INSTRUCTIONS FOR THE OPERATOR ASSIGNED TO THE MAINTENANCE OF THE “VIBEMAC 3022 LS” AUTOMATIC UNIT

INTRODUCTION

Thank you for having purchased this **VI.BE.MAC.** S.p.A. industrial sewing machine.
Before using this automatic unit, please read the following instructions in order to understand how the machine operates.
These instructions illustrate the working method to be followed, in compliance with current regulations.

Should you require an additional manual, or further clarification regarding general or technical information given in this manual, please contact:

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"Any comments and/or suggestions which might serve to improve this manual will be gratefully received”.

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1. GENERAL MACHINE SPECIFICATIONS

The 3022LS Unit is a industrial sewing machine with three needles, two needles sewing with chain stitches seam and one on the top of the waistband with Lock stitch seam. It is equipped with a device for Automatic Cut and Skip Stitch (both seam) at the required size, of the two ends of a waistband that has been formed, with a Border unit.
A LS01/Mp Digital Logic Panel controls all the functions. This panel using mono directional programmable counters is coupled with the type FMFY panel, present on the MITSUBISHI XL-CE servomotor.
The user can easily programme the number of stitches necessary for each counter, in order to obtain a finished waistband with the required characteristics, **and the measure has a tolerance of only ± ¼ of stitch for each function** controlled by the LS01/MP panel.

The cutting device consists of a cutting unit, moved by a special cylinder controlled by a safety device.
The skip stitch on the Chainstitch and Lock stitch side are a mechanical device, (patented), thereby preventing the formation of the seam, and is moved by a special pneumatic cylinder. The Servomotor used in the unit, activates also the Step-by-Step motor for the movement of the Auxiliary Puller, thereby the stitch length is electronic.

1.1.SUPPLY VOLTAGE

The supply voltage is 220V single-phase 50/60 Hz. Consumption is approx. 0,7KW.

1.2. COMPRESSED AIR CONSUMPTION AND PRESSURE

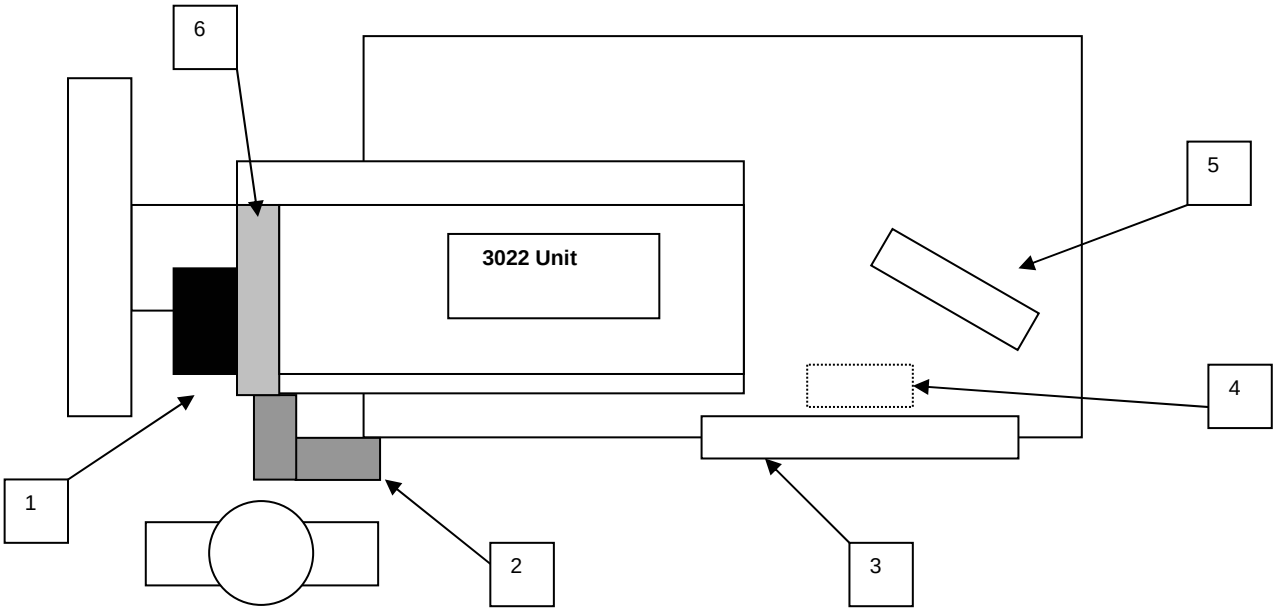
Consumption is approx. 0.5 litres of air intake per cycle with a minimum pressure of 6 bar.

1.3. DIMENSIONS AND WEIGHT

Width: 105 cm Length: 60 cm Height: 125 cm Weight: 130 kg (approx.)

1.4.WORK STATION

The operator works in a seated position in front of the sewing machine with:
· the speed control pedal (1) located at his feet, secured to the MITSUBISHI Motor.
· the waistband guide Border Unit (2), secured to its own adjustable stand, placed in front
· the waistband guide tape guide (3), secured to its own adjustable support, placed in front
· the main supply switch (4) under the table to his right, fixed to the stand.
· the LS01 logic panel (5) on his right, above the table.
· the sewing head with the working surface (6) under the three control photoelectric cells.



2. CONDITIONS OF USE

“Normal” operation includes all those operations for the preparation and application of waistbands onto trousers, respecting the following conditions:

· the operator must first have read and fully understood all parts of this manual.
· the operator must abide by all the instructions in this manual and "E.C." regulations.
· the maximum width of the waistband material cuts must be 103/105 mm for a 1"1/2 Folder and 93/95 mm for a 1"1/4 Folder.
· the material thickness of the trousers where the waistband is to be applied must not be greater than 6 mm.
· all safety regulations must be respected; safety covers and devices installed by the manufacturer must not be removed.
· the electrical supply must be constant.
· the machine must be connected to an electrical circuit with separate NEUTRAL and GROUNDING
· the machine must be earthed to prevent disturbances and electric shocks.
· the machine must not be used in continuous cycle, by blocking the control pedal in any position
· the machine must not operate at high temperatures (above 40°c) or low temperatures (below 10°c).
· water or other liquids (with the exception of oil) must not get into the sewing machine.
· water or other liquids must not get into the control panel, solenoid valves and cylinders.
· the automatic unit must not be used in areas where there is explosive gas, powder or oil vapours.
· the machine must not be connected to a compressed air circuit containing water or other liquids in the pressure circuit.
· the machine must be connected to a compressed air circuit with a constant minimum internal pressure of 5.5 bar.
· the operator must use soundproof earplugs to prevent damage to the ear.
· installation of the machine and extraordinary maintenance must be performed by qualified personnel.

The manufacturer declines any responsibility for damage to persons or things caused by the machine in cases where:

· the unit is not properly installed on an even surface.
· installation of the machine is not performed by qualified technician.
· eventual repairs (Mechanical and/or Electronic) of the machine are not performed by qualified technician.
· the electrical supply is not constant.
· the air pressure in the pneumatic circuit is not constant and/or the quality of air does not satisfy the requirements.
· routine maintenance of the unit is not performed as required.
· non-original spare parts or parts which are not specified for the model are used.
· there is a partial or total lack of observance of the instructions on the part of the operator.
· the operator has been working with broken or unsuitable needles, thereby ruining the trousers.
· exceptional circumstances apply.

In no circumstances:
· remove the safety covers and devices from their position, thereby making the machine dangerous for the operator.
· remove the eye protection shield without supplying the operator with special eye protection glasses in compliance with current regulations.
· deactivate the safety devices provided by the manufacturer, thereby making the machine dangerous for the operator.
· modify the machine, without authorisation from the manufacturer, thereby making the machine dangerous for the operator.

2.1. FORM OF GUARANTEE

A guarantee of 01 (one) year will be applied to all parts that make up the unit, when delivered to the manufacturer and found to be defective. The guarantee is not applied for parts of normal use (example: Oil – Needles – Blades).

All parts damaged through improper use by the operator, and/or improper adjustment of the unit by technical personnel not qualified by VI.BE.MAC. will NOT be considered as defective by the manufacturer. These will be charged for, including all transport costs and/or subsequent installation costs.

3. DESCRIPTION OF SWITCHES, BUTTONS AND CONTROLS

The 3022LS has the following switches:

3.1 MACHINE MAIN SWITCH

The main switch is located below the table on the central leg of the stand.
There are two buttons.
The RED (OFF) button on the left side is to turning off the unit.
The BLACK (ON) button on the right side is to turning on the unit.

3.2 LS/01 PANEL MAIN SWITCH

The main switch is located on the front of the panel. Check the position in the illustration in paragraph 7. LS01 PANEL.
The panel is automatically activated when the unit is turned on, VIBEMAC appears on the display and the programme in use.

3.3 CONTROL PEDAL

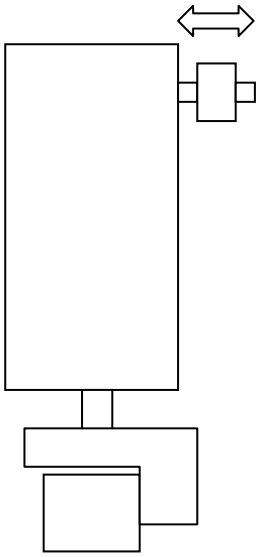
The control pedal is located at the base of the stand and is connected to the MITSUBISHI panel by a tie rod and a lever.
It is used to control the operating speed of the sewing machine.

3.4 MAIN AIR COCK

The main air cock, located at the intake of the reduction unit, makes it possible to remove the air from the pneumatic circuit inside the machine.
Move the black selector to select between two operating positions.
To open the air cock, move it towards the reducer.
To close the air cock, move it outwards.

3.5 PULLER LIFT COCK

Placed on the upper part of the cylinder, makes it possible to remove the air inside.
Move the black selector to select between two operating positions.
To open the air cock, move it right.
To close the air cock, move it left.



4. MACHINE START-UP

Press the black "ON" button on the main switch.
The sewing head is ready to operate in AUTOMATIC mode with the last programme used.
Open the air cock, located on the side of the reduction unit, moving it towards the reducer.

5. STOPPING THE MACHINE

Push the red "OFF" button on the main switch with the machine still.
Close the air cock, located on the side of the reduction unit, moving it outwards.

6. ROTATION DIRECTION

In the 3022 unit a single-phase MITSUBISHI motor is used.
The rotation direction of the unit is normally already programmed in the panel

7. WORKING CYCLE

The various counters in the 3022LS unit operates counting the stitch steps and no more the seam stitches, and the **obtained measure has a tolerance of only ± ¼ of stitch.** For example, the precedent value of **5 stitches** in a counter is equal now to a value of **20 steps**, the value of stitches inserted is always multiplied by four. This allows insertion of a finished value of 40 steps = 10 stitches as well as a value of 42 steps = 10 stitches and ½.
Normally, two basic programmes are loaded into the panel, with two different machine functions.
These are:

- Basic Programme n°. "**1**.Automatic machine stop when the final cut is performed" (FINAL STOP)
- Basic Programme n°. "**2**.Automatic machine stop when photoelectric cell 2 is uncovered" (INTERMEDIATE STOP)

PROGRAMME 1 – FINAL STOP
When the Panel performs the Final Cut of the waistband, it automatically stops the Sewing Head, even when the command lever of the motor is held completely down, to allow insertion of a new pair of trousers.
To reset the position of the control lever in the MITSUBISHI motor, bring it back to its pause position.
Press the Control Lever again to run a new Sewing Cycle.
This working system is used when:

- The length of the waistband of the trousers is 6cm longer than the length of the body panels of the trousers.
- The unit maximum productivity has to be obtained.

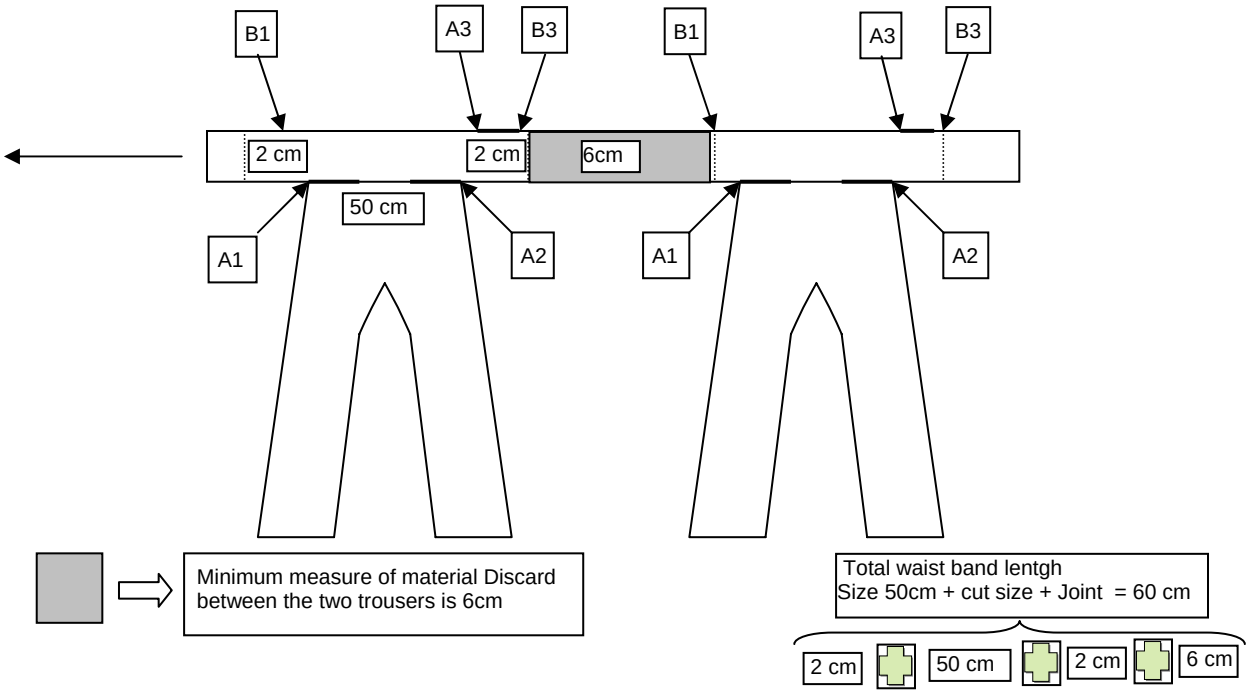
PROGRAMME 2 – INTERMEDIATE STOP
As soon as photoelectric cell N° 2 is "uncovered" by the end of the trousers, the Panel Automatically stops the Sewing Head, even when the Command lever of the motor is held completely down, to allow insertion of a new pair of trousers.
To reset the position of the control lever in the MITSUBISHI motor, bring it back to its pause position.
Press the Control Lever again to run a new Sewing Cycle.
Check that between the two pairs of trousers there is a minimum distance of 4 cm in order to correctly perform the final cut on the first pair of trousers and the initial cut on the second pair. This working system is used when:
- the length of the waistband of the trousers is the same as, or slightly longer than, the length of the body panels of the trousers.
- whenever it is not possible to use the cycle with the Final Stop.

7.1 PROGRAMME 1 CYCLE - START OF TROUSERS

The photoelectric cell N°1 reads insertion of the trouser. The **A1** counter is activated (initial skip stitch). The machine starts the sewing cycle, controlled by the operator, using the control pedal attached to the motor Panel. When the A1 counter reaches the programmed number, the skip stitch disconnects. The machine then has the initial part of the trousers under the other two photoelectric cells, when the photoelectric cell N°3 reads the beginning of the material the stitch counter **B1** is activated. After the set number of stitches, the cutting unit carries out the initial cut of the waistband, controlled by the safety sensor.

