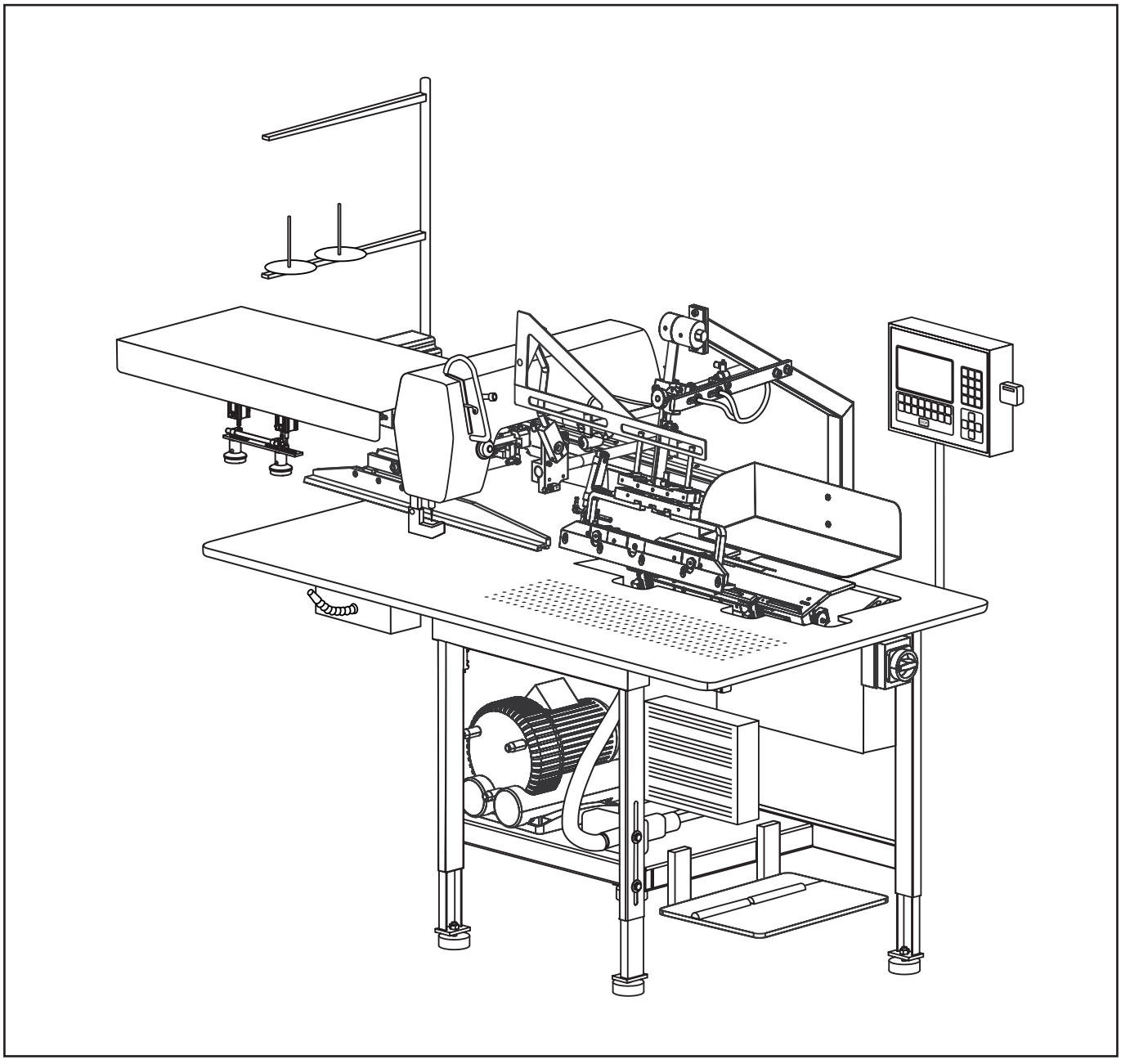
BEISLER
NÄHAUTOMATION
ADVANCED SEWING EQUIPMENT

Working Instructions
Short Seam Automat 2211-5



Contents of the working instructions

The working instructions are divided into four sections:

Scope of the working instructions
These working instructions describe the SHORT SEAM AUTOMAT 2211-5 of Beisler GmbH and apply only to those machine parts and components that are contained in the scope of delivery of the SHORT SEAM AUTOMAT 2211-5.
They do not apply to accessories or machine parts (e.g. sewing head) from third parties that the machine is equipped or retrofitted with. For those components, the working instructions of the respective manufacturer or supplier apply.

Section A General notes

Section A General notes

Contents

A.1 Safety instructions

Important information for the operator!

This machine has been manufactured in keeping with the latest technological developments and is operationally safe. However, it may present potential hazards, particularly if it is operated by inadequately trained personnel or if it is not used correctly:

- For personnel operating and handling the machine, the operator must prepare written instructions in a reasonable form and in the language of the operating personnel based on these working instructions (Germany: Accident Prevention Regulations UVV VBG 1 § 7.2).
- Use the operating instructions to familiarize the operating personnel with the functions, operation, and care of the machine and check to see if the operating personnel fully understands these instructions.
- Use the service instructions to familiarize the service personnel with the setting up and maintenance of the machine.
- For any modifications of the machine that have not been approved by Beisler GmbH in writing, the operator is fully responsible.
- The contents of the working instructions are subject to change without further notice.
- Concerning translations into foreign languages, the German version of these working instructions is binding.
- Should you encounter problems that are not mentioned in these working instructions, please contact your supplier immediately for your own safety. Please do not hesitate to contact Beisler if you have any suggestions that help to improve this product.
- **Keep these working instructions close to the machine so that safety instructions and information on operation, setting-up, and maintenance are always accessible.**

Warranty

Beisler GmbH warrants the safety, operatability, and repair without charge of the short seam automat 2211-5 for a period of 6 months under the condition that:

- the machine is used exclusively for the intended purpose and serviced in accordance with the information in these working instructions,
- modifications of the machine are carried out only with prior written approval of Beisler GmbH,
- only original spare parts or accessories approved by Beisler GmbH are used. For a complete list of all approved spare parts, please contact Beisler GmbH.

If the machine is used for more than 10 hours per day (shift operation), the warranty period is reduced to 3 months.

The warranty period starts with the delivery of the machine to the operator.

A.1 Safety instructions

Exclusion of liability
Beisler GmbH warrants the faultlessness of the product as set forth by their advertisement, product information and these working instructions. Other product characteristics are not warranted.
Beisler GmbH is not responsible for the profitability or for the correct function of the short seam automat 2211-5 if it is used for other purposes than those defined in section „Correct use“.
Beisler GmbH is not responsible for damage that arises from the use of non-defined and non-approved spare parts or accessories.

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A.1 Safety instructions

Important information for the operating personnel!

Please note that any work to the SHORT SEAM AUTOMAT 2211-5 must be carried out only by trained operating personnel:

- **Operating personnel means persons:**
  that have been given initial instructions for sewing automats and that have been trained for the operation and handling of the SHORT SEAM AUTOMAT 2211-5 on the basis of these operating instructions,
  that have been informed about potential risks arising from their work with the machine,
  that are capable of assessing their work with the machine due to occupational experience and instruction of the safety regulations and of recognizing potential hazards during work.
- Cleaning of the machine or of machine parts must be performed only by personnel that has been informed about potential hazards arising during the cleaning work.
- Prior to the initial operation of the SHORT SEAM AUTOMAT 2211-5, read the **operating instructions** carefully so that you can make full use of the advantages of the machine and to prevent damage.

Important information for the service personnel!

Please note that service work to the SHORT SEAM AUTOMAT 2211-5 must be carried out only by authorized and adequately trained expert personnel:

- **Expert personnel means persons:**
  that have aquired their expertise by a special training in machine technology or electrical engineering or by a special advanced training or a comparable qualification,
  that have acquired the knowledge required to perform all works for setting up and servicing the SHORT SEAM AUTOMAT 2211-5 from a training by Beisler GmbH,
  that are capable of assessing their work with the machine due to occupational experience and instruction of the safety regulations and of recognizing potential hazards during work.

- Prior to carrying out any service work to the SHORT SEAM AUTOMAT 2211-5, read the **entire working instructions** carefully so that you can make full use of the advantages of the machine and to prevent damage.

A.1 Safety instructions

A.1.1 Symbols used in the working instructions

WARNING!

is used if non-observance may cause serious or even lethal injuries.

CAUTION!

is used if non-observance may cause medium to minor injuries or damage.

NOTE!

is used for hints and useful information.

A.1.2 Symbols used on the machine

WARNING: DANGER!

Caution! Observe working instructions.

WARNING: HIGH VOLTAGE!

Caution! Prior to opening, pull out power plug.

A.1 Safety instructions

A.1.3 General safety instructions

Correct use

- The SHORT SEAM AUTOMAT 2211-5 is a sewing machine. It is to be used for:
  - Clipping the slash selvage and sewing the slash selvage to the left trousers component.
  - Sewing the slash selvage to the right trousers component.
    Optional: clipping of side pockets.
- The machine can be used for processing all conventional materials for outerwear.
- The machine has been designed for permanent operation in industry.
- The SHORT SEAM AUTOMAT 2211-5 has been tested for electromagnetic compatibility and is suited for installation in industrial operating rooms.

Incorrect use

- The SHORT SEAM AUTOMAT 2211-5 must not be operated in rooms that do not comply with the location requirements.
- The SHORT SEAM AUTOMAT 2211-5 must not be operated in the vicinity if devices or systems that produce strong magnetic fields as otherwise the correct function of the program control may be impaired.

Safety requirements

- DIN EN, Part 1:1991-11, Part 2:1995-06
  Safety of machines
- DIN EN 60601, Part 1:1994-05
  Safety regulations for electrically operated measuring and control installations, general requirements.
- DIN EN 50178 (VDE 0160): 1998-04
  Equipment of power systems with electronic devices
- DIN EN 50082 (VDE 0839) Part 2:1997-11
  Electromagnetic compatibility, basic specification, immunity to interference.
  Part 1: Domestic, business and commerce, small enterprises.
  Part 2: Industry.
- DIN EN 60204 (DIN VDE 0113): 1993-06
  Electrical equipment of industrial machines

Safety devices

The SHORT SEAM AUTOMAT 2211-5 is equipped with a circuit-breaker **(program stop switch)** that stops all machine movements and the sewing process when actuated manually.

Power supply connection

The power supply of the machine is established with a properly grounded power supply connection with:

- 230 V ± 10 %, 50/60 Hz, grounding plug.
- Fusing: 16 A
- Power consumption: 1.3 kW

Compressed air supply

The machine must be supplied by an on-site compressed air source.

- Operating pressure: 6 bar.
- Compressed air quality: oil-free
- Compressed air consumption: 12 NL

Location and storage requirements

Installation in sheltered, closed rooms.

- Room temperature: +10 °C to 45 °C
- Relative humidity: 80 % max.

Disposal

- Please discard the packaging material in accordance with existing disposal directives. Section C1, Delivery of the machine, contains a list of the packaging materials used.
- The machine contains reusable materials. Therefore, when discarding the machine, ask your local magistrate or community office about the possibilities of recycling.

A.2 Notices

Section B Operating Instructions

Section B Operating Instructions

Contents

B.1 Description of the machine

B.1.1 Functional units

Fig. 1

All functional units of the SHORT SEAM AUTOMAT 2211-5 are mounted to the height-adjustable table frame and freely accessible.

Transport and sewing unit

- [1] Transport stamp
- [2] Linear rail (under the cover)
- [3] Sewing head
- [4] Thread holder
- [5] Right slash selvage stop
- [6] Guide laser
- [7] Folder with quick stitch width setting
- [11] Pick-up plate
- [19] Vacuum pump
- [21] Compressed air device
- [22] Main clamp

Control unit

- [8] Program stop switch
- [9] Operating panel
- [10] Memory card

Worktable

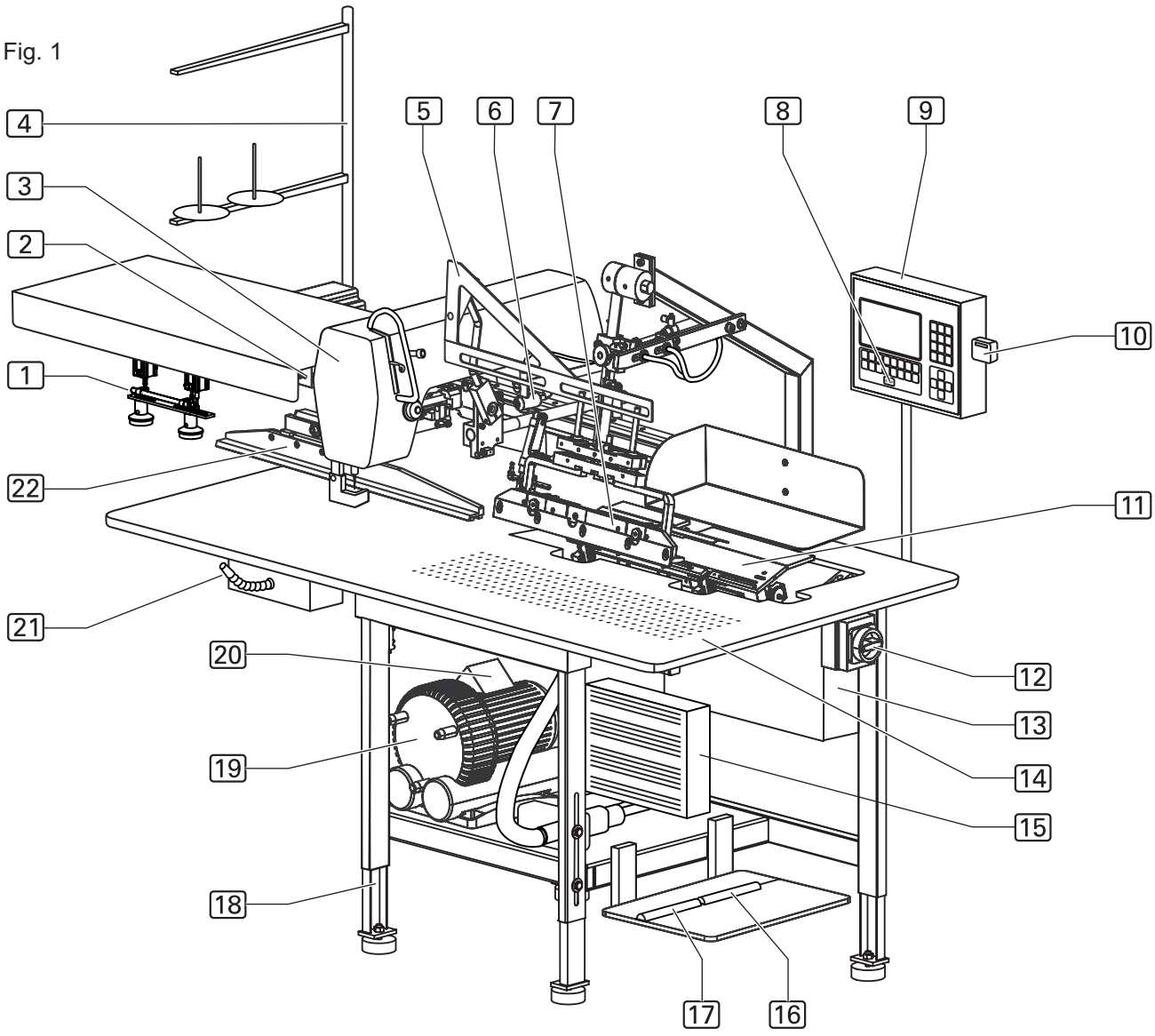
- [14] Working plate
- [18] Height-adjustable table leg

Power supply system

- [12] Main switch, emergency off switch
- [13] Control box
- [15] Sewing motor control
- [20] Vacuum pump power supply switch

Operating switches

- [16] Footswitch for machine operation
- [17] Footswitch for slash selvage clamp



B.2 Functions of the machine

B.2.1 Sewing functions of the machine

The short seam automat 2211-5 can perform six different, automated sewing functions:

- Clipping and crimping over of the left slash selvage with subsequent sewing of the slash selvage to the left trousers component.
- Sewing the slash selvage to the right trousers component.
- Clipping and crimping over of the side pocket to the left trousers component.
- Clipping and crimping over of the side pocket to the right trousers component.
- Clipping and crimping over of the left slash selvage and the sewing of the left slash selvage to the left trousers component at ladies' trousers.
- Sewing of the right slash selvage to the right trousers component at ladies' trousers.

B.2.2 Machine cycle left slash selvage

The machine cycle "Clipping left slash selvage and sewing it to the left trousers component" is performed as follows:

- The left slash selvage is lined up manually at the pick-up plate.
- The slash selvage is clipped, crimped over by the folder and picked up.
- The left trousers component is positioned manually on the working plate.
  The folder transports the slash selvage to the left trousers component and puts it down.
- The trousers component with the slash selvage is automatically transported by the transport system to the sewing head where it is tucked.
- The finished sewing piece is then blown off the worktable with compressed air.
- The assistance transport is activated.

B.2 Functions of the machine

B.2.3 Lining up the left slash selvage

Fig. 2/3

Ideally, the slash selvage and the left trousers component are premarked by a gusset. If a gusset is not available, the line-up position is marked with tape or with a felt pen at the working plate or at the pick-up plate.

Slash selvage line-up position, **Fig. 2:**

The slash selvage clamp [1] is open during the line-up process.

The slash selvage [3] is lined up at the stop rail [4] of the pick-up plate. The exact position to the cutter [2] is marked by the gusset in the slash selvage.

Slash selvage clamp, **Fig. 2:**

The slash selvage clamp [1] closes and secures the slash selvage [3] while the cloth material is clipped and then crimped over.

Crimping over and picking up the slash selvage, **Fig. 3:**

The folder [1] moves right to the pick-up plate [2]. The slash selvage [3] is clipped by the cutter [7] and crimped over and picked up by the folder clamp [4].

The cutter [8] of the working plate opens, the cutter [5] is passive and remains concealed in the working plate.

The both positioning lamps [5] support the lining up of the gusset of the left trousers part to the cutter [8].

Fig. 2

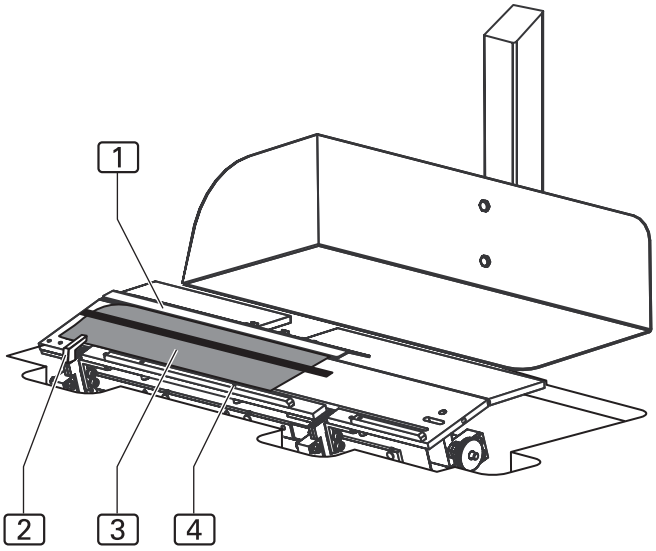
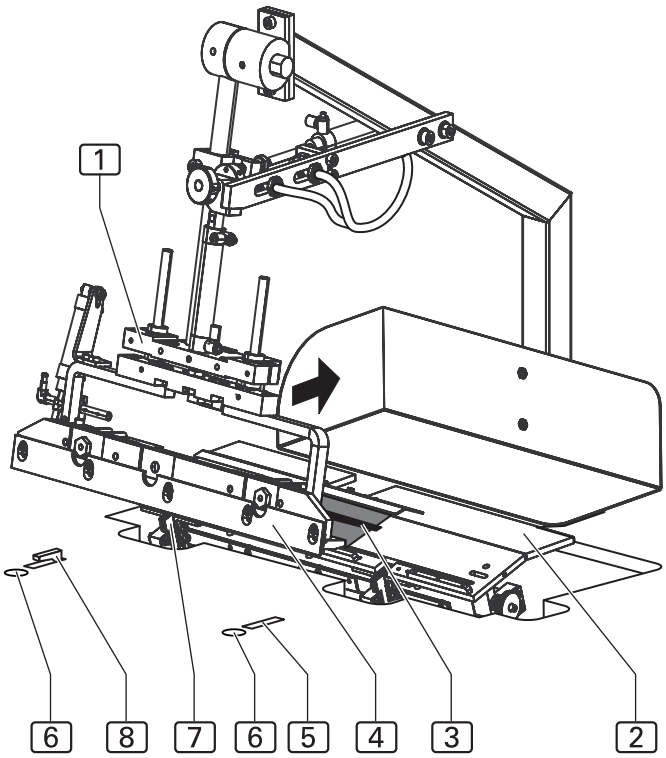


Fig. 3



B.2 Functions of the machine

B.2.4 Left trousers component line-up

Fig. 4/5

Line-up position of the left trousers component, **Fig. 4:**
The left trousers component [3] is lined up with the gusset to the cutter [4] and parallel to the red marking line [2] of the guide laser [1].

Folder, **Fig. 5:**
The folder [1] moves left to the working plate with the slash selvage, lowers and puts the slash selvage [2] onto the left trousers component [3].

Fig. 4

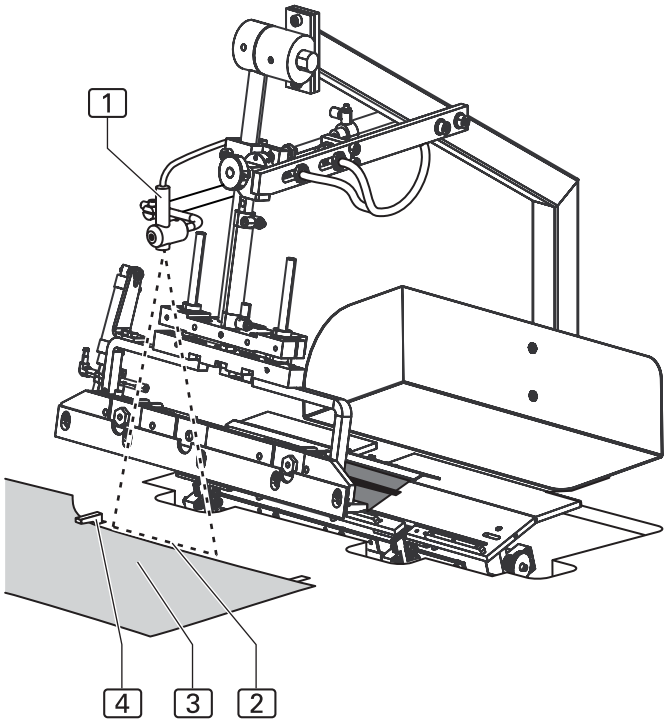
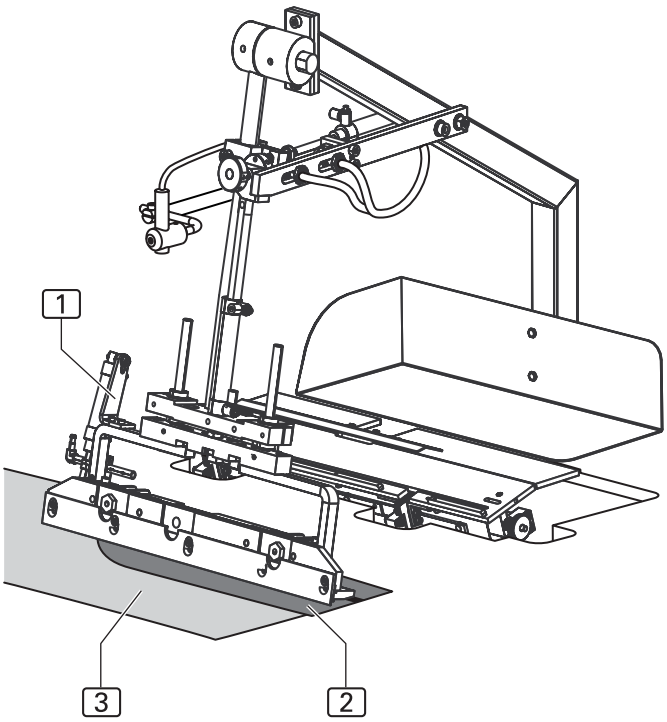


Fig. 5



B.2 Functions of the machine

B.2.5 Left slash selvage/trousers component sewing

Fig. 6

Main clamp, **Fig. 6:**

The main clamp [2] moves to the insertion position and picks up the trousers component. The folder moves up to its start position.

The main clamp transports the trousers component on the working plate from the insertion station to the sewing head.

Sewing head, **Fig. 6:**

The sewing head [1] only performs the sewing stitch and thread cutting functions. All other functions, such as seam length or setting the beginning and the end of the seam, are acquired by the machine's sensoring system and controlled by the program control in accordance with the set values.

Threads

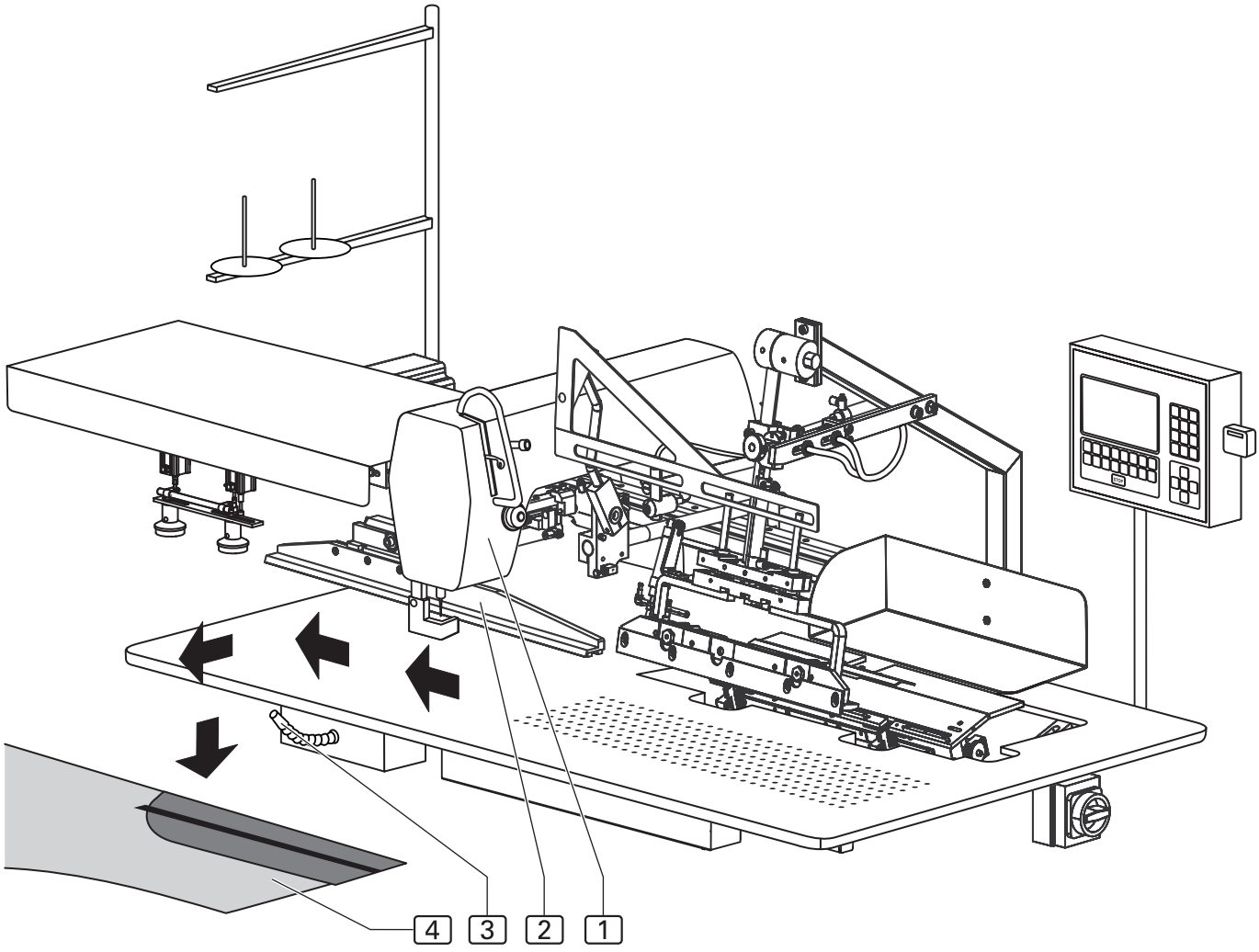
Thread stock and thread supply of the sewing head are monitored by sensors (top thread sensor and rest thread sensor).

The thread holder can hold two thread spools.

Blow-off, **Fig. 6:**

After the sewing process, the trousers component [4] is blown off the worktable with compressed air [3].

Fig. 6



B.2 Functions of the machine

B.2.6 Machine cycle right slash selvage

The machine cycle "Sewing the right slash selvage to the right trousers component" is performed as follows:

- The right trousers component is positioned manually on the working plate.
- The trousers component is clipped, the stop for the slash selvage swivels onto the working plate.
- The right slash selvage is lined up manually at the stop.
- The trousers component with the slash selvage is transported automatically to the sewing head where it is tucked.
- The finished sewing piece is then blown off the working table with compressed air.
- The assistance transport is deactivated.

B.2.7 Right trousers component line-up

Ideally, the right trousers component is premarked by a gusset. If a gusset is not available, the line-up position is marked with tape or with a felt pen at the working plate or at the pick-up plate.

Folder, **Fig. 7:**

The folder [1] moves right to the pick-up plate [1] and makes the working plate accessible. The cutter [3] opens, the two cutters [4] and [5] are passive and remain concealed in the working plate.

