



MODEL S-4001 ISBH+I SM

ELECTRONIC BUTTONHOLE MACHINE

PARTS AND SERVICE MANUAL

MACHINE SERIAL No:

PART NUMBER 97.2486.4.001

This manual is valid from the machine Serial No.: R241702



LIMITED WARRANTY ON NEW AMF REECE EQUIPMENT

Warranty provisions:

A ninety (90) day limited service labor warranty to correct defects in installation, workmanship, or material without charge for labor. This portion of the warranty applies to machines sold as "installed" only.

A one (1) year limited material warranty on major component parts to replace materials with defects. Any new part believed defective must be returned freight prepaid to AMF Reece, Inc. for inspection. If, upon inspection, the part or material is determined to be defective, AMF Reece, Inc. will replace it without charge to the customer for parts or material.

Service labor warranty period shall begin on the completed installation date. Material warranty shall begin on the date the equipment is shipped from AMF Reece, Inc.

Exclusions:

Excluded from both service labor warranty and material warranty are: (1) Consumable parts which would be normally considered replaceable in day-to-day operations. These include parts such as needles, knives, loopers and spreaders. (2) Normal adjustment and routine maintenance. This is the sole responsibility of the customer. (3) Cleaning and lubrication of equipment. (4) Parts found to be altered, broken or damaged due to neglect or improper installation or application. (5) Damage caused by the use of non-Genuine AMF Reece parts. (6) Shipping or delivery charges.

There is no service labor warranty for machines sold as "uninstalled".

Equipment installed without the assistance of a certified technician (either an AMF Reece Employee, a Certified Contractor, or that of an Authorized Distributor) will have the limited material warranty only. Only the defective material will be covered. Any charges associated with the use of an AMF Reece Technician or that of a Distributor to replace the defective part will be the customer's responsibility.

NO OTHER WARRANTY, EXPRESS OR IMPLIED, AS TO DESCRIPTION, QUALITY, MERCHANTABILITY, and FITNESS FOR A PARTICULAR PURPOSE, OR ANY OTHER MATTER IS GIVEN BY SELLER OR SELLER'S AGENT IN CONNECTION HERewith. UNDER NO CIRCUMSTANCES SHALL SELLER OR SELLER'S AGENT BE LIABLE FOR LOSS OF PROFITS OR ANY OTHER DIRECT OR INDIRECT COSTS, EXPENSES, LOSSES OR DAMAGES ARISING OUT OF DEFECTS IN OR FAILURE OF THE EQUIPMENT OR ANY PART THEREOF.

WHAT TO DO IF THERE IS A QUESTION REGARDING WARRANTY

If a machine is purchased through an authorized AMF Reece, Inc. distributor, warranty questions should be first directed to that distributor. However, the satisfaction and goodwill of our customers are of primary concern to AMF Reece, Inc. In the event that a warranty matter is not handled to your satisfaction, please contact AMF Reece office:

Prostejov, Czech Republic
Phone: (+420) 582-309-275
Fax: (+420) 582-360-608
e-mail: service@amfreece.cz



Warranty Registration Card

(Please Fax or Mail immediately after installation)

Note: All Warranty Claims Void, unless Registration Card on file at AMF Reece HQ

Machine model number:

(S101, S100, S104, S105, S311, Decostitch, S4000, EBS Mark II, etc)

Manufacturer's serial or production number:

Installation Site Information:

Customer's Name:

Customer's Mailing Address:

Customer's Telephone Number:

Supervising Mechanic's or Technician's Name:

Signature of Supervising Technician:

AMF Reece Technician's Name:

AMF Reece Technician's Signature:

Type of garment produced at this location?

Average Daily Production Expected from this machine?

(number of buttonholes, jackets sewn, pants produced, buttons sewn, etc)

Any special requirements required at this location?

What other AMF Reece Machines are at this location?

How can we serve you better?

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A - INTRODUCTION

1. BASIC INFORMATION

The sewing machine S-4001 ISBH+I SM is designed and produced to be very reliable. Important design goals have been to provide a safe machine that is simple and inexpensive to maintain.

The patented rotary needle bar shaft drive, a major benefit, delivers longer needle bar life. The added benefits of lower vibration and less noise, translate into less operator fatigue.

Simple buttonhole length adjustment located outside the machine, eliminates the need for tilt back, while the quick stop repair function delivers safety and makes repairs easier.

Special electronic and mechanical safety devices protect the operator and the machine. There is a special power lock out switch that permits the machine to be locked in the off position, so that it cannot be cycled accidentally. There is an emergency off switch. There is a low air pressure detector that will not permit machine operation if air pressure is dangerously low.

There are safety-warning labels on the machine in all areas that require special care. These must not be removed. If they are lost replace them immediately.

You are the most important safety equipment of all. Be sure you understand the proper operation of the machine. Never remove safety mechanisms or labels. We have made every effort to provide the safest possible machine, but without complete knowledge of how this machine operates, and the use of proper care by the operator, this machine can cause serious injury or death. That is why there are safety warnings throughout these instructions that carry one of these messages.

There are four categories of safety instructions in this manual:

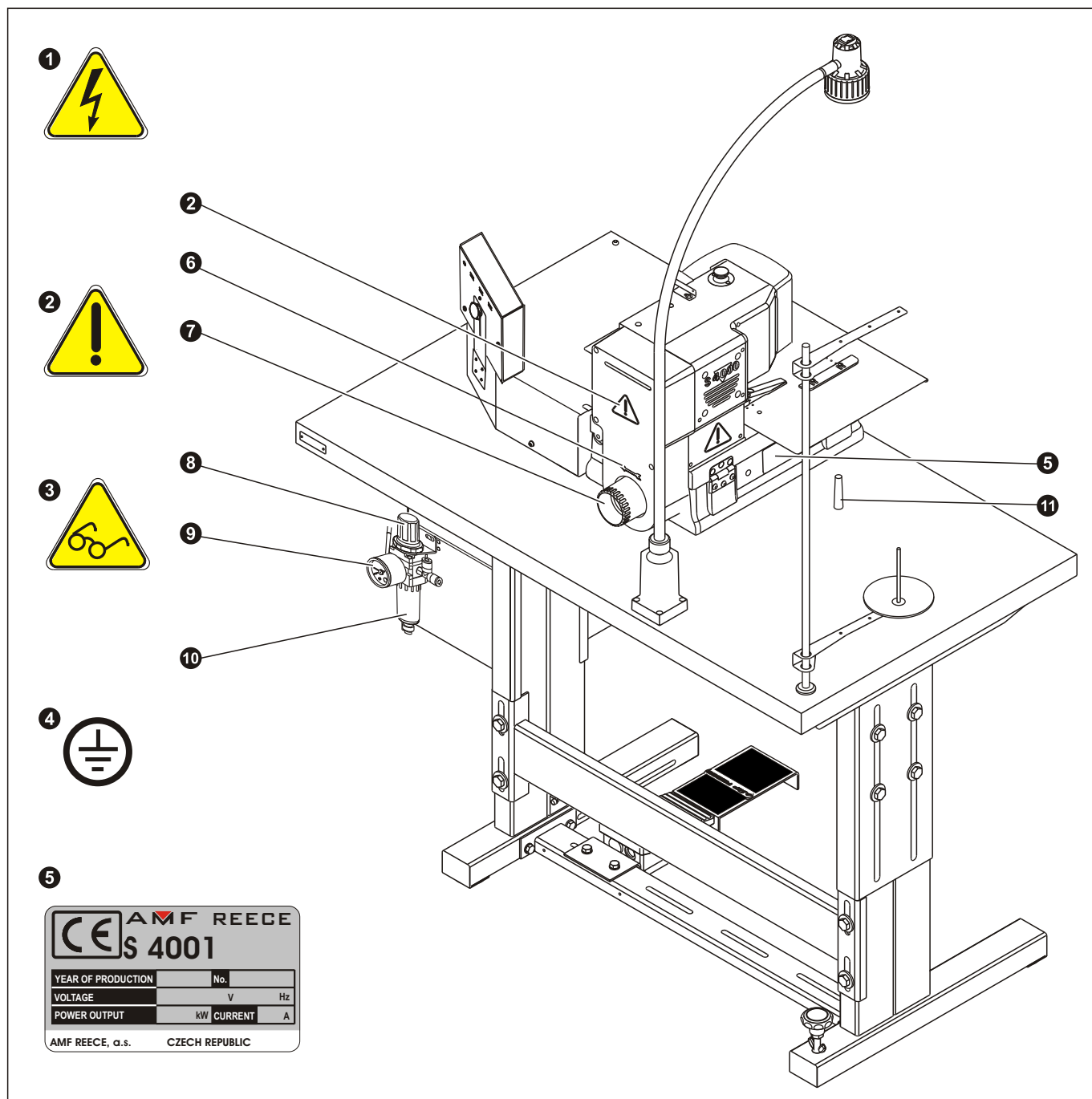
- | | |
|-----------------|---|
| DANGER! | Ignoring instructions may endanger operator's life. |
| CAUTION! | Ignoring instructions may cause a serious injury of the operator or damage the machine. |
| WARNING! | Ignoring instructions may cause damage on the machine or injury of the operator. |
| NOTICE! | Breaking procedures may cause functional problems of the machine. |

We recommend that servicemen from AMF Reece supervise the installation of the machines and initial training of your mechanics and operators.

The most effective method ensuring safety of operators working on the machine is a strict safety program including instructions for safety operation. Operators and servicemen should wear safety glasses.

A - INTRODUCTION

2. SAFETY DEVICE AND LABELS

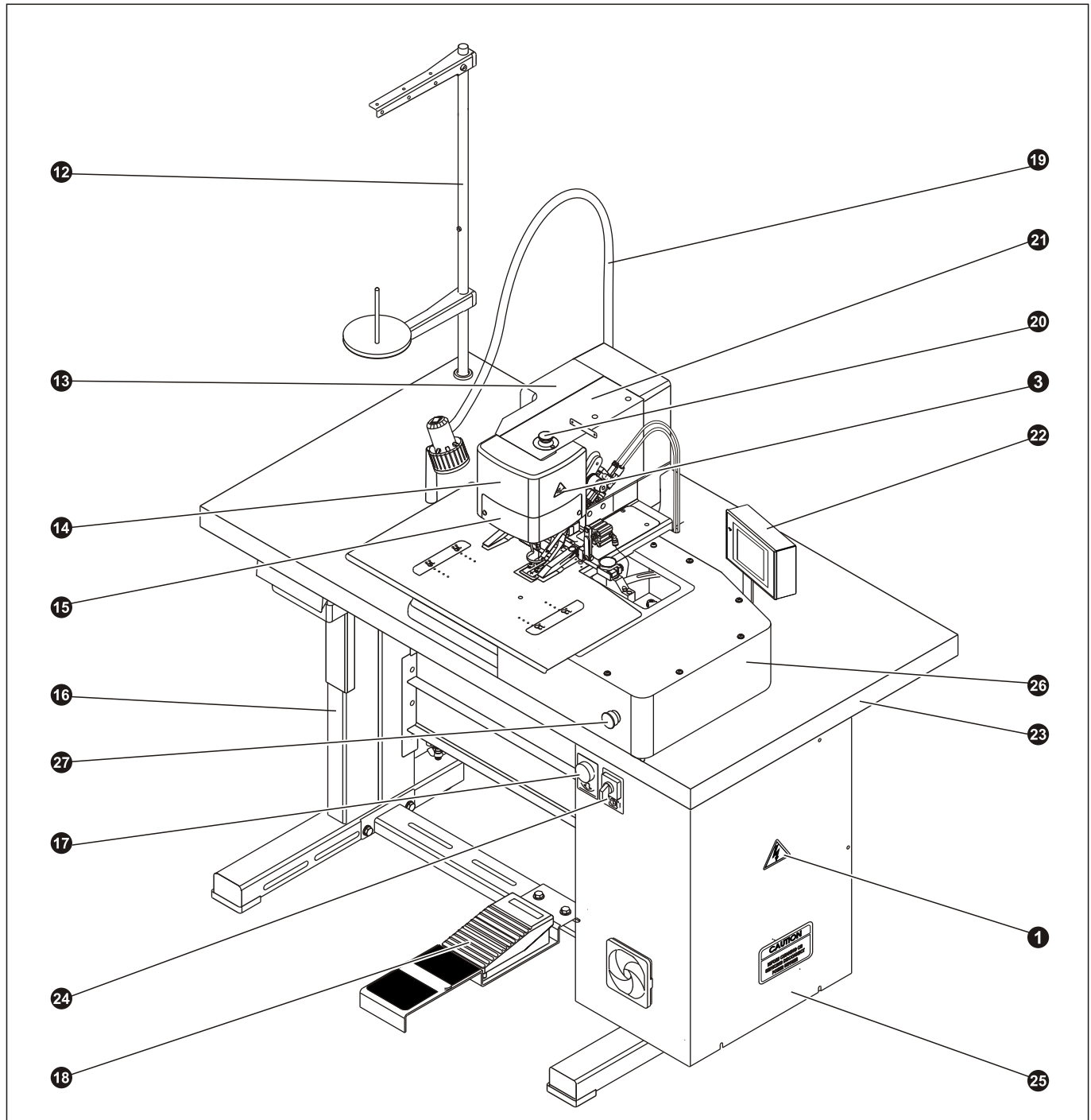


- 1** Warning
- 2** Covers removed, possible injury
- 3** Warning when opening cover eyes injury danger
- 4** Grounding
- 5** Standard label
- 6** Rotation direction
- 7** Hand wheel

- 8** Air pressure adjustment knob
- 9** Manometer with pressure sensor
- 10** Air pressure regulator
- 11** Rest pin
- 12** Thread stand
- 13** Head cover
- 14** Needle bar cover

A - INTRODUCTION

3. GENERAL MACHINE PARTS DESCRIPTIONS



- | | |
|--------------------------|------------------------------|
| 15 Eye guard | 22 Control panel |
| 16 Table | 23 Table top |
| 17 Clamps/Up Down | 24 Main Switch |
| 18 Foot pedal | 25 Control box |
| 19 Halogen lamp Button | 26 Indexer |
| 20 Emergency Stop Button | 27 Cycle interruption switch |
| 21 Machine head | |

A - INTRODUCTION

4. TECHNICAL CONDITIONS

Machine type	S 4001 ISBH+I
Description	Electronic controller chains stitch straight buttonhole machine for sewing imitation buttonholes on cuff Wiggins. With the automatic indexer, preset programs automatically control the sewing of multiple buttonholes either straight or on an angle
Sewing speed	1500-3800 stitches/min (500 - 1900 rev/min of the drive shaft)
Buttonhole length	15.8 - 25 mm (5/8" - 1")
Stitch density	3 - 12 stitches/cm (8 - 35 spi)
Type of the buttonhole	Single thread chain stitch without center cutting
Machine clamp foot height	12.7 mm (1/2")
Maximum work thickness	to 3 mm (1/8")
Bite range	1.7 - 2.3 (1/15" - 3/32")
Distance between the first and the second row of stitches	0 - 0.9 mm
Recommended thread	Thread size 80, 100, 120
Needle system	Needle 750 SC 90/14 (it is possible to order 80/12; 70/10)
Lubrication	Semi-automatic
Operating Conditions	According to IEC 364-3, IEC 364-5-51 temperature from +5°C to 40°C, relative air humidity from 30 to 80 %
Air pressure	0.55 MPa (80 PSI) Indexer 0,4 Mpa (58 PSI)
Machine db level	Laeg = 74dB; LWA = 87dB; LpC, peak = 103dB
Machine head dimension	340 mm (height) x 470 (width) x 250 mm (length)
Machine head weight	62 kg
Table Dimension	700 mm (height) x 600 mm (width) x 1100 mm (length)
Electrical Requirements	1NPE~60Hz 230V/TN-S (according to EN 60204-1)
	1NPE~50Hz 230V/TN-S (according to EN 60204-1)
Line Circuit Breaker	10A characteristic C (according to EN 60947-2)
	16A characteristic B (according to EN 60947-2)
Indexer number of buttonholes	1 — 8
Distance between buttonholes	4 — 63 mm
Max. indexer feeding	63 mm
Indexer dimension	114 mm (height) x 400 mm (width) x 383 mm (length)

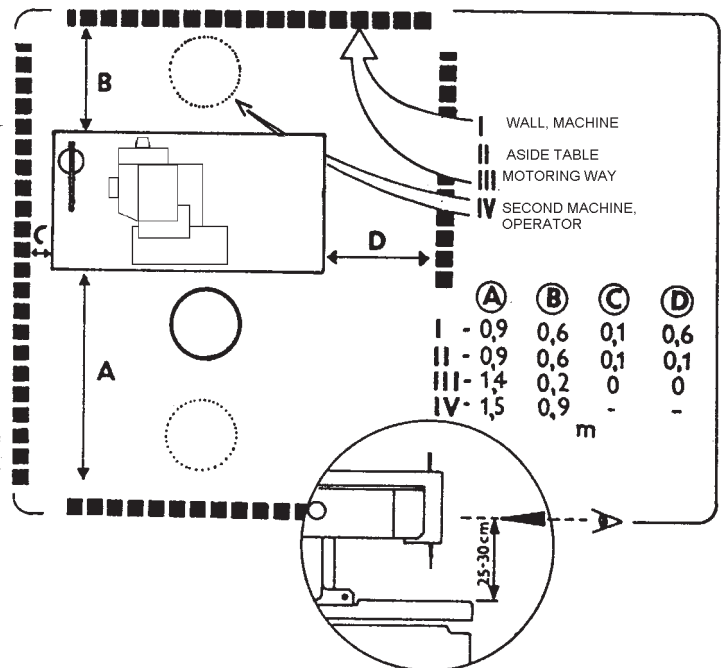
A - INTRODUCTION

5. INSTRUCTIONS FOR OPERATOR SAFETY AND MAINTENANCE

When installing the machine we recommend the minimum clearances noted above around the machine. Read all of the instructions that follow. DO NOT PUT THE MACHINE INTO OPERATION UNTIL YOU ARE COMPLETELY FAMILIAR WITH ALL INSTALLATION AND OPERATING INSTRUCTIONS.

DANGER!

- Before connecting the machine to the power supply, be positive that all safety covers are correctly installed.
- Always engage the power lockout switch, or disconnect the main power supply, before removing any safety covers.



WARNING!

- Locate the Emergency Stop button. Be sure you know how to use it.
- Be sure that you have a reliable and uniform power supply.
- Be sure that all electrical supply lines are in good condition and have no signs of damage to avoid electrical shock.
- If any covers become damaged, they must be repaired or replaced immediately.
- Do not touch moving parts of the machine while it is operating.
- Keep clear of the needle.
- Always switch off the main power before changing the needle.
- Before cleaning the machine or performing service to the machine, engage the power lock out switch or disconnect the main power supply.
- When the machine is not in use engage the power lock out switch or disconnect the main power supply.
- When this machine is used incorrectly, or is incorrectly maintained, it can be dangerous. Everyone who uses this machine, or maintains this machine, must be completely familiar with this manual.

CAUTION!

- Perform all regular service as described by this manual.
- If there is any problem with the power supply, turn off the main power switch.
- Do not remove, paint over, damage or in any way change safety labels. If a safety label cannot be easily read, replace it.
- Long hair and loose clothing may be dangerous near any machinery. Always contain long hair and avoid loose clothing, so that it cannot be caught by machinery and cause injury.
- Never use this machine while under the influence of drugs or alcohol.
- If anything seems to be operating incorrectly in the machine call for maintenance assistance immediately.
- Be sure that there is adequate light for safe operation. A normal minimum light level is 750 lux.

A - INTRODUCTION

CAUTION: LASER RADIATION

DO NOT VIEW DIRECTLY WITH OPTICAL INSTRUMENTS

Read carefully the supplemental rules described below before setting up laser system.



C.C. E.A. laser product has been designed and manufactured specifically for the work place and for use in working conditions.

It complies to the existing work safety regulation included in directive 73/23 and subsequent 93/68.

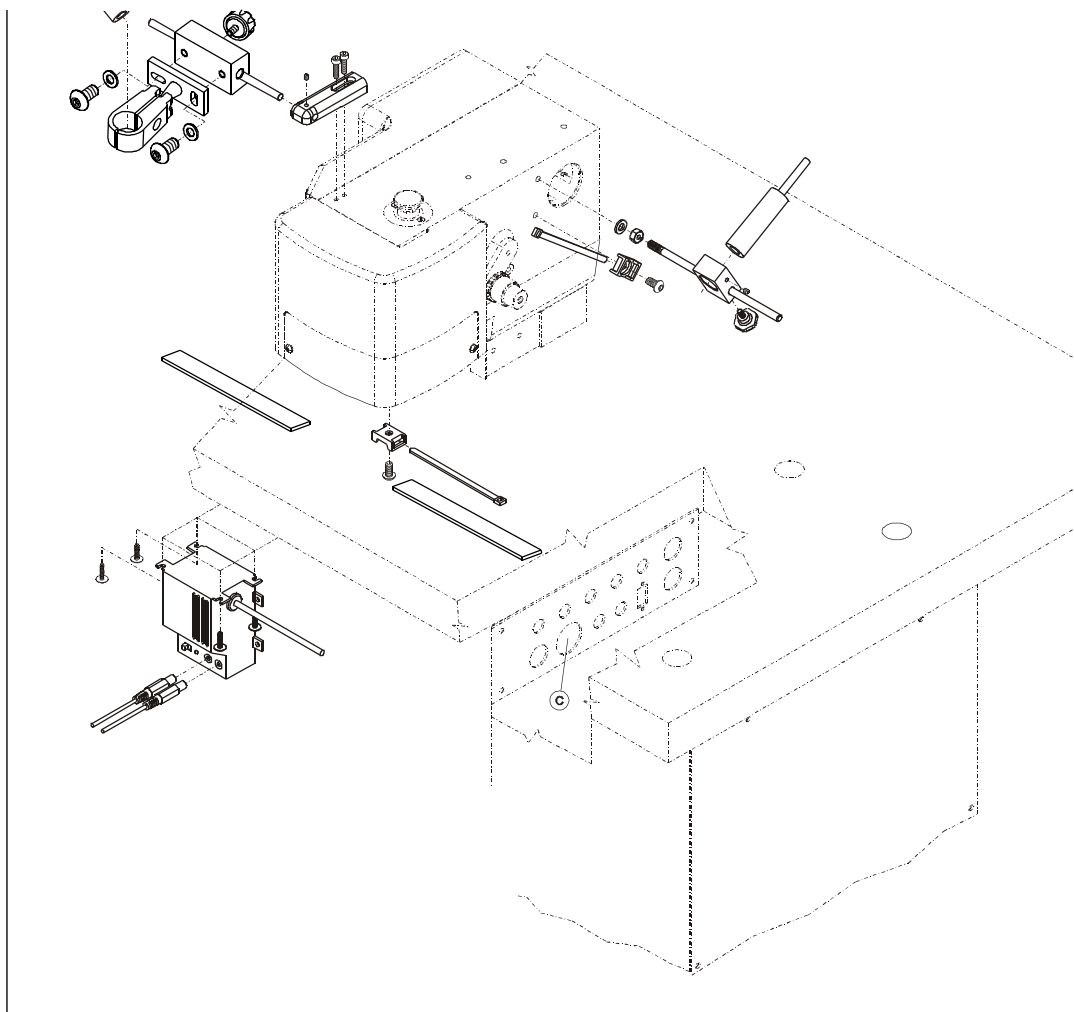
It has been made following to the International Standard CE/EN 60825.

Use C.C.E.A. laser system belong Class II. To this class emit low-power beam $\leq 1\text{mW}$ to be seen into the visible spectrum. They are not considered dangerous if just the laser beam will be accidentally (fraction of second) pointed at the eyes. The palpebral

reflexion would not allow a length of exposure higher than 0,25 seconds. It is absolutely necessary wearing specific safety glasses (with declared wavelength and filter), when eyes are directly and lasting exposed at the laser radiation. Our Lasers are followings: 650 nm.

LABELLING:

The label showing the laser class must be permanently attached so as to be clearly visible and readable when the system is working, for maintenance and other needs. Labels must be seen without a direct exposure at the laser radiation.



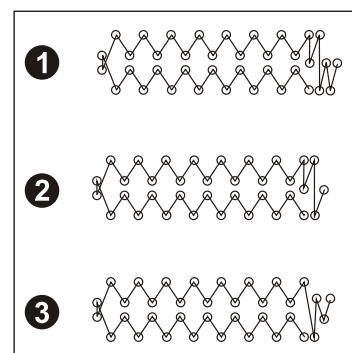
A - INTRODUCTION

6. SPECIAL ACCESSORIES

- machine device, which is not included in the standard equipment of the machine and a customer can order it

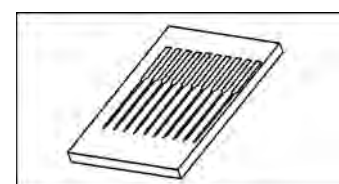
Sewing cam

- it is possible to sew a different buttonhole shape **1**, **3** than standard buttonhole **2** is
- a customer can order it
 - **1** part number 24.3079.0.000
 - **3** part number 24.3080.0.000
- to change a cam - see section E20



Needles 750 SC 80/12, 70/10

- the manufacturer recommends to use these needles when sewing the thin materials
- part number 02.0750.2.100 (80/12), 02.0750.2.109 (70/10)

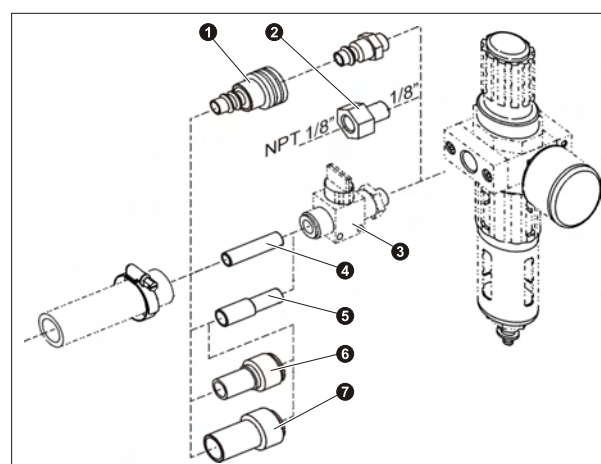


Connector Ø 8 **1**

- order it if the connecting tube has the inner diameter 8 mm. The connector Ø 10 is supplied with the machine.
- part number is 12.0008.3.607

Pneumatic Adapter **2**

- order it if using 1/8" NPT
- part number 12.0008.3.081



Hand valve **3**

- to dissipate any air from the machine, order it (air circuit is bled). It is necessary to order the connectors (see below) to the hand valve for connection to the air tubes.
- part number 12.0008.3.463

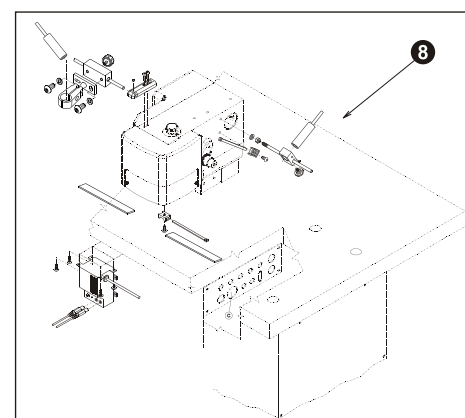
Connectors

- 4** 12.0008.3.464 Ø 8
for connection to the tube with inner Ø 8 mm
- 5** 12.0008.3.466 Ø 10
for connection to the tube with inner Ø 10 mm
- 6** 12.0008.3.467 Ø 12
for connection to the tube with inner Ø 12 mm*
- 7** 12.0008.3.465 Ø 16
for connection to the tube with inner Ø 16 mm*

- * To connect the tube with inner Ø 12 and Ø 16, it is also necessary to order Ø 10

Laser light kit

8 03.5519.0.022

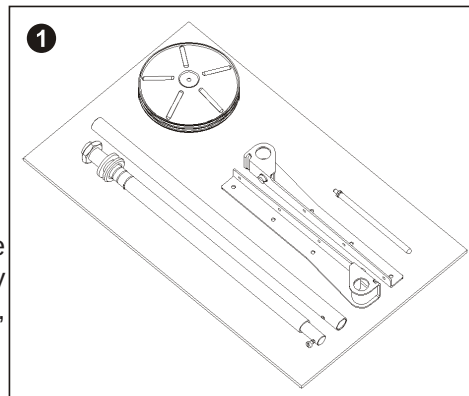


B - MACHINE ASSEMBLY

1. CONTENT OF THE SHIPPING BOX

1. The shipment contains one box.
2. There is a carton with accessories, service manual with parts section and thread stand **1** in the box.
3. During unpacking the shipment, follow the labels which are on a cover.

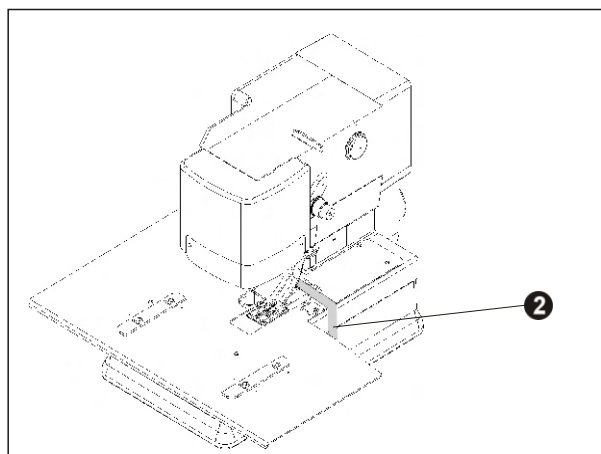
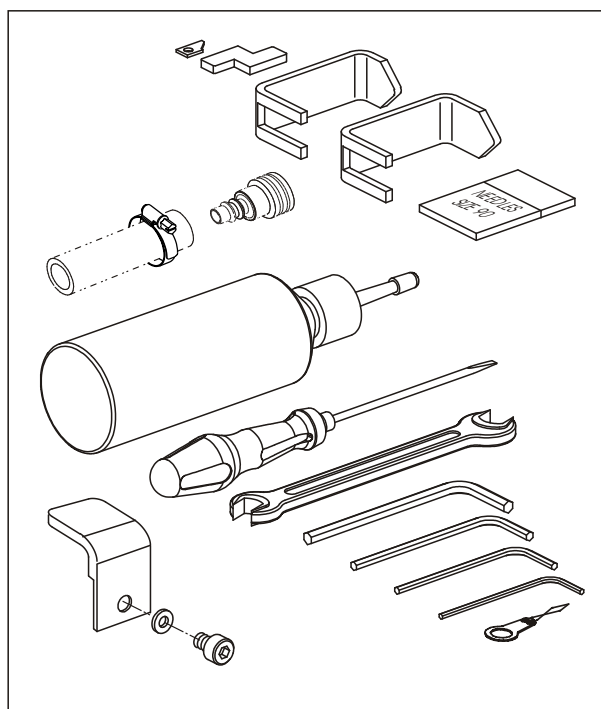
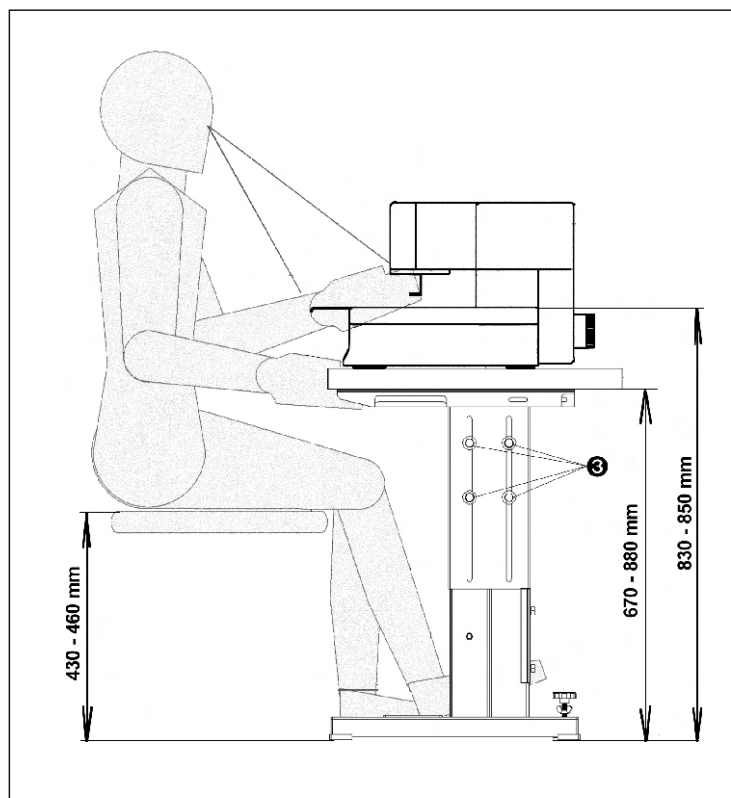
CAUTION: If the machine or crate was damaged in shipment inform the freight company immediately. Check the contents of the crate immediately and report any damage or missing items to the manufacturer immediately, late reports will not be considered.



2. ACCESSORIES

A package of accessories is supplied with this machine, please refer to page **3-63** for detailed descriptions.

The height of the working area is standardly set in range 830 - 850 mm from the manufacturer. When using this height of the working area, recommended height of the operator seat is in range 430 - 460 mm. The height of the table can be set in range 670 - 880 mm by screws **3**. Remove the shipping strap **2** after unpacking the machine, the use of this strap is recommended anytime the machine is transported.

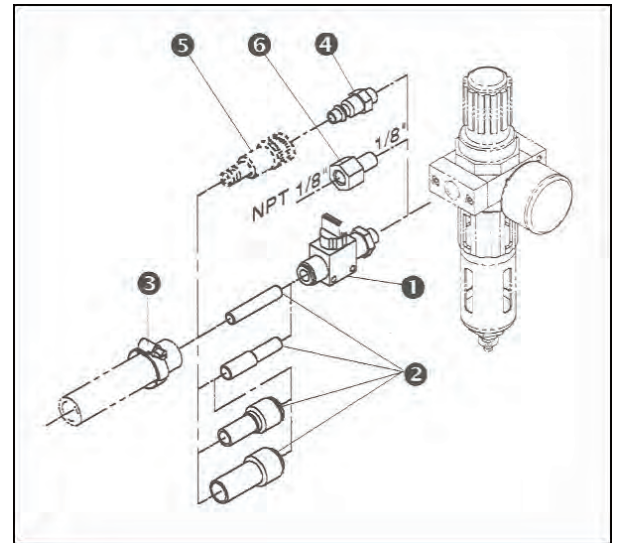


B - MACHINE ASSEMBLY

3. POWER AND AIR CONNECTION

1. The machine is equipped with a quick coupler **4** required with connector for inner Ø of the tube 10. The connector for inner Ø of the tube 8 is not supplied with the machine, a customer has to order it. The manufacturer recommends to use connector **6** for who requires to connect the tube with connector NPT. If a customer needs to use a shut off valve **1**, which allows fast releasing of the air from the circuit, he must order it.

A variety of connectors **2** can be used separately or in combination to adapt to the available input supply hose. It depends on type of the tube which is used by a customer. These connectors are not included in the accessories. A tubing clamp **5** is provided.



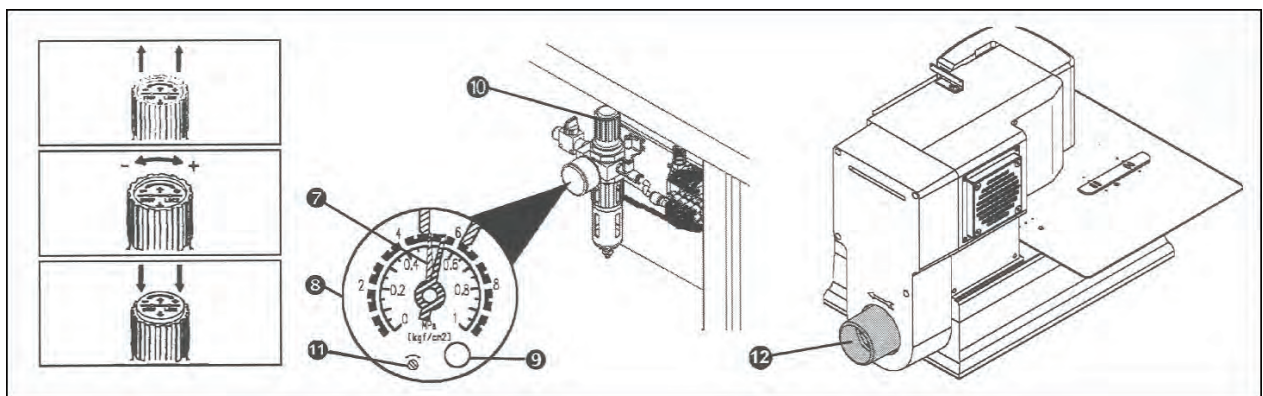
NOTE:

Parts **1**, **2**, **5**, **6** are included in Extra Parts - see 3-63.

2. After air connection check the set air pressure on the dial of the regulator. It should be in range 0.5 - 0.6 MPa. The green pointer **7** indicates the lowest working air pressure 0.5 MPa, which is set from the manufacturer on the regulator **8**. If the air pressure is lower than 0.5 Mpa after connecting the machine to the power supply „Low Pressure“ message appears on the control panel display. To adjust the working pressure, loosen the regulator cap lock **10** and turn the regulator cap clockwise to increase the pressure. Push the regulator cap **10** down.

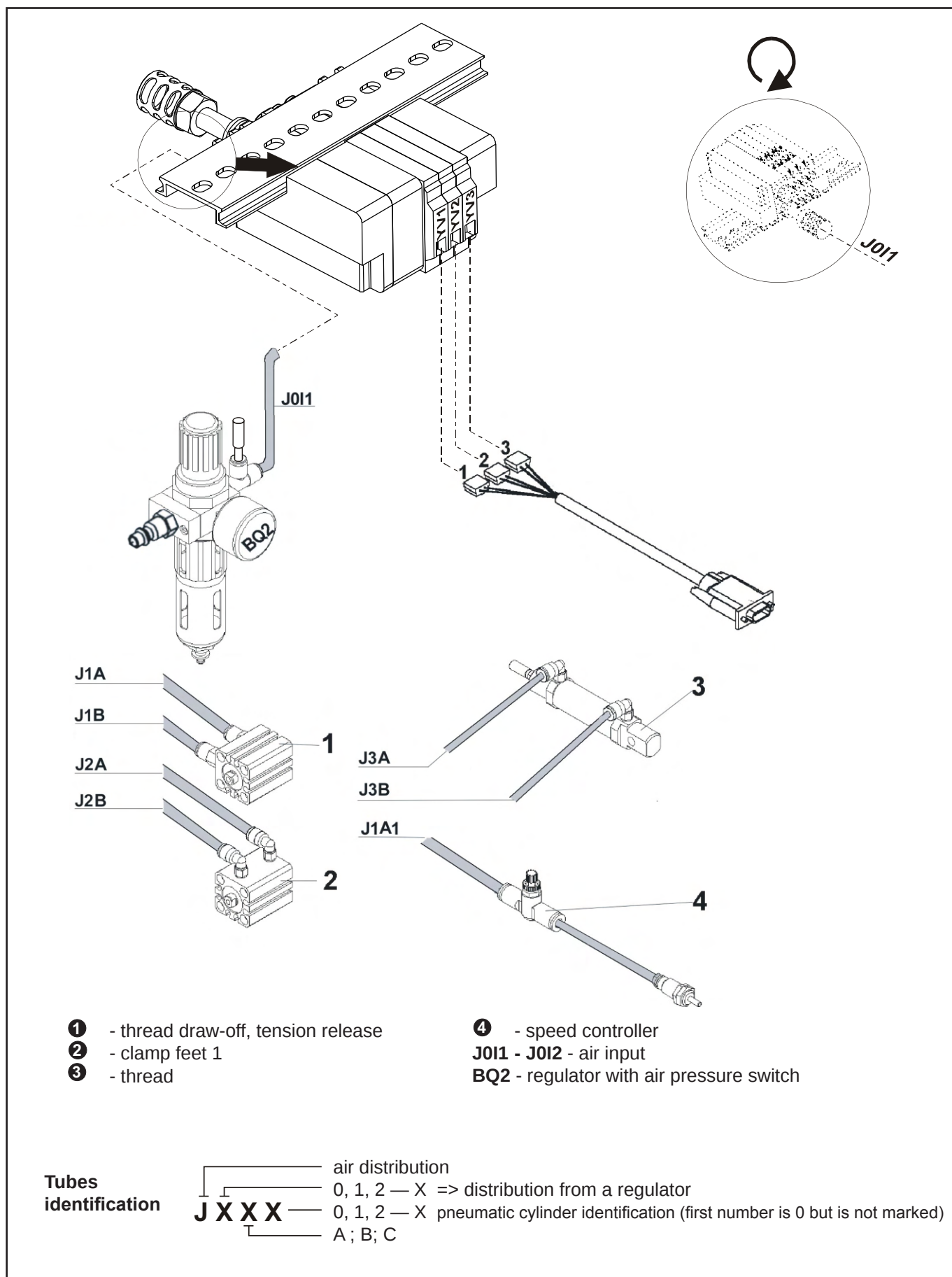
3. Power supply must be 208 to 230 volts 1 phase, 50 or 60 hertz. Receptacle plug must meet requirements of IEC standard 364-4-41, its circuit breaker must be minimal 10A with characteristic C according to the EN 60947-2 (or 16A with characteristic B). No other devices must not be connected to the circuit breaker of the socket. The hand wheel **12** must turn counter clockwise.

