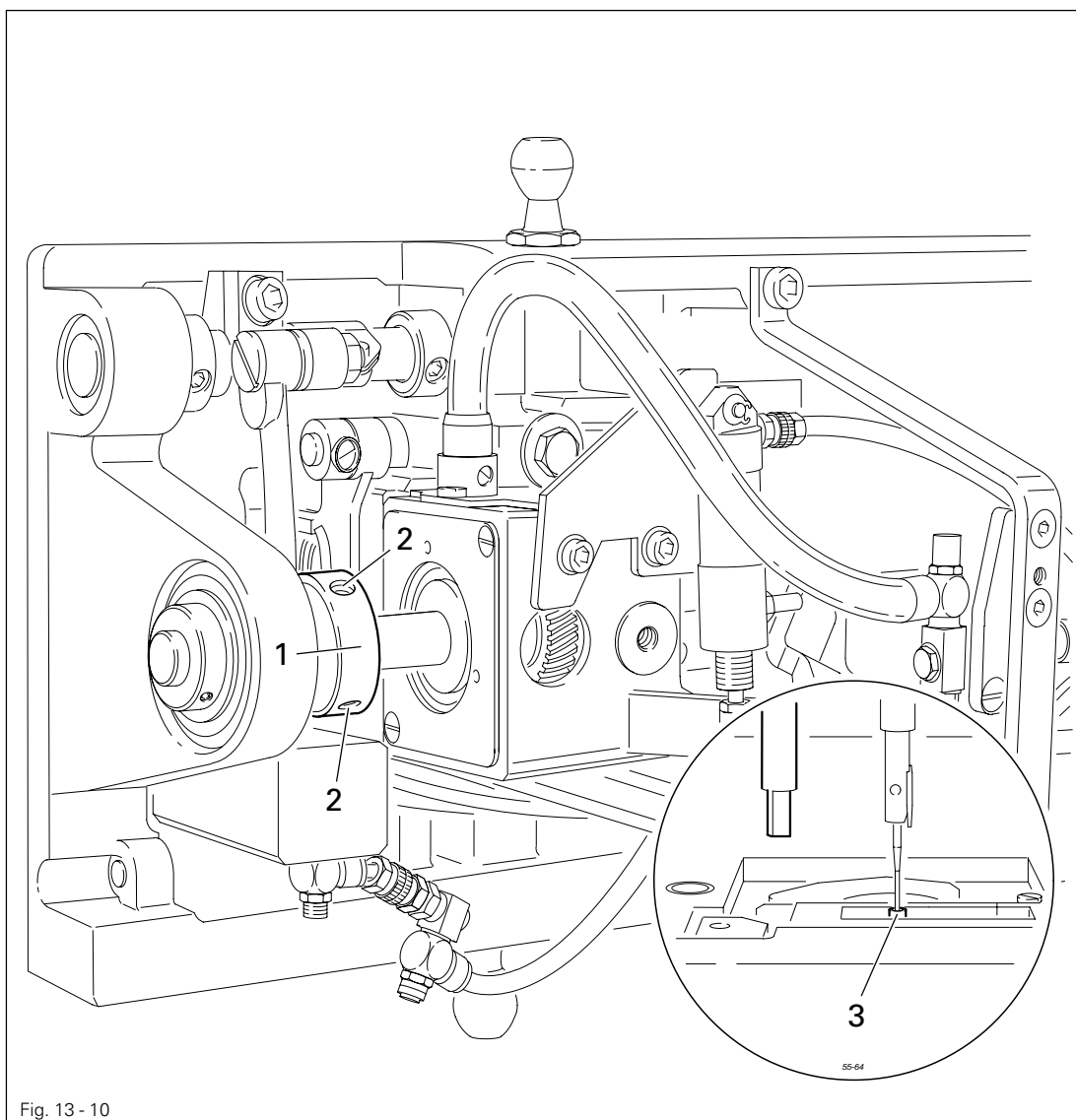
● Bring the needle bar to b.d.c.
● Adjust eccentric **1** (screws **2**) according to the **requirement.**

13.05.10   Counter presser height

Requirement
1. When the needle bar is at b.d.c., the top edge of counter presser **6** should be **2 mm** above the closed hook compartment cover **1**.
2. When the needle bar is at t.d.c., the top edge of the counter presser **6** must not be above the hook compartment cover **1**.

Fig. 13 - 11
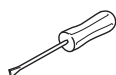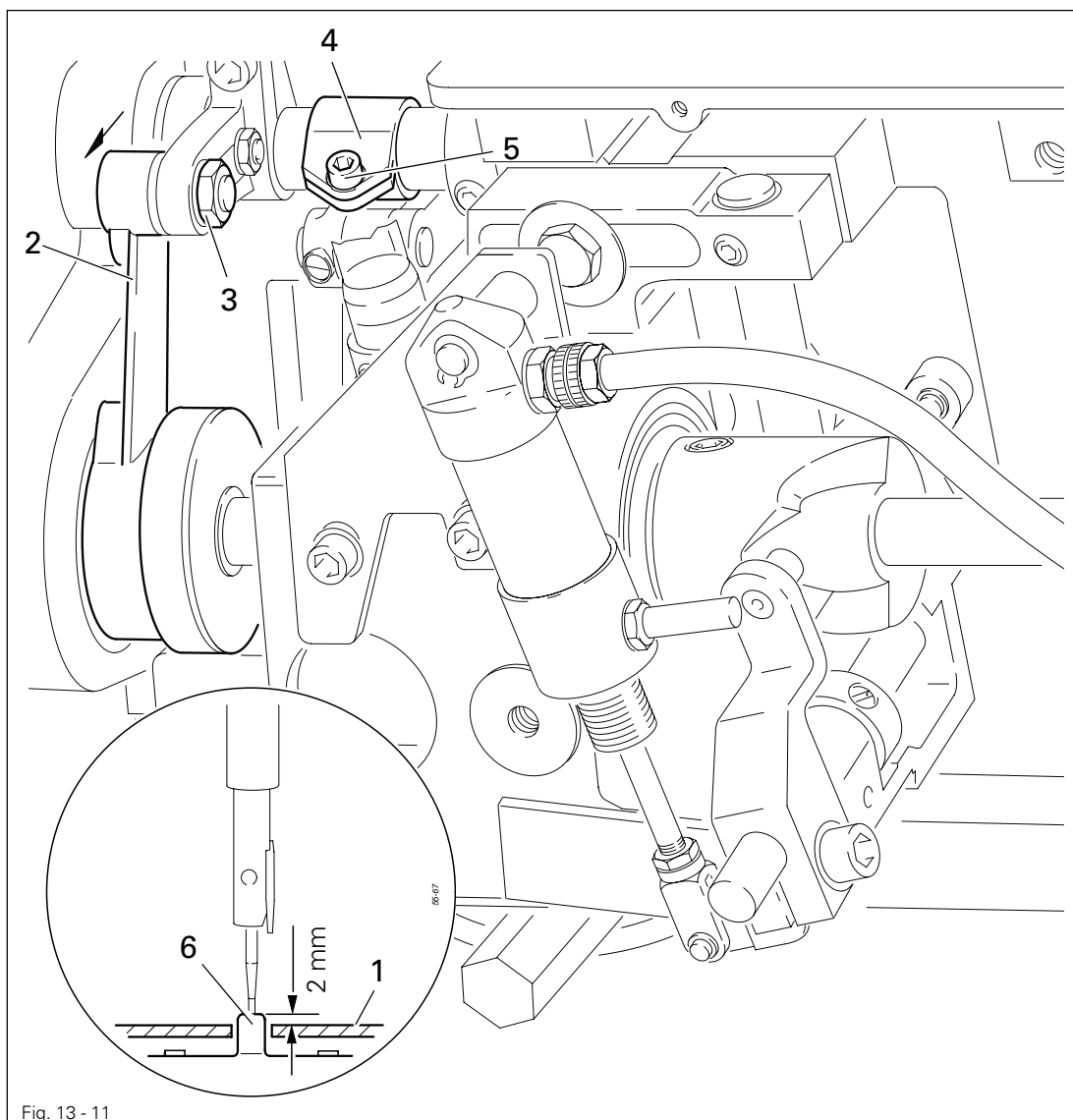
● Place the hook compartment cover **1** in position and pull down lever **2** (nut **3**) as far as possible, in the direction of the arrow.
● Adjust bracket **4** (screw **5**) so that when the needle bar is at t.d.c., the counter presser **6** is flush with the top edge of the hook compartment cover **1**.

By moving lever **2** (nut **3**) in the slot, the height of the counter presser **6** can be altered for different materials.

Adjustment

13.05.11   Counter presser position

> **Requirement**
> The needle should enter the needle hole in the centre of the counter presser **1**.

Fig. 13 - 12
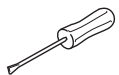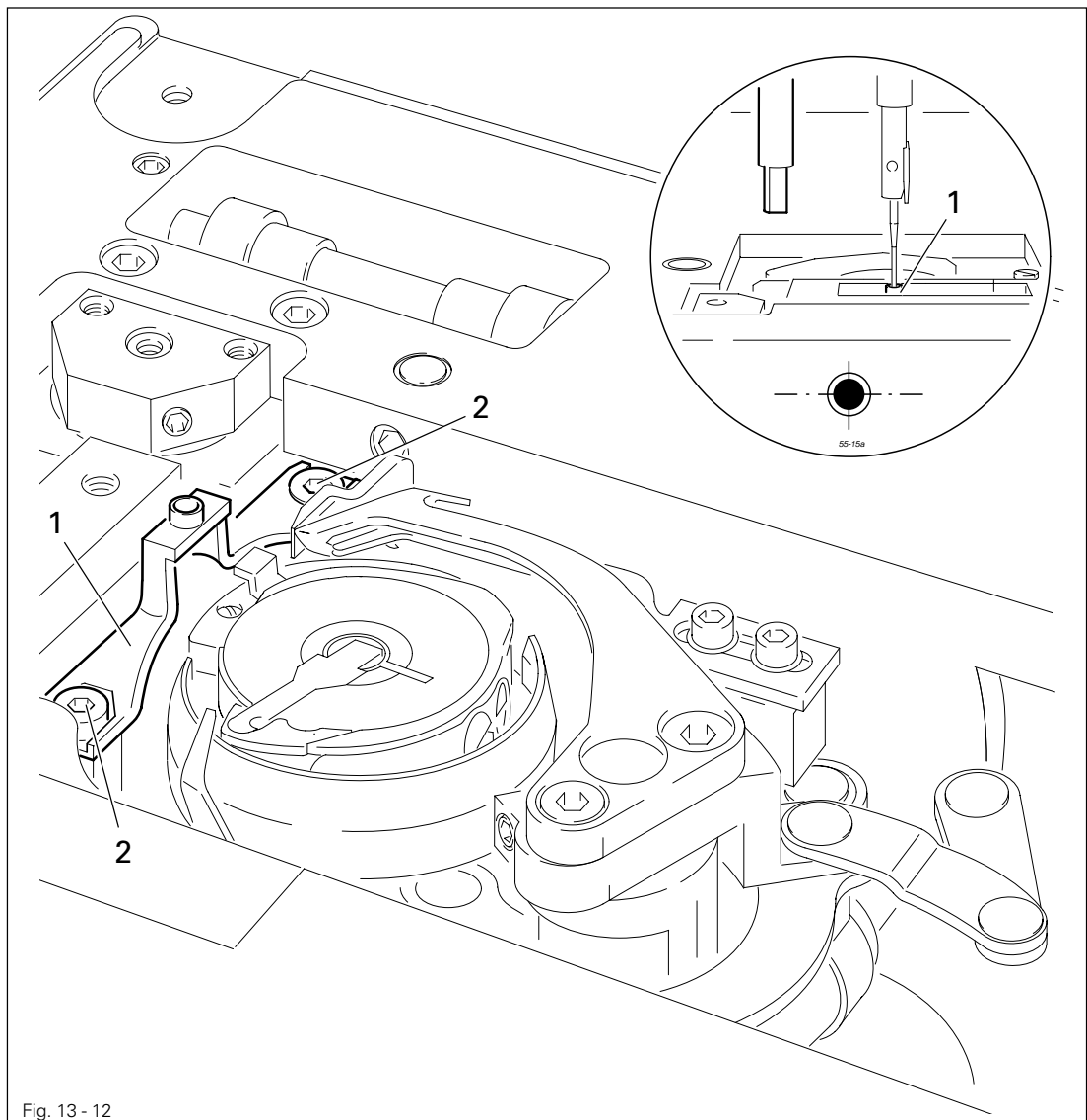
● Adjust counter presser **1** (screws **2**) according to the **requirement.**

13.05.12 Resting position of the roller lever / radial position of the control cam

> **Requirement**
> 1. When the plunger **1** is retracted, there must be a distance of **0.1 mm** between the outer edge of the control cam **6** and the roller of the roller lever **5**.
> 2. When the thread trimmer is switched on beforehand, the control cam **6** must have just brought the roller lever **5**, in TDC take-up lever, to its resting position.
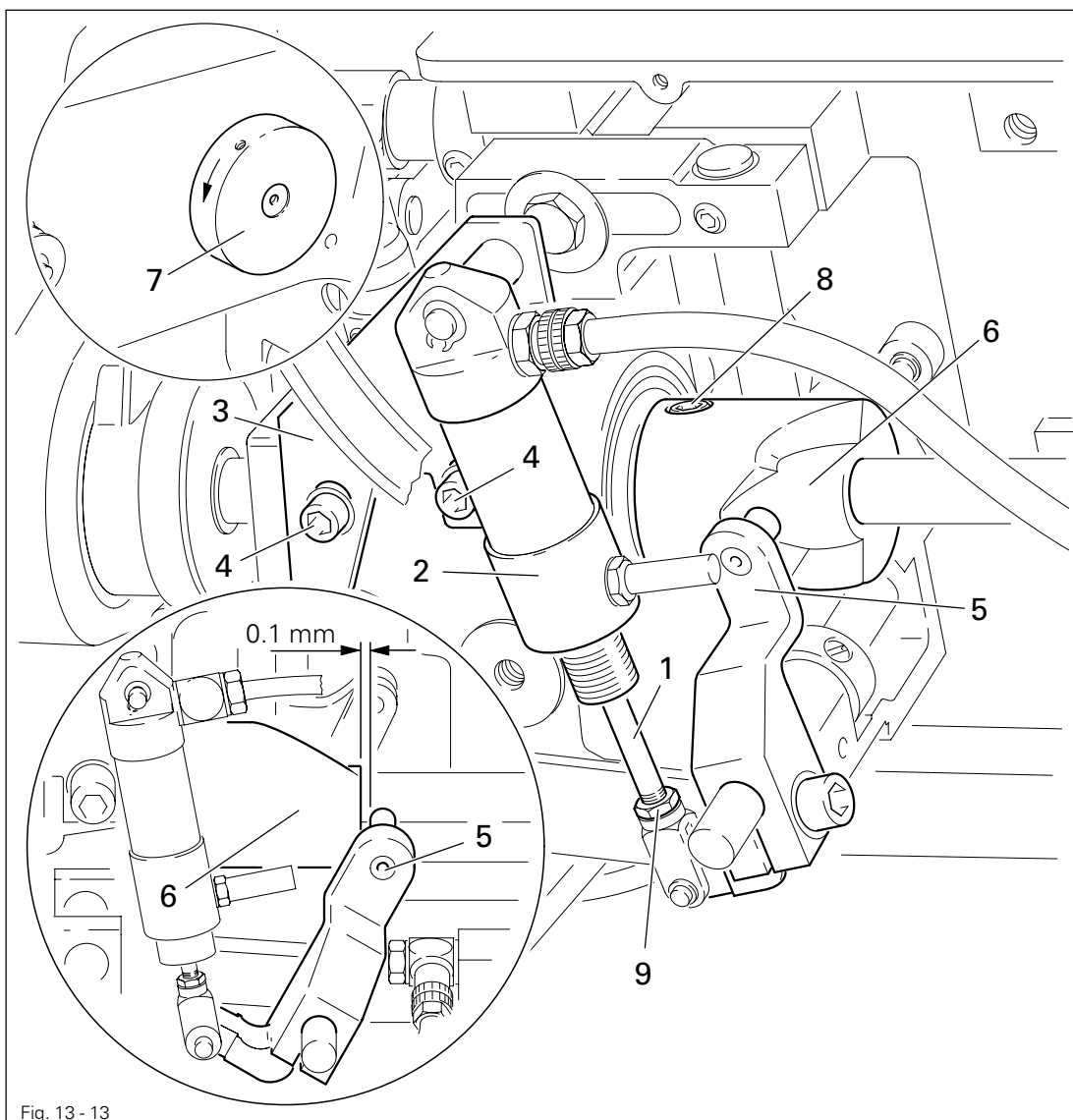
Fig. 13 - 13
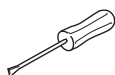
- ● Retract the plunger **1** in cylinder **2** until it stops.
- ● Move the cylinder carrier **3** (screws **4**) according to **requirement 1**.
- ● Bring the take-up lever to BDC and push the roller lever **5** into the control cam **6** by hand.
- ● By turning the handwheel **7** in the direction of the arrow, bring the take-up lever to TDC and check **requirement 2**.
- ● If required, turn the control cam **6** (screws **8**) according to **requirement 2**.

> ℹ️ On plunger **1**, the thread should be approx. **1 mm** above the lock nut **9**.

Adjustment

13.05.13   Thread catcher height

> **Requirement**
> The lower edge of the thread catcher **3** must be positioned at a distance of **0.8 mm** above the bobbin case **4**.
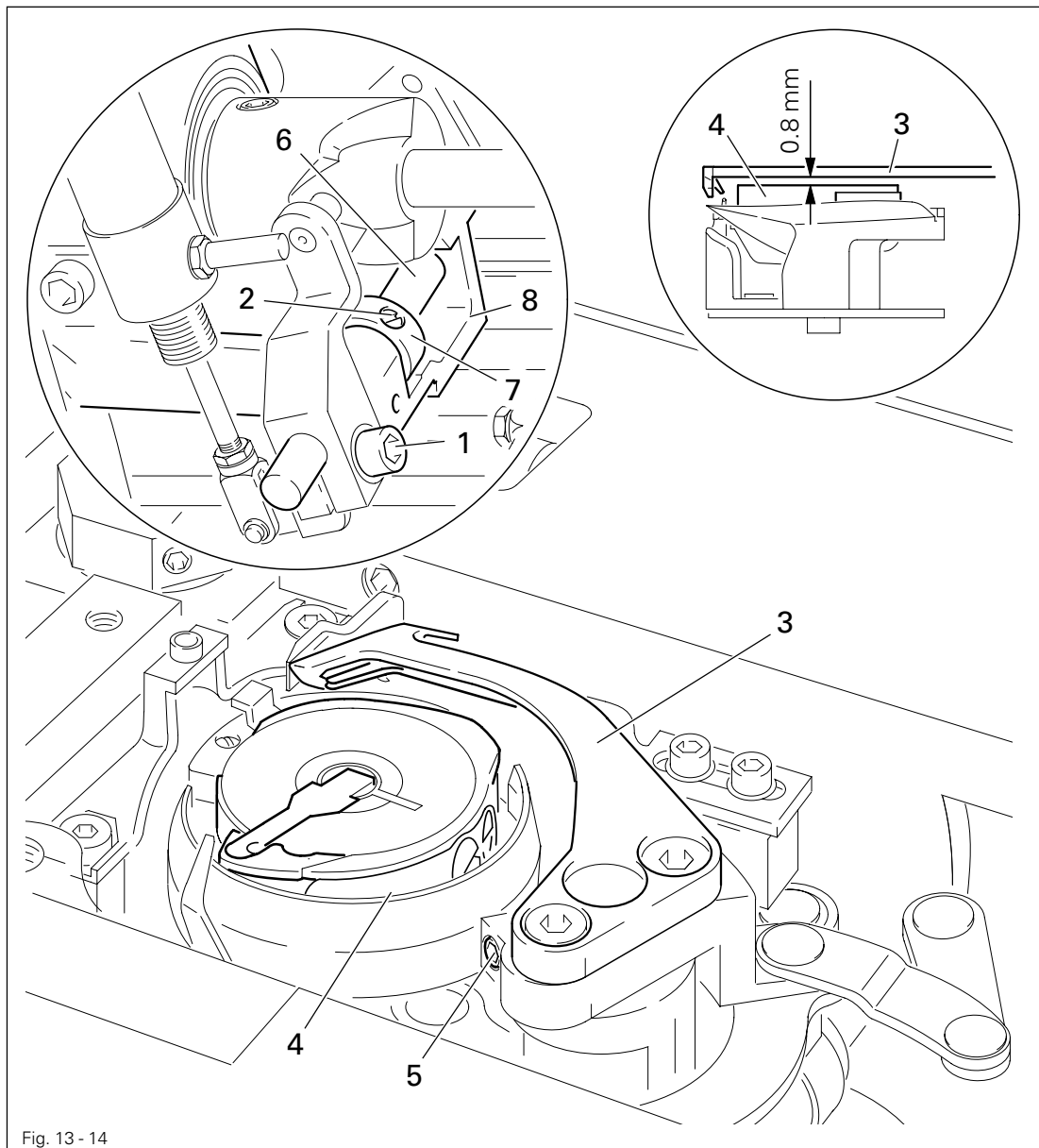
Fig. 13 - 14
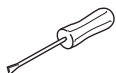
- Loosen screws **1** and **2**.
- Position the thread catcher **3** above the bobbin case **4**.
- Move the thread catcher **3** (screw **5**) according to the **requirement**.
- Determine the vertical play of shaft **6**, move retaining collar **7** against bearing housing **8** and tighten screw **2**.

ℹ️   Screw **1** remains slightly unscrewed for further adjustments.