7.2. PROGRAMME 1 CYCLE - END OF TROUSERS

Photoelectric cell N°1 reads the end of the trousers. The **A2** counter (end skip stitch) is activated. This counter determines the delay of the stitches of the skip stitch insertion at the end. Normally it is positioned between 01 and 02 stitches. The skip stitch at the end remains inserted until stitch counter A1 is activated again.
The machine then has the final part of the trousers under the other two photoelectric cells.
When photoelectric cell N°2 reads the end of the trousers, counter **A3** is activated determining the delay of the Material Pulling Grip at the beginning (set a number of stitches equal to the Final cut.)
When photoelectric cell N°3 reads the end of the trousers, counter **B3** is activated. After the set number of stitches,
the cutting unit carries out the final cut of the waistband, controlled by the safety sensor.

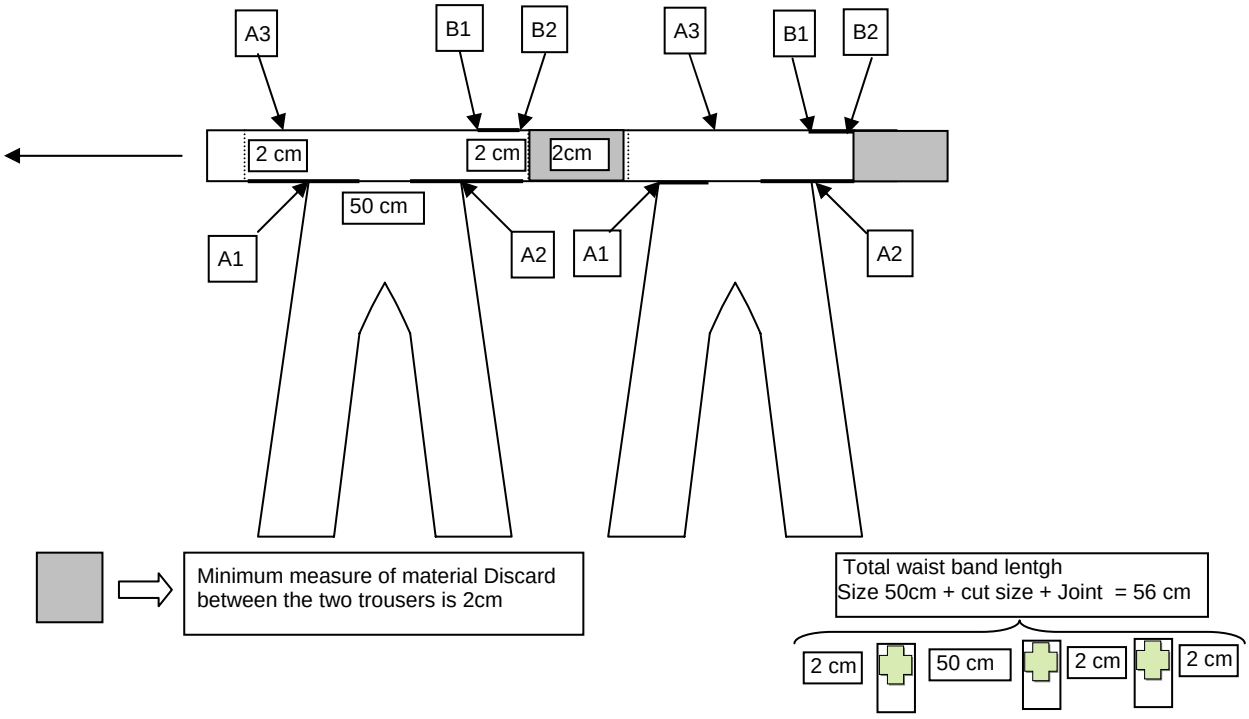


7.3. PROGRAMME 2 CYCLE - START OF TROUSERS

Photoelectric cell N°1 reads the insertion of the trousers. The **A1** counter (begin skip stitch) is activated. The machine begins the sewing cycle, controlled by the operator using the control pedal attached to the motor Panel. When the A1 counter reaches the programmed number, the skip stitch disconnects. The machine then has the initial part of the trousers under the other two photoelectric cells. When photoelectric cell N°3 "reads the initial part of trousers" the stitch counter **A3** is activated. After the set number of stitches, the cutting unit carries out the initial cut of the waistband, controlled by the safety sensor.

7.4. PROGRAMME 2 CYCLE - END OF TROUSERS

Photoelectric cell N°1 reads the end of the trousers. The **A2** counter (end skip stitch) is activated. This counter determines the delay of the stitches of the skip stitch insertion at the end. It is usually positioned between 01 and 02 stitches. The skip stitch at the end remains inserted until stitch counter A1 is activated again.
When Photoelectric cell N°2 reads the end of the trousers, the autmatic unit stops, allowing insertion of another pair of trousers.
When the cycle restarts the photoelectric cells N°2 and n°3 "read" in sequence the end of the trousers, the stitch counter **B1** is activated determining the delay of the Material Pulling Grip at the beginning and the stitch counter **B2** is activated.
After the set number of stitches, at the cutting speed (speed 2), the cutting unit carries out the initial cut of the waistband, with an initial impulse to the solenoid valve of the safety sensor, at the cutting speed (speed1).



8. “LS01PM” DIGITAL PANEL

The digital panel with the new software in the version **“LS01/PM”** controls all the various functions (CUT, SKIP STITCH, GRIP, END OF CYCLE STOP) of the equipment attached to the sewing machine.
During the sewing cycle, the machine is started and stopped and its speed is controlled by the MITSUBISHI panel and its control pedal.
The Panel is connected to the FMFY type MOTOR panel by the rear connector.
The LS01 digital Panel can run four different programmes, in a personalised sequence, and it is possible to set the use of the four INPUTS and of the five OUTPUTS as required.

The various counters in the 3022 unit operate counting the stitch steps and no more the seam stitches, and the **obtained measure has a tolerance of only ± ¼ of stitch.** For example, the precedent value of **5 stitches** in a counter is equal now to a value of **20 steps**, the value of stitches inserted is always multiplied by four. This allows insertion of a finished value of 40 steps = 10 stitches as well as a value of 42 steps = 10 stitches and ½.
Normally, two basic programmes are loaded into the panel, with two different machine functions.
These are:
Basic Programme n°. “**1**.Automatic machine stop when the final cut is performed” (FINAL STOP)
Basic Programme n°. “**2**.Automatic machine stop when photoelectric cell 2 is uncovered” (INTERMEDIATE STOP)

PROGRAMME 1 – FINAL STOP
When the Panel performs the Final Cut of the waistband, it automatically stops the Sewing Head, even when the command lever of the motor is held completely down, to allow insertion of a new pair of trousers.
To reset the position of the control lever in the MITSUBISHI motor, bring it back to its pause position.
Press the Control Lever again to run a new Sewing Cycle.
This working system is used when:
The length of the waistband of the trousers is 6 cm longer than the length of the body panel of the trousers.
The unit maximum productivity has to be obtained.

PROGRAMME 2 – INTERMEDIATE STOP
As soon as photoelectric cell N° 2 is "uncovered" by the end of the trousers, the Panel Automatically stops the Sewing Head, even when the Command lever of the motor is held completely down, to allow insertion of a new pair of trousers.

To reset the position of the control lever in the MITSUBISHI motor, bring it back to its pause position.
Press the Control Lever again to run a new Sewing Cycle.
Check that between the two pairs of trousers there is a minimum distance of 4 cm in order to correctly perform the final cut on the first pair of trousers and the initial cut on the second pair.
This working system is used when:
- the length of the waistband of the trousers is the same as, or slightly longer than, the length of the body panel of the trousers.
- whenever it is not possible to use the cycle with the Final Stop.

8.1.DESCRIPTION OF FRONT KEYBOARD

0 – 9 Numerical keyboard for setting values
Move the cursor one step right
Move the cursor one step left
Move the cursor to the preceding line
Move the cursor to the next line
F1 Solenoid Valves control function (OUTPUTS)
F Stitch Counter control function (COUNTER)
← Confirm set value (ENTER)
C Cancel data and exit from current function (CLEAR)
TEST TEST function
SEL Select programme to run, and/or enable selection of a sequence of programmes
PROG Set control programming
ON Enable panel operation
OFF Disable panel operation
RESET The panel goes to the start of the programme currently running.

8.2.TURNING THE MACHINE ON

When the machine is turned on, the following appears on the display:

VI.BE.MAC.3022
1, Program 1

On the bottom line is displayed the following:
• The first digit indicates the position of the programme currently running in the sequence.
• The second digit, PROGRAMME "x" indicates the number of the programme ready to run.

8.2.1.TURNING THE PANEL ON / OFF

Press the **OFF** key to disable the panel and set machine operation to NORMAL.
The display changes to:

control
disarmed

Press the **ON** key to enable the panel and set machine operation to AUTOMATIC.
The display changes to:

VI.BE.MAC.3022
1, Program 1

8.3.WORKING FUNCTION

When the machine is turned on, the following display appears:

VI.BE.MAC.3022
1, Program 1

On the bottom line is displayed the following:
• The first digit indicates the position of the programme currently running in the sequence.
• The second digit, PROGRAMME "x" indicates the number of the programme ready to run.

When a programme is running, the following display appears:

Execute the
N.Program 1

When the operator stops the sewing cycle, within a programme, the following display appears:

In delay the
N.Program 1

8.3.1.CALLING UP A NEW SEWING PROGRAMME

When the machine is turned on, the following display appears:

VI.BE.MAC.3022
1, Program 1

Press the **SEL** key, the following appears on the display:

Selection prog.
x ; x ; x ; x ;

X = number of programme in use

Insert the number of the programme to be used, from the **four** available, e.g. n°**1**
Press **ENTER** to exit

8.3.2.CREATING A SEQUENCE OF PROGRAMMES
When the machine is turned on, the following appears on the display :

VI.BE.MAC.3022 1, Program 1

Press the **SEL** key, the following appears on the display:

Selection prog. x ; x ; x ; x ;

X = number of programme in use
Insert the number of the **1st** programme to be used, **move to the right with the directional arrow** and insert the number of the **2nd** and so on for the other two positions.

Selection prog. 1 ; 2 ; x ; x ;

After setting the last programme
Press **ENTER** to exit

8.3.3.ENABLING OR DISABLING OUTPUTS
The operator may eliminate a certain function during the sewing cycle:
Press the **F1** key, on the display appears:

F1 y = on , n = off 1y 2y 3y 4y

On the bottom line are displayed the outputs (min. 1 - max. 5) selected as in the following paragraph:
7.2.2.3. ENABLING OUTPUTS USED IN THE PROGRAMME

The outputs are placed as follows:

Outputs 1 2 3 4 5

- Position 1 indicates the output of the SKIP STITCH function.
  Press the 1 **key to enable (y =on) or disable (n = off) the function.**
- Position 2 indicates the output of the GRIP function.
  Press the 2 **key to enable (y =on) or disable (n = off) the function.**
  The value is 1 (on) when the function is enabled and the value is 0 (off) when it is disabled.
- Position 3 indicates the output of the CUT function.
  Press the 3 **key to enable (y =on) or disable (n = off) the function.**
  The value is 1 (on) when the function is enabled and the value is 0 (off) when it is disabled.
- Position 4 indicates the output of the CUT Safety sensor function.
  Press the 4 **key to enable (y =on) or disable (n = off) the function.**
  The value is 1 (on) when the function is enabled and the value is 0 (off) when it is disabled.

Select the output or outputs to be modified using the numeric keyboard.
After this procedure, the condition of the outputs remains displayed until the original adjustment is completely restored to that of the programme loaded into the memory.

8.3.4.RESETTING THE PROGRAMME IN PROGRESS OR THE SEQUENCE
Press the **RESET** key, the panel returns to the first line of the programme that is running.
The following appears on the display:

VI.BE.MAC.3022 1, Program 1

8.3.5. SETTING THE CUT AND SKIP STITCH COUNTERS IN PROGRAMME N°1
Two different counter units, **A** e **B** are used within the programme that is running.
Each counter can be used more than once in sequence, with a maximum value of 250 stitches/setting.
Their function is to maintain or delay the insertion of a function.

ATTENTION: To make the correct setting always check, in the legend of the programme in use, the type and number of the counter to modify.

8.3.5.1. SETTING INITIAL SKIP STITCH COUNT (PROGRAMME 1)
Press the **PROG** key, the following appears on the display:

A counter

Use the numerical keyboard to set the number of the counter desired, in this case press **1**
Press the **ENTER** key
Use the numerical keyboard to set the value of the stitches desired. E.g.: 36 impulses = 9 stitches
Press the **ENTER** key

Increase the value to lengthen the initial skip stitch section of the trousers
Decrease the value to shorten the initial skip stitch section of the trousers

8.3.5.2.SETTING FINAL SKIP STITCH COUNT (PROGRAMME 1)
Press the **PROG** key, the following appears on the display:

A counter

Use the numerical keyboard to set the number of the counter desired, in this case press **2**
Press the **ENTER** key
Use the numerical keyboard to set the value of the stitches desired. E.g.: 4 impulses = 1 stitches
Press the **ENTER** key

Decrease the value to lengthen the final skip stitch section of the trousers
Increase the value to shorten the final skip stitch section of the trousers

8.3.5.3.SETTING INITIAL CUT COUNT (PROGRAMME 1)
Press the **PROG** key, the following appears on the display:

A counter

Press **the up arrow** to go to counter B
The following appears on the display:

B counter

Use the numerical keyboard to set the number of the counter desired, in this case press **1**
Press the **ENTER** key
Use the numerical keyboard to set the value of the stitches desired. E.g.: 8 impulses = 2 stitches
Press the **ENTER** key

Decrease the value to increase the length of the initial cut on the trousers
Increase the value to decrease the length of the initial cut on the trousers

8.3.5.4.SETTING FINAL CUT COUNT (PROGRAMME 1)

Press the **PROG** key, the following appears on the display:

A counter

Press **the up arrow** to go to counter B
The following appears on the display:

B counter

Use the numerical keyboard to set the number of the counter desired, in this case press **3**
Press the **ENTER** key
Use the numerical keyboard to set the value of the stitches desired. E.g.: 44 impulses = 11 stitches
Press the **ENTER** key

Increase the value to increase the length of the final cut on the trousers
Decrease the value to decrease the length of the final cut on the trousers

8.3.5.5. SETTING GRIP STARTING DELAY COUNT (PROGRAMME 1)

Press the **PROG** key, the following appears on the display:

A counter

Use the numerical keyboard to set the number of the counter desired, in this case press **3**
Press the **ENTER** key
Use the numerical keyboard to set the value of the stitches desired. E.g.: 60 stitches =15 stitches
Press the **ENTER** key

Increase the value to lengthen the delay of descent onto the trousers
Decrease the value to shorten the delay of descent onto the trousers

8.3.6. SETTING THE CUT AND SKIP STITCH COUNTERS IN PROGRAMME N°2
Two different counter units, **A** e **B** are used within the programme that is running.
Each counter can be used more than once in sequence, with a maximum value of 250 stitches/setting.
Their function is to maintain or delay the insertion of a function.

ATTENTION: To make the correct selection always checks in the legend of the programme in use, the type and number of the counter to modify.