The machine is equipped with a filters which contain capacitors which generate an high frequency leakage current. In order to prevent nuisance tripping, residual current protection device must be protected against these high frequency currents: this is the case for industrial residual current device (example „S“ type).



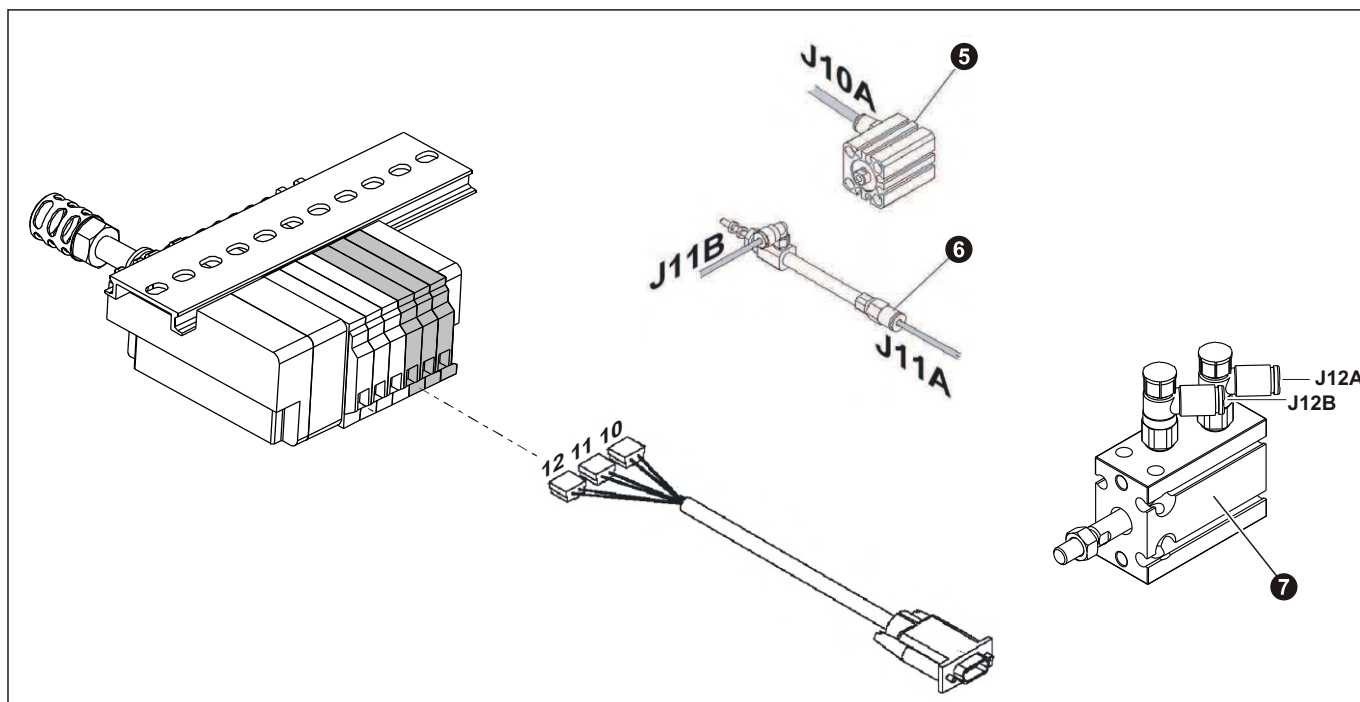
B - MACHINE ASSEMBLY

4. Head Pneumatic



B - MACHINE ASSEMBLY

5. Indexer Pneumatic



- ⑤ - clamp feet (Extra part)
- ⑥ - thread pick-up
- ⑦ - angle indexer clamp-feet swiveling

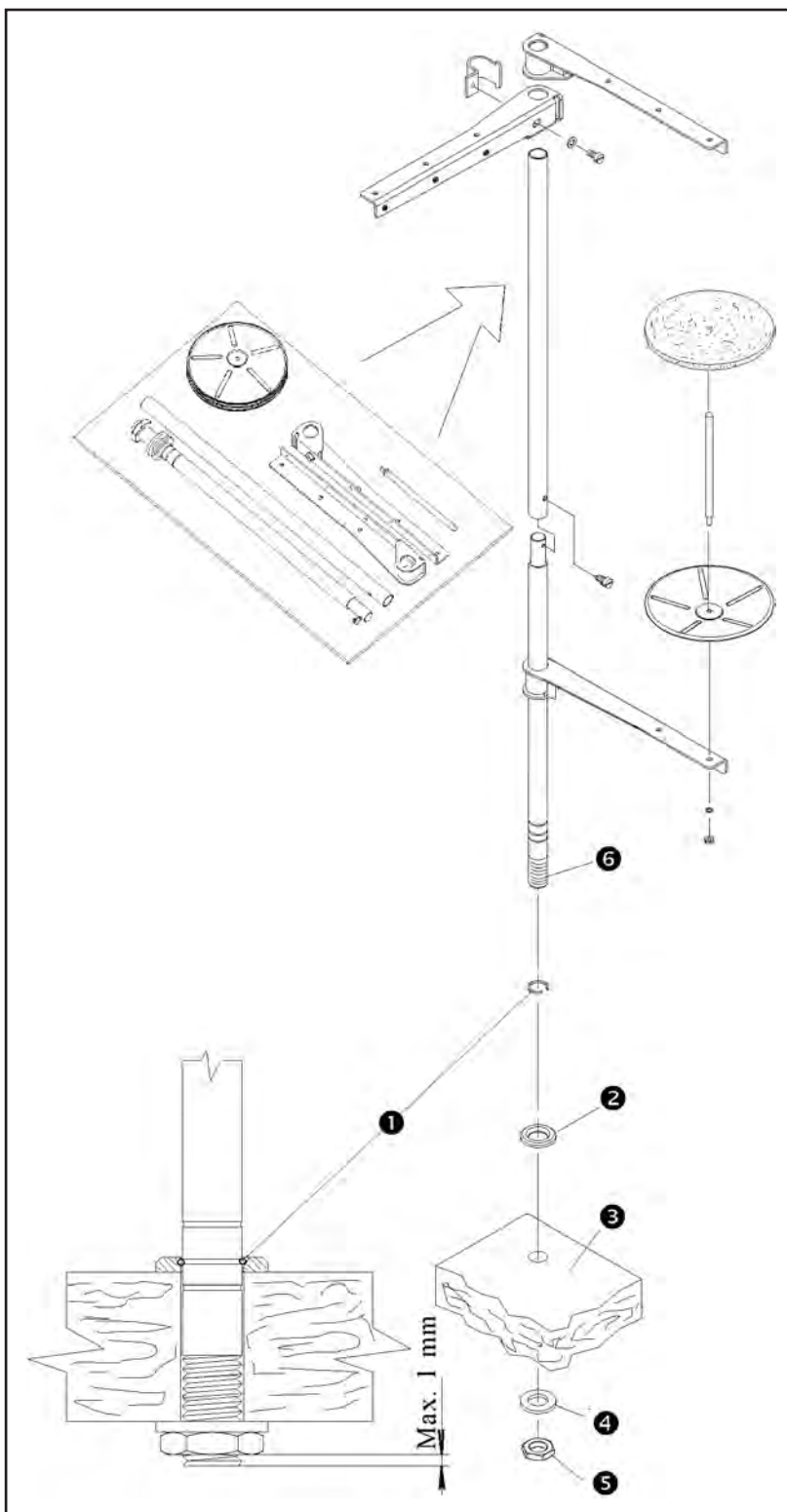
B - MACHINE ASSEMBLY

4. THREAD STAND INSTALLATION

1. Put the thread stand together according to the drawing.

2. Position of the locking ring **1** allows assembly of the thread stand for various thickness of the table top. Threaded end of the post $\hat{D}$ must not extend more than 1 mm (1/32) through the locking nut $\hat{I}$.

3. Insert the washer **2** and the post into the hole provided in the right rear of the table top **3**. Insert the washer **4** and tighten the nut **5**.



C - PROPER APPLICATION

1. POWER UP / HOME POSITION

1.1. Turn the main power switch on **1** by turning clockwise to the **I** position.



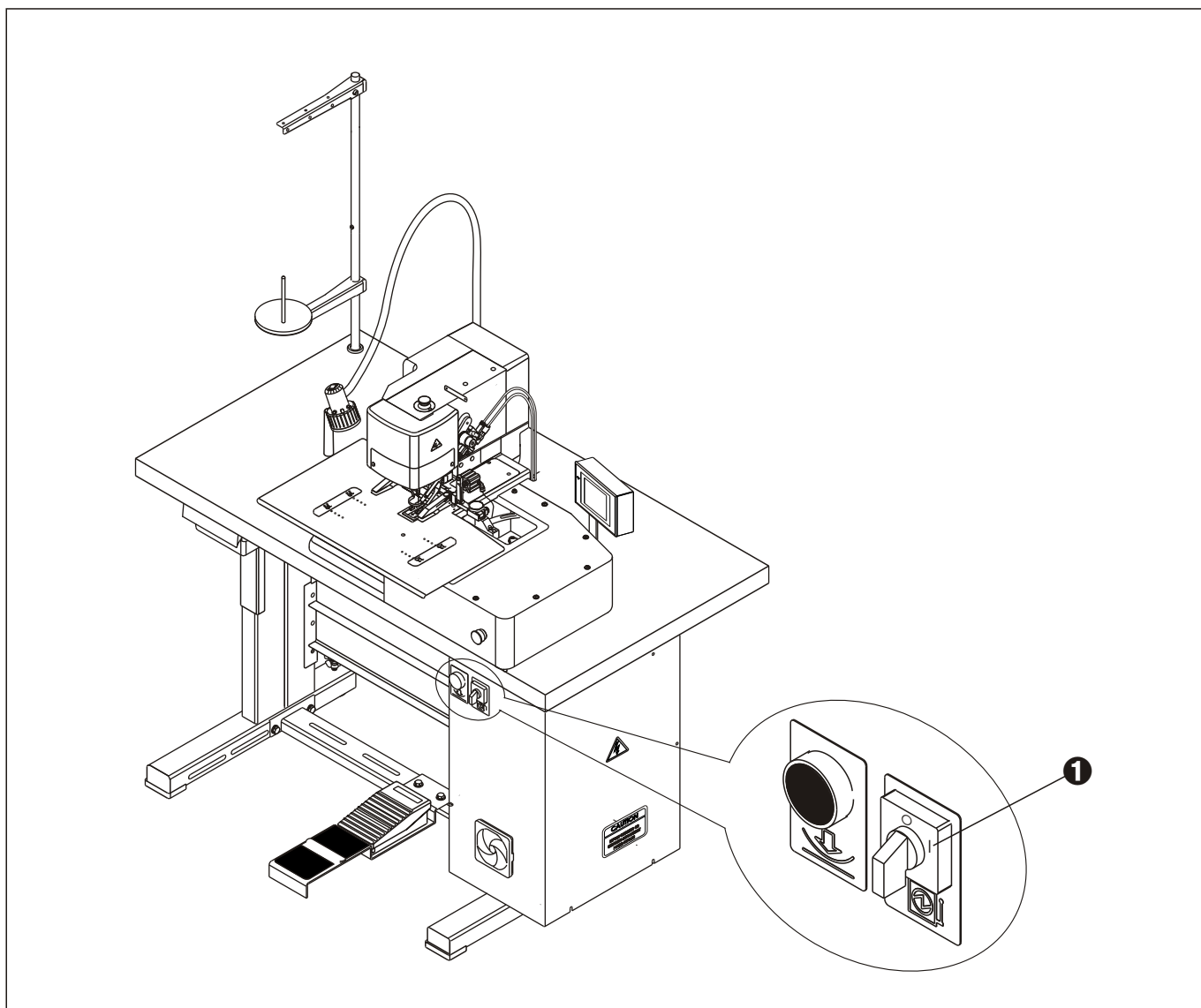
1.2. The machine is ready for operation when the control panel display lights, the Ready message appears on the display and the green LED lights

Ready	index	on
4x15mm	← A	1239

.

1.3. The machine must be in the home position before starting to sew (to be certain, press the foot treadle and sew one dummy buttonhole).

1.4. The power voltage control (Voltage monitoring relay HRN 35) is installed in the machine control system. This power voltage control cautions a machine operator if the supply voltage is not in the required range (185V - 255V) and the machine could be damaged - see section **E19**.



C - PROPER APPLICATION

2. NEEDLE INSTALLATION

WARNING! Before performing this adjustment, switch the main machine power off to prevent accidental starting of the machine. Disconnect the air supply and dissipate any stored energy.

Use needles ordering number 02.0750.2.110 (750SC 90/14) only - see accessories.

It is also possible to use needles ordering number 02.0750.2.100 (750 SC 80/12), 02.0750.2.109 (750 SC 70/10) for sewing the thin materials - these needles are not included in the standard machine equipment.

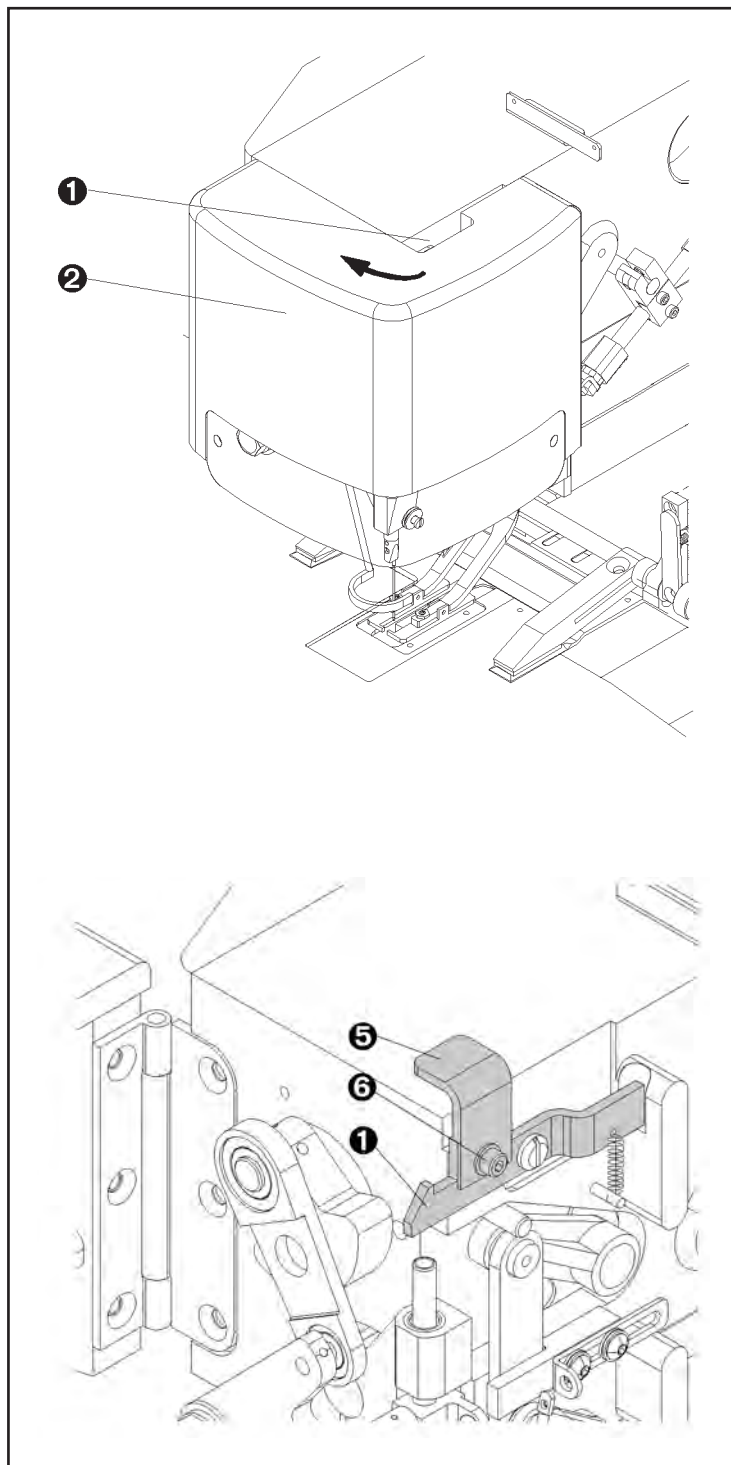
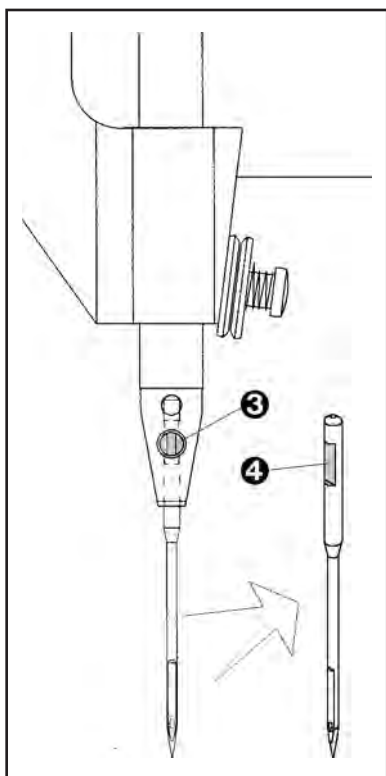
1. Using the screwdriver push the latch **1** and open the needle bar cover **2**.

Note: The accessories contain the lever **5** (ordering number 22.0213.0.000) and screw (ordering number 08.6000.4.005) with washer (08.6850.4.000) **6**, which is possible to fit to the latch. It allows opening of the cover without using the tool.

2. Loosen the screw **3** and remove the needle.

3. Insert the new needle so that the long thread groove **4** is in the rear and the spot for the clamping screw **3** is in line. Do not install a bent or broken needle. Roll the needle on a flat surface to check for straightness.

4. Tighten the screw **3** well.

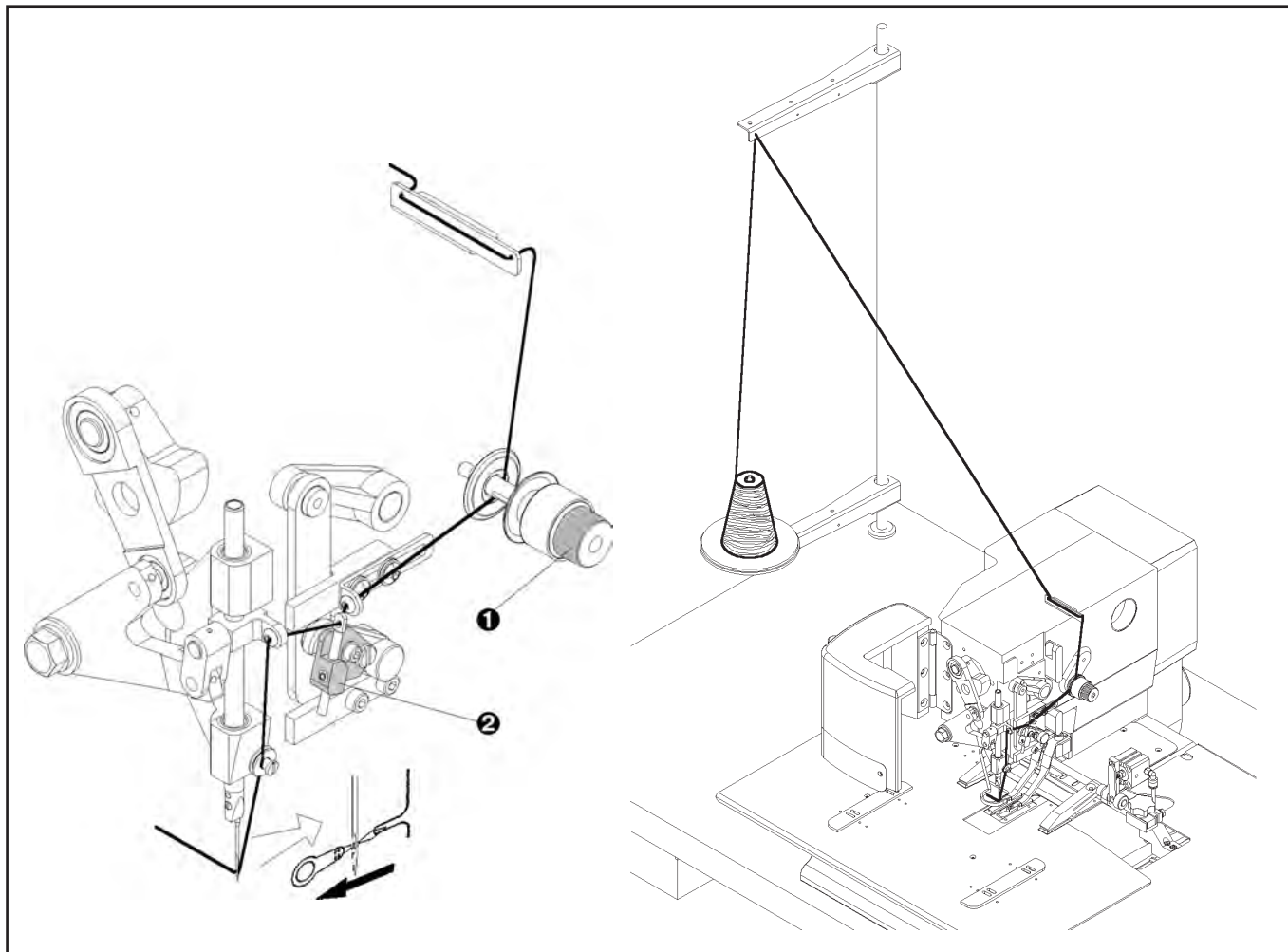


C - PROPER APPLICATION

3. THREADING

WARNING! Switch the main machine power off to prevent accidental starting of the machine. Disconnect the air supply and dissipate any stored energy.

When threading, see the pictures below. Change the thread tension by nut **1** according to the sewing conditions. To increase the thread draw off (for example sewing on the thin fabrics) there is an arm **2** installed on the thread draw off lever.



The appearance and quality of the buttonhole may be affected by one or more of the following:

- clamping of the material
- bartack quality
- thread tension
- type of thread (size, etc.)
- sewing width
- sewn material (thickness, density)

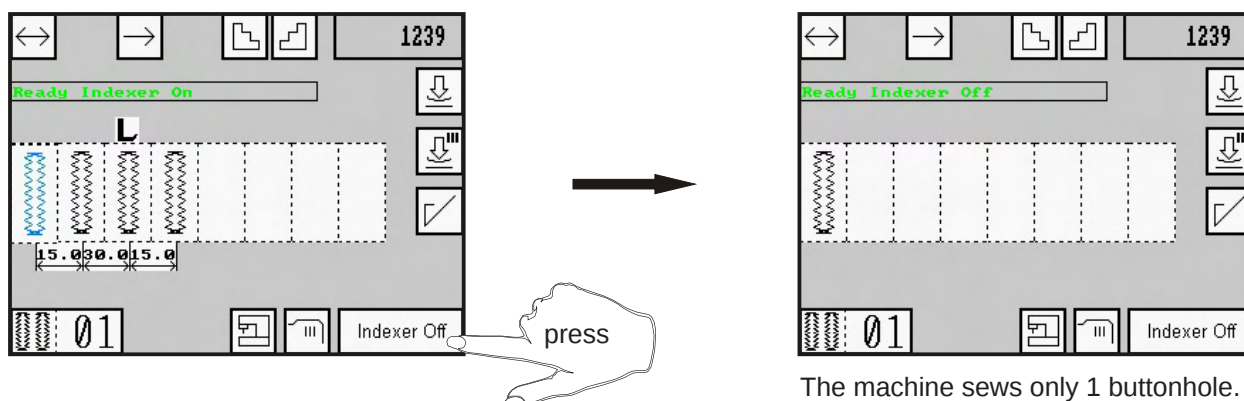
D - MACHINE CONTROLS

1. PROGRESS FOR SEWING A BUTTONHOLE

1.1. Bring the machine to the home position according to the section C1.

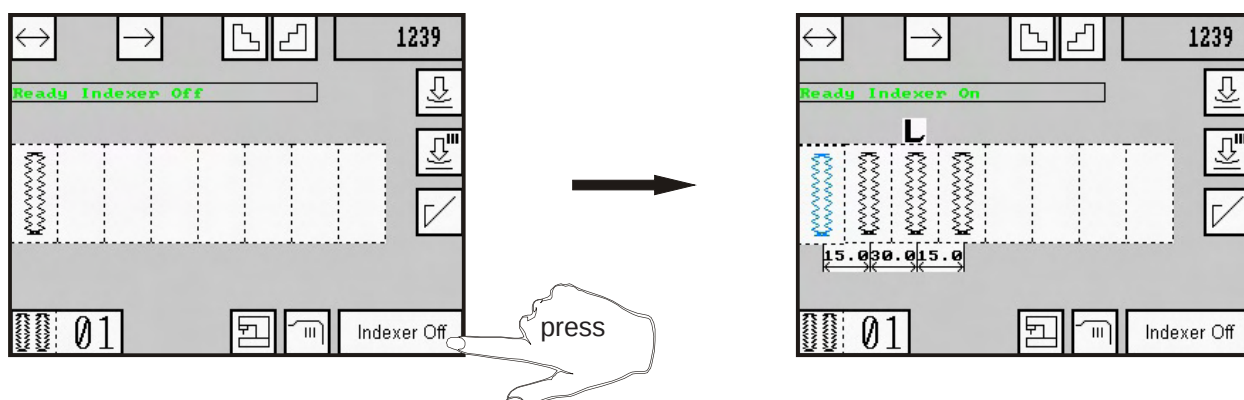
a) sewing without indexer

Check, if the message **Ready indexer Off** appears on the display. If not, follow steps below:



b) sewing with indexer

Check, if the message **Ready indexer On** appears on the display. If not, follow steps below:



After this setting, the machine will sew with the indexer according to the parameters set in the program.

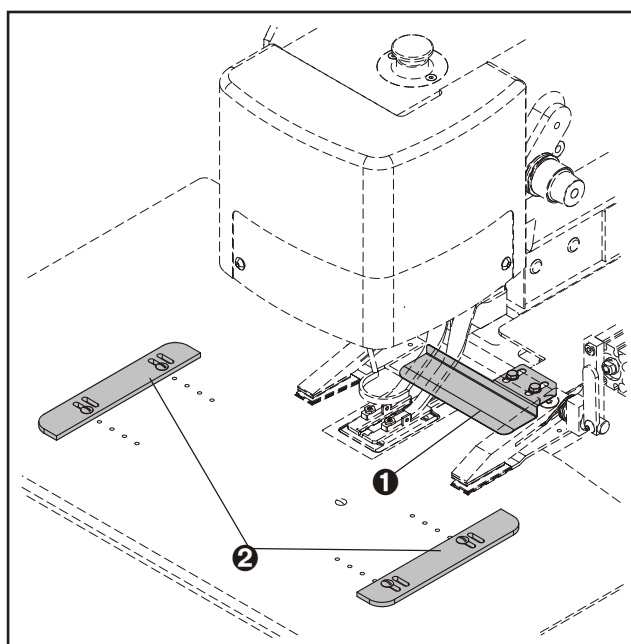
1.2. Be certain that the machine is threaded correctly according to the section C3 and insert the sewn work under the clamp feet. To place a buttonhole, use the adjustable front stop ① and side gages ②.

Note: There are no side stoppers ② on machines with positioning laser lights.

1.3. When the foot pedal ③ is pressed to the first position, the sewn work is clamped by the head clamp feet.

(Releasing the foot treadle will raise the clamp feet).

Note: It is possible to set the control so that both the clamping and the sew start are simultaneous, consult the programming section for this information.



D - MACHINE CONTROLS

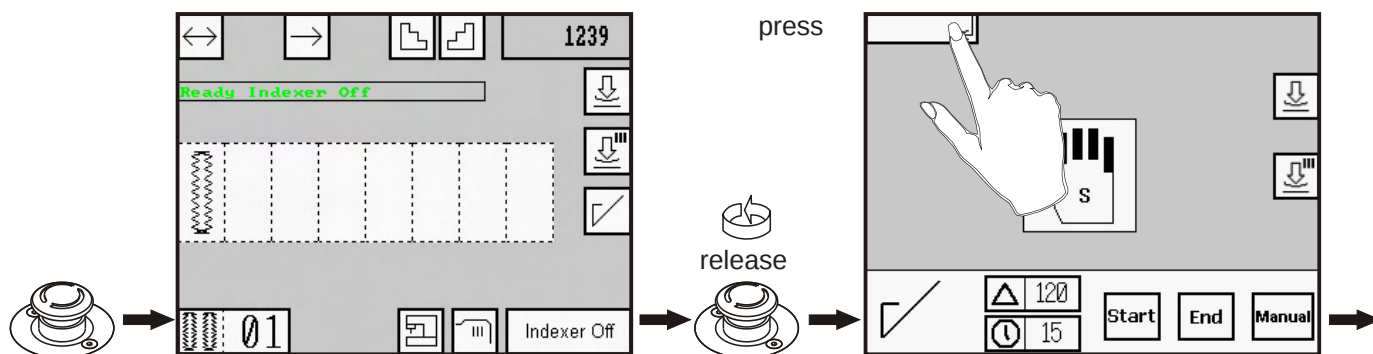
1.4. When the foot pedal is pressed to its second position, the sewing is started with or without indexer, it depends on set program - see 1a, b. When the buttonhole is sewn and the thread is trimmed, the machine goes to the home position and clamp feet raise.

1.5. When the clamp feet are up, it is possible to move the sewn work for sewing the second buttonhole - but only for sewing without indexer.

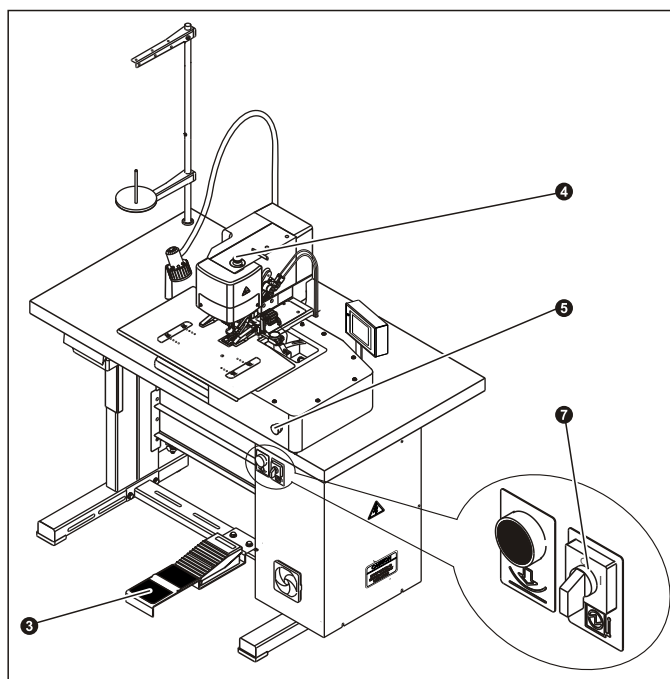
The machine automatically sews the buttonholes according to the set program - *sewing with indexer*.

1.6. a) sewing without indexer

Machine can be stopped in any place of the cycle by pressing the Emergency Stop button ④.



and pressing the foot pedal, the machine finishes the buttonhole.



D - MACHINE CONTROLS

b) sewing with indexer

If it is necessary to interrupt the cycle during the sewing with indexer (example: needle breakage, thread breakage):

b1) press the Cycle Interruption button **5**  on the indexer. The machine stops in the home position after buttonhole is finished.

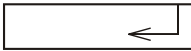
b2) Indexer clamp feet stay down. By the  and  buttons you can shift indexer clamp feet to the desired position and finish sewing by pressing the foot pedal **3** with simultaneous holding the button **5**.

b3) If you need to take out the fabric, you can do it by pressing the foot pedal **3** to the first position and rejecting then. You can hold the fabric by pressing the foot pedal **3** again and next sequence is the same as in point b2.

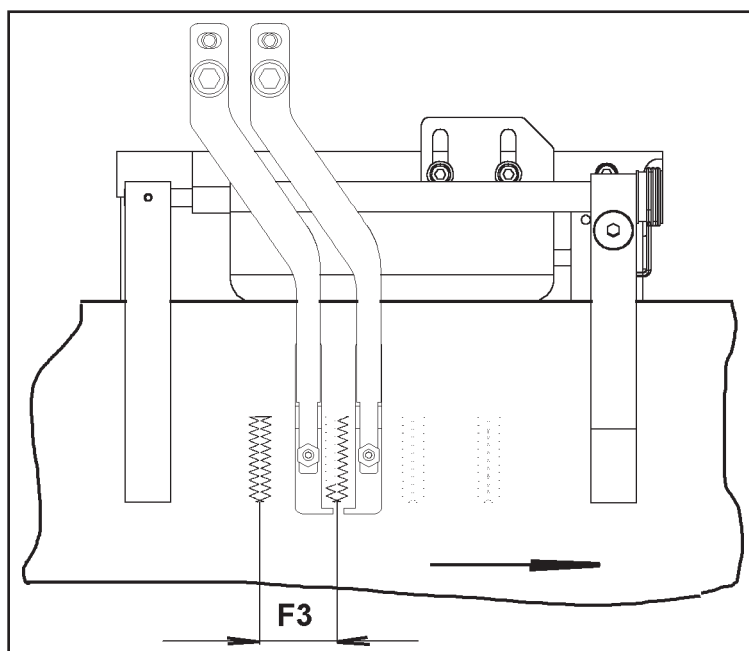
- if it is necessary to interrupt the cycle because of the operator safety:

b4) press Emergency Stop Button **4** .

b5) the machine stops immediately, the indexer clamp feet raise up and move to the home position - see b2.

b6) release the button , press  button and sew one dummy buttonhole, to bring the needle bar to the home position.

1.7. When the work is done, switch the machine off by the main switch **7**  by turning center clockwise to the 0 position, then stop the air supply by closing valve which is behind the regulator.



D - MACHINE CONTROLS

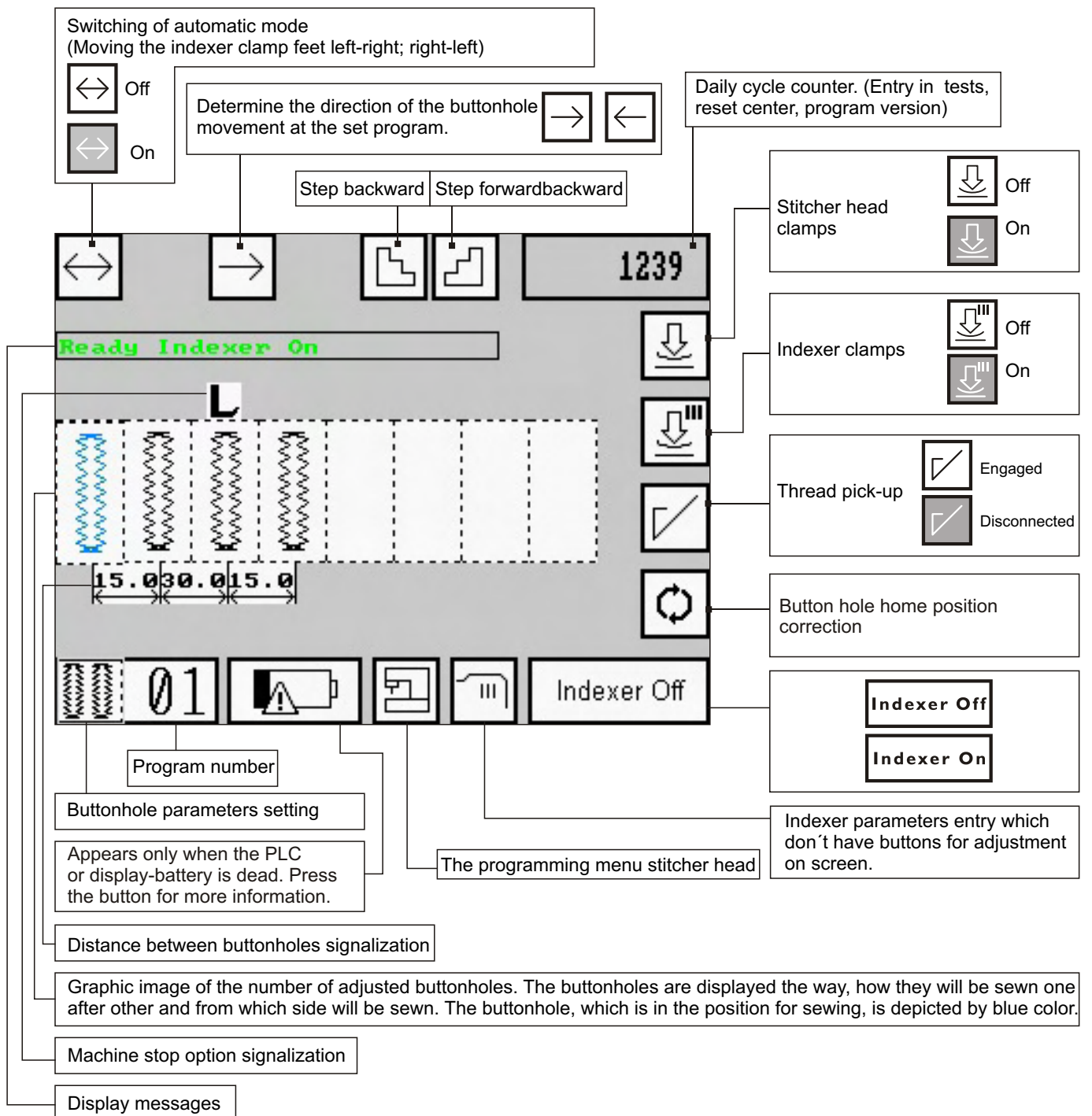
2. OPERATOR CONTROL PANEL PUSH BUTTONS AND SWITCHES



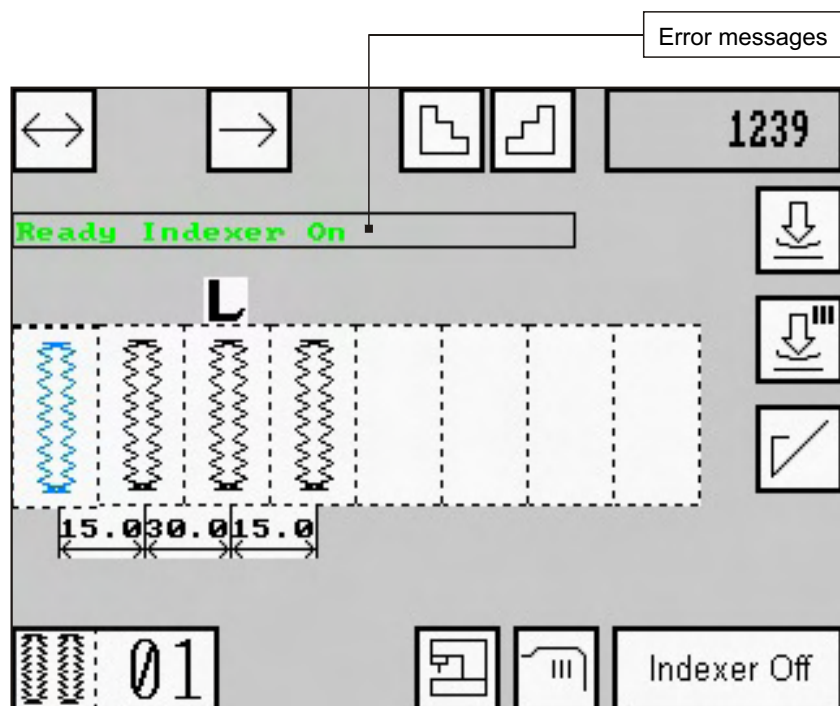
Emergency Stop Button



Cycle Interrupt Button



D - MACHINE CONTROLS



Ready indexer On

Ready indexer Off

Emergency stop

Wait please

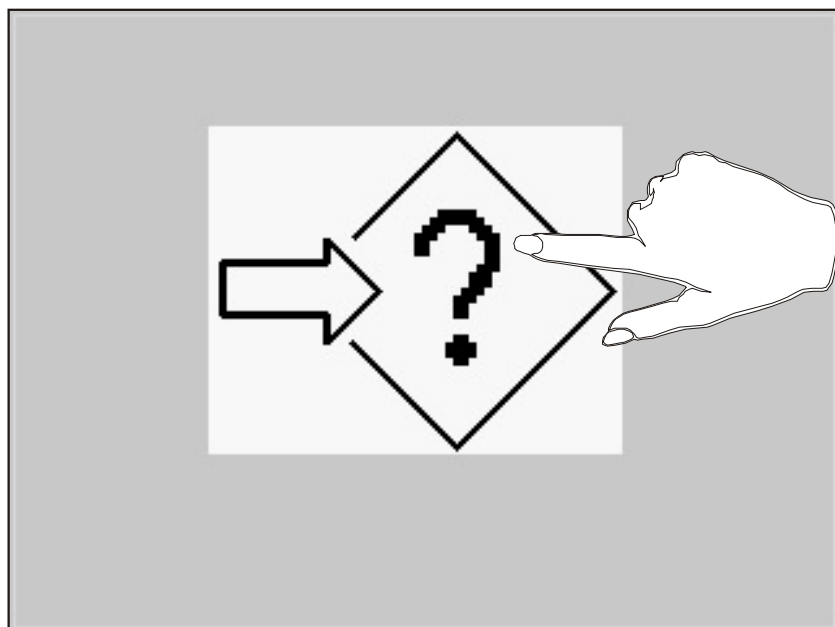
Busy

Motor not ready

Low air pressure

Home position time out

Error setting



It will display if the value of the parameter is adjusted out of range.