PFAFF

13.05.14 Thread catcher position and knife height

Requirement

When the thread trimmer is in resting position,

1. the front edges of the thread catcher 3 and the knife 5 must be flush with each other.
2. the upper edges of the thread catcher 3 and the knife 5 must be even.
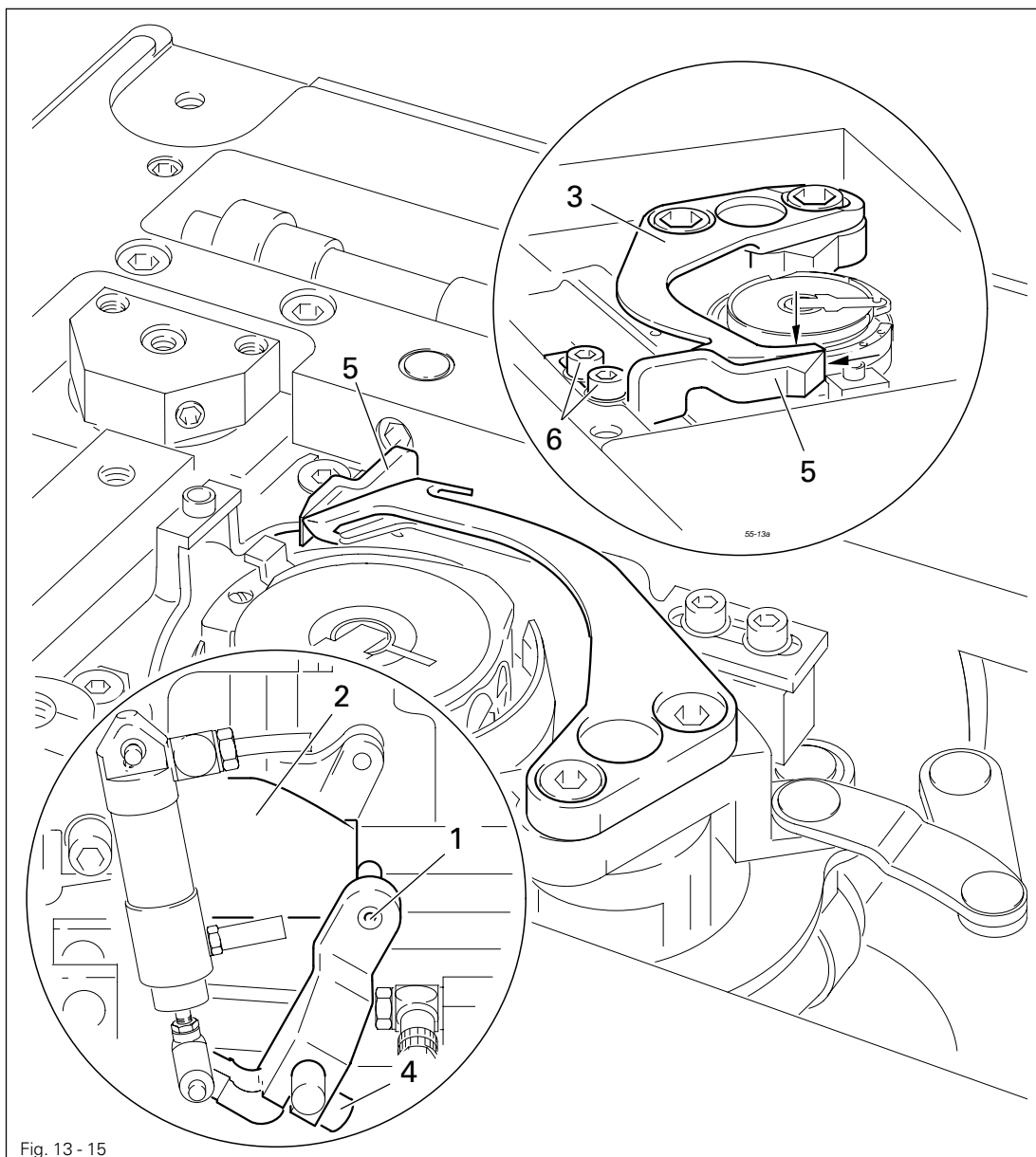
Fig. 13 - 15
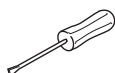
- Bring the needle bar to BDC.
- Move roller lever 1 against control cam 2 by hand.
- Turn the thread catcher 3 according to **requirement 1**.
- Tighten screw 4.
- Check the knife height according to **requirement 2**.

To adjust the height, disassemble knife 5 (screws 6) and insert shim
(part no. 91-141 402-05) according to the **requirement**.
To align the knife see **chapter 13.05.15 Knife pressure**.

Adjustment

13.05.15   Knife pressure

> **Requirement**
> When the point of the thread catcher **4** is **6 mm** in front of the front edge of the knife **5**, the cutting edge of the knife must lightly press against the thread catcher **4**.
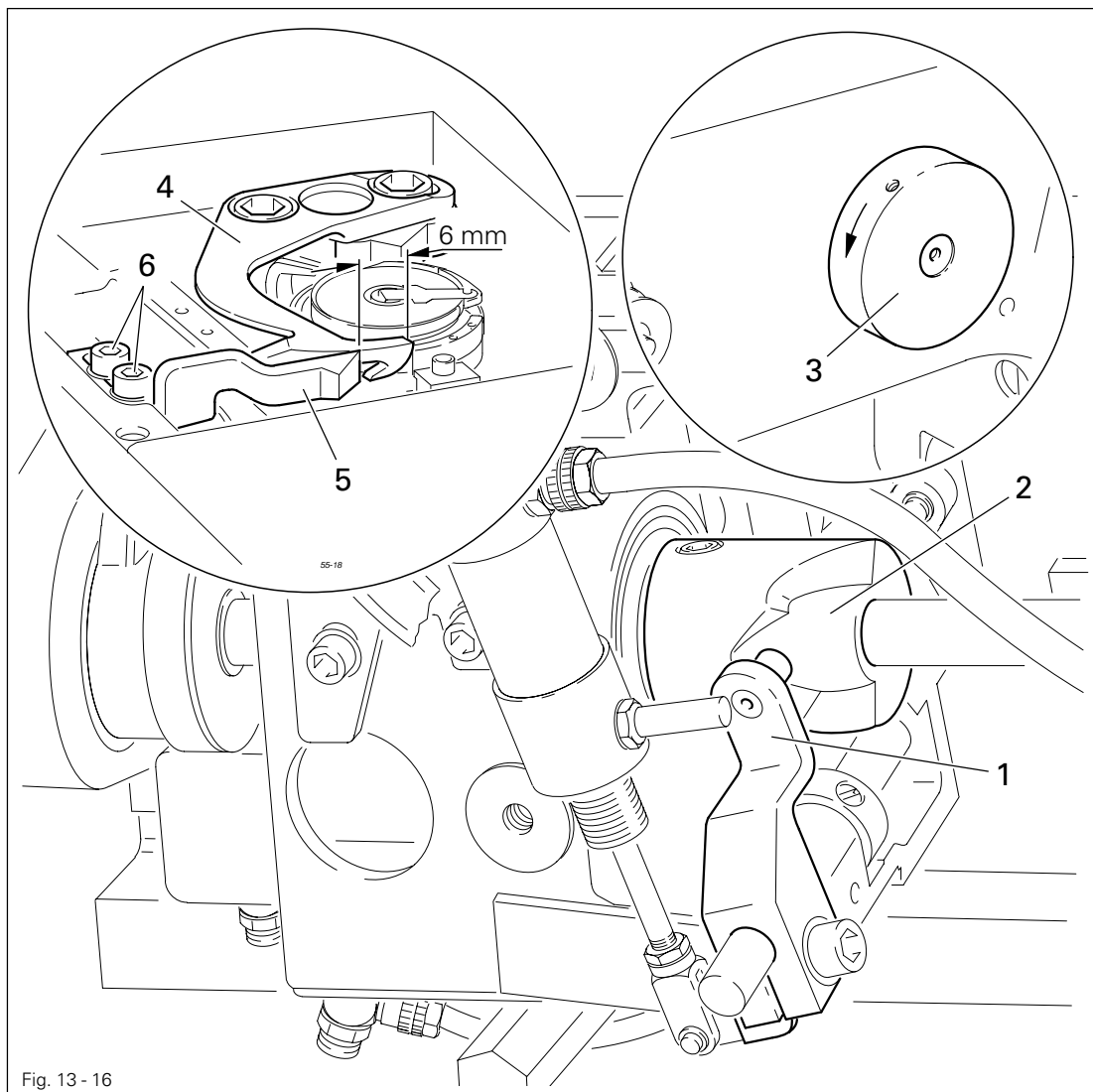
Fig. 13 - 16
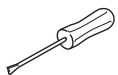
- Bring the take-up lever to BDC.
- Press the roller lever **1** into the control cam **2**.
- Turn the handwheel **3** in the direction of the arrow until the thread catcher **4** is approx. **6 mm** in front of the knife **5**.
- Move the knife **5** (screws **6**) according to the **requirement**.
- Check **requirement 1** from **chapter 13.05.14 Thread catcher position and knife height**.

13.05.16 Bobbin thread clamp spring

Requirement

The clamp spring **1** must

1. not be pressed down during the movement of the thread catcher.
2. clamp the bobbin thread reliably after it is cut
3. not obstruct insertion and removal of the bobbin case.

Fig. 13 - 17
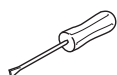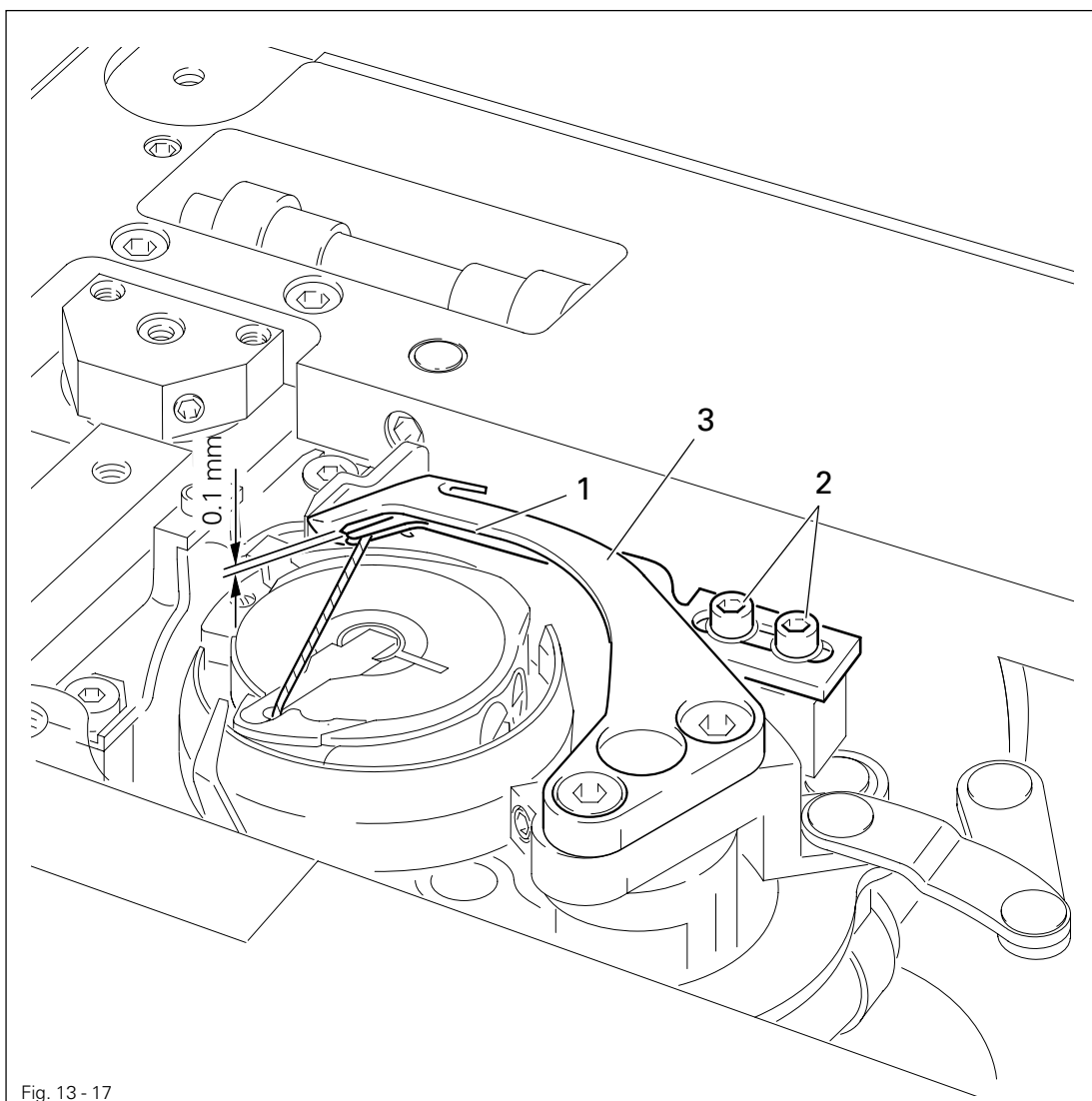
- ● Bring the thread trimmer to resting position.
- ● Move the clamp spring **1** (screws **2**) so that the clamp lips are as close as possible to the inside wall and to the front edge of the thread catcher **3**.
- ● Adjust the height by bending the clamp spring **1** so that between the upper side of clamp spring **1** and the lower side of the thread catcher **3** there is a distance of approx. **0.1 mm**.

Adjustment

13.05.17 Manual cutting test

Requirement

1. When it is moving forward, the thread catcher **1** must not push along the bobbin thread **3** in front of it.
2. At the front point of reversal of the thread catcher **1**, the bobbin thread **3** must lie approx. **2 mm** behind the lug of the thread catcher **1**.
3. At the end of the cutting operation, the needle and bobbin threads must be cut perfectly. The bobbin thread **3** must be clamped.
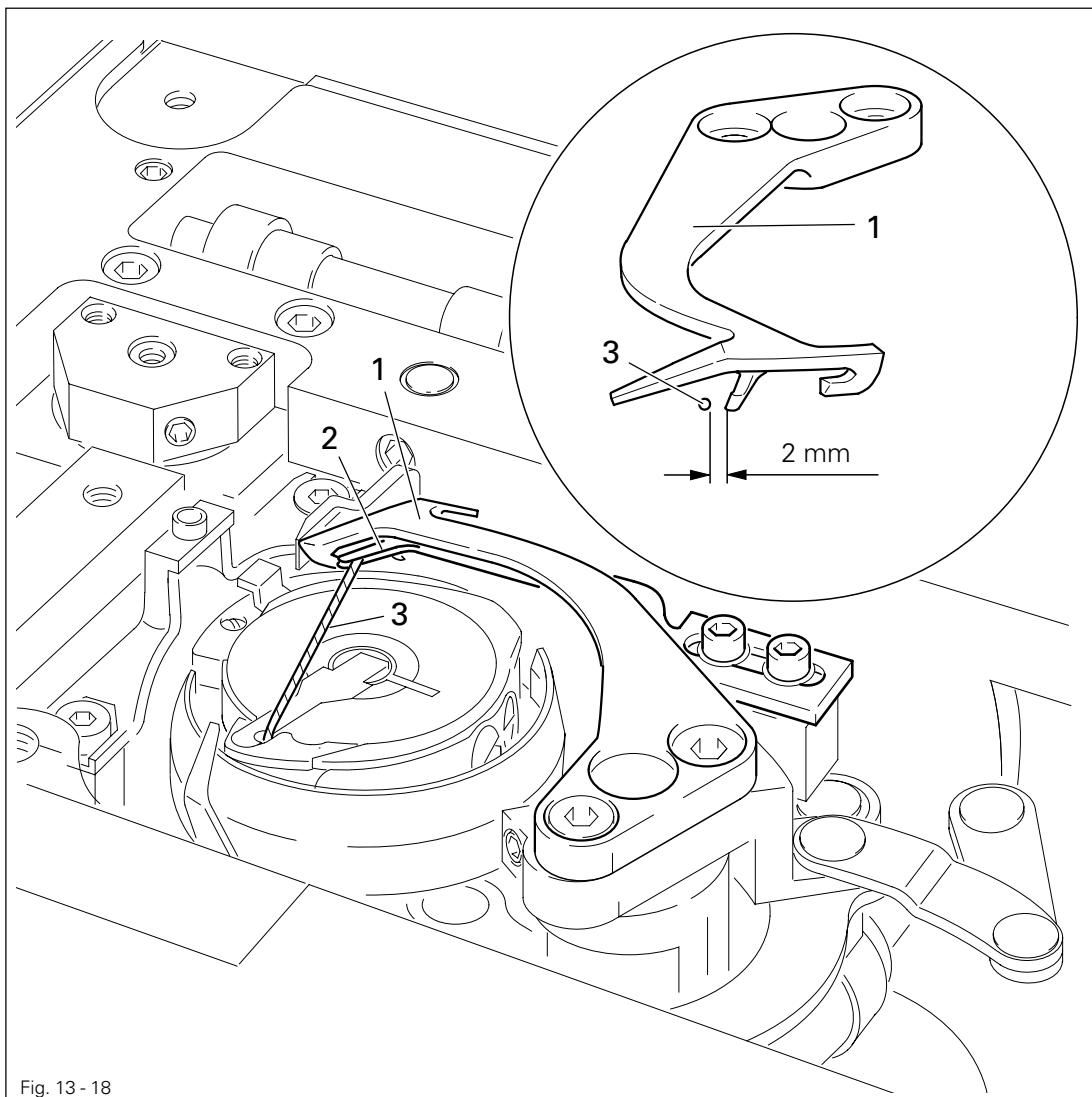
Fig. 13 - 18
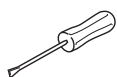
● Carry out the cutting operation manually.
● Check **requirement 1**. If necessary, readjust the thread catcher **1** according to **chapter 13.05.13 Thread catcher height**.
● Check **requirement 2**. If necessary, readjust the thread catcher **1** according to **chapter 13.05.14 Thread catcher position and knife height**.
● Check **requirement 3**. If necessary, readjust the bobbin thread clamp spring **2** according to **chapter 13.05.16 Bobbin thread clamp spring**.

13.05.18   Presser foot stroke position

Requirement
When the needle bar is at b.d.c., presser foot **3** must be at the bottom of its stroke.

Fig. 13 - 19
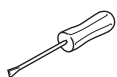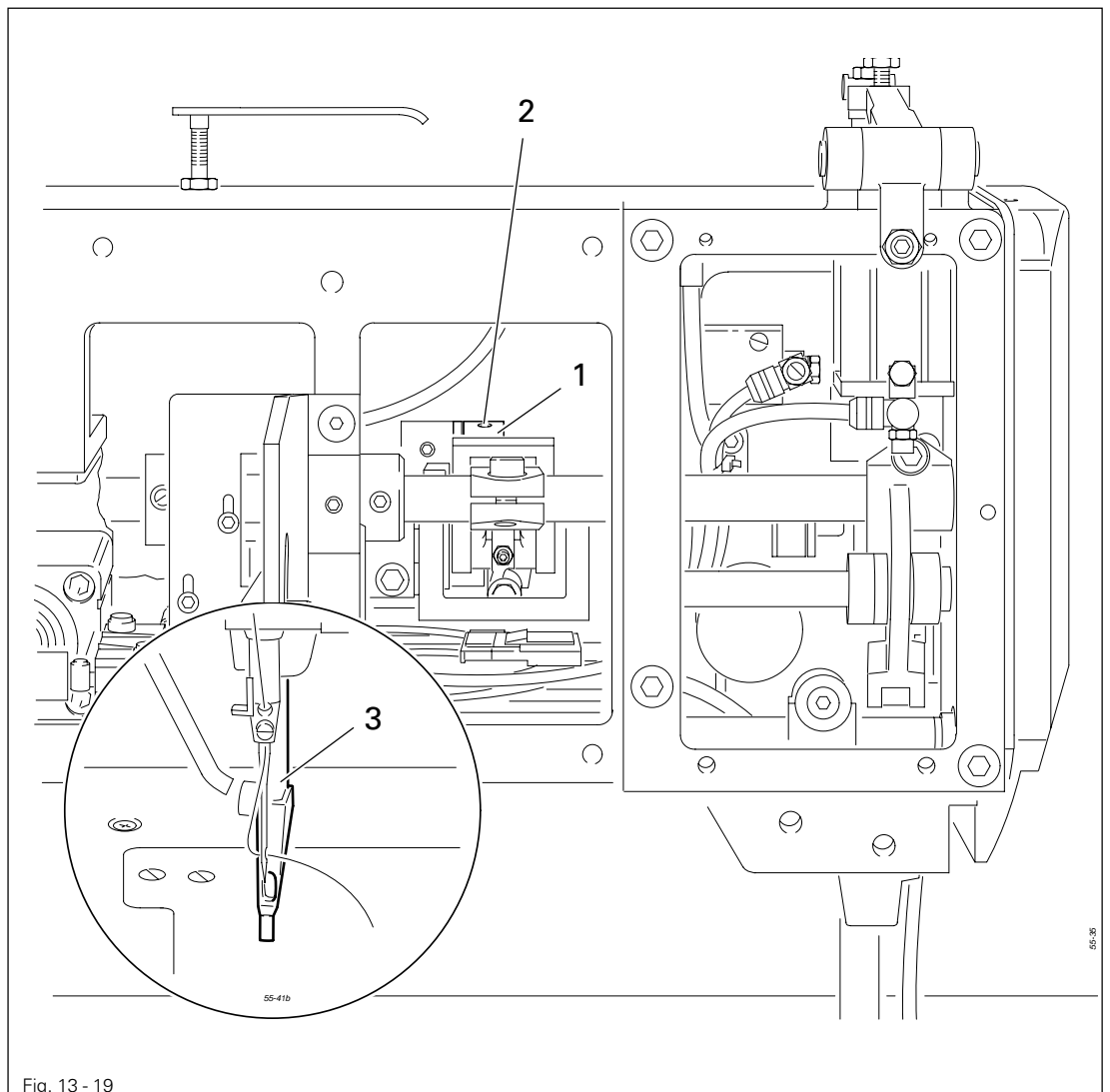
● Adjust eccentric **1** (screws **2**) according to the **requirement.**

Adjustment

13.05.19 Presser foot lifting stroke

> **Requirement**
> 1. When lever **1** is set at "0", the presser foot should not move.
> 2. With the lift set at **7 mm**, sprocket wheel **7** should just be released.
> 3. When the needle bar is at b.d.c., and the lever **1** is set at "10", joints **9** should be in line.