8.3.6.1. SETTING INITIAL SKIP STITCH COUNT (PROGRAMME 2)
Press the **PROG** key, the following appears on the display:

A counter

Use the numerical keyboard to set the number of the counter desired, in this case press **1**
Press the **ENTER** key
Use the numerical keyboard to set the value of the stitches desired. E.g.: 36 impulses = 9 stitches
Press the **ENTER** key

Increase the value to lengthen the initial skip stitch section of the trousers
Decrease the value to shorten the initial skip stitch section of the trousers

8.3.6.2. SETTING FINAL SKIP STITCH COUNT (PROGRAMME 2)
Press the **PROG** key, the following appears on the display:

A counter

Use the numerical keyboard to set the number of the counter desired, in this case press **2**
Press the **ENTER** key
Use the numerical keyboard to set the value of the stitches desired. E.g.: 8 impulses =2 stitches
Press the **ENTER** key

Decrease the value to lengthen the final skip stitch section of the trousers
Increase the value to shorten the final skip stitch section of the trousers

8.3.6.3. SETTING INITIAL CUT COUNT (PROGRAMME 2)
Press the **PROG** key, the following appears on the display:

A counter

Use the numerical keyboard to set the number of the counter desired, in this case press **3**
Press the **ENTER** key
Use the numerical keyboard to set the value of the stitches desired. E.g.: 8 impulses = 2 stitches
Press the **ENTER** key

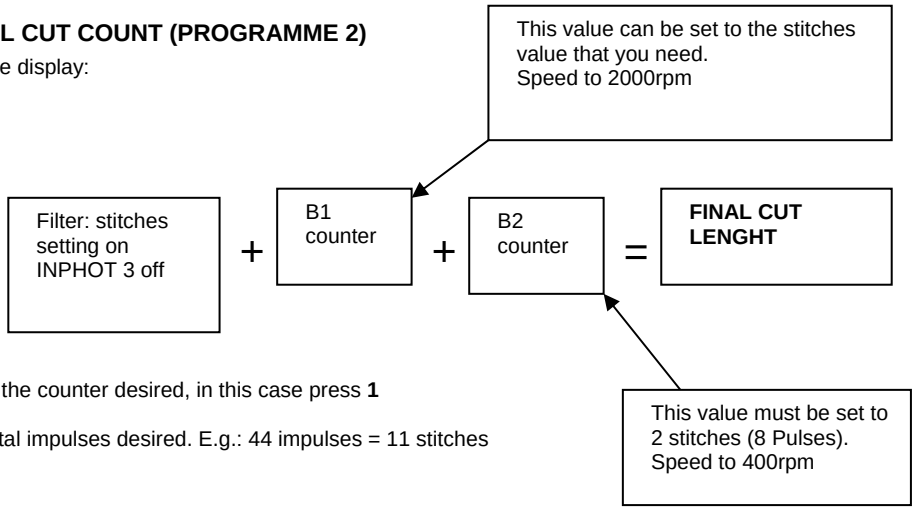
Decrease the value to increase the length of the initial cut on the trousers
Increase the value to decrease the length of the initial cut on the trousers

8.3.6.4. SETTING GRIP DELAY AND FINAL CUT COUNT (PROGRAMME 2)
Press the **PROG** key, the following appears on the display:

A counter

Press **the up arrow** to go to counter B
The following appears on the display:

B counter



Use the numerical keyboard to set the number of the counter desired, in this case press **1**
Press the **ENTER** key
Use the numerical keyboard to set the value of total impulses desired. E.g.: 44 impulses = 11 stitches
Press the **ENTER** key

8.4. SETTING BOBBIN COUNTER

Inside the panel, it is possible to set the control of the quantity of thread on the bobbin, if the 3022 **LS** machine (Lock Stitch) is used.
This function is disabled if the counter is set to number **0 zero**.

8.4.1. STARTING THE MACHINE – Setting counter to maximum

The operator must set the counter BEFORE starting production to know the number of stitches that can be sewn with one bobbin.
Press the **F** key, the following display appears:

```
- COUN.  POINT -
  POINTS =XXXX
```

Press the **ENTER** key to set the count
The display changes to:

```
- COUN.  POINT -
  SET =
```

Insert the following number with the numerical keyboard: **9 9 9 9**
Press the **ENTER** key

8.4.2. STARTING THE MACHINE – Resetting number of COMPLETED stitches

The operator must re-set the counter starting number to zero BEFORE starting production.
Press the **F** key, the following display appears:

```
- COUN.  POINT -
  POINTS =XXXX
```

Press the **C** key to re-set the counter.
The display changes to:

```
POINTS =XXXX You
Cancel?
```

Press the **C** key to confirm.
Substitute the bobbin in the rotating hook for a full one and start production.

8.4.3. MACHINE IN PRODUCTION – Adjusting the Counter

When all the thread in the first bobbin has run out, the operator must stop and set the counter.
Press the **F** key, the following display appears:

```
- COUN.  POINT -
  POINTS =XXXX
```

XXXX = total number of stitches sewn with one bobbin

The operator reads the value on the bottom line of the display (E.g.: 2500)
Press the **ENTER** key to set the count
The display changes to:

```
- COUN.  POINT -
  SET =
```

Use the numerical keyboard to set a number that is slightly lower (E.g.: 2450)
Press the **ENTER** key

8.4.4. MACHINE IN PRODUCTION – Resetting number of COMPLETED stitches in the counter
The operator must re-set the counter starting number to zero BEFORE starting production again.
Press the **F** key, the following display appears:

- COUN. POINT - POINTS =**XXXX**

XXXX = total number of stitches sewn with one bobbin
Press the **C** key to reset the count
The display changes to:

POINTS =XXXX You Cancel?

Press the **C** key
Change the bobbin and start sewing.

8.4.5. MACHINE IN PRODUCTION – RESETTING THE BUZZER
While the machine is running the sewing programme, the buzzer sounds. It to advise the operator that the bobbin is almost out of thread.

To re-set the buzzer sound, the operator may press any of the buttons on the front panel.
The operator may press any of the buttons on the front panel.

At the end of the sewing cycle, the operator **must carry out** the following procedure: 7.4.5.4. MACHINE IN PRODUCTION – Resetting number of COMPLETED stitches in the counter

If the operator **does NOT re-set** the number of COMPLETED stitches in the counter, he/she will have to press any of the buttons on the front panel when the buzzer starts to sound again at the beginning of the next sewing cycle.

8.5. PROGRAMMING THE PANEL

This programme is very important because it determines the SETTING of the BASIC PARAMETERS
Through this programme the following functions are set:

- MACHINE STOP (IN MSEC) with the stop command the stop time is set.
- INPUTS FILTER-DELAY (number of stitches) through the inputs reading the input signal is checked, and thereby the starting of relative counters.
- ENABLING OUTPUTS (total number of usable outputs)

Press the **PROG** key and hold it down until the second acoustic signal
The display changes to:

PASSWORD X X X X

Insert with the keyboard the access code (CODE used **1 – 2 – 3 – 4**)

Note: If you need
to RESET the LS01 panel digit the Password
1 3 5 9
and then confirm it
with **1**

8.5.1. SETTING THE TIMING OF THE STOP SIGNAL

The display changes to:

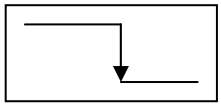
STOP-MOTOR **xx**

Value of between 1 and 250 msec;
The parameter is normally set to **15** msec. Use the keyboard to insert the value and confirm with the **ENT** key

8.5.2. SETTING FILTER/DELAY STITCHES FOR THE INPUTS

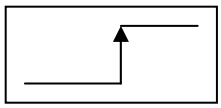
It is possible to set a filter for each INPUT selected, with a value between 1 and 99 stitches.
This filter can be enabled both when the input value passes from OFF to ON (Front upwards), and when the input value passes from ON to OFF (Front downwards).
ATTENTION: The panel will check the value of the filter signal referring to the number of set stitches, and then if correct it will start counting referring to the number of stitches set in the counter, specified in the programme, before changing the value of the output selected.
The display changes to:

STOP-MOTOR 15 **Off**. Phot 1 = **xx**



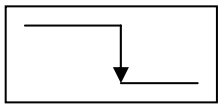
Insert the desired value for input n°.1 when it passes from OFF to ON (Front Downwards).
Normally the value is set to **0**
Confirm with the **ENT** key
The display changes to:

Off Phot 1 = **On** Phot 1 = **xx**



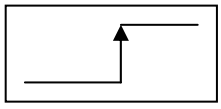
Insert the desired value for input n°.1 when it passes from ON to OFF (Front Upwards).
Normally the value is set to **0**
Confirm with the **ENT** key
The display changes to:

On Phot 1 = **Off** Phot 2 = **xx**



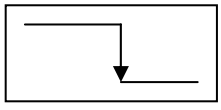
Insert the desired value for input n°.2 when it passes from ON to OFF (Front Downwards).
Normally the value is set to **8**
Confirm with the **ENT** key
The display changes to:

Off Phot 2 = **On** Phot 2 = **xx**



Insert the desired value for input n°.2 when it passes from OFF to ON (Front Upwards).
Normally the value is set to **8**
Confirm with the **ENT** key
The display changes to:

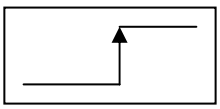
On Phot 2 = **Off** Phot 3 = **xx**



Insert the desired value for input n°.3 when it passes from ON to OFF (Front Downwards).
Normally the value is set to **16**
Confirm with the **ENT** key

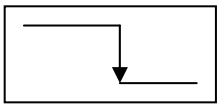
The display changes to:

Off Phot 3 =
On Phot 3 = **xx**



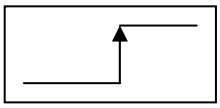
Insert the desired value for input n°.3 when it passes from OFF to ON (Front Upwards).
Normally the value is set to **8**
Confirm with the **ENT** key
The display changes to:

On Phot 3 =
Off Phot 4 = **xx**



Insert the desired value for input n°.4 when it passes from ON to OFF (Front Downwards).
Normally the value is set to **0**
Confirm with the **ENT** key
The display changes to:

Off Phot 4 =
On. Phot 4 = **xx**



Insert the desired value for input n°.4 when it passes from OFF to ON (Front Upwards).
Normally the value is set to **0**
Confirm with the **ENT** key

8.5.3. ENABLING THE OUTPUTS USED IN THE PROGRAMME
It is possible to set the number of outputs enabled, from 1 to 5, which can be set in the programme.
The display changes to:

On Phot 4 = xx
On. Outs = **xx**

Use the keyboard to insert the value desired, from a minimum of 1 to a maximum of 5.
This operation requires **4**, confirm with the **ENT** key

8.5.4. SETTING PULSE NUMBER FOR EACH MACHINE TURN
The display changes to:

K. points = **xx**

Use the keyboard to insert the desired value, same as the value, which appears on the motor, setting to the CP parameter in C mode.
Normally the base value is set to **30**, confirm with the **ENT** key
The display changes to:

END
FORMULATION

Confirm with the **ENT** key

8.6. PROGRAMME THE NUMBER OF IMPULSES FOR STITCH

Press the **PROG** key and hold it down until the second acoustic signal
The display changes to:

PASSWORD
* * * *

Insert with the keyboard the access code (CODE used **1 – 2 – 3 – 5**)
The display changes to:

K. points = **xx**

Use the keyboard to insert the desired value, same as the value, **which appears in C mode on the CP parameter**.
Normally the base value is set to **30** Confirm with the **ENT** key
The display changes to:

END
FORMULATION

Confirm with the **ENT** key

8.7. TEST FUNCTION

When the machine is turned on, the following appears on the display:

VI.BE.MAC.3022 1, Program 1

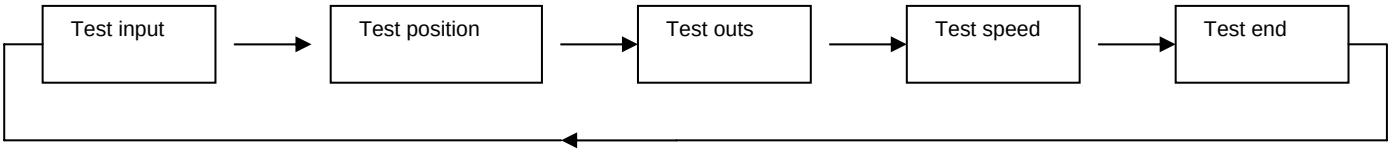
Press the **TEST** key and hold it down until the second acoustic signal
The display changes to:

PASSWORD X X X X

Insert with the keyboard the access code (CODE used **4 – 7 – 1 – 1**)
The display changes to:

Test inputs **X**

Using the directional arrows (Up/Down) move the flashing cursor to the Test to be controlled, selecting from the list below.

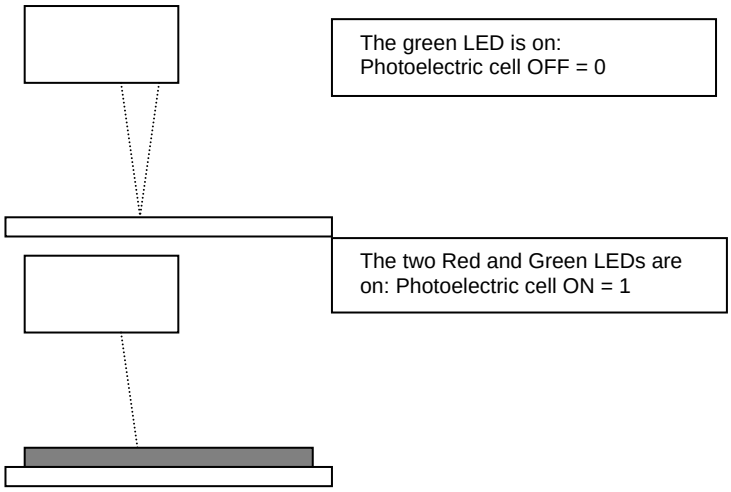


Test inputs selects the control of the INPUTS outside the panel
Test position selects the control of the INPUTS arriving from the motor panel
Test outs selects the control of the OUTPUTS
Test speed selects the control of the SPEEDS set on the motor panel

8.7.1. CONTROL OF INPUTS FROM THE PHOTOELECTRIC CELLS OR SENSORS

Using the directional arrow move the flashing cursor next to Test inputs.
The display changes to:

Test inputs **x**



Confirm with the **ENT** key
The display changes to:

External inputs 0 0 0 0

To verify the operation, remember that:

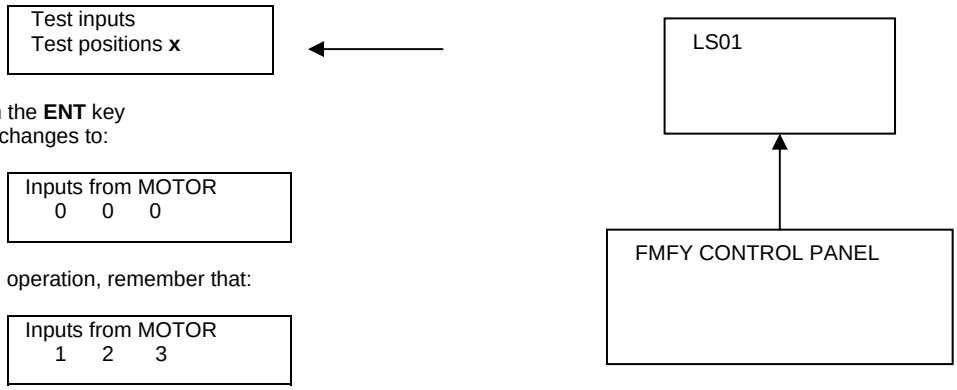
External inputs 1 2 3 4

- In position 1 is displayed the input of the SKIP STITCH photoelectric cell.
  The value is 1 (on) when it is covered and the value is 0 (off) when it is uncovered.
- In position 2 is displayed the input of the INTERMEDIATE STOP photoelectric cell.
  The value is 1 (on) when it is covered and the value is 0 (off) when it is uncovered.
- In position 3 is displayed the input of the CUT photoelectric cell.

The value is 1 (on) when it is covered and the value is 0 (off) when it is uncovered.

To exit from the function and return to the Main Menu, press the **ENT** key.

8.7.2. CONTROL OF INPUTS FROM THE MOTOR PANEL
Using the down arrow move the flashing cursor next to Test Positions.
The display changes to:



Confirm with the **ENT** key
The display changes to:

Inputs from MOTOR
0 0 0

To verify the operation, remember that:

Inputs from MOTOR
1 2 3

- Position 1 is NOT used.
- In position 2 is displayed the input of the SPEED CONTROL.
  The value is 1 (on) when the output is active.
  Press the controls pedal and while the machine is rotating the value changes to 1.
- In position 3 is displayed the input for the STEP MOTOR PULSE function.
  The value is 1 (on) when the sensor inside the handwheel is active.
  Manually turn the handwheel of the machine a few turns to change the value.