Right trousers component line-up position, **Fig. 8:**

The right trousers component [4] is aligned with the gusset at the cutter [2] and parallel to the pick-up plate and the folder at the red marking [3] of the guide laser [1].

Fig. 7/8

Fig. 7

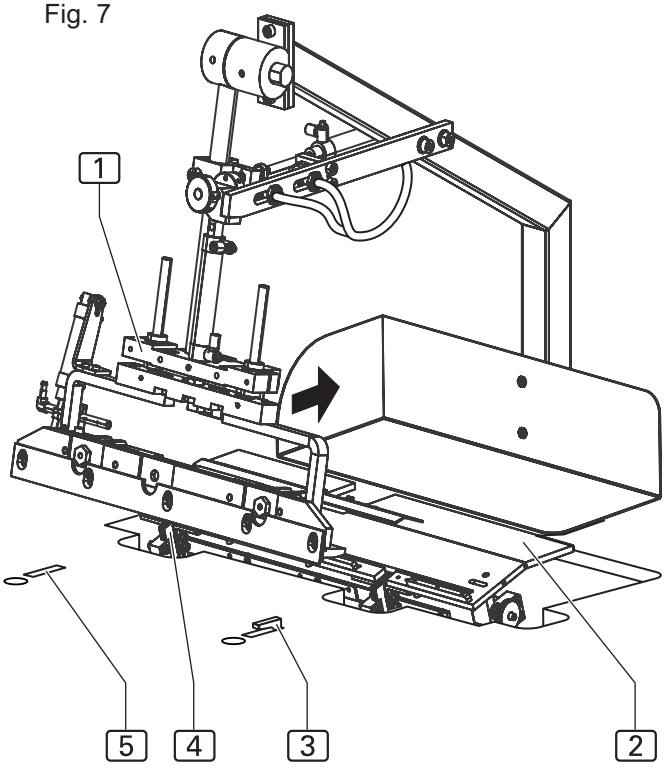
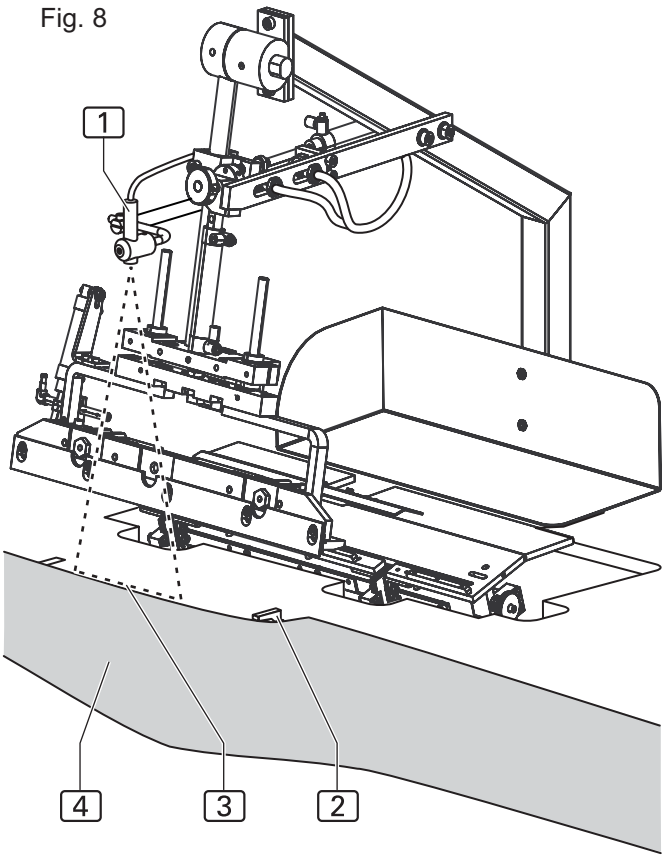


Fig. 8



B.2 Functions of the machine

B.2.8 Right slash selvage

Fig. 9

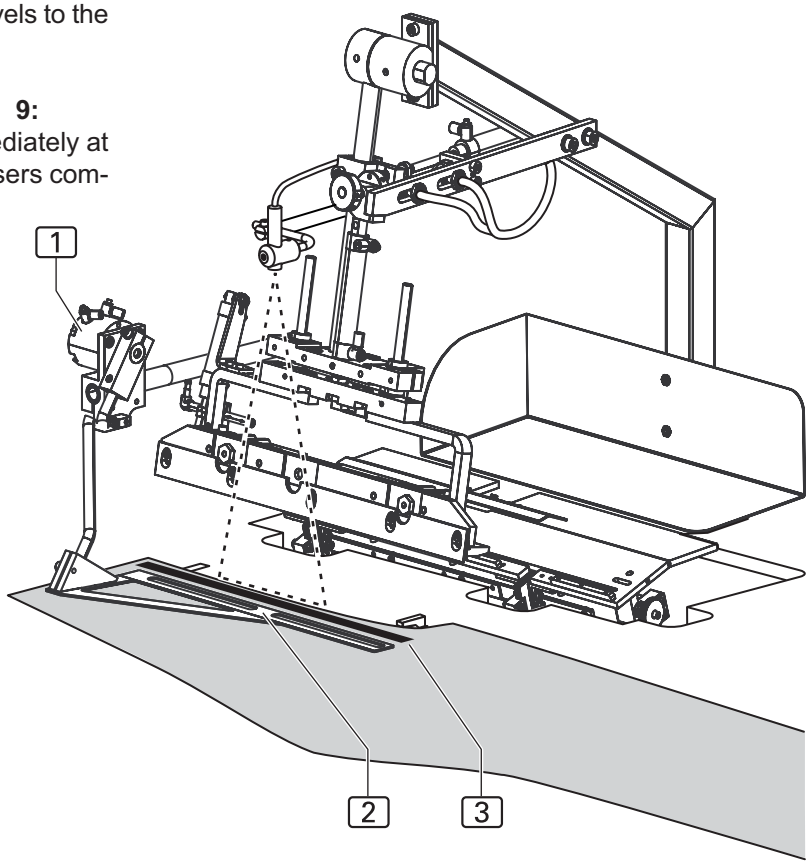
Stop, **Fig. 9:**

After the cutter has clipped, the stop [1] swivels to the right trousers component.

Line-up position of the right slash selvage, **Fig 9:**

The right slash selvage [3] is lined up immediately at the stop rail [2] and flush with the right trousers component.

Fig. 9



B.2 Functions of the machine

B.2.9 Sewing the right trousers component

Fig. 10

Main clamp, **Fig. 10:**

The main clamp [2] moves to the insertion station and picks up the trousers component. The folder moves up to its start position.

The main clamp transports the trousers component on the working plate from the insertion station to the sewing head.

Sewing head, **Fig. 10:**

The sewing head [2] only performs the sewing stitch and thread cutting functions. All other functions, such as seam length and determining the beginning or the end of the seam, are acquired by the machine's sensor system and controlled by the program control in accordance with the set values.

Threads

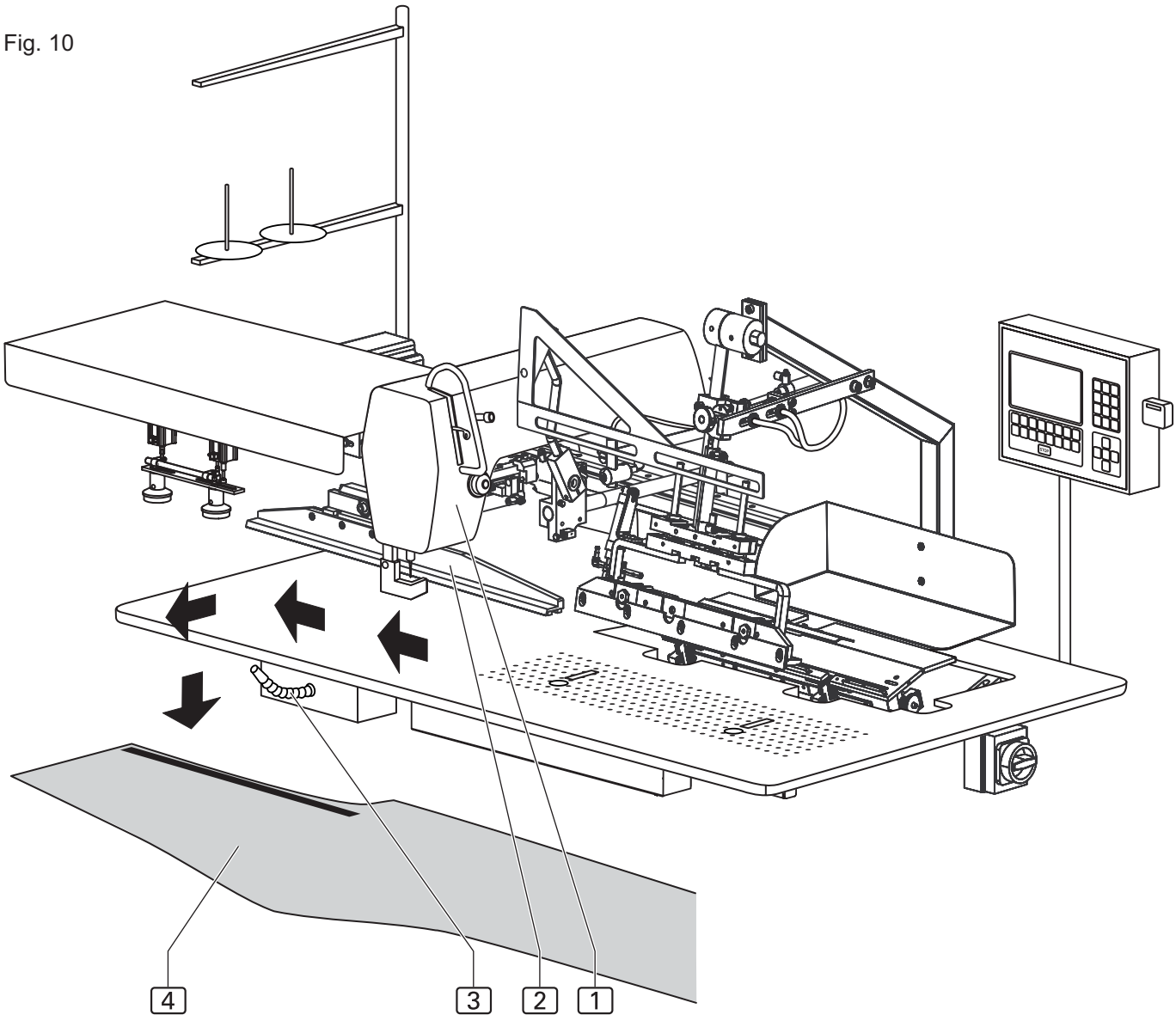
Thread stock and thread supply of the sewing head are monitored by sensors (top thread sensor and rest thread sensor).

The thread holder can hold two thread spools.

Blowing off, **Fig. 10:**

After the sewing process, the trousers component [4] is blown off the worktable with compressed air [3].

Fig. 10



B.2 Functions of the machine

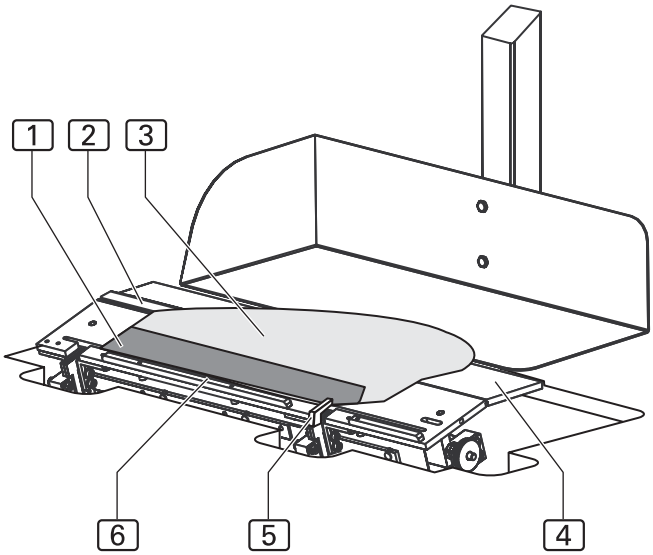
B.2.10 Machine cycle left side pocket

Fig. 11/12

The machine cycle "Clipping left side pocket and sewing it to the left trousers component" is performed as follows:

- The left side pocket is lined up manually at the pick-up plate.
- The cloth ledge is clipped, crimped over by the folder and picked up.
- The left trousers component is positioned manually on the working plate.
  After the cutter has clipped the trousers component, the folder transports the side pocket to the left trousers component and puts it down.
- The trousers component with the side pocket is automatically transported by the transport system to the sewing head where it is tucked.
- The finished sewing piece is then blown off the worktable with compressed air.
- The assistance transport is activated.

Fig. 11



B.2.11 Lining up left pocket at trousers component

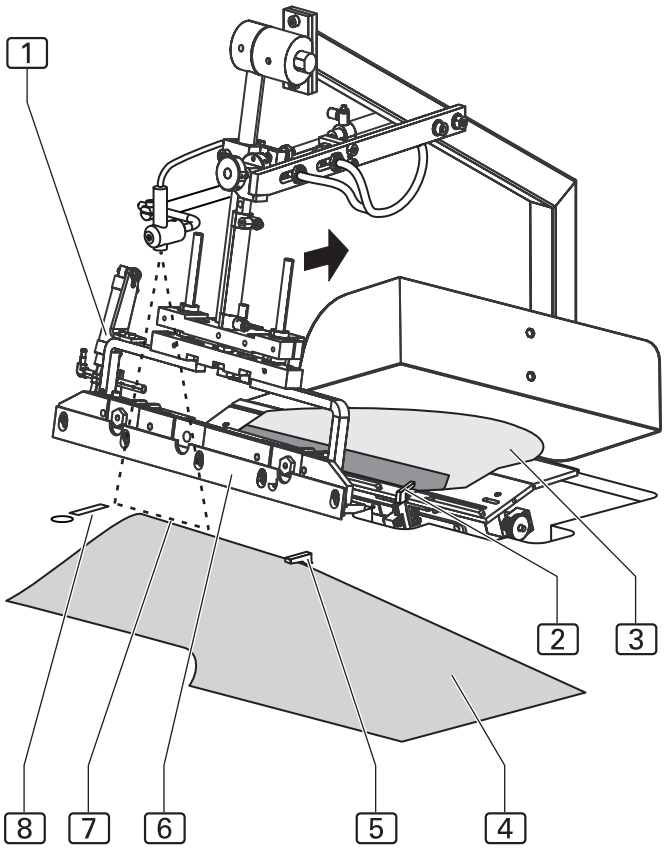
Ideally, the side pocket and the left trousers component are premarked by a gusset. If a gusset is not available, the line-up position is marked with tape or with a felt pen at the working plate or at the pick-up plate.

Side pocket line-up position, **Fig.11:**
The slash selvage clamp is closed during the line-up process.
The cloth ledge [1] of the side pocket [3] is lined up at the stop rail [6] of the pick-up plate [4]. The exact position to the cutter [5] is marked by the gusset in the cloth ledge.

Crimping over and picking up the side pocket, **Fig. 12:**
The folder [1] moves right to the pick-up plate. The cloth ledge of the side pocket [3] is clipped by the cutter [2] and crimped over and picked up by the folder clamp [6]. The cutter [5] of the working plate opens, the cutter [8] is passive and remains concealed in the working plate.

Left trousers component line-up position, **Fig.12:**
The left trousers component [4] is aligned with the gusset at the cutter [5] and parallel to the pick-up plate and the folder at the red marking [7] of the guide laser.

Fig. 12



B.2 Functions of the machine

B.2.12 Sewing left side pocket /trousers component

Fig. 13/14

Folder, **Fig. 13:**

The folder [1] moves left to the working plate with the side pocket, lowers and puts the side pocket [2] onto the left trousers component [3].

Main clamp, **Fig. 14:**

The main clamp [2] moves to the insertion station and picks up the sewing pieces. The folder moves up to its start position.

The main clamp transports the trousers component on the working plate from the insertion station to the sewing head [1].

After the sewing process, the sewing pieces [4] are blown off the worktable with compressed air [3].

Fig. 13

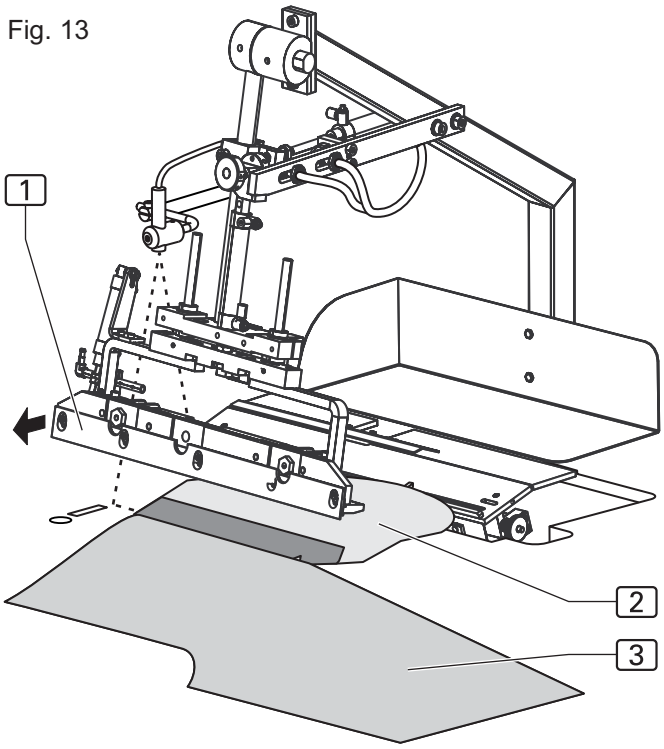
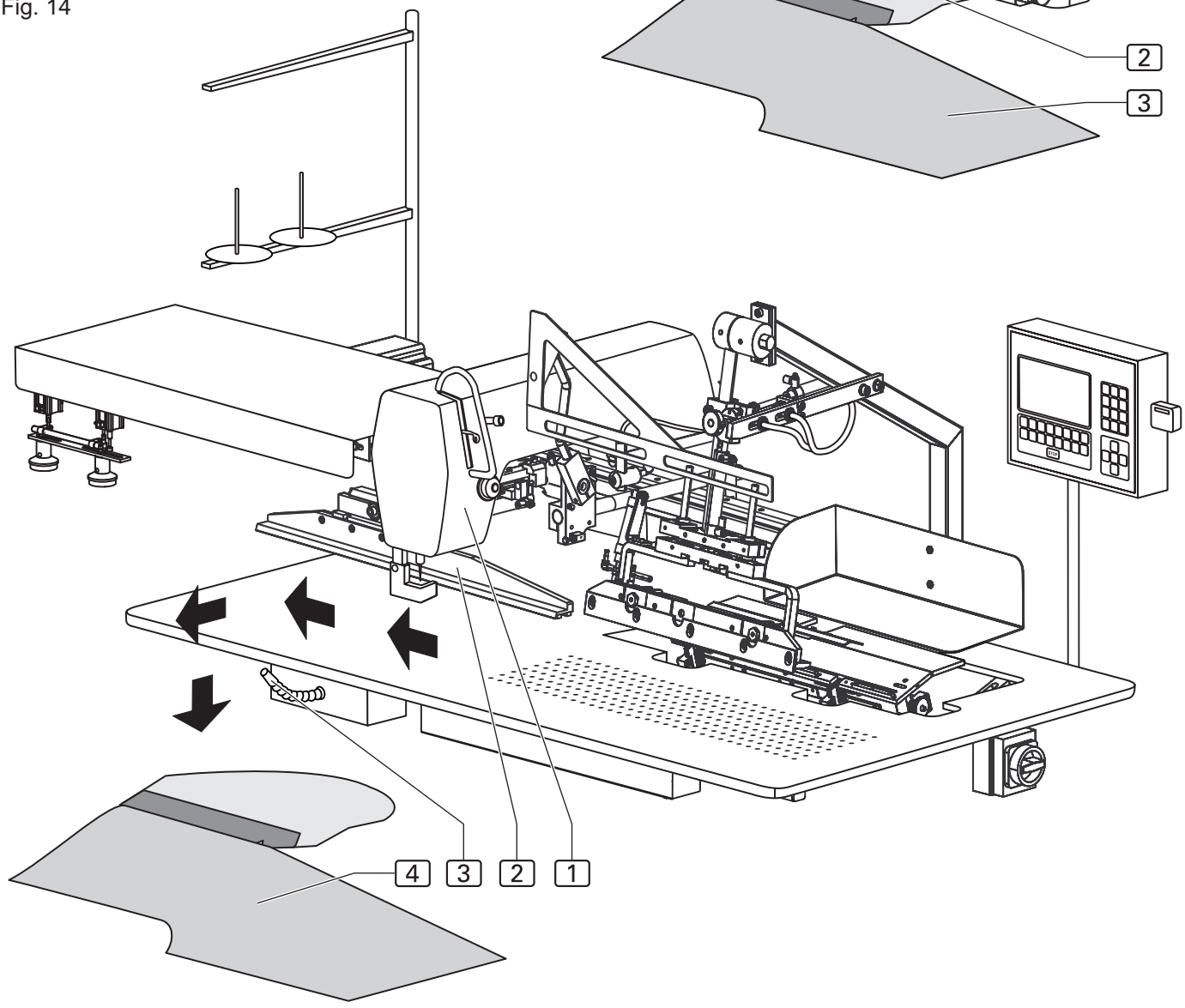


Fig. 14



B.2 Functions of the machine

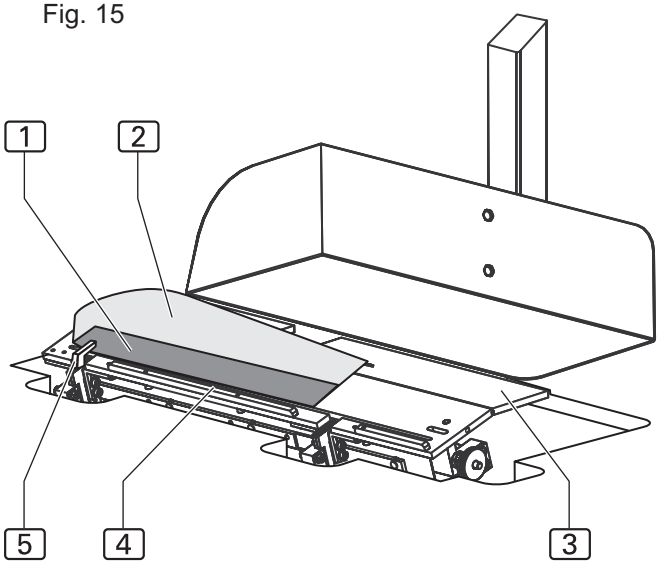
B.2.13 Machine cycle right side pocket

Fig. 15/16

The machine cycle "Clipping right side pocket and sewing it to the left trousers component" is performed as follows:

- The right side pocket is lined up manually at the pick-up plate.
- The cloth ledge is clipped, crimped over by the folder and picked up.
- The right trousers component is positioned manually on the working plate.
  After the cutter has clipped the trousers component, the folder transports the side pocket to the lright trousers component and puts it down.
- The trousers component with the side pocket is automatically transported by the transport system to the sewing head where it is tucked.
- The finished sewing piece is then blown off the worktable with compressed air.
- The assistance transport is activated.

Fig. 15



B.2.14 Lining up right side pocket at trousers

Ideally, the side pocket and the right trousers component are premarked by a gusset. If a gusset is not available, the line-up position is marked with tape or with a felt pen at the working plate or at the pick-up plate.

Side pocket line-up position, **Fig.15:**

The slash selvage clamp is closed during the line-up process.
The cloth ledge [1] of the side pocket [2] is lined up at the stop rail [4] of the pick-up plate [3]. The exact position to the cutter [5] is marked by the gusset in the cloth ledge.

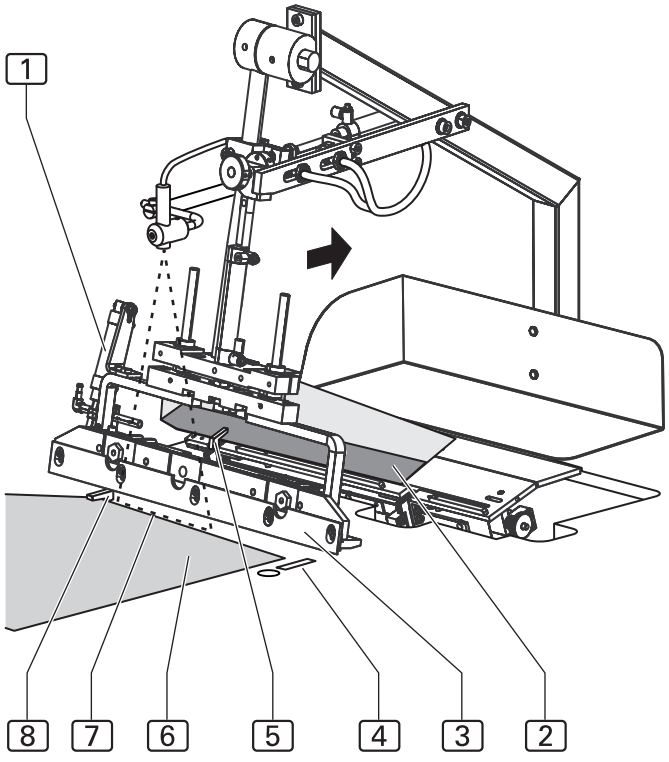
Crimping over and picking up the pocket, **Fig. 16:**

The folder [1] moves right to the pick-up plate. The cloth ledge of the side pocket [2] is clipped by the cutter [5] and crimped over and picked up by the folder clamp [3]. The cutter [8] of the working plate opens, the cutter [4] is passive and remains concealed in the working plate.

Right trousers component line-up position, **Fig.16:**

The right trousers component [4] is aligned with the gusset at the cutter [8] and parallel to the pick-up plate and the folder at the red marking [7] of the guide laser.

Fig. 16



B.2 Functions of the machine

B.2.15 Sewing the left side pocket /trousers component

Fig. 17/18

Folder, **Fig. 17:**

The folder [1] moves left to the working plate with the side pocket, lowers and puts the side pocket [2] onto the right trousers component [3].

Main clamp and sewing head, **Fig. 18:**

The main clamp [2] moves to the insertion station and picks up the sewing pieces. The folder moves up to its start position.

The main clamp transports the trousers component on the working plate from the insertion station to the sewing head [1].

After the sewing process, the sewing pieces [4] are blown off the worktable with compressed air [3].

Fig. 17

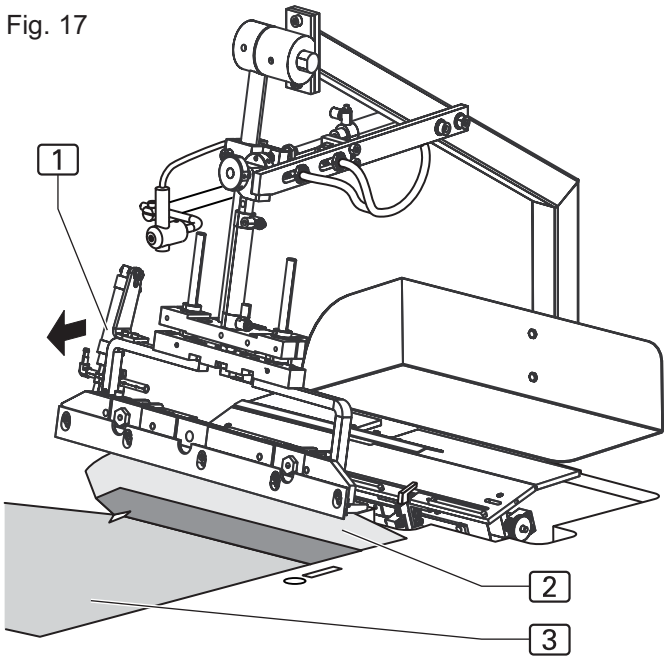
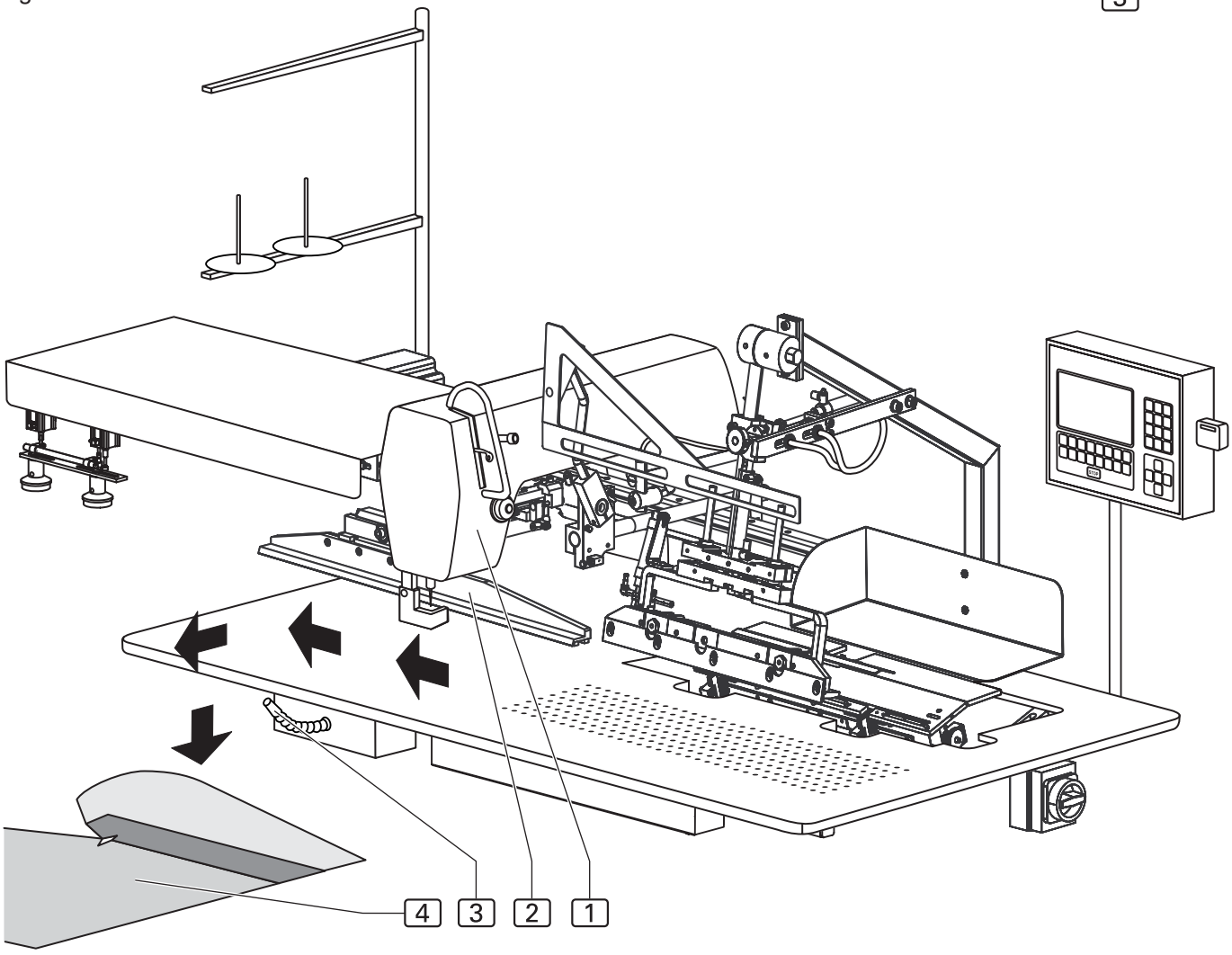


Fig. 18



B.2 Functions of the machine

B.2.16 Switches

The short seam automat is equipped with three different types of switches:

- Emergency switch for stopping a sewing program,
- supply switch for voltage and vacuum pump,
- control switches for controlling the machine operation.