Fig. 13 - 20
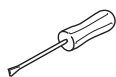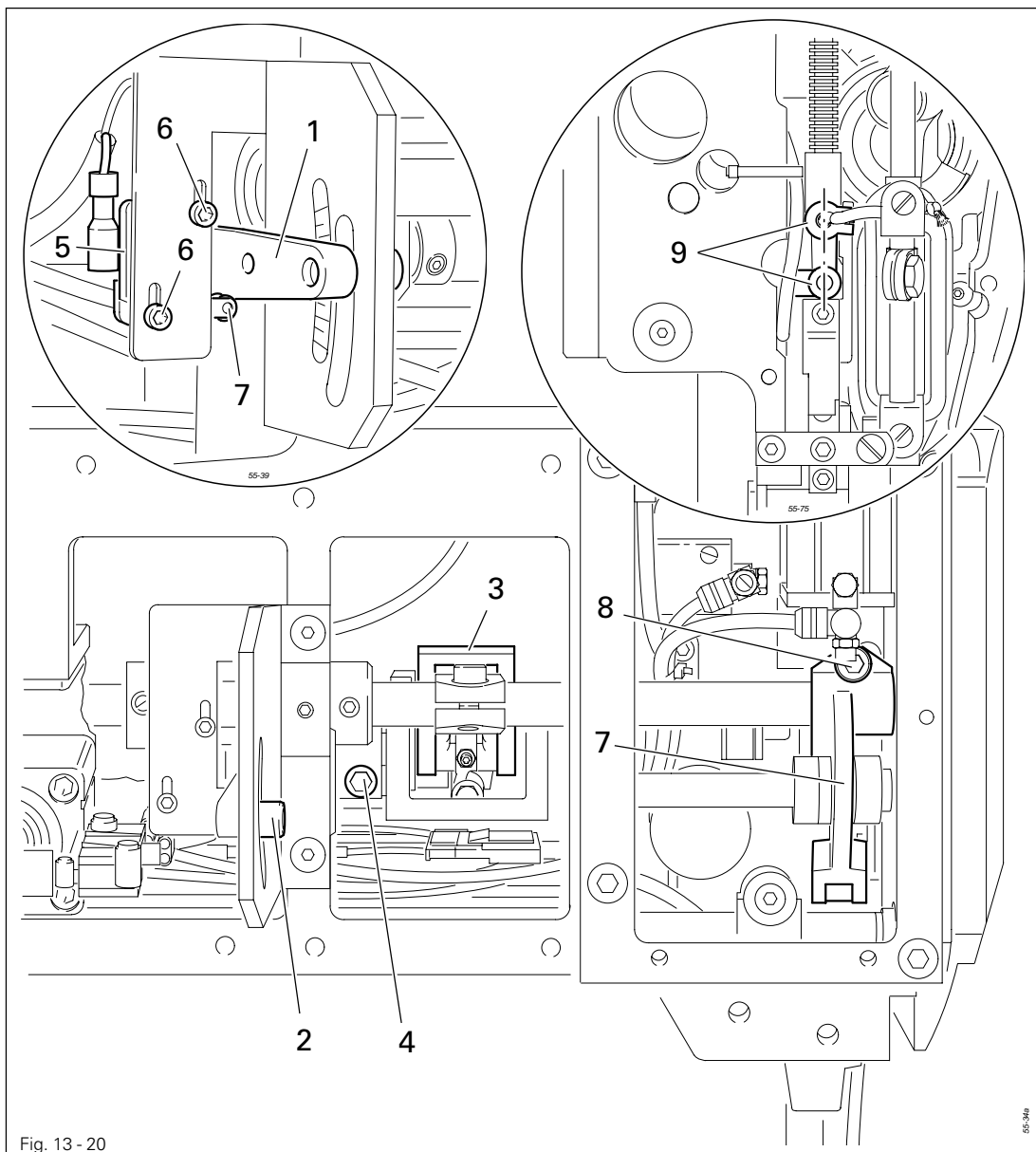
● Set lever **1** (screw **2**) at "0".
● Adjust crank **3** (screw **4**) according to **requirement 1.**
● Set lever **1** (screw **2**) at "7".
● Adjust switch **5** (screw **6**) according to **requirement 2.**
● Set lever **1** (screw **2**) at "10".
● Adjust lever **7** (screw **8**) according to **requirement 3.**
  (When joints **9** are over-extended, a double stroke is carried out.)

PFAFF

13.05.20   Adjust presser foot to material thickness

> **Requirement**
> At its b.d.c. the presser foot should be a distance above the counter presser equivalent to the thickness of the material.
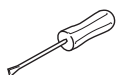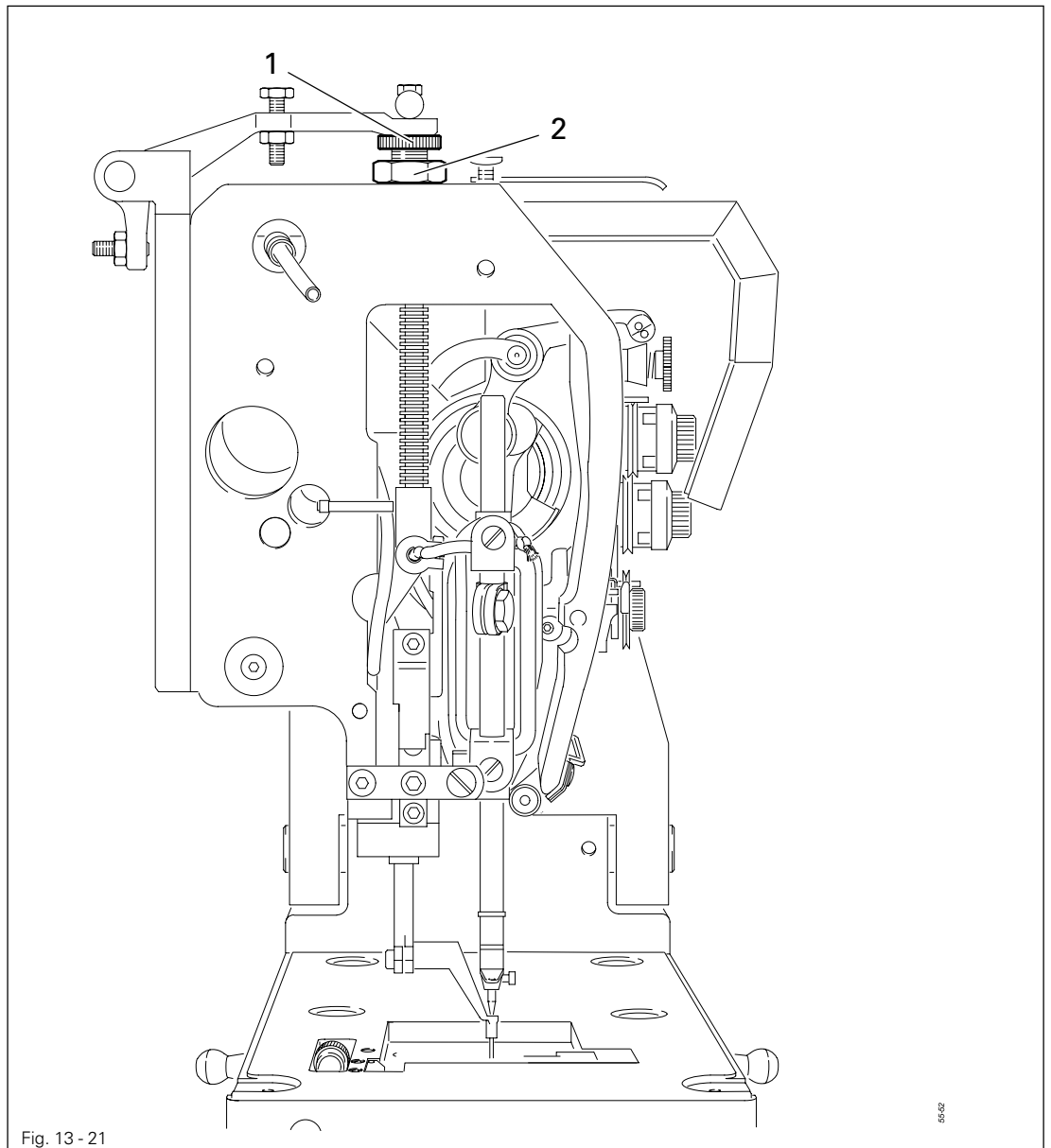
Fig. 13 - 21

● Adjust knurled screw **1** (screw **2**) according to the **requirement.**

Adjustment

13.05.21   Presser foot height

> **Requirement**
> When the needle bar is at t.d.c. and the presser foot **3** raised, the needle must not protrude below the presser foot.
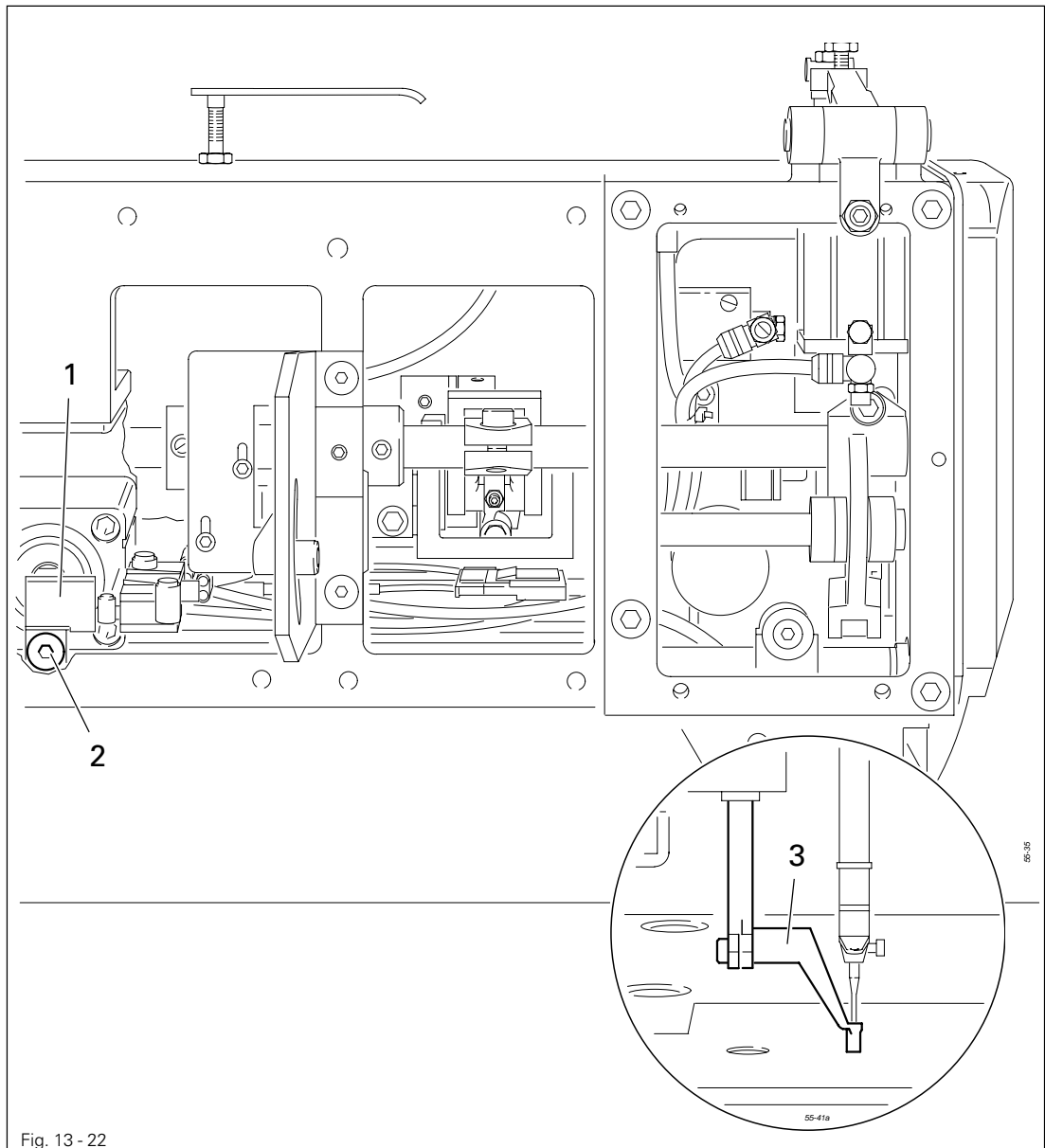
Fig. 13 - 22
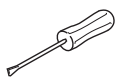
● Adjust clamp **1** (screw **2**) according to the **requirement**.

13.05.22   Adjustment of the presser foot level

Requirement
1. When the presser foot level is programmed, the second foot height should be set so that presser foot 5 is a distance above the counter presser 6 equivalent to the thickness of the workpiece.
2. When the needle bar is at b.d.c. and the level adjustment is raised to its maximum, the needle bar must not touch presser foot 5.
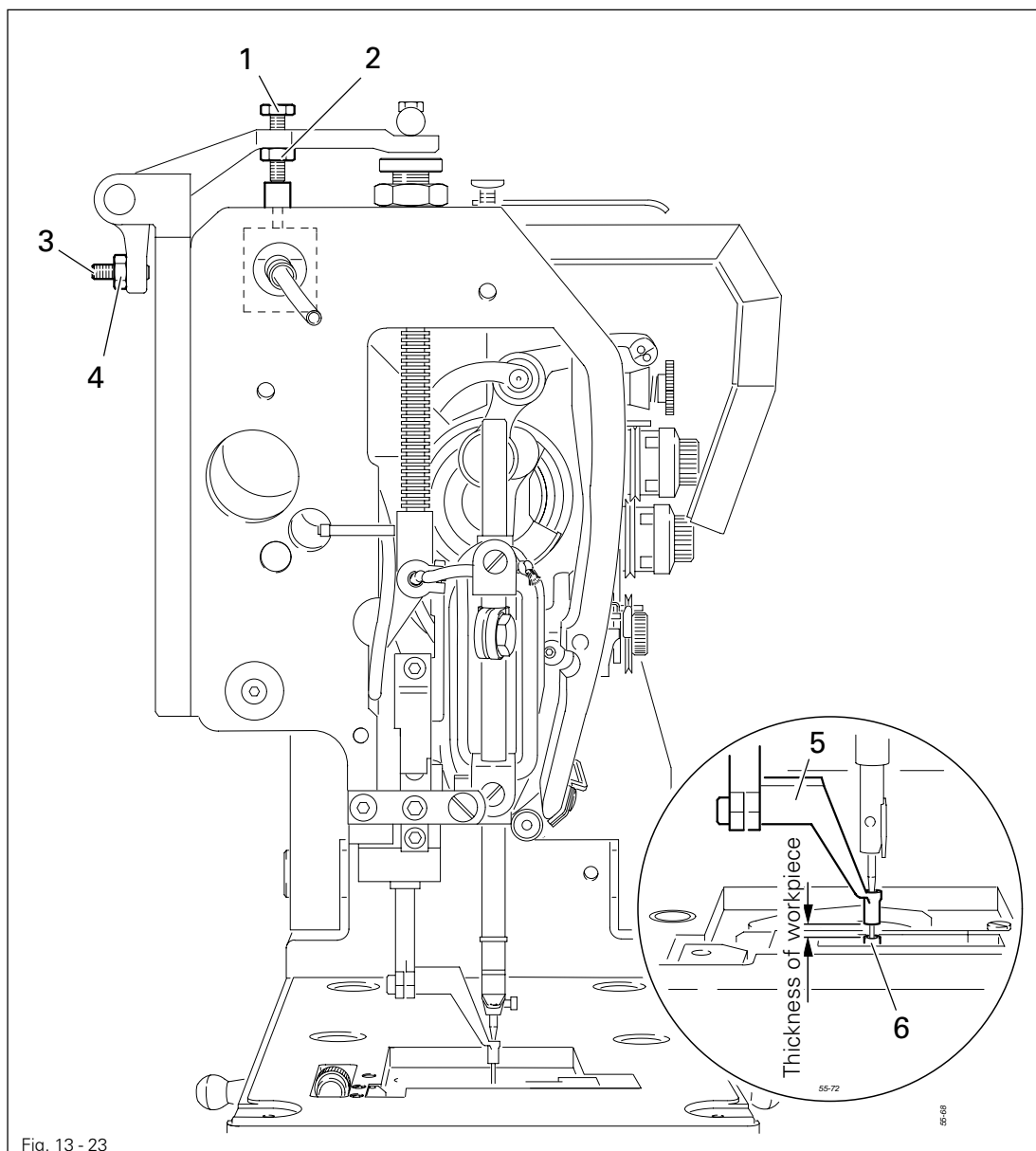
Fig. 13 - 23
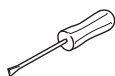
● Adjust screw 1 (nut 2) according to **requirement 1.**
● Adjust screw 3 (nut 4) according to **requirement 2.**

Adjustment

Bobbin winder

Requirement

1. When the bobbin winder is switched on, the bobbin winder spindle must move securely with the winder.
2. When the bobbin winder is switched off, friction wheel **5** must not be driven by drive wheel **1**.
3. The bobbin winder must switch off automatically when the bobbin has been filled to approx. **1 mm** from the edge.

Fig. 13 - 24
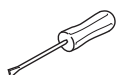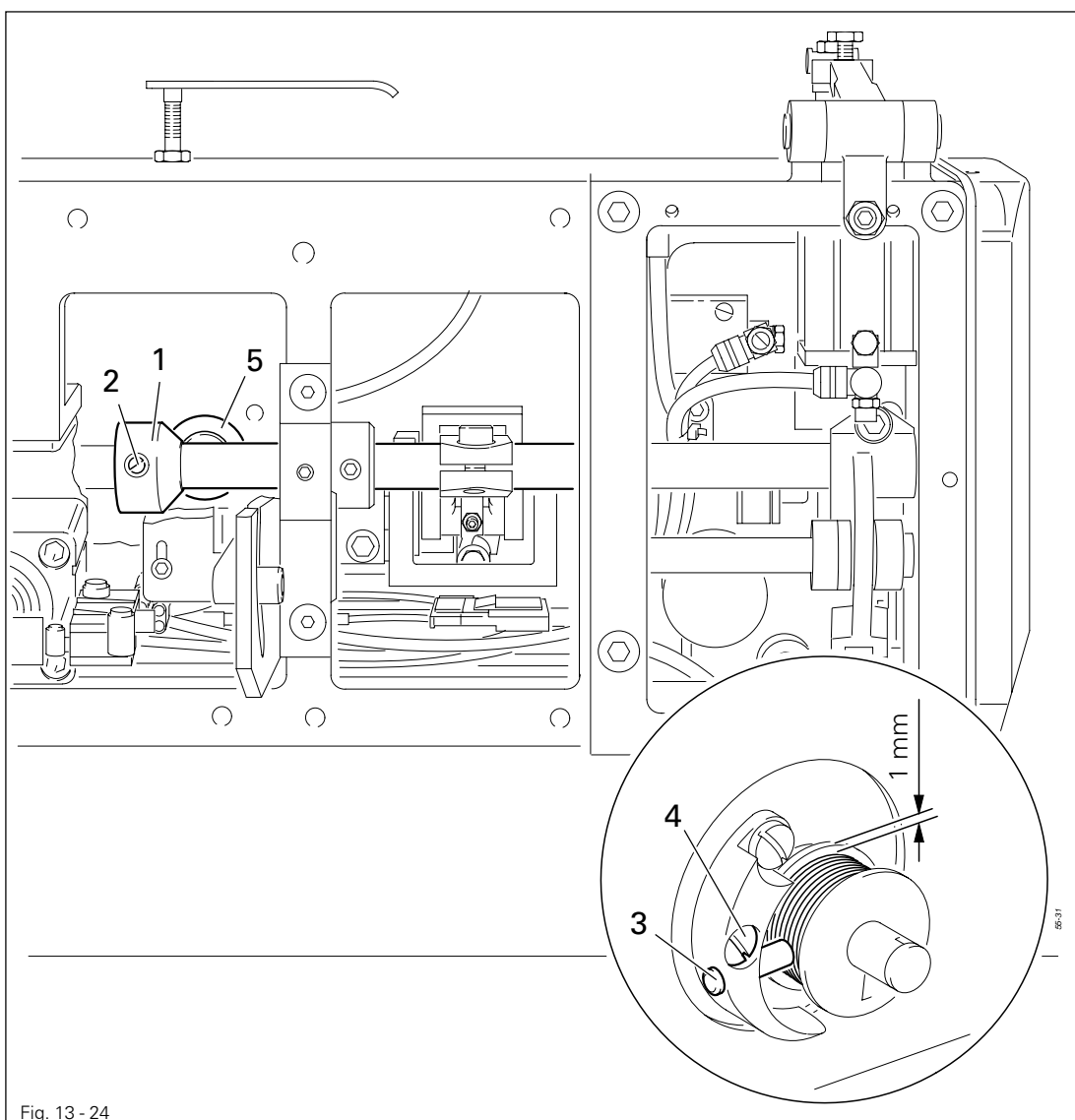
● Move drive wheel **1** (screws **2**) according to **requirements 1** and **2.**
● Move pin **3** (screw **4**) according to **requirement 3.**

PFAFF

13.05.24   Needle thread tension release

> **Requirement**
> For the tension release, the distance between the tension disks must be **0.5 mm**.

0,5 mm

2

1

Fig. 13 - 25
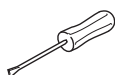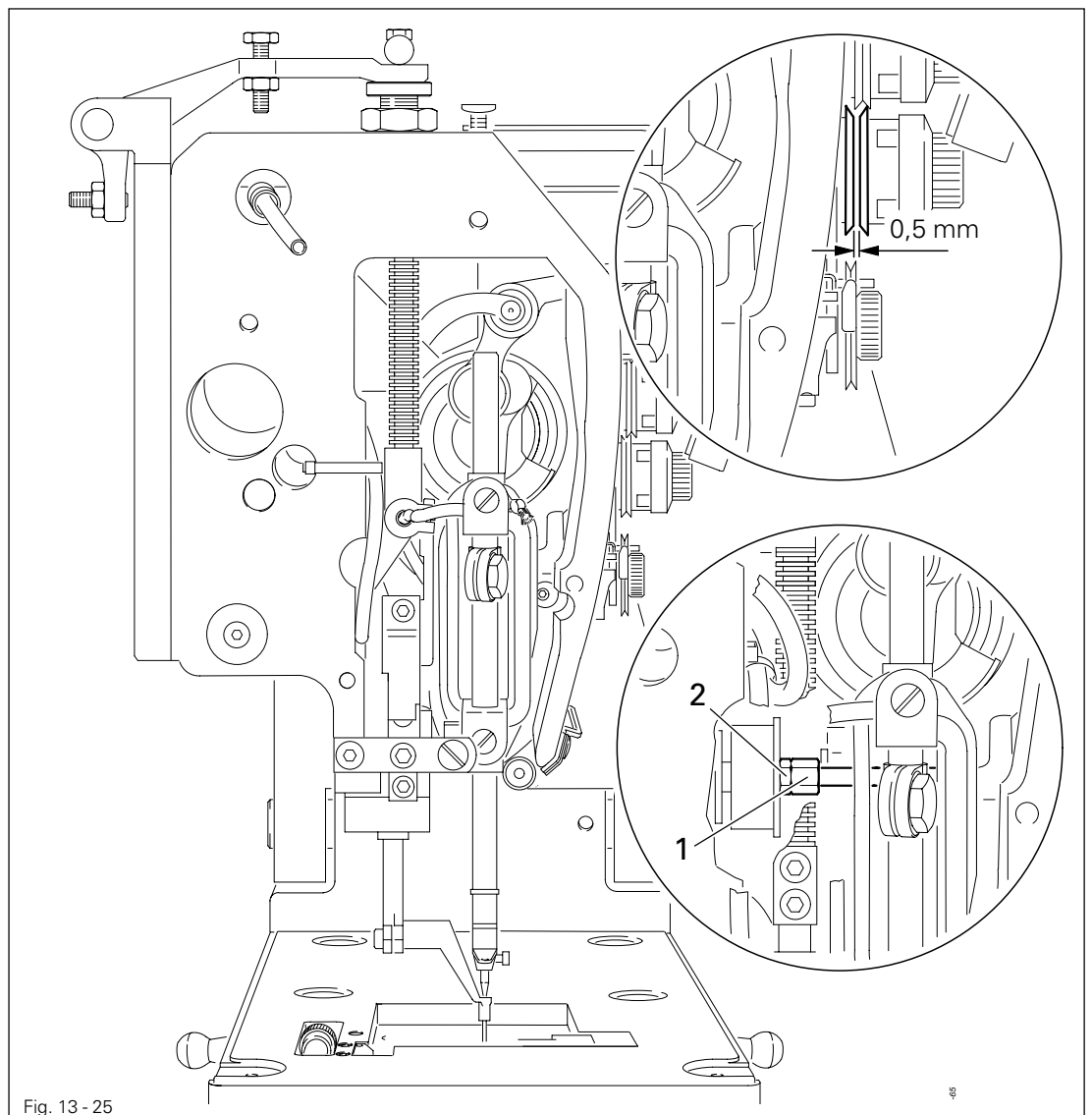
● Turn screw **1** (nut **2**) according to the **requirement**.