To exit from the function and return to the Main Menu, press the **ENT** key

8.7.3. CONTROL OF OUTPUTS TO SOLENOID VALVES
Using the down arrow move the flashing cursor next to Test Outs.
The display changes to:

Test positions
Test Outs x

Confirm with the **ENT** key
The display changes to:

Outputs
0 0 0 0 0

To verify the operation, remember that the outputs are arranged as follows:

Outputs
1 2 3 4 5

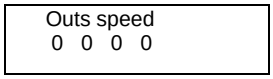
- In position 1 is displayed the output of the SKIP STITCH function.
  Press the **1** key to enable/disable the function.
  The value is 1 (on) when the function is enabled and the value is 0 (off) when it is disabled.
- In position 2 is displayed the output of the GRIP function.
  Press the **2** key to enable/disable the function.
  The value is 1 (on) when the function is enabled and the value is 0 (off) when it is disabled.
- In position 3 is displayed the output of the CUT function.
  Press the **3** key to enable/disable the function.

The value is 1 (on) when the function is enabled and the value is 0 (off) when it is disabled.
In position 4 is displayed the output of the CUT SAFETY SENSOR function.
Press the **4** key to enable/disable the function.
The value is 1 (on) when the function is enabled and the value is 0 (off) when it is disabled.

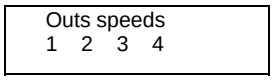
NOTES: The 3 CUT function is activated only if the 4 CUT SAFETY SENSOR is already active.
To exit from the function and return to the Main Menu, press the **ENT** key

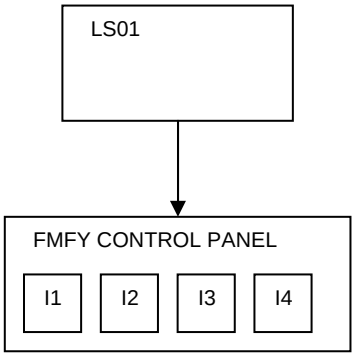
8.7.4. CONTROL OF THE AUTOMATIC SPEED AND MOTOR STOP OUTPUTS
Using the down arrow move the flashing cursor next to Test Speed.
The display changes to:

Confirm with the **ENT** key
The display changes to:



To verify the operation, remember that the outputs are arranged as follows:





ATTENTION: Re-set current test before passing to the next.

- In position 1 is displayed the input of the AUTOMATIC SPEED 1 function.
  Press the **1** key to enable/disable the function.
  The value is 1 (on) when the function is enabled and the value is 0 (off) when it is disabled.
- In position 2 is displayed the input of the AUTOMATIC SPEED 2 function.
  Press the **2** key to enable/disable the function.
  The value is 1 (on) when the function is enabled and the value is 0 (off) when it is disabled.
- In position 3 is displayed the input of the AUTOMATIC SPEED 3 function.
  Press the **3** key to enable/disable the function.
  The value is 1 (on) when the function is enabled and the value is 0 (off) when it is disabled.
- In position 4 is displayed the input of the MACHINE STOP function.
  Press the **4** key to enable/disable the function.

The value is 1 (on) when the function is enabled and the value is 0 (off) when it is disabled.

To exit from the function and return to the Main Menu, press the **ENT** key

8.7.4.1. LIST OF AUTOMATIC SPEEDS

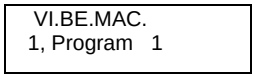
The three automatic speeds are of three different types according to the parameters in the motor panel.
The characteristics of each single speed are as follows.

V.A.0 = The machine starts to turn, at a speed of between zero and the maximum speed set by parameter H.,
Only if the control pedal in the box is in any other position than 0 (zero).
V.A.1 = The machine starts to turn automatically at the maximum speed set by parameter SPL,
for a specified number of stitches. This happens also if the control pedal in the box is in any position including 0 (zero).
V.A.2 = The machine starts to turn, at a speed of between zero and the maximum speed set by parameter SPM,
for a specified number of stitches, only if the control pedal in the box is in any other position than 0 (zero).
V.A.3 = The machine starts to turn, at a speed of between zero and the maximum speed set by parameter SPM,
only if the control pedal in the box is in any other position than 0 (zero).

To exit from the function and return to the Main Menu, press the **ENT** key

8.7.5.EXIT FROM TEST MODE
Using the down arrow move the flashing cursor next to Test End.
The display changes to:

Press the **ENT** key
The display changes to:



8.8. SETTING THE CUT IMPULSE DURATION

When the machine is started, the following appears on the display :

VI.BE.MAC.
1, Program x

On the bottom line is displayed the following:

- The first digit indicates the position of the line of instructions of the programme currently running.

The second digit, PROGRAMME "x" indicates the number of the programme ready to run.

Press the **PROG** key and hold it down until the second acoustic signal
The display changes to:

PASSWORD
X X X X

Using the keyboard, insert the access code (CODE used **7 – 8 – 9 – 0**)

Select the number of the programme to be modified, in this example number **1** or **(2)**
Press the **ENTER** key
The following appears on the display:

N.PROGRAM.
1, outs off

Program n°2

Follow the instruction and go to the line number 34 and 22

This is the first line of the programme
With the Up and Down directional arrows go to line number **19 or (34)**
The following appears on the display:

N.PROGRAM.
19, Time = **4**

This parameter indicates the duration of the INITIAL cut impulse, in this case 4x10=40 msecs.
Set the desired value
With the Up and Down directional arrows go to line number **35 or (22)**
The following appears on the display:

N.PROGRAM.
35, Time = **4**

This parameter indicates the duration of the FINAL cut impulse, in this case 4x10=40 msecs. Set the desired value
Press the **PROG** key to exit.

8.9. LIST OF STANDARD PROGRAMME N° 1. “AUTOMATIC MACHINE STOP WITH FINAL CUT”

When the machine is turned on, the following appears on the display :

VI.BE.MAC.3022 1, Program 1

On the bottom line is displayed the following:

- The first digit indicates the position of the line of instructions of the programme currently running.
- The second digit, PROGRAMME “x” indicates the number of the programme ready to run.

Press the **PROG** key and hold it down until the second acoustic signal
The display changes to:

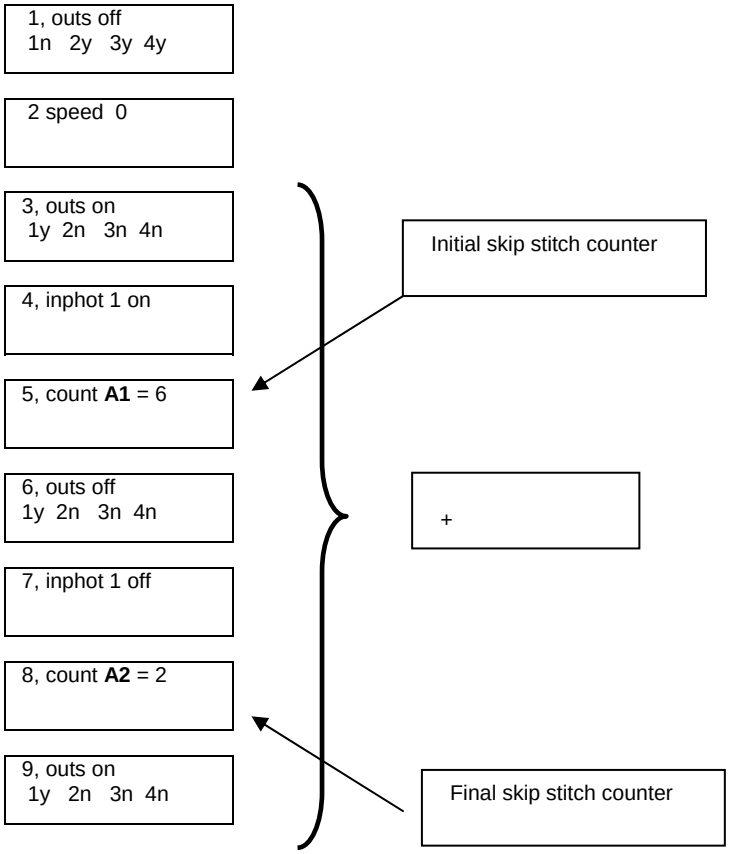
PASSWORD X X X X

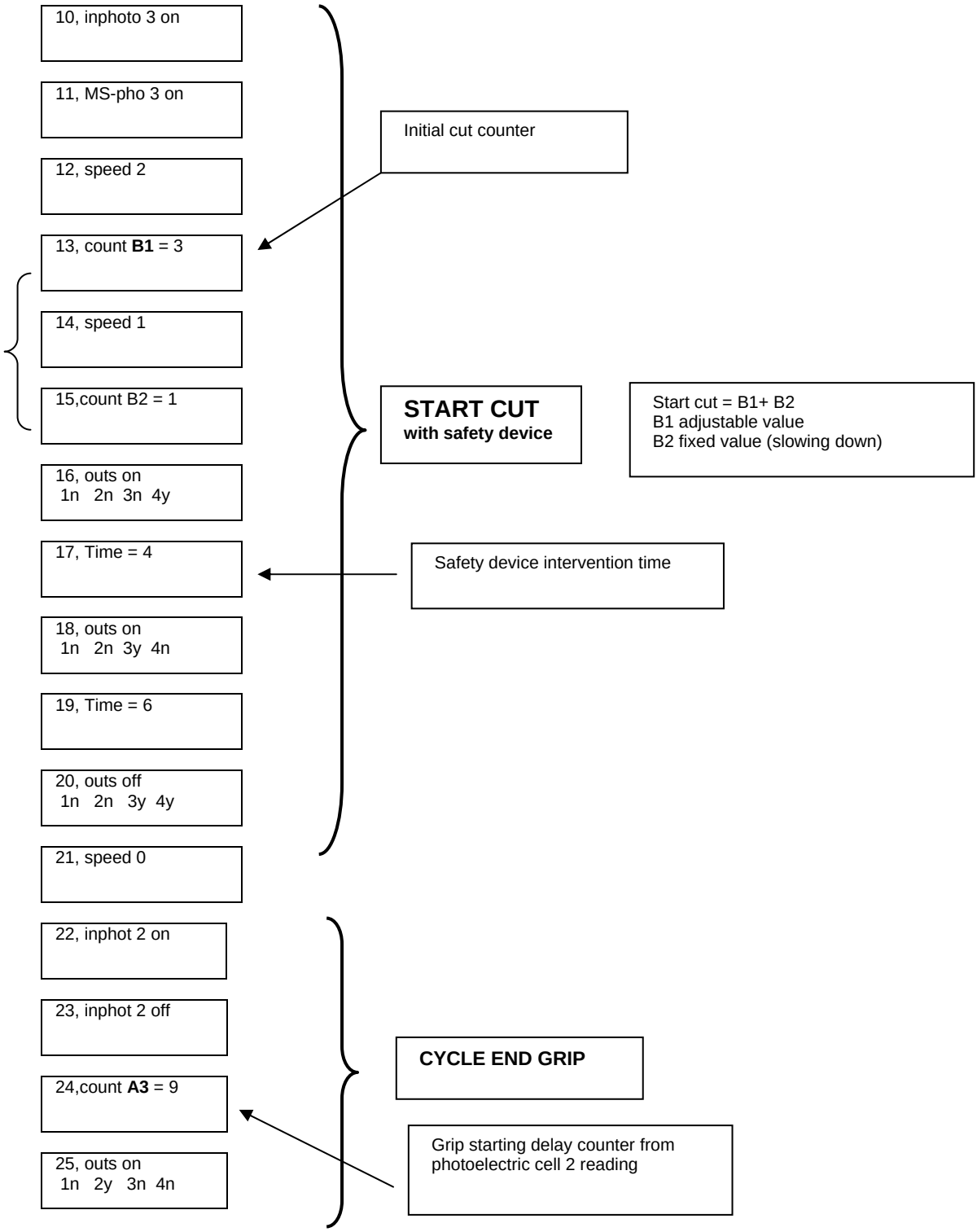
Using the keyboard, insert the access code (CODE used **7 – 8 – 9 – 0**)

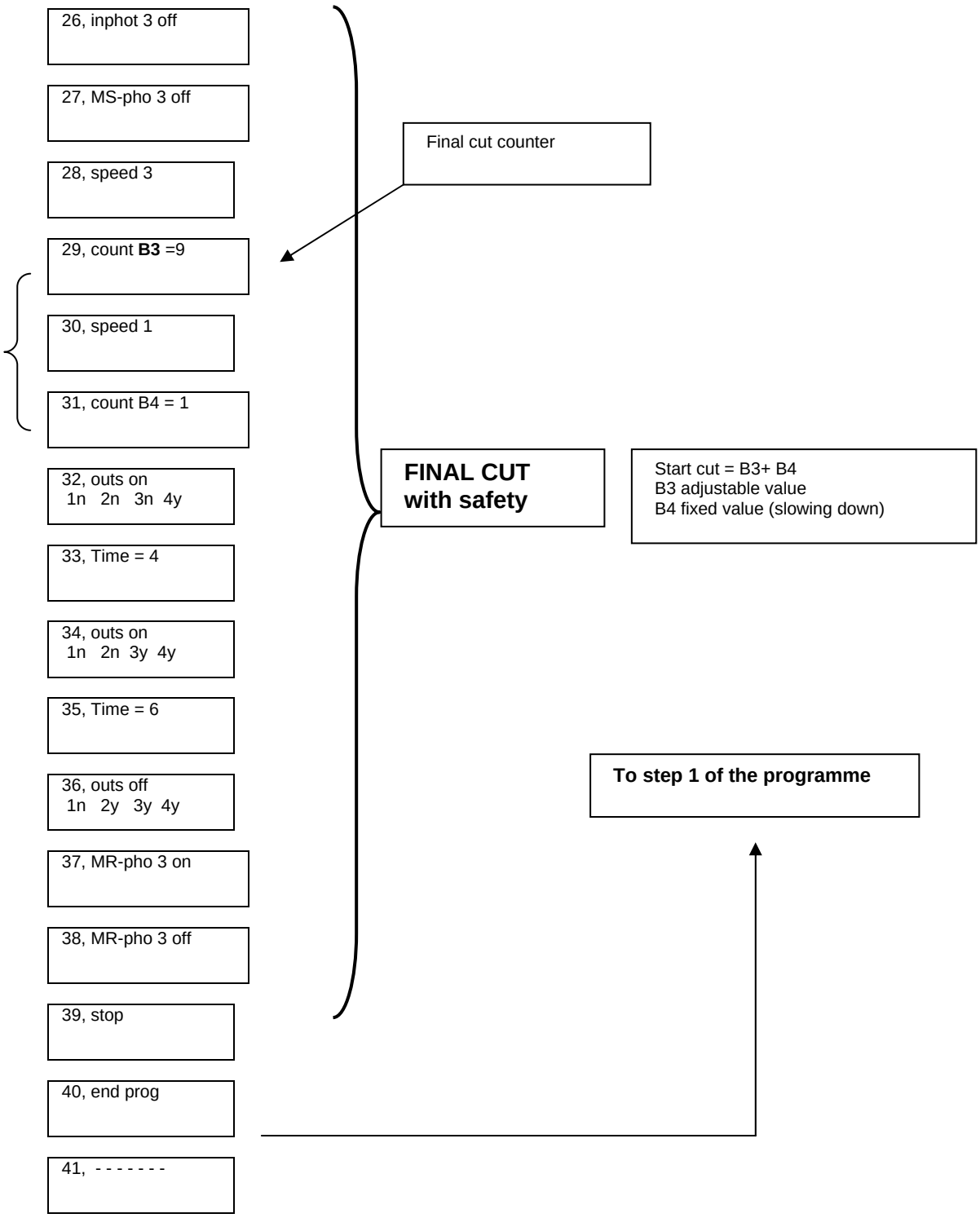
Select the number of the programme to be checked, in this case press **1**
Press the **ENTER** key
The following appears on the display:

N.PROGRAM. 1, outs off

This is the first line of the programme
Press **the down arrow** to scroll down the entire list




10, inphoto 3 on
11, MS-pho 3 on
12, speed 2
13, count **B1** = 3
14, speed 1
15,count B2 = 1
16, outs on
1n 2n 3n 4y
17, Time = 4
18, outs on
1n 2n 3y 4n
19, Time = 6
20, outs off
1n 2n 3y 4y
21, speed 0
22, inphot 2 on
23, inphot 2 off
24,count **A3** = 9
25, outs on
1n 2y 3n 4n
Initial cut counter
START CUT
with safety device
Start cut = B1+ B2
B1 adjustable value
B2 fixed value (slowing down)
Safety device intervention time
CYCLE END GRIP
Grip starting delay counter from photoelectric cell 2 reading


26, inphot 3 off
27, MS-pho 3 off
28, speed 3
29, count **B3** =9
30, speed 1
31, count B4 = 1
32, outs on
1n 2n 3n 4y
33, Time = 4
34, outs on
1n 2n 3y 4y
35, Time = 6
36, outs off
1n 2y 3y 4y
37, MR-pho 3 on
38, MR-pho 3 off
39, stop
40, end prog
41, - - - - - - -
Final cut counter
FINAL CUT with safety
Start cut = B3+ B4
B3 adjustable value
B4 fixed value (slowing down)
To step 1 of the programme

8.10. LIST OF STANDARD PROGRAMME N° 2 "INTERMEDIATE AUTOMATIC MACHINE STOP WHEN PHOTOELECTRIC CELL 2 IS UNCOVERED"

When the machine is turned on, the following appears on the display :

VI.BE.MAC.3022 1, Program 1

On the bottom line is displayed the following:

- The first digit indicates the position of the line of instructions of the programme currently running.
- The second digit, PROGRAMME "x" indicates the number of the programme ready to run.