Emergency switch:

Program stop key

When the program stop key [1] is pressed, all machine movements and the sewing process are stopped immediately.

The switch engages when pressed. Rotating the switch in the clockwise direction will release the switch, and it moves back into its original position.

The control program performs a reset.

Supply switches:

Main switch

The main switch [2] is used to turn the power supply of the machine on or off. For safety reasons, the machine must be turned off using the main switch when it is standing still for an extended period; in this case, all functional units are deactivated. The main switch also serves as an additional emergency off switch.

Vacuum switch

The vacuum switch [5] is used to turn the optional vacuum pump on and off.

Control switches:

Footswitch for machine operation

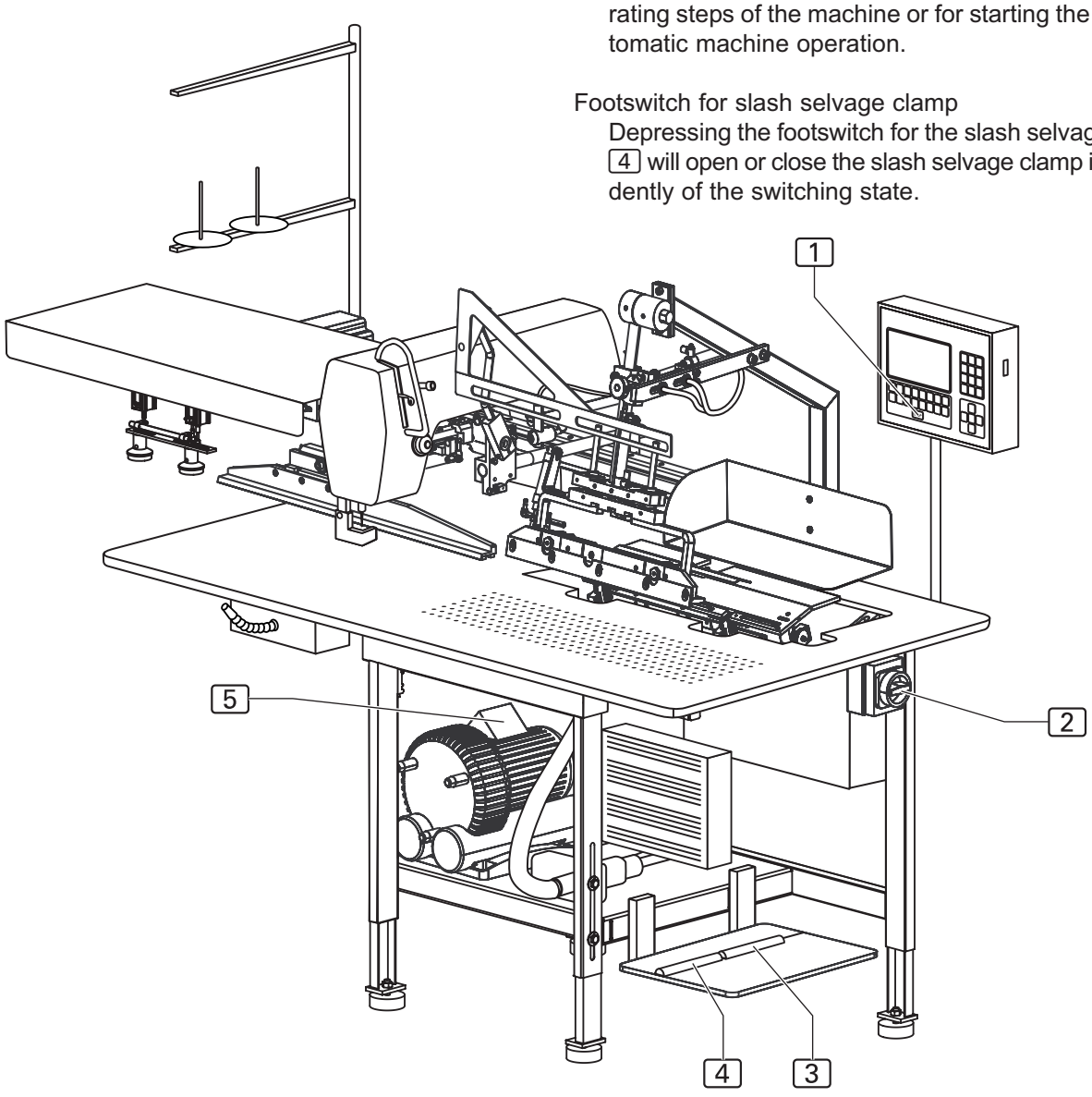
This footswitch [3] is used to control the individual operating steps of the machine or for starting the fully automatic machine operation.

Footswitch for slash selvage clamp

Depressing the footswitch for the slash selvage clamp [4] will open or close the slash selvage clamp independently of the switching state.

Fig. 19

Fig. 19



B.2 Functions of the machine

B.2.17Operating panel

Fig. 20

Display

During the operation of the machine, the display [1] shows the values of the selected sewing program. If menus were requested, the menu symbol or the corresponding parameters of the function are displayed.

Indicator panel

[8] Seam symbol
[9] Sewing program description (a sewing program may consist of several seams)
[10] Sewing program seam number
[11] Seam description
[12] Display field for the enabled seam functions
[13] Bar for requestable submenus

Memory stick slot [3]

The memory stick is the medium for storing the bakkup copies of all program control data. Programs can be copied to and stored on the memory stick and reloaded into the machine control when required.

Program stop key

If the program stop key [6] is pressed during the operation of the machine, all movements and the sewing process are stopped.

Numeric key pad

The numeric keypad [2] is used to enter all changable number values.
By pressing the M key, you can request the desired sewing programs.
By pressing the P key, you can request submenus, confirm inputs and exit the programming mode.

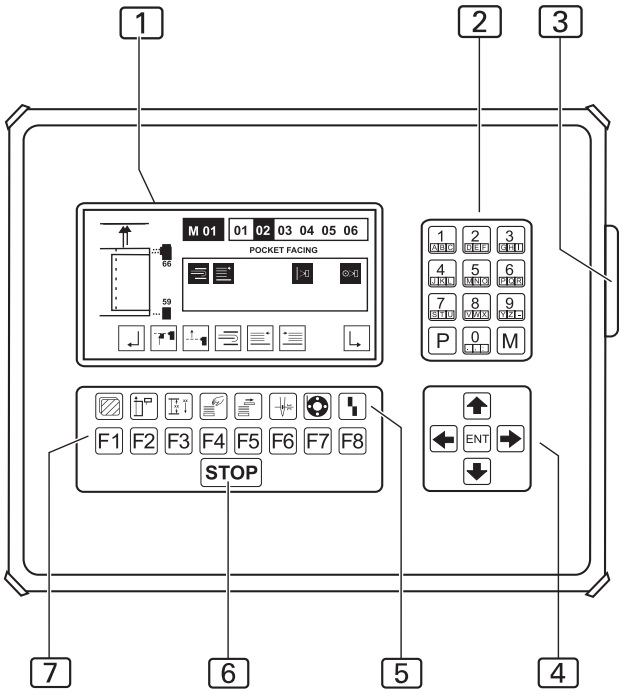
Arrow keys

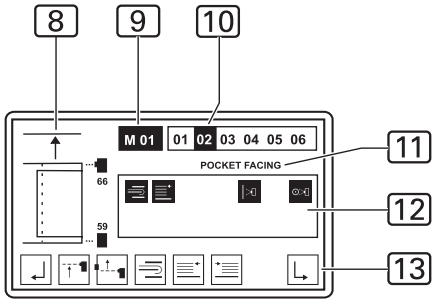
By pressing the UP or DOWN arrow key [4], you can move the cursor in the selected menu one line up or down.
By pressing the RIGHT or LEFT arrow key, you can mark the desired parameter in the selected menu using the cursor or browse forward or backward if the parameter list consists of several pages.

Function keys

You can use the function keys [7] to request the menus for setting or changing machine functions on the selected level.

Fig. 20





Symbol bar

The symbol bar [5] indicates menus that can be requested using the function keys directly from the start menu.
All other functions of the machine can be set or changed by selecting the corresponding menus on the different program levels. The corresponding symbols appear on the display of the operating panel.

B.3 Operation

B.3.1 Safety instructions for operation

Machine operation:

⚠ WARNING - Machine operation intervention!

The machine is driven by electric motors and by compressed air. Any attempt to stop the moving parts of the machine or to tamper with the movements by hand may cause severe injuries.

- **Keep hands away from machine during machine operation!**
- **During the sewing process, keep hands away from the operating range of the needle!**
- **If a failure is encountered during machine operation, press the program stop switch immediately!**

Clothing:

⚠ CAUTION - Unsuited work clothing!

As moving parts of the machine may catch and wind up loose clothing, make sure to stay away from the operating range of the machine to avoid injuries.

- **When operating the machine, do not wear wide or open clothing!**
- **Make sure that sleeves are tight-fitting and properly closed!**

Handling the guide laser:

⚠ CAUTION - Damage of the retina!

If the eye is directed toward the laser beam for some time, the retina may be damaged.

- **Do not look directly into the laser beam!**
- **Do not direct laser beam into eyes!**

⚠ CAUTION - Laser beam change!

An optical change of the laser beam may increase its luminous intensity and cause eye injuries.

- **If the direction of the laser beam is changed, if the laser beam is misadjusted or if the laser optics are damaged, turn the machine off and shut it down.**
- **Do not allow optical equipment (burning glasses or lenses) to interfere with the laser beam path.**

B.3 Operation

B.3.2 Preparing the machine

Prior to the production start, check the supply connections, connect the machine to the compressed air and power supply systems and prepare the sewing head.

1. Insert needle, pass top thread through needle and insert bobbin for bottom thread into sewing head (see working instructions of sewing head manufacturer or supplier).
2. **Fig 21:** Connect machine to compressed air supply by inserting the plug-in connector [4] of the compressed air supply hose into the compressed air receptacle in the operating room. The pressure of the compressed air is reduced to the required operating pressure of 6 bar by a pressure reducer [3]. Check manometer [2] to see if the correct operating pressure is set. The pressure reducer is installed at the side mounting wall of the worktable.
3. Connect machine to power supply system.

WARNING - Electric shock:

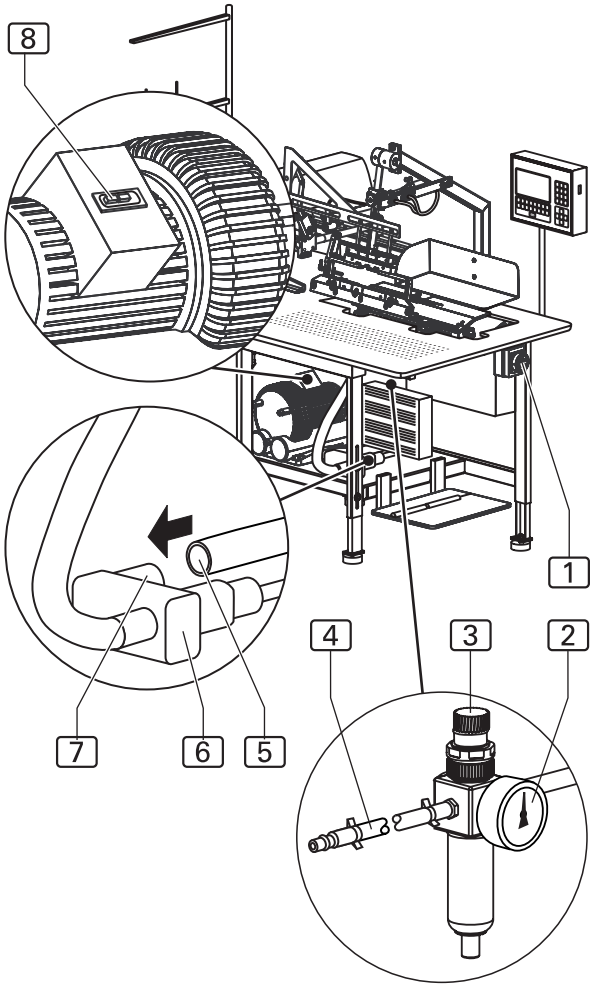
Contact with current-carrying components may cause a lethal electric shock. Check plug and cable before connecting machine to power supply system.

- **Do not use damaged plugs, sockets or cables to connect the machine to the power supply system!**
- **The machine is connected to a power source of 230 V ±10 % at 50/60 Hz.**
- **Before connecting the machine to the power supply system, check to see if the ratings of the power supply system in the operating room correspond with the ratings on the nameplate at the rear of the machine.**
- **If the ratings for voltage (V) and maximum current (A) do not match, the machine must not be connected.**
- **Insert the grounding plug into a properly grounded and fused power socket.**
- **Make sure that the power supply cable is not subject to tensile or pressure forces.**

4. Turn machine on by moving the main switch [1] into the position **I**.
5. Turn the vacuum pump of the machine on. Press vacuum switch [8] or open on-site vacuum supply.

Fig. 21

Fig. 21



NOTE - Vacuum supply!

If the machine is equipped with the optional vacuum pump, the vacuum supply is now ready for operation.
If the machine is prepared for the on-site vacuum supply system, the on-site vacuum hose [5] must be connected to the sleeve [7] of the vacuum valve [6].

The machine is ready for operation.

B.3 Operation

B.3.3 Selecting the sewing program

Fig. 22/23

After the machine has been turned on and the control program has been activated, the sewing program that had been selected last is set.
Sewing programs are stored in the memory (**M**) where up to 50 sewing programs (**M 01 - M 50**) can be programmed.
To each sewing program, up to six seam numbers (01, 02, 03, 04, 05, 06) are assigned.

Fig. 22: The program control of the machine is programmed at the factory with a sewing program [1] with three different seams [2].
The name of the sewing program is **M 01,** the seams are marked by the seam numbers (**01, 02, 03**):

- Seam **01** is used for clipping and crimping over the left slash selvage and for sewing the left slash selvage to the left trousers component.
- Seam **02** is used for sewing the right slash selvage to the right trouser component.
- Seam **03** is a test seam that is restricted to two functions:
  - Clamp movement from the insertion station to the sewing head,
  - Starting/ending the complete sewing process.

  The test seam is used for checking the clamp transport and the sewing process when the machine is set up.

1. Select sewing program at operating panel.

Request memory:

- Press [M] key.

Select sewing program number, e.g. 01:

- Press [0] and [1] keys.

The selected program is activated immediately.

2. Select seam number of desired seam.

Move cursor to seam number:

- Press [◄] or [►] key.

Confirm selection:

- Press [ENT] key.

Fig. 22

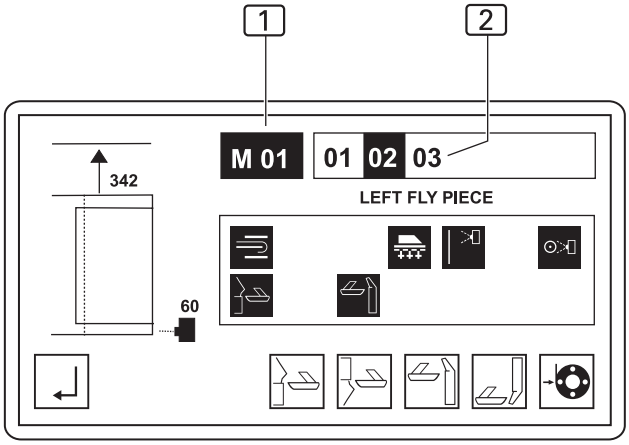


Fig. 23

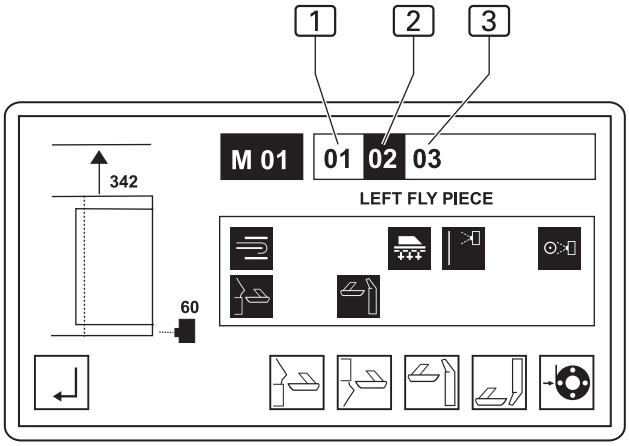


Fig. 23: Display during seam number selection:

[1] Active seam number
[2] Passive seam number
[3] Seam number is selected

B.3 Operation

B.3.4 Activating additional seam numbers

1. Select seam number of desired seam.

Move cursor to seam number:

- Press ← or → key.

Confirm selection:

- Press ENT key.

The seam number of the activated seam appears blackened.

B.3.5 Deactivating a seam number

1. Select seam number of desired seam.

Move cursor to seam number:

- Press ← or → key.

Confirm selection:

- Press ENT key.

The seam number of the deactivated seam is no longer blackened.

/

B.3.6 Setting the thread clamp manually

Before the first start of a sewing program, the top thread clamp must be activated to protect the top thread from being pulled out of the needle when the machine starts.

- Press F6 key.

B.3 Operation

B.3.7 Testing the cutters

Sharpness and function of the three cutters can be chekked individually. When the corresponding function key is pressed, a cutting movement is performed.

1. Request the cutter test menu.

- Press F7 key.

The display shows the symbols of the selectable functions on this level.

2. Rear working plate cutter (left trousers component).

- Press F4 key.

3. Front working plate cutter (right trousers component).

- Press F5 key.

4. Pick-up plate cutter (left slash selvage / right side pocket).

- Press F6 key.

5. Pick-up plate cutter (left side pocket / right slash selvage at ladies' trousers).

- Taste F7 drücken

6. Load bobbin.

- Press F8 key.

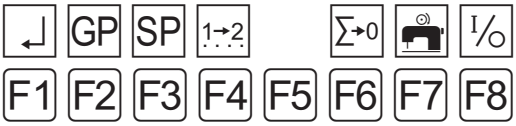
B.3.8 Resetting the day counter to zero

Use this function to reset the day counter for a program cycle or for a completed working cycle to zero.

1. Move to level 1.

Press F1 key.

The display shows the symbols for selectable functions on this level.



2. Request the day counter reset function.

- Press F6 key.

The day counter is now reset to zero.

3. Return to start level.

Press F1 key.

Display: PART: 0000

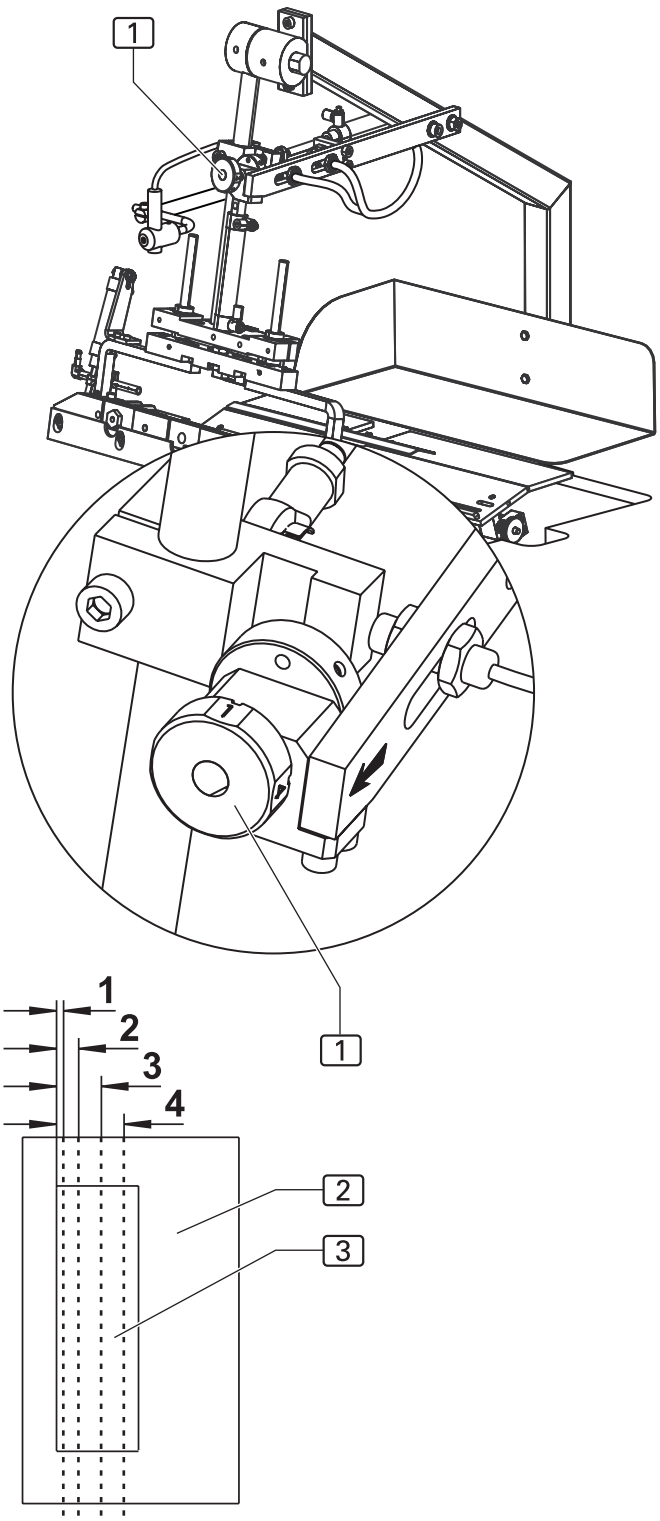
B.3 Operation

B.3.9 Quick stitch width setting

The quick stitch width adjustment makes the selection of 4 preadjusted different stitch widths possible.

- **Fig. 24:** Use the handwheel [1] to adjust the stitch width to the required range.
  [2] trousers component
  [3] slash selvage or prefactured pocket bag

Fig. 24



B.3 Operation

B.3.10 Controlling machine cycle

Fig. 25: The complete process of the sewing programs is controlled by using the two footswitches.

[1] Footswitch for machine operation
[2] Footswitch for slash selvage clamp

Each sewing program offers several alternatives (modes) for controlling the process.

The sewing programs:

- **M 01 with seam 01 (**"Crimping over left slash selvage and sew onto left trouser component") and
- **M 03 with seam 19** ("Right slash selvage for ladies' trousers."),

are controlled by using both footswitches.

- The footswitch for the slash selvage clamp [2] closes the slash selvage clamp after the slash selvage has been inserted,
- The footswitch for machine operation [1] controls the entire subsequent process of the sewing programm.

The sewing programs:

- **M 01 with seam 02** ("Sewing right slash selvage to right trousers component")
- **M 02 with seam 11,12** ("Right and left side pocket"),
- **M 03 with seam 20** ("Left slash selvage for ladies' trousers")

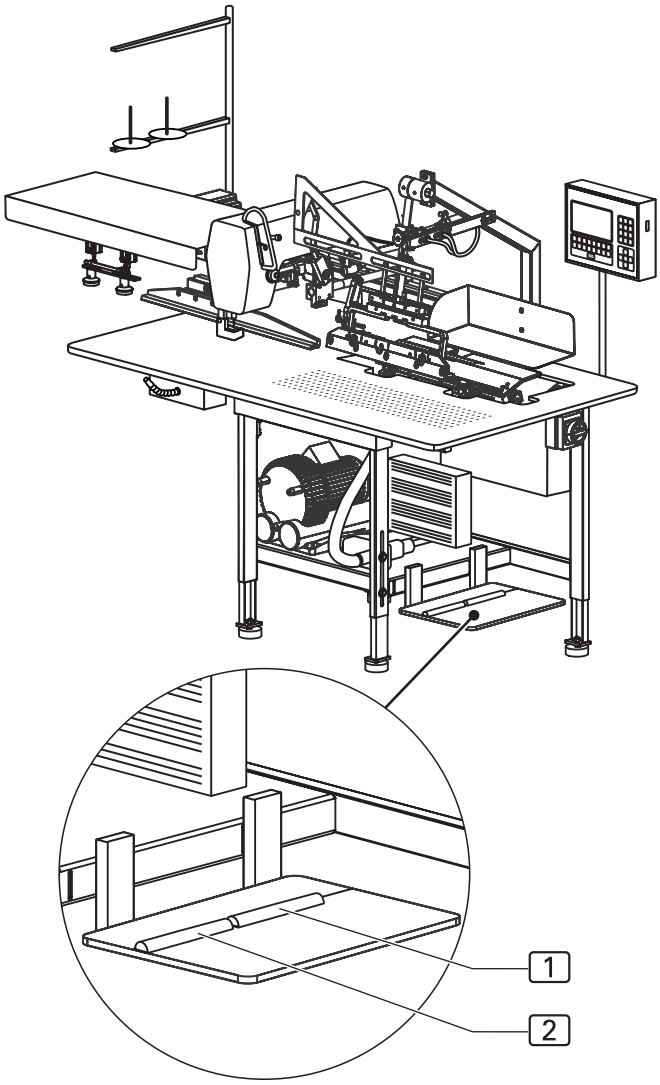
are controlled exclusively by using the footswitch for machine operation [1].

The sewing program:

- **M 0 with seam 03** ("Test seam")

is also controlled by using the footswitch for machine operation [2].

Fig. 25



B.3 Operation

B.3.11 Start mode 04 / 05

Start mode for:
- "Left slash selvage"
- "Left and right side pocket"
- "Right slash selvage for ladies' trousers"

The machine cycle "Crimping over left slash selvage and sewing to left trousers component" can be performed in two different modes (Mode 04, Mode 05).

Controlling machine cycle in Mode 04:
1. Line up left slash selvage.
2. Depress left footswitch for slash selvage clamp:
   - The slash selvage clamp closes.
3. Depress footswitch for machine operation:
   - The folder moves right to the pick-up plate.
   - The cutter "Slash selvage" cuts.
   - The slash selvage is crimped over and picked up.
4. Depress footswitch for machine operation and keep depressed:
   - The rear cutter "Left trousers component" opens, vacuum is activated.
   - Line up and smooth out left trousers component.
5. Release footswitch:
   - Further machine cycle is fully automatic:
   - The cutter "Left trousers component" cuts.
     The folder puts the slash selvage down onto the left trousers component.
   - The main clamp picks up the sewing piece.
   - The main clamp transports the sewing pieces to the sewing head.
   - The sewing pieces are tucked and blown off from the working plate with compressed air.
   - The main clamp returns to its start position.
6. The next machine cycle starts.

☞ NOTE - Supplying sewing pieces!

If the fully automatic machine cycle was started, the next sewing pieces can be lined up.
The footswitch for machine operation remains deactivated until the main clamp reaches its start position; after that, the next machine cycle can be started.

Controlling machine cycle in Mode 05:
1. Line up left slash selvage.
2. Depress left footswitch for slash selvage clamp:
   - The slash selvage clamp closes.
3. Depress footswitch for machine operation:
   - The folder moves right to the pick-up plate.
   - The cutter "Slash selvage" cuts.
   - The slash selvage is crimped over and picked up.
4. Depress footswitch for machine operation and keep depressed:
   - The cutter "Left trousers component" opens, vacuum is activated.
   - Line up and smooth out left trousers component.
5. Release footswitch:
   - The cutter "Left trousers component" cuts.
   - The folder puts the slash selvage down onto the left trousers component.
6. Depress footswitch for machine operation:
   - The main clamp moves to the insertion station and picks up the sewing pieces.
7. Depress footswitch for machine operation:
   - Further machine cycle is fully automatic:
     The folder moves right.
     The main clamp transports the sewing pieces to the sewing head.
     The sewing pieces are tucked and blown off from the working plate with compressed air.
     The main clamp returns to its start position.
     The next machine cycle starts.

☞ NOTE - Supplying sewing pieces!

If the fully automatic machine cycle was started, the next sewing pieces can be lined up.
The footswitch for machine operation remains deactivated until the main clamp reaches its start position; after that, the next machine cycle can be started.