Adjustment

13.05.25   Thread check spring and slack thread regulator

> **Requirement**
> 1. The stroke of thread check spring **7** must be completed when the needle point penetrates the material (travel of the spring approx. **7 mm**).
> 2. When the thread loop is at its largest when going round the hook, the thread check spring **7** must be lifted slightly above support **1**.

Fig. 13 - 26
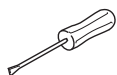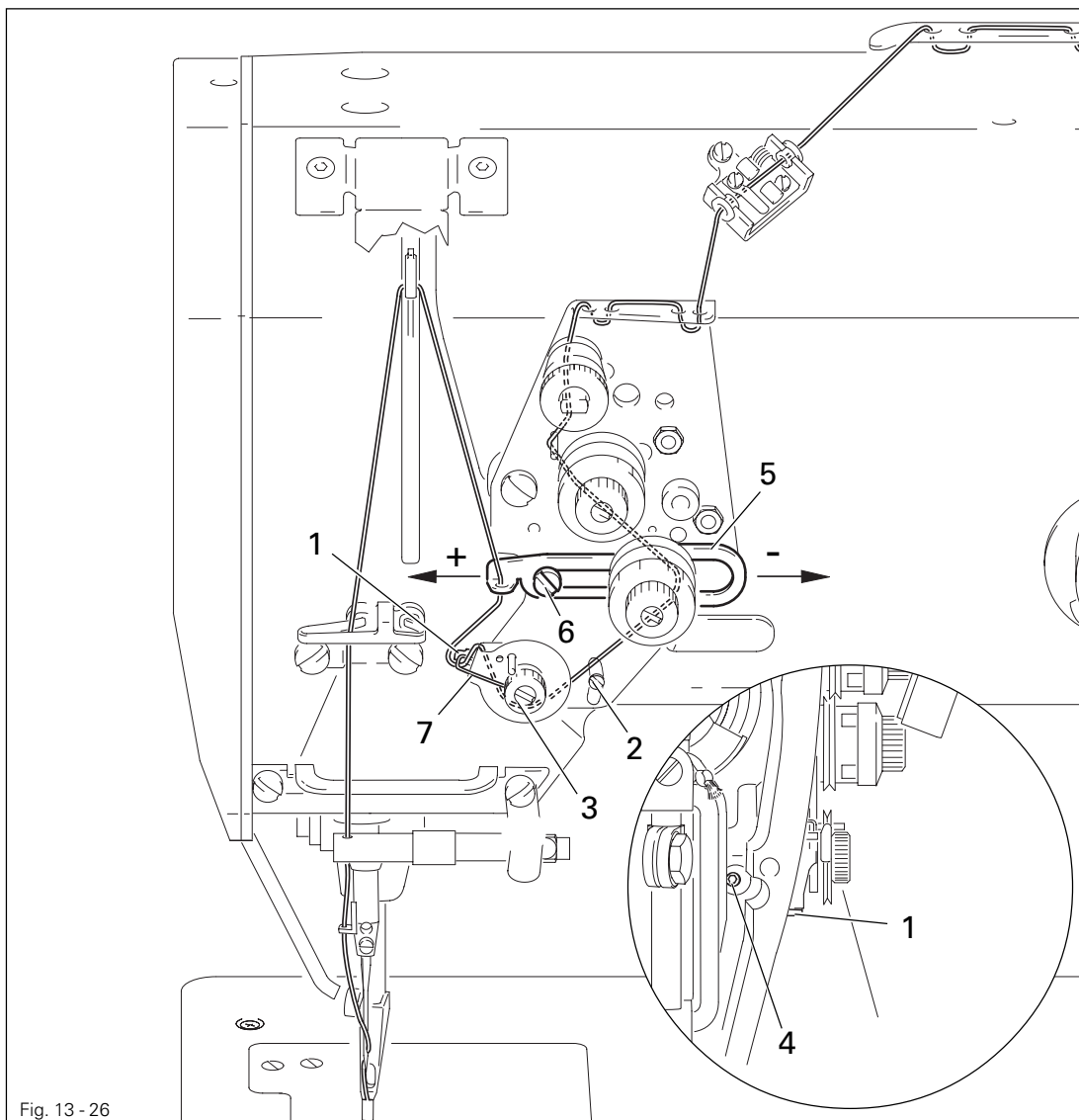
● Position rest **1** (screw **2**) according to **Requirement 1**.
● To adjust the spring tension, turn screw **3** (screw **4**).
● Position thread regulator **5** (screw **6**) according to **Requirement 2**.

> ℹ️ For technical reasons, it may be necessary to deviate from the travel of the spring and/or the spring tension indicated here.

13.05.26   Sewing head lifting cylinder

> **Requirement**
> The up and down movement of the sewing head must be uniform.
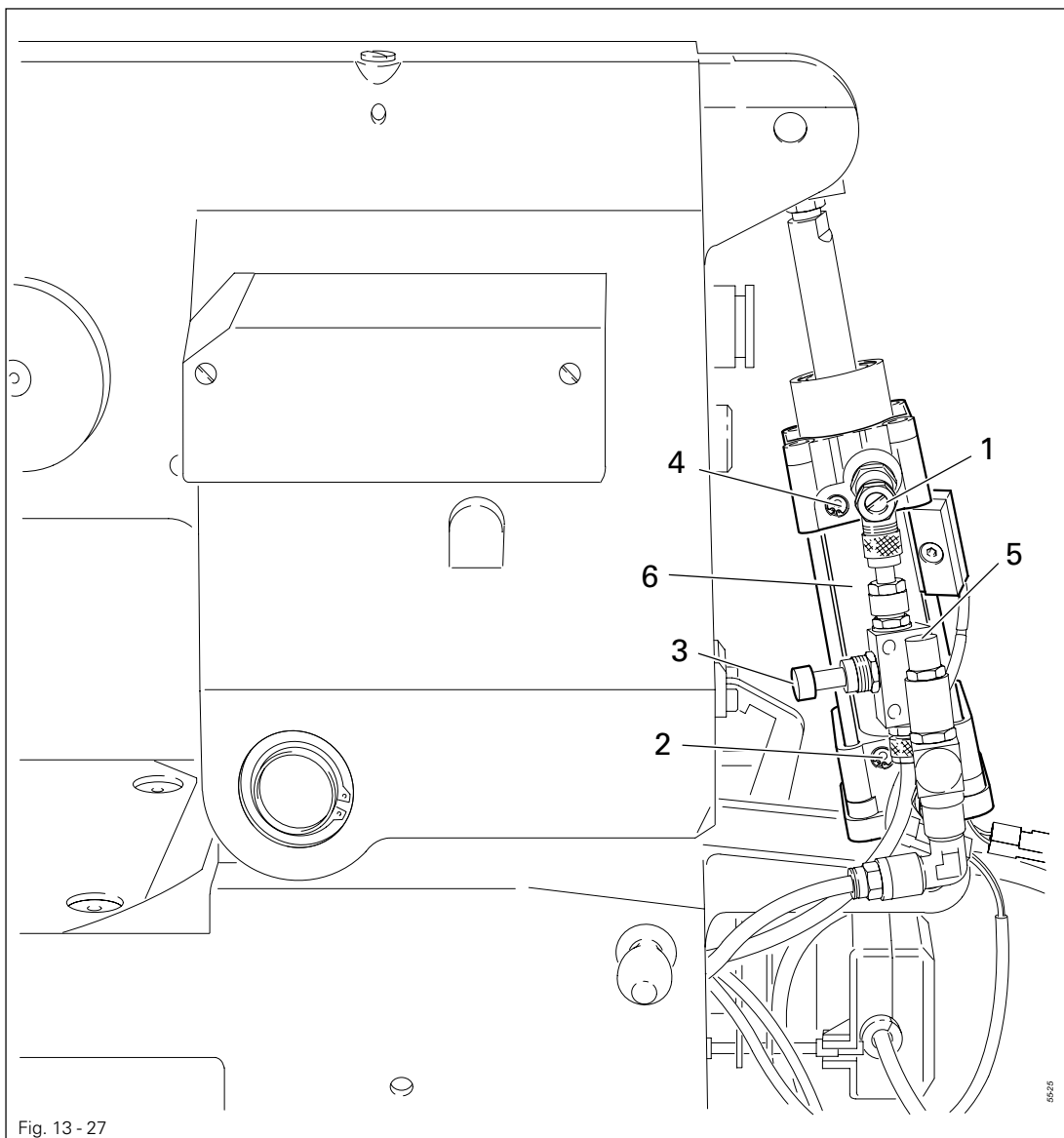
Fig. 13 - 27
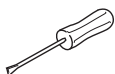
- Insert the sewing head and connect. (See **chapter 13.04 Removing/inserting sewing head.**)
- Adjust the speed (screw **1**) and shock absorbing action (screw **2**) of the upwards movement of the sewing head, and the speed (screw **3**) and shock absorbing action (screw **4**) of the downwards movement of the sewing head according to the **requirement.**

> ℹ The pressure for the downward movement can be regulated with screw **5** (standard setting **4.5 bar**).

> ⚠ When adjusting the shock absorbing action, make sure that the cylinder **6** moves as far as it can go especially for the downward movement of the sewing head!

Adjustment

Requirement
After the sewing operation has been completed, the machine is to position at TDC of the take-up lever.

Fig. 13 - 28
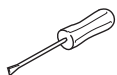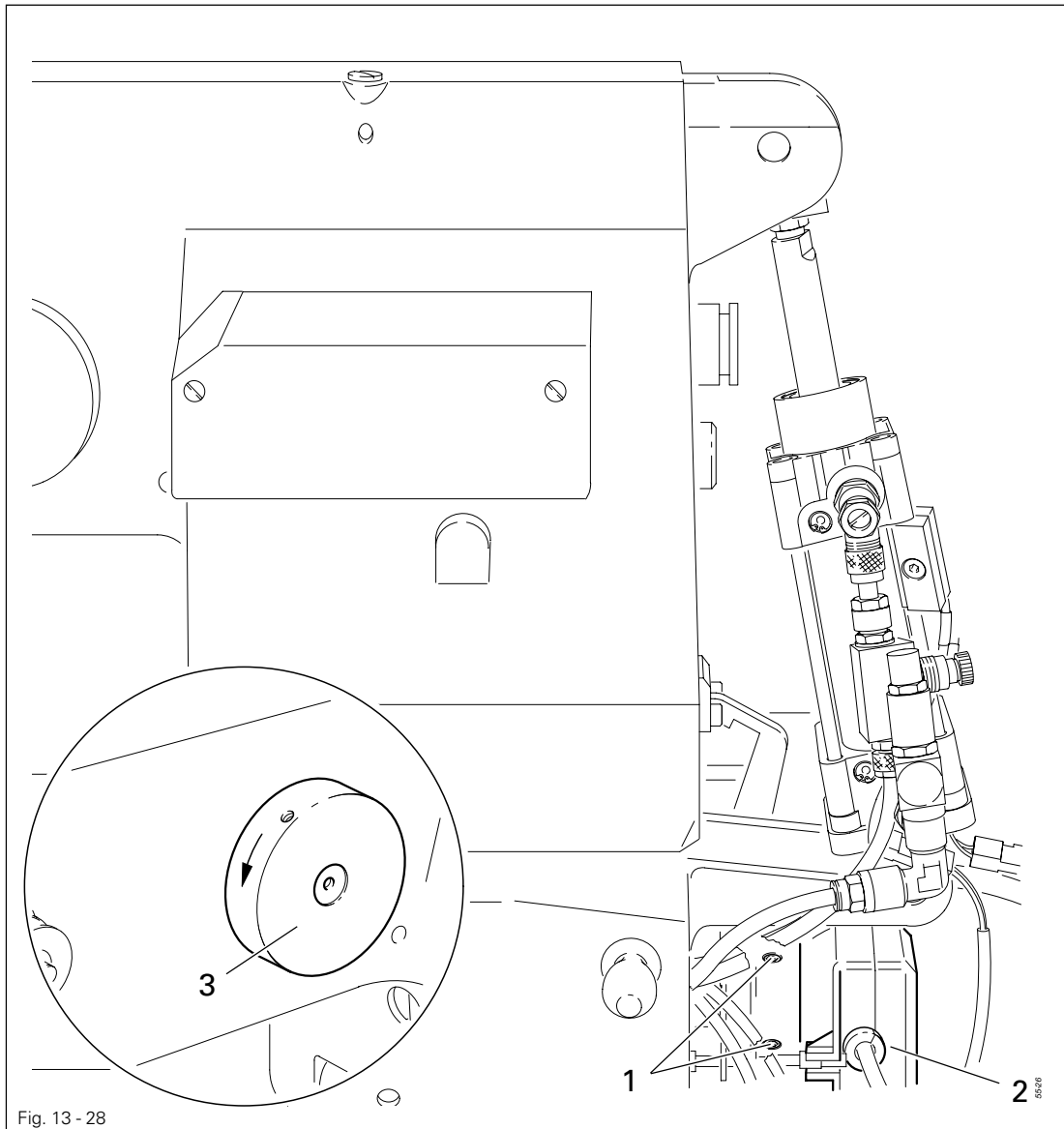
- Allow sewing machine to carry out positioning (switch on/off).
- Loosen screws **1**.
- Hold synchronizer **2** firmly and bring take-up lever **3** to TDC by turning the handwheel **4**.
- Tighten screws **1**.

⚠ After positioning and with the presser foot raised, the needle must not protrude below the presser foot.

13.05.28   Hook lubrication

> **Requirement**
> When the machine is running, after approx. **10 seconds** a fine line of oil must form on a
> paper strip held above the hook **1**.
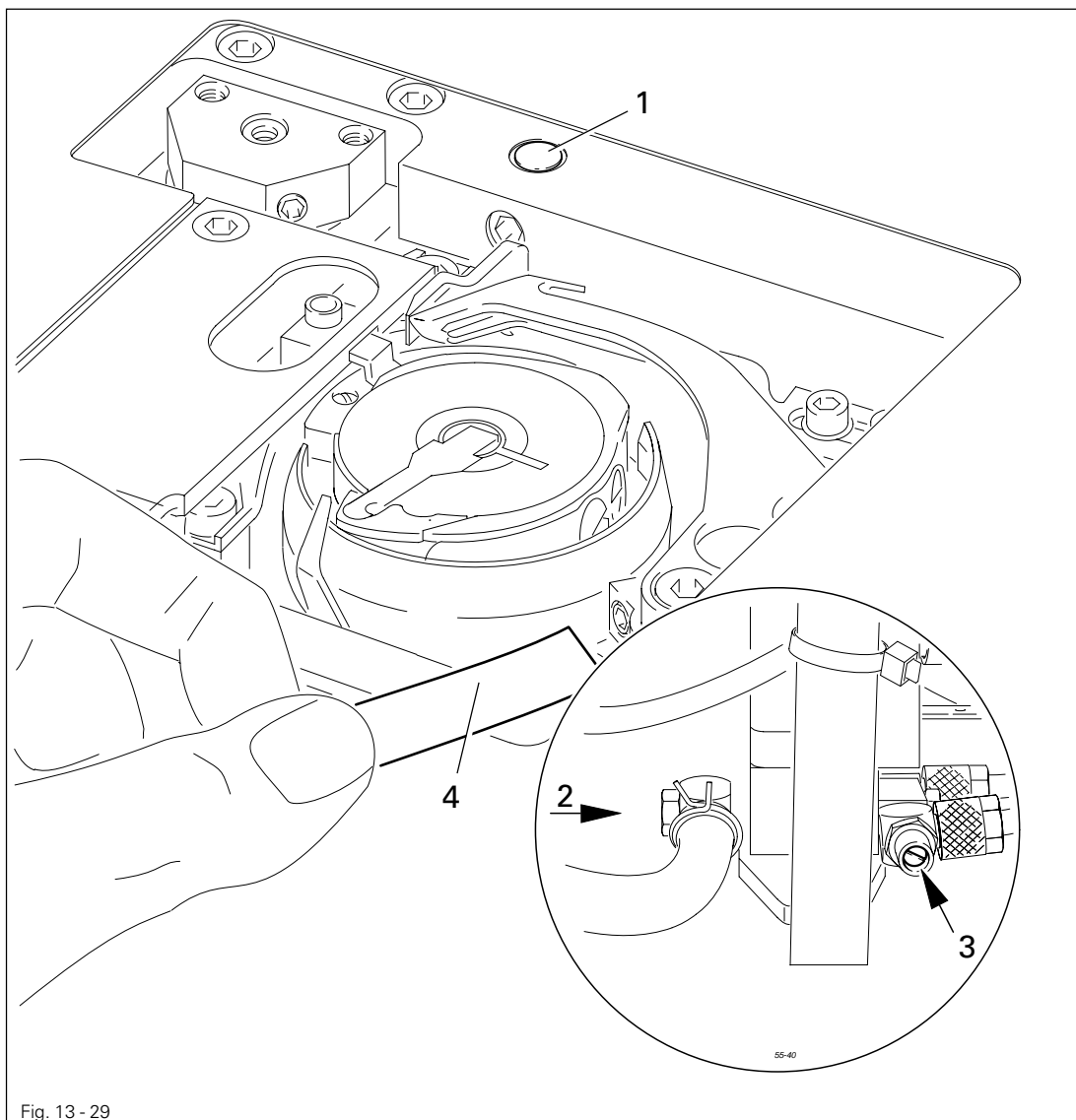
Fig. 13 - 29
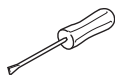
● Unscrew hook compartnant cover.
● Cover sensor **1** with metal ruler.
● Turn on machine.

● Select **INPUT** mode.

● Select **Input menu** function (number key 0).

6   ● Select SERVICE function.

1   ● Select SEWING DRIVE FUNCTIONS function.

Adjustment
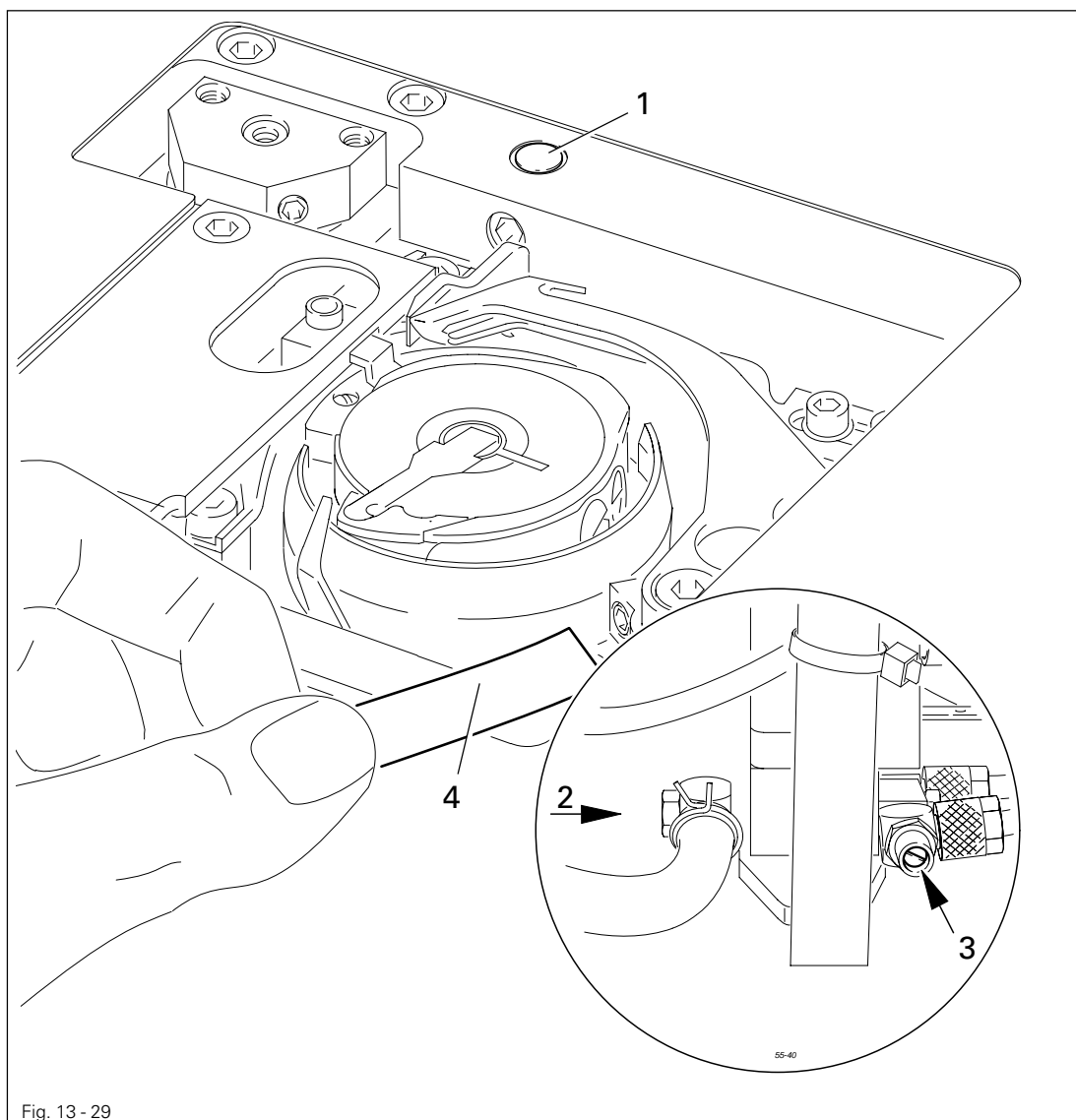
Fig. 13 - 29

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1 ● Select TURN SEWING MOTOR function.