Press the **PROG** key and hold it down until the second acoustic signal
The display changes to:

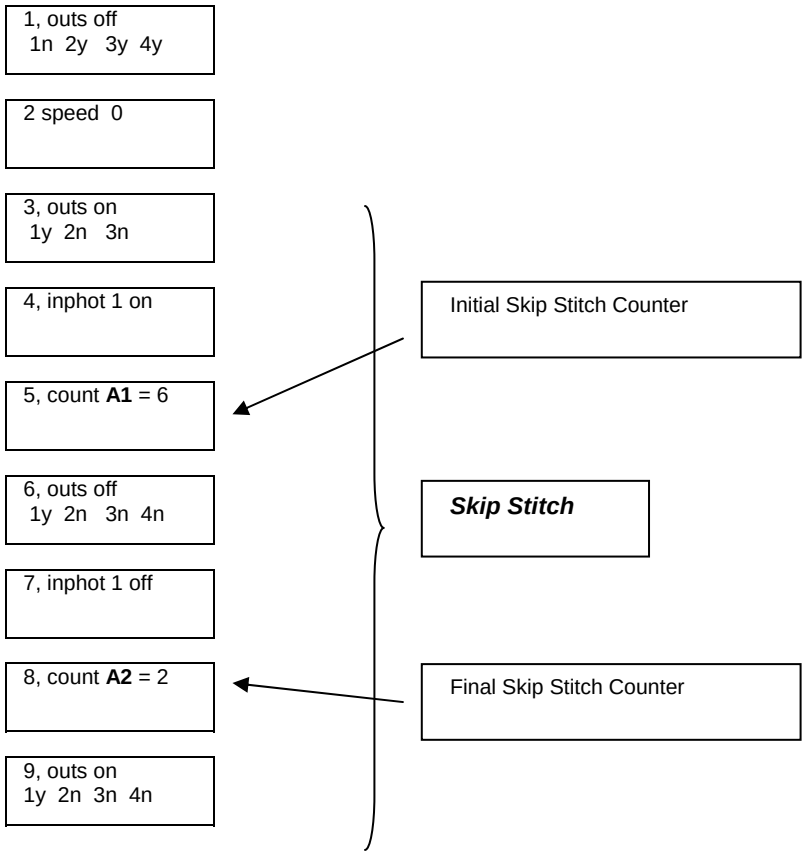
PASSWORD X X X X

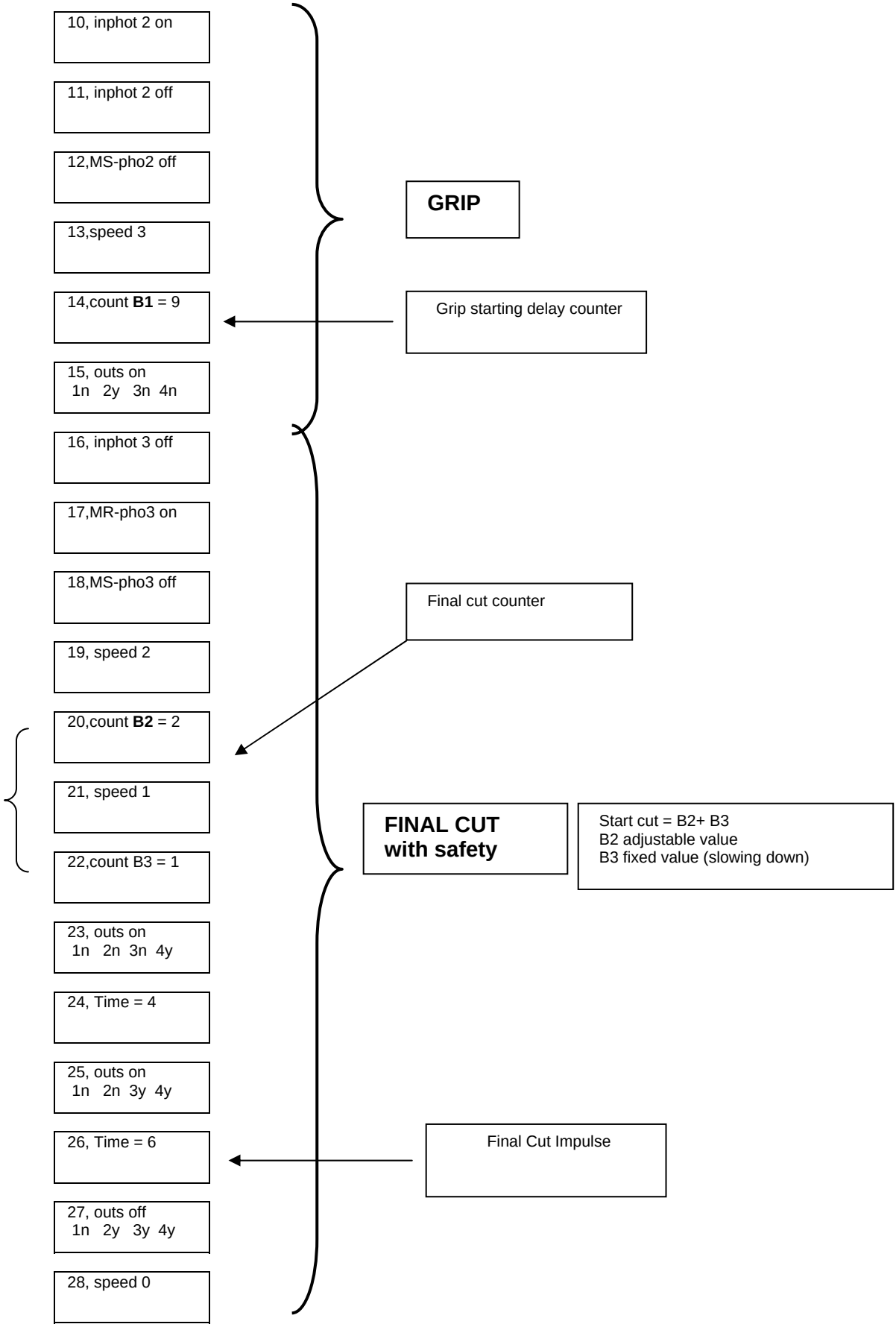
Using the keyboard, insert the access code (CODE used **7 – 8 – 9 – 0**)

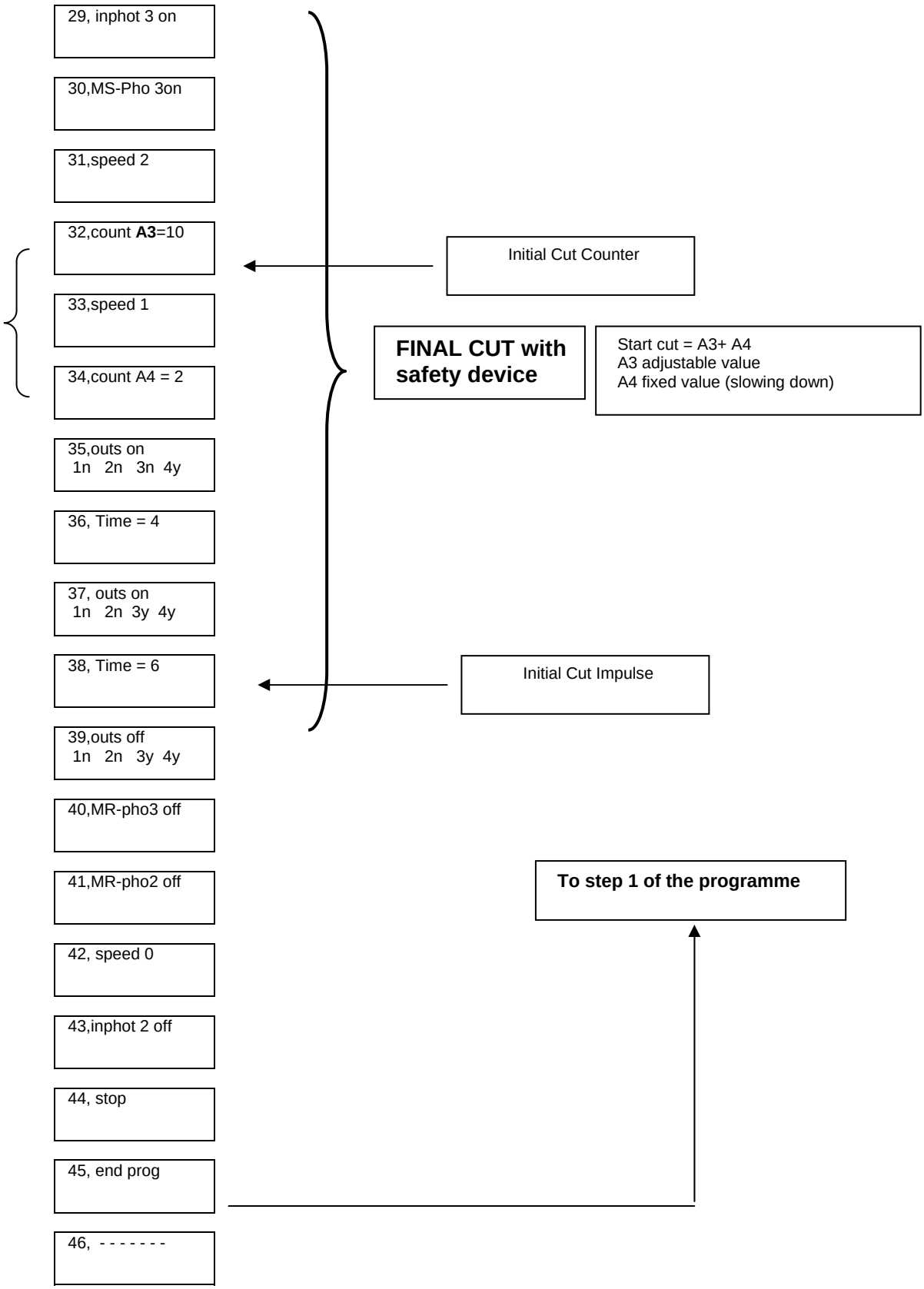
Select the number of the programme to be checked, in this case press **2**
Press the **ENTER** key
The following appears on the display:

N.PROGRAM. 1, outs off

This is the first line of the programme
Press **the down arrow** to scroll down the entire list




10, inphot 2 on
11, inphot 2 off
12,MS-pho2 off
13,speed 3
14,count **B1** = 9
15, outs on
1n 2y 3n 4n
16, inphot 3 off
17,MR-pho3 on
18,MS-pho3 off
19, speed 2
20,count **B2** = 2
21, speed 1
22,count B3 = 1
23, outs on
1n 2n 3n 4y
24, Time = 4
25, outs on
1n 2n 3y 4y
26, Time = 6
27, outs off
1n 2y 3y 4y
28, speed 0
GRIP
Grip starting delay counter
Final cut counter
FINAL CUT
with safety
Start cut = B2+ B3
B2 adjustable value
B3 fixed value (slowing down)
Final Cut Impulse


29, inphot 3 on
30,MS-Pho 3on
31,speed 2
32,count **A3**=10
33,speed 1
34,count A4 = 2
35,outs on
1n 2n 3n 4y
36, Time = 4
37, outs on
1n 2n 3y 4y
38, Time = 6
39,outs off
1n 2n 3y 4y
40,MR-pho3 off
41,MR-pho2 off
42, speed 0
43,inphot 2 off
44, stop
45, end prog
46, - - - - - - -
Initial Cut Counter
FINAL CUT with safety device
Start cut = A3+ A4
A3 adjustable value
A4 fixed value (slowing down)
Initial Cut Impulse
To step 1 of the programme

9. MITSUBISHI SERVOMOTOR

On the automatic unit is installed: a type **XL-CE MITSUBISHI** Servomotor linked to an **FMFY** model panel, a Positioner model **XC-KE-01P.**
The panel is modified in respect to that of the series through a specific programme of Inputs/Outputs.
A pulley with diameter of 95mm is mounted on the motor and the machine turns at about 5000 stitches per minute.
In the automatic unit in the Lock Stitch version, the pulley mounted on the motor has a diameter of 80mm and the machine turns at about 3200 stitches per minute.

9.1.POSITIONER:

The model **XC-KE-01P** Positioner has 2 disks (from internal to external):

1° Not adjustable Disk: Tachometer black disk for measuring speed.
2° Disk: Red Disk Needles stop position with pedal in neutral position during sewing.

In order to stop the needles at the end of the sewing in the Top Dead Centre losen the fixing screws of the Positioner, holding it turn the handwheel in required position.

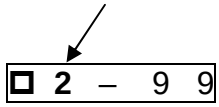
Turn the disks in an ANTICLOCKWISE direction to anticipate the signal
Turn the disks in an CLOCKWISE direction to delay the signal.

9.2.PANEL TYPE FMFY:

To select the various functions in the Motor Panel mod.FMFY there is a Display and a sequence of buttons to call required functions in the menu.
Set the type of sewing machine referring to the list of the original technical manual.
For the electrical connections check the various settings, referring to the list presented on the original technical manual from page 34 to 56.

9.2.1.SETTING MACHINE NEEDLE STOP POSITION

The following appears on the control panel:

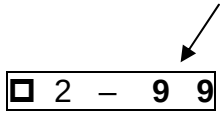


The first number identifies the type of stop of the sewing head during the sewing cycle moving the pedal in neutral position.
Setting number 1 the machine stops with the needle in the upper dead centre (PSU)
Setting number 2 the machine stops with the needle in the lower dead centre (PSD)

Press **the A key** to change the type of stop

9.2.1.MACHINE SEWING SPEED VARIATION

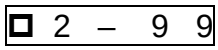
The following appears on the control panel:



The two highlighted numbers identify the percentage value of the sewing head speed during the sewing cycle.