B.3 Operation

B.3.12 Start mode 06 / 07

Start mode for:
- "Right slash selvage"
- "Left slash selvage for ladies' trousers"

The machine cycle "Sew right slash selvage to right trousers component" can be performed in two different modes (Mode 06, Mode 07).

Controlling machine cycle in Mode 06:
1. Depress footswitch for machine operation:
   - The folder moves right to the pick-up plate.
   - The cutter "Right trousers component" opens,
2. Depress footswitch for machine operation and keep depressed:
   - Vacuum is activated.
   - Line up and smooth out right trousers component.
3. Release footswitch:
   - The cutter "Right trousers component" cuts, the slash selvage stop swivels to the trousers component.
   - Line up right slash selvage to right trousers component at stop.
4. Depress footswitch for machine operation:
   - Further machine cycle is fully automatic:
     The folder moves left.
     The main clamp transports the sewing pieces to the sewing head.
     The sewing pieces are tucked and blown off from the working plate with compressed air.
     The main clamp returns to its start position.
     The next machine cycle starts.

☞ **NOTE - Supplying sewing pieces!**

If the fully automatic machine cycle was started, the next sewing pieces can be lined up.
The footswitch for machine operation remains deactivated until the main clamp reaches its start position; after that, the next machine cycle can be started.

Controlling machine cycle in Mode 07:
1. Depress footswitch for machine operation:
   - The folder moves right to the pick-up plate.
   - The cutter "Right trousers component" opens,
2. Depress footswitch for machine operation and keep depressed:
   - Vacuum is activated.
   - Line up and smooth out right trousers component.
3. Release footswitch:
   - The cutter "Right trousers component" cuts, the slash selvage stop swivels to the trousers component.
   - Line up right slash selvage to right trousers component at stop.
4. Depress footswitch for machine operation:
   - The folder moves left.
   - The main clamp moves to the insertion station and picks up the sewing pieces.
5. Depress footswitch for machine operation:
   - Further machine cycle is fully automatic:
     The main clamp transports the sewing pieces to the sewing head.
     The sewing pieces are tucked and blown off from the working plate with compressed air.
     The main clamp returns to its start position.
     The next machine cycle starts.

☞ **NOTE - Supplying sewing pieces!**

If the fully automatic machine cycle was started, the next sewing pieces can be lined up.
The footswitch for machine operation remains deactivated until the main clamp reaches its start position; after that, the next machine cycle can be started.

B.3 Operation

B.3.13 Resetting line-up process

This function depends on the selected machine cycle mode. It only refers to machine movements that can be executed before the start of the automatic process.
The machine movements can be reset gradually.

- Press F8 key (several times if required).

B.3.14 Moving machine to zero position

Prior to starting the production, after machine tests or after corrections to sewing programs, the machine must be returned to zero position for starting the machine cycle:
1. Press key STOP twice

(See Section B.3.15, Stopping a sewing program)

B.3.15 Stopping a sewing program

1. Press program stop switch.
   When this switch is pressed, all machine movements and the sewing process are stopped immediately. The switch engages when pressed.

To restart the machine after a program stop, all functions must be reset, and the machine must be returned to zero position by unlocking the program stop switch. Press key STOP twice.

B.3.16 Turning the machine off

For extended work intermissions, the machine must be turned off completely.
1. Turn power supply off by moving main switch to 0 position.

B.3.17 Periodic cleaning of the machine

The machine must be cleaned after large production series or at least once a day, whichever occurs first.

CAUTION - Danger of injuries!

As moving parts of the machine may catch and wind up loose clothing if the machine is put in motion accidentally, make sure to stay away from the operating range of the machine to avoid injuries.
Prior to any cleaning work, disconnect the machine from the power supply!
- **Turn the machine off using the main switch.**
- **Remove the power plug from the socket and protect it from accidental reconnection.**

Periodic cleaning:
1. Remove fabric residues.
2. Using compressed air, blow off dust and thread residues at the sewing head, at the working plate, at the main clamp and at the linear rail.

Section C Service Instructions

Section C Service Instructions

Contents

C.1 Delivery of the machine

C.1.1 Packaging

The machine is delivered in a solid packaging box on a pallet. All packaging materials can be separated and reused.

- Pallet made of pine wood
- Packaging box made of plywood / transport carton
- Polyethylene film (PE)

☞ **NOTE - Shipping braces!**

During shipping, moving machine parts are protected with shipping braces (cable ties). The positions of all parts fitted with shipping braces are marked with red labels.
After the machine has been installed and aligned, the shipping braces must be removed.

☞ **NOTE - Damages in transit!**

If any damage presumably caused by incorrect transport is found when the machine is unpacked, please contact your supplier immediately.

C.1.2 Scope of delivery

The machine is delivered in an operative condition. The scope of delivery comprises:

Short seam automat with sewing head
- The machine is equipped with several customer-specific accessories. For checking the exact lay-out, the information on the delivery note is authoritative.
- Service kit with machine oil.

Operating panel and program control:
- Preinstalled (ready-for-use) operating panel.
- Memory stick with factory-programmed standard sewing program.

Technical documents:
- Operating instructions.
- Service instructions.
- Programming instructions.

C.2 Storage and location requirements

C.2.1 Floor quality

The floor of the room where the machine is to be installed must have a sufficient surface strength. The location of the machine must be free of vibrations.
If several machines are to be installed in one room, the static load bearing capacity of the ceiling must be considered.

Weight:
- Machine with accessories approx 210 kg

C.2.2 Interior climate

Climatic requirements for the operating room:
The machine must only be stored or operated in closed operating rooms.
- Room temperature +10 °C to +45 °C
- Relative humidity 80 % max.

C.2.3 Floor space required

For operation during production and for service works, the machine must be freely accessible from all sides. On all sides, there must be a minimum clearance of 1 m.

Machine dimensions:
- L x W x H 1700 x 1200 x 1600 mm

☞ **NOTE - Electromagnetic interference!**

The machine must not be installed in the immediate vicinity of devices or electrical components (e.g. transformers) generating a strong magnetic field as otherwise the correct function of the program control may be impaired.

C.2.4 Supply connections

The machine requires on-site power and compressed air sources.

Power connection:
The power supply of the machine requires a properly grounded power connection with:
- Grounding plug 230 V ± 10 %, 50/60 Hz
- Fusing 16 A

☞ **NOTE - Peak voltages!**

The correct function of the machine requires that the power system supplies a constant current. Peak voltages may particularly impair the stability of the program control.

Compressed air supply:
The on-site compressed air supply system must meet the following requirements:
- Operating pressure 6 bar
- Compressed air quality oil-free
- Compressed air consumption 4.16 NL

Vacuum source:
The on-site vacuum source must meet the following requirements:
- Displacement (minimum) 130 m³/h

C.3 Start-up

C.3.1 Machine table alignment

Fig. 1/2

After the machine has been installed at the desired location, the machine table must be aligned:
- Set machine table to required height.
- Align machine table horizontally on all sides.

Setting table height:
1. **Fig. 1:** Lift machine: Connect lifting device at lift points (arrows) below the crossmembers. If the machine is equipped with optional transport rollers, release brakes before lifting.
2. **Fig. 2:** Loosen lockscrews [2] on all guide rails.
3. Pull table legs [3] out to the desired length and retighten lockscrews [2].
4. Lower machine to floor.

Horizontal positioning of the machine table:
1. Place bubble level onto working plate.
2. **Fig. 2:** Loosen table leg lock nuts [1].
3. Align machine table horizontally on all sides by raising or lowering table legs as required.
4. Retighten table leg lock nuts.

NOTE - Shipping braces!

Before the machine is connected to the power supply system, all shipping braces must be removed.
- **Cut off cable ties.**
- **Remove labels.**

Fig. 1

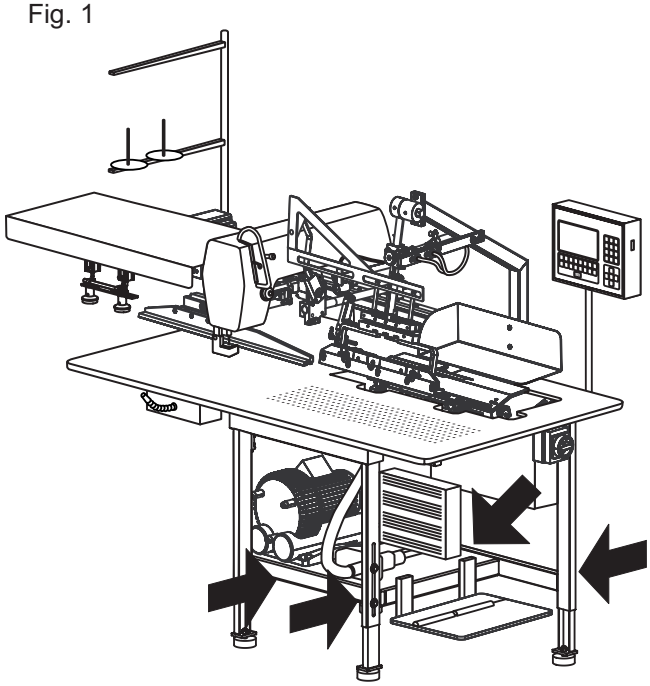
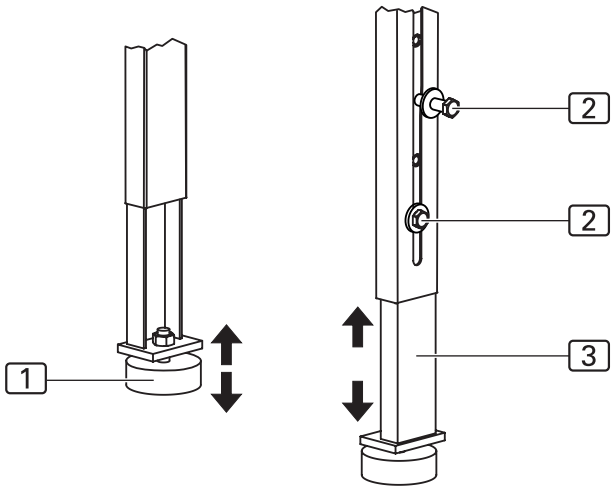


Fig. 2



C.3 Start-up

C.3.2 Compressed air / vacuum connections

Fig. 3/4

Fig. 3: The compressed air connection is preinstalled on the machine. It comprises the following components:
- Pressure reducer [3] with manometer [5] and water separator [4],
- Pressure hose with push-in plug [1].

The pressure reducer is installed at the side mounting wall of the worktable.

Connecting the machine to the compressed air supply system:
1. Connect pressure hose plug to on-site terminal unit.
2. Open on-site compressed air supply.
3. **Fig. 3:** Set pressure reducer to a machine operating pressure of 6 bar by rotating pressure reducer knob [1] and read value on manometer [5]:
   - To increase pressure, rotate in clockwise direction.
   - To reduce pressure, rotate in counter-clockwise direction.

Connecting the machine to the vacuum supply system:
Fig. 4: If the machine is equipped with the optional vacuum pump [3], no further installation is required. The vacuum system is ready for operation.
If the machine is delivered without vacuum pump, the on-site vacuum source must be connected to the machine's vacuum valve. The vacuum valve [5] is mounted below the worktable.

☞ **NOTE - Required components!**

The following components are required on the site:
- **A vacuum hose 3 with an inner diameter of at least 1¼ " or, as required, an adapter or reducing fitting to accommodate the on-site vacuum hose on the sleeve (outer diameter 1¼ ") of the machine's vacuum valve.**
- **A hose clamp with an inner diameter of at least 1¼ ".**

1. **Fig. 4:** Connect the on-site vacuum hose to the connection sleeve [4] of the vacuum valve [5].
2. Attach vacuum hose using the hose clamp.
3. Make sure that the vacuum hose [1] to the table plate has been attached correctly and securely.
4. Open on-site vacuum source.

Fig. 3

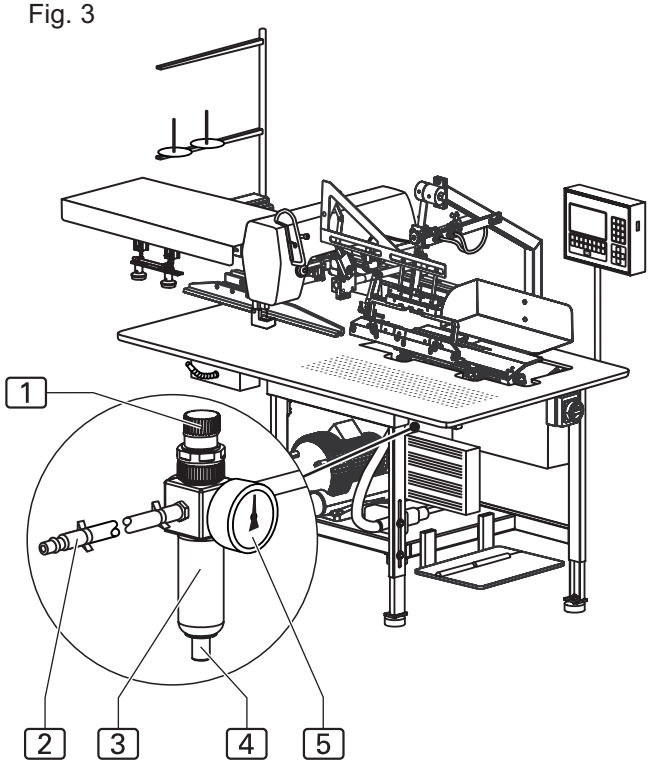
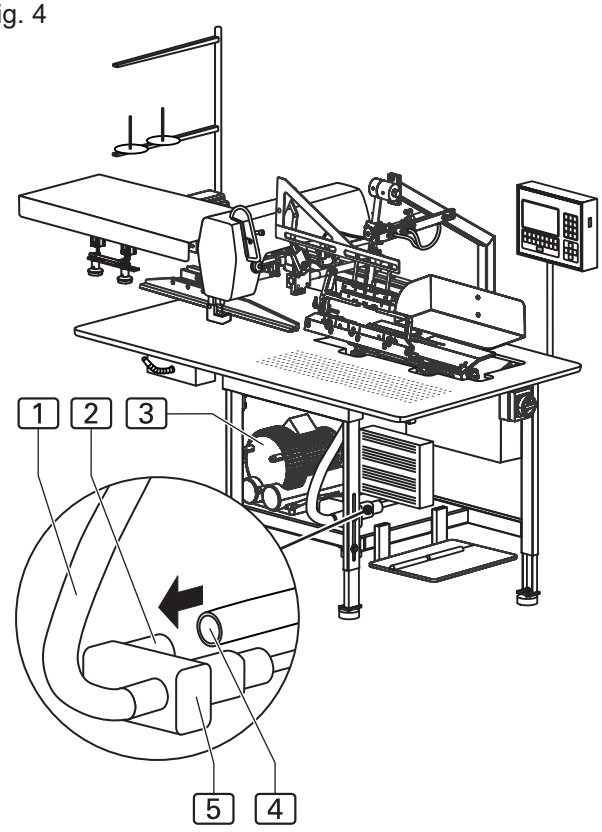


Fig. 4



C.3 Start-up

C.3.3 Connecting the machine to the power supply

The power cable and the power plug are preinstalled on the machine. The footswitches for controlling the machine operation and the bundle clamps are installed as well.

Connecting the machine to the power supply system:

1. Put footswitches for machine operation and for bundle clamp onto desired locations on floor at front side of machine.
2. Insert power plug into socket.

⚠ WARNING - Electric shock!

Contact with current-carrying components may cause a lethal electric shock. Check plug and cable before connecting machine to power supply system.

- **Do not use damaged plugs, sockets or cables to connect the machine to the power supply system!**
- **The machine is connected to a power source of 230 V ±10 % at 50/60 Hz.**
- **Before connecting the machine to the power supply system, check to see if the ratings of the power supply system in the operating room correspond with the ratings on the nameplate at the rear of the machine.**
- **If the ratings for voltage (V) and maximum current (A) do not match, the machine must not be connected.**
- **Insert the grounding plug into a properly grounded and fused power socket.**
- **Make sure that the power supply cable is not subject to tensile or pressure forces.**
- **Route the power supply cable in a way that ensures free access to and around the machine.**

☞ NOTE - Works to the electrical system!

Works to the electrical system of the machine must only be carried out by qualified and authorized expert personnel. Tampering with the machine without authorization makes the warranty void.

C.3.4 Safety check

Before the machine is released for operation, all safety devices must be checked for their correct operation.

⚠ CAUTION - Danger of injuries!

The safety devices protect the operating and service personnel while working on or with the machine. If the safety devices are fully or partially inoperative, the machine must not be started up.

Perform safety check:

1. Check to see if the cover above the clamp transport unit is correctly and safely installed.
2. Check to see if the finger protection at the sewing head covers the needle effectively.
3. Make sure that the guide laser is not directed into the view area of the machine operator.
4. The main switch also serves as an emergency off switch. To check the function of this switch, turn the machine on, start a machine cycle and turn the machine off during the tucking process using the main switch. All operational movements of the clamp and of the sewing head must stop, and the program control must switch off.
5. Check the function of the program stop key. Start a machine cycle and press the switch. All operational movements of the clamp and of the sewing head must stop.
6. Unlock the program stop switch. The program control starts a reset, and the clamp must return to its start position.

The machine is ready for operation.

C.4 Operation and shut-down

C.4.1 Working with the machine

Factory setting
The program control of the machine is programmed at the factory with a sewing program with three different seams.

Factory settings
The machine comes with a factory-installed standard program **M 01** with three seams (**01, 02, 03**):

- **Seam 01:** Clipping and crimping over of the left slash selvage with subsequent sewing of the slash selvage to the left trousers component.
- Seam **02:** Sewing the slash selvage to the right trousers component.
- Seam **03:** Test seam that is restricted to two functions:
  - Clamp movement from the insertion station to the sewing head,
  - Starting/ending the complete sewing process.

  The test seam is used for checking the clamp transport and the sewing process when the machine is set up.

The standard program **M 02** works with the two seams **(11 and 12)**.

- **Seam 11**: Controls the procedure for sewing the side pocket to the right trousers component.
- **Seam 12**: Controls the procedure for sewing the side pocket to the left trousers component.

The standard program **M 03** works with the two seams **(19 and 20)**.

- **Seam 19:** Controls the procedure for sewing the right slash selvage to the right trousers component at ladies' trousers.
- **Seam 20:** Controls the procedure for sewing the left slash selvage to the lefttrousers component at ladies' trousers.

C.4.2 Machine shut-down

When the machine is to be shut down, it must be disconnected from all supply sources.

Disconnecting the machine from the power supply system:

1. Turn machine off using main switch. Move switch to position 0.
2. Remove power plug from socket and protect it from accidental reconnection.

Disconnecting the machine from the compressed air supply system:

1. Shut off on-site compressed air.
2. Remove compressed air hose plug from terminal unit.

☞ **NOTE - Dust-proof protection!**

If the machine is to be shut down for an extended period of time, it should be covered with a plastic tarpaulin.

C.5 Maintenance

WARNING - Electric shock!

Contact with current-carrying components may cause a lethal electric shock.
As moving parts of the machine may catch and wind up loose clothing if the machine is put in motion accidentally, make sure to stay away from the operating range of the machine to avoid injuries.
Prior to any service, cleaning or maintenance works, disconnect the machine from the power supply system!

- **Turn the machine off using the main switch.**
- **Remove power plug from socket and protect it from accidental reconnection.**
- **If the power supply is not required for repair or set-up work, the machine must be disconnected from the power supply system.**

C.5.1 Inspection

The machine must be inspected annually.
The inspection comprises particularly the following items:

- safety devices of the machine,
- operativeness of the program control,
- correct function of inputs and outputs.

C.5.2 Cleaning

The machine must be cleaned after large production series, or at least once a day, whichever occurs first.

Cleaning the machine surfaces:

1. Disconnect machine from power supply system.
2. Remove fabric residues.
3. Using compressed air, blow off dust and thread residues at the sewing head, at the working plate, at the clamp and at the linear rail.
4. Wipe machine parts dry using a dry, clean cloth.

NOTE - Plastic surfaces!

Some parts of the machine surfaces are made of plastic materials. Solvents may dissolve plastics and make them unusable.
Do not clean the machine surfaces (particularly the operating panel) with cleaning agents that contain solvent.

C.5 Maintenance

C.5.3 Service

The following service works must be carried out in weekly intervals.

Oiling the clamp rail:
1. Disconnect machine from power supply.
2. Wipe clamp rails clean using a soft, oil-saturated cloth. The scope of delivery comprises 0.25 l of oil. When this oil is used up, you can order the special machine oil for service from the manufacturer or supplier of the machine.

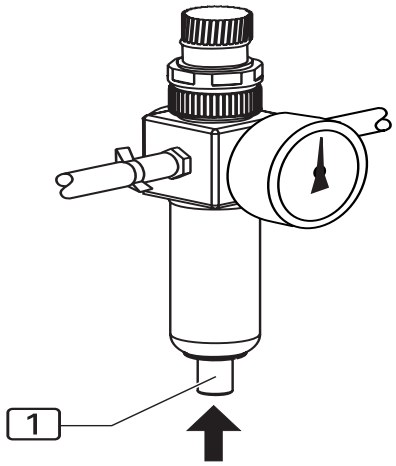
Emptying the water separator:
1. Disconnect machine from power supply.
2. **Fig. 5:** Drain water at pressure reducer water separator into suited container. Press button [1] at pressure reducer collector and keep de pressed until water has been drained completely.

☞ **NOTE - Sewing head!**

For information about service of the sewing head, please refer to the working instructions of the sewing head.

Fig. 5

Fig. 5



C.5 Maintenance

C.5.4 Repairs

Any repairs to the machine must only be carried out by:
- authorized Technical Service,
- personnel that has been instructed about the setting up and maintenance of the machine on the occasion of a training by the supplier or manufacturer.

Use only original spare parts for installing or replacing machine components.
Manufacturer and supplier will not be held responsible for spare parts from third parties.

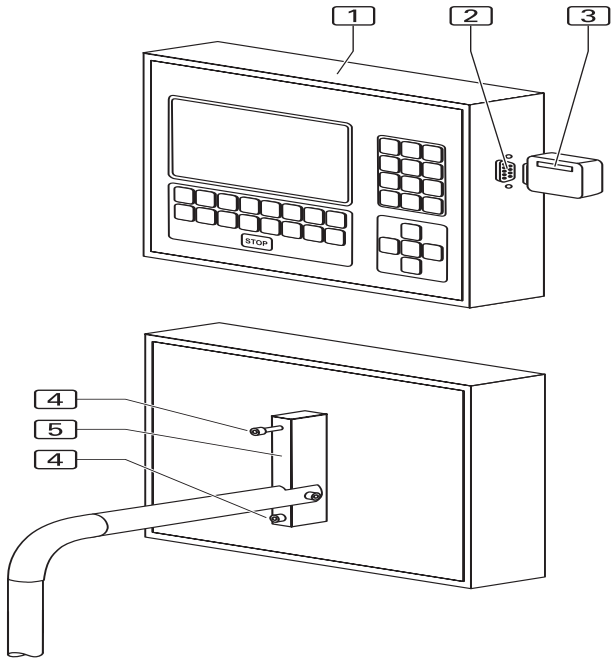
NOTE - Programming instructions!

Repairs require that machine components carry out their individual movements and that the machine movements are tested. These functions are controlled on level 1 of the service menu.
For the necessary instructions, please refer to the programming instructions section D.

Operating panel replacement:
1. Disconnect machine from power supply.
2. **Fig. 6:** Remove two lock screws [4] and disconnect interface connector [5].
4. Remove operating panel [1], install new panel and secure using screws.
5. Copy sewing programs: Insert memory stick [3] into socket [2] (see Section D, Programming Instructions).

Fig. 6

Fig. 6



C.5 Maintenance

C.5.4 Repairs

Fig. 7/8

Clamp transport belt replacement:

1. Disconnect machine from power supply system.
2. Slide clamp to left until it reaches stop position.
3. **Fig. 7:** Remove retaining screws [3] from drive roller cover [2] and remove cover.
4. Remove two retaining screws from slide roller cover [8] and remove cover [9].
5. Loosen two belt lock screws [4] and release belt tension [7].
6. Loosen lock nuts [6] of set screws [5] and rotate two set screws backward.
7. **Fig. 8:** Remove two connecting screws [1] from main clamp pedestal. Remove belt.
8. **Fig. 7:** Install new belt to drive roller [1] and to guide roller [10].
9. **Fig. 8:** The ends of the belt [3] are fitted with holes. Position the two ends of the belt with the belt clamp [2] exactly over the holes on the pedestal [4] and secure them using screws.
10. **Fig. 7:** Tension belt by tightening two set screws [5] until the belt can be depressed approx 10 mm with distinct counterpressure at the middle of the transport rail. Tighten lock nuts [6] and lock screws [4].
11. Install the two covers [2] and [9]

Fig. 8

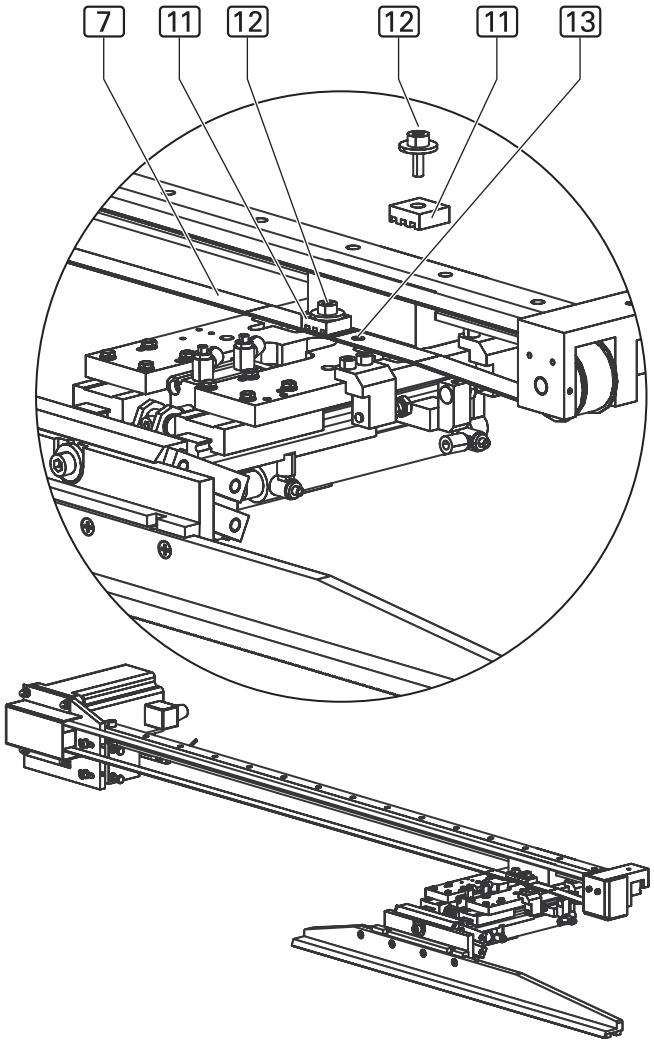
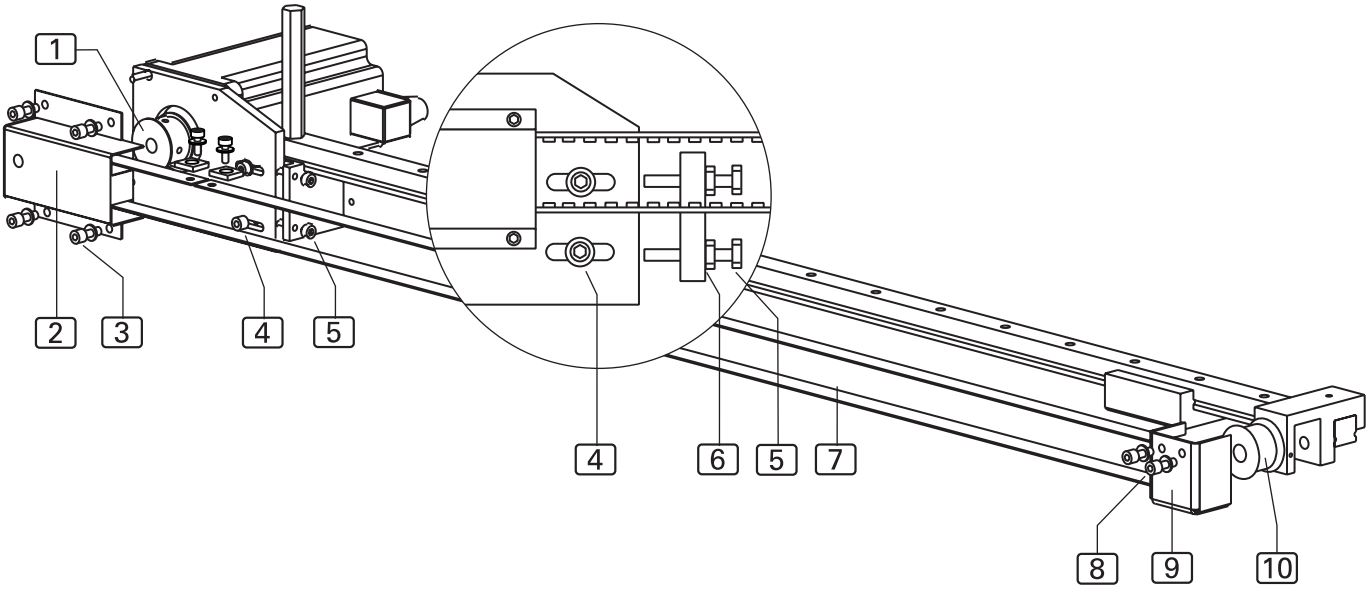


Fig. 7



C.5 Maintenance

C.5.4 Repairs

Fig. 9/10

Clamp rail replacement:
The clamp rail must be replaced if the protective lining at the bottom side of the rail is worn.