● Set the speed to **2000 min**$^{-1}$ using the **number keys**.

> ⚠ When the sewing motor is running, do not reach into the needle area!
> Danger of injury by the moving parts!

Enter ● Confirm input with the **Enter key**.

◇ ● Select the **start** function.

● Allow the sewing motor to run for **2-3 min**.

● While the motor is running, hold a paper strip **4** next to the hook and check the **requirement**.

● If necessary, adjust the oil supply with screw **2**.

● Switch the machine off and screw on the hook compartment cover.

> ⚠ The wick used for lubricating the front parts must always be impregnated with oil. However, oil must not drip onto the bedplate!

● If necessary, adjust the amount of oil with screw **3**.

PFAFF

13.06 Adjusting the clamp drive and clamp feeder

13.06.01 Monitoring the clamp drive

Requirement
1. The initiator **1** should be **0.2 mm** below the switch lug **3**.
2. It should not be possible to move clamp **5** more than **3 mm** down and **303 mm** up in y-direction from its zero point.
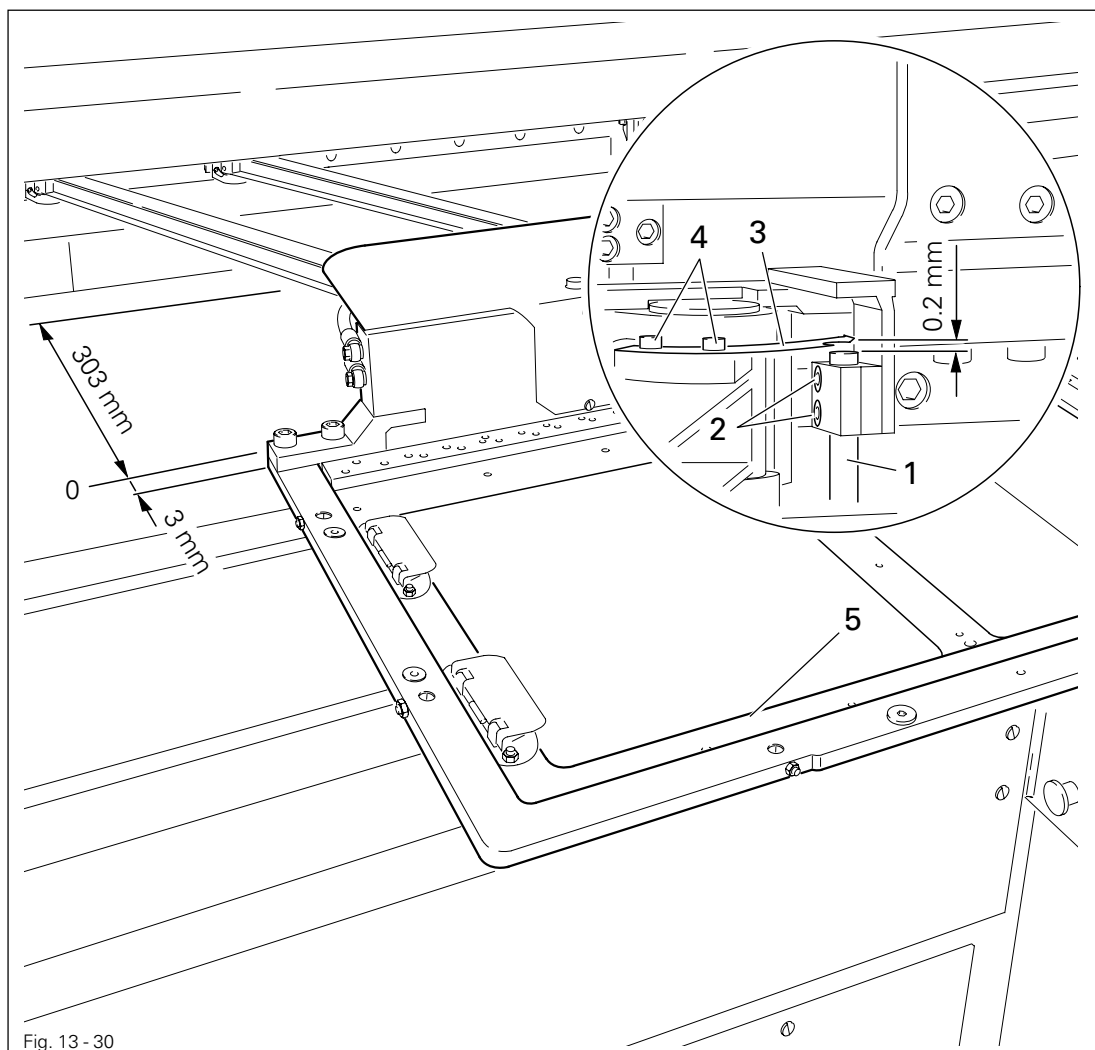
Fig. 13 - 30
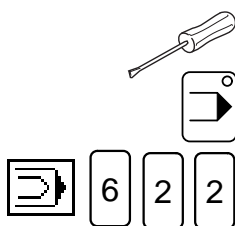
● Switch machine on.

● Select INPUT mode.

● Select the function STEPPING MOTOR 2 from the service functions.

● Adjust initiator **1** (screw **2**) according to **requirement 2**.
● To check **requirement 1** move stepping motor 2 and adjust switch lug **3** (screws **4**) according to **requirement 1**.

Adjustment

13.06.02   Aligning the clamp drive

Requirement
Clamp 2 should lightly touch the surface evenly over the entire table top area.

Fig. 13 - 31
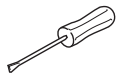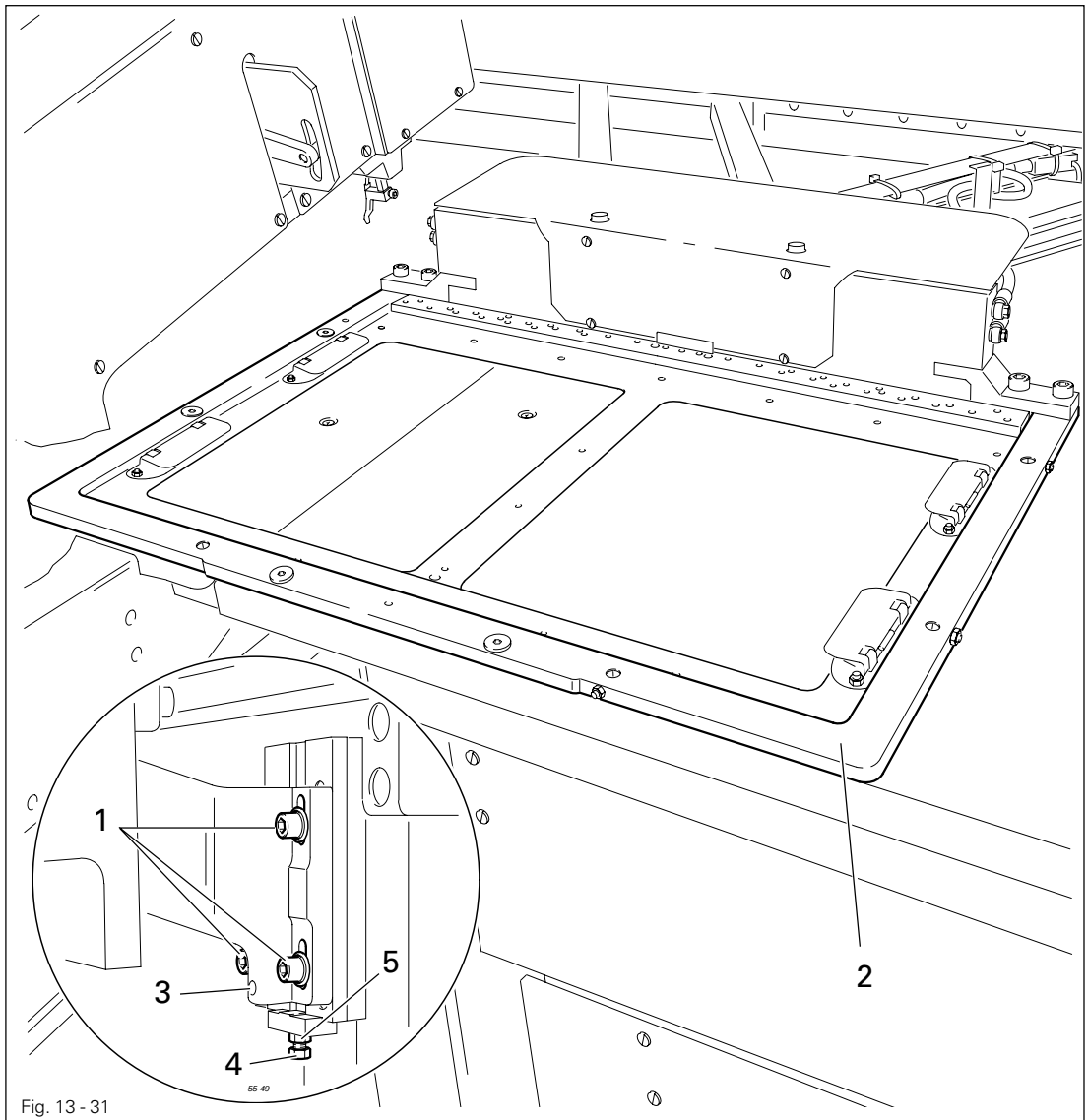
● Loosen the 4 screws on both sides of the machine.
● Align clamp 2 according to the **requirement** by turning screws 3 and 4 (nuts 5).

13.06.03 Hand-over position of the clamp feeder at the loading station

Requirement
During indexing the clamp should not move.
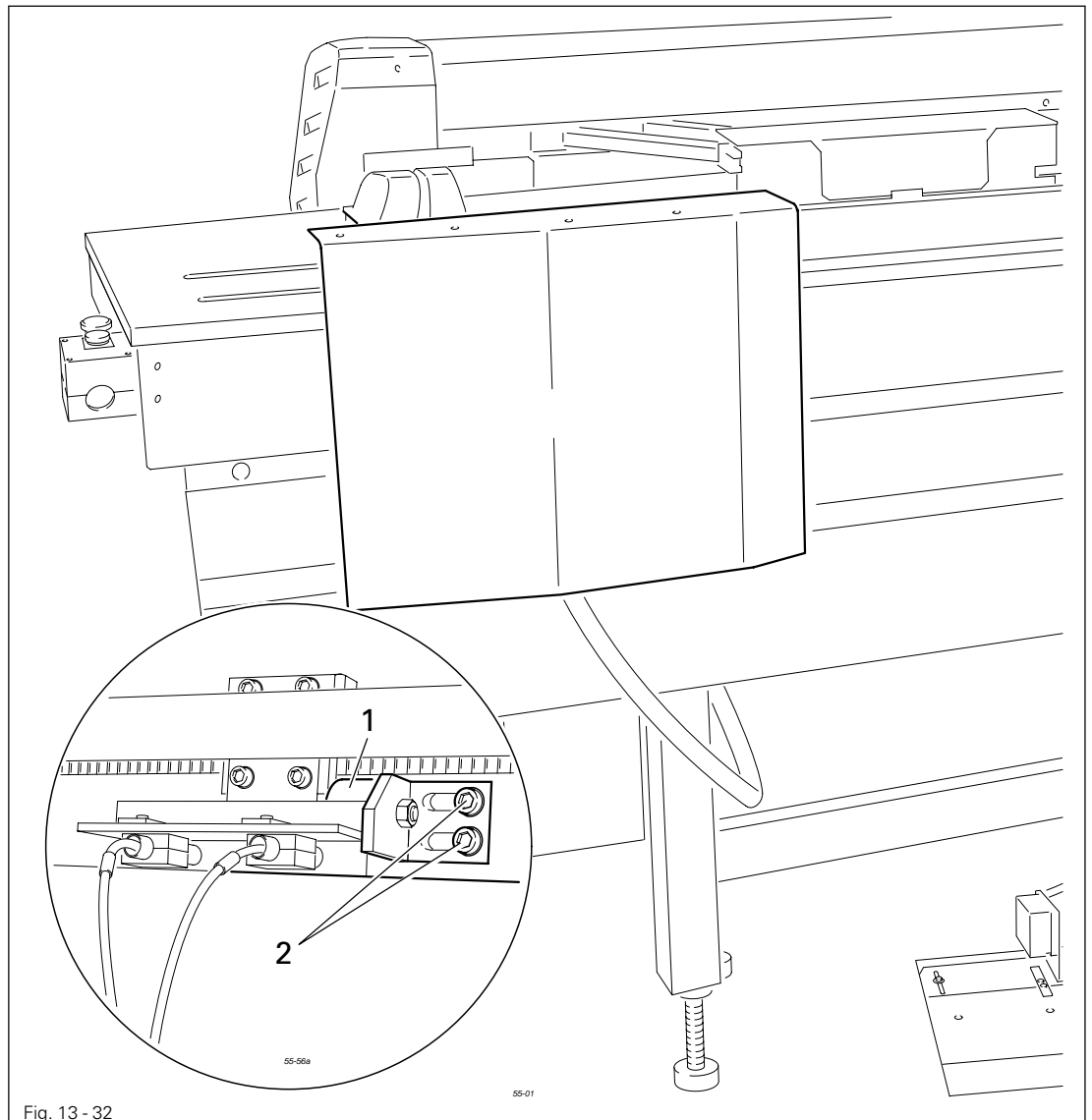
Fig. 13 - 32
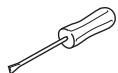
● Adjust stop **1** (screws **2**) according to the **requirement.**

● To check the **requirement** switch on the machine and run through the function sequence **Individual step.**

● Check the feeder hand over and feeder take over position and adjust if necessary, see **Chapter 8.07 Check/adjust zero points.**

Adjustment

13.06.04   Hand over position of the transport pins

> **Requirement**
> 1. The transport pins should be parallel to the clamp.
> 2. The clamp should be taken over without play.

Fig. 13 - 33
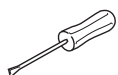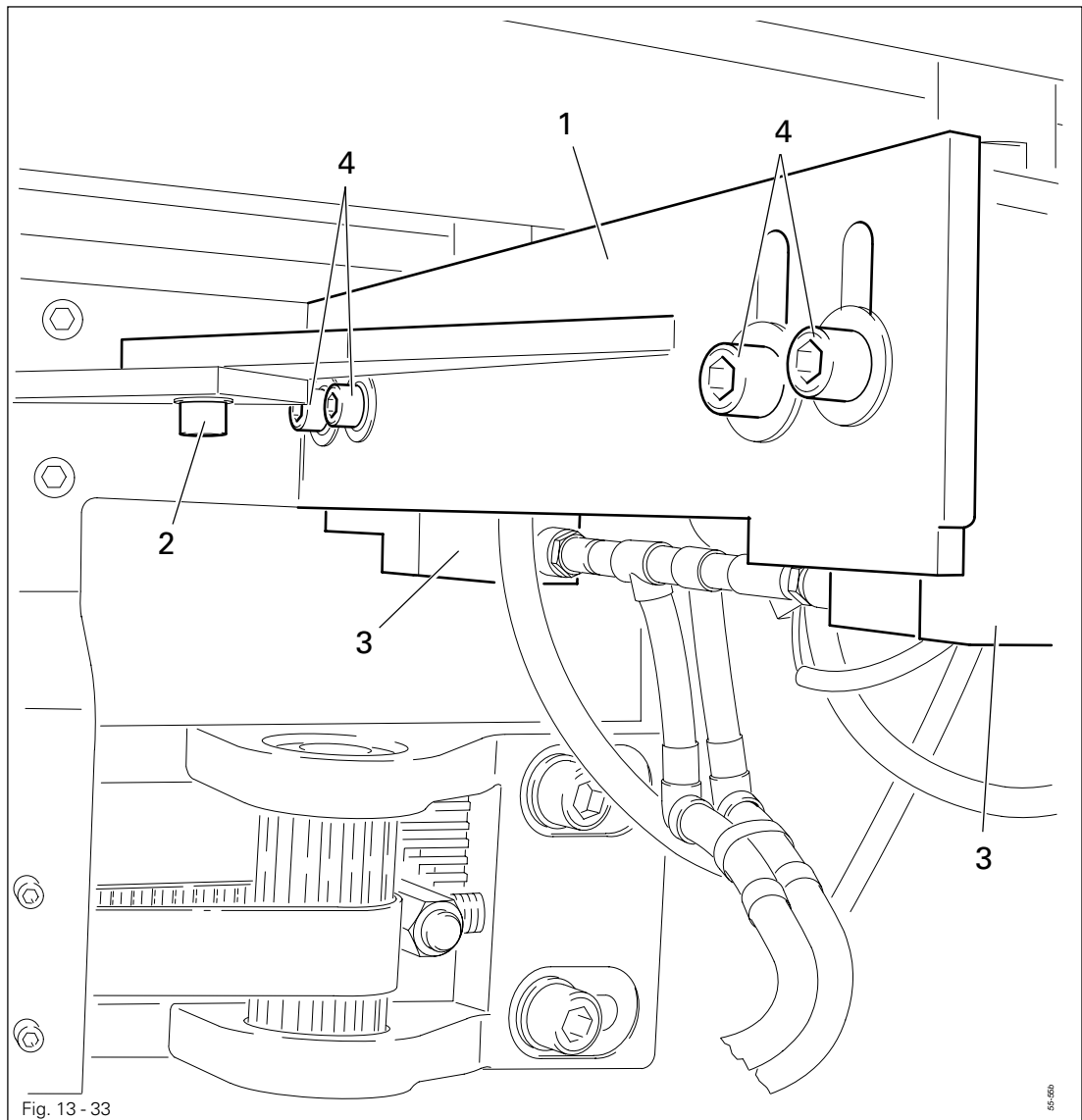
● Swing bracket **1** (screw **2**) according to **requirement 1.**
● Adjust cylinder **3** (screws **4**) according to **requirement 2.**

13.06.05   Adjusting the belt tensions

Requirement

The belt tensions should be tested and adjusted with measuring device **5**.

1. The belt tensions of the clamp drive should be tested with a reading of **1100 Nm** (belt width 50 mm).

2. The belt tension of the clamp feeder should be tested with a reading of **550 Nm** (belt width 25 mm).
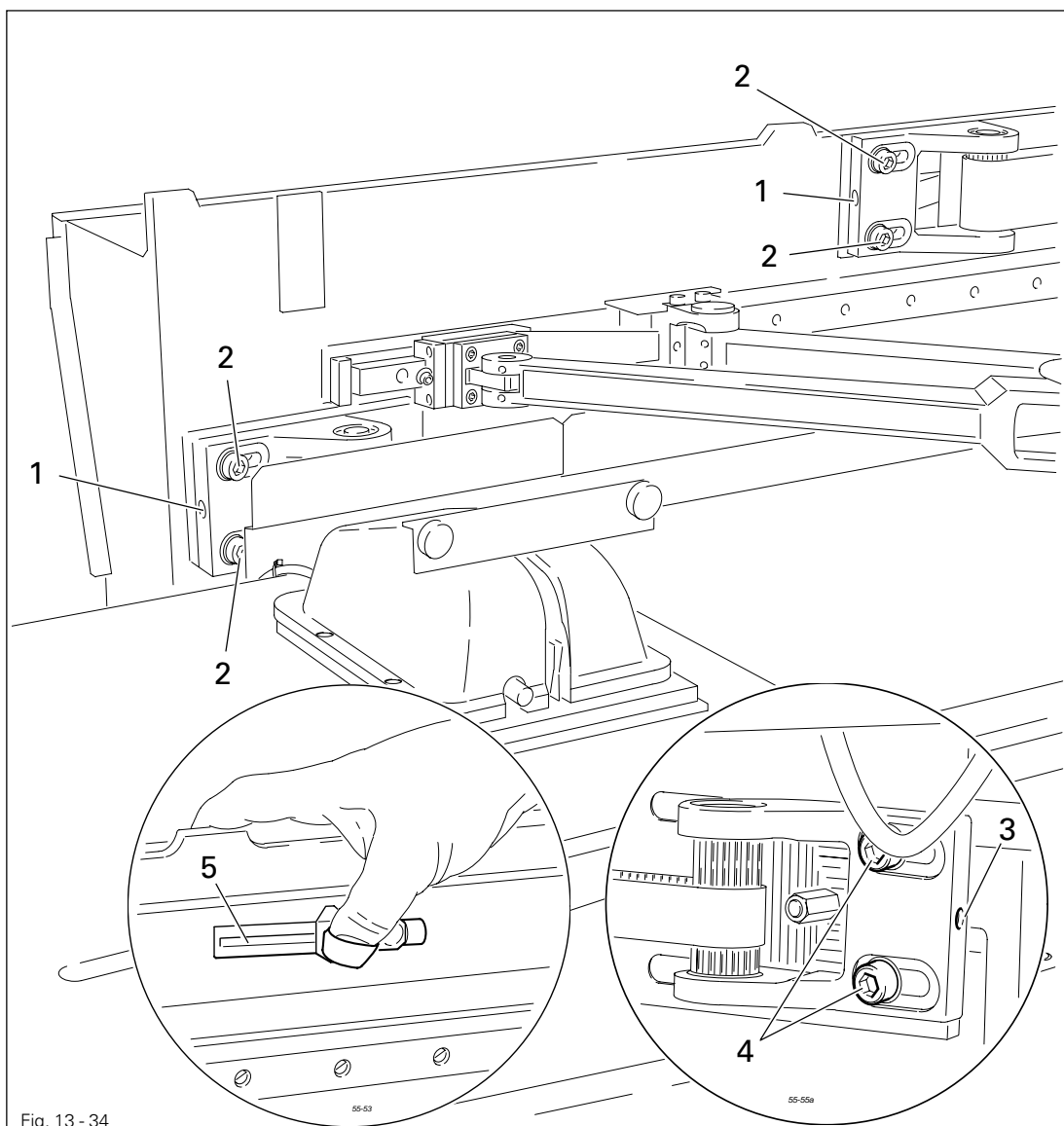
Fig. 13 - 34
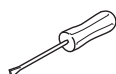
● Adjust belt tensions of clamp drive with screws **1** (screws **2**) according to **requirement 1.**

● Adjust belt tensions of clamp feeder with screw **3** (screws **4**) according to **requirement 2.**

ℹ️ Information about the correct use of measuring device **5** can be found in the enclosed instructions for measuring device **5**.

Adjustment

13.06.06   Clamp drive reference points

Requirement

With the TEST CARRIAGE function, the clamp drive should move exactly to all of the reference points.