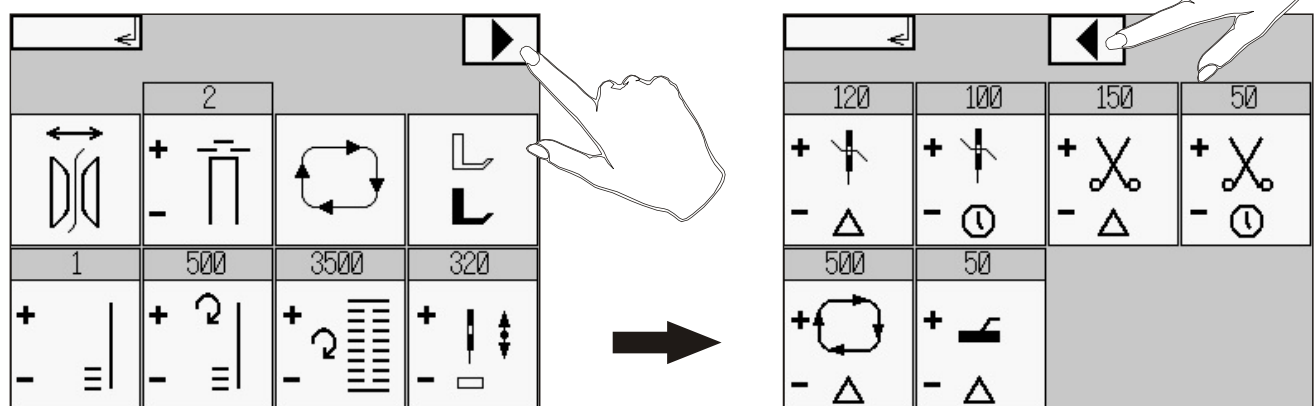
Press the screen on the display, you will return on the main screen.

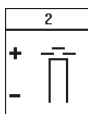
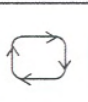
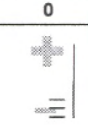
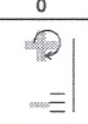
Press button  you will get to the main screen.

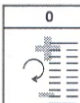
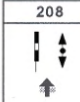
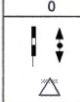
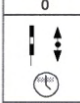
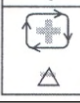
D - MACHINE CONTROLS

3. THE PROGRAMING MENU STITCHING HEAD

Enter the sewing head program menu by pressing button .



A  Off  On	Turning the second thread tensioner in bar on / off.
B 	Setting the number of bar stitches sewn with slow speed (in the range of 0 - 6 stitches).
	Setting the machine cycling. (On/Off). If the button lights, function is active.
	Setting the foot pedal position. (Possible setting 1step/2steps). Adjustment for position 1 means, that the machine closes clamps and starts sewing in one moment.
	Selecting the number of stitches in slow start. (Range 0 - 3 rpm)
	Setting the slow start speed at the sewing cycle. (Range 500 - 1000 rpm)

	Maximal speed. (Range 1000 - 3840 ppm)
	Correction of the needle bar upper position. (Range 0 - 600 imp)
	Draw-off delay. (Range 60 - 150 ms)
	Timing of the knife/draw-off activation. (Range 30 - 200 ms)
	Setting the trim delay. (Range 0 - 200 ms)
	Setting the trim timing activation. (Range 30 - 60 ms)
	Setting the delay between the sewing cycles. (Range 500 - 2500 ms)
	Clamp feet opening delay adjustment, in the end of cycle. (Range 0 - 100 ms)
To return to the main screen, press  key.	

D - MACHINE CONTROLS

4. THE PROGRAMMING MENU INDEXER

Automatic mode
(Moving the indexer clamp feet left - right; right - left)

☐ Off
☒ On

Determine the direction of the buttonhole movement at the set program.

☐ →
☐ ←

Ready Indexer On

15.0 30.0 15.0

01

Indexer Off

Indexer Off

Indexer On

Activation of the thread catcher in the beginning of sewing.

☐ Off
☒ On

Activation of the thread catcher at the end of automatic sewing cycle.

Activation of the thread catcher at end of sewing.

Start Endcycl End

120 15 40 150

Start Start End End

+ + + +

- Δ - Δ - Δ - Δ

Setting the delay of thread catcher activation at the beginning of sewing (in the range of 0 - 200 ms).

Setting the thread catcher activation time at the beginning of sewing (in the range of 0 - 30 ms).

Setting the thread catcher activation time at the end of sewing (in the range of 0 - 40 ms).

Setting the thread catcher activation time at the end of sewing (in the range of 150 - 250 ms).

Setting the indexer angle must match the mechanical indexer angle setting.

Activation of the indexer angle sewing.

Setting the indexer clamp-feet shift delay (in the range of 50 - 990 ms).

Setting the delay of clamp-feet releasing after end of the sewing cycle (in the range of 100 - 500 ms).

Correction of the indexer stepper motor home position (± 3 mm).

Correction of the distance between 1st and 2nd buttonhole while sewing -> direction

Enabling correction of the distance between 1st and 2nd buttonhole. Indicated by a blue line between 1st and 2nd buttonhole on the main screen.

Setting the speed of indexer clamp-feet motion (in the range of 0 - 600 rpm).

Angle

6 10 + X

15 20 -

300 200 600

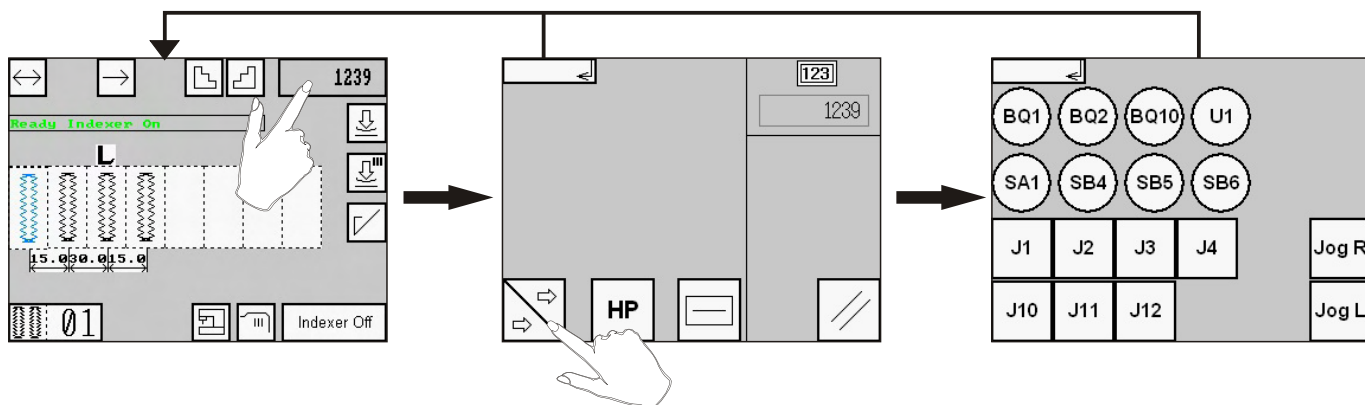
0.00 1.50

L = R

D - MACHINE CONTROLS

5. TESTS

Warning! Tests can be performed only by skilled service technicians.

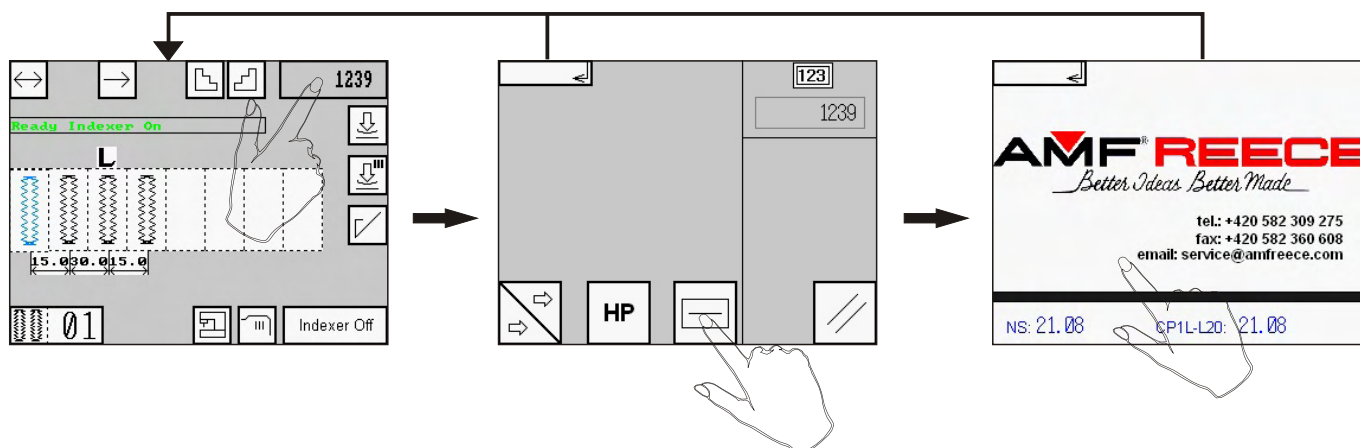


- (BQ1)** The end position sensor BQ1. Activate the sensor using a metal tool - icon starts lighting.
- (BQ2)** If the air pressure is less than 0,5 MPa the button is underlighted.
- (BQ10)** Stepper motor home position sensor BQ10. Activate the sensor using a metal tool - icon starts lighting.
- (SA1)** After pressing button key EMERGENCY STOP  the icon lights.
- (U1)** If the servodriver is in operation the icon lights.
- (SB6)** Cycle interruption button SB6. While pressing the button icon lights.

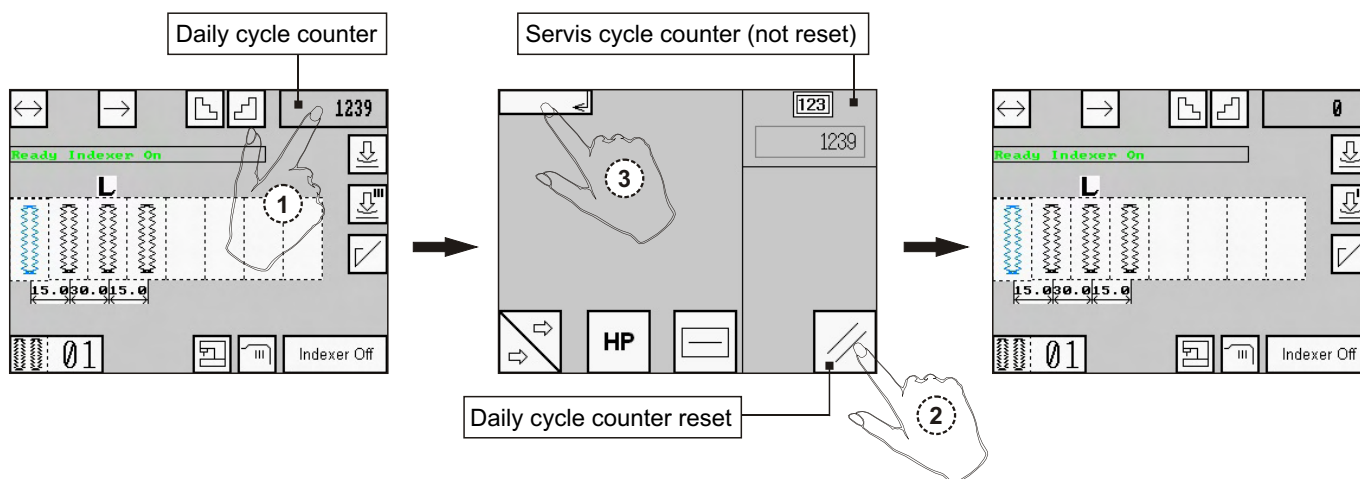
- | | | |
|-------------|--|------------|
| J1 | Press button key to activate the draw-off. The valve J1 is tested by this parameter. | J1 |
| J2 | When the button key is pressed, the clamp feet are closed. The valve J2 is tested by this parameter. | J2 |
| J3 | Press button key to activate the thread trimming. The valve J3 is tested by this parameter. | J3 |
| J4 | Press button key to activate the second thread tension. The valve J4 is tested by this parameter. | J4 |
| J10 | Press button key to close the indexer clamp feet. The valve J10 is tested by this parameter. | J10 |
| J11 | Press button key to activate the thread pick. The valve J11 is tested by this parameter. | J11 |
| J12 | Press button key to activate the indexer feet. The valve J12 is tested by this parameter. | J12 |
| JogR | Press this button to shift indexer by 10 mm right. | |
| JogL | Press this button to shift indexer by 10 mm left. | |

D - MACHINE CONTROLS

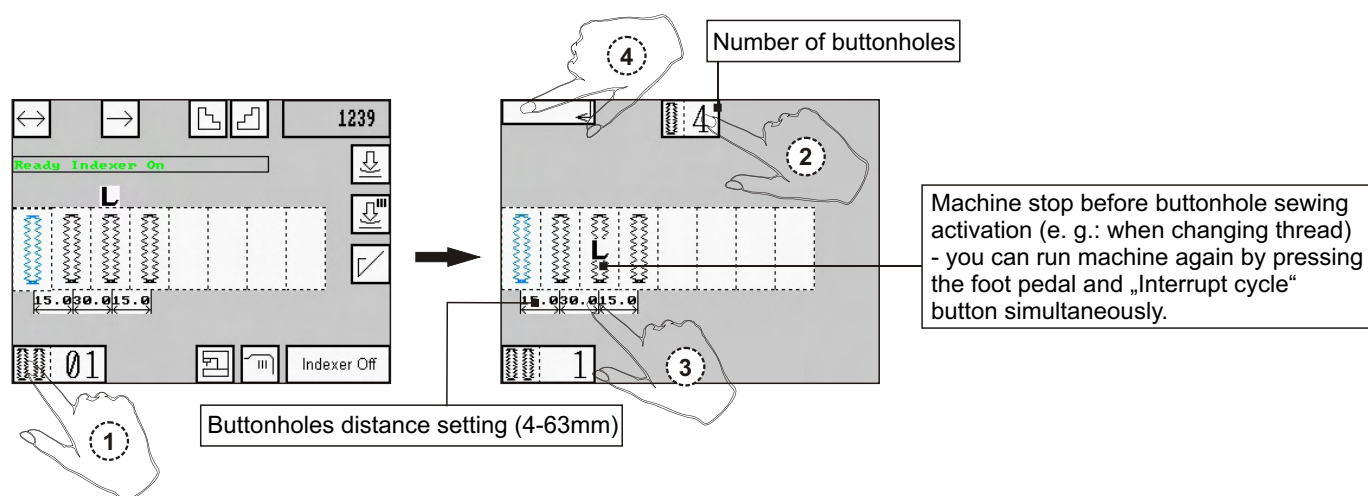
6. PROGRAM VERSION



7. COUNTER RESET



8. BUTTONHOLES PARAMETERS SETTING



D - MACHINE CONTROLS

9. FACTORY SETTING

- all the parameters are set according to table 1.

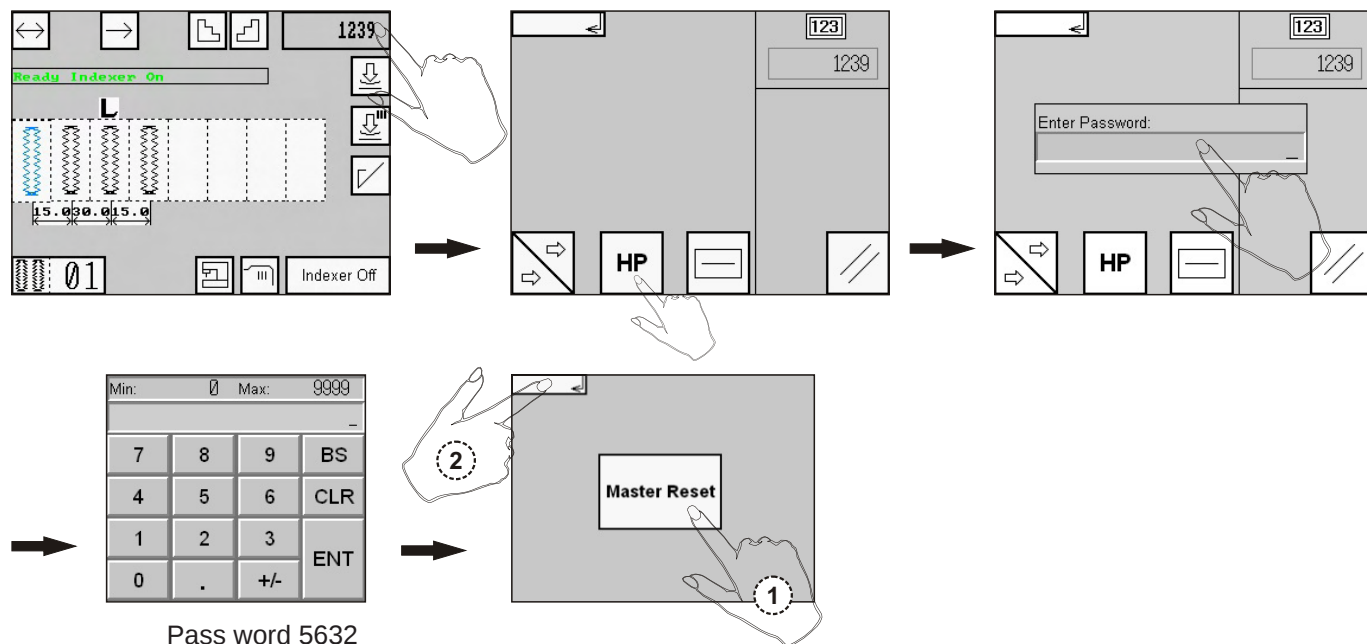


Table 1

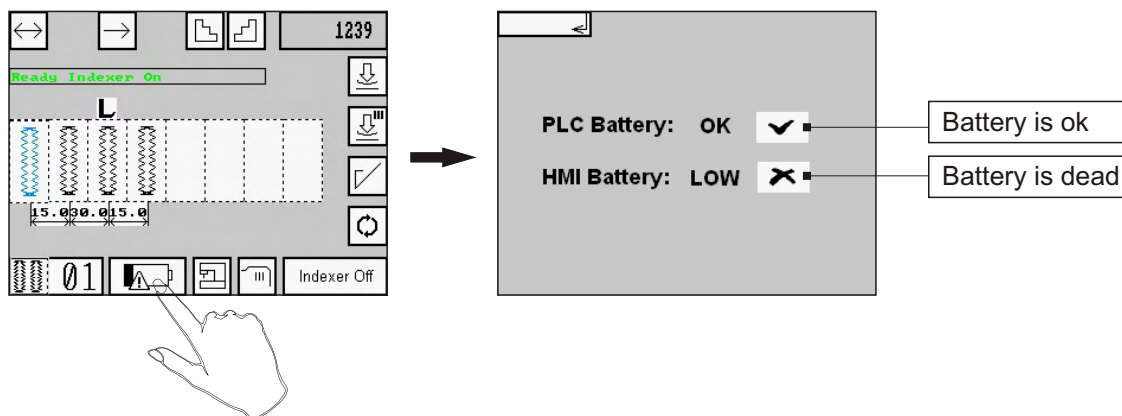
PARAMETER	RANGE	SETTING	PARAMETER	RANGE	SETTING
	Off On	Off	Indexer	Indexer Off Indexer On	Indexer On
	0 - 6	0		Off On	Off
	Off On	Off		1 - 8	4
	1 step 2 steps	2 poloha		4 - 63 mm	16
	0 - 3	0		Off On	Off
	500 - 1000 rpm	1000		Off On	Off
	1000 - 3840 rpm	3500		Off On	On
	0 - 600 ipm	320		Off On	On
	60 - 150 ms	120		0 - 200 ms	120
	30 - 200 ms	100		0 - 40 ms	15
	0 - 200 ms	150		0 - 100 ms	40
	30 - 60 ms	50		50 - 300 ms	200
	500 - 2500 ms	500		Off On	Off
	0 - 100 ms	50		6°, 10°, 15°, 20°	
				± 3 mm	0
				L=R Off L≠R On 0 - 2 mm	1
				200 - 990 ms	300
				100 - 500 ms	200
				0 - 600 rpm	600

D - MACHINE CONTROLS

10. DEAD BATTERY

If the PLC or display battery is dead, a flashing icon  appears on the main screen. By pressing the icon, one can find out which battery needs to be replaced.

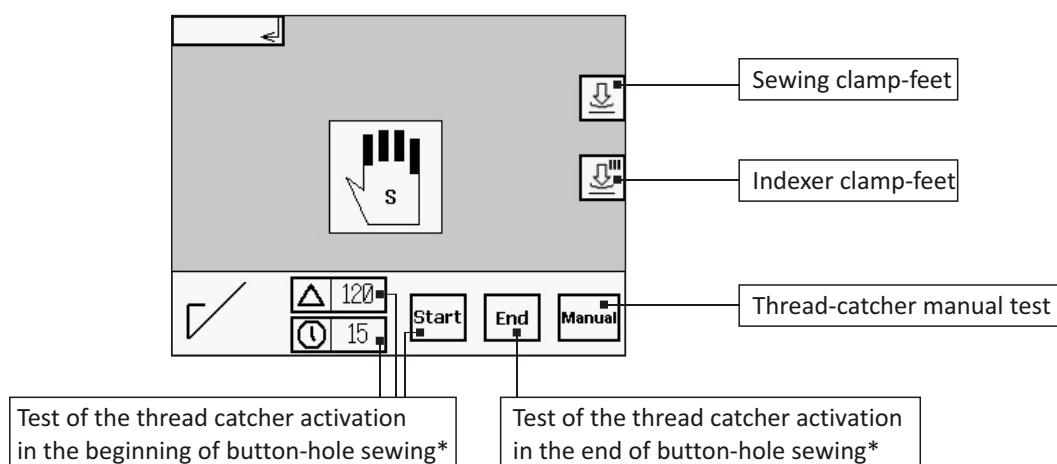
Warning! The battery shall be replaced in 4 days, all the data are lost afterwards!



11. SERVICE MODE

After pressing and releasing the emergency stop button  →  →  →  → the Service Screen appears.

The clamp feet and thread catcher can be tested with deactivated servomotor from this screen.



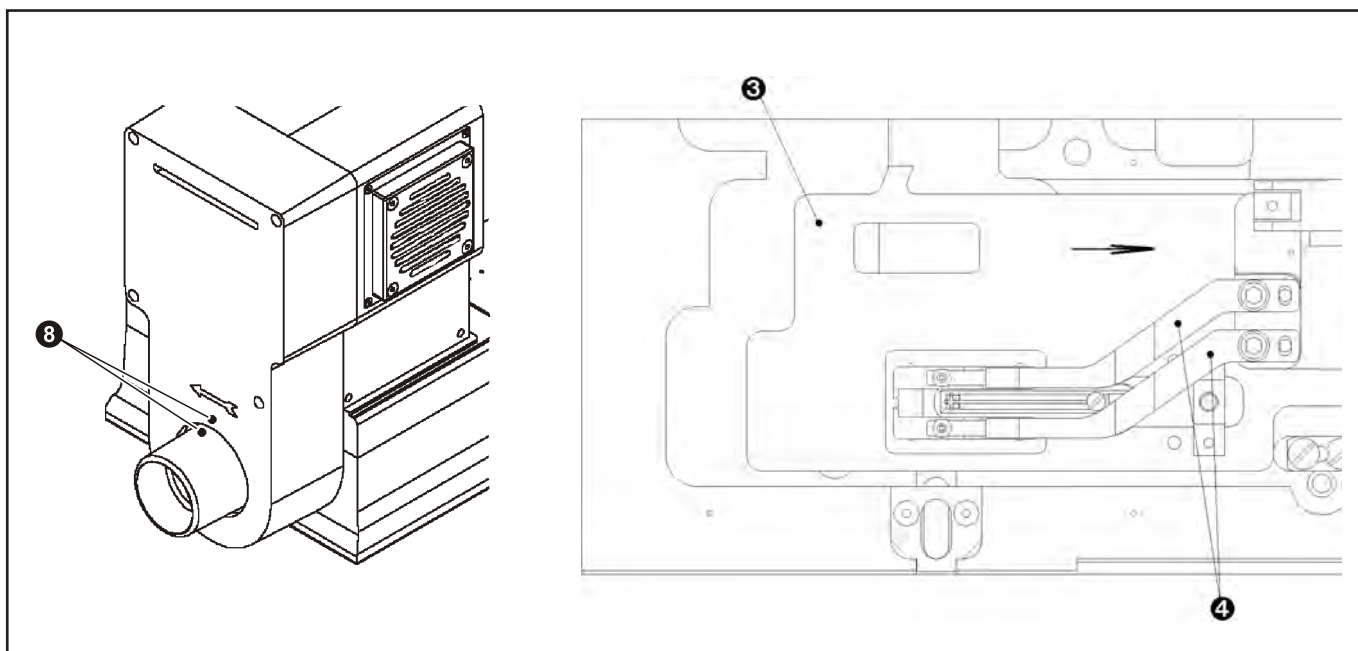
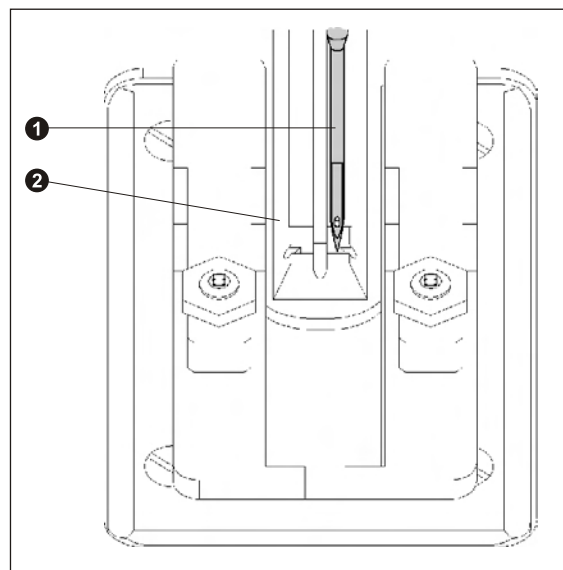
* The icons will not appear if this function is not activated in the indexer settings.

E - MACHINE ADJUSTMENTS

1. MACHINE HOME POSITION

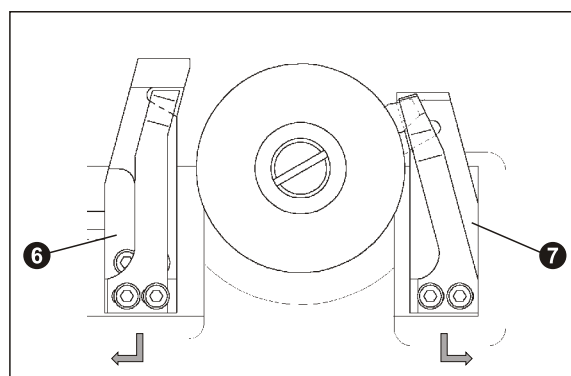
1. The needle bar is in the upper position. The needle **1** descends to the right side of the throat plate slot **2** during the first stitch. The marks **8** on the handwheel and cover casting are aligned.

2. The clamp plate **3** with clamp feet **4** is in the full forward position. The clamp plate moves to the rear during the first row of stitching.



2. MAIN CAM ADJUSTMENT

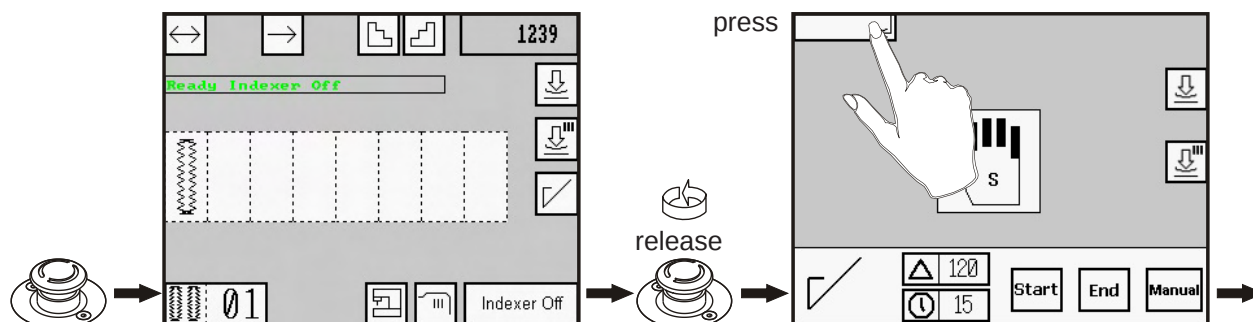
1. Tilt the machine on the rest pin and view the main cam assembly.
2. Initial setting is the following: Set the left shifter arm **6** maximum left and right shifter arm **7** maximum right.
3. Further setting shall be done according to **section E9**.



E - MACHINE ADJUSTMENTS

3. MACHINE ADJUSTMENT BASICS

1. Before making mechanical adjustment switch the machine to the *service mode* by pressing the button ⑦ Emergency Stop 

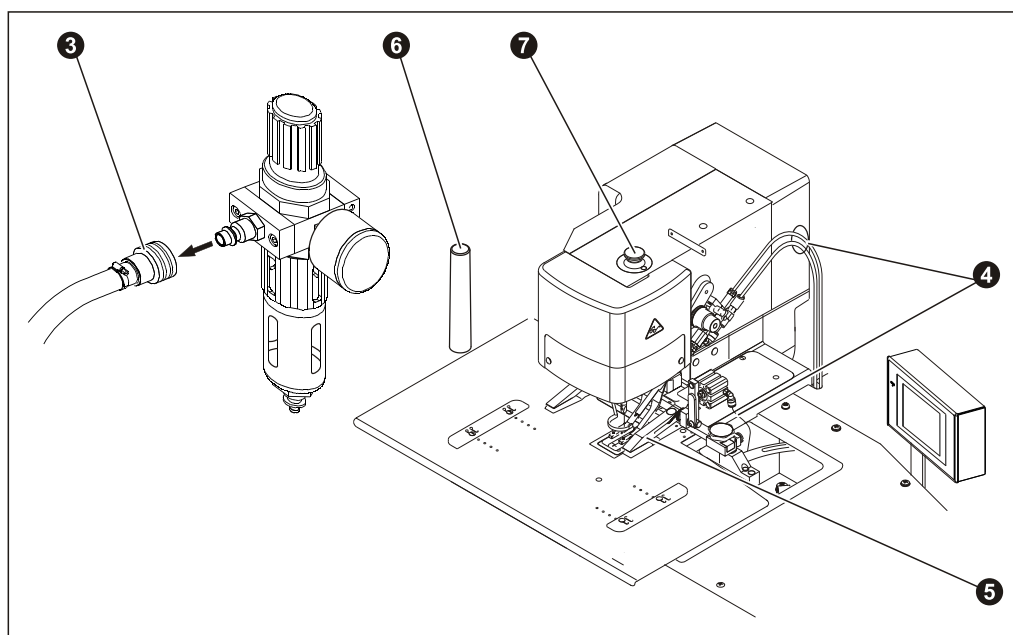


and pressing the foot pedal, the machine finishes the buttonhole.

CAUTION: It is not possible to start sewing by pressing the foot pedal when working in Service Mode.

3. If it is necessary to tilt the machine on the rest pin ⑥ during the machine adjustment, follow the below mentioned steps:

- disconnect the main air supply ③ from regulator
- disconnect the air tubes ④ from the cylinders of the indexer clamp feet and thread puller
- remove the indexer clamp feet ⑤.



E - MACHINE ADJUSTMENTS

4. NEEDLE BAR

1. Needle bar crank position

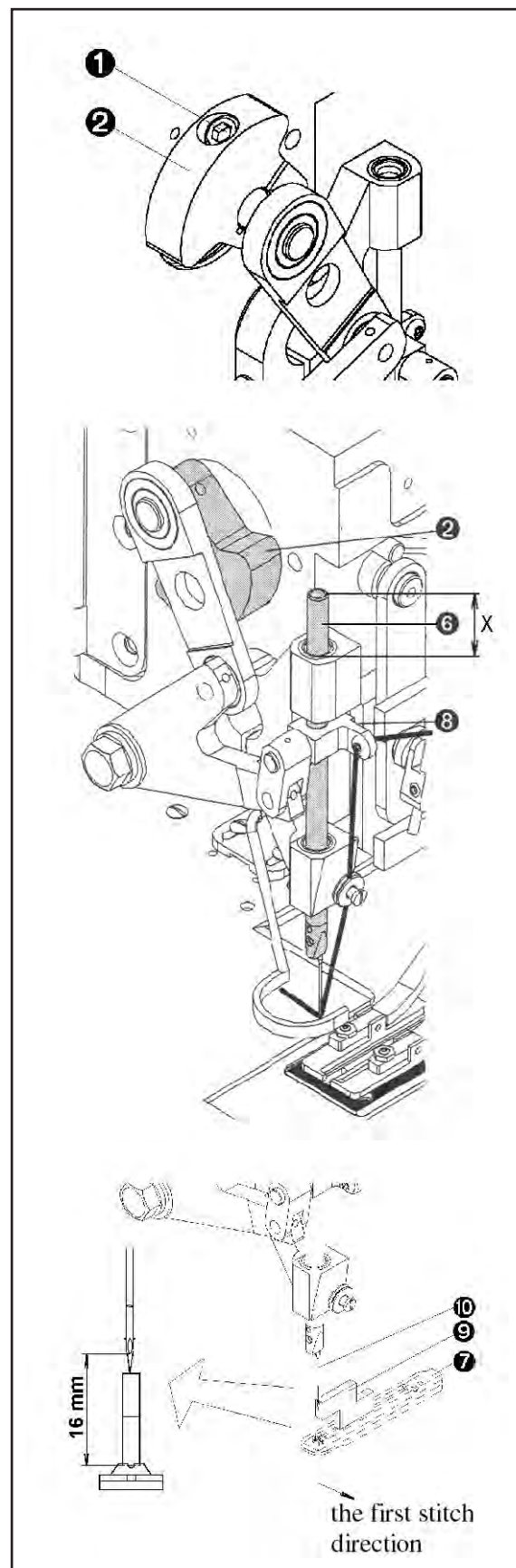
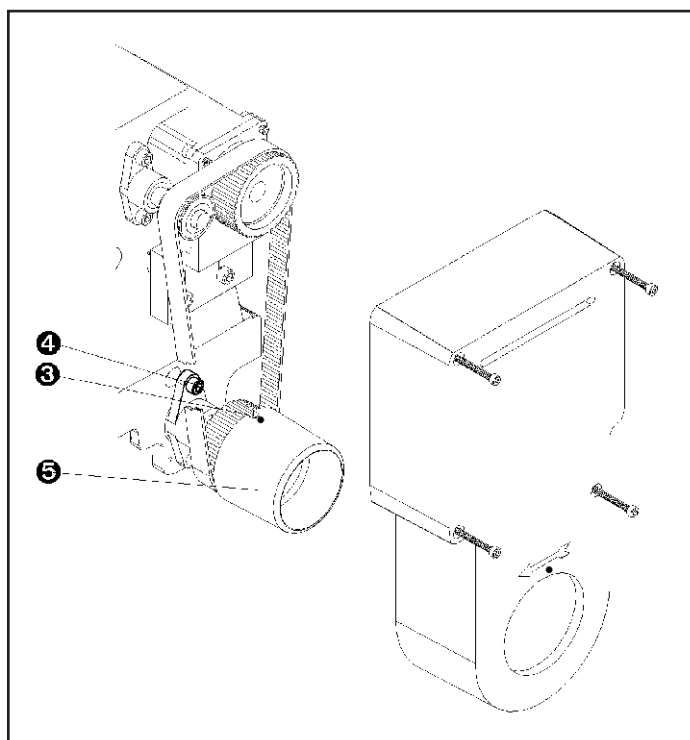
Turn the hand wheel **5** until the reference point of the pulley is in connection with the mark on the back cover as the picture in section E1. The needle bar need to be in the top position. If the needle bar is not in the indicated position turn the hand wheel **5** and loosen lightly the screw **1** in the needle bar crank **2**, hold the hand wheel and turn the crank in the direction to obtain the condition. Check again and tighten the screw **1** when the position is reached.

NOTE: The needle bar should be in the top dead centre position when the mark **3** is at 12 o'clock. To check, turn the hand wheel clockwise and counter-clockwise. The needle bar **6** must move downward in either direction. The needle shall make its first stroke into the right side of the throat plate.

2. The needle bar height adjustment

Adjust the needle bar **6** height to 16 mm (5/8") from the surface of the throat plate **7** to the lower edge of the needle eye. Use height gauge **9**. Loosen the set screw **8** and move the needle bar up or down as necessary.

NOTE: Alternatively, check distance **X** at the top death point=16.8 mm and bottom death point=10.2 mm.



E - MACHINE ADJUSTMENTS

5. BITE

Before the bite adjustment, remove the pulley cover **2** and the head cover **1**. Loosen the indexer clamp feet **4** by screw **3** and remove the indexer clamp feet from the machine. Disconnect the air tubes **5** from the thread puller cylinder and tubes **6** from the clamp foot cylinder.

1. Bite cam adjustment

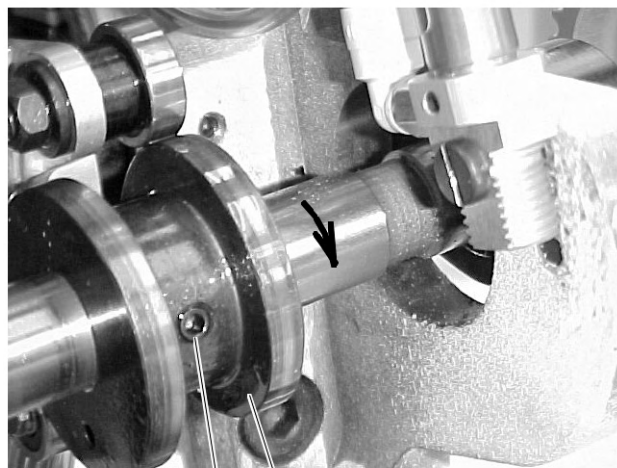
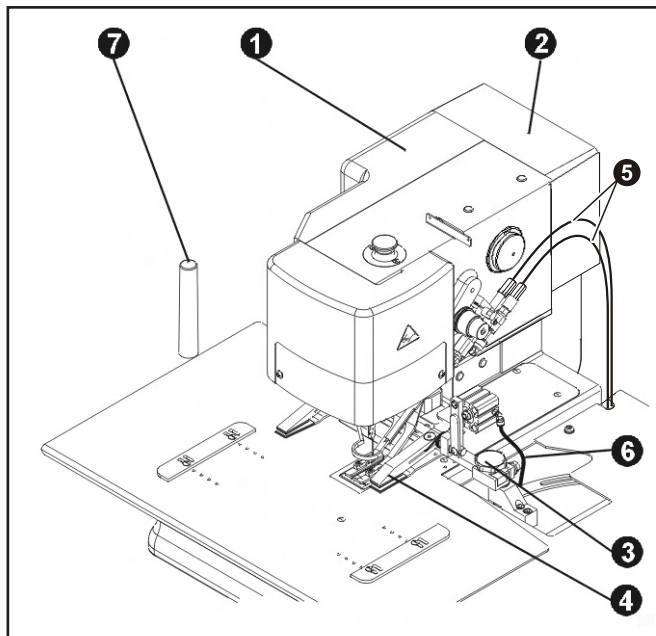
a) Check if the machine is in the home position.

b) Tilt the machine on the rest wood pin **7**. If the adjustment is correct, the second cam locking screw **8** (counter clockwise of the bite cam **9** - view from the front of the machine) must be roughly perpendicular to the bedplate casting.

c) Adjust the position of the bite cam so that the needle bite motion occurs equally with the needle out of the work piece on the up and down stroke.