Clamp rail removal:
1. **Fig. 9:** Lift main clamp [1].
2. Loosen retaining screw [2].
3. Pull clamp rail [1] down and remove.

Clamp rail installation:
1. Insert clamp rail [1] into fixture and push up until it has reached the stop. Make sure the clamp rail is positioned evenly in the fixture.
2. Tighten retaining screw [2].

Cutter replacement:
The cutters are integral to a block together with the pressure cylinder. The cutter block for the left slash selvage is attached with two fixing angles [1] and [2] and screws to the pick-up plate bracket.
The two cutter blocks for the left and right trousers components are each attached with a fixing angle [3] and screws to the bottom of the working plate.

Cutter block replacement:
1. Disconnect compressed air hoses (the hoses are merely pushed onto the sleeve).
2. **Fig. 10:** Remove retaining screws [4].
3. Position new cutter block, secure using screws and connect compressed air hoses.
4. Readjust cutter position as described in Section 5.5, "Machine set-up".

Fig. 9

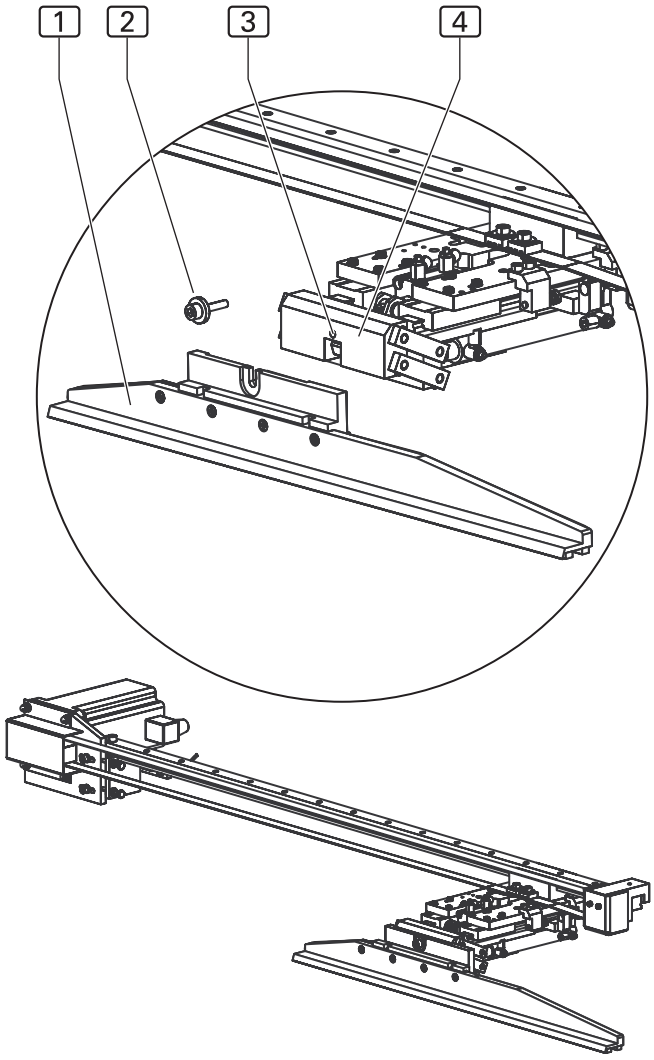
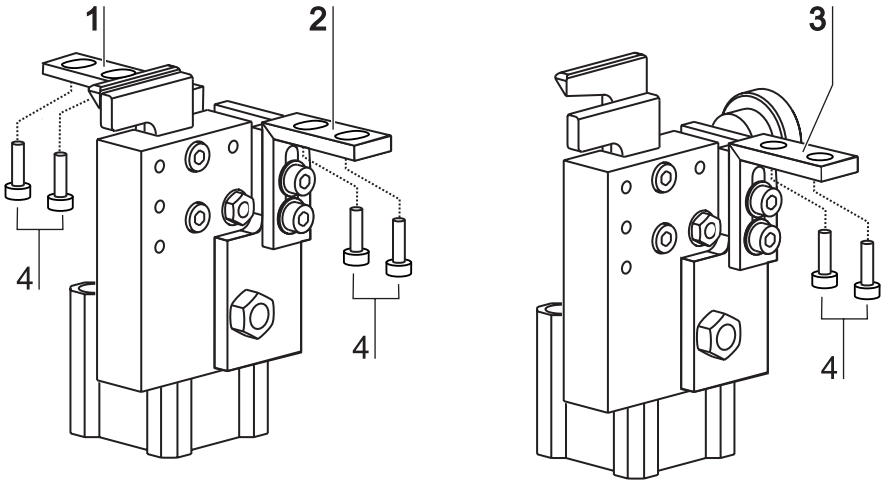


Fig. 10



C.5 Maintenance

C.5.4 Instandsetzung

Fig. 11/12

Assistance transport belt replacement:

1. Disconnect machine from power supply system.
2. Slide assistance transport to stop position.
3. **Fig. 11:** Remove retaining screws [1] of the cover [2] and remove cover.
4. Release belt tension, loosen the two belt lock screws [3] as well as set screw [4].
5. Remove the retaining screws [8] of the belt clamp [9]. Remove belt.
6. Install new belt to drive roller [7] and to guide roller [5].
7. The ends of the belt are fitted with holes. Position the two ends of the belt with the belt clamp [9] exactly over the holes on the holder and secure them using the screws.
8. Tension belt by tightening the set screws [4] until the belt can be depressed approx 10 mm with distinct counterpressure at the middle of the transport rail. Thighten the lock screws [3].
9. Install cover.

Fig. 12: Pin assignment step motor:

[1] Plug connections
[2] Step motor assistance transport

Fig. 12

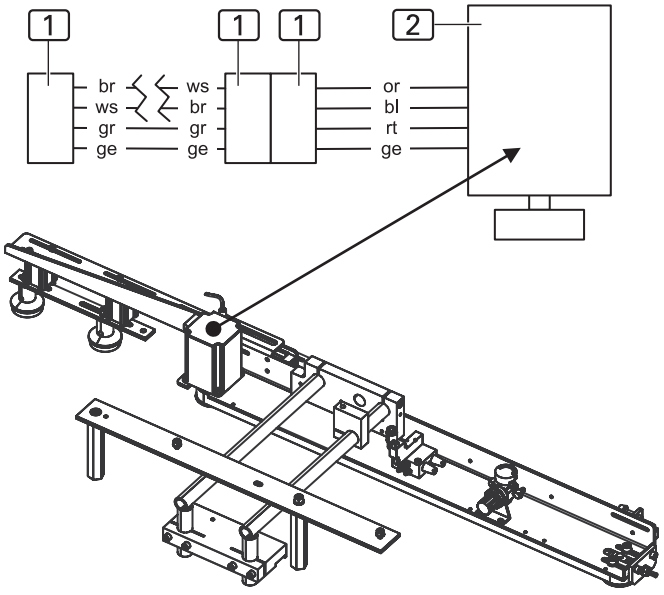
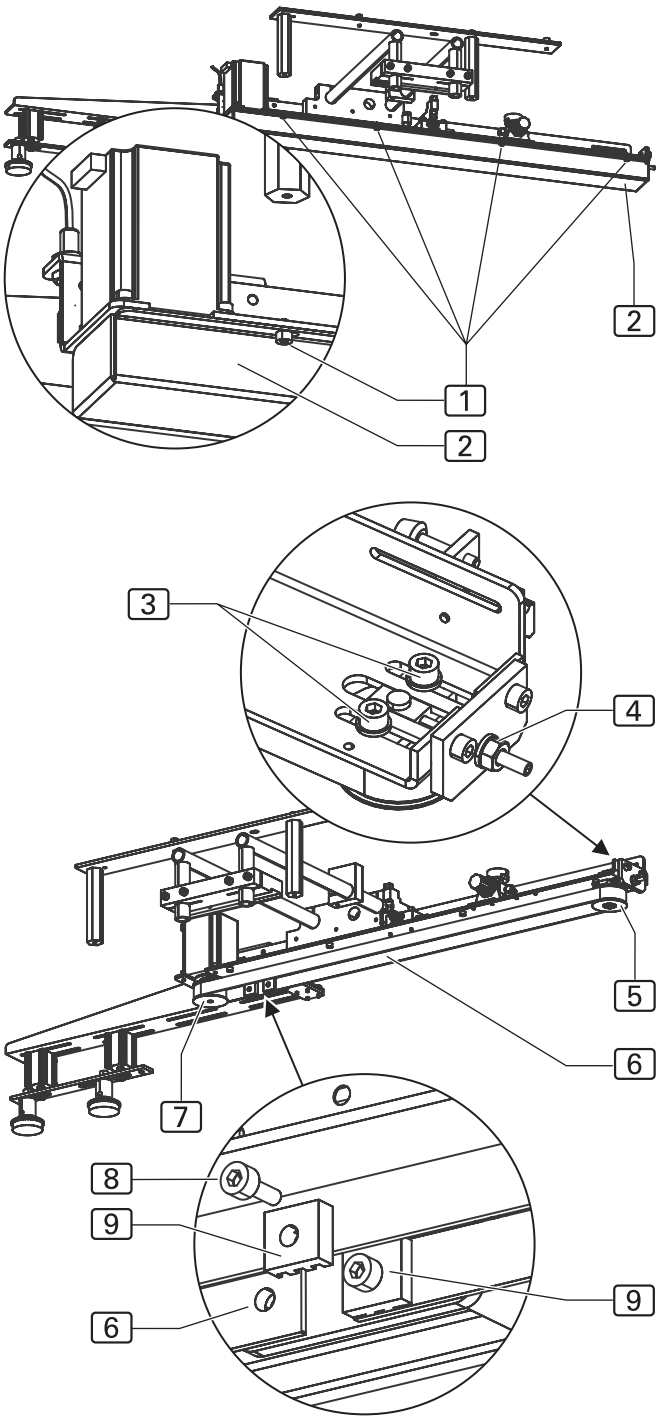


Fig. 11



C.5 Maintenance

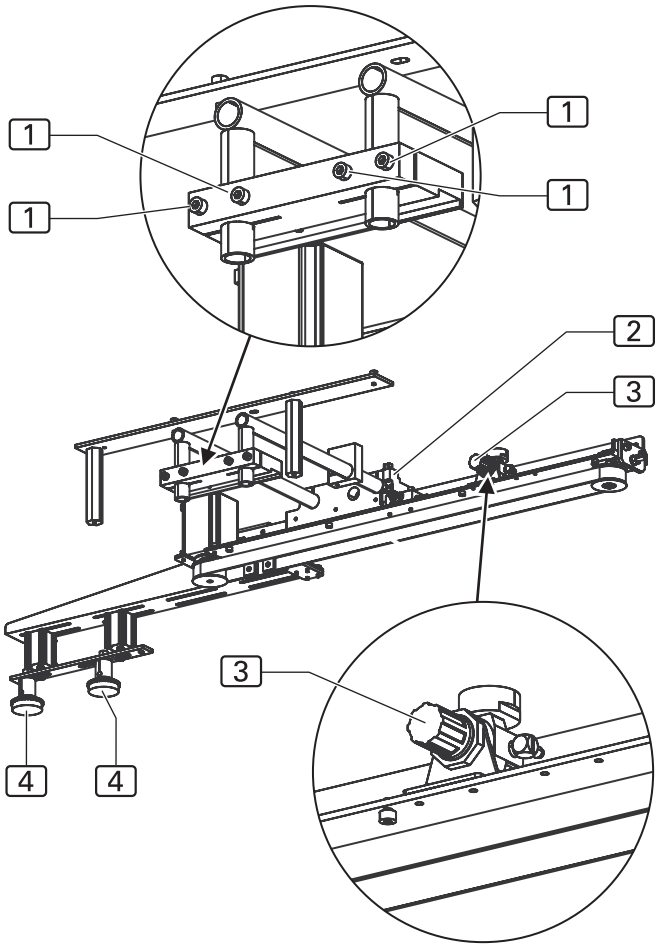
C.5.5 Machine set-up

Fig. 13

Assistance transport stamp pressure adjustment:
Fig. 13: Check to see if the stamps [4] exerts pressure onto the sewing piece evenly along the entire length of the transport section. Line up a piece of fabric to the insertion position and lower the stamps.
Check stamping pressure by trying to pull the sewing piece out of the stamps at several locations along the transport section. If the stamping pressure must be adjusted:

1. Adjust pressure at the pressure reducer [3] to 1 bar (0,1 mpa).
2. Check parallel alignment of the stamps [4] to the slide plate of the working plate. If the alignment of the stamps must be adjusted:
3. Loosen the four retaining screws [1].
4. Adjust height position of the complete assistance transport [1].
5. Tighten retaining screws [1].
6. Recheck pressure with completely lowered stamps along the entire length of the transport section.

Fig. 13



C.5 Maintenance

C.5.5 Machine set-up

Fig. 14

☞ **NOTE - Activating inputs/outputs!**

To allow for testing machine movements or interval operation, the individual stages of movement can be activated with the inputs/outputs of the machine control unit (see Section D.4.3., Service menu level 1).

Usually, the setting up of the machine is controlled by parameter values of the sewing programs (special parameters) and the parameter values of the machine control unit (global parameters). The following mechanical modifications may be required additionally to ensure correct seams with the set parameter values.

Guide laser adjustment:
The guide laser marks the line-up position of the left and right trousers components parallel to folder and pick-up plate. The position of the guide laser can be adjusted vertically and horizontally.

Adjusting the bracket height:
1. Fig. **14:** Loosen retaining screw [4] at rear of worktable.
2. Position laser light bracket [3] in the desired height.
3. Tighten retaining screw [4].

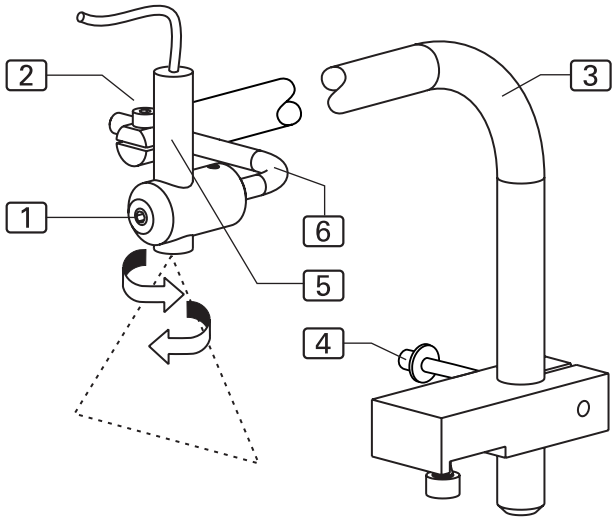
Horizontal adjustment:
1. Loosen lock screw [1].
2. Rotate laser light [5] to desired position.
3. Tighten lock screw [1].

Vertical adjustment for rotating the laser light to the desired position:
1. Loosen lock screw [2].
2. Rotate laser light angular bracket [6] to desired position.
3. Tighten lock screw [2].

☞ **NOTE - Seam width!**

The seam width can be determined by the vertical alignment of the guide laser when sewing the slash selvage.
If the alignment of the laser to the left is changed, the seam narrows, if the alignment of the laser to the right is changed, the seam becomes wider.

Fig. 14



C.5 Maintenance

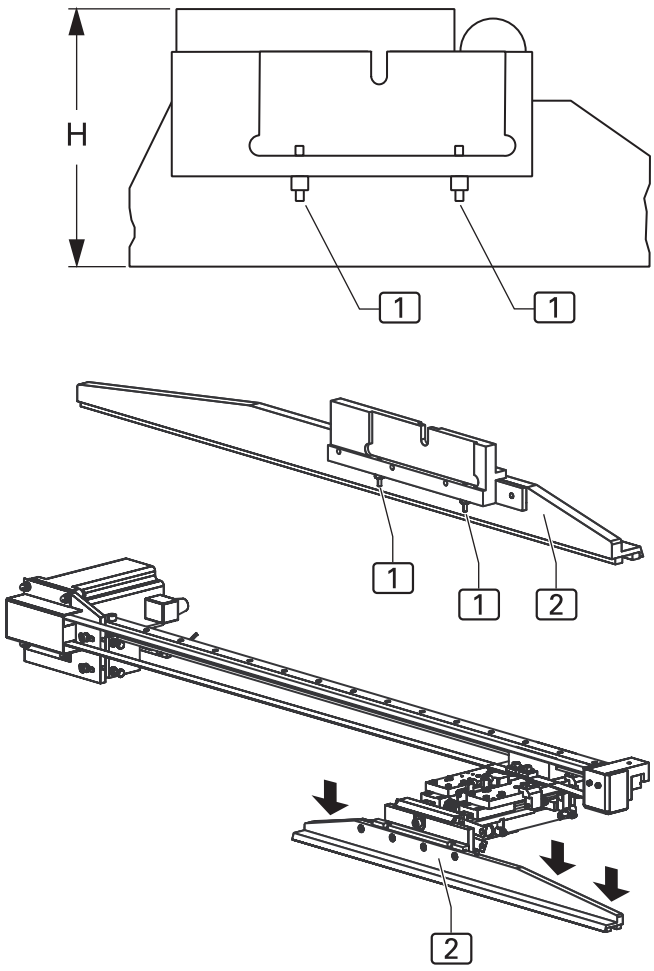
C.5.5 Machine set-up

Fig. 15

Clamp rail clamping pressure adjustment:
After any works to the main clamp, the clamping pressure and the alignment of the clamp rail to the needle must be checked.

1. Check to see if the main clamp exerts pressure onto the sewing piece evenly along the entire length of the rail by lining up a piece of fabric to the insertion position and lowering the main clamp.
2. Check clamping pressure by trying to pull the sewing piece out of the clamp at several locations along the clamp rail.
3. **Fig. 15:** If the pressure force is uneven or insufficient, remove clamp rail and change the position of the two adjusting screws [1] at the inner side of the clamp rail. If the adjusting screws are screwed in, the pressure of the clamp rail onto the working plate increases as the height **H** of the main clamp in the downward direction changes.
4. Repeat adjustment and recheck with lowered main clamp until clamping pressure is distributed evenly along the entire length of the clamp rail.

Fig. 15



C.5 Maintenance

C.5.5 Machine set-up

Fig. 16/17

Adjustment of the clamp slide disengagement position:
The disengagement position for the front and rear stop point of the clamp slide is set at the pedestal.
Fig. 16: The front stop point [3] determines how far the clamp slide will approach the needle of the sewing head, the rear stop point [4] determines how far the clamp slide will return to its start position.

Front stop point adjustment:
1. Lower main clamp.
2. Depressurize the machine. Disconnect compressed air supply hose from on-site compressed air supply system.
3. Move main clamp by hand below sewing head and lower needle using handwheel.
4. **Fig. 16:** Distance **A** between clamp rail [2] and needle [1] must be 1-1.5 mm.
5. Loosen lock nut [8] of stop screw [7] at pedestal and rotate stop screw to the desired position.
6. Check distance **A**.
7. Tighten stop screw lock nut.

Rear stop point adjustment:
The rear stop point is adjusted correctly if the clear length **B** of stop screw [6] measures exactly 10 mm.
1. Fig. **16:** Loosen lock nut [5] of stop screw [6] and rotate stop screw to the desired position.
2. Check length **B**.
3. Tighten stop screw lock nut.

Adjustment of the clamp rail parallel orientation:
1. Check to see if the sewing head needle is positioned exactly parallel to the clamp rail along the entire length of the rail by moving the main clamp under the sewing head and checking the distance between rail and needle at several locations.
2. **Fig. 17:** If distance is not identical at all locations, loosen eight retaining screws [1] of clamp bracket and move clamp rail to parallel position.
3. Tighten clamp bracket retaining screws and recheck parallel orientation of clamp rail.

Fig. 16

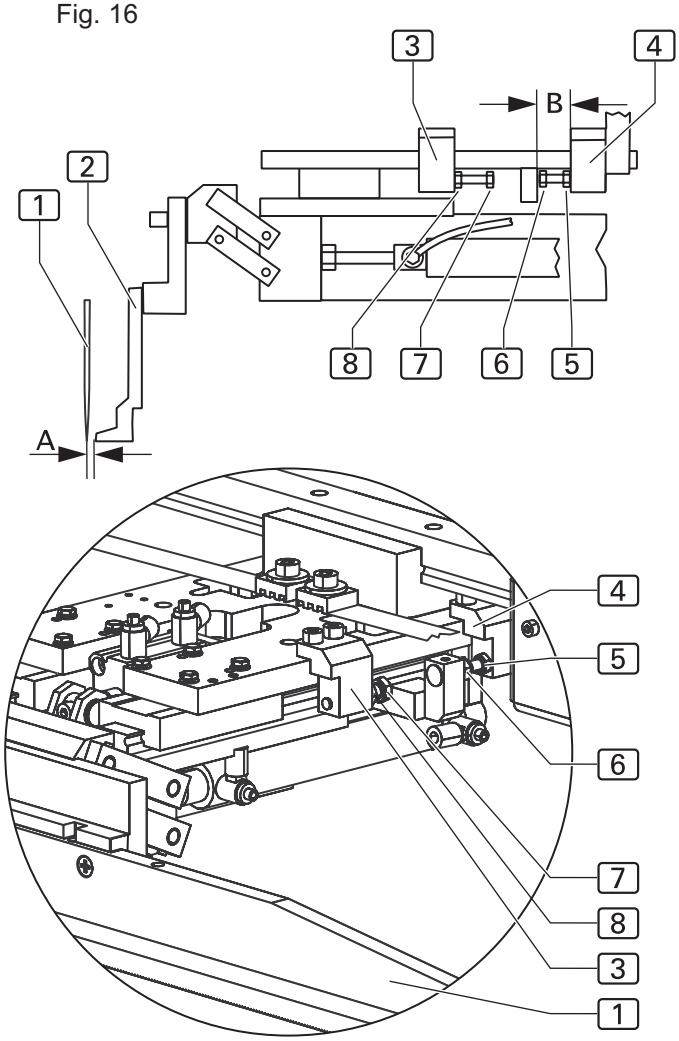
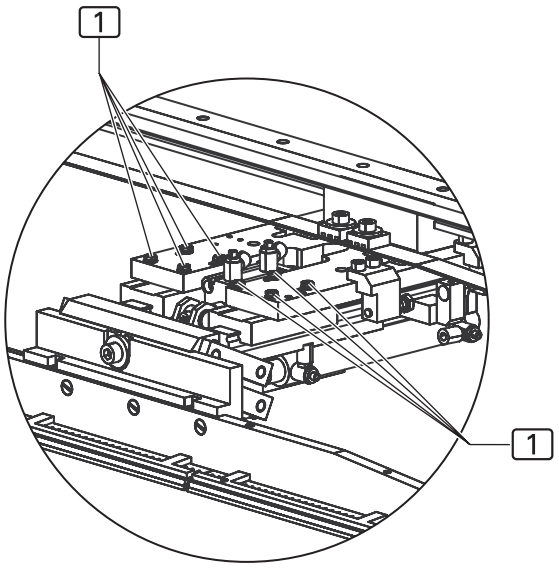


Fig. 17



C.5 Maintenance

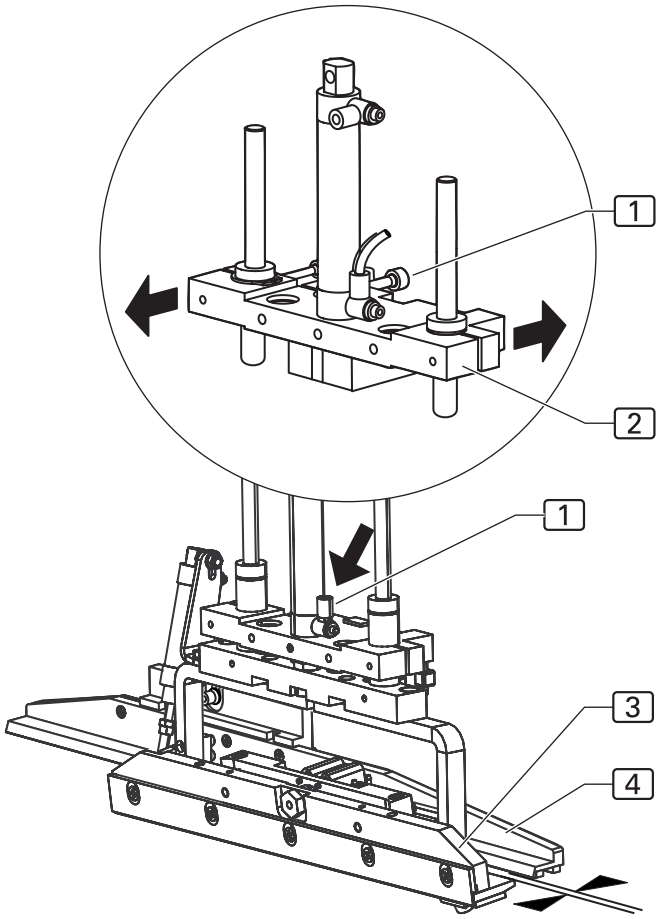
C.5.5 Machine set-up

Fig. 18

Folder to clamp rail alignment:
The lowered folder must be absolutely parallel to and in slight contact with the clamp rail along its entire length.

Folder position adjustment:
1. Move main clamp to position using input/output control functions:
   • Lower main clamp.
2. Move folder to position using input/output control functions:
   • Rotate folder.
   • Close folder clamp.
   • Lower folder.
3. **Fig. 18:** Check parallel alignment of folder clamp [3] to clamp rail [4]. To change the folder clamp alignment:
4. Loosen lock screw [1].
5. Rotate folder clamp bracket [2] to parallel position.
6. Tighten lock screw [1].

Fig. 18



C.5 Maintenance

C.5.5 Machine set-up

Fig. 19

The quick stitch width adjustment makes the presetting of 4 different stitch widths possible.
Fig. 19: Turning the handwheel [1] the stitch width between:
[5] trousers components and
[6] slash selvage oder prefactured pocket bag
can be presetted.

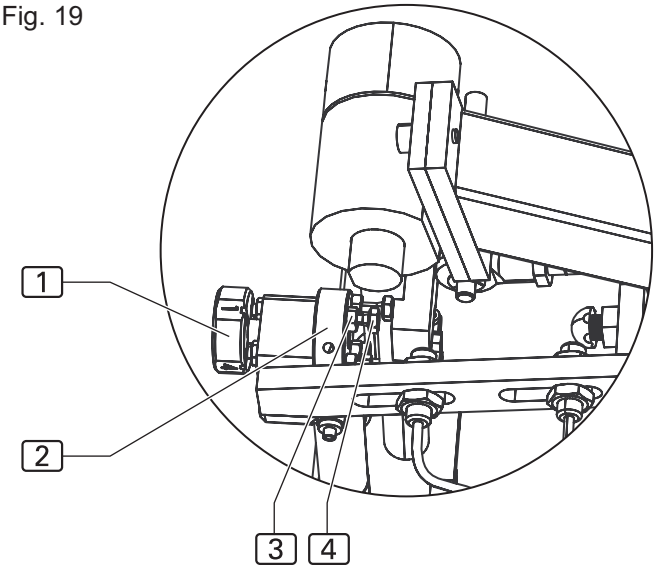
Folder lower position adjustment:

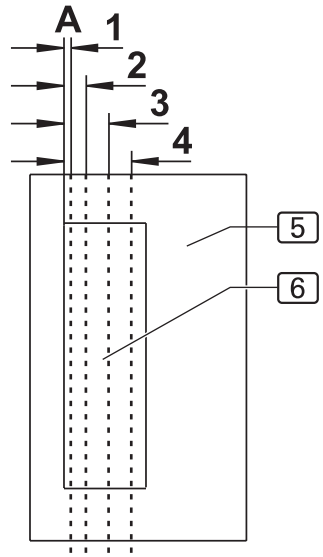
1. **Fig. 19:** Adjust stop screw [4] at revolver [2] for setting lower folder position. Loosen stop screw lock nut [3] at bracket and rotate stop screw [4] to the desired position.
2. Check distance between folder [8] and clamp rail [7].

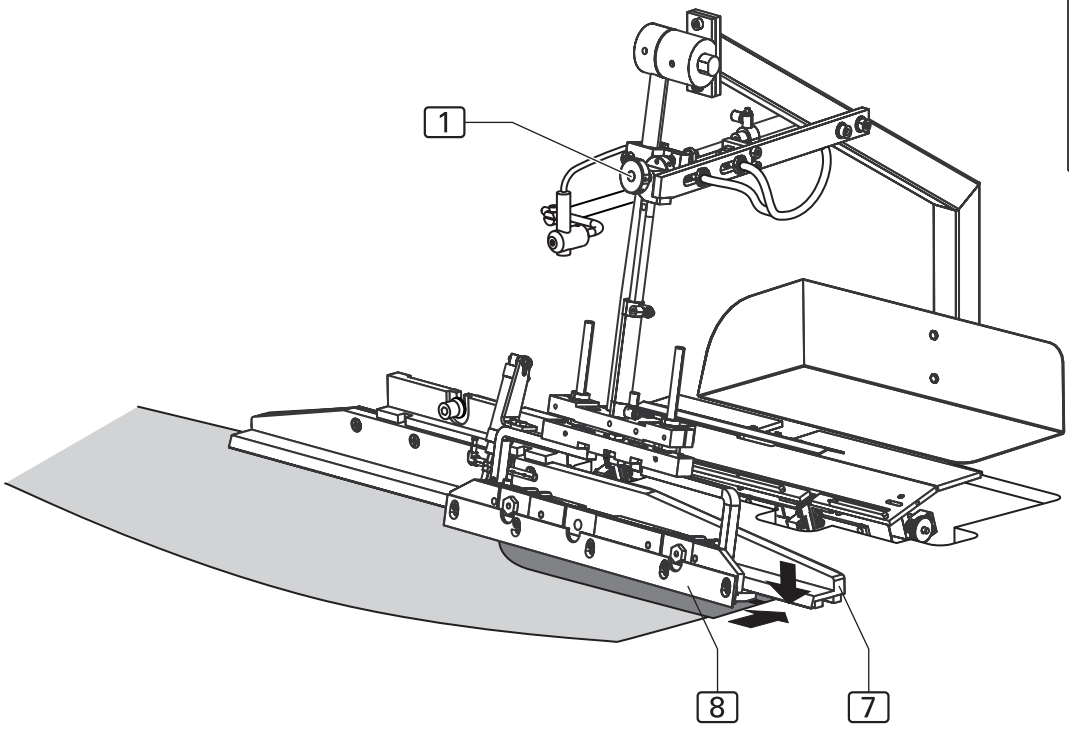
☞ **NOTE - Check folder lower position!**

When positioned correctly, the folder must lower to the working surface with slight friction contact to the left of the clamp slide.