Press **the C and D buttons** to change the speed value, example 50% of the maximum set value
Range of operation from 1 to 99% of the value set by parameter H in P – P mode

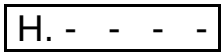
9.2.3.SETTING MAXIMUM SEWING – POSITIONING – CUT SPEED
The following appears on the control panel:



Press simultaneously the **up** ↑and **down** ⇩arrow keys
The following writing appears on the display:

(P mode)

Hold down the two keys until the writing changes to:

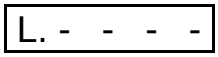


= Maximum set speed value

The **D** key **changes the units**
The **C** key **changes the tens**
The **B** key **changes the hundreds**
The **A** key **changes the thousands**

Regulate referring to the type of thread in use on the machine, 2999 turns for the thin thread and 2699 for the tick thread

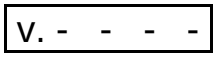
Press the **down** arrow key, the following writing appears on the display:



= Minimum and WAISTBAND CUT speed value (Speed1)

The **D** key **changes the units**
The **C** key **changes the tens**
The **B** key **changes the hundreds**
The **A** key **changes the thousands**

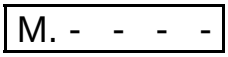
Regulate on value 400
Press the **down** arrow key until the following appears on the display:



= WAISTBAND CUT speed value (Speed2)

The **D** key **changes the units**
The **C** key **changes the tens**
The **B** key **changes the hundreds**
The **A** key **changes the thousands**

Regulate on value 2000
Press the **down** arrow key until the following appears on the display:



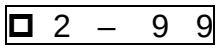
= WAISTBAND CUT MEDIUM speed value (Speed3)

The **D** key **changes the units**
The **C** key **changes the tens**
The **B** key **changes the hundreds**
The **A** key **changes the thousands**

Regulate on value 2000
Press simultaneously the **up** and **down** arrow keys to exit

9.2.4.SETTING THE NUMBER OF OUTPUT IMPULSES TO CONTROL THE STEP-BY-STEP MOTOR
This regulation is necessary to change the rotation speed of the Step-by-Step motor referring to the required stitch length.

The following appears on the control panel:



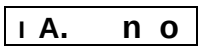
Press simultaneously the **down** ⇩arrow and the **C** key.

⇩ + C

The following writing appears on the display:

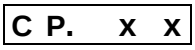
(C mode)

Hold down the two keys until the writing changes to:



Input Value 1

Press the **up** arrow key until the following writing appears on the display:



Setting the number of impulses in a rotation. (**Base 33)**

Using the **C** and **D** key insert the required number of impulses from the material end reading through the photoelectric cell.

Press simultaneously the **up** and **down** arrow keys to exit

IMPORTANT: Every time the number of impulses is changed, turn off the unit, wait that the display on the consolle turns off and then turn on the unit again.

NOTE: you must also modify the parameter on the LS02 Digital Panel follow the instruction on the page number 19
” 8.6. PROGRAMME THE NUMBER OF IMPULSES FOR STITCH”

9.2.5.INPUTS / OUTPUTS TEST
The following appears on the control panel:

□ 2 – 9 9

Press simultaneously the **up** ↑ and **down** ⇩arrows an the **C** key
The following writing appears on the display:

P - E

(E mode)

Hold down the two keys until the writing changes to:

1. E - -

The last error message of the machine appears on the display
Press the **down** arrow key
The following appears on the display:

2. E - -

The penultimate error message of the machine appears on the display
Press the **down** arrow key
The following appears on the display:

3. E - -

The third from last error message of the machine appears on the display
Press the **down** arrow key
The following appears on the display:

4. E - -

The fourth from last error message of the machine appears on the display
Press the **down** arrow key
The following appears on the display:

Check the Error list to uderstand the problen that you have, and to know in which way you can resolve it

P. - - - -

Motor actual running time in hours
The value must be multiplied by ten (Total time = n° X 10)

Press the **down** arrow key
The following appears on the display:

M. - - - -

Motor actual rotation time in hours
The value must be multiplied by ten (Total time = n° X 10)

Press the **down** arrow key

Display of all INPUTS present (from **iA** to **iP,** from **i1** to **i7**) **with the possibility of testing them manually**
The following appears on the display:

I A. O F	input parameter i A = OFF

The INPUT value (ON/OFF) of the parameter **i 1** is displayed.
Changing the logic state of relative input (pedal – switch – sensor – photoelectric cell) the value changes from **o f** to **o n**.
The parameters normally set by manufacturer are as follows:

FUNCTION	INPUT		PARAMETER
Adjustable speed rotation signal	**from pedal**	**(S1)**	**IG**
Thread Cut Signal	**from pedal**	**(S2)**	**IH**
Pressure foot Raise Signal	**from pedal**	**(S3)**	**II**
Pressure foot Raise Signal	from input	(F)	IF
Skip stitch Photocel Signal	**from input**	**(io6)**	**ID**
Bar Tacks Signal	from input	(S7)	IE
P.M.S. priority Seam Stop Signal	from input	(PSU)	IA
P.M.I. priority Seam Stop Signal	from input	(PSD)	IB
Low speed rotation signal	from input	(S0)	IC
Start Cut Speed 2 Input Signal	**from input**	**(S5)**	**I1**
Machine Stop Signal	**from input**	**(PSU)**	**I2**
Speed 1 Input Signal	**from input**	**(SPM)**	**I4**
End Cut Speed 2 Input Signal	**from input**	**(S5v)**	**I5**
Free input Signal	from input	(NO)	I6
Free input Signal	from input	(NO)	I7

15 inputs

Press the **down** arrow key **to cycle through required bold parameters**
When the following appears on the display:

I 5. O F	input parameter i 5 = OFF

The INPUT value (ON/OFF) of the last parameter **i 5** is displayed.
Press the **down** arrow key
The following appears on the display:

E C A. X X	input parameter MOTOR ENCODER phase A

The INPUT value (ON/OFF) of parameter **E C A** is displayed
Turn the synchronizer on the machine to change the value from **o n** to **o f** or viceversa.
Press the **down** arrow key
The following appears on the display:

E C B. X X	input parameter MOTOR ENCODER phase B

The INPUT value (ON/OFF) of parameter **E C B** is displayed.
Turn the synchronizer on the machine to change the value from **o n** to **o f** or viceversa.
Press the **down** arrow key
The following appears on the display:

U P. O N	input parameter HIGH THREAD position Sensor reading

The INPUT value (ON/OFF) of parameter **U P** is displayed.
Turn the synchronizer on the machine to change the value from **o n** to **o f** or viceversa.
Press the **down** arrow key
The following appears on the display:

D N. O F	input parameter LOW Needle position Sensor reading

The INPUT value (ON/OFF) of parameter **d n** is displayed.
Turn the synchronizer on the machine to change the value from **o n** to **o f** or viceversa.
Press the **down** arrow key
The following appears on the display:

D R. O F	Current position angle display from LOW Needle Reading

The INPUT value (ON/OFF) of parameter **d r** is displayed.
Turn the synchronizer on the machine to change it.
Press the **down** arrow key
The following appears on the display:

P D. X X X	Numerical value equivalent to the tension given by the VC changeable speed parameter with lowered pedal Reading field from 000 to 3FF

Press the **down** arrow key

The following appears on the display:

V 1. X X X Numerical value equivalent to the tension given by the VC changeable speed parameter with OPTION B. connector Reading field from 000 to 3FF

Press the **down** arrow key
The following appears on the display:

V 2. X X X Numerical value equivalent to the tension given by the VC changeable speed parameter with OPTION B. connector Reading field from 000 to 3FF

Press the **down** arrow key

Display of all signals going from the CPU to the OUTPUTS while the sewing machine is running (from **O A d** to **OD, OF, O1** to **O7, OJ, OK, OO,OP.**)
The following appears on the display:

O A D. O F output signal 0 A = OFF THREAD-TRIMMER

The OUTPUT value of parameter **0 A d** is displayed.
The parameters normally set by manufacturer are as follows:

FUNCTION		PARAMETER
Thread Cut Signal	(T)	OAD
Thread Discard Signal	(W)	OBD
Needles Cooling Exit Signal	**(NCL)**	**OCD**
SKIP STITCH lock stitch side Signal	**(OTC)**	**ODD**
Pressure foot Raise Signal	**(FU)**	**OFD**
Virtual Exit 1 Signal	(OT1)	O1D
High Needle Position Signal	**(UPW)**	**O2D**
Machine Running Signal	**(OP)**	**O3D**

8 outputs

Press the **down** arrow key **to cycle through required bold parameters**

Display of all INPUTS (from **OA** to **OD, OF, O1** and to **O7, OJ, OK, OO,OP.**) **with the possibility of testing them manually**
The following appears on the display:

O A O. O F output signal 0 A = OFF TREAD-TRIMMER

The OUTPUT value of parameter **0 A o** is displayed.
Press the **D** key to change the value from OFF to ON.
The parameters normally set by manufacturer are as follows:

FUNCTION		PARAMETER
Thread Cut Signal	(T)	OAo
Thread Discard Signal	(W)	OBo
Needles Cooling Exit Signal	**(NCL)**	**OCo**
SKIP STITCH lock stitch side Signal	**(OTC)**	**ODo**
Pressure foot Raise Signal	**(FU)**	**OFo**
Virtual Exit 1 Signal	(OT1)	O1o
High Needle Position Signal	**(UPW)**	**O2o**
Machine Running Signal	**(OP)**	**O3o**

8 outputs

Press the down arrow key **to cycle through required bold parameters**

The following appears on the display:

W T. X X Version of the motor in use (x x = 55 550 watts motor, xx = 75 750 watts motor)

Press the **down** arrow key
The following appears on the display:

V L. X X Tension value set at the input (x =100 referred to 100 volt, x =200 referred to 200 volt)

Press the **down** arrow key
The following appears on the display:

T P. X X Type of Central Unit in use (N =XC - EN, MFY = XC - FMFY)

Press the **down** arrow key
The following appears on the display:

D V. X X Version of the EEPROM system used in the main memory

Press the **down** arrow key
The following appears on the display:

R V. X X

Version of the system SOFTWARE used in the main memory

Press the **down** arrow key
The following appears on the display:

T. X X

SIMPLE SETTING Version used in the main memory

Press simultaneously the **up** and **down** arrow keys to exit

⇧ + ⇩

The following DISPLAY appears on the control panel:

□ 2 – 9 9

9.2.7.LOCK STITCH SIDE – SETTING THE LOCK STITCH SKIP STITCH
The following DISPLAY appears on the control panel:

□ 2 – 9 9

Press the follow 3 keys, DOWN arrow ⇩, **B and D keys** in the same time.

⇩ + B + D

The following DISPLAY appears on the control panel:

P - S (S mode)

Hold on the three keys until the follow dispaly appears:

K s m. o f (S mode)

Press DOWN arrow ⇩ until the follow dispaly appears:

NOTE: In case you do not need the SKIP STITCHES FUNCTION in the Lock stitches side you change the parameter value ID from **id.io6** to **id.no** in **C mode.**
To entry in C mode you press both **DOWN arrow + C** Keys togheter.
Scroll the list until you arrive to:

id. io6 → **id. no**

By **D** key you can change it to iod to no.
Press DOWN arrow + UP arrow togheter to exit.

K 1 1. x x START SKIP STITCH – RETARD TO EXIT FROM PHOTOCELL MATERIAL DETECTION

By **C** and **D** insert the value that you like, minimum 1 to 99 stitches.
Press DOWN arrow ⇩ until the follow display appears:

K 1 2. x x START SKIP STITCH – LENGTH FROM K11 COUNTER END.

By **C** and **D** insert the value that you like, minimum 1 to 99 stitches.
Press DOWN arrow ⇩ until the follow dispaly appears:

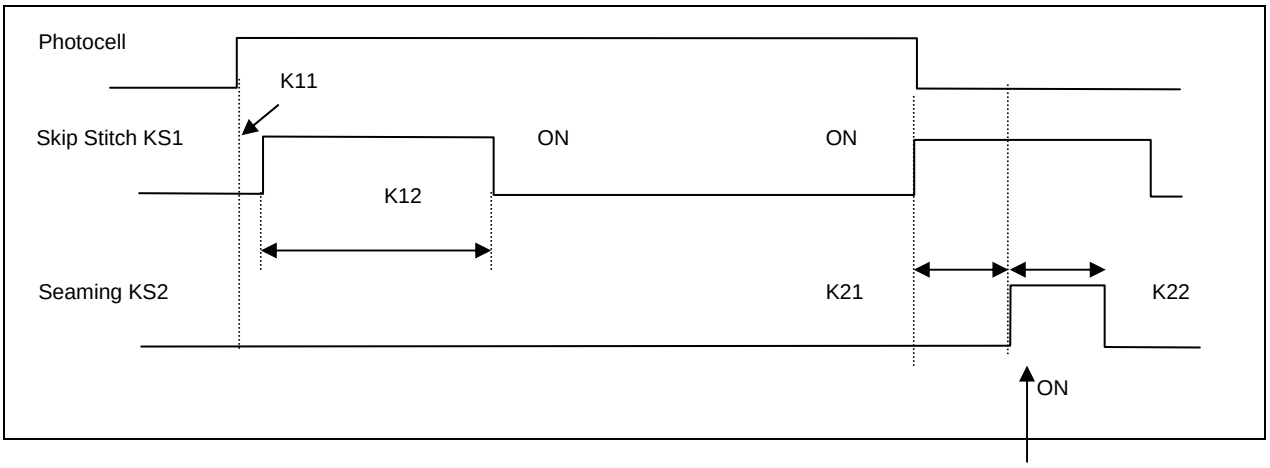
K 2 1. x x END SKIP STITCH – LENGTH FROM PHOTOCELL MATERIAL DETECTION

By **C** and **D** insert the value that you like, minimum 1 to 99 stitches.
Press DOWN arrow ⇩ until the follow dispaly appears:

K 2 2. x x END SEWING BETWEEN SKIP STITCHES – SEAMING LENGTH FROM K21 TO STOP CYCLE

By **C** and **D** insert the value that you like, minimum 1 to 99 stitches.

Press simultaneously the **up** ⇧and **down** ⇩arrow keys to exit



9.2.7.WRITING THE PROGRAMME IN THE PANEL MEMORY (BACK-UP)
Turn on the machine holding down the **down arrow** ⇩the **A** and the **C** key simultaneously

Turn on + ⇩ + **A** + **C**

The following writing appears on the display:

P - q	(q mode)

Hold simultaneously the THREE keys down until the writing changes to:

U C S. o f

Press simultaneously the **up** and **down** arrow keys to exit

🡅 + ⇩

The following appears on the control panel:

□ 2 – 9 9

Turn on the machine holding down the **down arrow** ⇩ the **A** the **B** and the **D** key simultaneously

Turn on + ⇩ + **A** + **B** + **D**

The following writing appears on the display:

P - u	(u mode)

Hold the keys down until the writing changes to:

B a c k u p

Press the **D** key to start the copying cycle.

All the data is normally transferred in about 5 seconds. If during the transfer the following message appears

M - 5

Turn off the machine and repeat operations described above.

9.2.7.RESETTING THE PANEL MEMORY
The following appears on the control panel:

□ 2 – 9 9

Press the **down arrow** ⇩the **B** and the **C** key simultaneously

⇩ + **B** + **C**

The following writing appears on the display:

P - r	(r mode)

Hold the THREE keys down until the writing changes to:

R e s e t

Press the **D** key to start the copying cycle. Hold it down until the writing flashes three times
The following appears on the control panel:

□ 2 – 9 9

9.2.8. ERROR LIST

If during Operation one of the following messagges appears

E - x

Turn off the machine and verify the cause of the problem performing suggested operations.
Below is the complete list of errors and possible solutions.