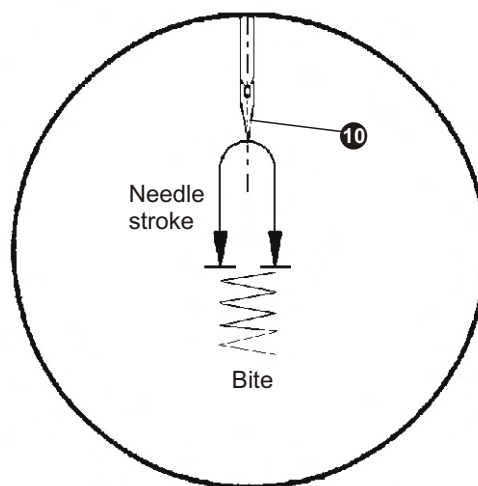
NOTE: There must be no bite movement before the needle **10** neither comes out of the garment nor after it has descended into the garment - see illustration.

d) Tighten both locking screws **8** securely.



8 **9**

Needle upper position



E - MACHINE ADJUSTMENTS

2. Bite width adjustment

To adjust the bite width, first remove the head cover. The S-4001 is fitted with a regular bite throat plate **11**, that allows a bite range of 1.5 mm (1/16") to 2.3 mm (3/32").

- a) loosen the adjusting screw **12**
- b) to increase the bite width, raise the bite lever **13**
- c) to decrease the bite width, lower the bite lever **13**
- d) tighten the adjusting screw **12**

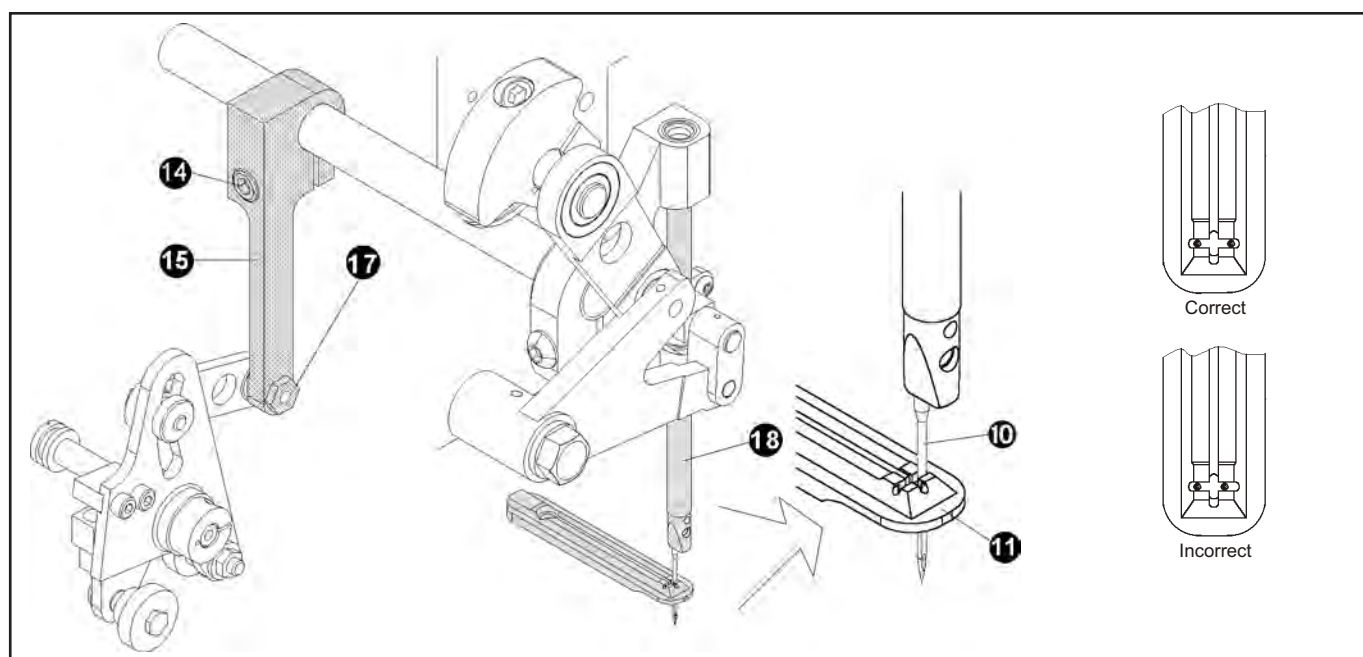
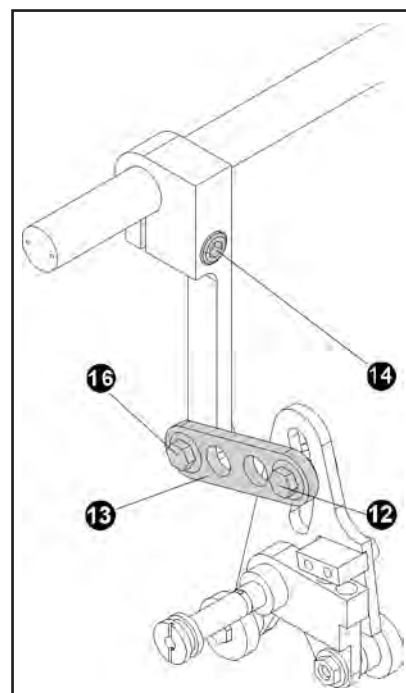
3. Centering the bite over the throat plate

a) with the machine in the home position - loosen the clamping screw **14** on the bite lever **15**

b) for rough adjustment, using the hand wheel, rotate the needle bar to its full down position and move the needle **10** to the right side of the throat plate slot **11**. Turn the hand wheel to the second needle down stroke and compare the needle position on the left side of the throat plate. Continue adjustment until the needle is roughly of equal distance from the right and left sides.

c) tighten the clamping screw **14**

d) for finite adjustment loosen the screw **16** and rotate the excentric nut **17**. Tighten the locking screw **16**.



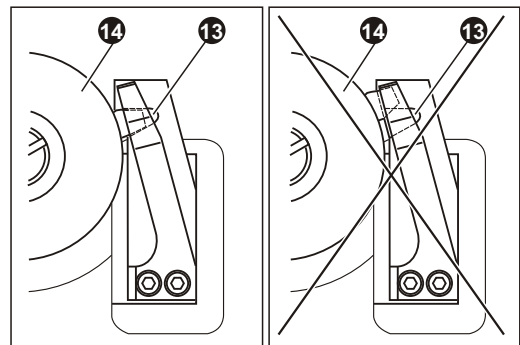
E - MACHINE ADJUSTMENTS

6. FEEDING

1. Tilt the sewing head on the rest pin.

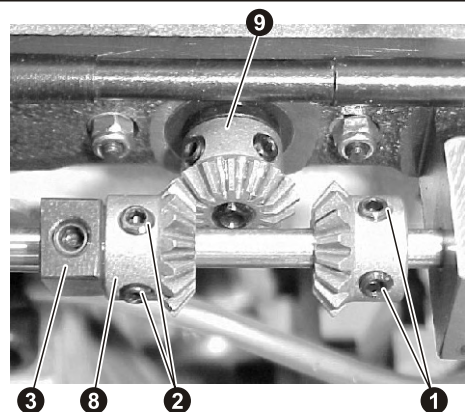
2. Bevel Gear Adjustment.

Manually turn the hand wheel in the sewing direction to be sure the drive disk switch spring **13** in the main cam disengages with any dog of the drive disk worm gear hub **14**. To be in the first row of stitches the dog of the drive disk wormgear hub **14** need to be completely under the drive disk switch spring blade **13**, not before-as the picture indication.



3. Remove the bevel gear cover and loosen the screws **1** and **2** on the horizontal bevel gears and screw on the stop **3**.

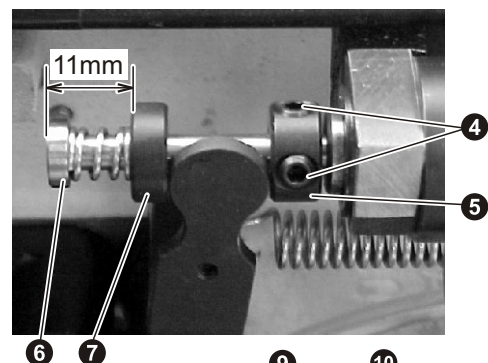
4. Loosen two adjusting screws **4** in the right collar **5**. Adjust the dimension 11mm from the end of the feed shaft **6** to the collar **7** by pressing the feed shaft **6** against the right collar **5**. Tighten the adjusting screws **4** in the right collar **5**. The tension of the left collar on the shaft is set.



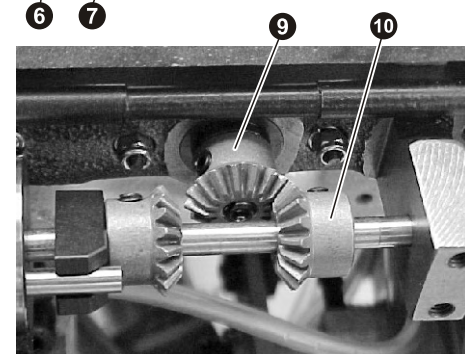
5. Engage the bevel gear **10** with the vertical gear **9** and tight on the shaft flat one of the two set screw **1**. This is a preliminary adjustment, no need to tight completely.

CAUTION: do not run the machine with the gear **10** in this position.

6. Engage the left bevel gear **8** with the vertical bevel gear **9** and check the teeth of the gear **8** and **10** are perfectly aligned. Use a marking line on the shaft as a reference to obtain the gears are aligned. If the teeth are not aligned turn the gear **8**, this operation turns the gear **9** and consequently the gear **10** turns in opposite direction with the shaft. Check again the marking and make this operation again if necessary, turning in one direction or opposite, till the teeth are perfectly aligned. Lock in this position both set screws **2**.



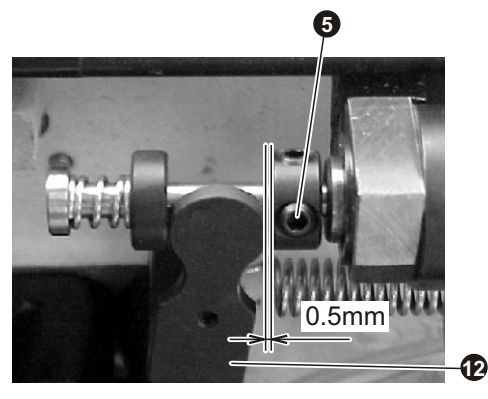
7. Move the stop **3** against the gear, push the stop rotating it in counter clockwise direction (view from the front of the machine) and tighten the set screw on the stop **3**.



8. Loosen the set screw **1** on the shaft flat, and slide the right gear **10** far away toward the back of the machine and tighten one screw **1** partially.

9. Manually turn the hand wheel in the sewing direction until the feed shifter lever moves to its full left position and the main cam reaches its second rest position (drive disk switch spring in the main cam **13** engages with the dog of the drive disk worm gear hub **14** for second row of stitches). The right gear **10** is now not near the vertical gear **9**, loose the set screw **1** on the flat and push the gear completely toward the gear **9** to engage perfectly. To be sure the gear **10** is completely engaged, push the shaft toward the back of the machine, by pressing its head **6**, in the way to create a space of 0.5 mm between the lever **12** and the collar **5**, as indicated in the picture. With the gear completely engaged in this condition tighten both set screws **1** securely.

The bevel gear adjustment is done. By manually turning the hand wheel finish the sewing cycle and bring the machine to the home position. Reinstall the bevel gear cover.



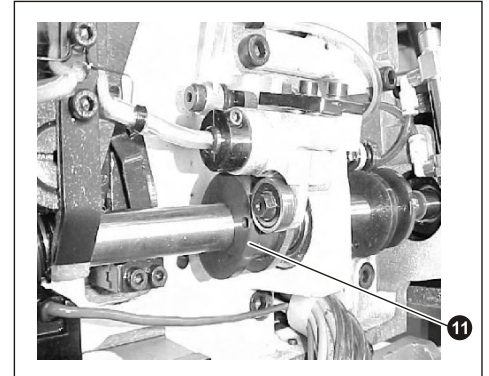
E - MACHINE ADJUSTMENTS

10. Setting the feeding timing:

Clamp plate movement occurs only when the needlepoint has risen above the garment and must be completed before the needle descends into the garment.

NOTE: Bear in mind that the clamp plate movement need to start when the needle bar is near to reach the top death point, in the way the pull up of the thread from material is made firmly. This condition helps to obtain a flat sewing, no puckering.

Anyway the clamp plate movement need to finish feeding in time before the needle start to penetrate the material. The longer is the stitch the earlier need to be set the start of the feeding to avoid the feeding finishes with the needle just inside the material.



11. To check the adjustment use a piece of paper to see the needle punctures.

12. If the feeding occurs while the needle is in the work or in case it starts too early, loosen the screws 11, on the feed cam, and adjust its position so that the rule explained in point 10 is respected. Retighten the feed cam set screws.

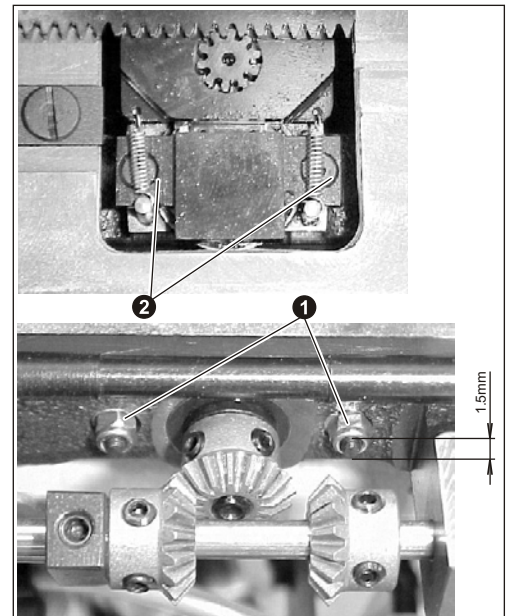
7. SLIP CLUTCH

The slip clutch pressure is factory set and under normal conditions will not need adjustment. The correct clutch torque setting is 0.43 Nm (60 to 65 inch ounces).

Hold the nut 1 and tighten the adjusting screws 2 with a torque screwdriver. Apply an equal amount of pressure to both sides of the clutch.

NOTE: If a torque screwdriver is not available, tighten the lock nuts so that the screws 2 extend through the nuts 1 1.5 mm.

CAUTION: Too little torque will produce an improper material feed. Too big torque may damage parts (bevel gears).



8. STITCH DENSITY

Adjust the feed connecting link position 3 in the cam follower slot 4 to obtain the correct stitch density.

To increase the density you need to move in the direction arrow 1:

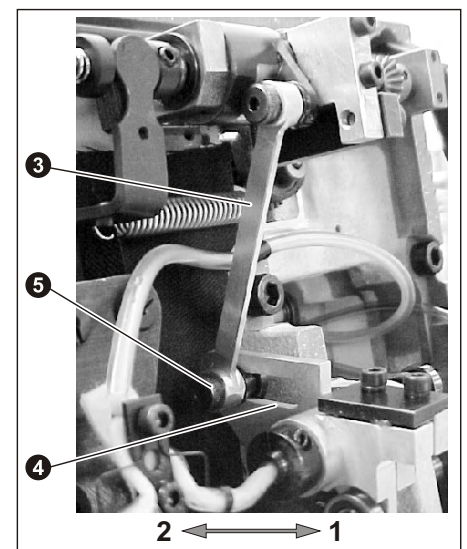
- a) Loosen the hex socket screw 5 and move the link 3 away from the bedplate, arrow direction 1, to increase density.
- b) Tighten the hex socket screw 5.

Maximum density is 12 stitches per 10 mm (30 stitches per inch), the appearance is based accordingly the thread size.

To decrease the density you need to move in the direction arrow 2:

- a) Loosen the hex socket screw 5 and move the link 3 toward the bedplate, arrow direction 2, to decrease density.
- b) Tighten the hex socket screw 5.

Minimum density is 4 stitches per 10 mm (10 stitches per inch), the appearance is based accordingly the thread size.



E - MACHINE ADJUSTMENTS

9. ADJUSTMENT OF BARRING STITCHES

The properly set of the first ① and of the second ② bar is shown in the picture beside. Each bar is performed by a half turn of the cam; in the half turn 5 stitches are performed. ⑦ is the first, ⑩ is the last, then the cam is disengaged.

1. First bar adjustments

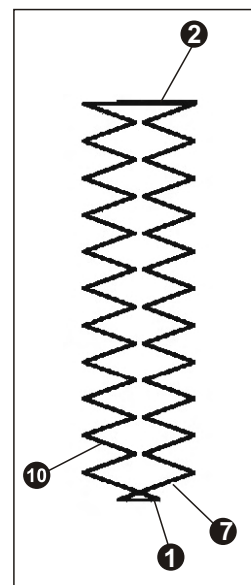
Insert a piece of paper under the clamp feet and clamp in the service mode to see how the machine works. Turn the hand wheel through the sewing cycle until the dog ⑤ releases the back shifter arm pocket ⑥. Then the cam will be engaged and start to turn while you turn the hand wheel.

The principle of work:

After a few degrees of the cam turning the clamp plate starts to move to perform the first stitch of the bar ⑦.

Needle bar is going from bottom to top, the clamp plate will move toward the right, the needle bar holder will move toward the left, so the stitch ⑦ will be same length of the others but with large bite size.

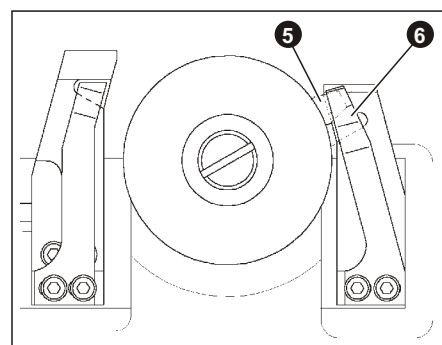
The needle needs to be with the eye at the level of the paper in the rising stroke when the clamp plate starts to move beside toward the right.



Adjustment:

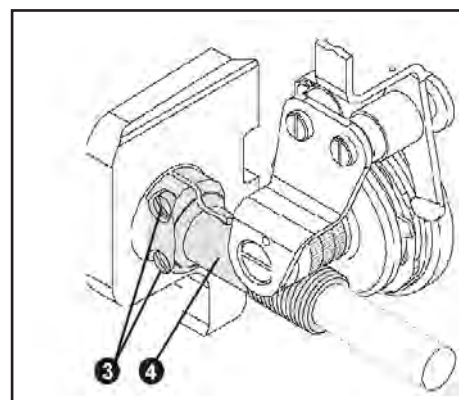
The timing of the cam turning is defined from the worm ④ on the main shaft. Loosen the screws ③, maintain firmly the worm and turn the hand wheel.

- Turn a few degrees in the sewing direction to delay the timing of the cam in relationship of the needle bar stroke. That means the needle will be higher or out of the paper when the clamp plate moves sideways.
- Turn a few degrees in the counter-sewing direction to advance the timing of the cam in relationship of the needle bar stroke. That mean the needle will be lower or inside the paper when the clamp plate starts to move sideways.



Tighten the screws ③ after the adjustment and check the principle of work is respected.

NOTE: Pay attention that making this adjustment the worm ④ not slide sideways toward the cam. The head of the worm need to stay in contact with the bearing of the shaft, so the worm need to be pushed always toward the front of the machine.

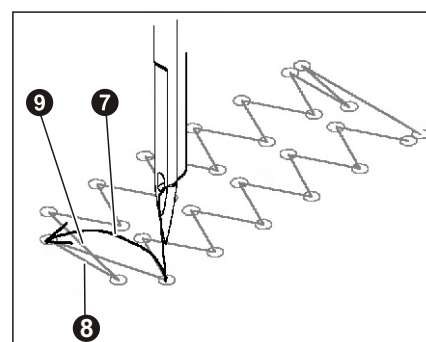


The principle of work:

The first stitch ⑦ has just been adjusted, the second stitch ⑧ is performed only by the needle bar movement, coming up from left toward the right (no clamp plate movement).

The third stitch ⑨ is performed as the first with the needle bar movement from right to left in relationship of the clamp plate movement toward the right.

If the first stitch is very well adjusted the third will be consequently well adjusted also, in case of difference a compromise between the two positions need to be found.



E - MACHINE ADJUSTMENTS

2. Second bar adjustments

The principle of work:

The second bar **2** is performed according to the first bar adjustment made before; changing the setting of the first bar influences the second bar too.

Insert a piece of paper under the clamp feet and clamp in service mode to see how the machine works. Turn the hand wheel through the sewing cycle until the dog **3** releases the front shifter arm pocket **4**. Then the cam will be engaged and starts to turn while you turn the hand wheel.

Before performing the second bar the machine makes 3 stitches regular bite.

The last 2 stitches are made to firmly lock the sewing end.

The diagram below shows the stitches.

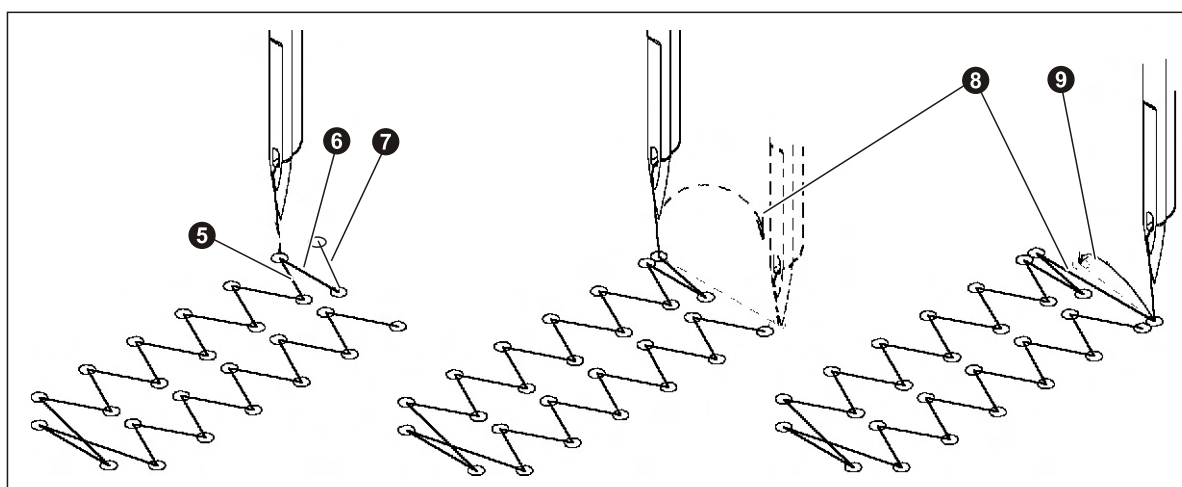
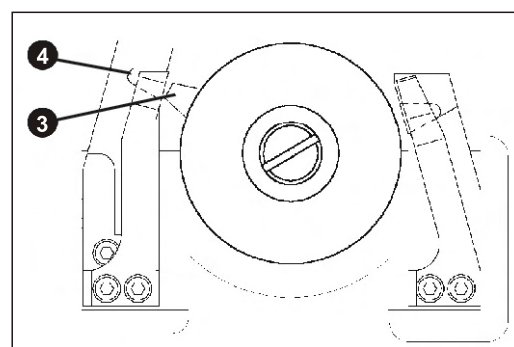
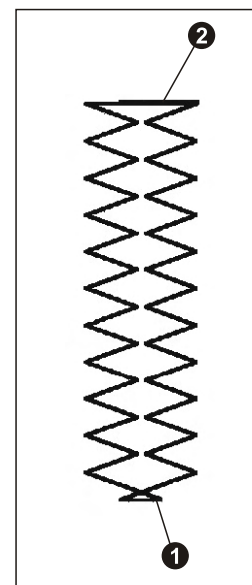
Stitches **5**, **6**, **7** are of standard bite, stitch **8** is the large bar, stitch **9** is the final locking stitch.

Adjustment:

Check the side clamp plate movement in the stitches **4** and **5**, see the picture below, start when the needle is out of the fabric.

If the movement starts earlier or later than the needle eye is at the paper level, the adjustment of the first bar needs to be checked.

In case there is a difference of the movement comparing first and second bar, it will be necessary to adjust the first bar advanced or delayed of the rule and find a compromise that no side movement happens with needle in the fabric.



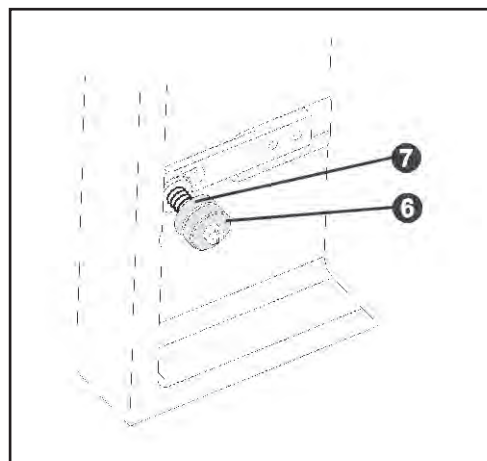
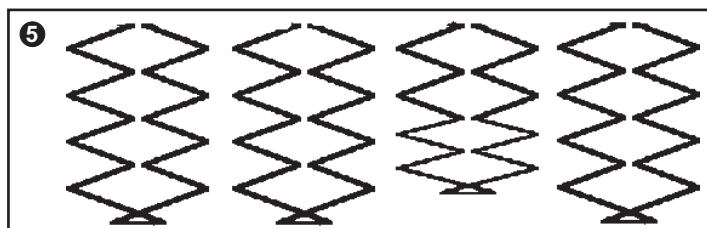
E - MACHINE ADJUSTMENTS

3. First bar position adjustments

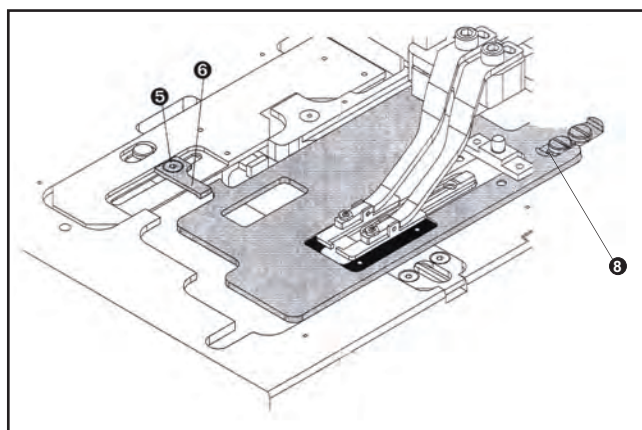
If the length of the buttonholes is not the same as show in the picture **5**, adjust the brake:

1. Loosen the nut **6** and turn the nut **7** clockwise to increase the brake or counter-clockwise to reduce the brake. This adjustment will provide a constant length of the buttonholes in the first bar.

NOTE: If the spring tension on the brake is too strong, the stitch density in the bar may be increased.



2. Turn the machine by handwheel until you reach the first bar. Check a proper adjustment of the stop **8**.

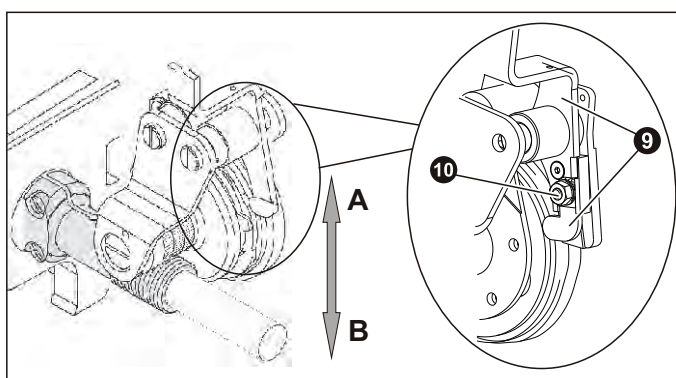


4. First bar shape adjustments

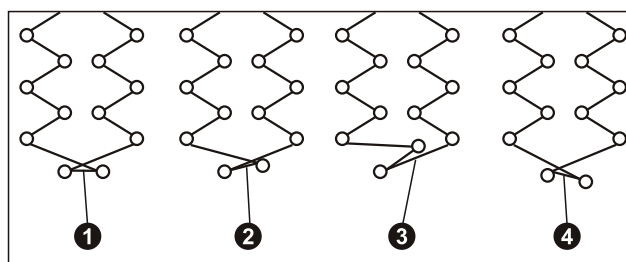
The timing of the exchange of the reverse of the feed is adjustable by the length of the lever **9** adjustable by loosen the nut **10**:

- Loosen the nut and move the dog of the lever in the **A** direction to advance the timing the back gear move toward the vertical gear (see the previous pages).
- Loosen the nut and move the dog of the lever in the **B** direction to delay the timing the back gear move toward the vertical gear (see the previous pages).

NOTE: Anytime the length of the lever is adjusted, the setting of the gear of the previous pages need to be made again from a beginning.



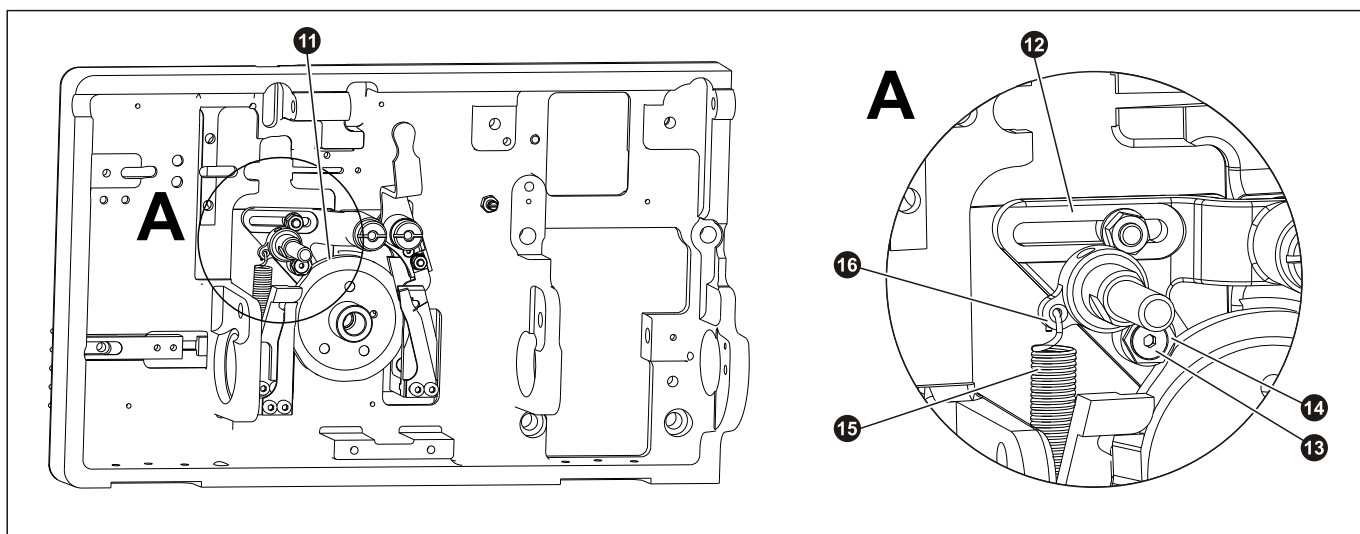
To obtain the best adjustment of the shape of the first bar try many times to sew without threading the needle and observe the holes of the needle. The right adjustment is represented in beside pictures **1** and **2**. The picture **3** shows a length of the lever too short; too advanced adjustment. The picture **4** shows a length of the lever too long; too delayed adjustment.



E - MACHINE ADJUSTMENTS

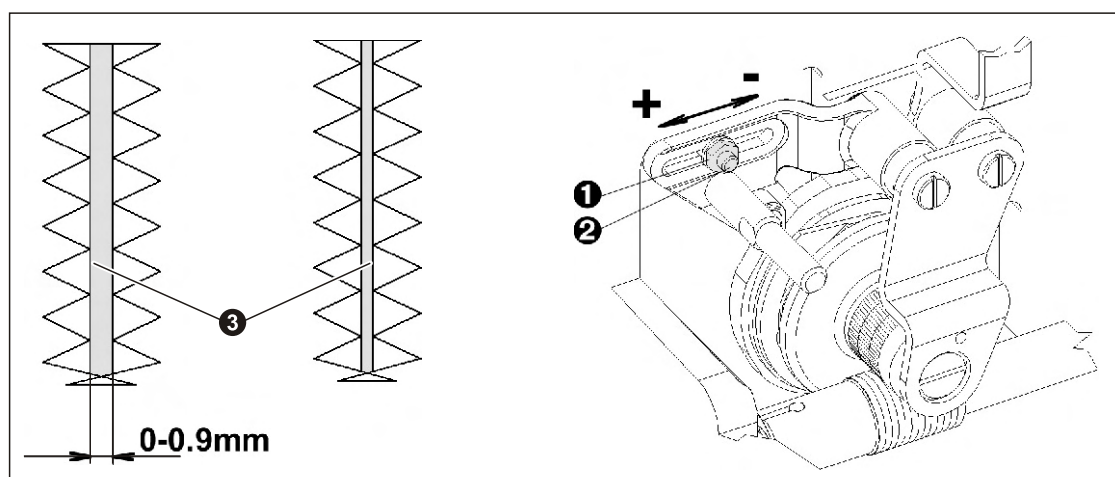
5. The clearance adjustment of the inside and outside rolls of the cam during the cam turning

- 1) Turn the hand wheel until the cam ⑪ starts to turn.
 - 2) Continue turning the hand wheel. The main cam assembly ⑪ moves the lever ⑫.
 - 3) Check by hand the minimal clearance of the lever ⑫ throughout one entire turn.
- NOTE:** After the half turn the cam engages, continue to turn till restart again.
- 4) The minimal clearance of the lever is defined from the distance of the inside and outside rolls
 - 5) Slightly loosen the M4 screw ⑬ and turn the eccentric ⑭ to move the outside roll closer or further from the cam
 - 6) Tighten the M4 screw after adjustment and check the clearance in all positions.
 - 7) There is a spring ⑮ that keeps the outside roll pressed on the cam to maintain the position with minimum clearance remaining between the two rolls. The collar ⑯ that engaging the spring ⑮ needs to be set so that the spring goes straight vertical as shown in the picture.



10. SPACE BETWEEN THE FIRST AND SECOND ROW OF STITCHES

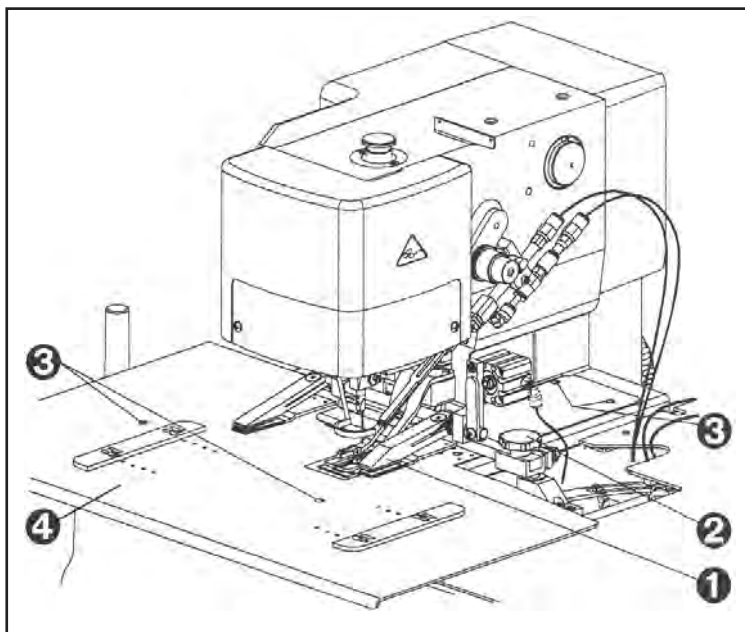
1. Tilt the sewing head on the rest pin.
2. Loosen the nut ① and move the stud ② to the required position (to the right - space ③ decreases, to the left - space increases). The space can be adjusted in range 0 - 0.9 mm.
3. Sew buttonhole on scrap fabric to check setting.



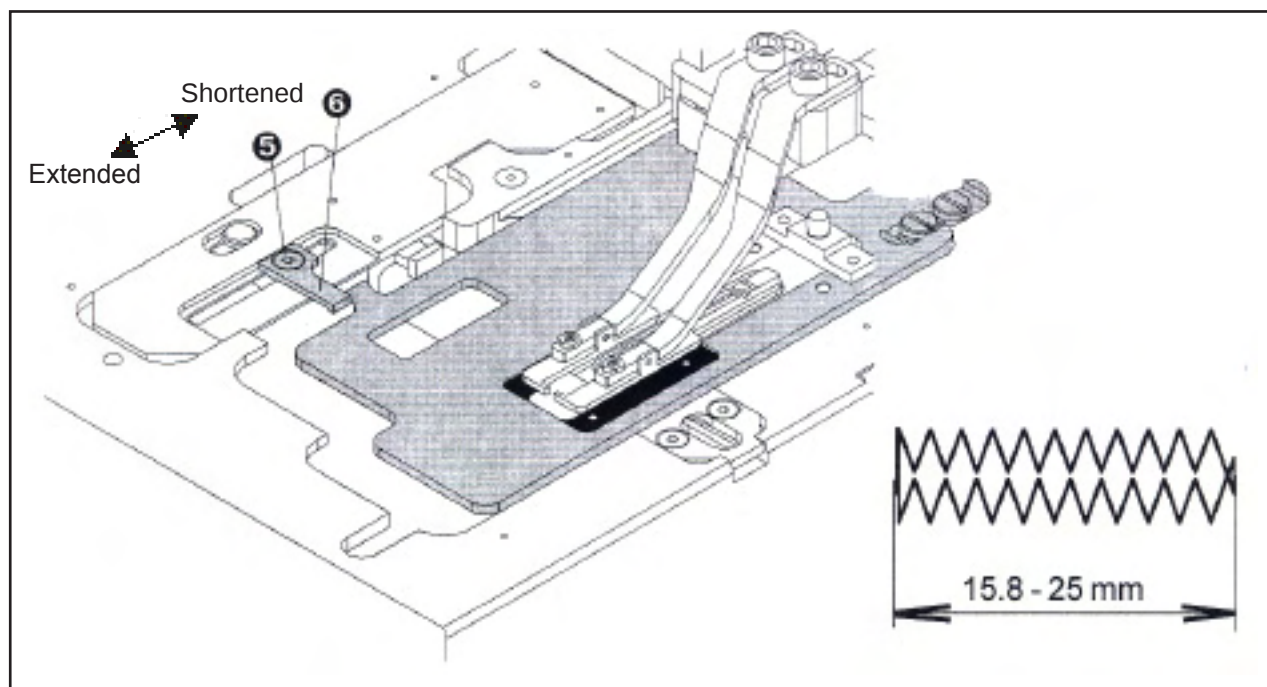
E - MACHINE ADJUSTMENTS

11. BUTTONHOLE LENGTH CHANGE

To change the sewn buttonhole length, remove the knob **2**, the indexer clamp feet **1**, and also 7 screws **3** and the cover plate **4**.



1. Loosen the screw **5** and move the stop **6** as needed. To the right - the buttonhole is shortened, to the left - the buttonhole is extended (refer to the picture below). The length can be set in the range 15.8 - 25 mm (0.62 - 0.98").