3. Tighten stop screw lock nut.







C.5 Maintenance

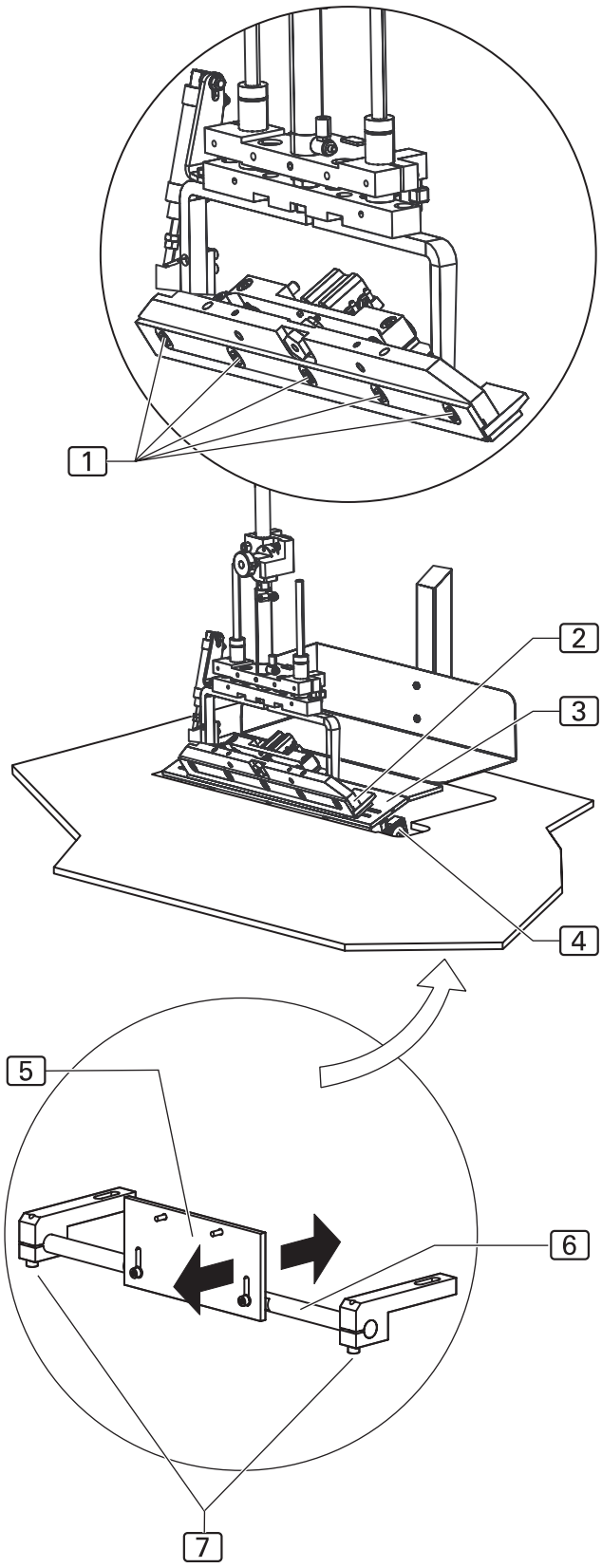
C.5.5 Machine set-up

Folder to pick-up plate alignment:
To ensure that the folder can pick up the left slash selvage evenly, the folder must lie evenly on the pick-up plate along its entire length when it is lowered.

Pick-up plate inclination adjustment:
1. **Fig. 20:** Fasten pick-up plate by rotating handwheel [4] completely to minus range.
2. Move folder [2] to pick-up plate [3] using input/output control functions:
   • Move folder to right.
   • Lower folder.
3. Adjust pick-up plate inclination so that the folder lies absolutely evenly on the pick-up plate by loosening the two retaining screws [7] of the pick-up plate bracket [5] on the worktable underside and rotate the bracket at the holder [6].
4. Tighten retaining screws.
5. Readjust folder rail [2]. Slightly loosen retaining screws [1] and depress folder rail evenly onto pick-up plate.
6. Tighten retaining screws [1].

Fig. 20

Fig. 20



C.5 Maintenance

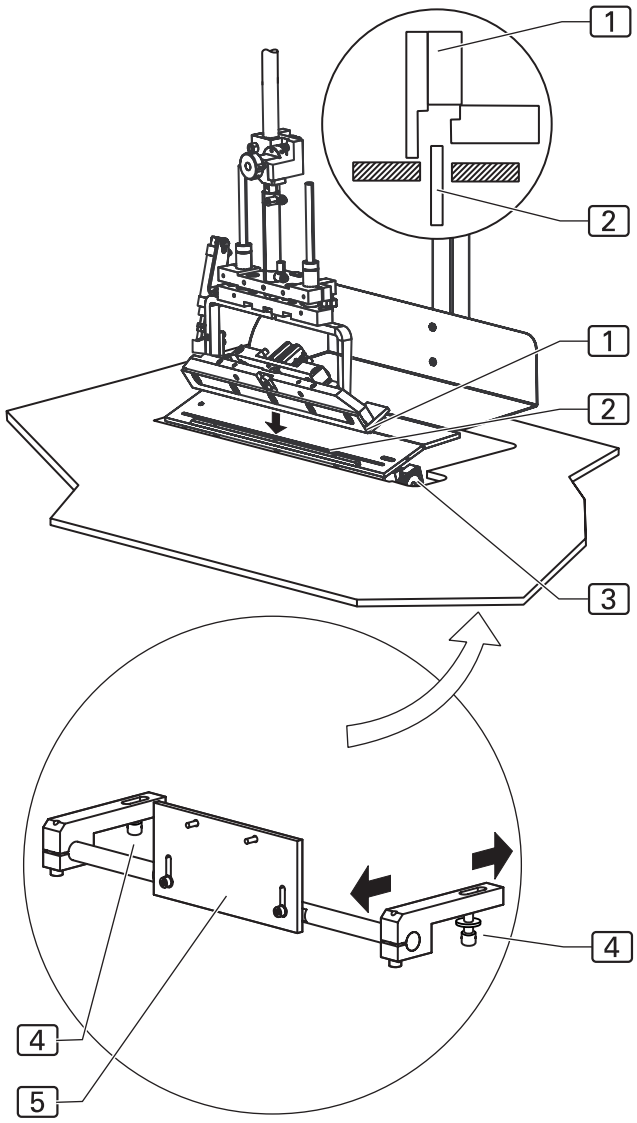
C.5.5 Machine set-up

Folder bar to folder clamp alignment:
To ensure that the folder can crimp over the left slash selvage evenly, the folder clamp [1] must be positioned centrically above the folder bar [2].

Folder bar adjustment:
1. **Fig. 21:** Fasten pick-up plate by rotating handwheel [3] completely to minus range.
   Loosen retaining screw [4] of folder bar bracket at the worktable underside and reposition bracket [5].
2. Tighten retaining screw.

Fig. 21

Fig. 21



C.5 Maintenance

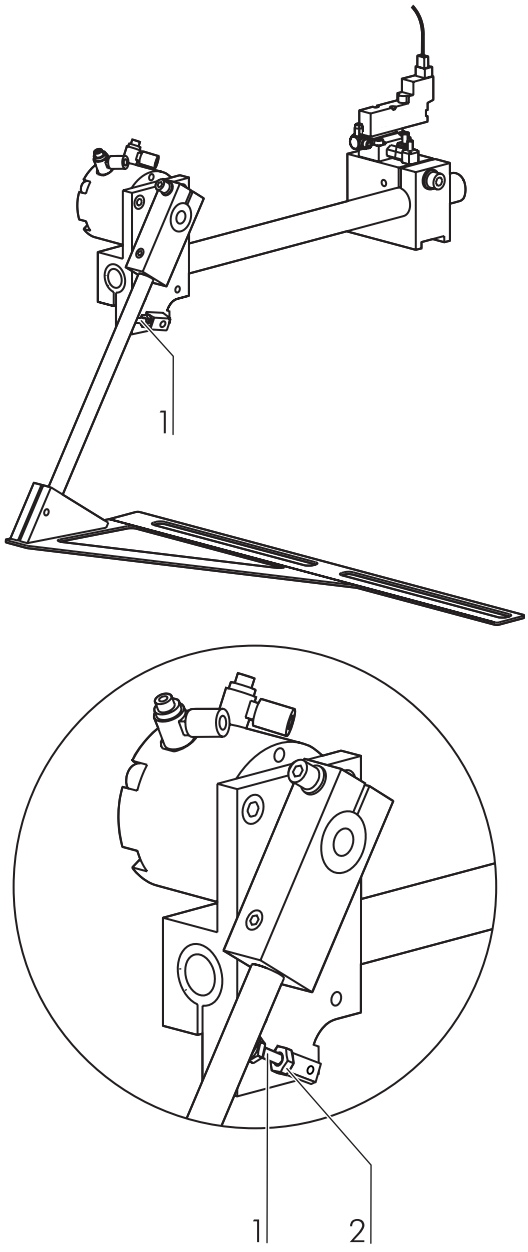
C.5.5 Machine set-up

Right slash selvage stop alignment:
The position of the stop determines the line-up position of the right slash selvage to the right trousers component.

Stop position adjustment:
Fig. 22: The end position of the stop is set using the adjusting screw [1].
1. Loosen locknut [2].
2. Rotate adjusting screw [1].
3. Tighten locknut.

Fig. 22

Fig. 22



C.5 Maintenance

C.5.5 Machine set-up

Fig. 23

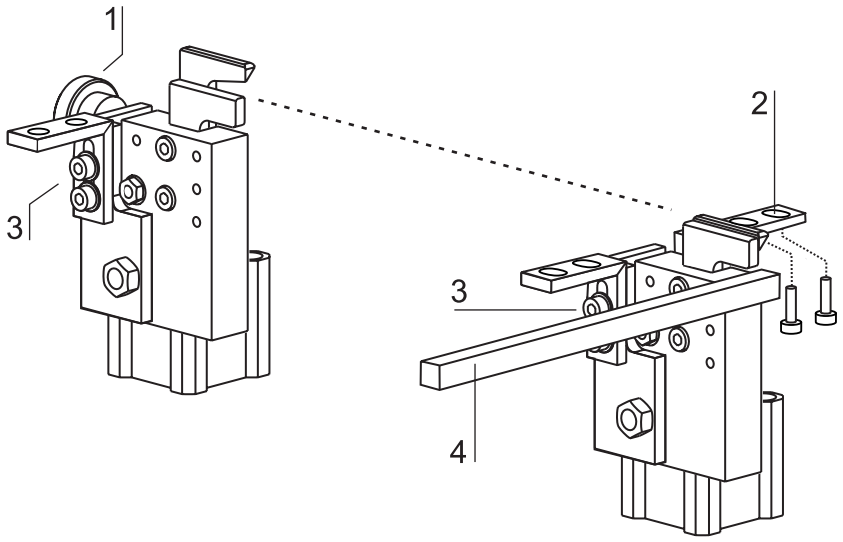
Cutter adjustment:
The depth of cut of the gusset is adjusted for all four cutters using different settings.

- **Fig 23:** The depth of cut of the two cutters of the working plate for the gusset of the left and right trousers components is changed by rotating the adjusting wheel [1].
- The depth of cut of the gusset in the left slash selvage depends on the cutter block's mounting position. The mounting angles [2] have slots. By repositioning the cutter block in the slots, the cutter can be positioned at an exact distance to the stop rail [4] of the pick-up plate.
- The vertical position of the cutters is set by repositioning the cutter block in the slots of the vertical angle arm [3]. Note that the lowered cutters must be positioned flush with the upper edge of the working plate or of the pick-up plate.

☞ NOTE - Cutting position alignment!

The two cutters for the gusset in the left slash selvage and in the left trousers component must be aligned to each other in a way that ensures that both cutting positions are exactly flush.

Fig. 23



C.5 Maintenance

C.5.5 Machine set-up

Fig. 24

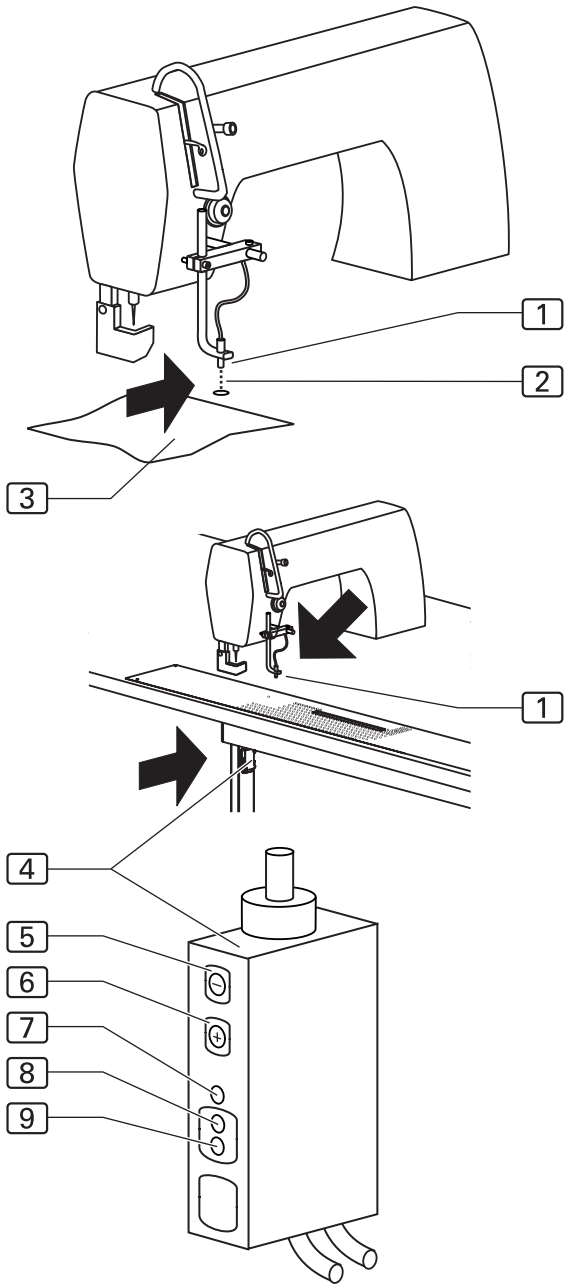
Photocell light sensitivity setting:
The photocell [1] at the sewing head controls the beginning and the end of the sewing process, provided that this function has been enabled as described in Section D.4.9. The sensitivity of the photocell must be set in accordance with the sewing material used.

1. **Fig. 24:** Make sure that the light beam [2] of the photocell is not interrupted.
2. Unlock the keypad:
   Keep the two buttons [5] and [6] (+ / -) depressed for approx 5 seconds.
   The green LED [8] illuminates momentarily to indicate the unlocked state. The keypad remains unlocked for 4 minutes (red LED [7] flashes), then the light guide controller is locked automatically.
3. Set sensitivity using buttons [5] and [6]:
   Press + to increase sensitivity.
   Press - to reduce sensitivity.
4. Interrupt light beam [2] with the sewing material to be used [3]; if the yellow LED [9] fails to go off, reduce sensitivity.

☞ **NOTE - Red LED!**

The red LED [7] must not illuminate in any switching state. If the red LED illuminates, the light amplifier is in a critical switching state. In this case, increase the photocell sensitivity until the red LED goes off, then set the sensitivity in accordance with the sewing material used as described above.

Fig. 24

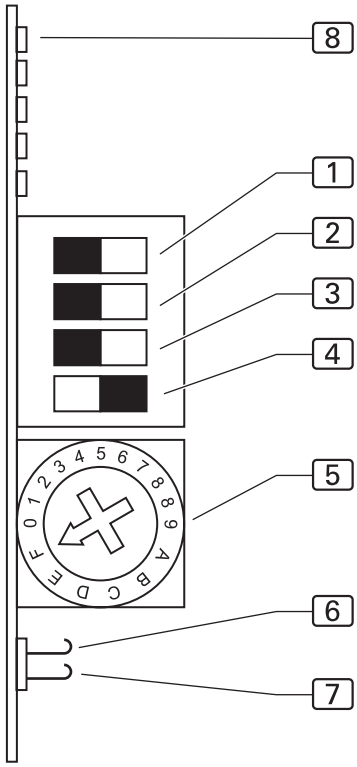


C.5 Maintenance

C.5.5 Machine set-up

Fig. 25

Fig. 25



Adjustment PCB stepper motor:
The PCB for controlling the stepper motor is installed in the control box.

NOTE - Machine cycle!

To prevent moving machine parts from colliding with each other or with other components when the machine is switched on again, move the machine manually into its start position before the PCB is replaced.

1. **Depressurize the compressed air system of the machine. Disconnect the compressed air hose of the machine from the on-site compressed air supply system.**
2. **Slide main clamp into start position.**

CAUTION - Damage to electrical components!

The PCB switches must not be tampered with while voltage is applied to the machine.
Otherwise, related electrical components may be damaged or become unusable!
Disconnect machine from power supply system and protect it against accidental reconnection.

Adjusting switches on the PCB:

1. **Fig. 25:** Set step width:
   - using DIP switches [1] and [2],
   - micro step at hook switches [6] and [7].
2. Set current lowering using DIP switch [3].
3. **DIP-switch** [4] to **ON**
4. Set motor phase current, rotate switch [5] to **F**.
5. Switch on supply voltage. When the PCB is adjusted correctly, the LED [8] (stand-by) is illuminated, the stand-by relay is energized.

Micro step		**DIP switch 1**	**DIP switch 2**
Hook switch [6] open Signal = 0	Hook switch [7] closed Signal = 0		
Hook switch [6] closed Signal = 1	Hook switch 6 open Signal = 1		
200	2000	ON	OFF
400	4000	ON	ON
500	5000	OFF	ON
1000	100000	OFF	OFF
Signal 0 = deenergized, Signal 1 = energized			
Rotary switch position	**Phase current**	**DIP switch 3**	**Current lowering**
F	5,50 A	OFF	ON
		ON	OFF

C.5 Maintenance

C.5.5 Machine set-up

Setting the thread cutter:
The three-digit value input (GP Par. 35) determines when the thread cutter is activated.
The setting of the thread cutter must be checked during machine operation and corrected as required.

1. Rotate sewing head handwheel in direction of machine rotation until needle reaches highest point (pinning position **C**).
   Lock handwheel at position **C** by depressing pinning pin of hole to left of handwheel.
2. **Fig. 26:** Install drive belt [1] so that the shaft feather key [2] is flush with motor housing mark [3].
3. Unlock handwheel.
4. Call menu Global Parameters:

- Press F1 key

- Press F2 GP key

Insert the following values in Global Parameters:

35: Thread lever in position up	**200 INC**
36: Switch-on pos. for thread cutting	**110 INC**

Store value and exit setting level:

- Press P key

5. Start the thread cutting function:

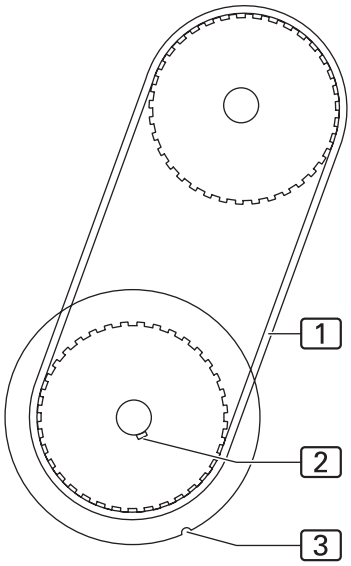
- Press P key

- Press F2 diagnostics key

- Press F2 sewing motor key

Fig. 26

Fig. 26



- Press F2 thread cutter key

Start or stop machine run:

- Press 0 key

6. Check position **C** to see if shaft feather key [2] is flush with motor housing mark [3].
   If required, change values and test thread cutting function.
7. Start thread cutting and recheck positions.

C.5 Maintenance

C.5.5 Machine set-up

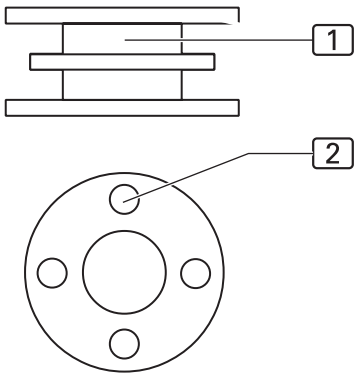
Checking the rest thread monitor:
The rest thread monitor is checked using a photocell. If the messages on the display do not match the filling state of the spool, the photocell sensitivity must be checked.

1. **Fig. 27:** Fill bobbin to half its capacity so that filling state indicators [2] of upper chamber [1] are covered.
2. Insert bobbin and sew until display shows: BOBBIN: 003 m.
   Keep sewing until display shows: BOBBIN EMPTY
3. Remove spool, unwind rest thread and measure remaining length (should be 0.5 m).

Adjusting the photocell:
- If the thread on the spool is sewn off over the rest length of 0.5 m without the message BOBBIN EMPTY being displayed, the photocell sensitivity must be increased:
  - Rotate potentiometer at photocell in clockwise direction.
- If the message BOBBIN EMPTY is displayed even though the spool contains more than 0.5 m thread, the photocell sensitivity must be reduced:
  - Rotate potentiometer at photocell in counter-clockwise direction.

Fig. 27

Fig. 27



C.6 Troubleshooting

Error 01: „Sewing program empty“	Current sewing program empty; possibly distances and routes have not been input or the entire program was erased	Insert program values manually, copy from other program or retrieve from ROM (parameter INIT)
Error 02 : „Seam not enabled“	Current sewing program not activated; number appears black on white	Press <ENT> key to activate program
Error 04 : „Clamp in wrong position“	Real value pulse from clamp motor does not correspond with nominal value	Reduce current for clamp motor to MAX clamping pressure
Error 05 : „I/O communication error“	Error transmitted between control unit and I/O module	Check connecting cable; if OK, replace control unit and/or I/O module
Error 06 : „Position not valid“	Clamp slide not positioned correctly	Check sensor connection to clamp motor; check connecting cable between adapter board 9020020 and I/O module 9020013; replace adapter board 9020020
Error 07: „No pulses from clamp motor“	No position pulse from clamp motor. If the clamp motor moved slightly, the pulses could not be processed properly. If the motor did not move, problem may be caused by control unit or clamp motor power unit	Check connection to clamp motor; replace clamp motor; replace adapter board 9020020; check condition of LEDs at power board (Berger); if required, check Berger motor; check connection to clamp motor (plug); check connection between 9020020 and power unit (plug); replace adapter board 9020020
Error 08: „Main clamp at the stopper“	Limit switch ES04 switched during clamp movement even though clamp should have been distant still	Check distance counter using test program (steps); if counter is faulty, replace clamp motor or adapter board 9020020; if counter is OK, check switch 04
Error 09: „Clamp can not leave the switch“	Clamp slide moves to limit switch during initialization but does not return (direction not reversed)	Using test program ‘Clamp motor actuation’, enter slow speed and reverse direction using arrow keys; if motor does not reverse direction, check: connection between 9020020 and power unit (plug); Berger power unit; if motor reverses direction, check limit switch ES04
Error 12: „Safety photocell not lighted“	No reflection for FZ 20 (safety)	Replace reflective film; check photocell (input)

C.6 Troubleshooting

Error 13: „Clamp position error“	Excessive difference between nominal position (step motor default) and actual position (pulse from incrimental sensor) of clamp slide; clamp slide probably blocked	Remove blocked component; check clamp slide for easy movement; check motor pinion (may be loose on shaft); tension transport belt
Error 14: „Insertion/sewing length error“	Sewing length exceeds maximum possible sewing distance; excessive insertion distance	Program sewing distance / insertion distance correctly
Error 15: „Switch for curve start“	ES12 (curve start slope) does not switch or switches too late	Check ES12 (input); check mechanical components for easy movement
Error 16: „Folder not left“	ES08 (folder at left stop) does not switch or switches too late	Check ES08 (input); check mechanical components for easy movement
Error 21: „Folder not sideways“	ES05 (clamp movement sideways) does not switch or switches too late	Check ES05 (input); check mechanical components for easy movement
Error 22: „Clamp/curve wrong“	Clamp does not correspond with curve	Clamp safety switch (ES15/16) not identical with curve safety switch (ES13/14)
Error 29: „No pulses from sewing motor“	No pulse from sewing motor after sewing process starts (sewing motor does not run)	Check sewing motor and synchronization; check connection between I/O module 9020013 and sewing motor; read both upper LEDs at 9020013: left LED illuminates briefly when needle up; right LED shows synchronization pulses (512 pulses/rotation); if no LED illuminates when handwheel is actuated, check sewing motor power supply and replace sewing motor, if required. If LEDs are OK and motor does not run before error messages, check connection between 9020020 and sewing motor, replace 9020020 or sewing motor, if required; if motor makes some stitches before error message, check connection between control unit and I/O module, replace components as required
Error 30: „Sewing motor too fast“	During thread cutting, sewing motor did not reach cutting speed within error period	Replace sewing motor or synchronizer

C.6 Troubleshooting

Error 32: „Thread position does not come“	During thread cutting, sewing motor did not reach cutting position	Input slower cutting speed and earlier cutting position; replace sewing motor or synchronizer
Error 33: „Sewing motor does not stop“	After thread cutting, sewing motor does not stop within error period	Input slower cutting speed and earlier cutting position; replace sewing motor or synchronizer
Error 34: „Needle not up“	Needle not in upper rest position; when the error message is issued, the control unit attempts once more to move the needle to the upper position	Check sewing motor and synchronizer; check connection between 9020013 and sewing motor; read condition of two upper LEDs at 9020013: if no LED illuminates when handwheel is rotated, check sewing motor power supply; replace sewing motor if required; if LEDs are OK, check connection between 9020020 and sewing motor; replace 9020020 if required
Error 35: „Thread breakage“	Thread monitor detects thread breakage	
Error 37: „Thread only rest“	The photocell at the spool case is illuminated, spool empty	If spool is not empty, the photocell is maladjusted (response too sensible); adjust correctly
Error 41: „No parts“	Photocell FZ21 remains illuminated during insertion	Adjust photocell sensibility; input test 21
Error 42: „Photocell not lighted“	Photocell FZ21 does not detect end of seam	Sewing distance too long; adjust photocell sensibility; input test 21
Error 43: „Photocell lighted too early“	Photocell FZ21 detects intermittent reflection during insertion	Adjust photocell sensibility; input test 21
Error 45 ... 48: “I/O DAC, ULN, 485, RES”	Internal hardware error during data transmission to adapter board 9020020	Replace 9020020

C.7 Specifications

Power supply

Supply voltage	230 V ±10 %, 50/60 Hz
Power supply connection	(1, N, PE) AC
Power consumption	1.3 kW
Fusing	16 A

Dimensions of the machine

Width x Depth x Height in mm	1700 x 1200 x 1600

Table height

Adjustable height in mm	790-1240

Weight

Overall weight	approx 210 kg

Compressed air

Operating pressure	6 bar
Quality	oil-free
Air consumption	12 NL

Vacuum

Displacement (minimum)	130 m^3/h

Section D Programming Instructions

Section D Programming Instructions

Contents

Section D Programming Instructions

D.1 Operating panel

D.1.1 Display and key functions

Fig. 1

[1] Display
During machine operation, the display shows the values of the selected sewing program. If menus are activated, the menu symbols or the corresponding parameters of the function are displayed.

[2] Numeric keypad
All variable number values are entered using the numeric keypad.
The desired sewing programs are requested using the M key. The P key is used to request submenus, to confirm input and to exit the programming mode.

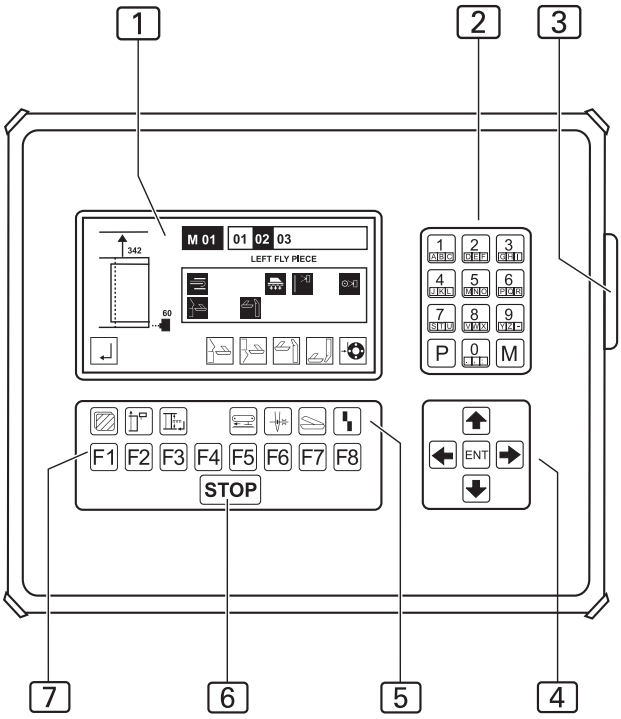
[3] Slot for memory stick
The memory stick is the storage medium for bakkup copies of all program control data. Programs can be copied to and stored on the memory stick and loaded into the machine control unit if required.

[4] All arrow keys
Pressing the UP or DOWN arrow key will move the cursor one line up or down in the selected menu.
Pressing the LEFT or RIGHT arrow key will either mark the desired parameter or, if the parameter list comprises several pages, browse forward or backward.