E - 1	Check that the motor supply connector is inserted properly
E - 2	Check the voltage on line (Overvoltage)
E - 3	Check that the ENCODER connector on the motor panel is inserted properly Check that the machine is not blocked Check that the motor is not blocked
E - 4	Check that the motor panel supply connector is inserted properly
E - 6	Problem with the INPUTS signals (NOISE-INTERFERENCES) Check that no interferences to the software input signals are present.
E - 8	Check that the machine is not blocked Check that the synchronizer is connected
E - 9	Check that no (Solenoid valves – Bobbins) are in short circuit Check that the synchronizer is connected

9.2.9.PARAMETERS LIST
Fist of all recall the 280M (Factory setting) from the motor

C Mode	C1	**IA**	PSU	**IO8**	Input from thread break detector
	C10	**ID**	TL	**IO6**	Input from Skip Stitch photocell
	C49	**I1**	IO1	**SPM**	Input Initial Cutter speed (speed 2 parameter value LS01)
	C62	**I2**	U	**PSU**	Input Stop sewing cycle
	C70	**I4**	NO	**SPL**	Input Slow Cutter speed (speed 1 parameter value LS01)
	C73	**I5**	NO	**S5v**	Input Final Cutter speed (speed 3 parameter value LS01)
	C82	**OA**	T	**NO**	No used
	C87	**OB**	W	**NO**	No used
	C92	**OC**	B	**NCL**	Output Needle Cooler
	C100	**OD**	B	**OTC**	Output Skip Stitch Lock Stitch side
	C116	**O2**	NCL	**KS2**	Output Second sequence
	C118	**O3**	TF	**OP**	Output machine in rotation
	C122	**O5**	TF	**HI**	Output supply LS01
	C164	**A1**	NO	**IOC**	Logic AND1 output
	C167	**N1**	NO	**KS1**	Input N1 logic A1 first conditiones
	C169	**N2**	NO	**KS2**	Input N2 logic A1 first conditiones
	C170	**N2L**	OF	**ON**	Input N1 logic A1 level
	C171	**A2**	NO	**SPM**	Logic AND2 output
	C174	**N3**	NO	**OTC**	Input N3 logic A2 first conditiones
	C176	**N4**	NO	**OP**	Input N4 logic A2 first conditiones
	C178	**A3**	NO	**THI**	Logic AND3 output
	C181	**N5**	NO	**OT8**	Input N5 logic A3 first conditiones
	C183	**N6**	NO	**OTC**	Input N6 logic A3 first conditiones
	C184	**N6L**	OF	**ON**	Input N6 logic A3 level
	C207	**CPK**	ON	**OF**	Cancel output CP
	C208	**CP**	0	**33**	Pulse number each turn
P Mode	P1	**H**	4000	**2799**	Maximum speed
	P2	**L**	200	**400**	Low speed (speed 1 value)
	P5	**V**	1700	**2000**	Slow down speed (speed 3 value)
	P6	**M**	1700	**2000**	Slow down speed (speed 2 value)
Q Mode	Q17	**TH**	OF	**ON**	Sensore rottura filo valido (OPTIONAL)
	Q18	**TST**	TR	**ST**	Operazione dopo rilevamento rottura filo
	Q19	**B**	600	**1000**	Velocità fino a che s'ignora sensore
	Q20	**THS**	7	**F**	Numero di punti che s'ignora il sensore rottura filo alla partenza di un nuovo ciclo
S Mode	S2	**SQS**	NO	**GO**	Sequence conditiones starts
	S4	**NS1**	OF	**ON**	Sequence condition KS1 start (time/stitches)
	S5	**NE1**	OF	**ON**	Sequence condition KS1 end (time/stitches)
	S6	**S1S**	KS	**IN**	Sequence condition KS1 input start
	S7	**S1E**	KS	**OF**	Sequence condition KS1 input end
	S8	**NS2**	OF	**ON**	Sequence condition KS1 start (time/stitches)
	S9	**NE2**	OF	**ON**	Sequence condition KS1 end (time/stitches)
	S20	**K11**	7	**1**	Sequence condition KS1 counter
	S21	**K12**	7	**11**	Sequence condition KS1 counter
	S22	**K21**	7	**11**	Sequence condition KS2 counter
	S23	**K22**	7	**25**	Sequence condition KS2 counter

C Mode Press **DOWN ARROW + C** key in the same time

P Mode Press **DOWN ARROW + UP ARROW** keys in the same time

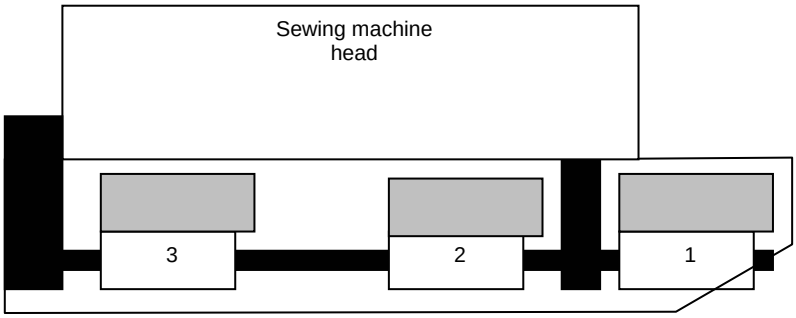
Q Mode Press **DOWN ARROW + B + D** keys in the same time

To exit from **press UP and DOWN arrows keys** in the same time the

10. INPUTS / PHOTOELECTRIC CELLS

The 3 photoelectric cells of the machine are of type "RT01".
Their function is to signal to the LS01 logic panel the position of the trousers on the working surface of the machine.
The photoelectric cells read the position of the trousers using a STAINLESS STEEL mirror fixed to the working surface.
This type of photoelectric cell has two lights, to verify its operation:
GREEN LIGHT ON
· The photoelectric cell is on with the output value on OFF, it can read through the STAINLESS STEEL mirror.
RED AND GREEN LIGHT ON
· The photoelectric cell is on with the output value on ON, it cannot read since the STAINLESS STEEL mirror is covered by the material.

IMPORTANT
Clean the optical scanner and the mirror every morning with a piece of cloth to remove any dirt that may have accumulated during normal operation of the machine.



Photoelectric cell N°1, located near the operator, controls the Skip Stitch function.
It is connected to the LS01/P panel by the rear 15 poles inputs connector.
It is connected to the terminals as follows:
n°7 Light Blue wire
n°1 Black wire
n°5 Brown wire.
The Orange wire is NOT connected to any pole.

Photoelectric cell N°2 is located centrally and controls the Automatic Stop function.
It is connected to the LS01/P panel by the rear 15 poles inputs connector. It is connected to the the terminals with this order:
n°7 Light Blue wire
n°2 Black wire
n°5 Brown wire.
The Orange wire is NOT connected to any pole.

Photoelectric cell N°3 is located near the Puller roller and is the photoelectric cell for the Cut function.
It is connected to the LS01/P panel by the rear 15 poles inputs connector.
It is connected to the terminals as follows:
n°8 Light Blue wire
n°3 Black wire
n°6 Brown wire.
The Orange wire is NOT connected to any pole.

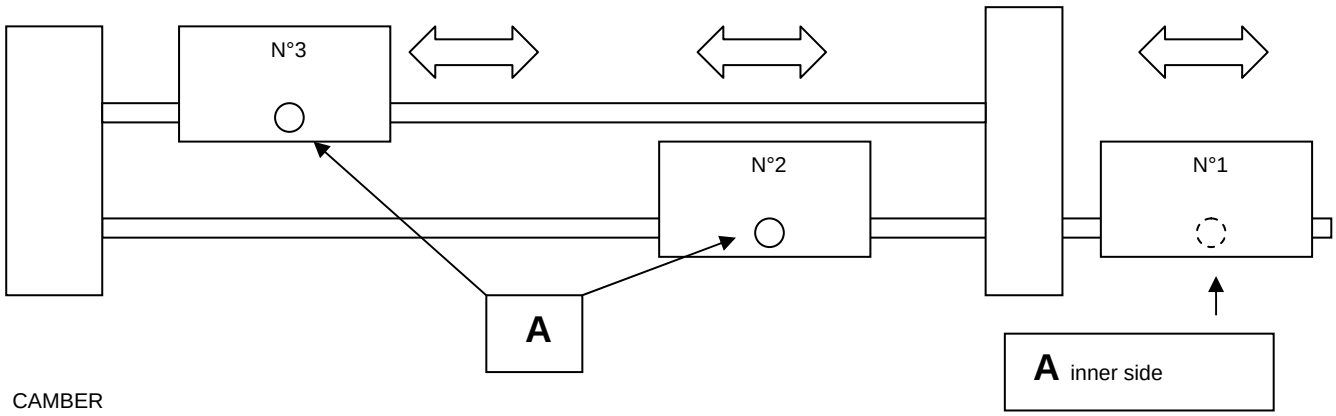
10.1.INPUTS/SAFETY SENSOR

The sensor is placed vertically near the Puller cylinder.
It is connected to the LS01/P panel by the rear 15 poles inputs connector.
It is connected to the terminals as follows:
n°9 Light Blue wire
n°11 Black wire
n°10 Brown wire.
The Orange wire is NOT connected to any pole.

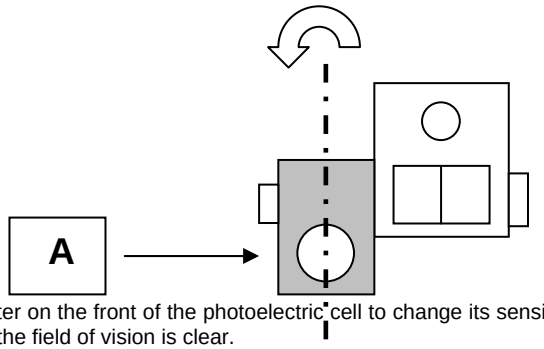
10.2.ADJUSTMENTS

The position, camber and sensitivity of these photoelectric cells can be changed.

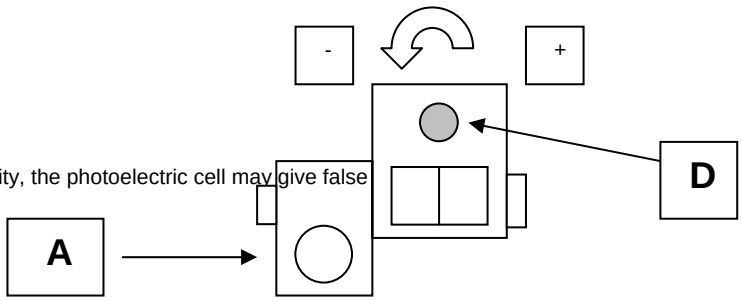
POSITION
Loosen the clamping screw and move the photoelectric cell along the clamping rod.



CAMBER
Loosen the clamping screw and turn the photoelectric cell along the axis.
Attention: the photoelectric cell may give false readings if the camber is not perpendicular to the mirror below.



SENSITIVITY
Turn the potentiometer on the front of the photoelectric cell to change its sensitivity. At minimum sensitivity, the upper red light of the potentiometer turns on even when the field of vision is clear.



At maximum sensitivity, the photoelectric cell may give false

11. SOLENOID VALVES

The solenoid valves mounted on the machine are:

11.1.CUT

This EV6 solenoid valve is a 5-way shutter valve, type EA58ML, with a 6W 24V DC coil.
It controls the cutting cylinder fixed to the cutting unit and is
connected to the LS01 panel by the rear 9-pole OUTS connector.
It is connected to pins n°3 and 7.

ATTENTION
If the lever connected to the safety cylinder doesn't complete the movement, and,
there by, the safety sensor can't read the unit it WILL NOT perform the Cut FUNCTION.

11.2.SKIP STITCH

This EV2 solenoid valve is a 3-way valve, type PA13, with a 2.5W 24V DC coil.
It controls the cylinder for insertion of the skip stitch comb
Connected to a flow regulator and to the LS01 panel by
the rear 9-pole OUTS connector.
It is connected to terminals n°1 and 6.

11.3.GRIP

This EV5 solenoid valve is a 5-way shutter valve, type EA58ML, with a 6W 24V DC coil.
It controls the pair of cylinders that close and move the grip unit and is
connected to the LS01 panel by the rear 9-pole OUTS connector.
It is connected to terminals n°2 and 6.

11.4.SAFETY

This EV3 solenoid valve is a 3-way shutter valve, type PA13, with a 2,5W 24V DC coil.
It controls the safety cylinder, with the front part of the cylinder connected
to an air reduction unit and is connected to the LS01 panel
by the rear 9-pole OUTS connector.
It is connected to terminals n°4 and 7.

ATTENTION
If the lever connected to the cylinder doesn't complete the movement and
the safety sensor doesn't close the internal electrical connection the unit WILL NOT perform the Cut function.

11.5.PRESSURE-FOOT LIFTER

This EV4 solenoid valve is a 3-way shutter valve, type PA13, with a 2,5W 24V DC coil.
It controls the PRESSURE-FOOT LIFTER cylinder, with the upper part of the cylinder connected
to a reduction unit and is connected to the motor panel by the 4-pole F.L. connector.
It is connected to terminals n°3 and 4.

11.6.NEEDLES COOLING

This EV1 solenoid valve is a 3-way shutter valve, type PA13, with a 2,5W 24V DC coil.
It is connected to a flow regulator and controls the NEEDLES COOLING, and is connected
to the motor panel by the 12-pole S.M. connector.
It is connected to terminals n°11 and 12.

12. SAFETY MICROSWITCH

The function of this microswitch is to prevent the Cutting function in the event that the safety guard is removed.
It is a lever microswitch, type V9LR, fixed between the right puller support and the cutting unit safety guard.
It is connected in series between the LS01 panel and the EV6 solenoid valve.

13. CYLINDERS

There are five cylinders in the machine, for the following functions:

13.1.CUT

It is a 40/40 cylinder with internal buffer.
It is connected to the upper mobile blade by a fork, and is fixed to the back of a vertical support by a pin blocked with a grub screw.
By changing the position of the vertical support it is possible to change the final position of the upper blade when the cylinder is fully extended.

13.2.CUT SAFETY

Is a 10/5 cylinder.
It is connected by a fork to the lever which activates the reading state of the safety sensor, and is fixed to the back of a vertical support by a pin blocked with a grub screw.
By changing the position of the fork it is possible to change the final position of the upper blade when the cylinder is fully extended.
In the event of malfunction always check that the safety sensor is able to read the position of the cylinder.

13.3. PRESSURE-FOOT LIFTER

It is a double-effect 27/35 cylinder.
It is located into the machine and is directly connected to the Pressure Foot.

13.4.PULLER

It is a special 25/25 double-effect cylinder.
It is located in front of the cutting unit and is connected to its own support by a pin.
The reduction unit located under the table provides the working pressure of the cylinder
The working pressure is normally 2 bar and results from the difference between the general air pressure and the pressure sent to the cylinder by the reduction unit

13.5.SKIP STITCH

It is a special simple-effect cylinder with spring return.
It is fixed into the sewing head, under the horizontal safety guard where the cutting unit is also fixed.
The flow regulator in the outlet to the specific solenoid valve provides the exit speed of the cylinder.

14. MATERIAL PULLING DEVICE

The unit for the continuous draught of the material, uses a pair of rollers located behind the Pressure Foot and before the cutting device. While the speed of the lower roller is controlled by the Step - by - Step motor, the upper roller receives the movement by a pulley of changeable diameter. The advantage of this solution is to allow to change or keep on the upper roller the same speed of the lower roller in order to increase wearability of the trousers.

14.1.UPPER RUBBER ROLLER - PULLER

The Puller unit is located exactly on the axis of the original lower roller of the machine.
The function of the Puller is to pull the upper part of the waistband, so that the material is pulled and sewn by the machine in a perfectly matched way, all of which goes to increase the fit of the waistband of the trousers
To adjust the draught of the Puller use the special changeable Diameter pulley located on the upper shaft of the equipment.