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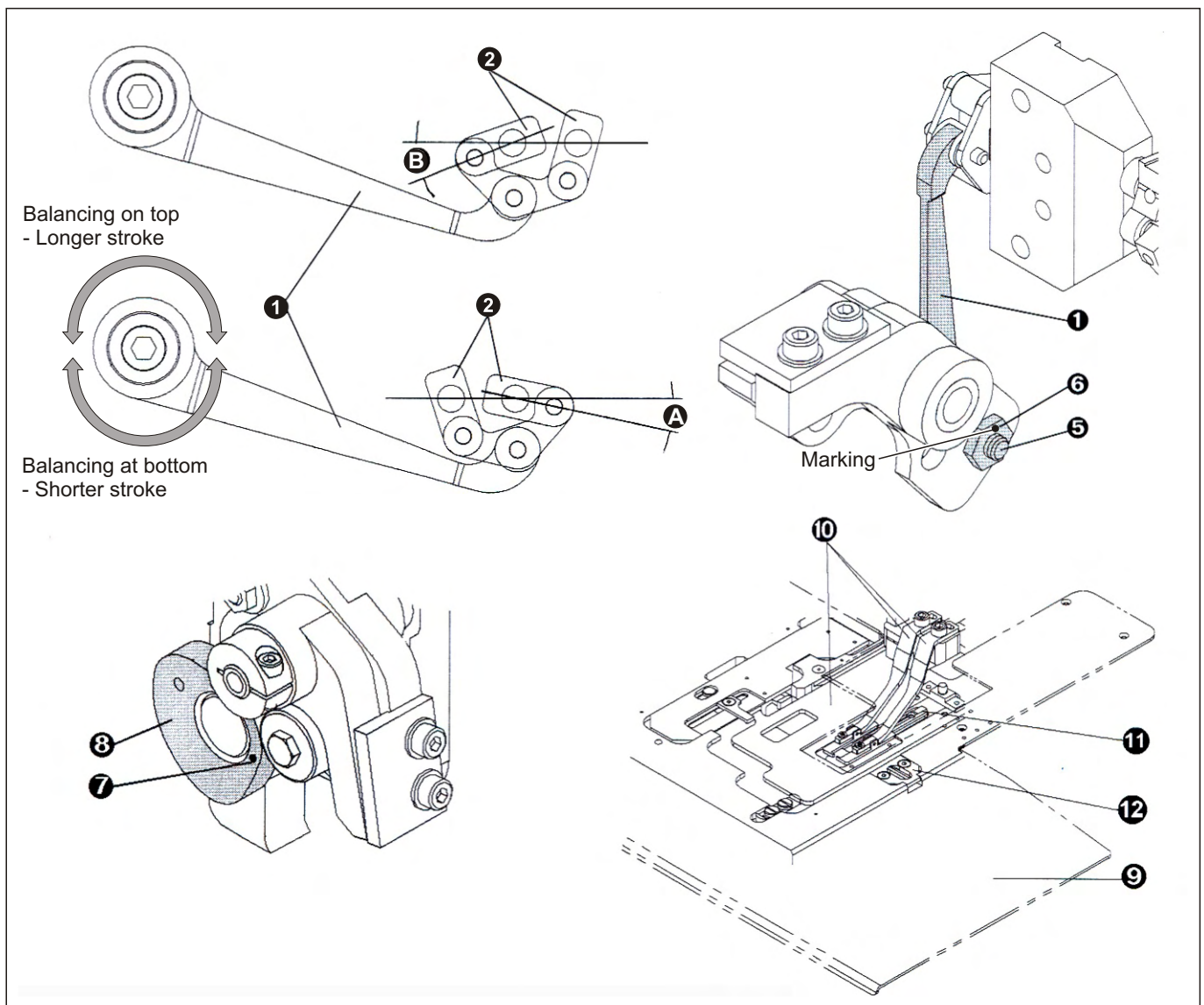
12. LOOPER ADJUSTMENT

Before making the loopers adjustment, follow the below described points:

1. Turn the hand wheel and observe the position of the connecting link **1** at both ends of the looper link arm travel **2**. Angle **A** must equal angle **B**.
2. If incorrect - loosen the hex mounting screw **5** and rotate the eccentric adjusting nut **6** as needed.
3. Tighten the hex mounting screw **5**.

NOTE: The eccentricity also slightly influences the loopers stroke - see the arrows in the picture below. Check the marking of the eccentric situated on the back hex nut - while balancing the eccentric on top the stroke is longer, at bottom it is shorter. Longer stroke means smaller angles (A) and (B), thus the loopers turn more.

4. Turn the hand wheel and bring the needle bar to the upper position.
5. Check the needle is straight; better use a new needle to set the new timing.
6. Tilt the machine head on the rest pin and check if the mark **7** on the looper cam **8** is visible from the front of the machine (as in the picture). If not, remove the cam and install it correctly.
7. Remove the cover plate **9**, disconnect the main air supply and the tubes from the clamp feet cylinder and remove the clamping assembly **10** from the machine, remove the throat plate **11**, trimming hook cover **12** and trimming hook. Dismantle the loopers with holders.



E - MACHINE ADJUSTMENTS

The first looper adjustment

1. Bring the machine to the home position, loosen the screws **13** of the looper cam **8** and adjust the looper cam to the lowest position. This is a starting point.

2. Loosen the looper screw **15** and turn the looper to find the correct angle as shown in picture 5. Tighten the screw **15** again.

3. Install the holder with the first looper **14** on the shaft.

4. Loosen the looper holder screw **16** and turn the holder so that the needle passes the looper in the center of the looper recess. There must be a minimum clearance between the needle and the looper recess as shown in picture 9.

5. Move the looper holder in the side direction so that the distance of the looper **14** from the needle is 0.1 mm. Tighten the looper holder screw **16**.

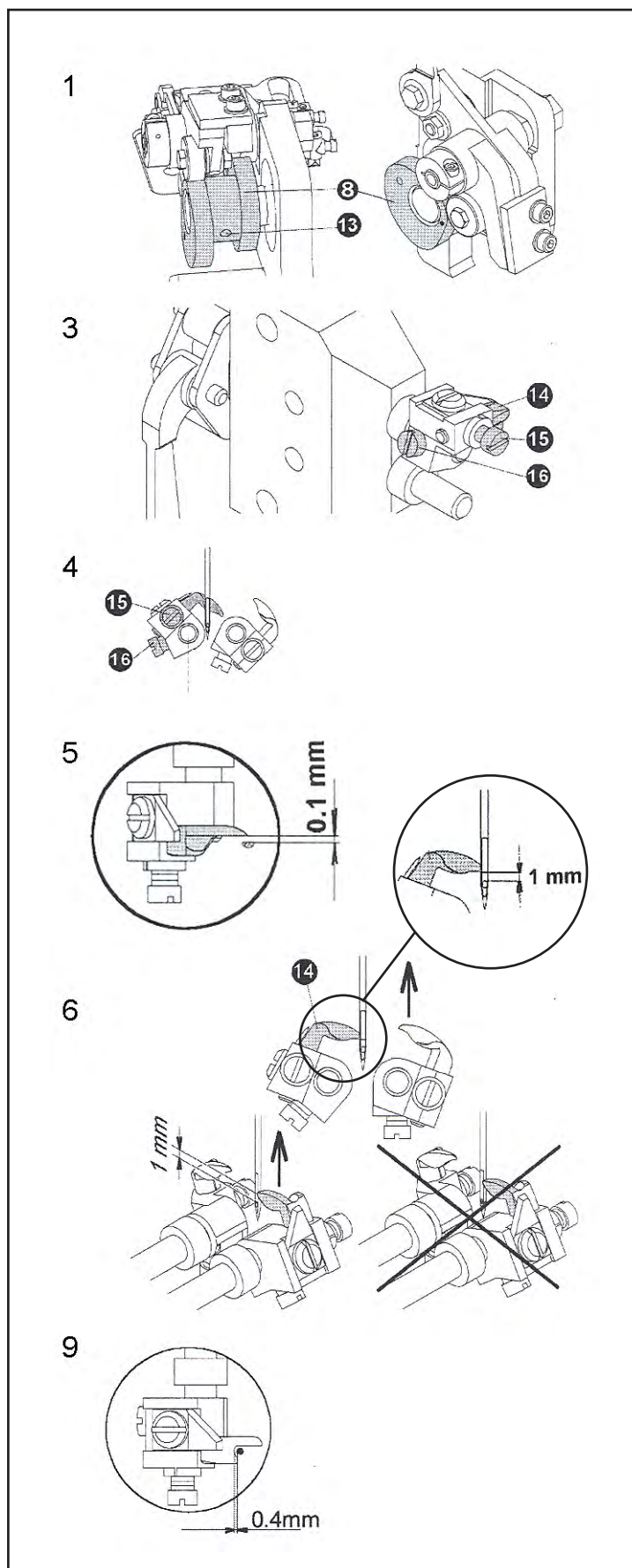
6. Turn the hand wheel to find the left needle down death position. Continue to turn to rise the needle bar 3.1 mm (1/8").

7. Check if the tip of the looper is at the centerline of the needle 1 mm above the needle eye.

8. If incorrect - loosen the looper cam screw **13** by the wrench and hold it. Turn the hand wheel - counter clockwise if the looper tip is higher than 1 mm; clockwise if less than 1 mm. Tighten the looper cam screw **13**.

9. Turn the hand wheel till the needle moves down to the looper and check the minimum clearance (not more than 0.4 mm) between the needle and the looper recess.

- If the needle is too close to the looper (no distance from the recess) when the needle moves down, the timing is too much delayed. Repeat from the point 4, before turn the holder a little to give more space.
- If the needle is too far from the looper (more than 0.4 mm from the recess) when the needle moves down, the timing is too much advanced. Repeat from the point 4, before turn the holder a little to give less space.



E - MACHINE ADJUSTMENTS

The second looper adjustment

10. Follow the points 2. and 3. analogically for the second looper.

11. Loosen the looper holder screw **19** and turn the holder so that the needle passes in the center of the looper recess. There must be minimum clearance between the needle and the looper recess.

12. Move the looper holder in the side direction so that the distance of the looper **18** to the needle is 0.1 mm. Tighten the looper holder screw **19**.

13. Turn the hand wheel to find the right needle down death position. Continue to turn to rise the needle bar 3.1 mm (1/8").

14. Check if the tip of the looper is at the centreline of the needle 1 mm above the needle eye. Tighten the screw **19**.

15. Supposing the first looper adjustment has been done, find the position described at point 14. only by turning the looper holder.

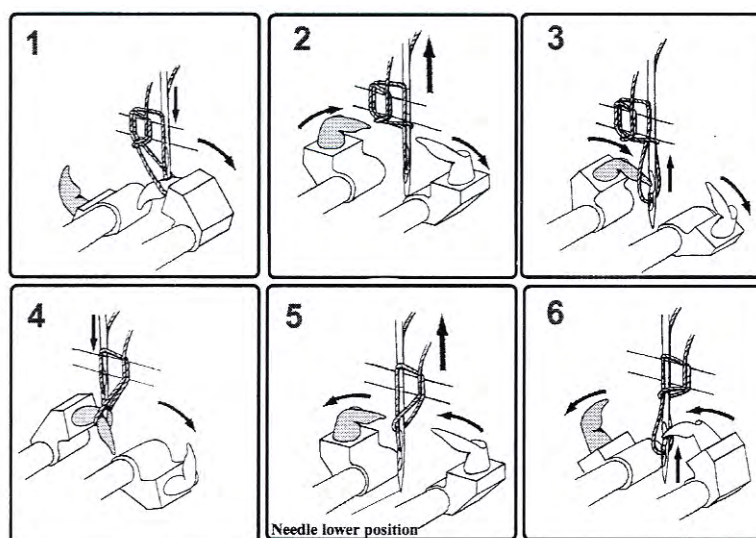
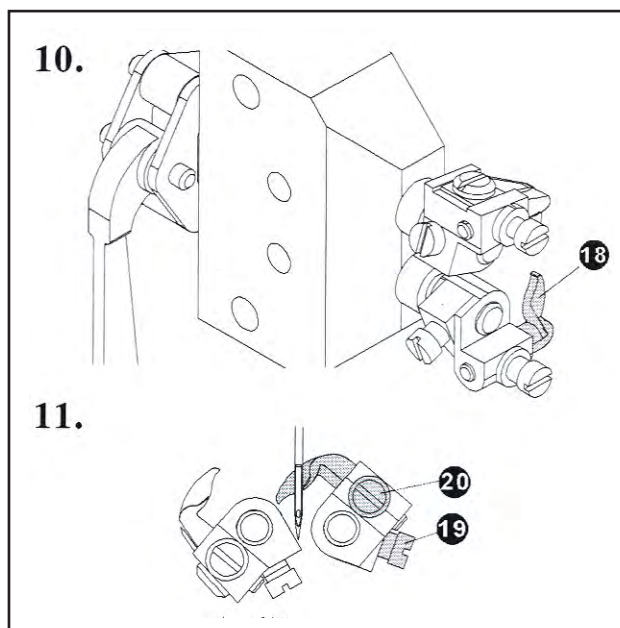
16. Turn the hand wheel till you find the bottom position with the needle in the centre between both looper points. The distance between the looper point need to be minimum 6.35 mm and max 7.25 mm. (Note: use a gauge 03.0050 to check the measure of the distance between the loopers)

Final check:

If the distance between the looper points is larger or smaller than the described, restart from the beginning (first looper adjustment), adjust the holders closer or further.

Readjust the cam according to the timing request and rise or descend the needle bar height as can be requested from the specific situation.

The following drawing explains the stitches formation:



E - MACHINE ADJUSTMENTS

13. THREAD DRAW-OFF

1. Adjustment of the Draw-Off Lever Position

The correct adjustment ensures a long enough thread tail for starting the sewing of the next buttonhole. Remove the covers because this mechanism adjustment is performed in the rear of the head. Air supply is necessary for this adjustment.

- loosen the screw **6**
- the piston **7** of the cylinder **8** is in the home position (retracted). Move the lever **9** to the pin **10** with minimal clearance 0.1 mm. Tighten the screw **6**
- check the correct clearance adjustment by switching the valve **11** of the draw-off cylinder (YV1).

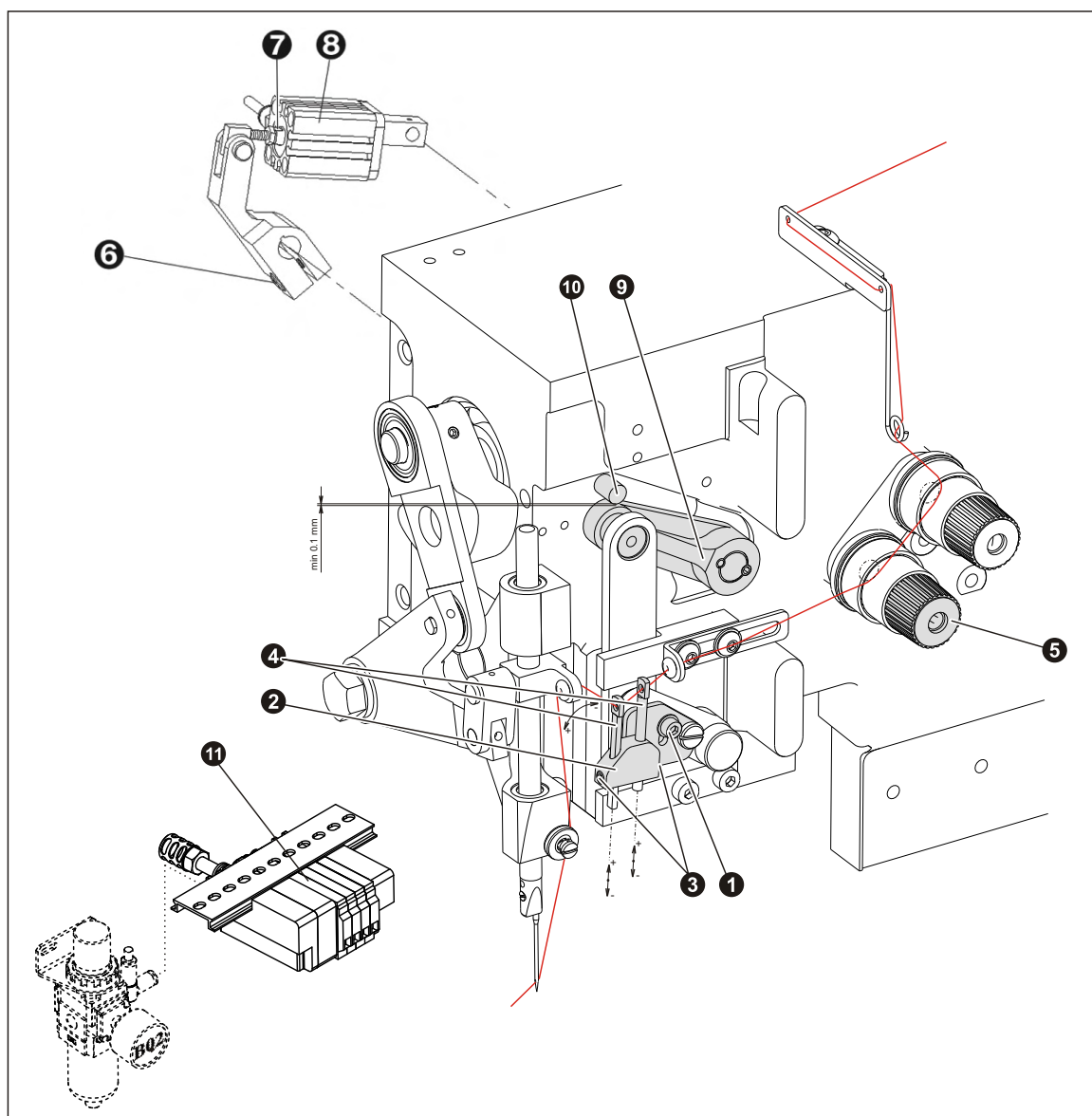
2. The thread end adjustment

If the first stitches are missing or the buttonhole is not sewn, follow the below mentioned steps:

- loosen the screw **1**.
- turn the draw-off lever **2** counter clockwise to increase the thread tail length; turn the draw-off lever clockwise to decrease the thread tail length

3. Stitches tying

- loosen the screws **3**
- move the thread take-up pins **4** up or down to decrease/increase the size of the loops and thus improve the sewing appearance.



E - MACHINE ADJUSTMENTS

14. THREAD TENSION

The thread tension influences the appearance of the buttonhole. A thread tension change may be needed if the thread and fabric changes. Check to ensure all parts, which are in contact with the thread, are smooth and polished with no burrs or sharp edges.

The main sewing thread tension is the first on top, the secondary thread tension is the one that is normally open during the sewing.

The secondary thread tension helps a better performance of the bars and of the thread trimming.

1. Adjustment of the main sewing thread tension

- By turning the tension knob clockwise of the first tension, the thread tension increases.
- By turning the tension knob anti-clockwise of the first tension, the thread tension decreases.

NOTE: Too big thread tension can cause the unsightly appearance of the buttonhole when sewing on a thin and elastic material.

2. Adjustment of the secondary thread tension

The secondary thread tension can be used to obtain more tension on the first bar, with the speed slowdown in the bar.

The secondary thread tension is always used on the cycle end to tighten the thread for the trimming.

Find a compromise to have a good result in the first bar and short thread remaining at the end of sewing on the material.

More thread tension (turn the knob clockwise) of this secondary tension means shorter thread at the end on the material side.

NOTE: The length of the thread end on the material and from the needle for the next sewing is connected to the delay and timing of the thread pick-up lever and trimming hook.

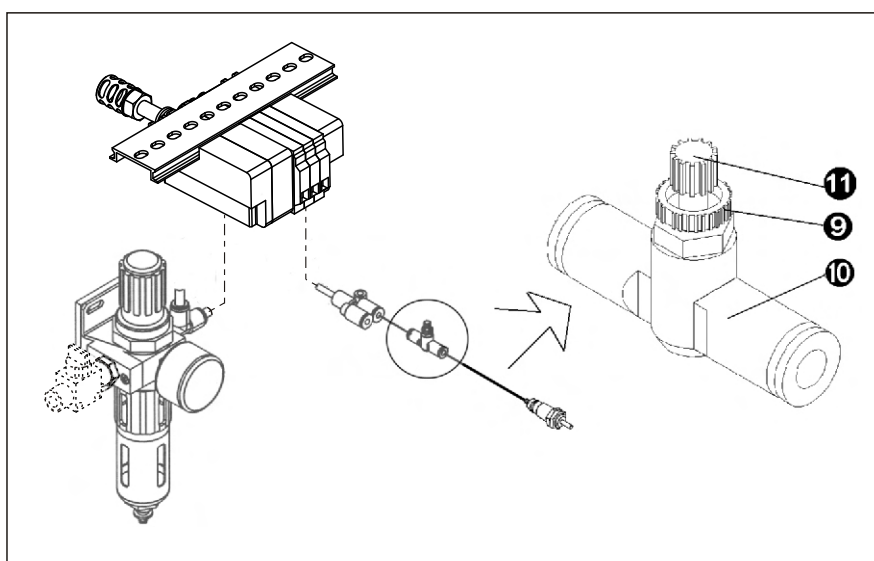
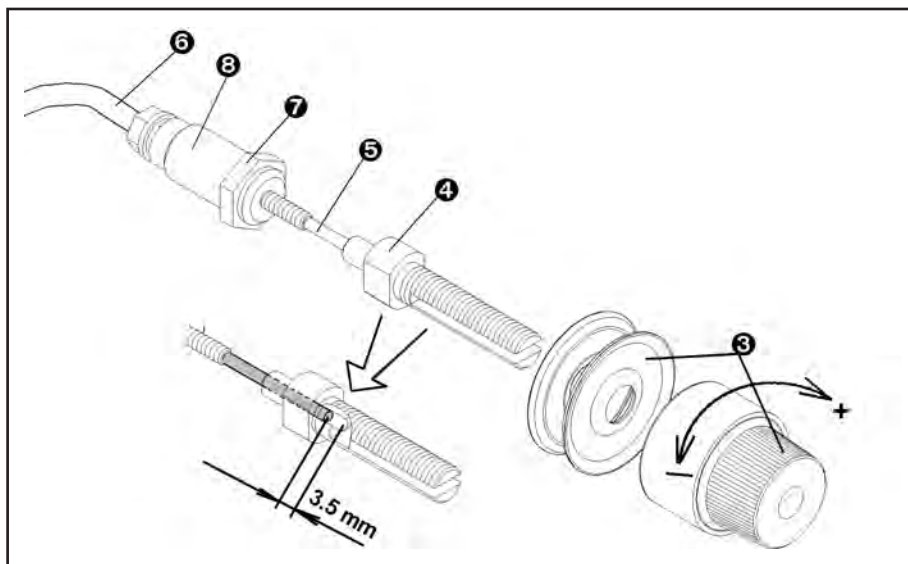
E - MACHINE ADJUSTMENTS

3. The correct position of the secondary tension mechanism

- a) Remove the tension assembly **3** from the shaft **4**
- b) Check if the distance between the stud slot edge and the pin **5** is 3.5 mm
If incorrect, it is necessary to adjust the position of the pin.
- c) Remove the pulley cover and the head cover to obtain a good access for this adjustment. Switch off the air supply.
- d) Disconnect the air tube from the cylinder.
- e) Loosen the nut **7** and turn the cylinder **8** as necessary. Turning clockwise the pin is extended. Tighten the nut **7** when the correct measurement is obtained.
- f) Connect the air tube **6** to the cylinder, open the air supply and install the covers.

4. Regulation of the tension discs opening

The flow control **10** must to open the secondary thread tension smoothly, loosen the nut **9** to adjust the regulator **11**, the final result at the end of sewing must be connected to the timings of the thread pick-up lever and thread trimming.



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15. THREAD TRIMMING

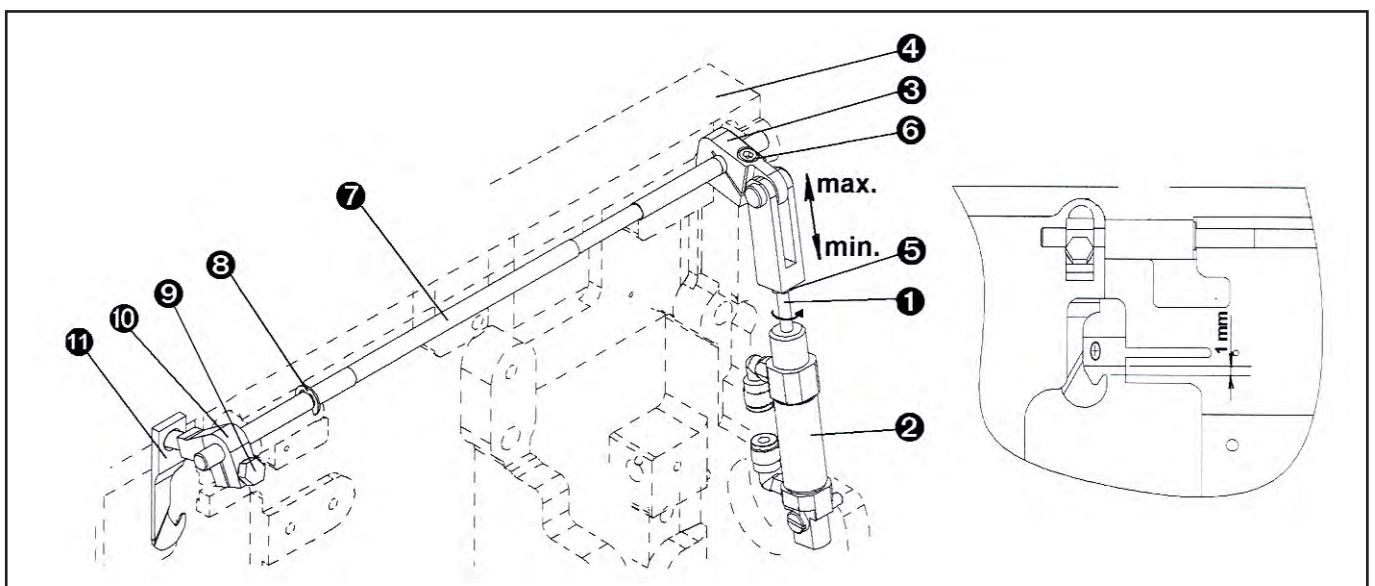
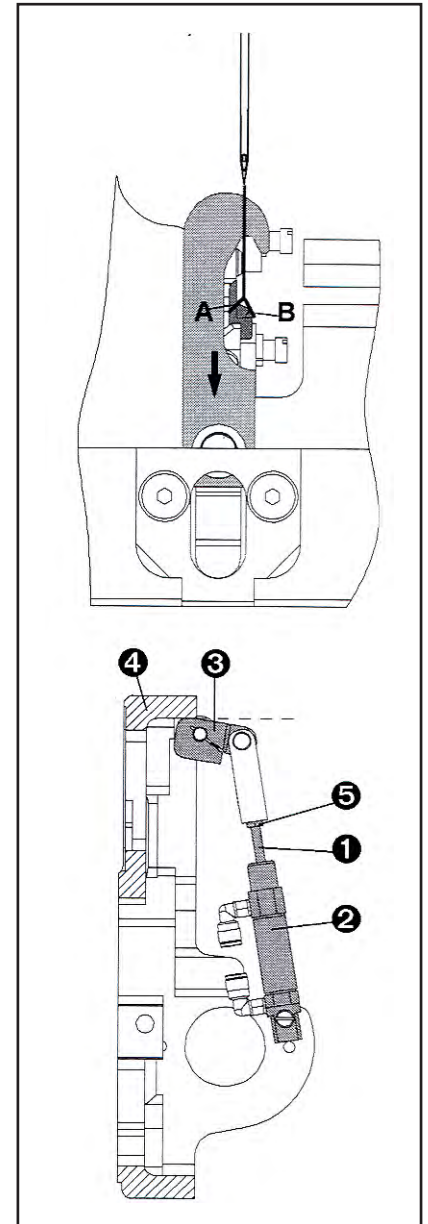
Trimming mechanism ensures the correct thread trimming after sewing the last stitch. As the trimming hook moves in the direction of arrow, both thread loop legs **A** and **B** are pulled forward. When the thread hook approaches the end of the stroke, leg **A** contacts the trimming knife, the thread is cut.

1. Trimming cylinder adjustment – rest position

- Tilt the machine head on the rest pin and close the air supply. Extend the piston rod **1** of the cylinder **2** to the maximum position.
- Check that the cylinder does not push the lever **3** too much and into contact with the casting **4**. If no clearance exists, adjust as follows:
 - Loosen the screw **6**
 - To obtain the correct position of the lever **3**, loosen the nut **5** and turn the cylinder piston **1** in or out as needed
 - Tighten the nut **5** and the screw **6**.
- After this adjustment check if no axial clearance exists on the shaft **7**.
- If the axial clearance exists on the shaft, loosen the screw **6**, move the shaft **7** to the left so that the locking ring **8** touches the recess in the plate **4**. Move the lever **3** to the right and tighten the screw **6**.

2. Trimming hook adjustment – rest position

- Push the piston **1** of the trimming cylinder **2** to the maximal position and loosen the screw **9** of the trimming actuator **10**.
- Turn the trimming actuator **10** and set the clearance 1.0 mm between the throat plate and the point of the trimming hook. (See the picture below).
- Tighten the screw **9** of the trimming actuator **10**.
- Open the air supply, switch the valve of the trimming cylinder and check if the actuator **10** does not hit the bedplate casting when it is driven to cut.



E - MACHINE ADJUSTMENTS

16. MACHINE HEAD CLAMPING FEED ADJUSTMENT

1. Adjustment of the clamp height

Be sure that air supply is switched on and the clamp feet are opened. If clamp feet are not opened, push the clamp Up / Down button.

- loosen the nut ❶
- turning the screw ❷ clockwise lowers the clamp feet mechanism ❸ to clamp mat ❹; turning counter clockwise the feet rise more
- tighten the nut ❶

NOTE: The correct height is when the underside of the clamp feet is slightly lower than the point of the needle in the home position.

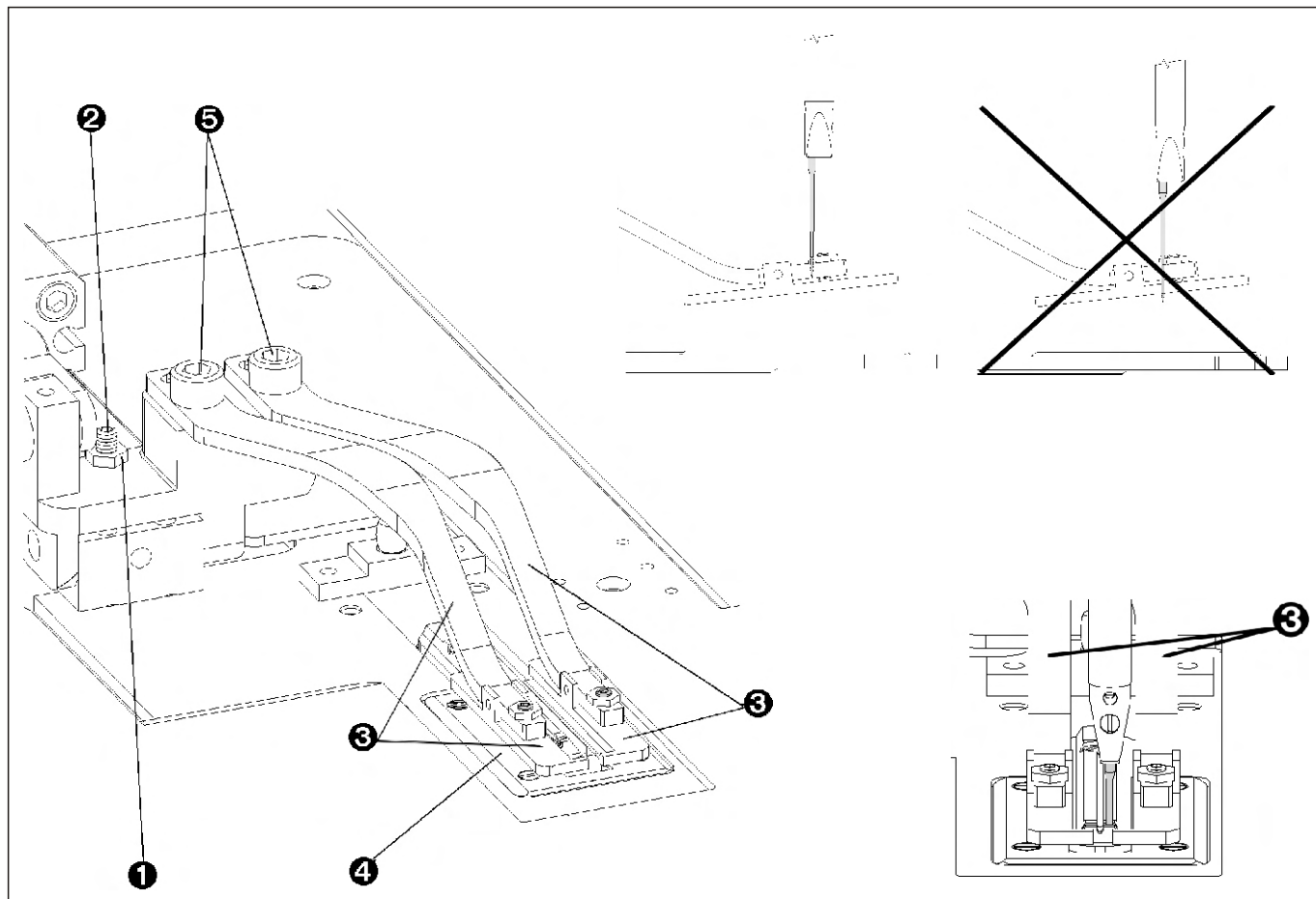
2. Adjustment of the distance between the clamp feet

NOTE: The check must be performed on the first and also on the second bite.

Be sure that the clamp feet are closed. If clamp feet are not closed, push the clamp Up / Down button.

- turn the handwheel slowly to be sure that needle does not hit the clamp feet ❸.
If this happens:
- push the clamp up/down button to open the clamp feet
- loosen the screw ❺ and get the clamp feet arm further from the needle and tighten the screw ❺
- to check this adjustment, turn the handwheel when the clamp feet are closed. The needle must not hit the clamp feet.

NOTE: Keep a minimal distance between the needle bar and the clamp feet during this adjustment. Too big distance of the clamp feet can cause the missing stitches when sewing on thin and elastic fabrics.

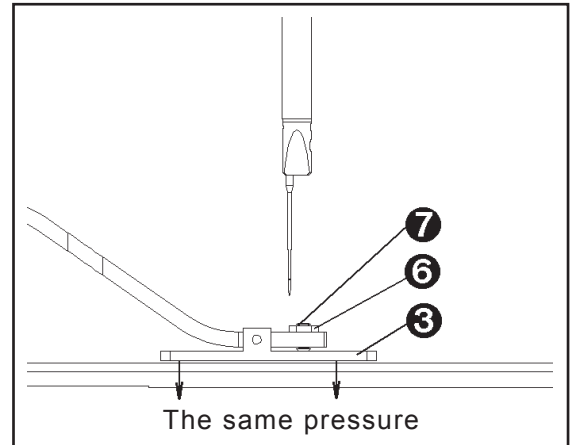


E - MACHINE ADJUSTMENTS

3. Clamp feet pressure adjustment

The whole length of the clamp feet must hold the garment with the same pressure.

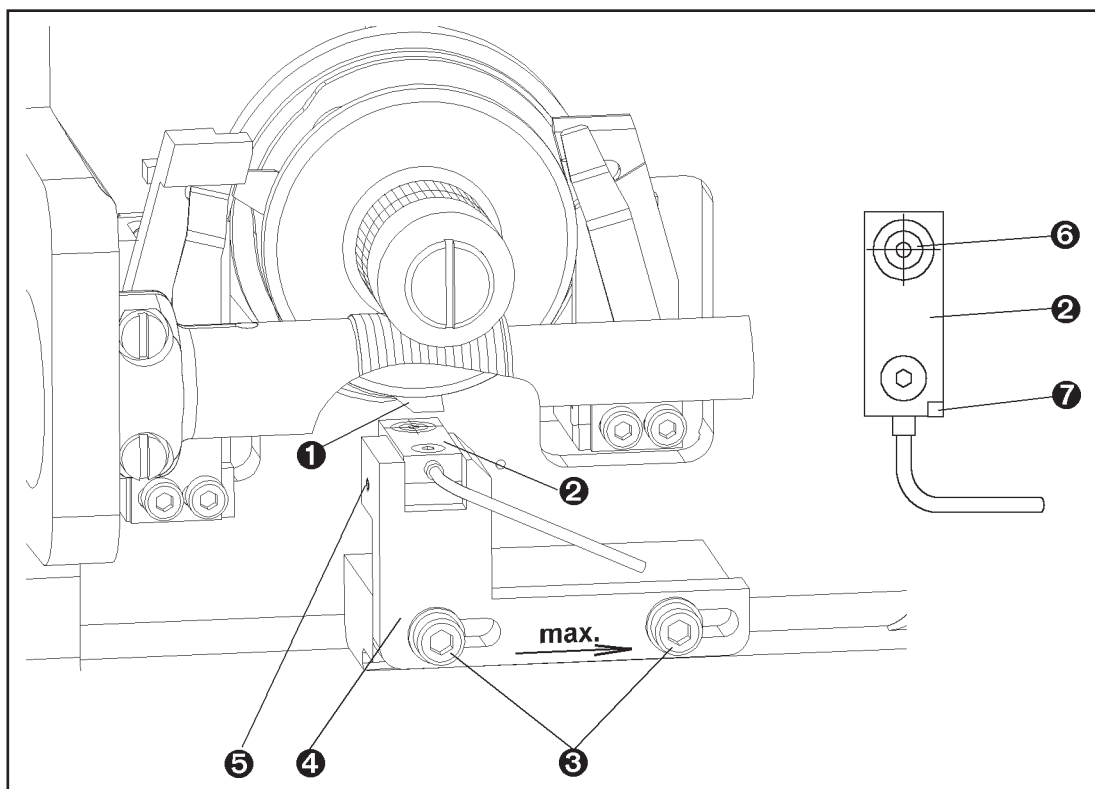
- Push the clamp up/down button to close the clamp feet **3**.
- To adjust the clamp feet to the correct position, loosen the nut **6** and turn the screw **7**.
- Tighten the nut **6**.



17. ADJUSTMENT OF THE STOPPING SENSOR POSITION

Follow the below described steps to set the position of the sensor:

- Put machine in the service mode (see E-3).
- Turn the hand wheel counter clockwise until the machine is in the position for start sewing the second bar. Continue to turn till the stop disk finger **1** will be perpendicular to the sensor **2**.
- Loosen the screws **3** and move the sensor bracket **4** to the right. Tighten the screws **3**.
- Loosen M3 screw **5** and adjust the sensor position so that the stop disk finger **1** is in the centre of the sensor mark **6**. The red LED **7** lights up on the sensor.
- Tighten the M3 screw **5**.
- Return the machine head back to the working position.
- Push the key on the control panel and switch the machine to the working mode.
- Connect the air tubes with the indexer clamp feet. Open the air supply.
- Run the machine for a complete cycle to the home position.
- In the home position and till the start of the first bar the sensor must to be off (red LED does not light). If this is not the case loosen the screws **3** and move the bracket **4** slightly in the opposite direction till the light comes off.



E - MACHINE ADJUSTMENTS

18. CHANGING THE DRIVE BELT

NOTE: make the adjustment without the needle installed to avoid the possible misadjusting of the bottom and top pulley causing a crash.

1. Remove the pulley cover **1** after loosening the M4 screws **2**.

NOTE: If the belt needs to be changed and it is not broken the following points 2 and 4 are obviously found automatically if the machine is at the home position.

2. By turning the hand wheel **3** adjust the position of the shaft so that the mark **4** on the pulley **5** is in level with the screw **6** on the lower shaft bearing carrier.

NOTE: The pulley is black marked from the manufacturer.

3. Lock the position by the holder 24.0030.0.000 **7**, which is included in the accessories, exactly the finger of the holder on the black mark. Using the screw **6** fix the holder to the bearing holder upper screw.

4. Turn the pulley **8** of the needle bar shaft, until the needle bar reaches the upper position.

NOTE: Also this pulley is black marked.

5. Lock the position by the holder 24.0024.0.000 **9**, which is included in the accessories, exactly the finger of the holder on the black mark. Using the screw **10** fix the holder to the bearing carrier lower mounting screw.

6. Rotate the motor pulley **11** until the marks **17** on the motor pulley and the motor bracket are aligned.

7. Loosen the screws **13** on the motor bracket **14** and move the motor with the machine bracket down to fit the belt.

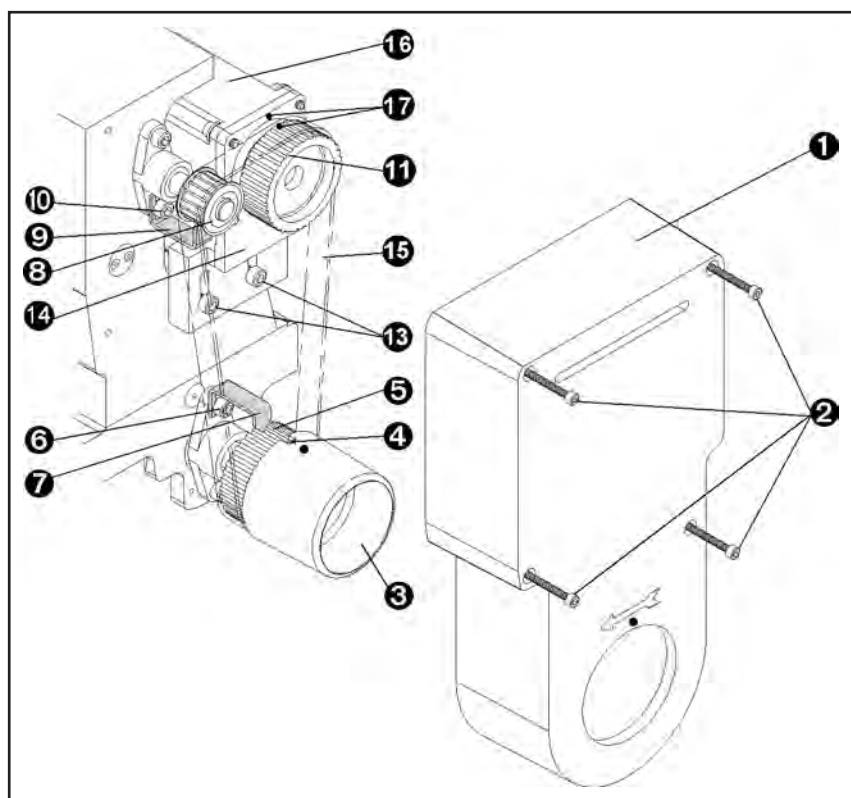
8. Fit the belt **15** on the shaft pulleys **5**, **8** and motor pulley **11**. To tighten the belt **15**, move the motor bracket **14** with motor **16** up. Tighten the screws **13** to lock the motor bracket. Be sure the marks **17** are aligned.