[5] Symbol bar
The symbol bar indicates the menus that can be requested using function keys [6] directly from the start level.
For all other menus, the corresponding symbols are shown on the operating panel display.

[6] Program stop key
If the key is pressed during machine operation, all machine movements and the sewing process are stopped.

Fig. 1



[7] Function keys
The function keys are used to request the menus on the selected level for setting or changing machine functions.
Two function keys have an identical function in all selectable menus.
To move to the previous level or to the start level and to move to the next level:

Press F1 or F8 key

D.2 Fundamentals of programming

D.2.1 Program control layout

The program control is controlled using four different kinds of menus:
1. System menu,
2. Service menu,
3. Global parameter menu,
4. Special parameter menu.

System menu
The system menu is used to perform all settings for the program control operating system and for managing the sewing programs:
- Copying factory settings to the program control unit,
- Saving programmed sewing programs to the memory stick,
- Copying and renaming sewing programs,
- Copying sewing programs from the memory stick to the program control unit.

Service menu
The service menu is used to directly request service functions. These functions support machine set-up or other works required during machine operation, e.g. resetting the day counter or winding the bottom thread.

Global parameter menu
This menu is used exclusively for setting the global parameters, i.e. parameters that control the basic functions of the machine. Changing global parameters will result in changes of seams of all stored sewing programs (e.g. time for blowing off a finished sewing piece using compressed air).

Special parameter menu
Special parameters are settings that refer only to one particular seam of a sewing program. Changing a special parameter will affect only the currently selected seam for which a setting is made (e.g. stitch length of a seam).
The special parameter menu consists of several submenus.
Special parameters can be functions that are enabled or disabled as required or parameter values that are set in lists.

Sewing program
A sewing program controls the entire machine operation during production:
- transport of the sewing piece to the sewing head,
- tucking of a seam and
- ejection of the sewing piece.

A sewing program is determined by two different kinds of values:
- global parameters,
- special parameters.

Sewing programs can be copied or renamed.

Seam number
Each sewing program can be executed with up to six seams of different stitch widths. The seams are assigned to the sewing program by seam numbers (01, 02, 03, 04, 05, 06).
The numeric string of the two-digit seam number is freely selectable.

Combination sewing program **with seam**
A sewing prgram can be combined with one seam, with several seams or with all six seams.
If a sewing program with several seam numbers is requested, the seams are effected in the sequence of the seam numbers from left to right.
The sequence of the seam number is freely selectable.

Memory
Sewing programs are stored in the memory (**M**).
The program control memory can contain up to 50 sewing programs (**M 01 - M 50**) with up to six seams (**01, 02, 03, 04, 05, 06**) each.
All sewing programs stored in the memory can be copied to the memory stick (backup copies).

Creating sewing programs
Basically, it is possible to create entirely new sewing programs; however, it is easier to:
- copy a factory-programmed sewing program to an unused location in the memory and to modify this program,
- copy an already modified sewing program to an unused location in the memory and to adapt it further in accordance with the intended purpose.

D.2 Fundamentals of programming

D.2.1 Program control layout

Access to menus
The following menus are freely accessible:
- Service menu,
- Global parameter menu,
- Special parameter menu.

Except for three submenu pages, the entire system menu is controlled by access privileges. These privileges protect the system menu from unauthorized access. Data cannot be entered and the system menu cannot be modified unless the service code is entered. This code is contained in the documentation delivered with the machine.

Menu level structure
Fig 2: The program control is divided into six menu levels (start level and levels 1-5).
The **system menu** is requested from the start level. The remaining operator prompting is achieved with plain text in the submenus.
The **service menus** are requested directly from the start level and from level 1.
The **global parameter menu** is requested from level 1, the parameters pertaining to the menu are selected and changed in a list.
The **special parameter menu** is requested from level 1 and edited in four other levels (levels 2-5) and in the pertaining parameter lists.

⚠ CAUTION - Damage to machine!

Some of the menu entries start machine units or a machine cycle.
This may damage machine components if the machine is not ready for operation.
Do not enter data unless the machine is ready for operation.

Factory setting
The program control of the machine is programmed at the factory with a sewing program with three different seams.

Factory settings
The machine comes with a factory-installed standard program **M 01** with three seams (**01, 02, 03**) and **M02** with two seams **(11, 12)**.
The seams of **M01** differ in their control functions by sewing pocket edge and pocket bag:
- **Seam 01:** Clipping and crimping over of the left slash selvage with subsequent sewing of the slash selvage to the left trousers component.
- Seam **02:** Sewing the slash selvage to the right trousers component.
- Seam **03:** Test seam that is restricted to two functions:
  - Clamp movement from the insertion station to the sewing head,
  - Starting/ending the complete sewing process.

  The test seam is used for checking the clamp transport and the sewing process when the machine is set up.

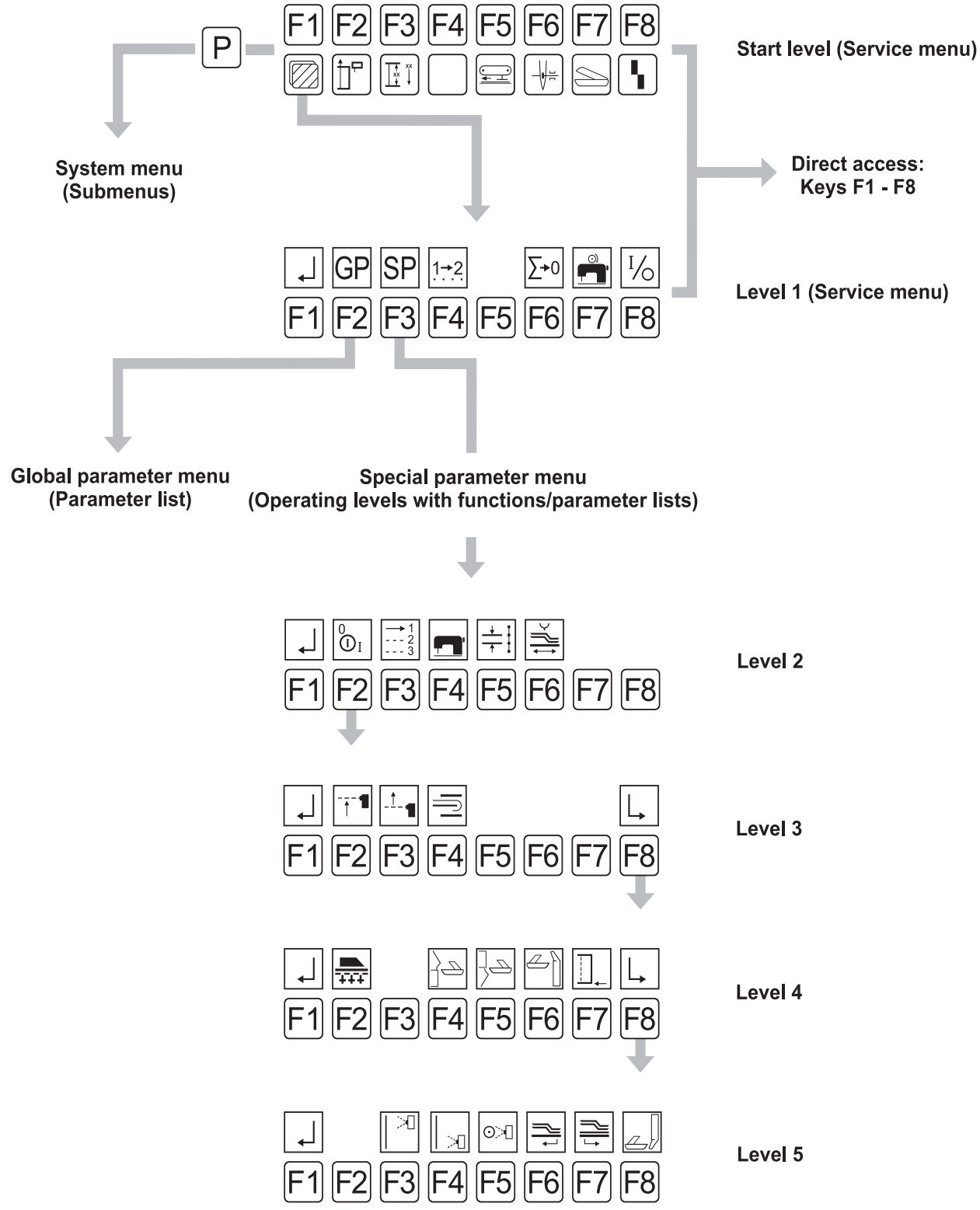
The standard program **M 02** works with the two seams **(11 and 12)**.
- **Seam 11**: Controls the procedure for sewing the side pocket to the right trousers component.
- **Seam 12**: Controls the procedure for sewing the side pocket to the left trousers component.

The standard program **M 03** works with the two seams **(19 and 20)**.
- **Seam 19:** Controls the procedure for sewing the right slash selvage to the right trousers component at ladies' trousers.
- **Seam 20:** Controls the procedure for sewing the left slash selvage to the lefttrousers component at ladies' trousers.

D.2 Fundamentals of programming

D.2.2 Program level overview

Fig. 2



D.3 Programming

D.3.1 System menu

The system menu is divided into several submenus. The submenus themselves are divided into access-protected and open submenus. Access is protected by the **service code**.

Open submenus
Open submenus are freely accessible from the start menu:
- Enter service code,
- Clamp motor step test
- Display total piece counter

Access-protected submenus
Access-protected submenus can only be opened after the service code has been entered:
- Eprom seam parameters
- Copy seam numbers
- Erase seams
- Enter seam name
- Copy sewing program to memory stick
- Load sewing program from memory stick
- Copy variables (global parameters/special parameters) to memory stick
- Load variables (global parameters/special parameters) from memory stick
- Run clamp motor in permanent test
- Test thread cutter

☞ **NOTE - System menu control!**

The submenus of the system menu are requested and exited using the same keys. Exceptions from this rule are indicated by plain text in the corresponding menu. Request the system menu from the start level:

- Press [P] key.

Confirm input and exit the system menu:

- Press [P] key.

☞ **NOTE - Submenu levels!**

All input for the system menus must be started from the submenu level (1).

To change to the submenu level (1):

- Press [←] key.

The submenus of the system menu can be requested using either the arrow keys or the function keys.

☞ **NOTE - RESET!**

As a rule, a RESET should be performed in the system menu after settings have been changed to reset the machine to its start position.

- Press key STOP twice

■ **Entering the service code**
Entering the service code allows access to the access-protected submenus of the system menu.

- Press [P] key
- Press [F3] key (service code).
- Enter service code numbers using the numeric keypad. The code is: 50190
- Press [P] key to confirm input.

■ **Displaying total piece counter**
With this counter, the total number of finished pieces can be displayed. The counter cannot be reset.

- Press [P] key.
- Press [F4] key (additional programs).
- Press [F3] key (piece counter).

The number of pieces : 0000000 is displayed.

D.3 Programming

D.3.1 System menu

■ Eprom seam parameters

This function allows to copy the factory-programmed fixed seams from the Eprom back to the sewing program.

- Press [P] key.
- Press [F1] key (init parameters).
- Press [F4] key (Eprom seam parameters).
- Enter seam number 01 using numeric keypad.

■ Setting the seam sequence

The settings refer to the selected sewing program. The sequence for sewing the seams can be set at will. When the sequence is set, existing seam numbers are overwritten or new seam numbers are written.

- Press [F1] key.
- Press [F4] key.

The display shows the marking of the sewing program and the seam numbers.

20 **01** 02 03 04

Mark seam number to be changed using cursor:

20 01 **02** 03 04

- Press [ENT] key.

Enter new seam number using numeric keypad:

20 01 **04** 03 04

Confirm input and exit menu:

- Press [P] key.

The display shows the new seam sequence.

20 **01** 04 03 04

D.3.1 System menu

■ Copying seam numbers

Use this function to copy the properties of a factory-programmed sewing program or of your self-configured sewing programs into an other sewing program. During the copying process, all seams of a sewing program are transferred so that the existing properties of a sewing program will be overwritten completely..

1. Request sewing program (destination) and mark desired seam number (source).
   - Press [M] key.
2. Enter two-digit seam number using numeric keypad.
   - Press [P] key.
   - Press [F1] key (init parameters).
   - Press [F2] key (copy seam number).
   - Enter two-digit seam number using numeric keypad.

The display shows *O.K. PLEASE WAIT* to indicate that the copy process has been successfully completed.

■ Erasing seams

Request sewing program and mark seam number to be erased using cursor (seam number is underlaid black).

- Press [←] or [→] key
- Press [P] key.
- Press [F1] key (init parameters).
- Press [F5] key (erase seam).
- Enter seam number using numeric keypad.

Confirm safety prompt, press [ENT] key.

☞ **NOTE - Deleting seam numbers!**

If a seam number is deleted, it is removed from all sewing programs into which it had been inserted.

D.3 Programming

D.3.1 System menu

■ **Entering seam names:**
A sewing program can be named using plain text.

Request sewing program.

- Press [P] key.
- Press [F1] key (init parameters).
- Press [F5] key (enter seam name).
- Use the numeric keypad to enter numbers or text. To enter letters, hold the required color-coded function key depressed and press the corresponding color-coded number key for the letter on the numeric keypad. To enter blanks between text or number combinations, press the LEFT or RIGHT arrow key.

Delete the letter:

- Press 4 x [9] key

Confirm input, exit menu:

- Press [P] key.

■ **Copying sewing programs to the memory stick**
Programmed sewing programs can be copied to the memory stick (back-up copies).

Select sewing program.

- Insert memory stick into USB slot.
- Press [P] key.
- Press [F1] key (init parameters).
- Pess [F6] Machine <--> Stick.
- Press [F1] Active seam --> Memory stick.
- Enter seam number using numeric keypad.

■ **Loading sewing programs from the memory stick**
To reestablish or to change seams, sewing programs can be loaded from the memory stick by overwriting an existing location or selecting an unused location.

- Insert memory stick into USB slot.
- Press [P] key.
- Press [F1] key (init parameters).
- Pess [F6] Machine <--> Stick.
- Press [F2] key Stick --> Active seam.
- Enter sewing program and seam number using numeric keypad.

D.3 Programming

D.3.1 System menu

■ Copying variables to the memory stick

All variables (global parameters/special parameters) can be stored on the memory stick (backup copies).

- Insert memory stick into USB slot.
- Press [P] key.
- Press [F1] key (init parameters).
- Pess [F6] Machine <--> Stick.
- Press [F3] key Machine memory--> Stick.

Confirm safety prompt.

- Press [ENT] key.

■ Loading variables from the memory stick

All variables (global parameters/special parameters) can be downloaded from the memory stick to the program control memory to reestablish the machine configuration.

- Insert memory stick into USB slot.
- Press [P] key.
- Press [F1] key (init parameters).
- Pess [F6] Machine <--> Stick.
- Press [F4] key Stick --> Machine memory.

Confirm safety prompt.

- Press [ENT] key.

☞ **NOTE - Current configuration!**

If this function is used to download all variables from the memory stick to the program control, all current sewing programs will be overwritten.

■ Running clamp motor in permanent test

The clamp motor can be run permanently to check for constant machine movement.

- Press [P] key.
- Press [F2] key (diagnostics).
- Press [F3] key (clamp transport).
- Press [F2] key (clamp motor permanent test).

Confirm safety prompt.

Press [ENT] key.

The clamp motor runs permanently until it is stopped. To stop the motor:

- Press key **STOP**.

■ Testing the thread cutter

By entering a three-digit value global parameter 35, you can determine when the thread cutter is activated. The input must be checked for a machine cycle and corrected if required.

- Press [P] key.
- Press [F2] key (diagnostics).
- Press [F2] key (sewing motor).
- Press [F2] key (thread cutter).
- Enter value using numeric keypad.

Start or stop machine cycle.

- Press [0] key.

D.3 Programming

D.3.2 Service menu start level

The service functions of the service menu are requested by direct access from the start level or from level 1. Service functions support the working process during machine production.

Functions on the start level
The function keys on the start level are assigned to the symbols below them. These symbols cannot be changed; they are always visible.

F1 Request service menu level 1
F2 Insertion distance length,
photocell correction for beginning of seam
F3 Change photocell correction for end of seam, seam length and fixed seam end point
F5 Drive assistance transport to service position
F6 Actuate thread clamp manually
F7 Test cutters manually
F8 Reset insertion process

■ **Requesting service menu level 1:**
Direct access to the functions of the service menu on the level 1.

• Press F1 key.

■ **Insertion distance length, photocell correction for beginning of seam:**
The settings control the beginning of the seam. They refer to the currently selected seam and are in close relation to the settings made using function F3 for the end of the seam.
The menu offers two setting options:
• The **photocell response delay** for the beginning of the seam,
• the setting of the **insertion distance length** at the beginning of the seam

Photocell response delay:
To set the response delay of the photocell, the corresponding function "Photocell for beginning of seam" must be enabled (see Section D.3.9). The higher the input value, the later the sewing process starts.

Insertion distance length:
If the function "Photocell for beginning of seam" is disabled, the beginning of the seam is controlled by a fixed insertion distance (see Section D.3.9). The insertion distance is the distance that the main clamp moves toward the sewing head before the sewing head starts sewing.
The setting refers to a correction of the insertion length for the beginning of the seam. The higher the input value, the longer the insertion distance.

Enter value:

• Press F2 key.

The cursor automatically marks the variable value.
To change this value gradually:

• Press ← or → key.

Enter a completely new numeric value:

• Enter numbers using numeric keypad.

Confirm input and exit menu:

• Press P key.

NOTE - Checking settings!

The settings must be checked using a sewing piece; if required, they must be corrected.

D.3 Programming

D.3.2 Service menu start level

■ **Photocell correction for end of seam, seam length and fixed seam end point:**

The settings control the end of the seam. They refer to the currently selected seam and are in close relation to the settings made using function F2 for the beginning of the seam.

The menu has two setting options:

- the **photocell response delay** for the end of the seam,
- the setting of the overall **seam length**.

Photocell response delay:

To set the response delay of the photocell, the corresponding function "Photocell for end of seam" must be enabled (see Section D.3.9). The higher the input value, the later the sewing process stops.

Seam length:

If the function "Photocell for end of seam" is disabled, the end of the seam is controlled by a fixed seam length. For this purpose, the function "Sewing to fixed seam end position" must be enabled (see Section D.3.10). The setting therefore refers to the seam length to be fixed. The higher the input value, the longer the seam.

- Press F3 key.

The cursor automatically marks the variable value.
To change this value gradually:

- Press ◄ or ► key.

Enter a completely new numeric value:

- Enter numbers using numeric keypad.

Confirm input and exit menu:

- Press P key.

☞ **NOTE - Checking settings!**

The settings must be checked using a sewing piece; if required, they must be corrected.

■ **Drive assistance transport to service position**

To get sufficient space for works on the sewing head, the assistance transport can be driven to the outer service position.

- Press F5 key.

Return to start position:

- Press F5 key.

■ **Manual actuation of the thread clamp:**

After the top thread has been passed through the needle, the thread clamp is actuated manually to protect the top thread from being pulled out of the needle when a machine cycle starts.

- Press F6 key.

D.3 Programming

D.3.2 Service menu start level

■ **Manual testing of the cutters**
Sharpness and function of the three cutters can be chekked individually. When the corresponding function key is depressed, a cutting movement is performed.

1. Request the cutter test menu.

• Press F7 key.

The display shows the symbols of the selectable functions on this level.

2. Rear working plate cutter (left trousers component).

• Press F4 key.

3. Front working plate cutter (right trousers component).

• Press F5 key.

4. Pick-up plate cutter (left slash selvage, right side pocket for ladies' trousers).

• Press F6 key.

5. Pick-up plate cutter (left side pocket, right slash selvage for ladies' trousers).

• Press F7 key.

6. Filling spool.
Insert thread and fill spool:

• Press F8 key.

Acknowledge status messages on display:

If the message SPOOL EMPTY is displayed, insert a full spool and

• Press ENT key.

If the message SPOOL: 004 M is displayed when a full spool is inserted

• Press F7 key.

• Press F8 key.

NOTE - Rest thread monitor sensitivity

If the spool is empty and the display does not show a status message, the photocell sensitivity must be adjusted (see Section C, Service Instructions).

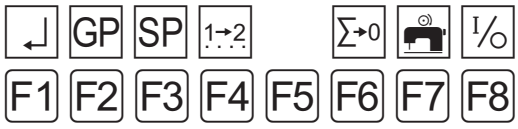
■ **Resetting the insertion process:**
This function depends on the mode of machine operation. It refers only to machine movements that can be performed before the automatic operation.
The machine movements will be reset to start position.

• Press F8 key (several times if required).

D.3 Programming

D.3.3 Service menu level 1

Functions on level 1
The function keys on the start level are assigned to the symbols above them as shown on the display.
The settings of the global parameter menu (GP) and of the special parameter menu (SP) which can also be requested from this level are described in separate sections.



F1 Back to start level
F2 Request global parameter menu
F3 Request special parameter menu
F4 Set seam sequence
F6 Reset day counter to zero
F7 Manual winding
F8 Select machine control inputs / outputs

■ **Setting the seam sequence:**
The settings refer to the selected sewing program. The sequence for sewing the seams can be set at will. When the sequence is set, existing seam numbers are overwritten or new seam numbers are written.

• Press F1 key.

• Press F4 key.

The display shows the marking of the sewing program and the seam numbers.

01 **01** 02 03 04

Mark seam number to be changed using cursor:

01 01 02 03 04

Open overwrite function:

• Press M key, seam number will be deleted.

• Press ENT key.

Enter new seam number using numeric keypad:

01 01 **04** 03 04

Confirm input and exit menu:

• Press P key.

The display shows the new seam sequence.

01 **01** 04 03 04

Erase seam number:

• Mark seam number using cursor, then delete:

• Press M key.

• Press P key.

☞ **NOTE - Seam sequences!**

Just as the seam sequence can be selected at will, a seam can be written into a sewing program once or several times. A sewing program may consist of up to six seams.

■ **Resetting the day counter to zero:**
This function is used to reset the day counter for a production cycle to zero.

• Press F1 key.

• Press F6 key.

The display counter is now reset to zero.
Display: PART: 0000

D.3 Programming

D.3.3 Service menu level 1

■ **Manual winding:**
This function is used to wind thread from the thread spool to the top thread spool. To start the function:

- Press F1 key.

- Press F7 key.

- To exit, press any key.

☞ **NOTE - Remove top thread!**

The top thread must be removed up to the thread lever to protect the top thread and the bottom thread from being entangled.

■ **Selecting machine control inputs / outputs:**
This menu is used for troubleshooting and for a manual testing of machine operation settings.
The outputs (OUT) can be selected and tested separately. The corresponding inputs (INP) are displayed for an active output. Additionally, the selected output can be switched intermittently.

Activated inputs/outputs are marked with highlighted numbers.

01	02	03	04	05	06	07	08	09	10
11	12	13	14	**15**	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

☞ **NOTE - Machine movements!**

If outputs are activated, the machine performs the corresponding functions. Before activating the outputs, remove all unnecessary objects within the operating range of the machine.

Select output:

- Press F1 key.

- Press F8 key.

Select number line:

- Press ↑ or ↓ key.

Mark output number by moving the corresponding function number using the cursor. The cursor now has the shape of an arrow.

- Press ← or → key.

Activate output:

- Press ENT key.

The function number is highlighted in black. The output is active.

Deactivate output:

- Press ENT key.

Switch output to intermittent operation:

- Mark function number using cursor.
- Press ENT key for approx 3 seconds.

The function number is highlighted in black and flashes. The output is active intermittently.

Switch off intermittent operation of output:

- Press ENT key.

The function number is highlighted in black again. The output is still active.

Deactivate output:

- Press ENT key.

D.3 Programming

D.3.4 List of inputs and outputs

Outputs						
Valve	**Output number**			**Cylinder number**	**Signal output**	**Valve type**
Y01	01	Open / close clamp		01	X07 Pin02	5/2 way
Y02	02	Move clamp in / out sideways		02	X07 Pin03	5/2 way
Y03	03	Swing folder left / right		03	X11 Pin20	5/2 way
Y04	04	Rotate folder		04	X11 Pin21	5/2 way
Y05	05	Open / close folder clamp		05	X11 Pin22	5/2 way
Y10	10	Thread clamp forward / rearward		10	X07 Pin06	5/2 way
Y11	10	Blow thread in, synchronous with Y10			X07 Pin06	3/2 way
Y12	12	Right front trousers component cutter		12	X07 Pin11	5/2 way
Y13	13	Slash selvage cutter		13	X07 Pin16	5/2 way
Y14	14	Left front trousers component cutter		14	X07 Pin12	5/2 way
Y15	15	Vacuum on/off		15	X07 Pin01	5/2 way
Y16	16	Slash selvage clamp open / close		16	X07 Pin14	5/2 way
Y22	22	Stamp assistance transport		22	X11 Pin31	5/2 way
Y25	25	Swivel right slash selvage clamp in/out		25	X07 Pin15	5/2 way
Y27	27	Scissors side pocket		27	X11 Pin17	5/2 way
Y31	31	Thread cutter		31	X07 Pin05	3/2 way
Y34	34	Folder up		34	X11 Pin18	3/2 way
Y35	35	Folder down		34	X11 Pin19	3/2 way
Y36	36	Thread tension blower		36	X07 Pin04	3/2 way
Y46	46	Slash selvage trousers		46	X07 Pin13	3/2 way
Y47	47	Parts from trousers		47	X07 Pin07	3/2 way

Inputs						
Switch	**Input number**		**Switch type**		**Signal input**	
S01	01	Start switch	Footswitch	Make	X09 Pin01	
S02	02	Footswitch slash selvage clamp	Footswitch	Make	X09 Pin02	
S04	04	Clamp reference point	Initiator NPN	Break	X09 Pin04	
S07	07	Folder at right stop	Initiator NPN	Make	X09 Pin07	
S08	08	Folder at left stop	Initiator NPN	Make	X09 Pin08	
S09	09	Assistance transport basing point	Initiator NPN	Make	X09 Pin09	
S21	21	Photocell beginning / end of seam	Photocell NPN		X13 Pin21	
S23	23	Top thread monitor	Touch probe		assignment plug X2	
S24	24	Bottom thread monitor (chain stitch)	Touch probe		assignment plug X2	
S25	25	Spool rest thread monitor (lock stitch)	Photocell NPN		X13 Pin25	

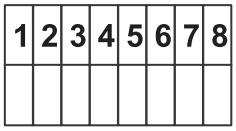
D.3 Programming

D.3.5 Service menu level 1

Terminal assignment for lock stitch (1-4):
S23 *Top thread monitor
Terminal assignment for chain stitch (5-8):
S24 *bottom thread monitor

Terminal assignment *plug X2:

yellow	1
green	2
white	3
brown	4



D.3.6 Global parameters

Global parameters are values that control the basic functions of the machine. If global parameters are changed, this change affects all stored sewing programs.
The minimum and maximum input values are limited by the program control unit. Values that are not within the limits will not be accepted but reduced to the corresponding minimum or maximum value

■ **Requesting / exiting the global parameter menu:**
Change from service menu start level to level 1:

- Press F1 key.

- Press F2 key.

Browse through list:

- Press ← or → key.

Move to line in list:

- Press ↑ or ↓ key.

Change parameters:

- Press ENT key.
- Insert new value using numeric keypad or
- Press ← or → key.

Confirm input:

- Press ENT key.

Exit menu and save changed parameter:

- Press P key.

D.3 Programming

D.3.7 List of global parameters

No.	Programmable global parameters (F2)
01	TILL CLAMP SIDEWAYS FWD: Scan and part pickup after clamp movement forward / time interval
02	TILL CLAMP DOWN .....: Lower clamp after clamp movement forward for part pickup / time interval
03	TILL VACUUM OFF .....: Switch vacuum off after clamp down / time interval
04	THRD LENGTH,BOBBIN FULL Length of thread of filled bobbin
05	TILL CLAMP INSERTING: Clamp insertion delay / time delay
06	SEWING END ->CL.SIDEW.: Clamp movement sideways rearward after sewing is completed / time interval
07	TIME AFTER CLAMP OPEN : Clamp movement right to programmed position after clamp up / time interval
10	TILL FOLDING CL. CLOSED: After folder right and down, time until folding clamp closes / time interval
11	TILL FOLDER LIFT UP...: After folding clamp closes, time until folder up / time interval
12	TILL FOLDER SWINGS LEFT: After folder up, time until folder swings left and rotates / time interval
13	IMPULS FOLDER DOWN ...: Pulse duration folder down, time until folder is switched airless during pick-up / time delay
14	CL.OPEN TILL FOLDER UP: After folding clamp opens, time until folder up / time interval
17	TILL TENSION OPEN ....: After end of seam, time until tension blower on / time interval
18	DURATION OF TENS. OPEN: ON duration for tension blower
19	TILL THREAD CLAMP FORW.: After clamp up, time until thread clamp forward / time interval
20	DUR.THREAD CLAMP FORW.: Duration of blowing and thread clamp forward
21	TILL STACKER TRANSPORT: After sewing drive stops and transport stamp down, time until stacker transport moves backward to ES8 / time interval
22	DUR.SLIDING TABLE OPEN: Duration for sliding table open / time delay
23	LIFT.TABLE MOD 00/01-99: Lower lift table, defaults: Input 00: Lower lift table using photocell control Input 01-99: Lift table is lowered after corresponding number of pieces
24	DUR.LIFTING TABLE SINKS: Lower lift table / duration
25	TILL FABRIC CLAMP FORW.: After footswitch is released, time until pocket bag clamp closes / time interval

D.3 Programming

D.3.7 List of global parameters

No.	Programmable global parameters (F2)
26	TILL SCISSORS CLOSED: Time until scissors close / time interval
27	DURATION SCISSORS CUTS: Cutting action of scissors / duration
28	TILL FABRIC CLAMP OPEN: After cutting action, time until clamps opens / time interval
29	TILL SWING RETAINER DWN: Lower swing retainer after seem has been sewn
30	TILL RETAINER SWINGS: Swing retainer after retainer has been lowered
31	DUR. OF PULLING RETAINER: Time during which the retainer pulls
32	BLOW OUT THE PART ....: Blow off sewing piece / duration
33	CLAMP MOVES TO STACKER: Time until moving begins / time interval
34	STACKER STAMP OPEN: Distance how long the stamps will transport the sewing piece / traverse part
35	THREAD CATCH. "UP" POS: Thread lever in top position / duration
36	SWITCH ON POS.OF TRIMM.: Switch-on position for thread cutting: Input value 01-255
37	TRIMMING SPEED .....: Speed during thread cutting
38	DURATION OF TRIMMING: ON duration for thread cutting
39	THREAD CATCH.TURNS BACK: Thread lever reversing angle
40	PROCESS IN STEPS .....: Gradual operation

D.3 Programming

D.3.8 List of special parameters

Special parameters are values that refer to only one specific sewing program. Changes of these values affect only the currently selected sewing program for which the setting is made.
Special parameters are edited in four different levels (level 2 to level 5).
Special parameters can be functions that may be enabled or disabled or parameter values that are set in lists.