Point 1

Point 2
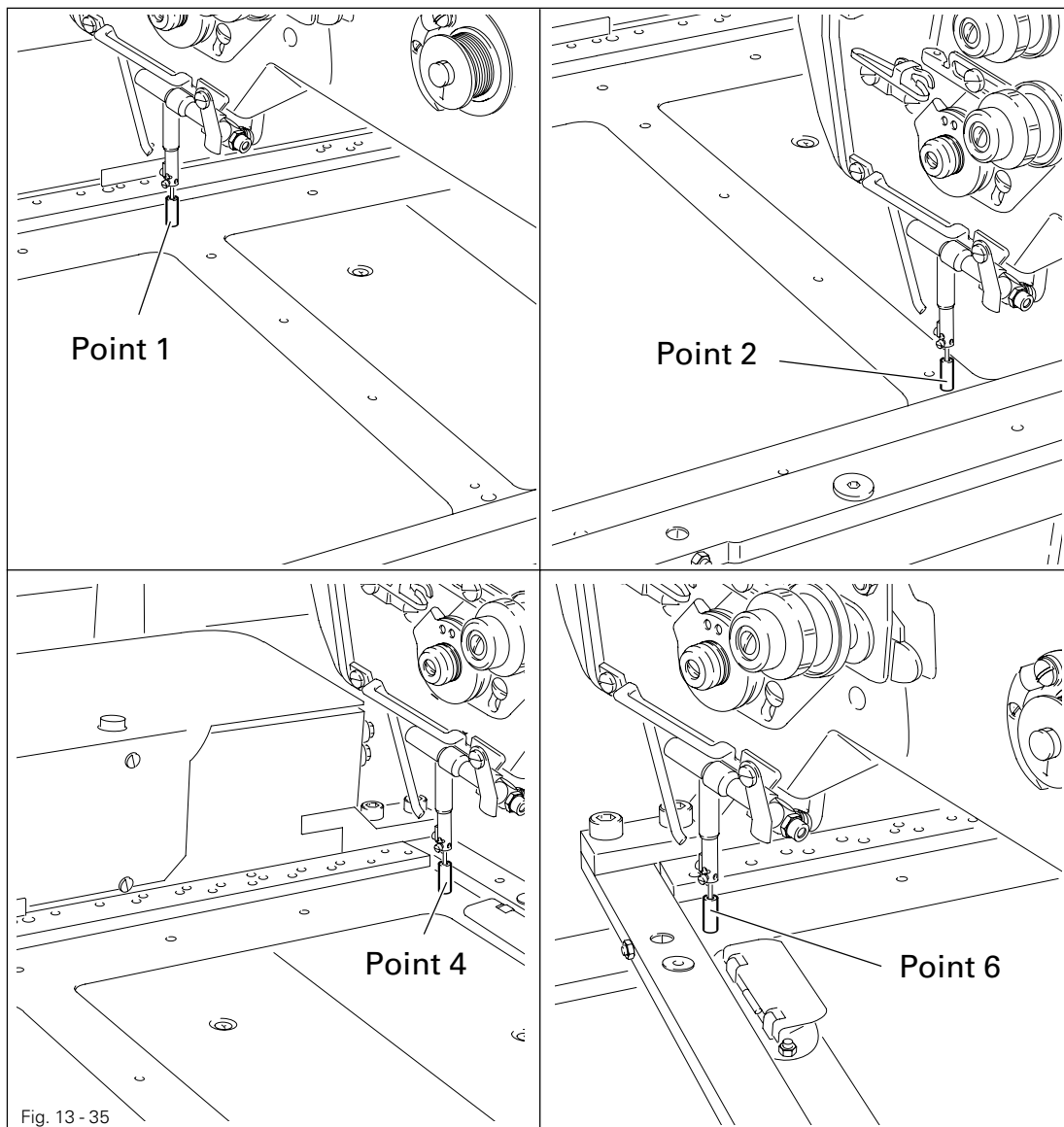
Point 4
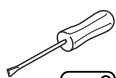
Point 6

Fig. 13 - 35

● Switch on the machine.

● Select INPUT mode.

|6| |2| |4| ● Select the TEST CARRIAGE function from the service functions.
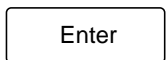
Enter   ● Insert clamp and press ENTER.
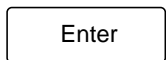
Enter   ● Move to point 1.
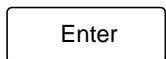
Enter   ● Move to all the reference points one after the other.
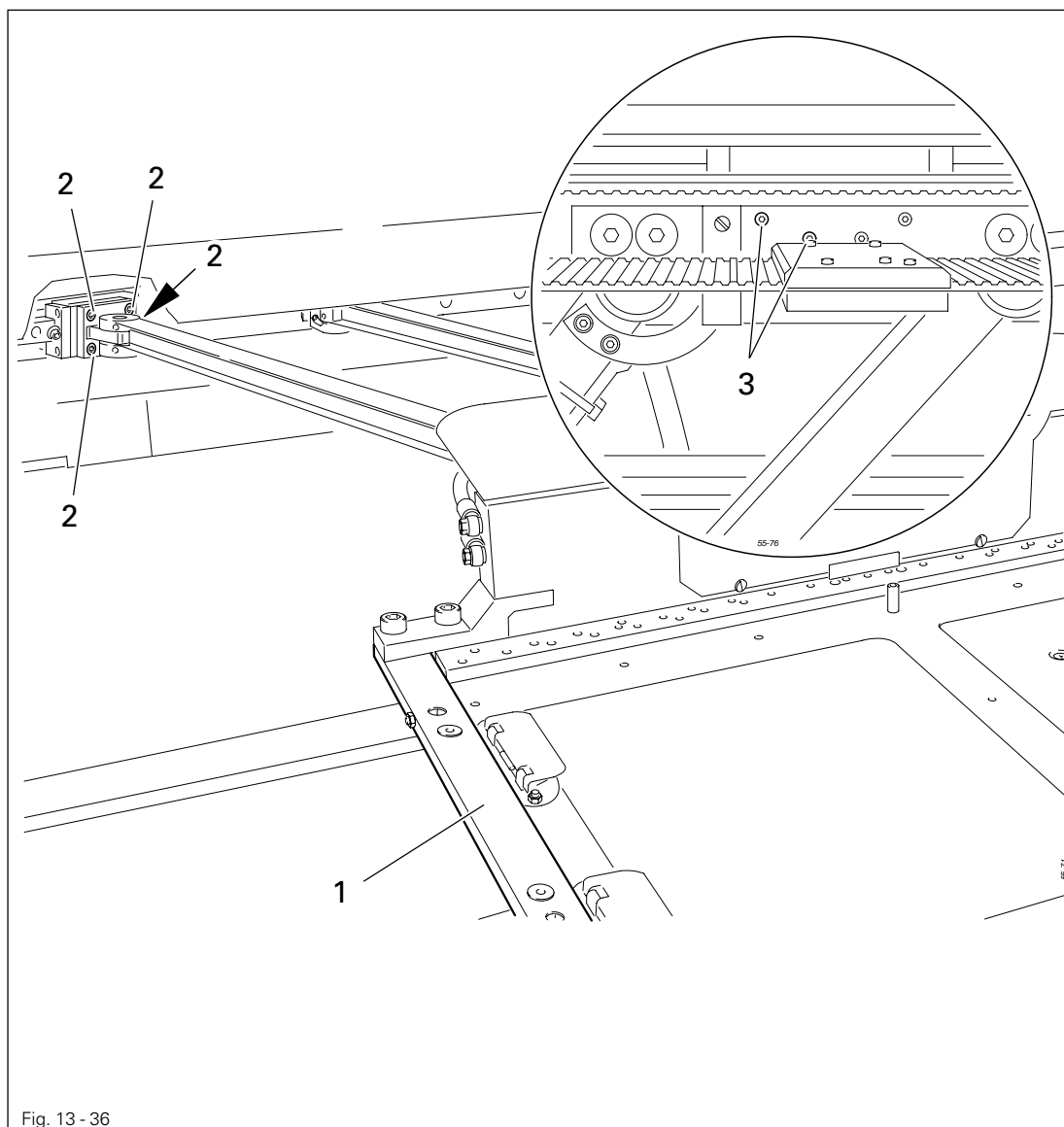
Fig. 13 - 36
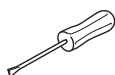
Adjustment for lateral deviation between Point 1 and Point 2:
● Adjust clamp **1** (screws **2** and **3**) according to the **requirement**.

Adjustment for linear deviation between Point 1 and Point 2:
● Adjust the zero points according to **Chapter 8.07 Check/adjust zero points.**

Adjustment for linear deviation between Point 4 and Point 6:
● Carry out increment correction with the INCREMENT-CORRECTION MOTOR 1 and INCREMENT-CORRECTION MOTOR 2 functions according to the **requirement.**

After an increment correction the zero points must be checked and, if necessary, adjusted, see **Chapter 8.07 Check/adjust zero points.**

Contents .... Chapter - Page

14 Control

14.01 Basic setting / Diagnosis / Pin assignment

14.01.01 Basic control unit A20

⚠️ In the factory, the basic control unit is equipped with the necessary operating and ramp software. This may only be replaced by appropriately trained personnel.

Pin locations

Key for booting the software

Disk drive

Mains connection

X4, Com2

X5, SM-axis 1

X6, SM-axis 2

X3, Com1

X7, SM-axis 3

X8 CAN-Bus

16V/AC, Si 0.5 A/T

X11, Main drive

Index

Network, Si 1.25 A/T

5 V CPU, Si 2A/T

Thread monitor

24 V, max. 5 A

Periphery, Si 6.3 A/T
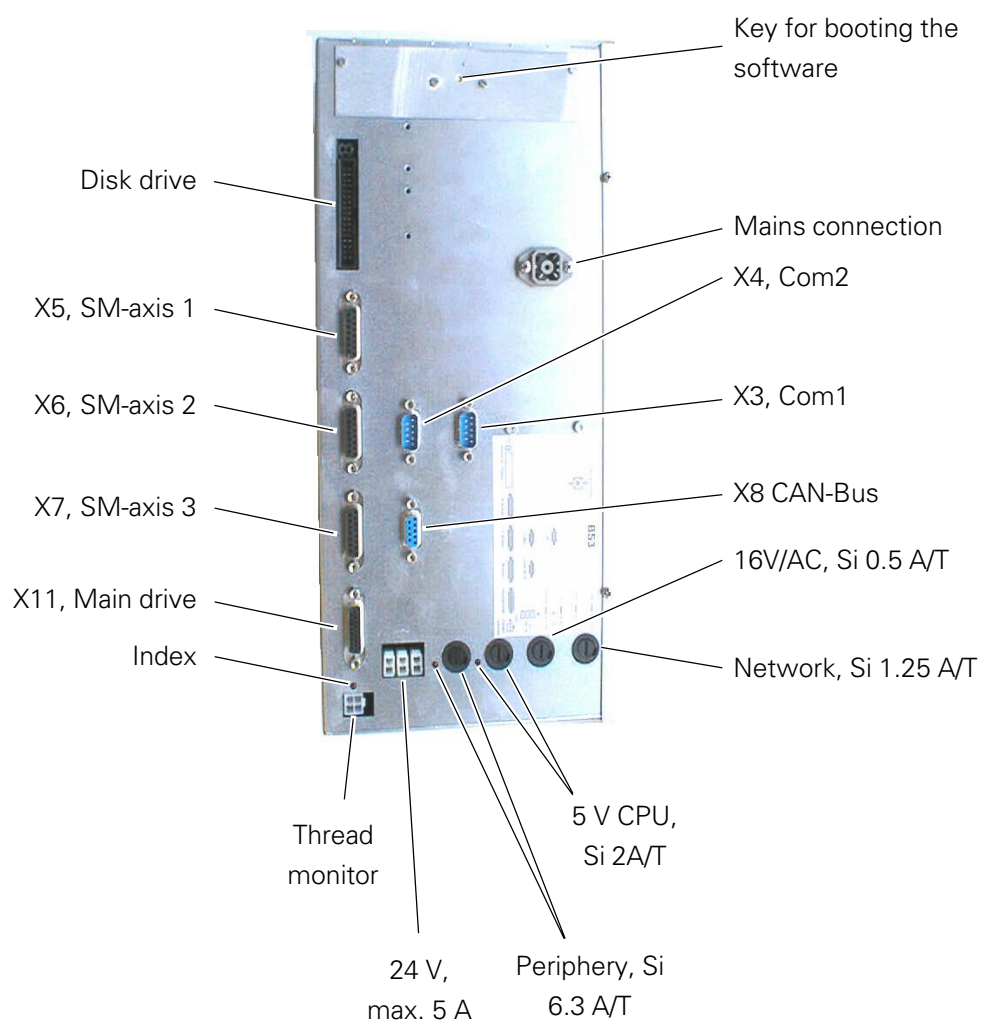
Operation indicators/Voltage supply

LEDs are provided on the top of the equipment for the various operating voltages (see adhesive label on the top side of the equipment).

These are LEDs for +5V, +24V and for the synchroniser index on the main drive unit.

Fuses

(see label)

Mains fuse	2.5 AT
+5 V supply	8 AT
+24 V supply	1.6 AT

Pin assignment

X3 (COM1) and X4 (COM2)

PIN	Signal	PIN	Signal
1	Vterm1	6	bridged at PIN 4
2	RxD	7	RTS
3	TxD	8	CTS
4	bridged at PIN 6	9	Vterm2
5	GND		

X 5 (X-axis/motor 1), X6 (Y-axis/motor 2), X7 (motor 3)

PIN	Signal	PIN	Signal
1	Pulse +	9	Pulse -
2	Direction +	10	Direction -
3	Fkt1 +	11	Fkt1 -
4	Fkt2 +	12	Fkt2 -
5	Vex +	13	Vex -
6			
7	Input2 +	14	Input2 -
8	Input1 +	15	Input1 -

X8 (CAN-Bus)

PIN	Signal	PIN	Signal
1	P8HA +	6	
2	P8HA -	7	
3	DoRi +	8	DoRi -
4	GND	9	GND
5			

X11 Main drive

PIN	Signal	PIN	Signal
1	Screening	14	A_A
2	TxD_A	15	A_B
3	RxD_A	16	B_A
4	TxD_B	17	B_B
5	RxD_B	18	I_A
6		19	I_B
7	GND	20	GND
8		21	A_OC
9	R1_A	22	B_OC
10	R1_B	23	I_OC
11	R2_A	24	V2
12	R2_B	25	GND
13	GND	26	Vex

14.01.02   Sewing drive A22

⚠ Before leaving the factory the sewing drive controller is equipped with the necessary operating software. This software may only be replaced by appropriately trained personnel.

The LED "Power on" shows that the unit is ready for operation. Diagnosis functions and fuses are not available. If error messages appear on the machine display, see **Chapter 14.02.02 Error ind sewing drive.**

Pin assignment

X1 (Synchronizer)

PIN	Signal	PIN	Signal
1	FA	6	
2	FB	7	
3	SM	8	
4	ADTC1	9	GND
5	+ 5V		

X2 (Commutating signal generator)

PIN	Signal	PIN	Signal
1		6	KA
2		7	KB
3		8	KC
4	ADTC2	9	GND
5	+ 5V		

X3 (Interface)

PIN	Signal	PIN	Signal
1	GND	14	A
2	TxD	15	A\
3	RxD	16	B
4	TxD\	17	B\
5	RxD\	18	Index
6		19	Index\
7	GND	20	
8		21	
9	REF1	22	
10	REF1\	23	
11	REF2	24	
12	REF2\	25	
13	GND	26	

X6 (Mains)

PIN	Signal
1	PE
2	N
3	L1

X14 (Motor)

PIN	Signal
1	PE
2	U
3	V
4	W

14.01.03 List of parameters - Sewing drive

Parameter	Denomination	Range		Default	
		min.	max.	(Quick)	3587
(606) 0D$_H$	minimum speed (in 10 min^{-1})	3	64	(20)	3
(607) 0E$_H$	maximum speed (in 100 min^{-1})	1	100	(15)	45
(609) 10$_H$	positioning speed (in 10 min^{-1})	3	25	(20)	20*
(718) 07$_H$	rest brake power	0	100	(0)	0
(722) 11$_H$	positive ramp (in ms^{-1})	1	50	(45)	45
(723) 12$_H$	negative ramp (in ms^{-1})	1	50	(30)	45
(804) 15$_H$	count position (in Incr.)	0	239	(120)	0
(840) 1C$_H$	time-out (in 10 ms)	1	100	(10)	10
(841) 16$_H$	reference signal 1 (in Incr.)	0	239	(0)	60*
(842) 17$_H$	reference signal 2 (in Incr.)	0	239	(0)	133*
(843) 1F$_H$	machine code	0	255	(255)	1
(850) 0F$_H$	max. motor speed (in 100 min^{-1})	20	60	(50)	50
(851)	steep brake ramp for path monitoring	see par. 08$_H$		(Bit7 = 1)	Bit7 = 1
(852) 18$_H$	altern. pos. ramp (in 0,1 min^{-1})	1	250	(10)	-
(853) 19$_H$	altern. neg. ramp (in 0,1 min^{-1})	1	250	(10)	-
(854)	braking when power off	see par. 08$_H$		(Bit3 =1)	Bit3 = 1
(884) 00$_H$	P-quota speed controller	1	50	(12)	25
(885) 01$_H$	l-quota speed controller	0	100	(30)	30
(886) 02$_H$	P-quota position controller	1	50	(20)	20
(887) 03$_H$	D-quota position controller	1	100	(30)	30
(889) 04$_H$	time for position control (in 10 ms)	0	100	(40)	40
(890) 05$_H$	P-quota for rest brake	1	50	(25)	25
(891) 06$_H$	D-quota for rest brake	0	50	(20)	20
(894)	rotary direction synchronizer	see par. 08$_H$		(Bit1 =1)	Bit1 = 1
(897)	commutating signal generator	see par. 08$_H$		(Bit4 =0)	Bit4 = 0
(898)	pole number motor	see par. 08$_H$		(Bit5 =0)	Bit5 = 0
(997) 0A$_H$	winding resistance motor (in 100 mOhm)	10	99	(50)	50
(998) 09$_H$	constant of e.m.f. motor (in V/1000 rev.)	10	250	(60)	60
(999) 13$_H$	delay for path-optimized brakes (in ms^{-1})	20	50	(30)	30

*   The parameter can be changed in the input and/or varies dependent on the machine type.

Special requirements for parameter 08$_H$

In the following byte some parameters are encrypted. These can only be changed by manipulating the corresponding bits. Bits 0, 2 and 6 may not be changed.

Bit:	7	6	5	4	3	2	1	0	
	1	1	0	0	1	0	1	0	(Bitpattern class 3587)

(894)   0: rotary direction commutating signal generator

(854)   0: motor slows down until it comes to a halt, when power off
                                              1: motor is braked by means of e.m.f., when power off

(897)   0: Quick commutating signal generator
                                  1: other commutating signal generator

(898)   0: 6-pole motor
                      1: 4-pole motor

(851)   0: set value for flat ramps on stitch-counted seams (parameter 12$_H$ < 20)
            1: set value for steep ramps on stitch-counted seams (parameter 12$_H$ > 20)

PFAFF

14.01.04   Stepping motor drive A21

The stepping motor controller has the following initial setting:

DIP-switch

OFF ON

*		Step no.: 1000
*		Step no.:
*		Current reduction active
*		Enable

Rotary switch

B	Position B ==> phase current 5.4 A

For information about LED status indications see Chapter **14.02.03 Errors - Stepping motor drive.**

Pin assignment

X1 (motor 1) and X2 (motor 2)

PIN	Signal	PIN	Signal
1	Pulse +	9	Pulse -
2	Direction +	10	Direction -
3	Gate/Enable +	11	Gate/Enable -
4	Current control +	12	Current control -
5		13	
6		14	
7		15	Ready -
8	Ready +		

Control

14.01.05   Feed motor drive

⚠️ The feed motor drive is set or programmed by the manufacturer for the requirements of this machine. A replacement is only permissible with programmed drives.

Operating signals

LED H1 (yellow)	LED H2 (green)	Meaning
Off	off	Power off – no function
On	off	Power on, ready for operation after approx. 0.5 s self-test
On	on	Drive has been started
On	on	Overload protection active
Flashing	off	see Chapter **14.02.04 Errors - feed motor drive**

14.02   Error description

If an error occurs on the machine, the current operation is interrupted and an error message sent out. Depending on the gravity of the displayed error, an error-free operation can be achieved by adjusting, checking, different handling etc. If necessary, individual components must be replaced. For many of the error messages, the cause which led to the error is also displayed and will be helpful for error correction (see **Chapter 14.02.01 Example of an error message).**

14.02.01   Example of an error message

Below is an example of an error occurring when an output is activated:

```
┌──────────────────────────────┐  ┌──┐┌──┐┌──┐┌───┐
│1⟩2⟩1000 AB⟩  5 ┊⤒ 2.0 ⓜₐₓ 3200 ▥ 5000│  │▼ ││→ ││ +││Esc│
│ERROR :   Y1 (1)              │  └──┘└──┘└──┘└───┘
│CAUSE :   E8 (1)              │  ┌──┐┌──┐┌──┐┌────┐
└──────────────────────────────┘  │→ ││← ││ −││Clear│
                                   └──┘└──┘└──┘└────┘

┌─┐┌─┐┌─┐┌─┐┌─┐┌─┐┌─┐┌─┐┌─┐┌─┐  ┌──────────────┐
│1││2││3││4││5││6││7││8││9││0│  │    Enter     │
└─┘└─┘└─┘└─┘└─┘└─┘└─┘└─┘└─┘└─┘  └──────────────┘
```
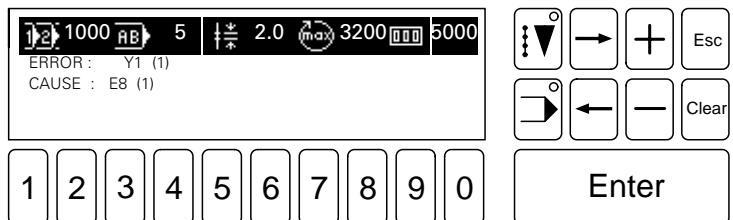
If an error occurs when switching an output, the respective output is displayed with the desired switching state, (0) or (1). (0) means that the output is to be switched off, (1) means that the output is to be switched on. The next line displays the cause which led to the error. In brackets the set condition for an eror-free operation is displayed. In the example input E8 should therefore be switched on.

14.02.02 Sewing drive error

If an error occurs during an operation with the sewing motor, the operation is interrupted and an error message is displayed.

The error message is generated by the motor controller and appears on the display of the control panel; the index number is hexadecimal.