9. Remove the pulley holders **7**, **9**.

10. Press the pedal to check the adjustment. The needle bar must be in the upper position and the position of the main shaft must be as described in the previous point 2.

11. Small changes of the needle bar adjustment are possible in the program parameters.

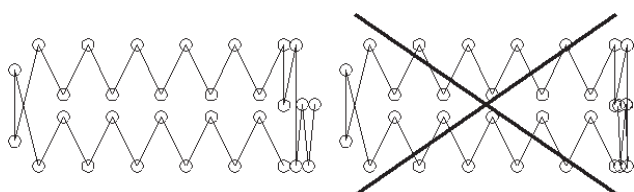
12. If the hand wheel is in the right position described in the previous point 2 but the needle bar is not at the top position check all the adjustments described in section E before to reinstall the needle.



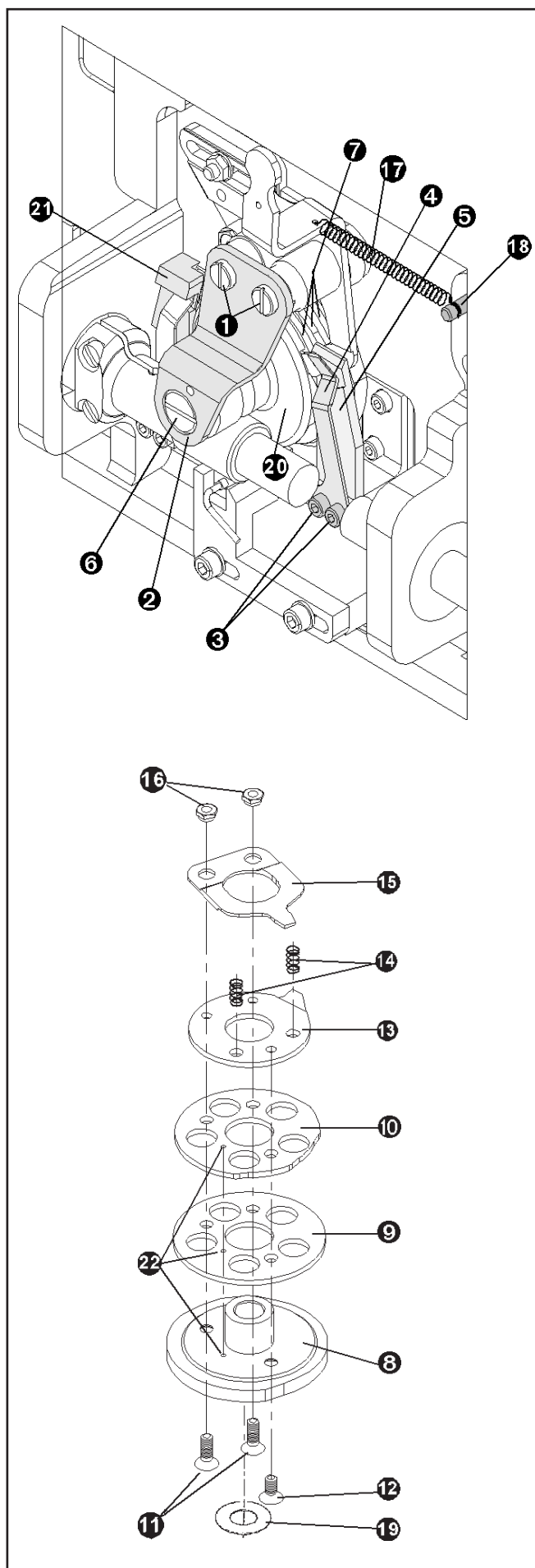
E - MACHINE ADJUSTMENTS

19. THE MAIN CAM CHANGE

1. Loosen the screws **1** and remove the holder **2**.
2. Unscrew the screws **3** and remove the right control spring **4** and the holder **5**.
3. Loosen the stud **6** and remove the worm gear hub and the main cam assembly **7**. Dismantle the assembly.
4. Assemble the main cam assembly according to the following steps:
 - a) Install the washer **9** on the barring cam **8**. The mounting hole **22** must be covered.
 - b) Install the feed reversing cam **10** in the same way.
 - c) Place the stop disc **13** on the feed reversing cam **10** and fix it using the screws **11** and **12**.
 - d) Insert the springs **14** into the holes in the stop disc and install the drive disc spring **15**. Lock it using two screws **16**.
5. Remove the spring **17** from the pin **18**.
6. Using a grease, place the thrust washer **19** on a bedplate.
7. Install the main cam assembly **7** and the worm gear hub on the thrust washer. Lock it by stud **6**.
8. Install the spring **17** on the pin **18**.
9. Install the holder **5**, control spring **4** and tighten the screws **3**.
10. Install the holder **2** and lock it by screws **1**.
11. Turn the hand wheel to check the clearance on the main cam - see section E9, point 5.
12. Switch the machine on and check if the machine stops in the home position - see sections E2, E9.
13. Check the shape of a bar - see section E9
14. Sew a few buttonholes. The shape of a bar must be as shown on picture below.



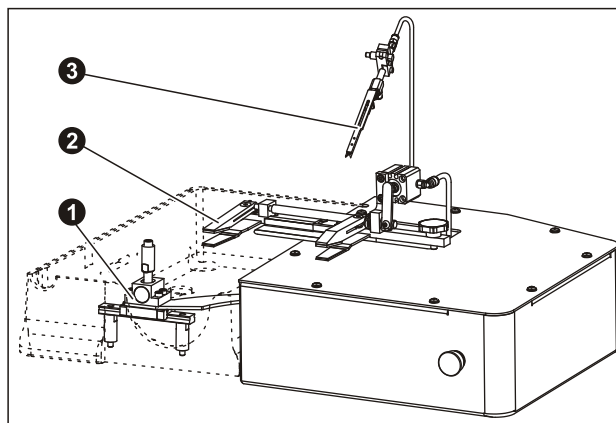
15. If incorrect, tilt the machine head and move the left shifter arm to the left to obtain correct shape of a bar (the clearance between the control spring and the shifter arm spring **21** must approximately be 1.2 - 1.5 mm)



F - INDEXER - STRAIGHT

1. INTRODUCTION

The indexer is used to clamp and feed sleeve wiggans while sewing Imitation Buttonholes. It can be preset to provide a line of buttonholes straight or at an angle with the Wiggan edges. Programs can be set for any number of buttonholes up to 8 within a 63 maximum travel and the space between each is also adjustable. The outside indexer parts are the following mechanisms: Bar movement **1**, Clamping **2** and Thread puller **3**.



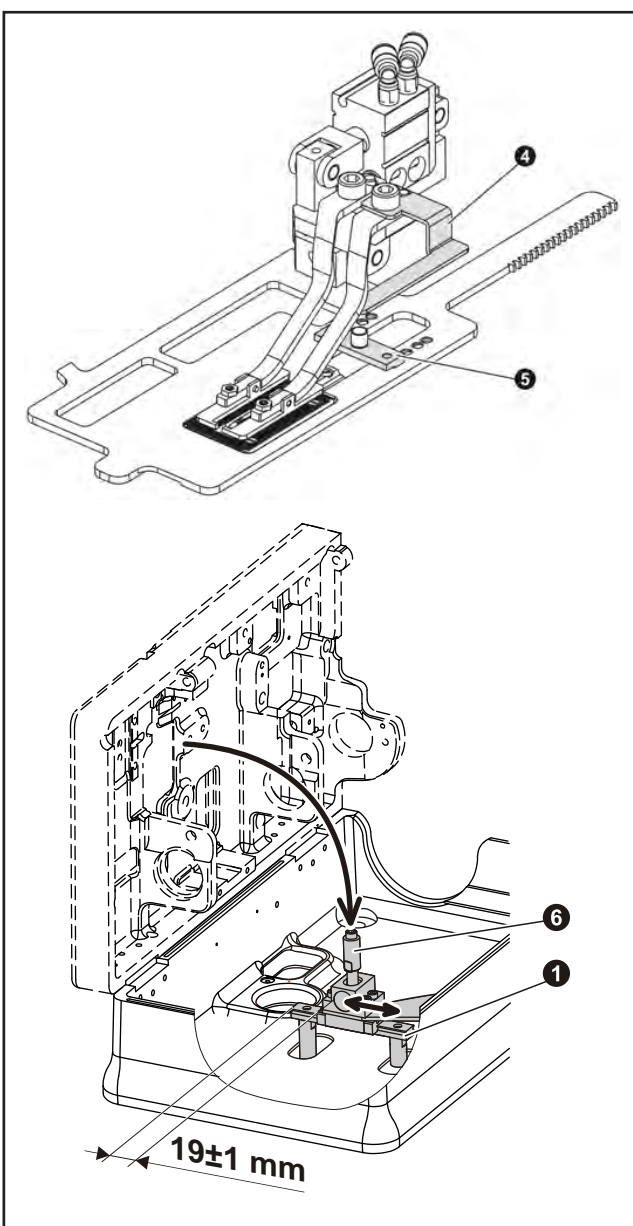
2. SEWING HEAD AND INDEXER CONNECTION

1. Indexer is fixed by the wood screws to the table 24.0107.1.000. The distance between the machine base and the indexer cover is 1mm. The indexer front cover is aligned with the machine base.

2. The indexer clamp feet are installed on the holder **5** and are 22.3036.0.000 locked by the bracket **4** 24.4018.0.000

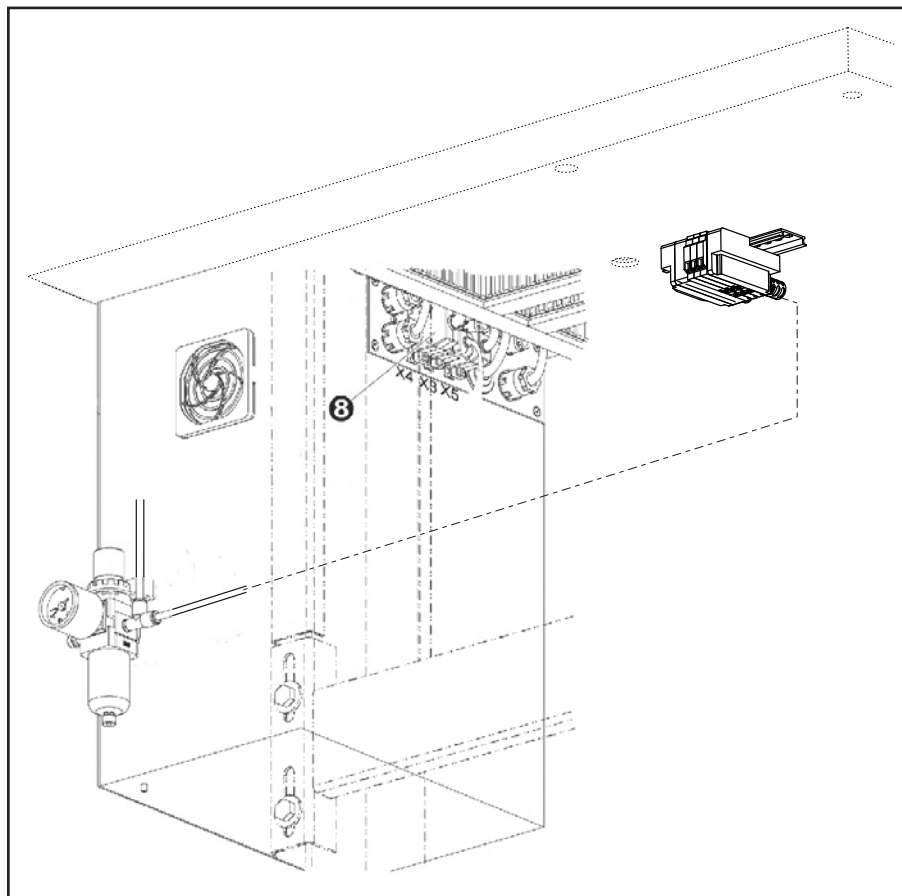
3. Indexer is connected with the sewing cam mechanism by the pin **6**.

To ensure correct return of the sewing head to the working position, keep clearance 8 ± 1 mm as shown on the picture.



F - INDEXER - STRAIGHT

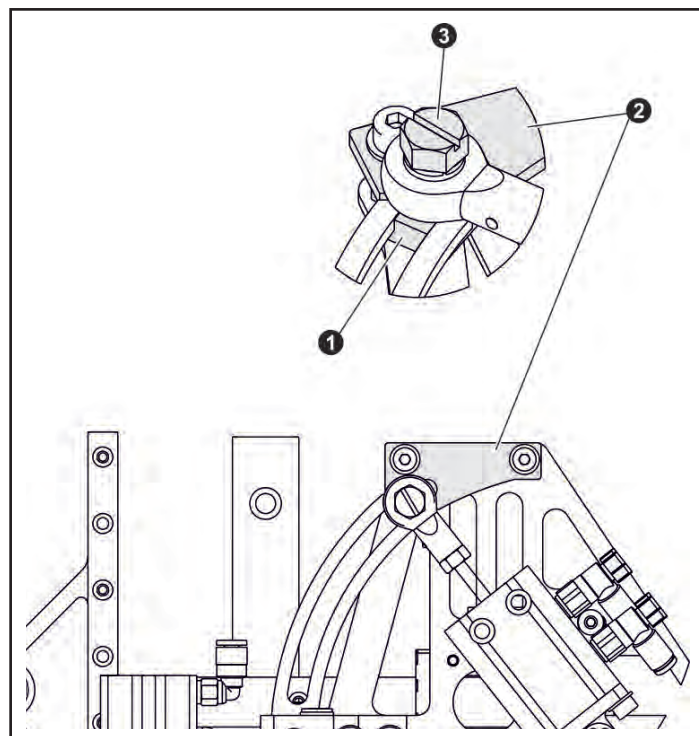
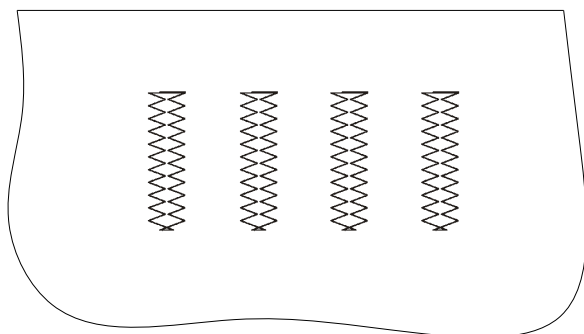
4. The electrical signal for indexer electromagnetical valves (10, 11) is ensured by the connecting cable with cannon conector **8** (X4), which is connected to the rear of the control box.



3. INDEXER FUNCTIONS

The indexer provides for straight sewing of buttonholes.

Straight sewing of buttonholes is ensured by engaging the nut **1** to the slot of the locking lever **2**.



F - INDEXER - STRAIGHT

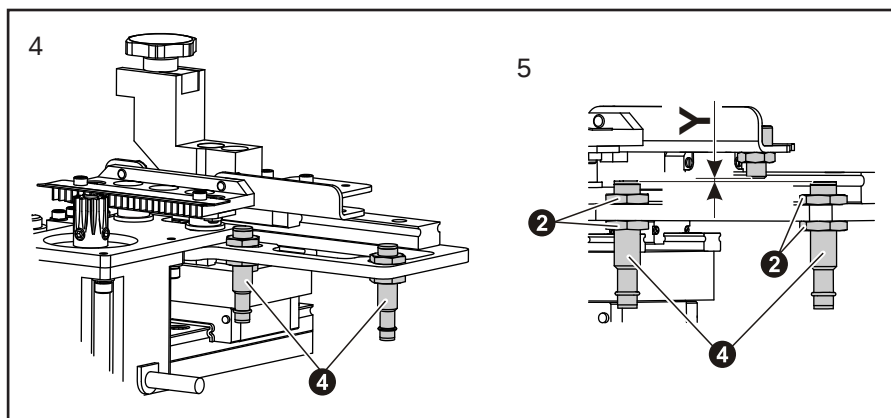
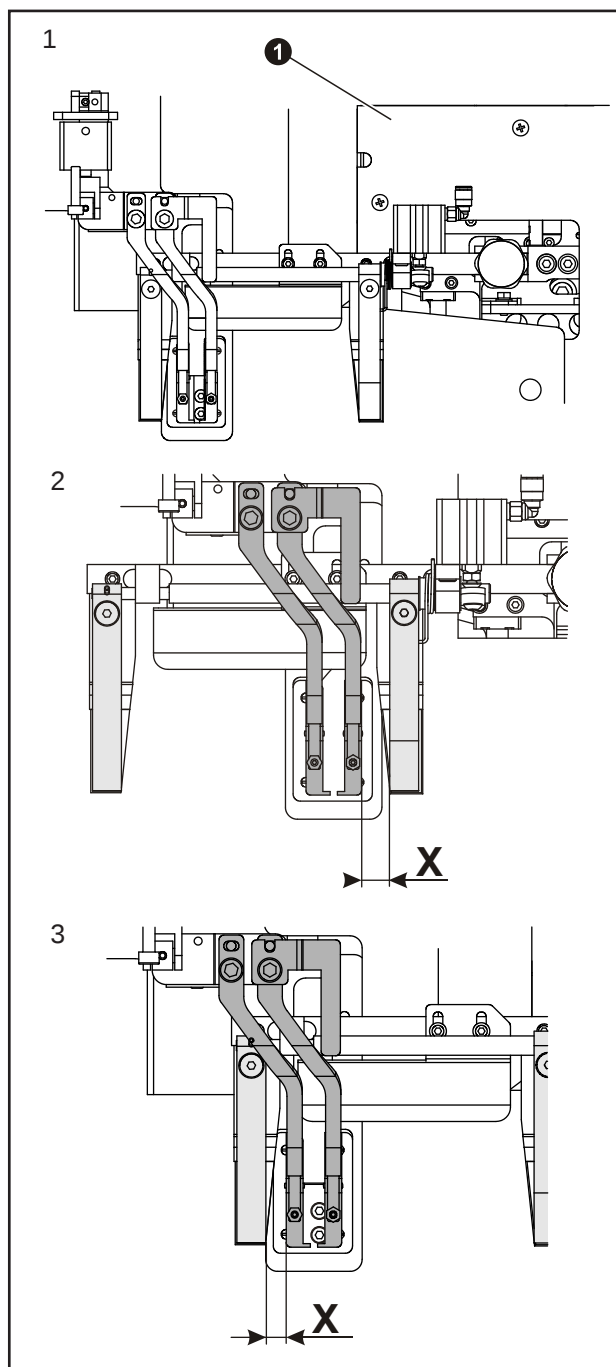
4. ADJUSTMENT OF THE INDEXER CLAMPING FEED MOVEMENT

1. By pressing the key  on the display, check that the distance **X** between the indexer clamping feed and the sewing head clamping feed is the same on both left and right side.

2. If the distance is not the same, do the following:

- a) switch the machine off
- b) tilt the sewing head on the rest pin (see chapter E3) and remove the indexer cover **1**. Bring the sewing head back to its working position.
- c) move the indexer clamping feed to utmost position
- d) loosen the sensor nuts **2** and position the sensors **4** into utmost position to get the same distance of the feet **X** on both sides
- e) adjust the clamping feed **3** by moving the sensors **4** to the left or the right
- f) make sure that the **Y** sensor **4** is also correct. Use the gauge **Y** = 0,3 - 0,5 mm to adjust the gap between the sensor and metal part
- g) switch the machine on
- h) by pressing the key , check that the distance **X** between the clamping feed is the same on both sides

3. To ensure smooth movement of the indexer clamping feed, its speed regulation is very important. The adjustment is done electronically - see chapter D 4B.12



F - INDEXER - STRAIGHT

5. THE INDEXER CLAMPING FEED PRESSURE ADJUSTMENT

1. First place the material under the left clamping feed.



2. Press the . Pull the clamped material and check if the material is held well.
3. Do the same with the right clamping feed.
4. If the pressure is not the same on both clamping feed, follow the below mentioned steps:

The left clamping feed holds the material more than the right one

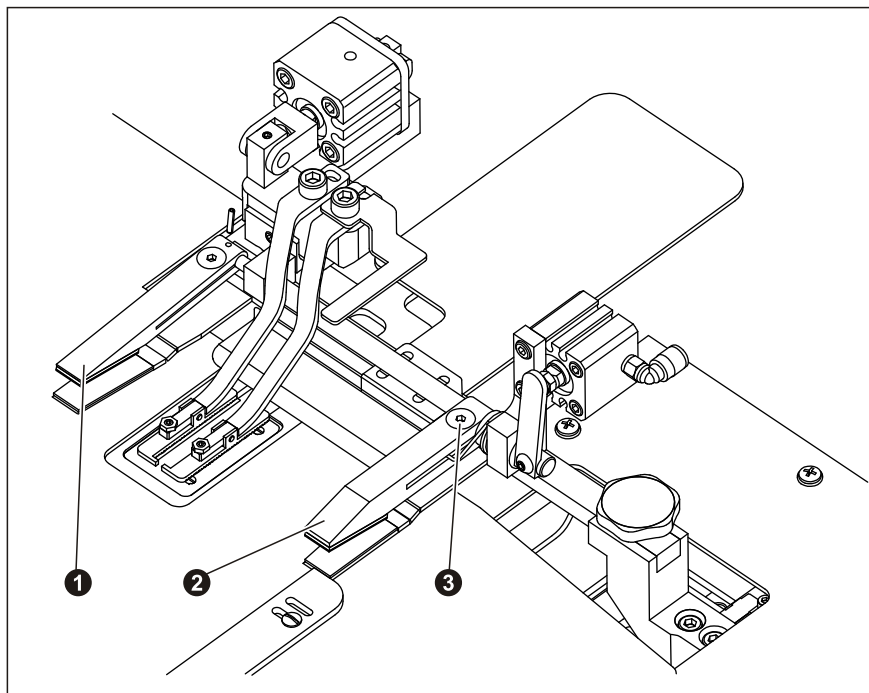
- a) press the left clamping feed **1** by hand down to the clamp mat.
- b) move the right clamping feed **2** closer to the clamp mat by loosening the screw **3** on the right clamping feed
- c) tighten the screw **3** and release the left clamping feed by hand **1**

The left clamp foot holds the material less than the right one

- a) press the left clamping feed by hand down to the clamp mat.
- b) move the right clamping feed back from the clamp mat by loosening the screw on the right clamping feed
- c) tighten the screw and release the left clamping feed by hand

Check the correction of the adjustment according to the points 1-4.

NOTE: Since the clamp cylinder is closer to the right clamping feed, it is necessary to set the stronger pressure on the left clamping feed.

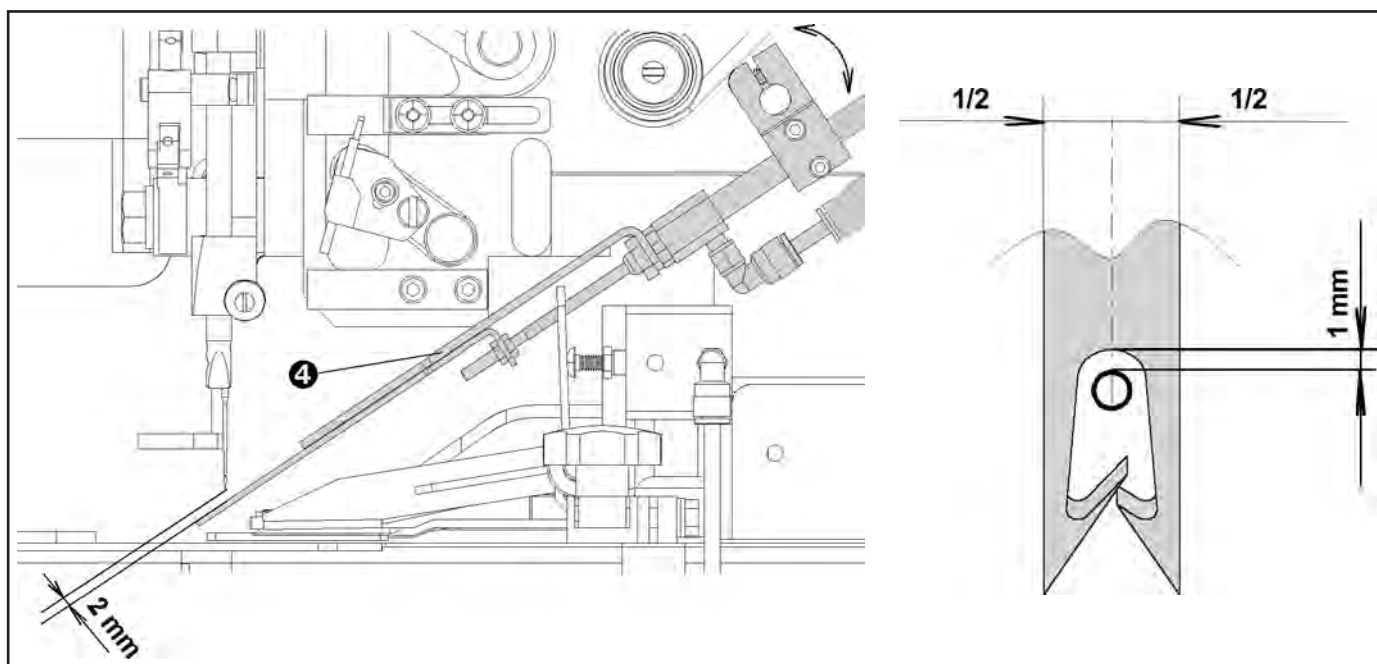
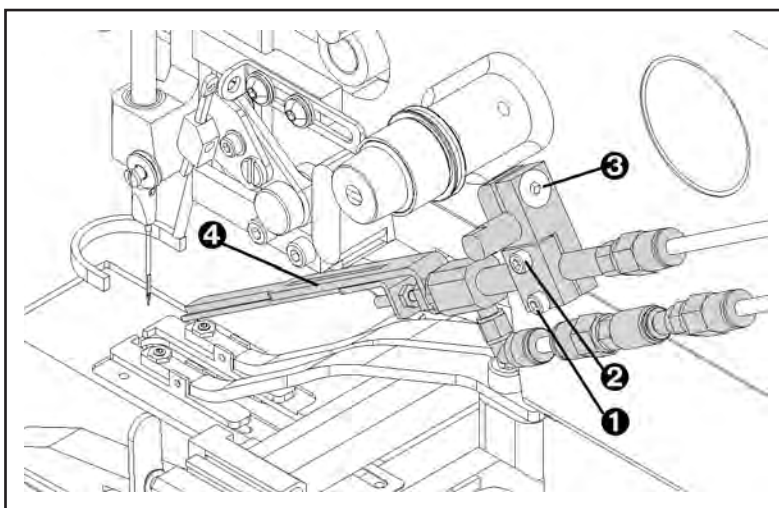


F - INDEXER - STRAIGHT

6. THREAD PICK-UP ADJUSTMENT

If the thread is not caught and held after trimming it is necessary to adjust the thread pick-up.

1. The machine must be in the home position.
2. Disconnect the air tubes of the thread puller.
3. Loosen the screws **1**, **2**, **3**.
4. Manually extend the cylinder **4**.
5. Adjust the thread puller position to obtain the distance 2 mm between the needle tip and the thread puller and at the same time to have the needle in the centre of the thread puller slot. Tighten the screw **3**.
6. Move the thread puller assembly so that the distance between the needle and the end of the slot is approximately 1 mm. Tighten the screws **1**, **2**.
7. Connect the thread puller air tubes and check the adjustment.



F - INDEXER - ANGLE 20°

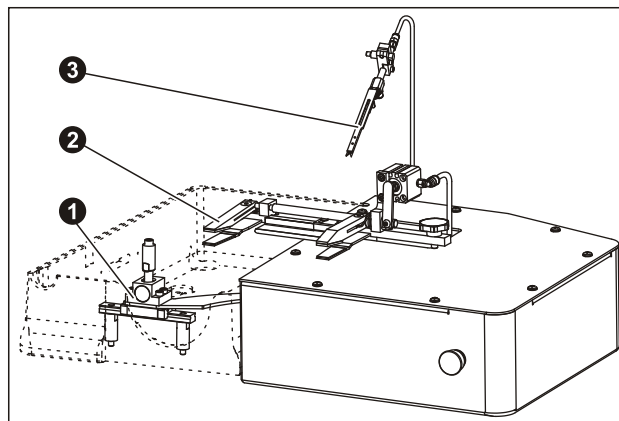
1. INTRODUCTION

Indexer – Angle 20° is an additional device that allows automatic sewing of decorative holes with programming a number of holes and their distance. This type also allows angle positioning of decorative holes. As external parts of the indexer, there are mechanisms of bar-tack move **1**, clamping **2** and pulling up threads **3**. Accurate positioning of the indexer is ensured by the position sensor and the step motor.

Indexer Range:

Number of holes: 1-8

Angle of orientation: 0°, 6° - 20°



2. INTERCONNECTION OF THE SEWING HEAD AND THE INDEXER

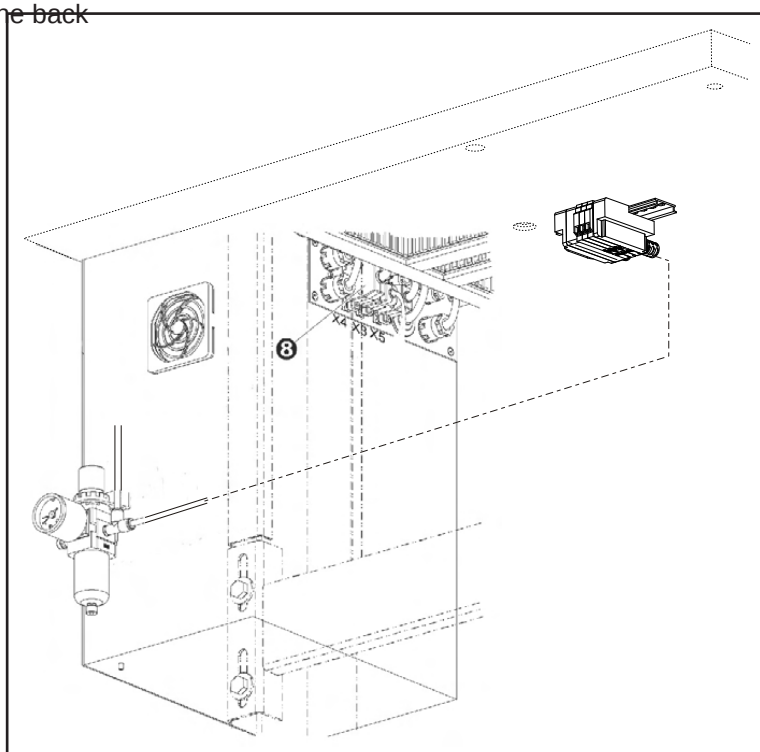
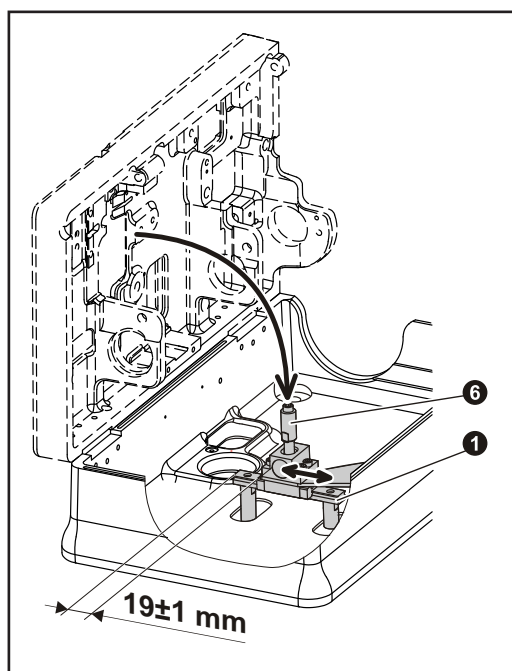
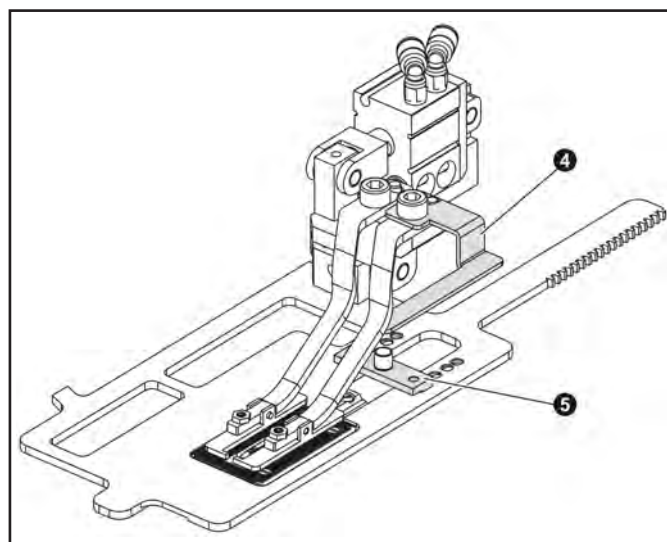
1. The indexer is fixed to the table (24.0107.1.000) by wood screws so that the distance between the sewing machine base and the indexer cover is 1 mm. The front of the indexer is in one level with the sewing machine base.

2. The indexer clamps are fixed to the holder **5** 24.4103.0.000 and are secured by the holder **4** 24.4018.1.000.

3. The indexer is connected to the mechanism of the sewing cam by a pin **6**.

4. For easy tilting of the head into the basic position, the distance between the base and the rail should be 19 +/- 1 mm.

5. The connection of electric signal for the indexer electromagnetic vents (10, 11, 12) is provided by a connecting cable **7** X4 06.2400.0.904, that is connected to the back side of the rack.



F - INDEXER - ANGLE 20°

3. INDEXER FUNCTIONS

The indexer enables sewing of holes both with cross move of the clamping feet and angle move.

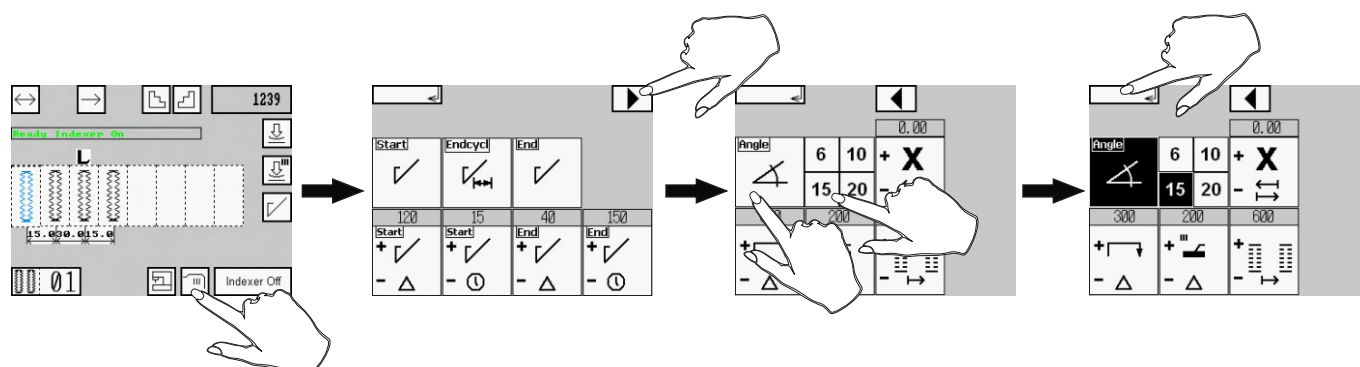
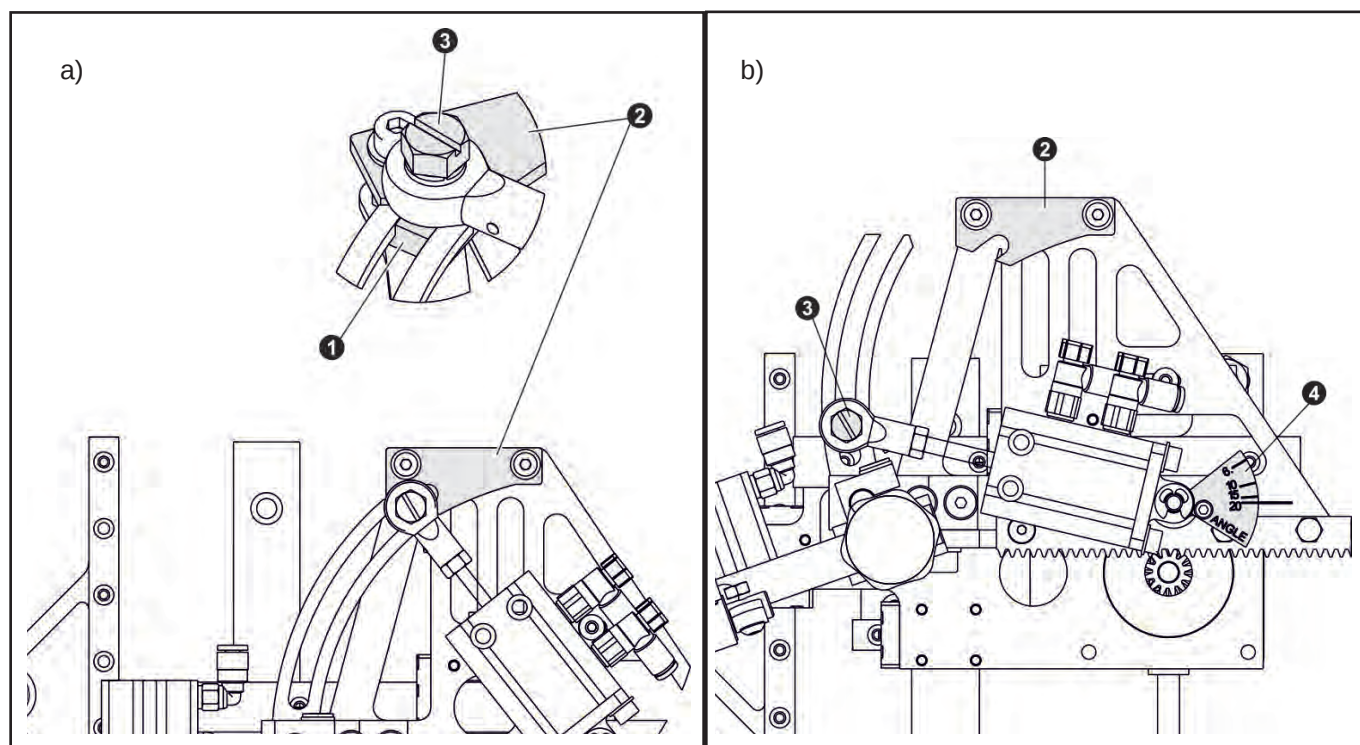
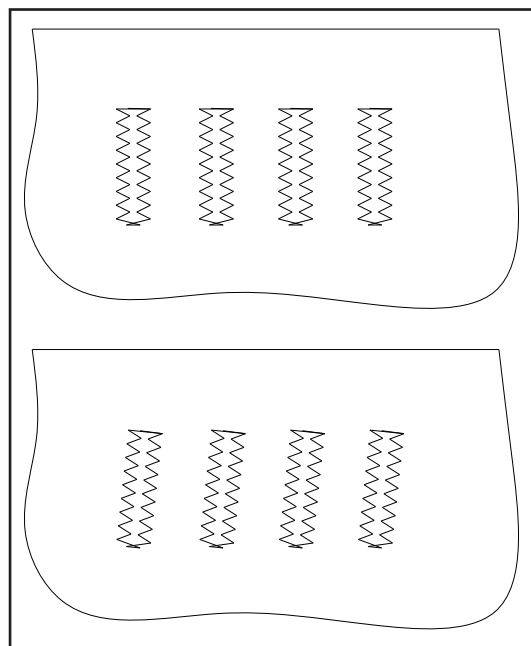
a) Sewing with cross move is ensured by the sliding nut **1** that clicks into the slot of the locking clamp **2**.

b) When sewing with angle turning, loosen the screw **3** and move the nut **1** to the left. Set the requested angle, using the ruler **4**. The clamping feet are then released **5**. Maximum turning to the side is 20°. The parameter "Angle" in the "Indexer" menu must be activated. Set the required angle on the display using the angle value shown on the ruler **4**.

Possibilities: 6°, 10°, 15° and 20°. If the required angle value is outside the range of these parameters, use the closest value given:

Example:

The angle set on the ruler is 13°. The given settings on the display are 10° or 15°. Thus the closer value is 15° and this is the value that you set on the display.