■ **Request / exit special parameter menu:**
Change from service menu start level to level 1:

• Press F1 key.

SP

• Press F3 key.

Exit menu:

• Press P key.

No.	Programmable special parameters in lists (F3)
01	CLAMP POSITION RIGHT: Clamp position right during piece transfer
02	FOLDER SWING RELEASE: Swing folder Input of distance (in mm) after which folder swings right after beginning of insertion, Default 120 mm
03	INSERT SPEED .....: Clamp insertion speed
04	CLAMP SPEED .....: Clamp transport speed
05	WAITING POSITION Waiting position of clamp behind the end of seam
06	SEWING SPEED 1 .....: Sewing speed 1 beginning of seam
07	SEWING SPEED 2 .....: Sewing speed 2 main seam
08	SEWING SPEED 3 .....: Sewing speed 3 end of seam
09	DISTANCE SEWING SPEED 1: Distance for slow sewing (sewing speed 1)
10	DISTANCE SEWING SPEED 3: Distance for slow sewing at end of seam (sewing speed 3)
12	THREAD MONITOR ON AFTER: Top thread monitor on (distance in mm after beginning of seam)
13	TOP THREAD MON. FILTER: Filter for top thread monitor (response delay)
14	BOTTOM THREAD MON. FILTER: Filter for bottom thread monitor (response delay)
16	TACKING LENGTH SEAM BEG: Initial bar tack length only for lock stitch

D.3 Programming

D.3.8 List of special parameters

No.	Programmable special parameters in lists (F3)
17	TACKING LENGTH SEAM END: Final bar tack length only for lock stitch
18	STITCH LENGTH SEAM BEG: Stitch length at beginning of seam (input 5.0 mm max.)
19	DISTANCE OF THIS ST.LEN: Distance of stitch length at beginning of seam
24	ST.LENGTH OF MAIN SEAM: Stitch length for main seam (input 5.0 mm max.)
25	STITCH LENGTH SEAM END: Stitch length at end of seam (input 5.0 mm max.)
26	DIST.OF THIS ST.LENGTH: Distance of stitch length at end of seam
27	ST.LENGTH TRIMM.STITCH: Stitch length of cutting stitch (input 5.0 mm max.)
28	CHOICE OF TRIMMING ST.: Cutting stitch Input 00: Last stitch forward Input 01: Last stitch rearward
30	START MODUS .....: Start mode preselection
31	LAMP/CURVE CODE: On: 01 Off: 00
32	BLOWING MODUS .....: Blowing, mode Input 00: Alle nozzles off Input 01: Nozzle for blowing off sewing pieces switched on
33	PUSH RETAINER MODUS: On: 01 Off: 00
34	SWING RETAINER MODUS: On: 01 Off: 00
37	ADDITIONAL TRANSPORT SECTION: section of additional transport traverse path
38	ADDITIONAL TRANSPORT SYNCHRONIZING: ratio of speed to main clamp adjustment range: 75% to 125% (synchronious at 120%)

D.3 Programming

D.3.9 Level 2 special parameters / Functions

Fig. 3/4

Functions of level 2 submenus
The following section describes the special parameters that can be enabled or disabled as functions.

F1 Back to start level
F2 Enable / disable functions

■ **Enabling / disabling functions:**
Functions can be enabled or disabled for a selected sewing program. This process covers three levels (3, 4 and 5). The changes made are reflected on the display:

Fig. 3: Enabled functions are displayed as symbols [1] and [2].

Fig. 4: Disabled functions are removed from the sewing pictograph [1] and from the inner section [2] of the display.

Start menu:

- Press F2 key.

Level 3 is displayed.

Fig. 3

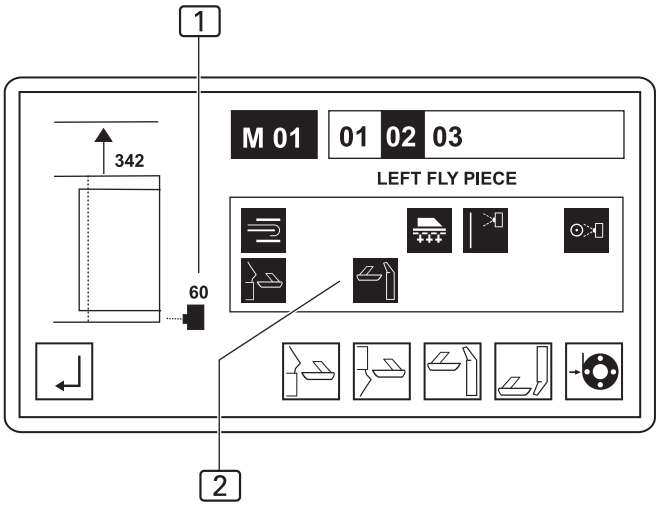
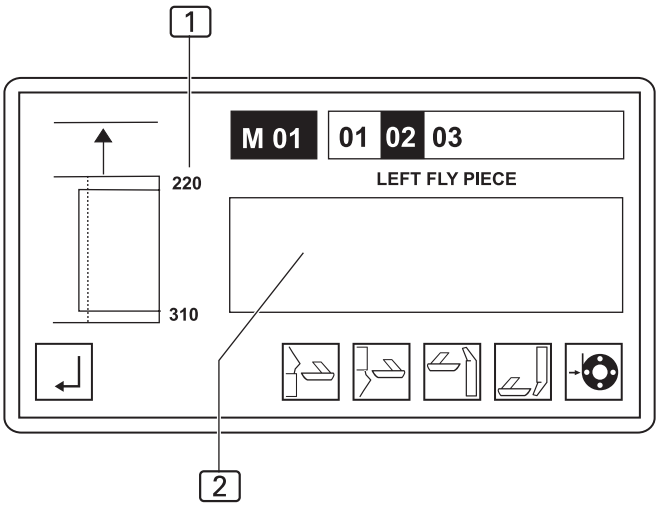


Fig. 4



D.3 Programming

D.3.10 Level 3 special parameters / Functions

Level 3 submenus

F1 Back to start level
F2 Switch photocell for beginning of seam on or off
F3 Switch photocell for end of seam on or off
F4 Switch folder on or off
F8 Request next level (level 4)

■ **Switching photocell for beginning of seam on or off:**

If the photocell that scans the start position of the seam is switched off, the machine control requires a fixed insertion distance for machine operation. Therefore, switching off the photocell results in a switch-over to a fixed insertion length (see Fig. 4). This function is directly related to the photocell correction functions of the service menu.

• Press F2 key.

The alternating request of this function switches between two modes:
Photocell for beginning of seam and fixed insertion distance.

■ **Switching photocell for end of seam on or off:**

If the photocell that scans the end position of the seam is switched off, the machine control requires a fixed point for the end of the seam to ensure correct machine operation. Therefore, switching off the photocell results in a switch-over to a fixed end of seam point. This function is directly related to the photocell correction functions of the service menu.

• Press F3 key.

The alternating request of this function switches between two modes:
Photocell for end of seam and fixed end of seam point or fixed seam length.

■ **Switching folder on or off:**

The folder puts the pocket edge onto the pocket bag. If this function is disabled, the pocket edge must be put onto the pocket bag manually.

• Press F4 key.

D.3 Programming

D.3.11 Level 4 special parameters / Functions

Level 4 submenus

F1 Back to level 3
F2 Enable/disable vacuum
F4 Enable/disable working plate cutter (left trousers component)
F5 Enable/disable working plate cutter (right trousers component)
F6 Enable/disable pick-up plate front cutter (left slash selvage)
F7 Sewing to fixed end-of-seam position
F8 Request next level (level 5)

■ **Enabling or disabling vacuum:**
The vacuum is used as a fixing aid for the left or right trousers component before the clamp transport transfer. It can be disabled during the checking of machine movements. To enable or disable this function:

• Press F2 key.

☞ **NOTE - Operation without vacuum!**

During normal production operation, the vacuum should always be enabled as otherwise failures in the machine cycle may occur.

■ **Enabling or disabling cutters:**
Sewing programs have been programmed at the factory with an individual cutter cut. For specific seams, this function can be enabled or disabled separately:

1. Working plate cutter (left trousers component).

• Press F4 key.

2. Working plate cutter (right trousers component).

• Press F5 key.

3. Pick-up plate cutter (left slash selvage, right side pocket, left slash selvage for ladies' trousers).

• Press F6 key.

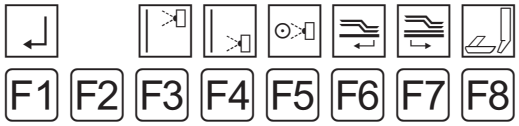
■ **Sewing to fixed end-of-seam position:**
If this function is enabled, a fixed position for the end of the seam can be programmed for sewing the slash selvages:

• Press F7 key.

D.3 Programming

D.3.12 Level 5 special parameters / Functions

Level 5 submenus



F1 Back to level 4
F3 Switch top thread monitor on or off
F4 Switch bottom thread monitor for chain stitch upper part on or off
F5 Switch rest thread monitor for lock stitch upper part on or off
F6 Clamp position after end of seam
F7 Clamp waiting position
F8 Scissors pick-up plate left side pocket

■ **Switching the top thread monitor on or off:**
For testing purposes, the top thread monitor can be switched off. To switch the top thread monitor on or off:

• Press F3 key.

☞ **NOTE - Operation without top thread monitor!**

During normal production, the top thread monitor should always be switched on as otherwise the sewing programm will not be stopped if the thread breaks.

■ **Switching the bottom thread monitor on or off:**
Depending on the specifications of the sewing head, the machine is equipped with a bottom thread monitor (for chain stitch upper part). Monitor can be switched on or off for testing purposes. To switch a monitor on or off:

• Press F4 key

☞ **NOTE - Operation without thread monitor!**

During normal production, the rest thread monitor or the top thread monitor should always be switched on as otherwise the sewing programm will not be stopped if the thread breaks.

■ **Switching the rest thread monitor on or off:**
Depending on the specifications of the sewing head, the machine is equipped with a rest thread monitor (for lock stitch upper part). Monitor can be switched on or off for testing purposes. To switch a monitor on or offf:

• Press F5 key

☞ **NOTE - Operation without thread monitor!**

During normal production, the rest thread monitor or the top thread monitor should always be switched on as otherwise the sewing programm will not be stopped if the thread breaks

■ **Switching clamp position behind end of seam on or off:**
If this function is enabled, the closed clamp moves to the clamp transport end point behind the end of the seam before releasing the sewing piece. To enable or disable this function:

• Press F6 key.

■ **Moving clamp to waiting position:**
If this function is enabled, the clamp moves to the waiting position (e. g. special parameter 05: 48 cm).

• Press F7 key.

■ **Scissors pick-up plate (left side pocket, right slash selvage for ladies' trousers):**
Enable scissors:

• Press F8 key.

D.3 Programming

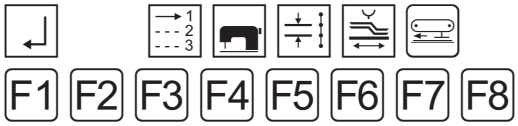
D.3.13 Level 2 special parameters / Lists

Parameter setting for level 2 submenus
The following section describes the special parameters that are set in lists. When a submenu is requested, only those positions of the parameter list are displayed that refer to the machine function.

Move to a line in the list:

- Press ↑ or ↓ key.

Special parameter menu



F1 Back to start level
F3 Select start modes list
F4 Open upper part parameters list
F5 Open stitch lengths and bar tacks list
F6 Open parameter list for clamp transport
F7 Open assistance transport list

■ **Selecting start modes:**
Two modes can be set in this menu:
- Start mode,
- Blowing mode.

- Press F3 key.

Change parameters:

- Press ENT key.
- Insert new value using numeric keypad or
- Press ← or → key.

Confirm input:

- Press P key.

Settable values:

Start mode
The selected start mode determines how the machine operation is started and executed. Four modes are available:
- Mode 04
- Mode 05
- Mode 06
- Mode 07

The individual settings for machine operation are described in Section B.3.10, Machine operation.

Blowing mode
When this mode is selected, the sewing piece is smoothened after the sewing process before it is transported to the stacker.
- 00, off
- 01, on, only parts blowing Y47
- 02, on, only slash selvage blowing Y46
- 03, on, eingeschaltet parts blowing Y47 and slash selvage blowing Y46

■ **Setting upper part parameters:**
This list is used for setting all parameters for functions of the sewing head.
The minimum and maximum values of input are limited by the program control unit. Values that are not within the limits will not be accepted but reduced to the corresponding minimum or maximum value.

- Press F4 key.

The parameter list is shown on the display.

☞ **NOTE - Sewing speed!**

Possible settings for the sewing speed refer to the following sewing ranges:
- **Sewing speed 1 to the start distance,**
- **sewing speed 2 to the center distance,**
- **sewing speed 3 to the end of the seam.**

The speed is set in increments of 100 rpm.

D.3 Programming

D.3.13 Level 2 special parameters / Lists

■ **Setting stitch lengths and bar tacks:**
All settings for the configuration of the seam can be changed using this list.
The minimum and maximum values of input are limited by the program control unit. Values that are not within the limits will not be accepted but reduced to the corresponding minimum or maximum value.

• Press F5 key.

The parameter list is shown on the display.

■ **Parameters for clamp transport:**
This list is used to make all settings for the clamp movement.

• Press F6 key.

The parameter list shown on the display has the following function:
01 Clamp insertion as seen from right end of rail
02 Stop position 600 mm is a safety value. Only values higher than 600 mm can be input
03 Settable range: 35 % - 80 %
04 Settable range: 35 % - 99 %
05 Range of the curve where no sewing is performed. If value "0" is input here, the sewing process starts immediately.

■ **Parameters for assistance transport:**
This list is used to make all settings for the assistance transport.

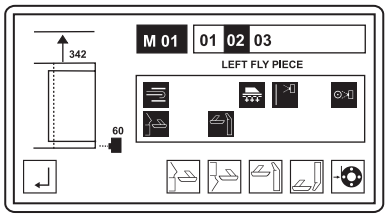
• Press F7 key.

The parameter list shown on the display, has the following function:
37 Distance how long the assistance transport will transport the sewing piece synchronous with the main clamp:
00 cm = switched off
38 Synchronization from assistance transport to main clamp:
Settable range: 75 % - 125 %

D.4 Factory settings

D.4.1 Factory settings global parameters

■ M 01 Global parameters

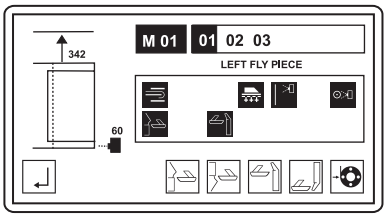


Pos.	Global parameters 2211-5	Value	Unit
01	TILL CLAMP SIDEWAYS FWD	0.3	sec
02	TILL CLAMP DOWN	0.1	sec
03	TILL VACUUM OFF	0.2	sec
04	Fadenlänge Spule voll	003	m
05	TILL CLAMP INSERTING	0.2	sec
06	SEWING END ->CL.SIDEW	0.1	sec
07	TIME AFTER CLAMP OPEN	0.1	sec
10	TILL FOLDING CL. CLOSED	0.5	sec
11	TILL FOLDER LIFT UP	0.2	sec
12	TILL FOLDER SWINGS LEFT	0.2	sec
13	IMPULS FOLDER DOWN	0.05	sec
14	CL.OPEN TILL FOLDER UP	0.20	sec
17	TILL TENSION OPEN	0.00	sec
18	DURATION OF TENS. OPEN	0.4	sec
19	TILL THREAD CLAMP FORW.	0.2	sec
20	DUR.THREAD CLAMP FORW.	0.5	sec
21	TILL STACKER TRANSPORT	0.0	sec
22	DUR.SLIDING TABLE OPEN	0.0	sec
23	LIFT.TABLE MOD 00/01-99	0.0	
24	DUR.LIFTING TABLE SINKS	0.00	sec
25	TILL FABRIC CLAMP FORW	0.0	sec
26	TILL SCISSORS CLOSED	0.0	sec
27	DURATION SCISSORS CUTS	0.0	sec
28	TILL FABRIC CLAMP OPEN	0.0	sec
29	TILL SWING RETAINER DWN	0.0	sec
30	TILL RETAINER SWINGS	0.0	sec
31	DUR.OF PULLING RETAINER	0.0	sec
32	BLOW OUT THE PART	0.5	sec
33	CLAMP MOVES TO STACKER	0.0	sec
34	STACKER STAMP OPEN	0.0	cm
35	THREAD CATCH. "UP" POS	200	INC
36	SWITCH ON POS.OF TRIMM	100	INC
37	TRIMMING SPEED	180	Rpm
38	DURATION OF TRIMMING	0.35	sec
39	THREAD CATCH.TURNS BACK	00	INC
40	PROCESS IN STEPS	00	

D.4 Factory settings

D.4.2 Factory settings special parameters

■ **M 01 Special parameters seam 01:**

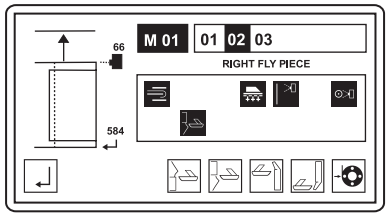


Pos.	SEAM 01 - LEFT ZIPPER FLY	Value	Unit
01	CLAMP POSITION RIGHT	030	mm
02	FOLDER SWING RELEASE	370	mm
03	INSERT SPEED	60	%
04	CLAMP SPEED	99	%
05	WAITING POSITION	43	cm
06	SEWING SPEED 1	1200	Rpm
07	SEWING SPEED 2	4200	Rpm
08	SEWING SPEED 3	1200	Rpm
09	DISTANCE SEWING SPEED 1	10	mm
10	DISTANCE SEWING SPEED 3	15	mm
12	THREAD MONITOR ON AFTER	05	mm
13	TOP THREAD MON. FILTER	20	mm
14	BOTTOM THREAD MON. FILTER	00	
16	TACKING LENGTH SEAM BEG	08	mm
17	TACKING LENGTH SEAM END	00	mm
18	STITCH LENGTH SEAM BEG.	1.5	mm
19	DISTANCE OF THIS ST.LEN	08	mm
24	ST.LENGTH OF MAIN SEAM	3.0	mm
25	STITCH LENGTH SEAM END	1.5	mm
26	DIST.OF THIS ST.LENGTH	08	mm
27	ST.LENGTH TRIMM.STITCH	1.5	mm
28	CHOICE OF TRIMMING ST	00	
30	START MODUS / INSERTING	05	
31	LAMP/CURVE CODE	00	
32	BLOWING MODUS	03	
33	PUSH RETAINER MODUS	00	
34	SWING RETAINER MODUS	00	
37	ASSIST.TRANSPORT/ DISTANCE	45	cm
38	ASSIST.TRANSPORT/SYNCHRON.	120	%

D.4 Factory settings

D.4.2 Factory settings special parameters

■ **M 01 Special parameters seam 02:**

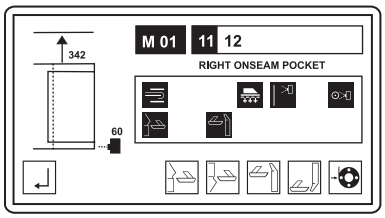


Pos.	SEAM 02 - RIGHT ZIPPER FLY	Value	Unit
01	CLAMP POSITION RIGHT	030	mm
02	FOLDER SWING RELEASE	370	mm
03	INSERT SPEED	60	%
04	CLAMP SPEED	99	%
05	WAITING POSITION	43	cm
06	SEWING SPEED 1	1200	Rpm
07	SEWING SPEED 2	4200	Rpm
08	SEWING SPEED 3	1200	Rpm
09	DISTANCE SEWING SPEED 1	10	mm
10	DISTANCE SEWING SPEED 3	15	mm
12	THREAD MONITOR ON AFTER	05	mm
13	TOP THREAD MON. FILTER	20	mm
14	BOTTOM THREAD MON. FILTER	00	
16	TACKING LENGTH SEAM BEG	00	mm
17	TACKING LENGTH SEAM END	08	mm
18	STITCH LENGTH SEAM BEG.	1.5	mm
19	DISTANCE OF THIS ST.LEN	08	mm
24	ST.LENGTH OF MAIN SEAM	3.0	mm
25	STITCH LENGTH SEAM END	1.5	mm
26	DIST.OF THIS ST.LENGTH	08	mm
27	ST.LENGTH TRIMM.STITCH	1.5	mm
28	CHOICE OF TRIMMING ST.	00	
30	START MODUS / INSERTING	07	
31	LAMP/CURVE CODE	00	
32	BLOWING MODUS	01	
33	PUSH RETAINER MODUS	00	
34	SWING RETAINER MODUS	00	
37	ASSIST.TRANSPORT/ DISTANCE	00	cm
38	ASSIST.TRANSPORT/SYNCHRON.	120	%

D.4 Factory settings

D.4.2 Factory settings special parameters

■ **M 02 Special parameters seam 11:**

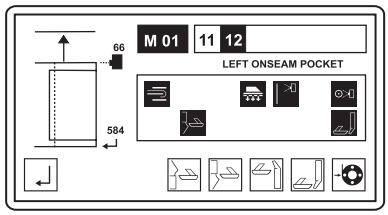


Pos.	SEAM 11 - RIGHT ONSEAM POCKET	Value	Unit
01	CLAMP POSITION RIGHT	030	mm
02	FOLDER SWING RELEASE	370	mm
03	INSERT SPEED	60	%
04	CLAMP SPEED	99	%
05	WAITING POSITION	43	cm
06	SEWING SPEED 1	1200	Rpm
07	SEWING SPEED 2	4200	Rpm
08	SEWING SPEED 3	1200	Rpm
09	DISTANCE SEWING SPEED 1	10	mm
10	DISTANCE SEWING SPEED 3	10	mm
12	THREAD MONITOR ON AFTER	05	mm
13	TOP THREAD MON. FILTER	20	mm
14	BOTTOM THREAD MON. FILTER	00	
16	TACKING LENGTH SEAM BEG	10	mm
17	TACKING LENGTH SEAM END	00	mm
18	STITCH LENGTH SEAM BEG.	1.5	mm
19	DISTANCE OF THIS ST.LEN	08	mm
24	ST.LENGTH OF MAIN SEAM	3.0	mm
25	STITCH LENGTH SEAM END	1.5	mm
26	DIST.OF THIS ST.LENGTH	08	mm
27	ST.LENGTH TRIMM.STITCH	1.5	mm
28	CHOICE OF TRIMMING ST.	00	
30	START MODUS / INSERTING	05	
31	LAMP/CURVE CODE	00	
32	BLOWING MODUS	03	
33	PUSH RETAINER MODUS	00	
34	SWING RETAINER MODUS	00	
37	ASSIST.TRANSPORT/ DISTANCE	45	cm
38	ASSIST.TRANSPORT/SYNCHRON.	120	%

D.4 Factory settings

D.4.2 Factory settings special parameters

■ **M 02 Special parameters seam 12:**

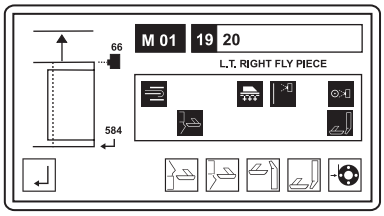


Pos.	SEAM 12 - LEFT ONSEAM POCKET	Value	Unit
01	CLAMP POSITION RIGHT	030	mm
02	FOLDER SWING RELEASE	370	mm
03	INSERT SPEED	60	%
04	CLAMP SPEED	99	%
05	WAITING POSITION	43	cm
06	SEWING SPEED 1	1200	Rpm
07	SEWING SPEED 2	4200	Rpm
08	SEWING SPEED 3	1200	Rpm
09	DISTANCE SEWING SPEED 1	10	mm
10	DISTANCE SEWING SPEED 3	10	mm
12	THREAD MONITOR ON AFTER	05	mm
13	TOP THREAD MON. FILTER	20	mm
14	BOTTOM THREAD MON. FILTER	00	
16	TACKING LENGTH SEAM BEG	00	mm
17	TACKING LENGTH SEAM END	10	mm
18	STITCH LENGTH SEAM BEG.	1.5	mm
19	DISTANCE OF THIS ST.LEN	08	mm
24	ST.LENGTH OF MAIN SEAM	3.0	mm
25	STITCH LENGTH SEAM END	1.5	mm
26	DIST.OF THIS ST.LENGTH	08	mm
27	ST.LENGTH TRIMM.STITCH	1.5	mm
28	CHOICE OF TRIMMING ST.	00	
30	START MODUS / INSERTING	05	
31	LAMP/CURVE CODE	00	
32	BLOWING MODUS	01	
33	PUSH RETAINER MODUS	00	
34	SWING RETAINER MODUS	00	
37	ASSIST.TRANSPORT/ DISTANCE	00	cm
38	ASSIST.TRANSPORT/SYNCHRON.	120	%

D.4 Factory settings

D.4.2 Factory settings special parameters

■ **M 03 Special parameters seam 19:**

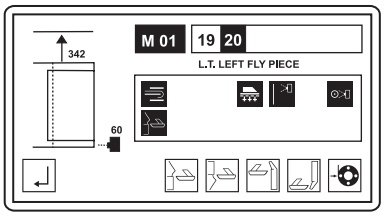


Pos.	SEAM 19 - RIGHT ZIPPER FLY LADY TROUSERS	Value	Unit
01	CLAMP POSITION RIGHT	030	mm
02	FOLDER SWING RELEASE	370	mm
03	INSERT SPEED	60	%
04	CLAMP SPEED	99	%
05	WAITING POSITION	43	cm
06	SEWING SPEED 1	1200	Rpm
07	SEWING SPEED 2	4200	Rpm
08	SEWING SPEED 3	1200	Rpm
09	DISTANCE SEWING SPEED 1	10	mm
10	DISTANCE SEWING SPEED 3	10	mm
12	THREAD MONITOR ON AFTER	05	mm
13	TOP THREAD MON. FILTER	20	mm
14	BOTTOM THREAD MON. FILTER	00	
16	TACKING LENGTH SEAM BEG	00	mm
17	TACKING LENGTH SEAM END	10	mm
18	STITCH LENGTH SEAM BEG.	1.5	mm
19	DISTANCE OF THIS ST.LEN	08	mm
24	ST.LENGTH OF MAIN SEAM	3.0	mm
25	STITCH LENGTH SEAM END	1.5	mm
26	DIST.OF THIS ST.LENGTH	08	mm
27	ST.LENGTH TRIMM.STITCH	1.5	mm
28	CHOICE OF TRIMMING ST.	00	
30	START MODUS / INSERTING	05	
31	LAMP/CURVE CODE	00	
32	BLOWING MODUS	01	
33	PUSH RETAINER MODUS	00	
34	SWING RETAINER MODUS	00	
37	ASSIST.TRANSPORT/ DISTANCE	00	cm
38	ASSIST.TRANSPORT/SYNCHRON.	120	%

D.4 Factory settings

D.4.2 Factory settings special parameters

■ **M 03 Special parameters seam 20:**



Pos.	SEAM 20 - LEFT ZIPPER FLY LADY TROUSERS	Value	Unit
01	CLAMP POSITION RIGHT	030	mm
02	FOLDER SWING RELEASE	370	mm
03	INSERT SPEED	60	%
04	CLAMP SPEED	99	%
05	WAITING POSITION	43	cm
06	SEWING SPEED 1	1200	Rpm
07	SEWING SPEED 2	4200	Rpm
08	SEWING SPEED 3	1200	Rpm
09	DISTANCE SEWING SPEED 1	10	mm
10	DISTANCE SEWING SPEED 3	10	mm
12	THREAD MONITOR ON AFTER	05	mm
13	TOP THREAD MON. FILTER	20	mm
14	BOTTOM THREAD MON. FILTER	00	
16	TACKING LENGTH SEAM BEG	00	mm
17	TACKING LENGTH SEAM END	10	mm
18	STITCH LENGTH SEAM BEG.	1.5	mm
19	DISTANCE OF THIS ST.LEN	08	mm
24	ST.LENGTH OF MAIN SEAM	3.0	mm
25	STITCH LENGTH SEAM END	1.5	mm
26	DIST.OF THIS ST.LENGTH	08	mm
27	ST.LENGTH TRIMM.STITCH	1.5	mm
28	CHOICE OF TRIMMING ST.	00	
30	START MODUS / INSERTING	06	
31	LAMP/CURVE CODE	00	
32	BLOWING MODUS	01	
33	PUSH RETAINER MODUS	00	
34	SWING RETAINER MODUS	00	
37	ASSIST.TRANSPORT/ DISTANCE	45	cm
38	ASSIST.TRANSPORT/SYNCHRON.	120	%