Number	Error
1	Transfer error
2	Time-out serial interface
3	Check sum error in received data
4	Time-out command
30h	Time-out slave expired (command string incomplete)
31h	Incorrect command code
32h	Framing or parity error
33h	Check sum incorrect
34h	Incorrect data on requests
35h	No parameter programmable (motor is in operation)
36h	Parameter does not exist
37h	Incorrect parameter value
38h	EEPROM is being programmed
39h	Incorrect machine speed
3Ah	Incorrect position
3Bh	Path for guided positioning too short
3Ch	Reset of position counter not possible (motor is in operation)
3Dh	Rotating in TDC after power-on not permissible
3Eh	Synchronization marker not detected
3Fh	Target position < 3 incr. from count position
40h – 4Fh	-
50h	Power monitoring (failure of 2 power half waves)
51h	Malfunction power electronics on initializing
52h	Short circuit in the motor
53h	Power off detected
54h	Malfunction in power electronics in operation
55h	No increments
56h	Motor blocks
57h	Commutating signal generator plug missing
58h	Increment signal generator plug missing
59h	Motor not running properly (set speed not achieved)
5Ah	-
5Bh	Feedback control algorithm is inhibited
5Ch – 69h	-
6Ah	EEPROM not programmable
6Bh	EEPROM missing
6Ch	Master Reset carried out
6Dh	-
6Eh	Remaining path for path-monitored, guided delay ramp is too small
6Fh	Slave has received 5 garbled messages in a row
70h	Time monitoring system expired
71h – FFh	-

Control

Errors – Stepping motor drive

If problems occur with the stepping motor drive during the operation, an error might have occurred in the stepping motor controller.
The error message is indicated by LEDs on the stepping motor controller.

LED	Meaning
01 ROT. ERROR	goes out when - the motor blocks - the stepping motor amplifier is not ready - the Enable input is not activated - a breakage has occurred in the supply and/or blocking detection line
06 READY	is lit up when - the amplifier is driven correctly - the supplied voltage is in the rated range
07 FAULT	lights up if a short-circuit occurs between two motor phases
08 TEMP	lights up if the temperature at the cooling device is too high (>75ºC)
09 OVER-VOLT	lights up if there is an over-voltage (>400 V) during braking
10 LOW-VOLT	lights up if there is a low voltage (< 200 V)
09 + 10	are lit if the Enable input is not activated

Additional problems

Problem	Cause	Correction
no LED are lit	- supply voltage missing	check supply voltage
	- supply voltage incorrect	connect properly
motor is not rotating and does have a holding torque	- signal input current controller active	set input to inactive
	- signal input Enable not active	
	- motor connected incorrectly	connect properly
motor is not rotating but does have a holding torque	- signal input gate active	set input to inactive
	- signal input pulse	correct timing and voltage level
motor is rotating unevenly	- signal inputs pulse and direction	correct timing and voltage level
	- overload	check load conditions
	- motor defective	replace motor
motor is rotating in the wrong direction	- motor phases connected the wrong way round	connect motor phases properly
	- signal input direction incorrectly set	correct rotary direction
motor has too little momentum	- motor phase current incorrectly set	choose the correct phase current

Control

14.02.04   Error – Feeder motor drive

If problems arise during the operation of the feeder motor drive, the motor controller may be switched to fault. In this case there is an error message in the form of a flashing LED in the motor controller.

H1(yellow) flashes	Condition / cause	Correction / Comment
once |_____|_____	processor error	switch the mains off and back on again (reset)
twice | |_____| |_____	power off low voltage	flashes until UZK< 65 V automatic reset
three times |||_____|||_____	power off due to overcurrent I >180% I_N short circuit	check drive / motor cable
four times ||||_____||||_____	overcurrent or motor acts as generator	check mains, check drive
five times |||||____|||||____	I*t power off motor	motor overloaded, check drive
six times ||||||___||||||___	I*t power off frequency converter	frequency converter overloaded, check drive
seven times |||||||__|||||||__	motor temp. too high	check bridge X5/10-11, motor overloaded
eight times ||||||||_||||||||_	frequency converter temp. too high	frequency converter overloaded, check installation conditions
nine times |||||||||_|||||||||_	error in the EEPROM	switch mains off and on again (Reset)

14.02.05 Error during stitch generation

If an error occurs during the calculation of the stitch data, operation is interrupted and an error message displayed. The error message appears in clear text and if necessary with a number in brackets. This number indicates the section, where the error has occurred. Additionally errors may occur which have not been assigned a special text.

The meaning of the error number is shown in the following table:

Number	Error
0	No error
1	Wrong machine code in geometrical data record
2	Section clamp or section obstacle is missing or in the wrong place
3	Increment too large
4	Program end without trimming
5	Stitch length inadmissible
6	Wrong element in the geometrical record data
7	Fast slew although machine sewing
8	Stitch length inadmissible (line)
9	Stitch length inadmissible (circle)
10	Circle point = circle end point
11	Division by 0
12	Stitch length inadmissible (curve)
13	No coordinate section in front of the curve point
14	Sewing area exceeded
15	Curve without end point
16	Machine buffer functions full
17	Start sewing command in the loading position program
18	Wrong curve point
19	Wrong curve point
20	Wrong curve point
21	Wrong curve point
22	Stitch length not initialized
23	Load position program not finished
24	Stitch width command in the loading position program
25	Value not permissible for section stitch direction
26	Trimming command, although thread has been trimmed
27	Start sewing command, although machine is sewing
28	Trimming command in the Sewing-off area
29	Sewing-off command, although thread has been trimmed
30	Trimming command immediately after Start Sewing command
31	Start backtack too long
32	Start backtack in feed area
33	End backtack in feed area

Control

14.03 Tables

14.03.01 Tables for lock/release functions

Code number		Function
0		Program number selection
1		Sequence program number selection
2		Merged program number selection
100		Automatic program number selection
3		Bobbin thread functions
4		RESET STITCH COUNTER
5		BOBBIN-THREAD PRESELECT
6		**Sewing head functions**
7		STITCH LENGTH
8		MAXIMUM SPEED
9		REDUCED SPEED
103		SLOW START SPEED
10		Clamp configuration
11		CLAMP WEIGHT
12		MATERIAL THICKNESS
13		Input menu
14		PROGRAM MANAGEMENT
15		DIRECTORY
16		DIRECTORY OF MEMORY
17		DIRECTORY OF DISK
18		READ/WRITE PROGRAM
19		READ ONE PROGRAM FROM DISK
20		READ ALL PROGRAMS FROM DISK
21		WRITE ONE PROGRAM ON DISK
22		WRITE ALL PROGRAMS ON DISK
23		DELETE PROGRAMS
24		DELETE ONE PROGRAM IN MEMORY
25		DELETE ALL PROGRAMS IN MEMORY
26		DELETE ONE PROGRAM ON DISK
27		DELETE ALL PROGRAMS ON DISK
28		FORMAT DISK
29		STATISTICAL PROGRAM DATA

Code number	Function
30	DATA TRANSFER WITH PC
31	CREATE/MODIFY PROGRAM
32	COUNTERS
33	RESET PIECE COUNTER
34	THREAD MONITOR
35	SUPPRESSED STITCHES NEEDLE THREAD MONITOR
36	SUPPRESSED STITCHES BOBBIN THREAD MONITOR
37	STITCH REVERSAL
38	REACTION TIME THREAD MONITOR
39	NUMBER OF SLOW START-STITCHES
40	CARRIAGE START (NIS)
41	START FOR THREAD TRIMMING
104	RELEASE THREAD TENSION / CUT
42	SWITCH FUNCTIONS
43	THREAD MONITOR
44	NEEDLE THREAD MONITOR
45	BOBBIN THREAD MONITOR
46	FREE
47	LANGUAGE SELECTION
48	GERMAN
49	ENGLISH
50	FRENCH
51	SPANISH
52	ITALIAN
101	CHINESE
102	PORTUGUESE
53	OPTIONS
54	CLAMP MONITOR
55	FEEDER
56	LOCK/RELEASE FUNCTIONS
57	OTHER FUNCTIONS
58	AUTOMATIC CLAMP RELEASE
59	FOOT SWITCH FLIP-FLOP-MODE
60	TIMES
61	TIME FOR THREAD NIPPER OPEN
62	TIME FOR THREAD WIPER
63	TIME FOR NEEDLE COOLING

Control

Code number	Function
64	SERVICE
65	SEWING DRIVE FUNCTIONS
66	TURN SEWING MOTOR
67	THREAD TRIMMING PROCEDURE
68	CUTTING SPEED – PRESELECT
69	STEPPING MOTOR FUNCTIONS
70	STEPPING MOTOR 1
71	STEPPING MOTOR 2
72	MOVE CARRIAGE
73	TEST CARRIAGE
74	SWITCH OUTPUTS
75	DISPLAY INPUTS/OUTPUTS
76	ADJUST ZERO POINT
77	CARRIAGE POSITION
78	NEEDLE POSITION
79	FEEDER HAND OVER POSITION
80	FEEDER TAKE OVER POSITION
81	INCREMENT-CORRECTION MOTOR 1
82	INCREMENT-CORRECTION MOTOR 2
83	CONFIGURE MACHINE
84	THREAD WIPER
85	FREE
86	CLAMP MONITOR
87	FEEDER
88	SHORT END THREAD CUTTER
89	ADJUSTMENTS READ/WRITE
90	READ MACHINE DATA FROM DISK
91	WRITE MACHINE DATA TO DISK
92	READ CONFIGURATION/ZERO POINTS FROM DISK
93	WRITE CONFIGURATION/ZERO POINTS TO DISK
94	OTHER FUNCTIONS
95	CARRY OUT COLD START
96	DISPLAY SOFTWARE STATUS
97	CONTRAST SETTING OF DISPLAY
98	CHANGE CODE NUMBER
99	INSTALL OPERATING SYSTEM

14.03.02 Machine data table (MDAT)

The following input functions are stored:

Program selection:	Program type (0 = standard/ 1 – sequence/ 2 – merged programs) Program number Sequence program number Merged program number Index of active program (for sequence or merged programs) Index of next program) (for sequence or merged programs) Array of program sequences Array of merged programs
Bobbin thread functions:	Bobbin thread preselect
Sewing head functions:	Maximum speed Reduced speed
Clamp configuration:	Weight class Material thickness Slow start speed
Counters:	Suppressed stitches needle thread monitor Suppressed stitches bobbin thread monitor Stitch reversal Slow start stitches Carriage start NIS Start for thread trimming Release thread tension /cut
Switch functions:	Needle thread monitor Bobbin thread monitor Bobbin thread sensor (no function at present) Language selection Clamp monitor / Automatic program number selection Feeder Lock/release functions Automatic clamp realease Foot switch flip-flop-mode
Times:	Time for clamp nipper open Time for thread wiper Time for needle cooling
Service:	Cutting speed Code number

Control

14.03.03   Table of outputs

Nodes A11/X300

Output	Denomination		Index number
OUT1	Y1.1	Lower presser foot	0
OUT2	Y2.2	Raise sewing head	1
OUT3	Y2.2	Lower sewing head	2
OUT4	Y3	Air needle cooling	3
OUT5	Y4	2. level foot on	4
OUT6	Y5	Thread wiper on	5
OUT7	Y6	Secondary tension on	6
OUT8	Y7	Thread trimmer on	7
OUT9	Y8	Bobbin cover open	8
OUT10	Y9	Balance wheel brake off	9
OUT11	Y10	Thread nipper on	10
OUT12	Y11.1	Clamp open	11
OUT13	Y11.2	Clamp closed	12
OUT14	Y12	Hook lubrication on	13
OUT15	K20	Thread tension on	14
OUT16	BOBRES	Reset bobbin thread monitor	15

Nodes A12/X300

Output	Denomination		Index number
OUT1	OUT1	Prog. Output 1	16
OUT2	OUT2	Prog. Output 2	17
OUT3	OUT3	Prog. Output 3	18
OUT4	OUT4	Prog. Output 4	19
OUT5		not assigned	20
OUT6		not assigned	21
OUT7		not assigned	22
OUT8		not assigned	23
OUT9		not assigned	24
OUT10		not assigned	25
OUT11		not assigned	26
OUT12		not assigned	27
OUT13		not assigned	28
OUT14		not assigned	29
OUT15		not assigned	30
OUT16		not assigned	31

Nodes A13/X300

Output	Denomination		Index number
OUT1	Y50.1	Lower take-over clamp	32
OUT2	Y50.2	Raise take-over clamp	33
OUT3	Y51	Take-over clamp open	34
OUT4	Y52.1	Transport pins raised	35
OUT5	Y52.2	Transport pins lowered	36
OUT6	Y53	Clamp interlock closed	37
OUT7	STR	Start stacker motor clockwise	38 (S)
OUT8	STL	Start stacker motor anti-clockwise	39 (S)
OUT9	S1IND	Stacker motor frequency 1	40 (S)
OUT10	S2IND	Stacker motor frequency 2	41 (S)
OUT11	H70	Lamp start button (preliminary start)	42
OUT12	UECHECKDIS	Monitoring/Clamp take-over off	43
OUT13		not assigned	44
OUT14		not assigned	45
OUT15		not assigned	46
OUT16		not assigned	47

Special commands

Nodes A13/X300

Output	Denomination		Index number
	Y5FKT	Thread wiper function	48
	Y10FKT	Thread nipper function	49
	FEEDER HAND OVER	Feeder in hand-over position (pins on right)	50
	FEEDER TAKE OVER	Feeder in take-over position (pins on left)	51

Control

14.03.04   Table of inputs

Nodes A11/X400

Input	Denomination	
IN1	IN1	programmable input 1
IN2	IN2	programmagle input 2
IN3	IN3	programmable input 3
IN4	IN4	programmable input 4
IN5	E1	Presser foot raised
IN6	E2.1	Sewing head raised
IN7	E2.2	Sewing head lowered
IN8	E8	Bobbin cover closed
IN9	E30	Clamp inserted on right
IN10	E31	Clamp inserted on left
IN11	E32	Small presser foot stroke
IN12	AC_OK	Supply voltage OK
IN13	PRESS	Compressed air OK
IN14	FKEY	Key for secured functions
IN15	FOOT1	Foot switch Pos. 1
IN16	FOOT2	Foot switch Pos. 2

Nodes A12/X400

Input	Denomination	
IN1	THERR	Needle thread disturbance
IN2	BOBERR	Bobbin thread disturbance
IN3	SM1LIMIT	Zero position SM 1
IN4	SM2LIMIT	Zero position SM 2
IN5	E34	bottom counter presser
IN6	E35	Temperature controller
IN7	E72	Stop button
IN8	DEMO	Demo program
IN9	JIGCODE	Bit 0
IN10	.	Bit 1
IN11	.	Bit 2
IN12	.	Bit 3
IN13	.	Bit 4
IN14	.	Bit 5
IN15	.	Bit 6
IN16	.	Bit 7

Nodes A13/X400

Input	Denomination		
IN1	E50.1	Clamp take-over down	
IN2	E50.2	Clamp take-over up	
IN3	E51.1	Clamp take-over open	
IN4	E51.2	Clamp take-over closed	
IN5	E52	Transport pins down	
IN6	E53	Clamp interlock closed	
IN7	E60	Feeder take-over position brakes (pins on left)	
IN8	E61	Feeder take-over position end position (pins on left)	
IN9	E62	Feeder hand-over position brakes (pins on right)	
IN10	E63	Feeder hand-over position end position (pins on right)	
IN11	E70	Feeder start key	
IN12	E71	Feeder stop key	
IN13	E73	Feeder fade out MSB autom. program number selection	
IN14		not assigned	
IN15		not assigned	
IN16		not assigned	

Control

14.04 Installing operating programs

The booting of the software and firmware is menu-driven. When required the software triggers off the booting of the firmware.

Disks required:
- KL3587BOOT1 (machine software)
- KL3587BOOT2 (firmware, ramp)

14.04.01 Booting for software updates

● Switch on the machine and select INPUT mode.

● Select **Input menu** function.

6 ● Select SERVICE function.

8 ● Select OTHER FUNCTIONS function.

5 ● Select INSTALLING OPERATING PROGRAMS function.

+ ● Insert "KL3587BOOT1" disk into the disk drive and press the **Plus key**.
(Following display appears after a few seconds.)

```
BOOTPROGRAM
KL3587
ALL DATA ON FLASHDISK WILL BE ERASED
- START BOOTPROGRAM WITH ENTER
- SKIP WITH ANY OTHER
```

1 2 3 4 5 6 7 8 9 0   Enter
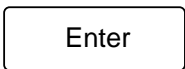
Enter ● Press **Enter** to start the Boot program. Press any other key on the control panel to interrupt the Booting procedure.

```
- SAVE KONFIGURATION WITH ENTER
- SKIP WITH ANY OTHER
YOU SHOULD NOT SAVE KONFIGURATION
IF YOU ARE BOOTING THIS BS3 - UNIT
ON THIS MACHINE FOR THE FIRST TIME!
```

1 2 3 4 5 6 7 8 9 0   Enter

Enter

● Press **Enter** to save the configuration data and continue the booting procedure (e.g. for a software update).
Press any other key on the control panel to delete the configuration data (e.g. when replacing a BS3).

```
BOOTPROGRAM
running...

PLEASE WAIT
 - COPYING KL3587.EXE
```

1	2	3	4	5	6	7	8	9	0
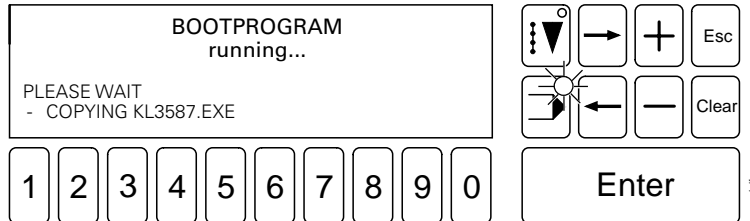
During the booting procedure the data being currently booted is displayed.

```
BOOTPROGRAM
PASSED

REMOVE THE DISK FROM DRIVE
AND RESTART THE MACHINE
```

1	2	3	4	5	6	7	8	9	0
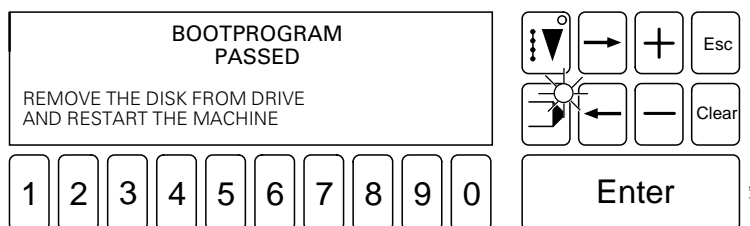
● After concluding the booting procedure the disk must be removed from the disk drive and the machine switched off and on again with the on/off switch.
● If, after the firmware has been checked automatically by the software, the firmware has to be booted, a command appears to enter the disk "Kl3587BOOT2".

14.04.02   Booting after changing the basic control unit

⚠ Only have this work carried out by properly trained personnel! Do not touch any live parts! Danger from electric voltage!

● Switch off the machine and open the control cabinet.
● Insert the disk "Kl3587BOOT1" in the disk drive.
● Switch on the machine and press the boot key **1** within the next 10 seconds (accessible through hole).
● After the boot display appears on the display screen, the procedure continues as in **Chapter 14.04.01 Booting for software updates.**

Reference List

Reference list for the circuit diagrams

M 1	Stepping motor 1
M 2	Stepping motor 2
M 3	Sewing motor
M 4	Fan control cabinet

A 11	CAN node 1
A 12	CAN node 2
A 20	Controller BS 3
A 21	Stepping motor amplifier
A 22	Sewing motor amplifier
A 23	Synchronizer
A 24	Needle thread monitor, monitoring results
A 25	Needle thread monitor, sensor
A 26	Control panel
A 27	Start inhibitor stepping motor 1
A 28	Start inhibitor stepping motor 2
A 29	Start inhibitor

K 1	Start inhibitor sewing motor
K 2	Start inhibitor stepping motors/sewing motor
K 20	Thread tension is released
K 54	Voltage supervision relay

H 70	Start key lamp (preliminary start)

Z 1	Line filter

Q 1	On/off switch

Optional feeder parts

M 5	Motor feeder
A 13	CAN node 3
A 60	Frequency converter
K 55	Relay

Machine inputs

E 1	Presser foot up
E 2.1	Sewing head lifted
E 2.2	Sewing head lowered
E 8	Bobbin cover closed
E 10	Linkage monitoring
E 13.1	Clamp up (optional)
E 13.2	Clamp down (optional)
E 30	Clamp inserted right
E 31	Clamp inserted left
E 32	Small presser foot stroke
E 33	Reduced speed
E 34	bottom counter presser
E 35	Temperature controller
E 70	Stop key
E 72	Stop key
ac-ok	Low voltage monitoring
boberr	Bobbin thread error
fkey	Key for secured functions
foot 1	Foot switch Pos. 1
foot 2	Foot switch Pos. 2
press	Compressed air o.k.
sm1limit	Zero position SM 1
sm2limit	Zero position SM 2
therr	Needle thread error
In 1	Programmable input 1
In 2	Programmable input 2
In 3	Programmable input 3
In 4	Programmable input 4

Inputs feeder options

E 50.1	Feeder/take-over clamp down
E 50.2	Feeder/take-over clamp up
E 51.1	Feeder/take-over clamp open
E 51.2	Feeder/take-over clamp closed
E 52.1	Feeder/transport pins raised (right)
E 52.2	Feeder/transport pins raised (left)
E 53	Feeder/clamp interlock open
E 60	Feeder/take-over position brakes (pins left)
E 61	Feeder/take-over position end setting (pins left)
E 62	Feeder/hand-over position brakes (pins right)
E 63	Feeder/hand-over position end setting (pins right)
E 64	Feeder/obstacle recognised (photoelectric barrier)
E 65	Feeder/control area
E 66	Feeder/control take-over clamp
E 70	Feeder/start key
E 71	Feeder/stop key
E 73	Feeder fade out MSB autom. program number selection

Reference List

Machine outputs

Y 1	Lower presser foot
Y 2.1	Raise sewing head
Y 2.2	Lower sewing head
Y 3	Air needle cooling on
Y 4	2. level foot on (prog. Output 5)
Y 5	Thread wiper on (optional)
Y 6	Secondary tension on
Y 7	Thread trimmer on
Y 8	Bobbin cover open
Y 9	Balance wheel brake off
Y 10	Thread nipper on
Y 11.1	Clamp open
Y 11.2	Clamp closed
Y 12	Hook lubrication on
Y 13.1	Jig down (optional)
Y 13.2	Jig up (optional)
Bobres	Reset bobbin thread monitor
K 20	Thread tension on
out 1	programmable outlet 1
out 2	programmable outlet 2
out 3	programmable outlet 3
out 4	programmable outlet 4