F - INDEXER - ANGLE 20°

4. ADJUSTMENT OF THE CLAMPING FEET SHOULDER SIDE MOVE

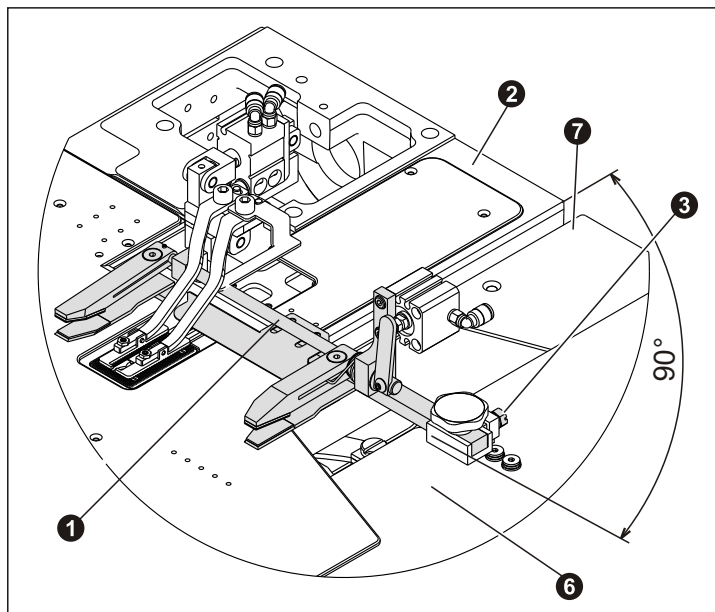
a) Setting of the basic position

Do the setting while the air supply is disconnected and the clamping feet are in a position for cross move of the material – see F3, section a.

Check if the shoulder **1** of the clamping feet is in a 90° position to the casting of the base plate **2**. If this is not the situation, then loosen screw **3** and turn the shoulder **1** of the clamping feet into the required position. Tighten the screw **3**.

b) Adjustment of fluent move of the clamping feet

Rebuild the indexer for sewing with angle move of the material – F3, section b. Keep removed the cover sheet **6** and the top cover **7** of the indexer. Connect the air supply and switch the machine on by turning the switch into the position I on the box. Activate the indexer switch on the display of the main screen into the position "Indexer On".



Check the fluency of the indexer clamps turn-

ing by pressing the buttons  .

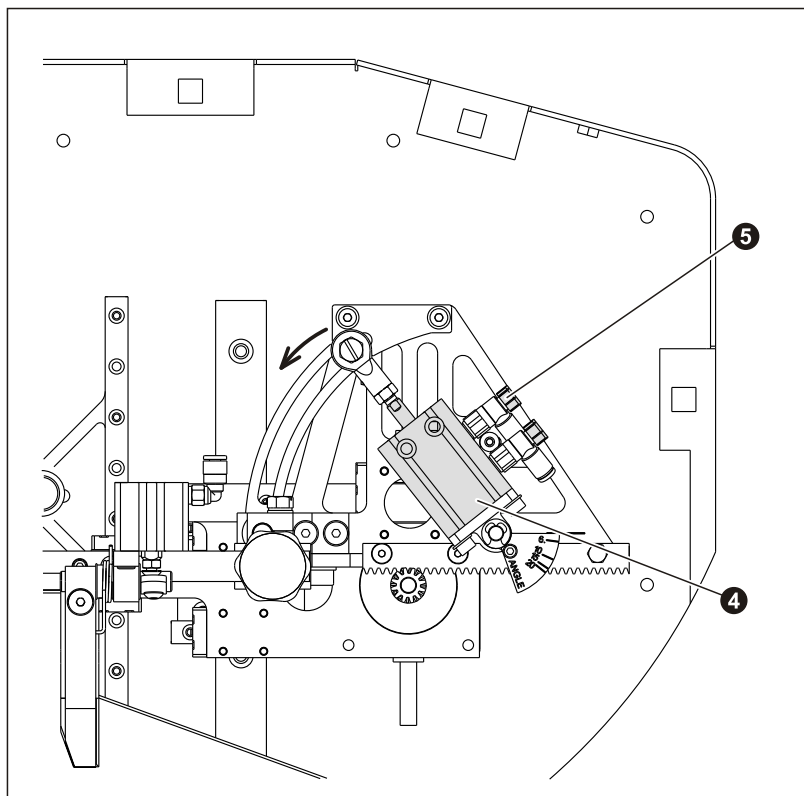
The clamp turning is controlled by a pneumatic cylinder **4**. To maintain correct function of the clamps turning, it is important to regulate the air flow that comes into the valve. If the air flow is too big, the movements of the clamp fixing mechanism are torn (fitful).

To achieve a reduction of the impacts in the valve, proceed as follows:

- Slide the adjustment screw **5** of the throttle vent.
-  turn it clockwise as needed - the speed of the cylinder rod slows down – a smoother motion is reached.
- Check the fluency of the clamping feet

turning by pressing buttons  .

To reach an optimal function, repeat the procedure several times, and then cover up the indexer.



F - INDEXER - ANGLE 20°

5. ADJUSTMENT OF THE MOVE OF THE CLAMPING FEET SHOULDER

The clamping feet of the indexer must be rebuilt into the position for angle move of the material. The angle must be 20°. If this is not the situation, take off the cover and disconnect the air supply. Press the "Emergency Stop" button. Activate the indexer for 20° angle.

Proceed as follows:

Display

a) Main screen → press 

b) Next screen → press 

c) Next screen → press  then

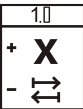
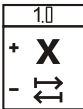


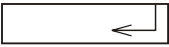
The correction of the basic position of the indexer clamps has to be set to "0" value.

Display

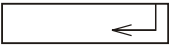
a) Main screen → press 

b) Next screen → press 

c) Next screen → press  → Enter password: 5632 → ENT →  → set 0.

→  Return to the main screen.

Set the shoulder **1** of the clamping feet to 20° angle – see F3, section b.

Connect the air supply and release the "Emergency Stop" button, press  on the display. The machine is thus set into the basic position.

Press buttons   and check the distance X1, X2. Applies X1 = X2. If this is not the situation, change the position of the shutter **2**. Loosen screws **3** and move shutter **2** as needed.

$$X_1 > X_2$$

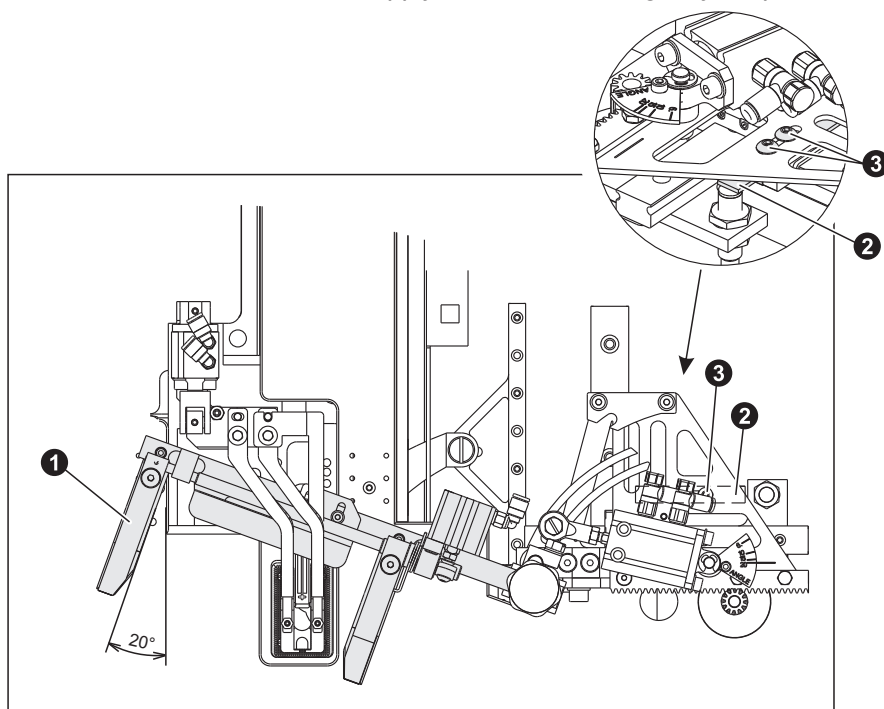
$$X_1 < X_2$$



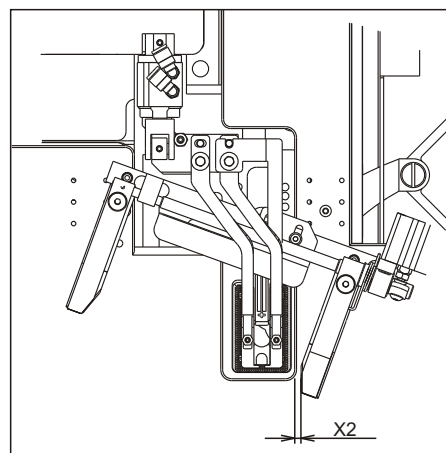
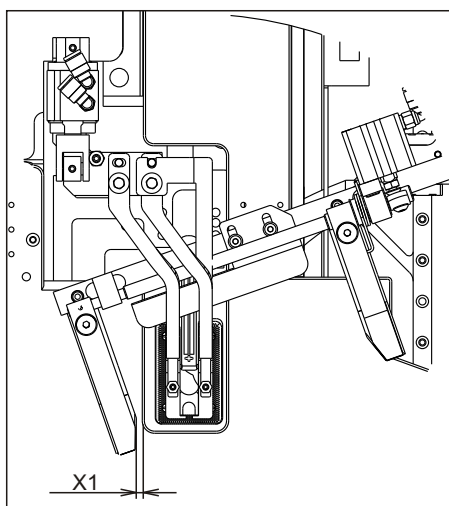
→ direction of shutter move



← direction of shutter move



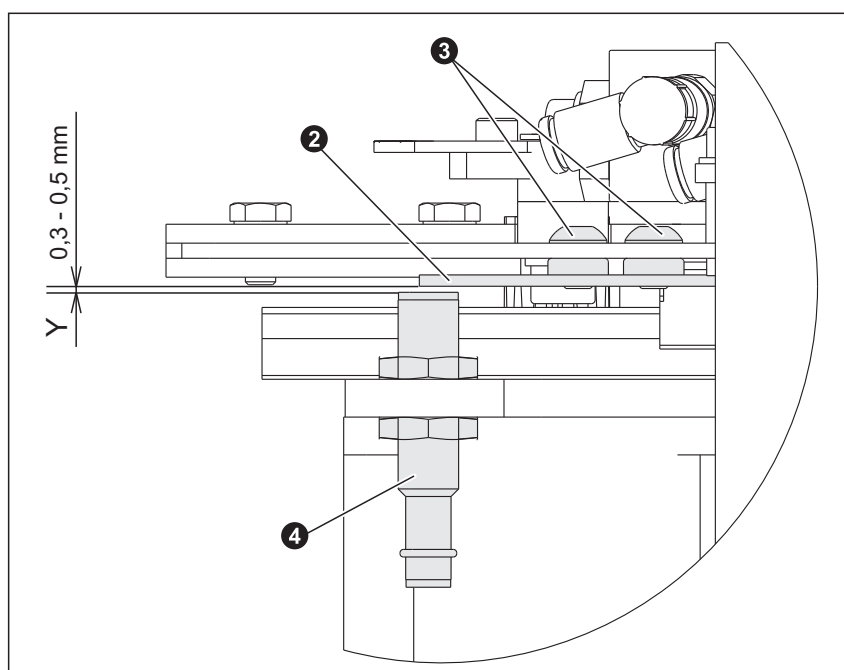
F - INDEXER - ANGLE 20°



Tighten screws **3**.

Press the button **Indexer Off** and **Indexer On** on the display of the main screen. Thus the indexer is set into the basic position. Check the distance X1, X2 by pressing buttons **←** **→**. If needed, repeat the whole procedure several times.

Pay attention to the correct height settings of the Y sensor. Set the gap Y using the gauge Y = 0,3 to 0,5 mm.



F - INDEXER - ANGLE 20°

6. SETTING OF THE INDEXER CLAMPING FEET DOWN FORCE

1. First put the material under the left fixing clamp.



2. Press the clamps button on the display. Pull the fixed material and find out if the material is well-held.
3. Do the same with the right fixing clamp.
4. If you find out that the down pressure is not the same for both clamps, proceed as follows:

Left fixing clamp holds the material more than the right one

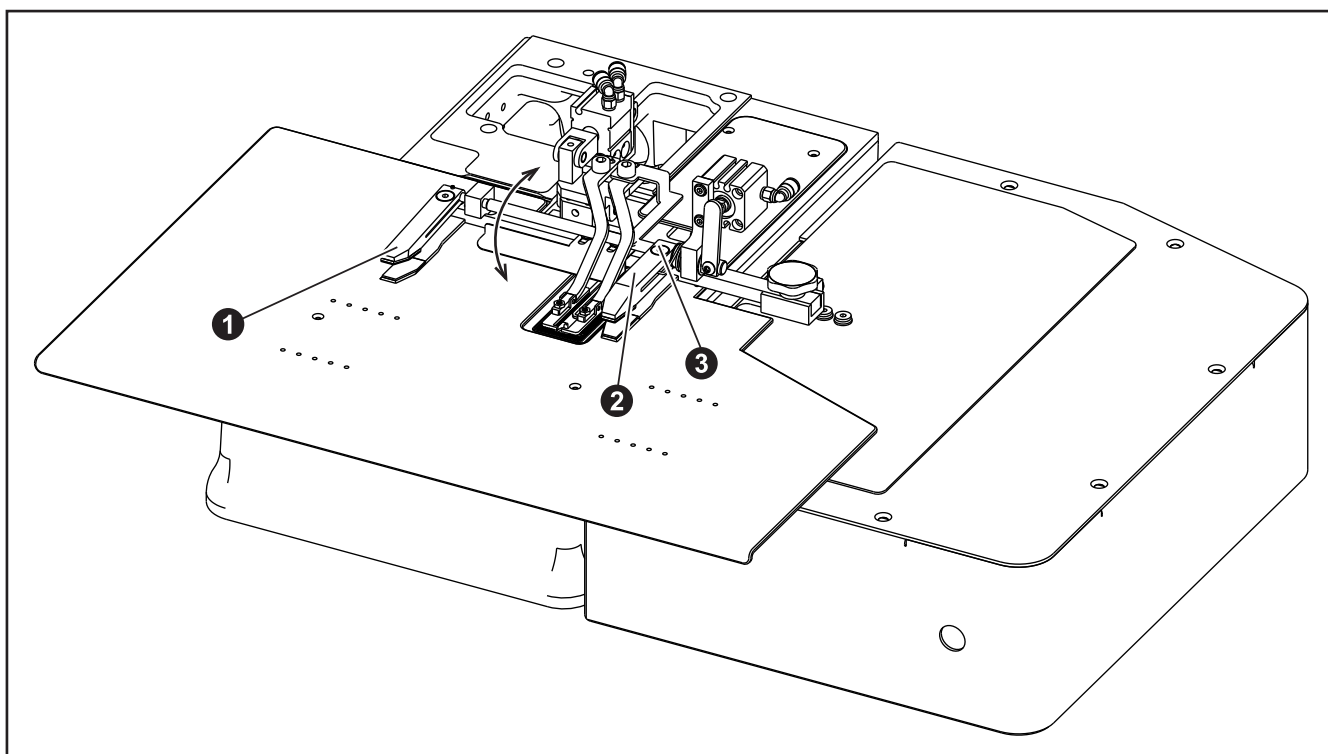
- a) Manually press the left fixing clamp ① as far as the clamping pad
- b) By loosening the screw ③ on the right fixing clamp bring the right fixing clamp ② to the fixing pad.
- c) Tighten the screw ③ and manually release the left fixing clamp ①;

Left fixing clamp holds the material less than the right one

- a) Manually press the left fixing clamp (1) as far as the clamping pad
- b) By loosening the screw on the right fixing clamp turning away the right fixing clamp from the fixing pad.
- c) Tighten the screw and manually release the left fixing clamp

Check the correct adjustment as shown in paragraphs 1 – 4.

NOTE: As the fixing cylinder is closer to the right fixing clamp, it is necessary to set the down pressure on the left fixing clamp with a preload.



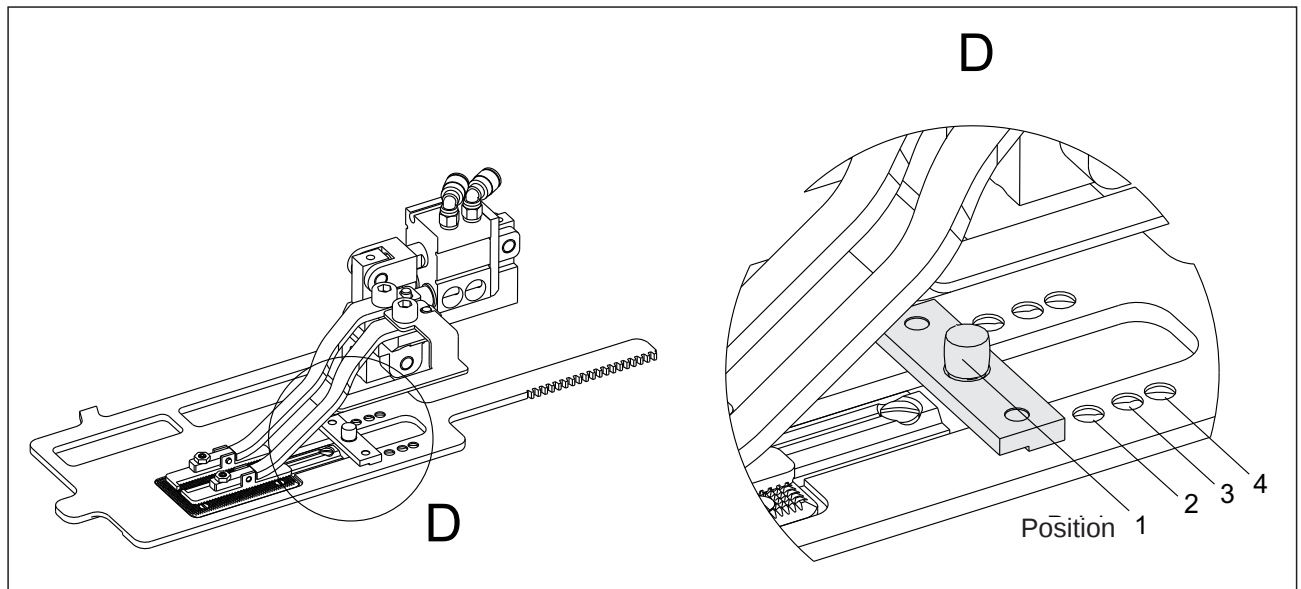
F - INDEXER - ANGLE 20°

7. SETTING THE DISTANCE BETWEEN THE HOLE AND THE EDGE OF THE MATERIAL

This machine allows for mechanical adjustment of the indexer clamps, this is the distance between the decorative hole and the edge of material.

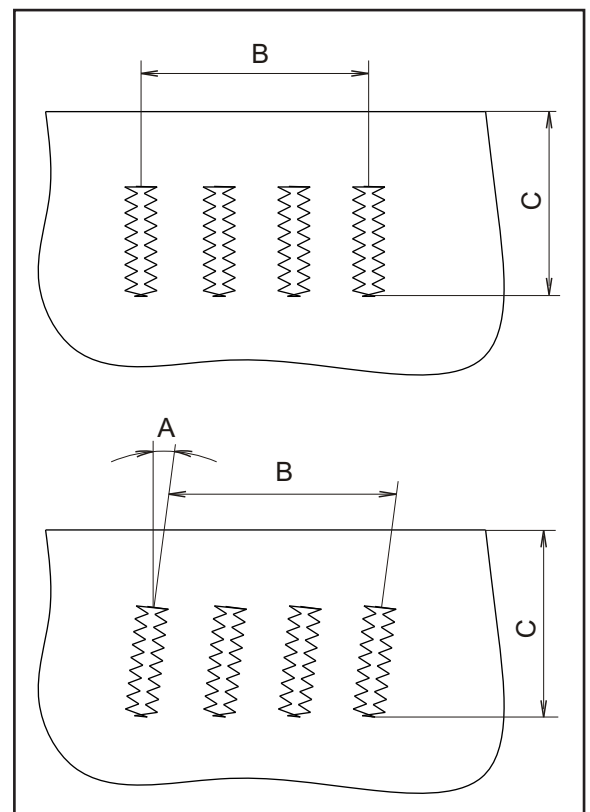
This distance is mainly limited by the angle of the indexer clamping feet turning.

There are 4 basic positions. The machine in the basic version is in position 1.



The chart shows a distance from the edge of the hole in dependence on the clamp turning angle. The given values are relevant to 20 mm holes.

Position	Indexer Angle (A)	Max. Length (B)	Length (C)
1	0°	73 mm	48 mm
	6°	65 mm	48 mm
	10°	63 mm	48 mm
	15°	54 mm	47 mm
	20°	51 mm	46 mm
2	0°	73 mm	59 mm
	6°	65 mm	59 mm
	10°	63 mm	59 mm
3	0°	73 mm	65 mm
	6°	65 mm	65 mm
4	0°	73 mm	70 mm



F - INDEXER - ANGLE 20°

8. CHANGE OF POSITION OF INDEXER CLAMPS MOVE

Turning element **1** of the indexer clamps is positioned on the mechanism **2** of the clamping feet of the sewing head. To change its position it is necessary to demount the clamps.

Press the button "Emergency Stop" and disconnect the air supply.

Loosen the screw **3** and take off the indexer fixing **4** clamps.

Loosen screws **5** and take out the stainless steel cover plate **6** of the sewing head.

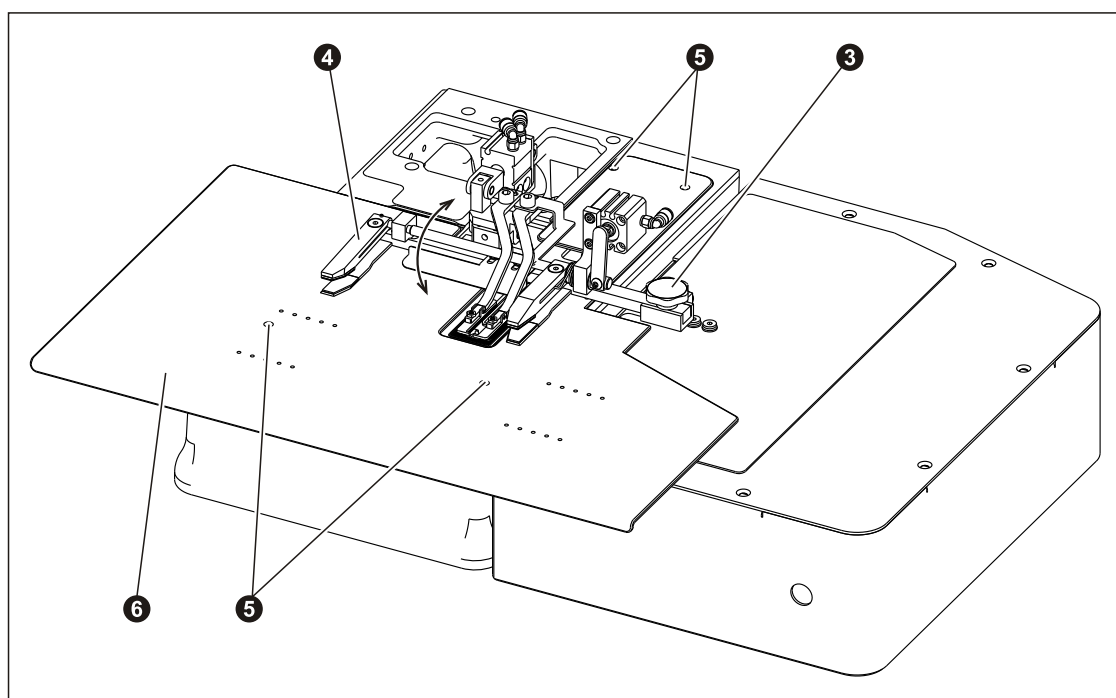
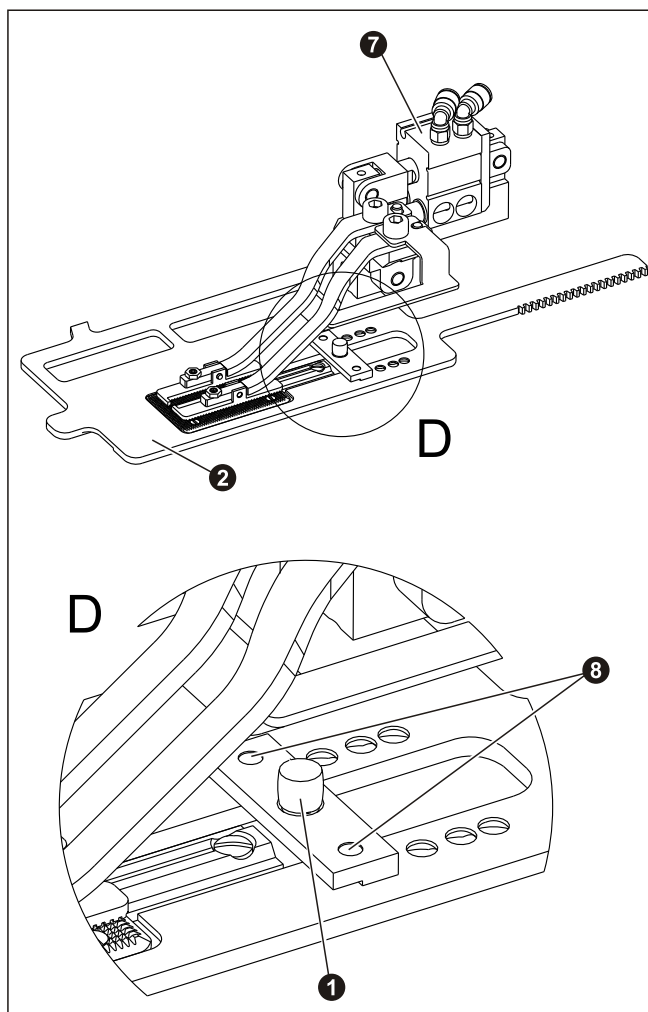
Take out the mechanism **2** of the clamping feet of the sewing head. Disconnect the lines to the cylinder **7**. Loosen screws **8** and turn the turning element **1** into the required position. Secure its position by screws **8**.

Connect the air supply lines into the cylinder **7** and put the mechanism **2** of the clamping feet back to the sewing head.

Return the stainless steel cover **6** and secure it by screws **5**.

Mount the indexer clamping feet **4** and secure them by the screw **3**.

Connect the air supply and release the button "Emergency Stop". Press the button "Indexer On/Of" on the display of the main screen and then the machine is set up for its use.



NOTE:

For position 3, 4 it is possible to use prolonged clamping feet that provides better material fixing:
Clamping Mat Left 24.4006.1.000, Clamping Mat Right 24.4007.1.000, Clamp Foot Left 24.4015.1.000.

G - MACHINE MAINTENANCE

Warning:

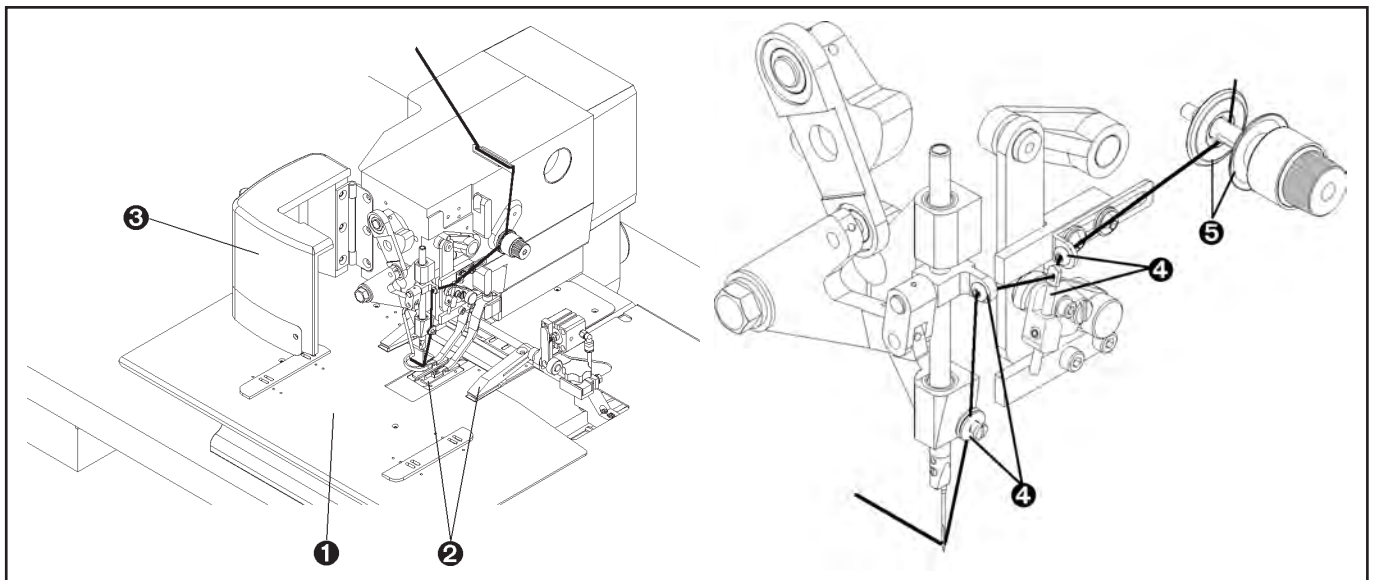
- Check for damage to electrical cables
- Check safety covers for damage and replace if needed immediately
- Keep your hands out of the sewing area
- Do not modify the machine in any way, which could eliminate safety parts
- Do not attach external lights or other devices to the machine's electrical system

Caution:

- Do not neglect periodic maintenance.
- If you have fault in electrical power supply, switch off the operating switch (circuit breaker).
- Do not damage, correct and remove safety labels.
- Do not work with the machine when you are under the influence of the drugs or alcohol.
- User has to ensure the lighting of the working area minimal 750 Luxes.

1. MACHINE CLEANING AND MAINTENANCE

1. Switch the power off and disconnect air supply.
2. For cleaning and oiling, remove the cover **1** and take out the clamp feet mechanism **2**. Clean the clamping area from the fabric and thread lints.
3. Open the needle bar cover **3** and clean the thread lints from the guides **4** and thread tension **5**.
4. Clean the thread lints and fabric from the sewing area - throat plate, loopers.
5. Lubricate the machine according to the section G 4.



G - MACHINE MAINTENANCE

6. Remove the filter cover **6** with cleaning pad **7**.
Remove the dust from the cleaning pad or in case of considerable dirt, wash it using a mild detergent.

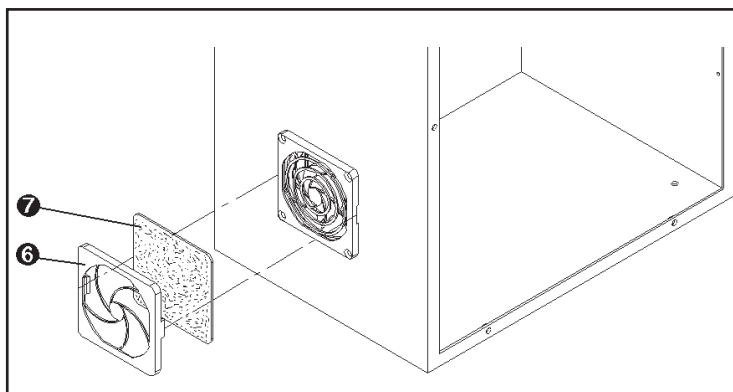
Perform the same cleaning on the rear fan .

7. The filter and regulator maintenance

Bowl assembly - polycarbonate bowls may be damaged and possibly fail if exposed to synthetic oils, thinner solvents, trichlorethylene, kerosene and other aromatic hydrocarbons. Clean only with a neutral detergent.

Auto drain - Drain line length should be shorter

than 5 m. Be sure not to have any upward turns in the drain line which would prevent drainage.



If the unit has no function it is necessary to:

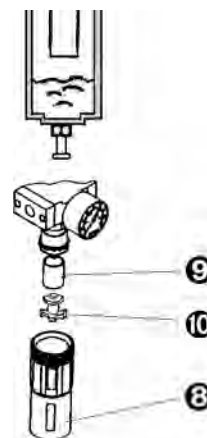
- check if the supplied pressure is higher than the set pressure of the regulator
- check if the valve assembly is clean
- check the membrane or spring because of damage
- check if the air flow direction is correct

Change of the filter element

Conditions

- low flow rate
- high pressure drop
- when the pressure drops to 0.7 bar
- filter element change after one year (in case it has not been changed)

- unscrew the polycarbonate bowl **8**
- take the filter element out **9** with baffle **10**
- change old filter element with new one
- fit the baffle **10** into new filter element **9** and place them both back
- place the polycarbonate bowl back



8. Check the mechanisms especially in the sewing area by sight.

9. When the maintenance and checking are finished, insert the clamp feet mechanism to the machine.

G - MACHINE MAINTENANCE

2. PERIODIC MAINTENANCE

once a day (8 hours of operation)

- cleaning of the sewing mechanism area and inner frame of the machine
- lubrication of mechanisms - see area F4.

once a week (40 hours of operation)

- visual check - external and internal mechanisms
- fill oil into reservoir with oil level indicator, or sooner if required

once a month (160 hours of operation)- check of the clearance in sewing mechanism drive

- check of the screw connections tightening (obtain values below)
- check of condensate in regulator
- check of dirty of cleaning pads in control box

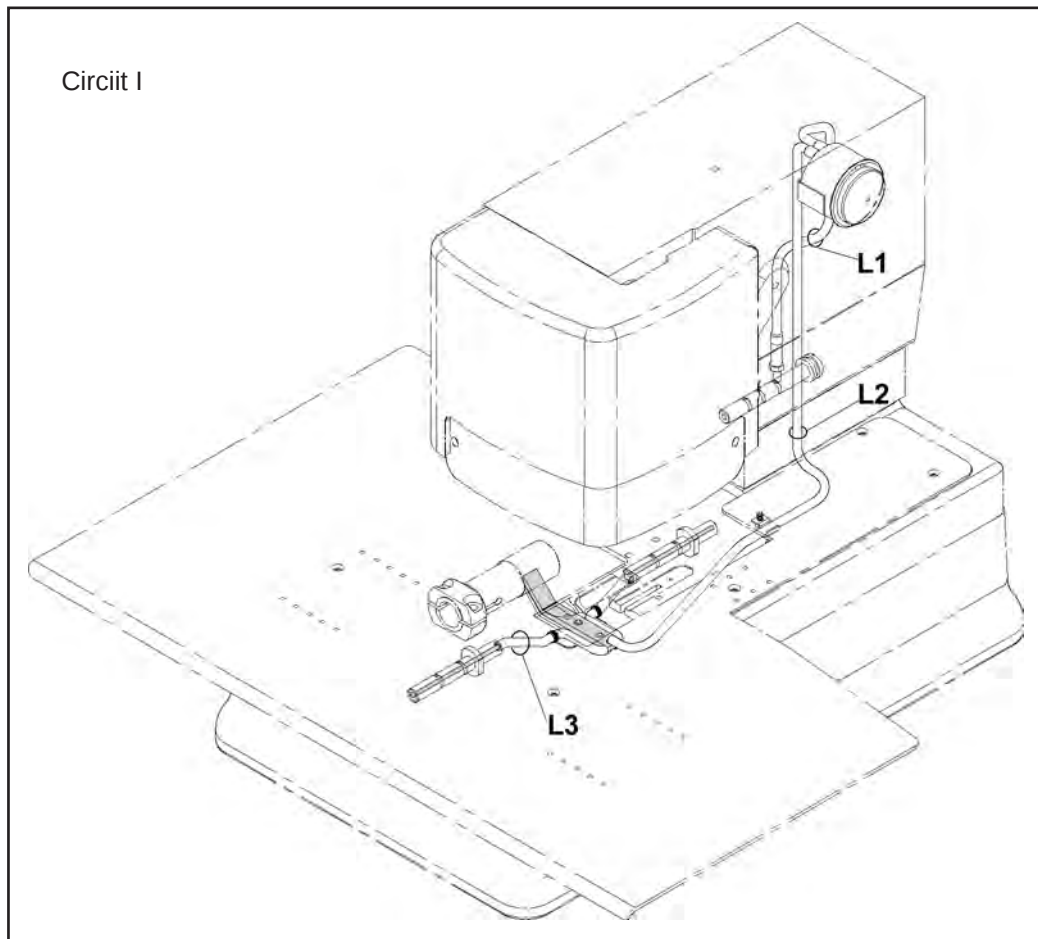
Recommended values for screws tightening (Nm):			
			
M3	0,5	0,6	0,8
M4	1,2	1,5	2,0
M5	2,5	3,0	4,0
M6	4,0	5,0	7,0
M8		8,0	16,0
M10		10,0	30,0

G - MACHINE MAINTENANCE

3. LUBRICATION DIAGRAM

The machine is mostly equipped with needle and ball bearings, which in combination with single lubrication circuit decrease the requirements for maintenance.

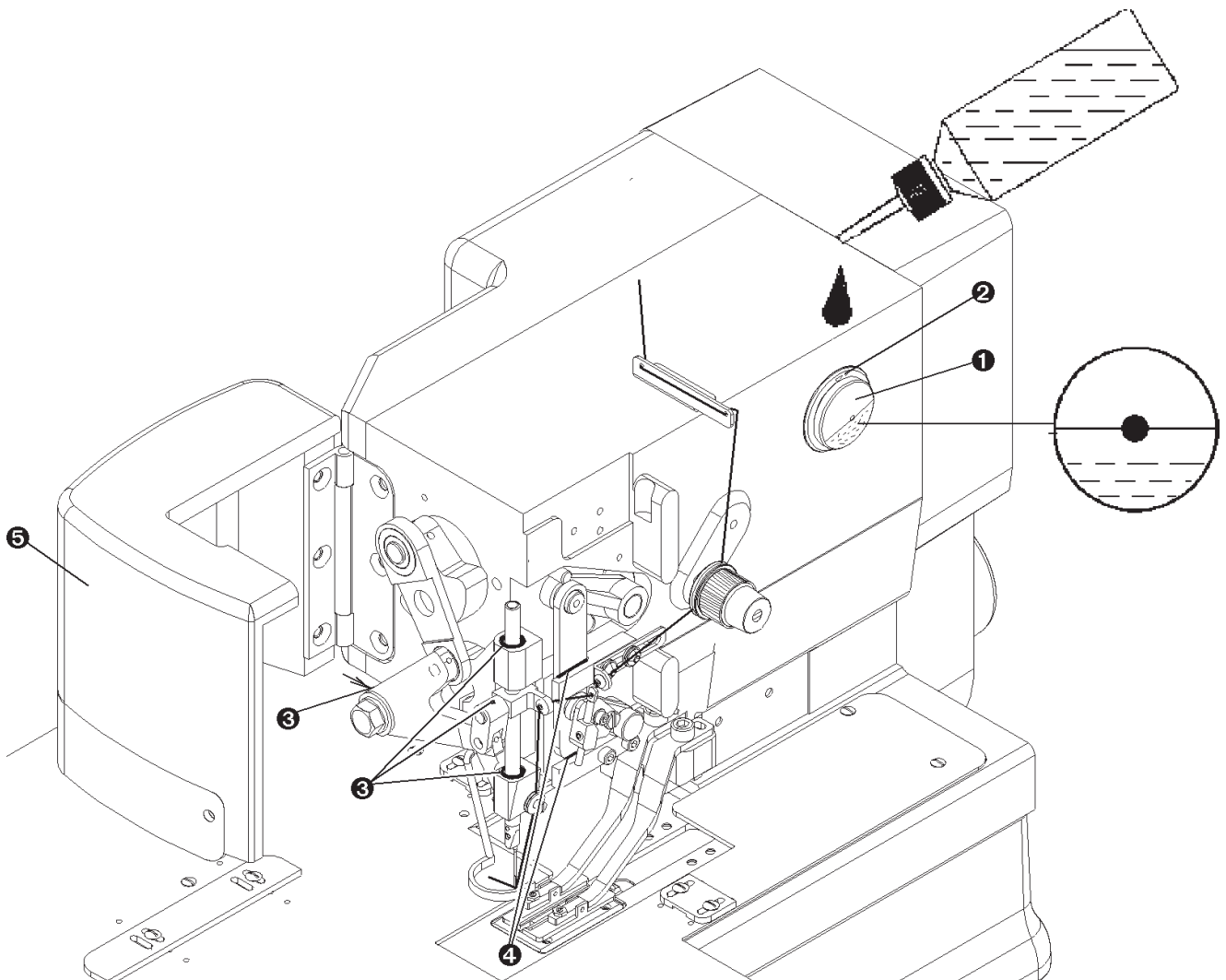
Circuit I - with the oil supply in oil indicator for lubrication of the bite, feeding and looper levers and worm gears. In case of replacement of any part of distribution, it is possible to order the tube kits and wicks. To connect the tubes - see picture.