Optional feeder outputs

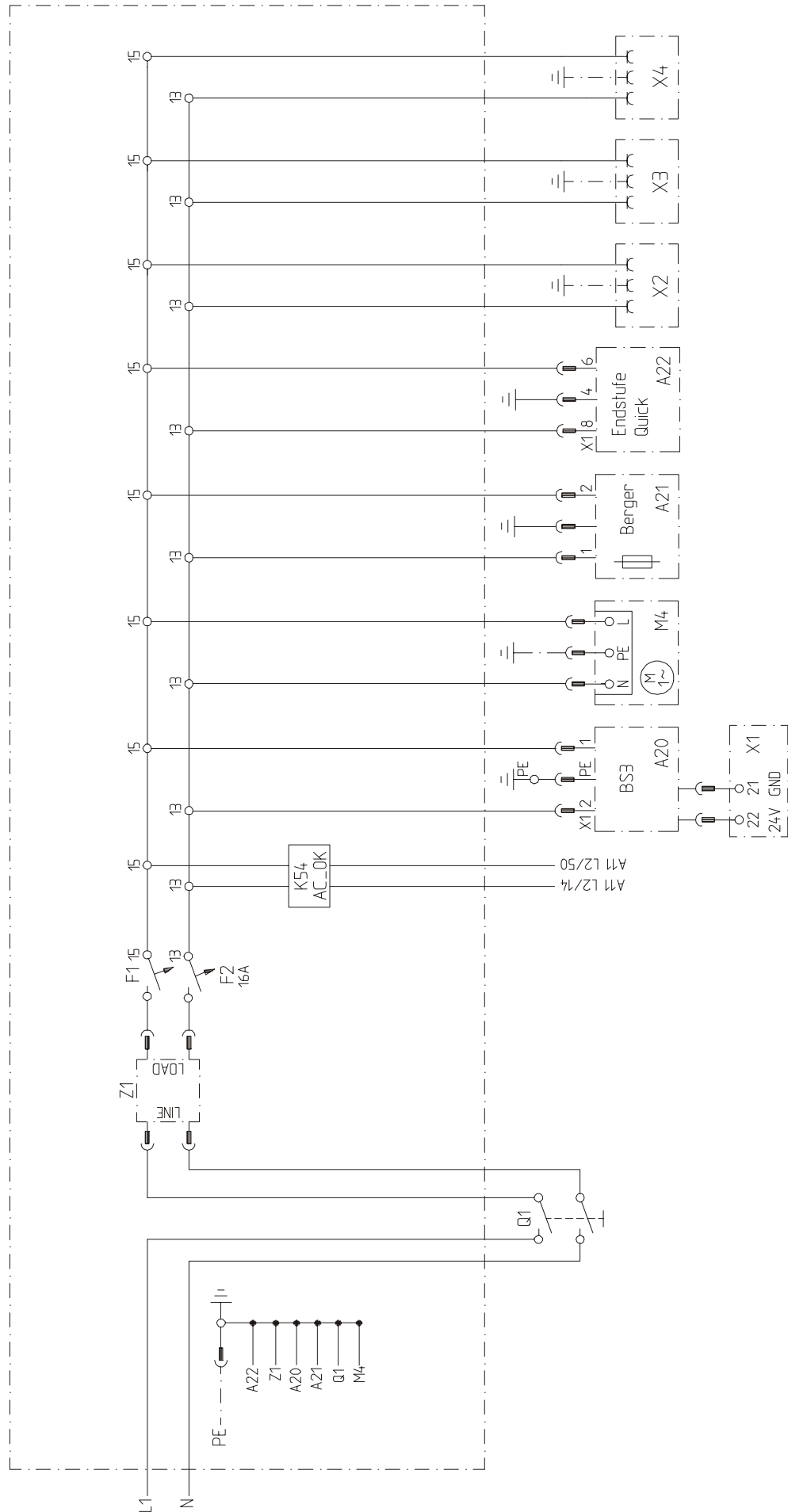|		
Y 50.1	Feeder/lower take-over clamp
Y 50.2	Feeder/raise take-over clamp
Y 51	Feeder/take-over clamp raised
Y 52.1	Feeder/transport pins raised
Y 52.2	Feeder/transport pins lowered
Y 53	Feeder/clamp interlock closed
str	Feeder/start stacker motor clockwise
stl	Feeder/start stacker motor anti-clockwise
s1ind	Feeder/stacker motor frequency 1
s2ind	Feeder/stacker motor frequency 2
h 70	Feeder/lLamp start button (preliminary start)
K 55	Feeder/E66 activated

Plug-in connections - machine

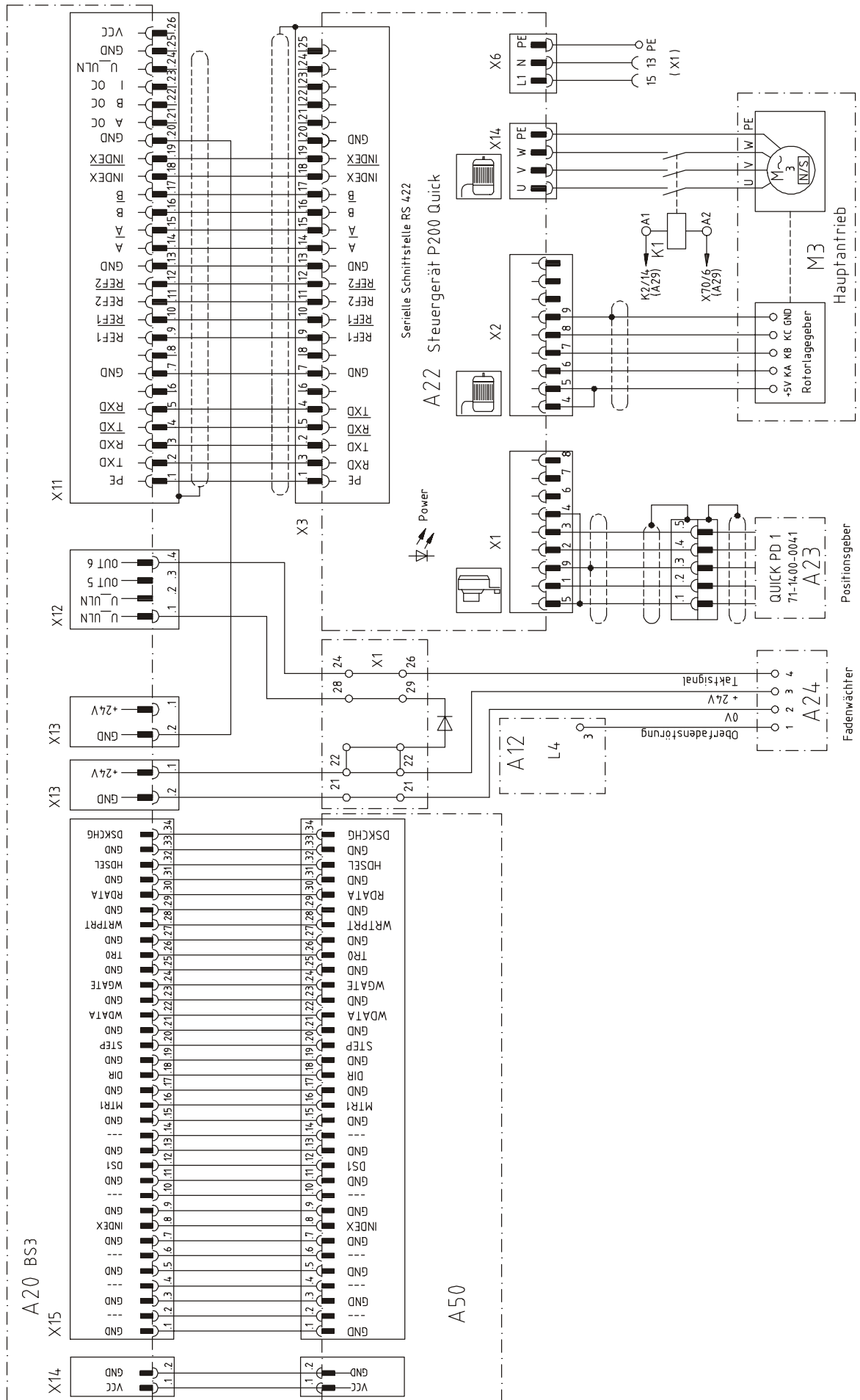| X 1	Distribution strip	Control cabinet
X 2	Plug – door	Control cabinet
X 3	Plug – feeder	Control cabinet
X 4	Plug – height adjustment	Control cabinet
X 9	Central plug – sewing head	Sewing head
X 16	Solenoid switchE2.1	Sewing head
X 17	Solenoid switch E2.2	Sewing head
X 18	Thread tension on K20	Sewing head
X 22	Initiator E30	Clamp
X 23	Initiator E31	Clamp
X 24	Initiator E13.1 (optional)	Control cabinet
X 25	Initiator E13.2 (optional)	Control cabinet
X 26	Initiator sm1	Control cabinet
X 27	Initiator sm2	Control cabinet
X 29	Power supply 24V	Control cabinet
X 30	Stop key	Control cabinet
X 31	Bobbin cover open	Sewing head
X 32	Rotor position	Control cabinet
X 33	Sewing motor	Control cabinet
X 35	CAN-nodes	Control cabinet
X 36	Key for secured functions	Control cabinet
X 37	Initiator E10	Clamp
X 38	Foot switch	Control cabinet
X 39	bottom counter presser	Sewing head
X 40	Control feeder	Control cabinet
X 70	Start inhibitor	Control cabinet

Plug-in connections – optional equipment feeder

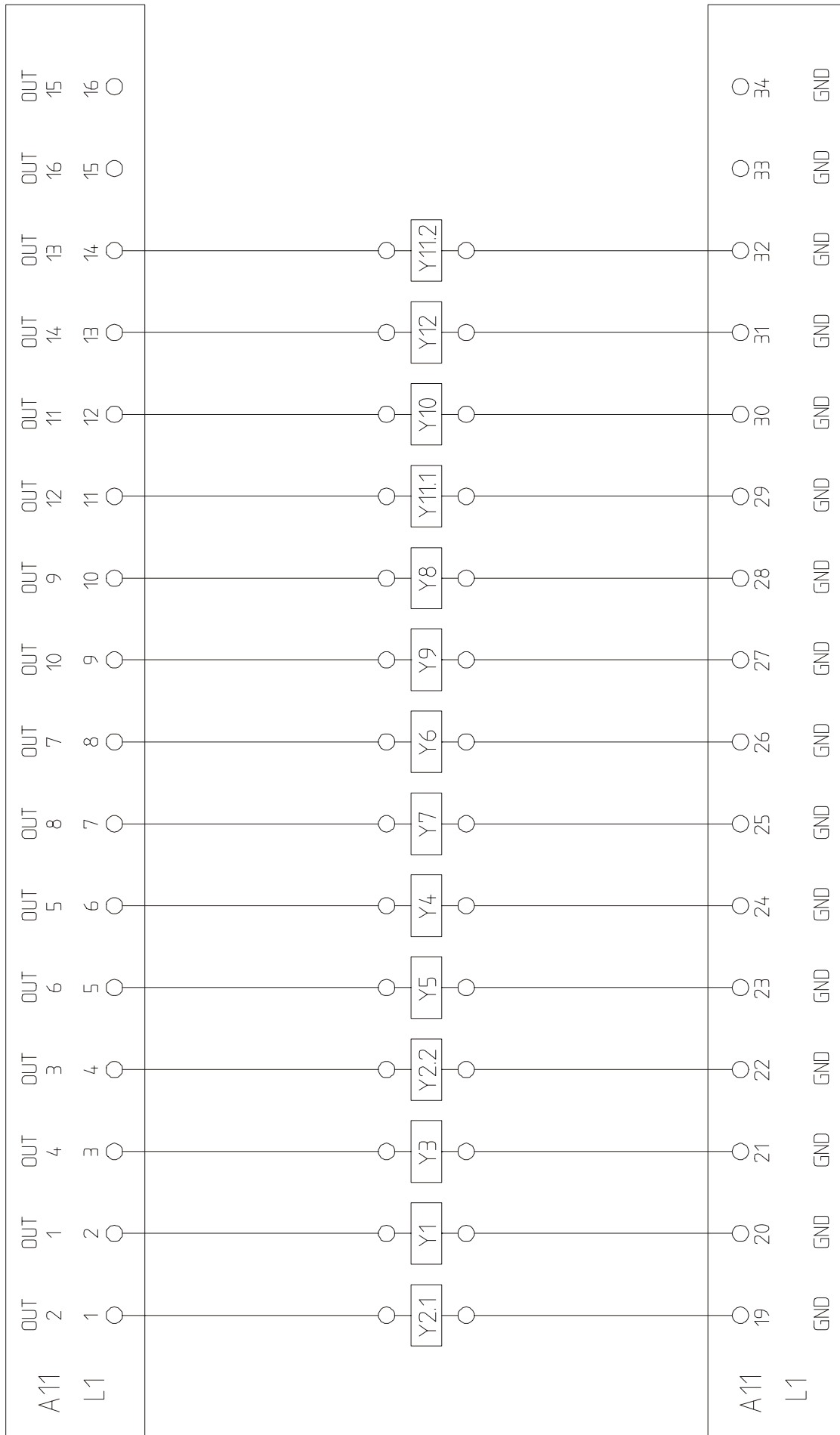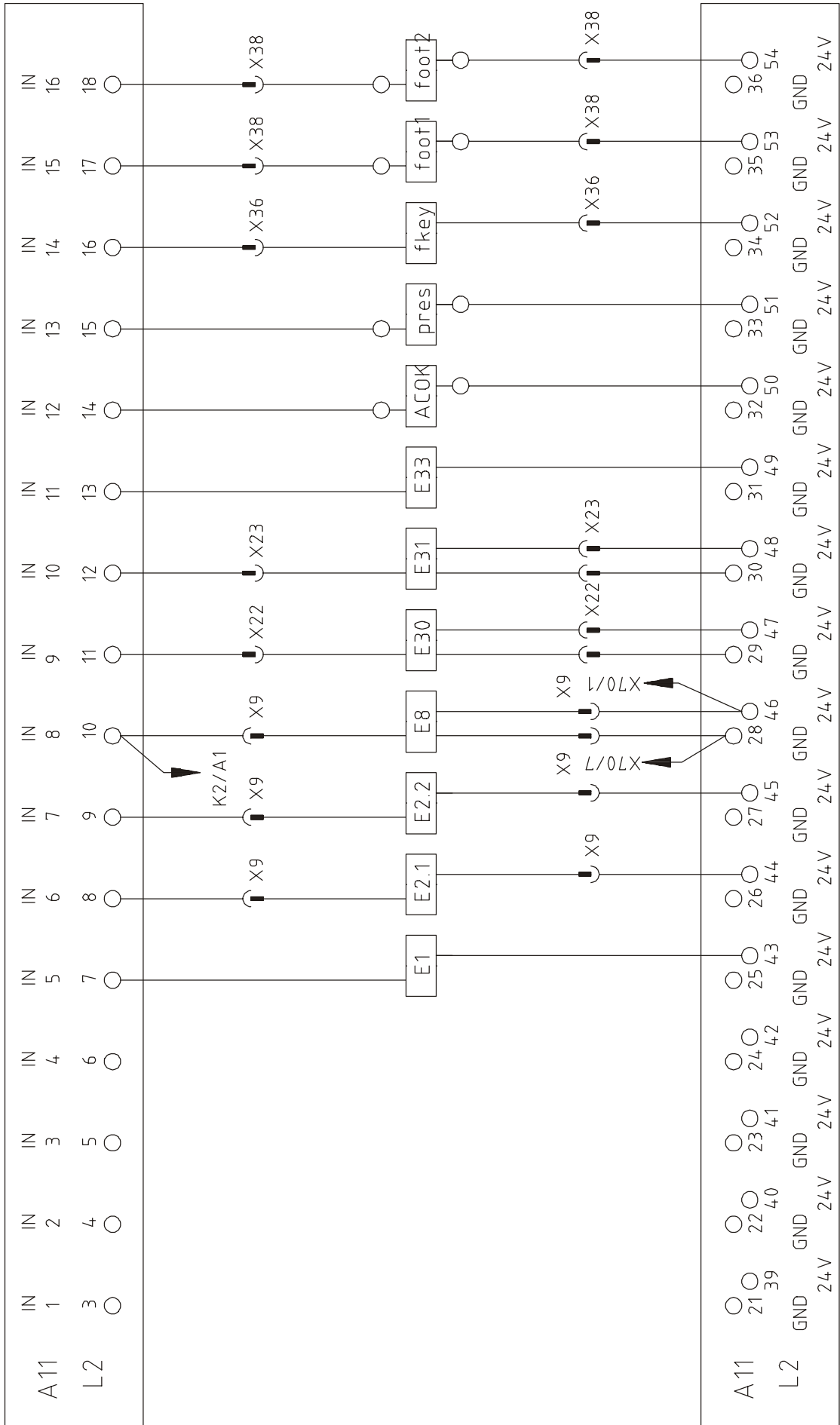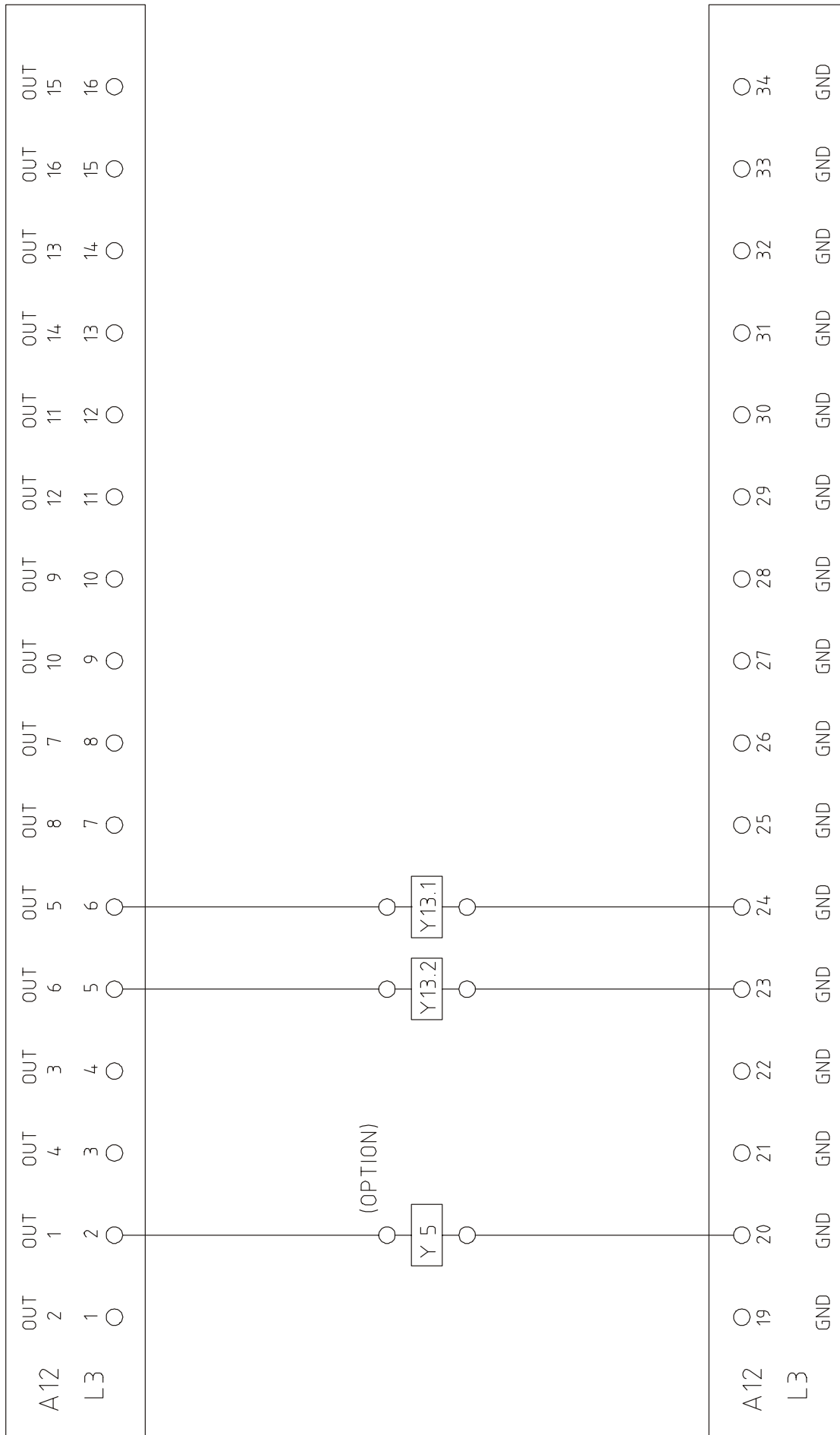| X 44	Data line	Distribution/feeder
X 45	Solenoid switch E50.1	Clamp drive /feeder
X 46	Solenoid switch E50.2	Clamp drive/feeder
X 47	Switch E51.1	Clamp drive/feeder
X 48	Switch E51.2	Clamp drive/feeder
X 49	Solenoid switch E52.1	Transport pins/feeder
X 50	Solenoid switch E52.2	Transport pins/feeder
X 51	Photoelectric barrier E64	Jig feed/feeder
X 52	Initiator E65	Feed pins/feeder
X 60	Control take-over clamp	Jig feed/feeder
X 61	Control take-over clamp	Distribution/feeder

A11 L1			A11 L1
OUT 15	16 ○		○ 34 GND
OUT 16	15 ○		○ 33 GND
OUT 13	14 ○——○ Y11.2 ○———		○ 32 GND
OUT 14	13 ○——○ Y12 ○———		○ 31 GND
OUT 11	12 ○——○ Y10 ○———		○ 30 GND
OUT 12	11 ○——○ Y11.1 ○———		○ 29 GND
OUT 9	10 ○——○ Y8 ○———		○ 28 GND
OUT 10	9 ○——○ Y9 ○———		○ 27 GND
OUT 7	8 ○——○ Y6 ○———		○ 26 GND
OUT 8	7 ○——○ Y7 ○———		○ 25 GND
OUT 5	6 ○——○ Y4 ○———		○ 24 GND
OUT 6	5 ○——○ Y5 ○———		○ 23 GND
OUT 3	4 ○——○ Y2.2 ○———		○ 22 GND
OUT 4	3 ○——○ Y3 ○———		○ 21 GND
OUT 1	2 ○——○ Y1 ○———		○ 20 GND
OUT 2	1 ○——○ Y2.1 ○———		○ 19 GND

A12	OUT 2	OUT 1	OUT 4	OUT 3	OUT 5	OUT 6	OUT 8	OUT 10	OUT 7	OUT 9	OUT 12	OUT 11	OUT 14	OUT 13	OUT 16	OUT 15
L3	1	2	3	4	6	5	7	9	8	10	11	12	13	14	15	16

(OPTION)

Y 5

Y13.2

Y13.1

A12	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
L3	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND

PFAFF

PFAFF