G - MACHINE MAINTENANCE

4. MACHINE LUBRICATION

1. It is necessary to lubricate the places shown below before the machine is switched on for the first time or after a long idle period. Use oil ESSO TERESSO 32 or similar quality.
2. The amount of oil in the reservoir **1** is indicated by the red mark. Too much oil may cause its overflowing from the base area.
3. The reservoir is fitted through the hole **2** in front of the gage.
4. The points for lubrication of the needle bar mechanism **3** and draw-off mechanism **4** are shown in the illustration below (after opening the needle bar cover **5**). Lubricate the main cam worm gear through the hole **6**. Lubricate all of these points every 8 hours.



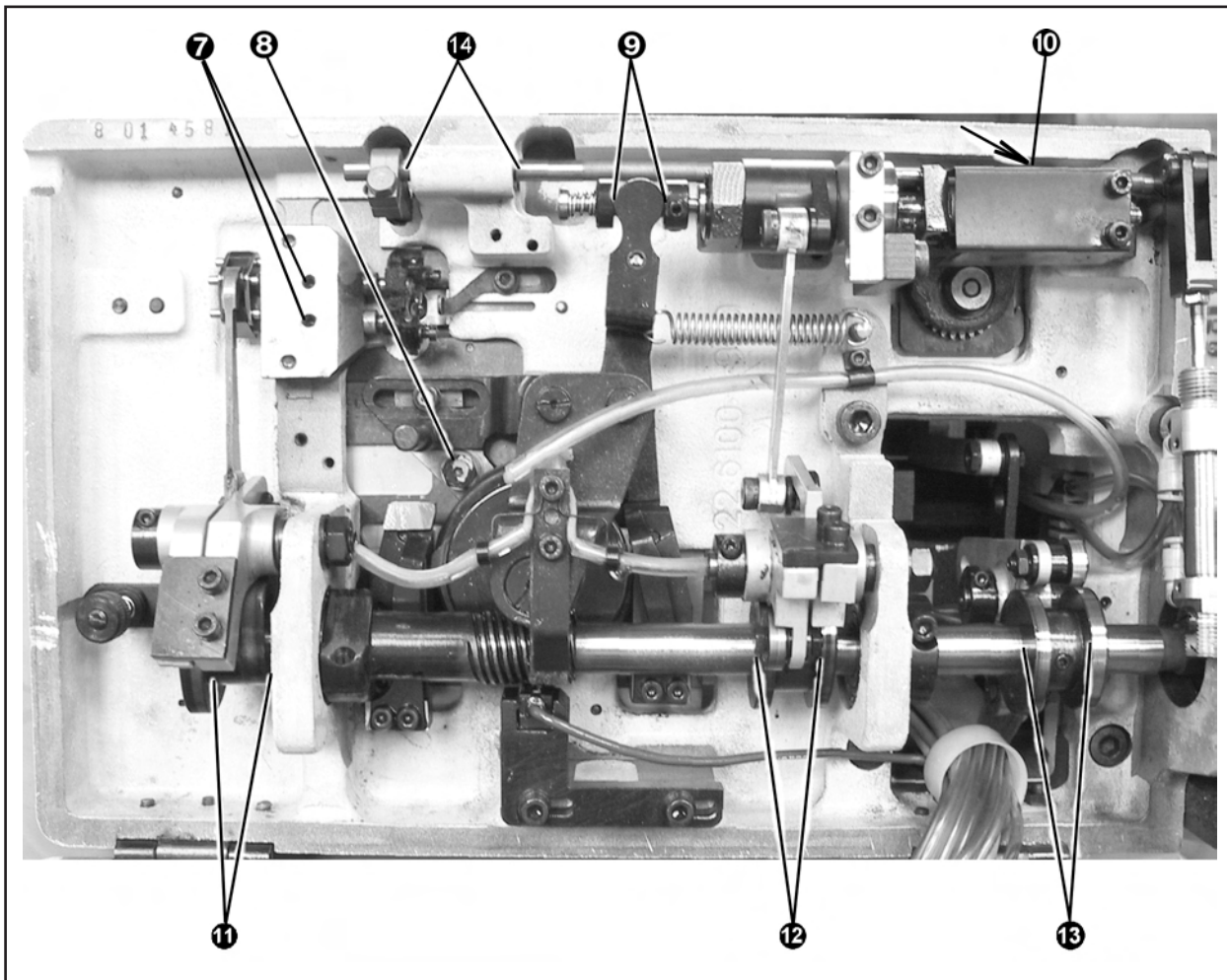
G - MACHINE MAINTENANCE

5. Tilt the machine head on the rest pin and lubricate the places shown in the picture.

- | | |
|-----------------|-----------------------|
| ⑦ looper shafts | ⑪ looper cam surfaces |
| ⑧ roller | ⑫ feed cam surfaces |
| ⑨ shifter | ⑬ bite cam surfaces |
| ⑩ bevel gears | ⑭ trimmer shaft |

Tilt the sewing head back into the sewing position.

6. After lubrication it is important to sew minimum 10 buttonholes on scrap fabric to dispel any excess oil. Wipe all visible excess oil from the mechanism in the work area.



G - MACHINE MAINTENANCE

5. MACHINE DISPOSAL

1. To ensure machine ecological disposal, it is necessary to remove nonmetallic parts from the machine. To take these parts out, it is necessary to perform the partial dismantling of the machine, remove covers, dismantle the machine arm and remove the frame.
2. Aluminium and duralumin parts must be treated separately, also nonferrous metal parts and plastic parts.
3. Parts mentioned in point 2 can be found in the spare parts manual with these marks:

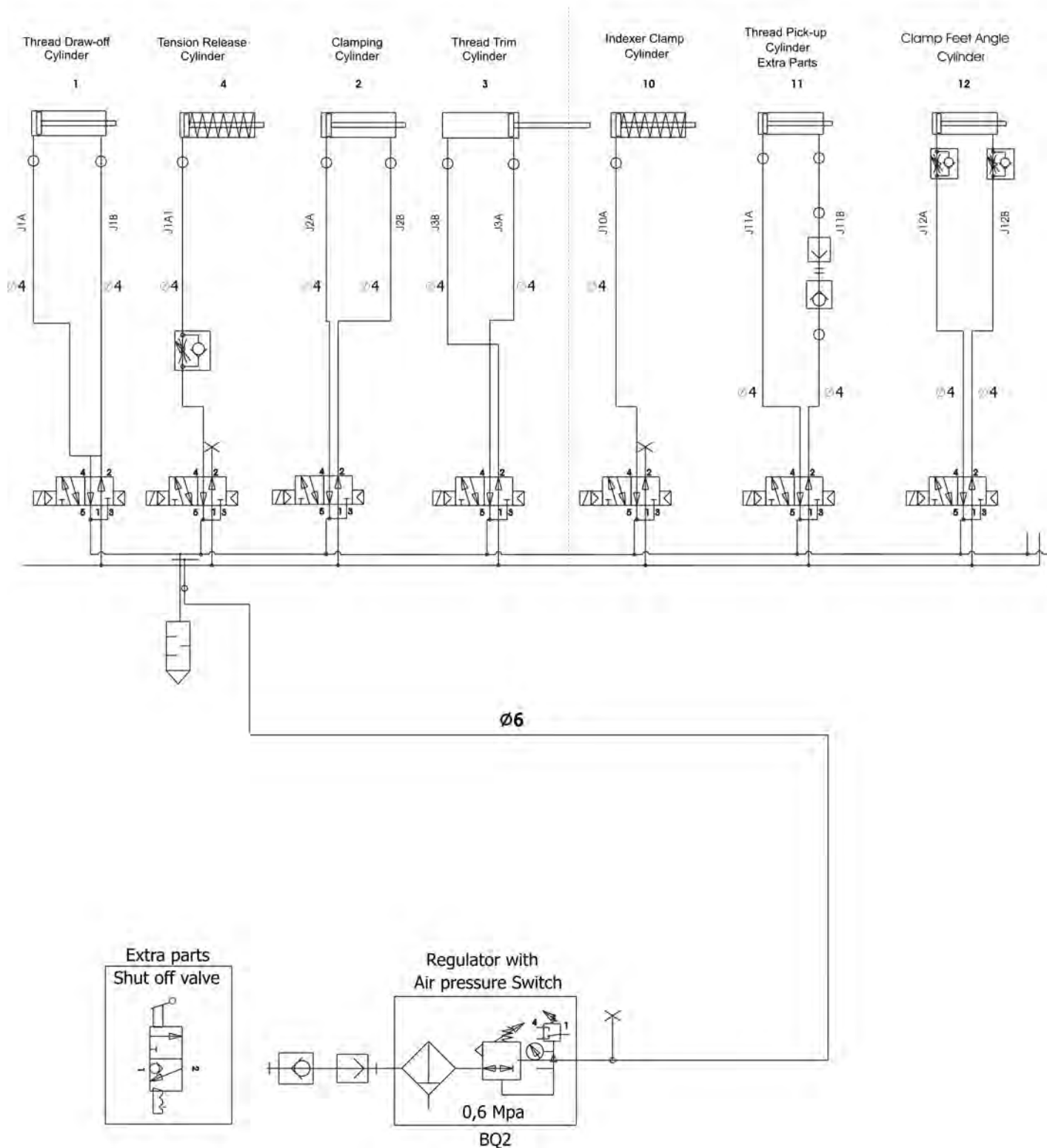
- aluminium parts
- non-ferrous metal parts
- plastic and non-metalic parts

H - PNEUMATIC DIAGRAM

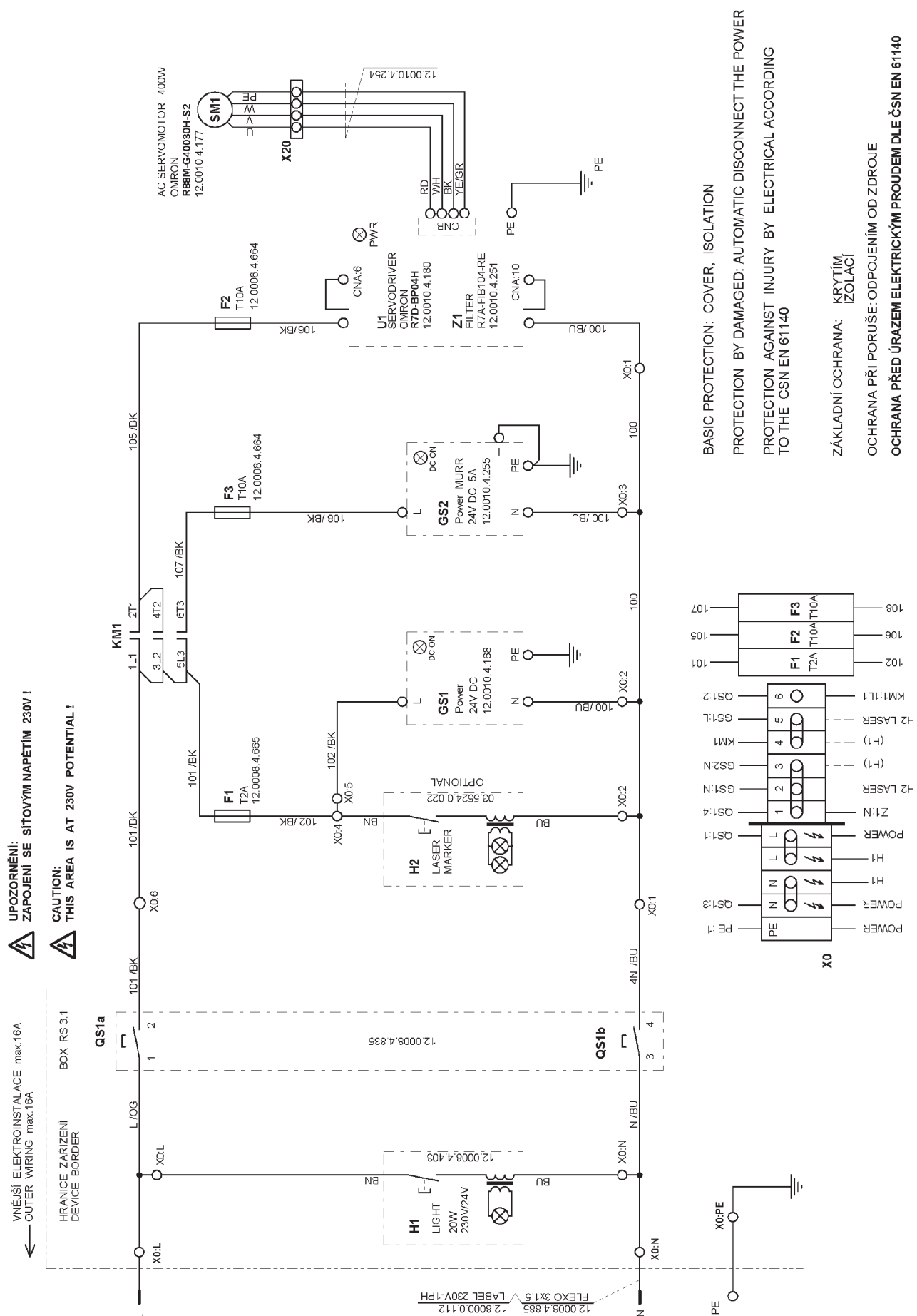
S-4001 ISBH+I SM

HEAD

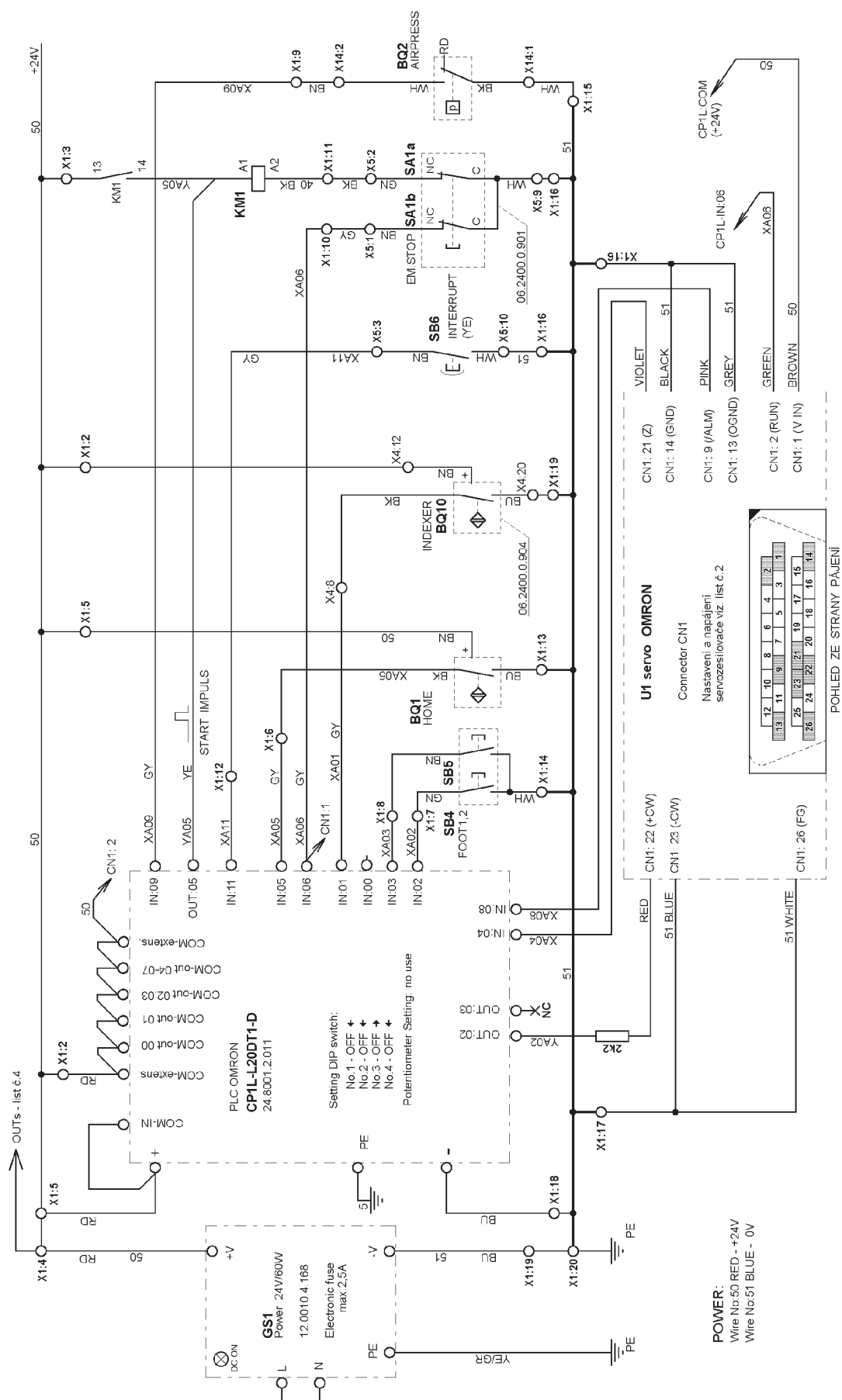
INDEXER



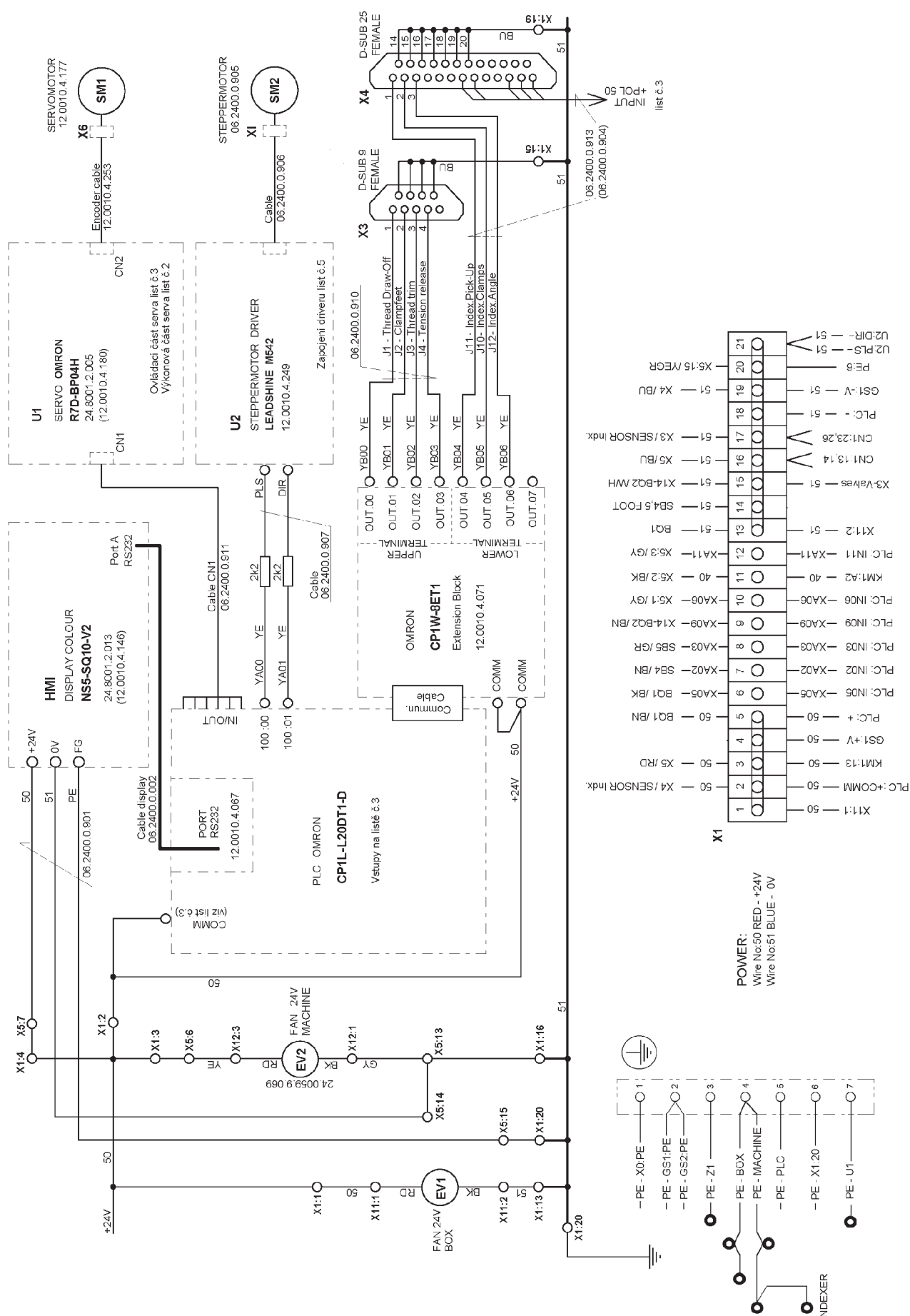
I - ELECTRICAL DIAGRAM



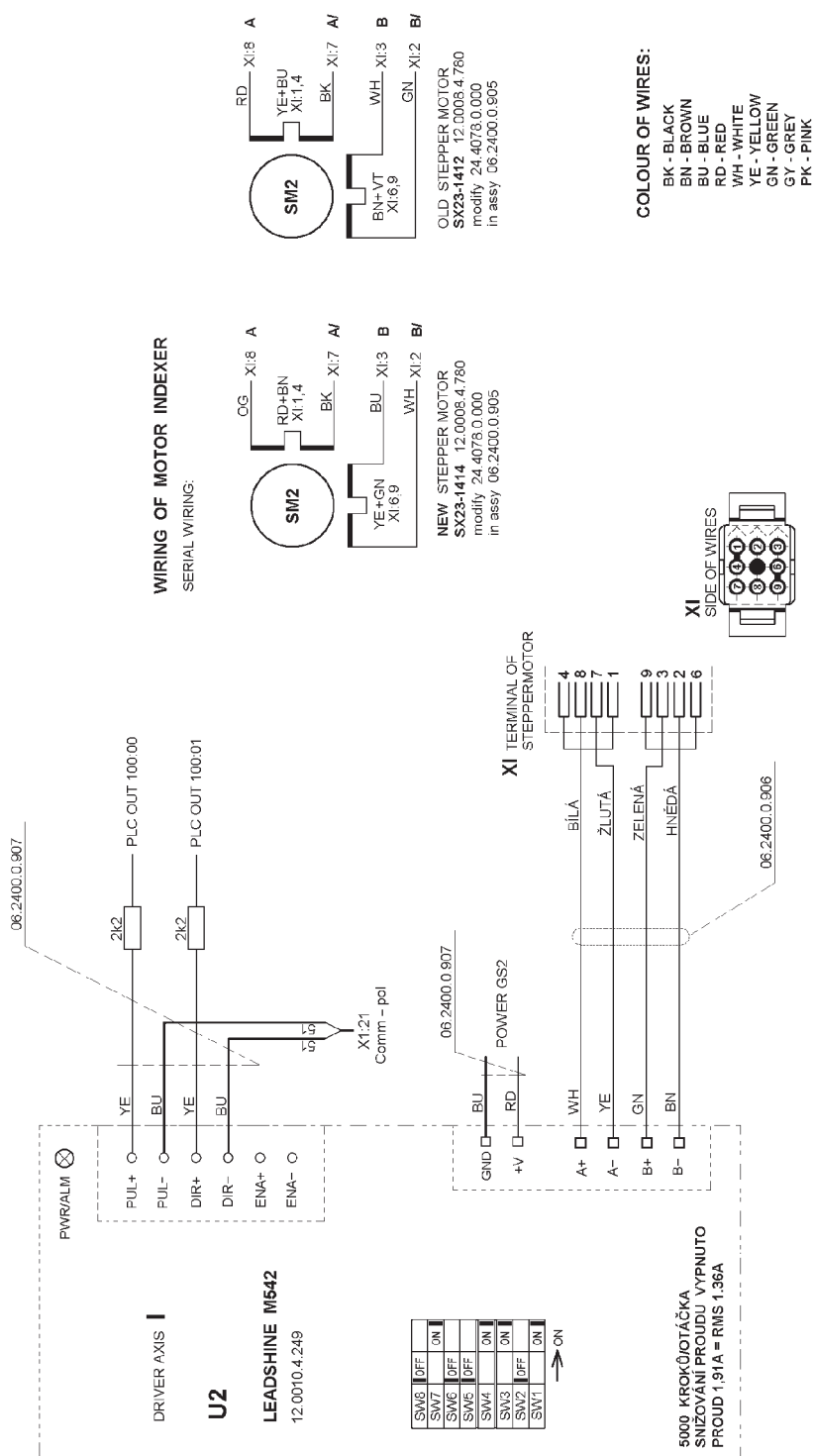
I - ELECTRICAL DIAGRAM



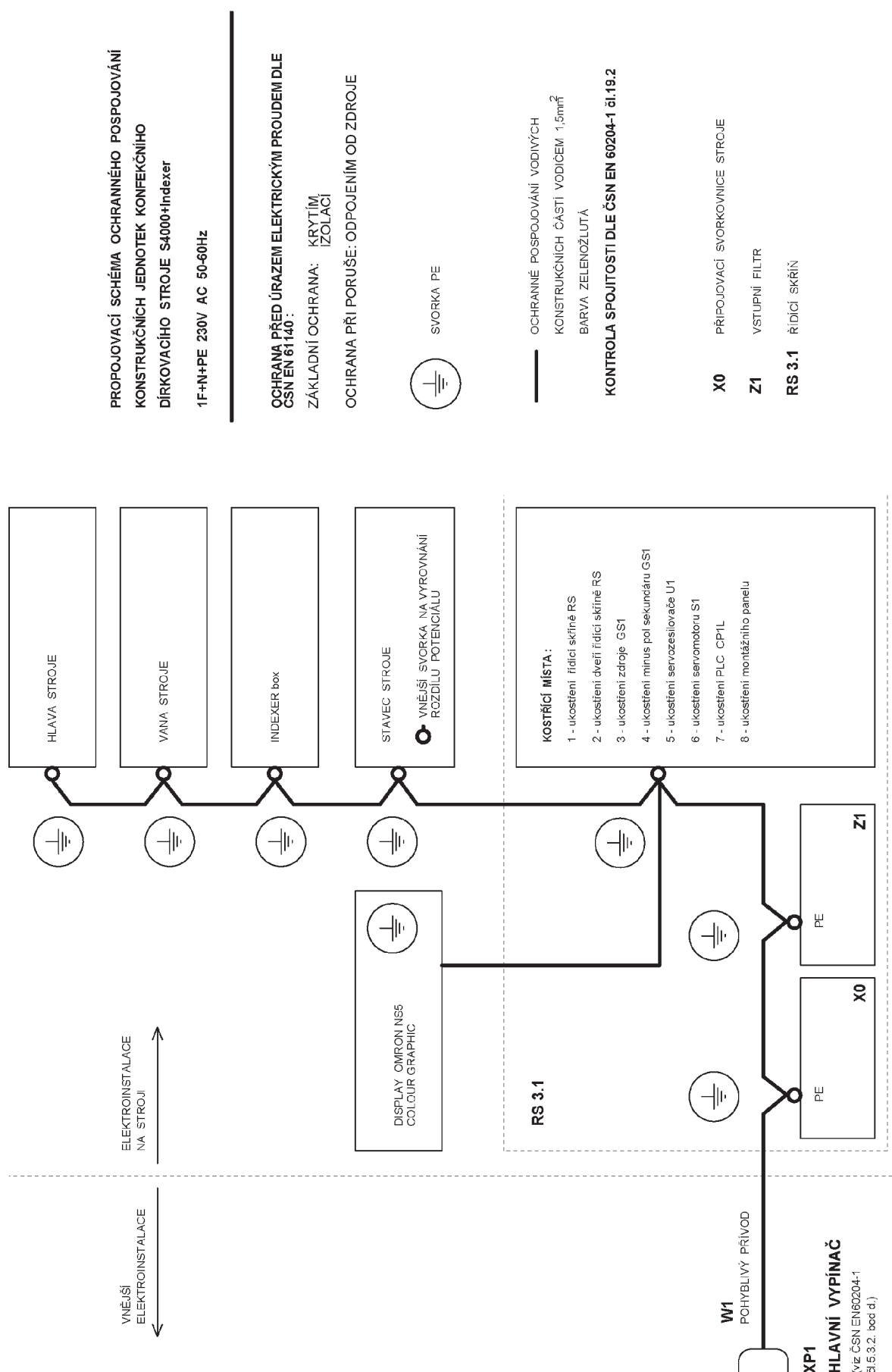
Released: 12/2013
E-mail: service@amfreece.cz; webside: amfreece.com
Phone: +420 582 309 146; Fax: +420 582 360 606



I - ELECTRICAL DIAGRAM



I - ELECTRICAL DIAGRAM



TROUBLESHOOTING

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TROUBLESHOOTING

1. MECHANICAL FAULTS

FAULT	POSSIBLE CAUSE	PROBABLE SOLUTION
Thread breakage	Needle, looper, throat plate damaged	Change damaged parts
	Incorrect needle and sewing mechanism adjustment	Check the adjustment of the mechanisms
	Thread tension is too tight	Adjust correct tension
	Incorrect threading	See section C3 for checking.
	Thread guides polished incorrectly	Polish
	Poor thread quality	Replace thread
	Thread is too heavy for selected needle and throat plate	Use recommended thread sizes - see section A4
Machine fails to sew	Needle, looper, throat plate damaged	Change damaged parts
	Incorrectly adjusted needle bar height	See section E4 for checking
	Incorrectly adjusted clearance between needle and throat plate	See section E5 for checking
	Incorrect loopers timing	See section E12 for checking
Machine sews in one spot	Incorrectly adjusted front stop	Adjust the stop - see section E11
Stitch skip at the beginning of sewing	Needle, looper, throat plate damaged	Change damaged parts
	Needle thread end is too short	See section E13, point 2
	Incorrectly adjusted needle bar height	See section E4
	Incorrectly adjusted clearance between needle and throat plate	See section E5
	Incorrect loopers timing	See section E12
	Incorrectly adjusted clamp feet pressure	See section E 16
Stitch skip during sewing	Needle, looper, throat plate damaged	Change damaged parts
	Incorrectly adjusted needle bar height	See section E4
	Incorrectly adjusted clearance between needle and throat plate	See section E5
	Incorrect loopers timing	See section E12
	Incorrect thread tension adjustment	Adjust the tension correctly see section E14
	Incorrect threading	See section C3
	Thread loops are too small	See section E13 point 3
	Incorrectly adjusted clamp feet pressure	See section E16 point 3
	The clamp feet are adjusted too far from the sewing	See section E16 point 2

TROUBLESHOOTING

FAULT	POSSIBLE CAUSE	PROBABLE SOLUTION
Thread not trimmed at the end of the cycle	Trimming knife damaged	Replace knife
	Wrong adjustment of pulling hook	See section E 15 (2)
	Throttle valve regulating tension disc is too loose.	See section E14 point (3)
	Incorrect loopers timing	See section E12
	Incorrect setting of trimming delay	Change Trim delay parameter D4 (F2)
	Trimming length incorrectly set	Change Trim time parameter D4 (F2)
Sewing motor turns, machine does not sew	Belt broken or loose	See section E18 for changing
Machine sews continually, does not stop	Stopping sensor adjusted incorrectly	See section E17 for correct position adjustment
Zero pressure on regulator	Shut off valve closed	Open shut off valve
Low air pressure	Filter element dirty	Change the filter element
	Air fitting or tubing obstruction	Check supply lines

TROUBLESHOOTING

2. INDEXER FAULTS

FAULT	POSSIBLE CAUSE	PROBABLE SOLUTION
Thread pick up does not catch the thread (breaks needle)	Thread puller position adjusted incorrectly	See section F7 for adjustment
	Thread Pick-up delay set incorrectly	Change Thread Pick-up delay parameter in indexer menu
	Incorrect setting of Thread Pick-up timing	Change Thread Pick-up time parameter in indexer menu
	Thread Pick-up parameter is not activated	Activate the Thread Pick up parameter in indexer menu
	Valve 11 does not switch on	Check or replace
Sewn buttoholes vary in spacing	One of the pneumatic valves 13 — 18 does not switch on	Check or replace the valves
	Loose screw M5 - see Parts - page 3-66, det. 22	See section F5 for adjustment
	Indexer clamp feet do not have the same pressure	See section F6
The machine sews in one spot, no movement of material	Indexer clamp feet are not closed	Valve 10 does not switch on, check or replace
	Low air pressure	Check main supply and manual shut-off valve
	Indexer clamp feet delay incorrectly set	Change Move delay parameter in indexer menu
	Activation of indexer clamp feet timing incorrectly set	Change Clamps delay parameter in indexer menu
Indexer clamps do not swivel	Indexer clamp feet are not adjusted for angle movement	Loosen the screw and move it from the locking lever
	Angle parameter not activated	Activate the Angle parameter in Indexer menu
	Valve 12 does not switch on	Check or replace
	Air coming into the cylinder is too tight	Loosen the valve on the swivelling cylinder

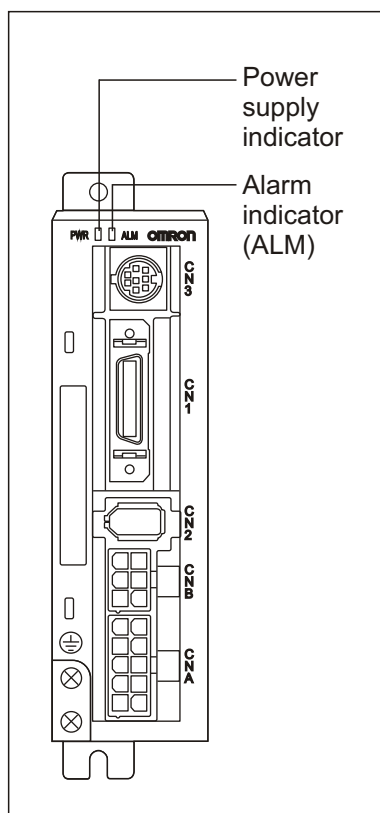
3. ERROR MESSAGES OF THE CONTROL PANEL DISPLAY

FAULT	POSSIBLE CAUSE	PROBABLE SOLUTION
Low air pressure	Hand valve of the regulator switched off (if assembled)	Open the hand valve
	The air pressure in the air supply piping below 5 MPa	Increase the air pressure
Emergency stop	Emergency Stop button is switched on	Release the Emergency Stop button
Operation mode	The machine is in the operation mode, motor is disconnected	Press  on the control panel
The distance between buttonholes larger than 63 mm	The maximal length of the indexer clamp feet movement is exceeded	See Service - Section D8 (page 1-24)
VAL > MIN VAL > MAX	Parameter range exceeded	Choose lower or higher value
Low voltage	The power supply is below 185V - relay HRN-35	Call electroengineer in a plant

TROUBLESHOOTING

4. ERROR MESSAGES OF THE SERVO

The following messages can be seen on the servo, which is placed inside the control box. In order to eliminate these messages, switch off the machine for 1 minute. Then switch the machine on again. The error message should not appear on the display. If the message appears - call AMF Reece service.



PWR - Power supply indication:

INDICATOR	STATUS
Lit green	Voltage is good
Lit orange - Flashes at a 1 sec. intervals	Warning - i.e.: - Exceeded power - Exceeded feed back - Default of inner fan
Lit red	Alarm - default

ALM - Default indication (Alarm indicator):
in case default appears, the indicator is switched on.

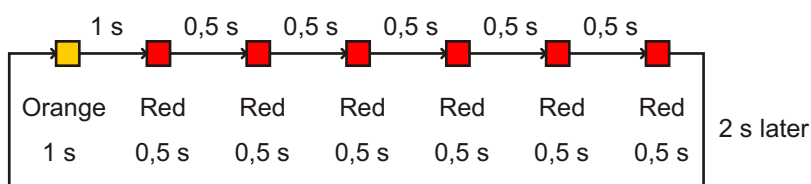
Alarm indicator on the Servo Drive

The alarm LED indicator on the front of the Servo Drive lights up if an error is detected. The indicator shows the alarm code by the number of orange and red flashes.

Example:

When an overload alarm (alarm code 16) has occurred and the Unit has stopped the indicator will flash in orange and 6 times in red.

Orange 10s digit, Red: 1s digit



TROUBLESHOOTING

Alarm code	Error detection function	Detection details and cause of error	Alarm reset possible
11	Power supply undervoltage	The DC voltage of the main circuit fell below the specified value while the RUN Command Input was ON	Yes
12	Overvoltage	The DC voltage of the main circuit is abnormally high	Yes
14	Overcurrent	Overcurrent flowed to the IGBT. Servomotor power line ground fault or short circuit	No
15	Built-in resistor overheat	The resistor in the Servo Drive is abnormally overheating	No
16	Overload	Operation was performed with torque significantly exceeding the rated level for several seconds to several tens of seconds.	Yes
18	Regeneration overload	The regeneration energy exceeded the processing capacity of the regeneration resistor.	No
21	Encoder disconnection detected	The encoder wiring is disconnected.	No
23	Encoder data error	Data from the encoder is abnormal.	No
24	Deviation counter overflow	The number of accumulated pulses in the deviation counter exceeded the setting in the Deviation Counter Overflow Level (Pn63)	Yes
26	Overspeed	The servomotor exceeded the maximum number of rotations. If the torque function was used, the Servomotor's rotation speed exceeded the settings in the Overspeed Detection Level Setting (Pn70 and Pn73)	Yes
27	Electronic gear setting error	The section in Electronic Gear Ratio Numerator 1 (Pn46) or Electronic Gear Ratio Numerator 2 (Pn47) is appropriate.	Yes
29	Deviation counter overflow	The number of accumulated pulses for the deviation counter exceeded 134,217,728.	Yes
34	Overrun limit error	The servomotor exceeded the allowable operating range set in the Overrun Limit Setting (Pn26).	Yes
36	Parameter error	Data in the parameter saving area was corrupted when data was read from the FEPRM at power ON.	No
37	Parameter corruption	The checksum didn't match when data was read from the FEPRM at power ON.	No
38	Drive prohibit input error	The forward drive prohibit and reverse drive prohibit inputs are both turned OFF.	Yes
48	Encoder phase Z error	A phase-Z pulse was not detected regularly	No
49	Encoder CS signal error	A logic error of the CS signal was detected	No
95	Encoder CS signal error	The combination of the Servomotor and Servo Drive is not appropriate. The encoder was not connected when the power supply was turned ON.	No
96	LSI setting error	Excessive noise caused the LSI setting not to be completed properly.	No
Others	Other errors	The servo Drive's self-diagnosis function detected an error in the Servo Drive.	No

TROUBLESHOOTING

5. ELECTRICAL FAULTS

FAULT	POSSIBLE CAUSE	PROBABLE SOLUTION
 When switch in position I, neither the work light, display or the cooling fan operate	No power supply	Check main power supply or voltage in the socket
	Fuse F1 failure	Replace fuse PN 12.0008.4.665
	Power switch QS1 damaged	Replace the switch 12.0008.4.835
	Power GS1 failure	Replace the power 12.0010.4.168
 When switch in position I, display does not operate	Cable from the display disconnected	Check the display connection
	Display or its control damaged	Replace display PN 24.8001.2.003
When sewing operation started, motor does not operate. Contactor KM1 switched on.	Fuse F2 damaged	Replace fuse 12.0008.4.664
	Contactor KM1 damaged	Replace contactor 12.0008.4.833
	Filter Z1 damaged	Replace filter 12.0010.4.251
	Servodriver U1 error	Call AMF Reece service or replace servodriver U1 24.8001.2.005
	Error in sewing motor circuit	Switch the machine off for 1 minute, or restart it, alternatively call AMF Reece service
When sewing operation started, motor fails to operate. Contactor KM1 switched off.	Make sure the machine is ready for operation	Press key in the display  (see section D1, point 6)
	Contactor KM1 damaged	Replace contactor 12.0008.4.833
	Check the Emergency Stop button	Replace button 12.0008.4.563
	Control unit PLC error	Replace the control unit PLC 24.8001.2.011
The needle does not stop in the upper position	Position of the sensor BQ1 incorrectly adjusted	Adjust according to section E17
	Sensor BQ1 failure	Replace the sensor 06.2400.0.009
	Check the servo amplifier and servo	To set the servo amplifier - call AMF Reece service, alternatively replace motor (page 2-9) and servo amplifier (page 2-9)
When sewing operation started, air valves do not operate. The air pressure correct.	Fork is not fitted properly into connector X3, X4	Check the connector X3, X4 connection
	Block CPAW failure	Replace the block 12.0010.4.071.
Broken drive indexer	Lack of power supply to drive.	Check contactor KM1 switching. Replace contactor 12.0008.4.833
No flash light on GS 2 power supply	Fuse F3 burnt.	Replace fuse 12.0008.4.664.
	Power GS2 failure.	Replace power supply 12.0010.4.255.
	Driver U2 failure.	Replace driver 12.0010.4.249
No flash light on U2 driver	Power GS2 failure.	Replace power 12.0010.4.255
	Driver U2 failure.	Replace driver 12.0010.4.249
When switched on, indexer motor not in its position	Indexer motor SM2 failure.	Replace motor 06.0010.4.249.
		Replace driver 12.0010.4.093
Indexer motor rotates and hits a stopper	Indexer sensor BQ10 failure	Check adjustment or replace sensor 12.0010.4.093