14.1.1.POSITION ADJUSTMENT

The operator MUST switch off the unit following procedure 5. STOPPING THE MACHINE.
The two clamping screws of the Puller unit determine the working position.
These allow to change the unit position in right or left direction in order to increase or reduce the bending of the waistband and thereby wearability of the trousers.

14.1.2. RUBBER ROLLER REPLACEMENT

The operator MUST switch off the unit following procedure 5. STOPPING THE MACHINE.
Remove the safety guard loosening the clamping screws.
Lift the Roller moving the cock located on the upper side of the Puller cylinder.
Loosen the self-regulating nut with a 10 mm wrench, keeping the roller still by the upper joint shaft with one hand.
Take off the washer and remove the pair of rollers by pulling it from its housing.
Insert a new roller, making sure it is of the right type for the material being sewn.
For Denim/Jeans the BLACK one is recommended, for all other materials it is white.
Loosen the self-regulating nut with a 10 mm wrench, keeping the roller still by the upper joint shaft with one hand.
Place the safety guard tightening the clamping screws.
Lower the Roller moving the cock located on the upper side of the Puller cylinder.
Turn the machine on and start production.

14.1.3.CHANGEABLE PULLEY

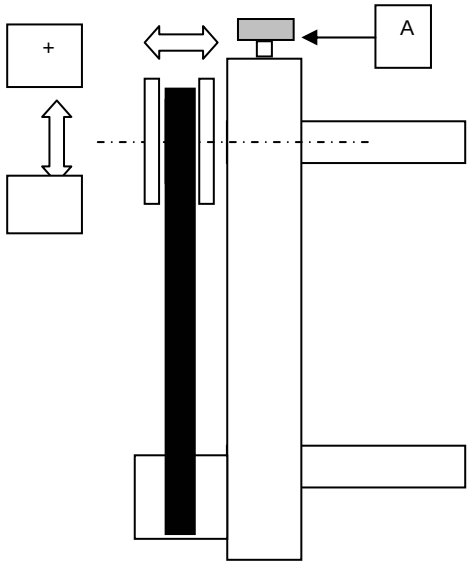
The unit for the continuous draught of the material, uses a pair of rollers located behind the Pressure Foot and before the cutting device. The speed of the lower geared roller is controlled by the Step - by - Step motor while the rubber Upper roller, receives the movement by a pulley of changeable diameter. The advantage of this solution is to keep the same rotation speed between the rollers, or allow to change the speed of the upper roller, in order to increase wearability of the trousers.

This pulley takes its movement from the Pinion fixed to the lower external shaft of the machine and transmits the rotary movement to the rubber roller of the Puller.

There is a knob on the pulley to vary the ratio of transmission between the lower an the upper roller.

Tightening the adjustment knob the diameter of the pulley decreases and the speed of the upper roller increases, in respect to the movement received by the machine.

Moving the adjustment lever up, the ZEROMAX decreases the draught in respect to the movement received by the machine.



ADJUSTMENT

For the best draught/wear ratio of the roller the fwg. adjustment must be made carefully:

Run a sewing cycle of about 20 cm on the trousers.

Check that the material is being pulled by the upper roller.

Loosen the knob to reduce the speed of the upper roller,

so that the material being sewed is slightly undulated.

Run another sewing cycle of about 20 cm on the trousers

Slightly increase the draught of the upper roller by tightening the knob (A).

14.2.GEARED LOWER ROLLER

The function of the lower roller moved by the Step - by - Step motor is to move the material in respect to the required stitch length. It pull the lower part of the waistband, so that the material is perfectly matched and sewn by the Unit, all of which goes to increase the fit of the waistband of the trousers also with particular materials as stretch, fibres etc.
To adjust the rotation speed of the roller, and thereby, the required stitch length use the specific CP parameter of the motor panel.
Follow specific instructions at paragraph "9.2.4.SETTING THE NUMBER OF OUTPUT IMPULSES TO CONTROL THE STEP/BY/STEP MOTOR."

15. FOLDER UNIT

The Folder unit guides the material for forming the waistband and is placed on a special removable support.
The characteristics of the Folder unit depend on:
· the type of waistband (SINGLE or DOUBLE)
· the height of the waistband
· the type of material used
The border unit, with its own support, is secured to an adjustable Folder Unit housing.
By pulling the Folder unit towards the operator, it moves in front of the pressure-foot where it can carry out the necessary functions freely.
To obtain a consistent quality in the waistband the Folder Unit should be centred in respect to the needles and the pressure-foot, and its Position, Height and Camber should be checked.

15.1.POSITION

Loosen the two clamping screws to check that the Folder Unit is positioned as follows:
· It must be aligned with its left-hand part on the left-hand side of the pressure-foot.
· No part of it must touch the pressure-foot .
· Its adjustable claw must not touch the work surface of the machine.

15.2.WORK SURFACE HEIGHT

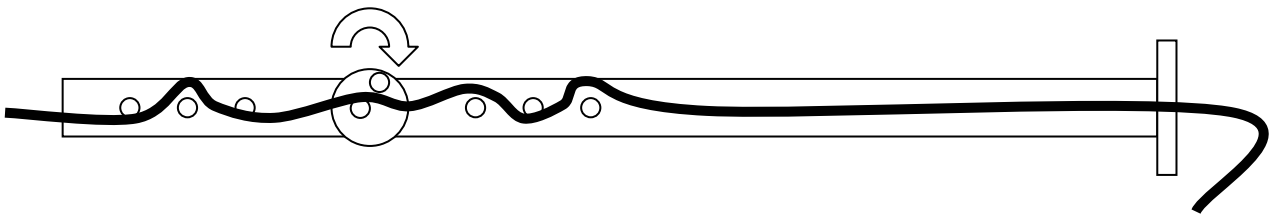
Loosen the two clamping screws to check that the Folder Unit is positioned as follows:
· It must be parallel to the working surface

15.3. CAMBER OF BORDER UNIT HOUSING

Loosen the two clamping screws to check that the Folder Unit is positioned as follows:
· It must be perpendicular to the working surface
Check that the Folder Unit forms a waistband with the upper left edge the same as the lower.
After changing the camber always check the subsequent height and position of the Folder Unit.

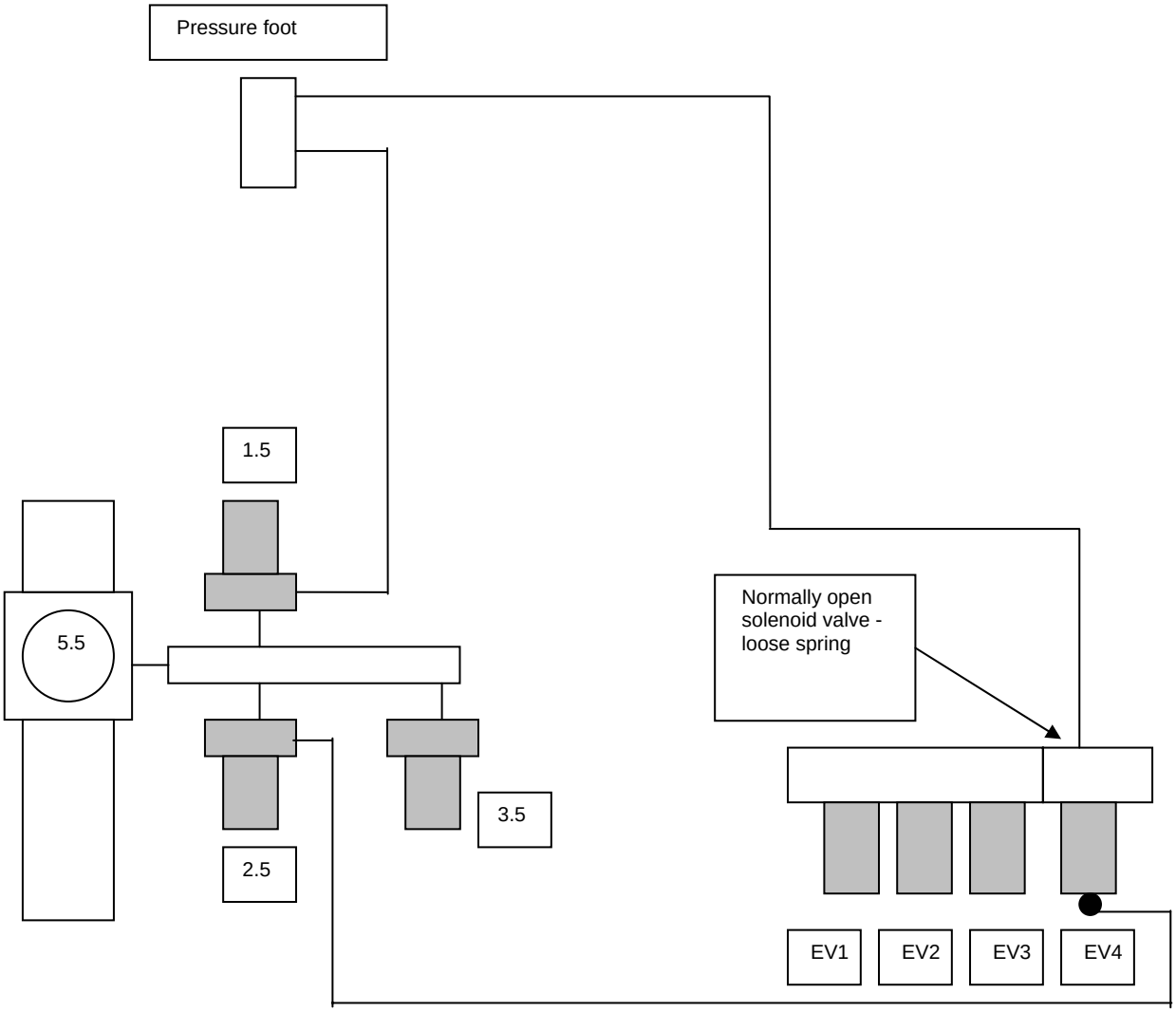
16. TAPE GUIDE

The function of the tape guide is to make the tape formed by the waistband slightly taut.
Adjust the adjustable support to obtain the correct tension.
When using STRETCH material decrease the number of passages to the minimum, to avoid problems with the size of the waistband when it is applied to the trousers.



17. PRESSURE-FOOT PRESSURE ADJUSTMENT

The pressure of the pressure-foot is adjusted using the pressure regulator in the pneumatic circuit (see scheme).
The foot should be adjusted to the least pressure possible, paying attention that the pressure foot doesn't jump up and down by itself and the material below does not slip at speed.
Perfectly adjusting the pressure allows to obtain a waistband with optimal wearability also with particular materials.



18. MECHANICAL ADJUSTMENTS OF THE EQUIPMENT

The operator MUST switch off the machine, following procedure 5. STOPPING THE MACHINE before making any adjustment

18.1 CUTTING DEVICE

The operator MUST switch off the machine, following procedure 5. STOPPING THE MACHINE.
Below is a list of the most common adjustments to be made to the machine in the event of malfunction.
Always make sure that the two blades are sharp and show NO sign of serration.

18.1.1 MOBILE BLADE POSITION ADJUSTMENT

When the cutting cylinder is fully extended, loosen the two screws that secure the vertical support with a 13 mm fixed wrench, to change the final position of the upper mobile blade.
Check that the final part of the mobile blade clears the fixed blade by about 2 mm.
Using the two screws that secure the vertical support the alignment of the cylinder with the mobile blade can be checked to make sure that the cylinder can move freely in both directions.

18.1.2 CUTTING PRESSURE ADJUSTMENT

The cutting pressure of the mobile blade can be varied.
Loosen the clamping bolt with a 10 mm wrench to increase or decrease the pressure by tightening or loosening the adjustment screw.
With the mobile blade in its pause position (fully open) the 3 washers must rub slightly.

18.1.3 UPPER BLADE REPLACEMENT

Remove the mobile blade unit by loosening the clamping bolt with a 10 mm wrench and loosening the pressure adjustment screw.
Loosen the three clamping screws with a 4 mm Allen wrench.
Remove the blade and thoroughly clean the support.
Insert the new blade and reassemble all the parts.
To avoid malfunction, it is advisable to change the blades in pairs.

18.1.4 LOWER BLADE REPLACEMENT
Remove the mobile blade unit by loosening the clamping bolt with a 10 mm wrench and loosening the pressure adjustment screw.
Loosen the three clamping screws with a 4 mm Allen wrench.
Remove the blade and thoroughly clean the support.
Insert the new blade and reassemble all the parts.
To avoid malfunction, it is advisable to change the blades in pairs.

18.2.SKIP STITCH DEVICE

The operator MUST switch off the machine, following procedure 5. STOPPING THE MACHINE.
Below is a list of the most common adjustments to be made to the machine in the event of malfunction.

18.2.1 SKIP STITCH PLATE ADJUSTMENT
The position of the plate itself can be adjusted by loosening the pair of screws on the plate slide.
Make sure the loop-enlarger unit is positioned correctly and then check the following:
· that the sheet rests completely on the loop-enlarger support, with the slide free to carry out the two movements.
· that the sheet is able to cover the loop-enlarger hook with its own comb, to prevent the formation of the chain stitch.
· that the distance between the plate, with its own comb, and the upper part of the lower rotating hook is at least 0.5 mm.
· that the distance between the needle, at Bottom Dead Centre, and the front part of the comb is 2 mm.

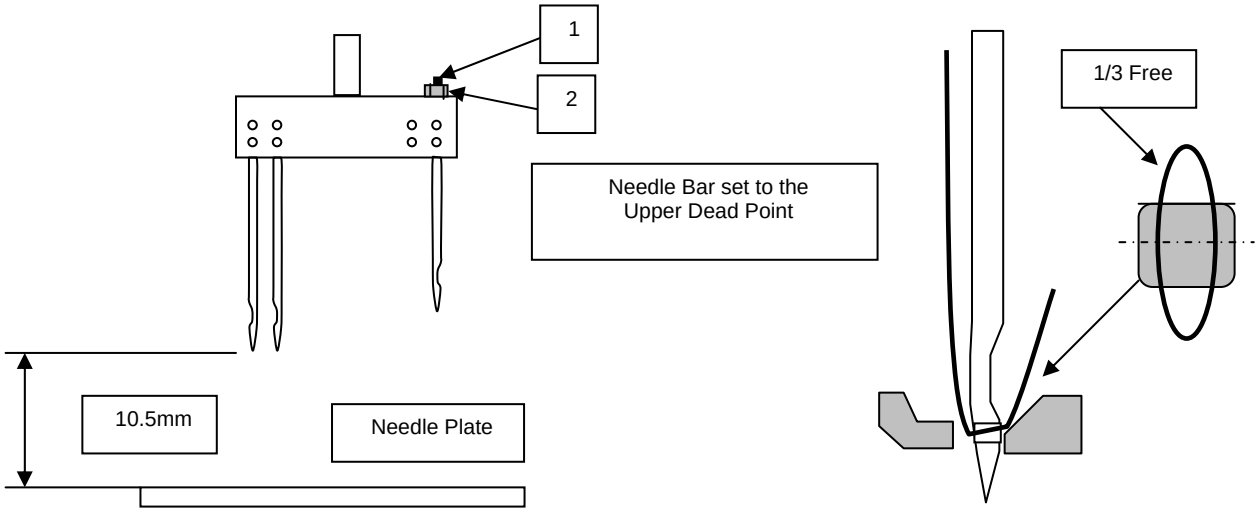
18.2.2. CYLINDER-SLIDE SUPPORT ADJUSTMENT
The skip stitch cylinder moves a slide, to which is fixed the skip stitch plate.
To prevent any end float, a "U" support is mounted, in which the cylinder-slide union runs.
Check that the "U" support touches the union support along its entire length, but without blocking its movement.

19. SEWING HEAD MECHANICAL ADJUSTMENTS

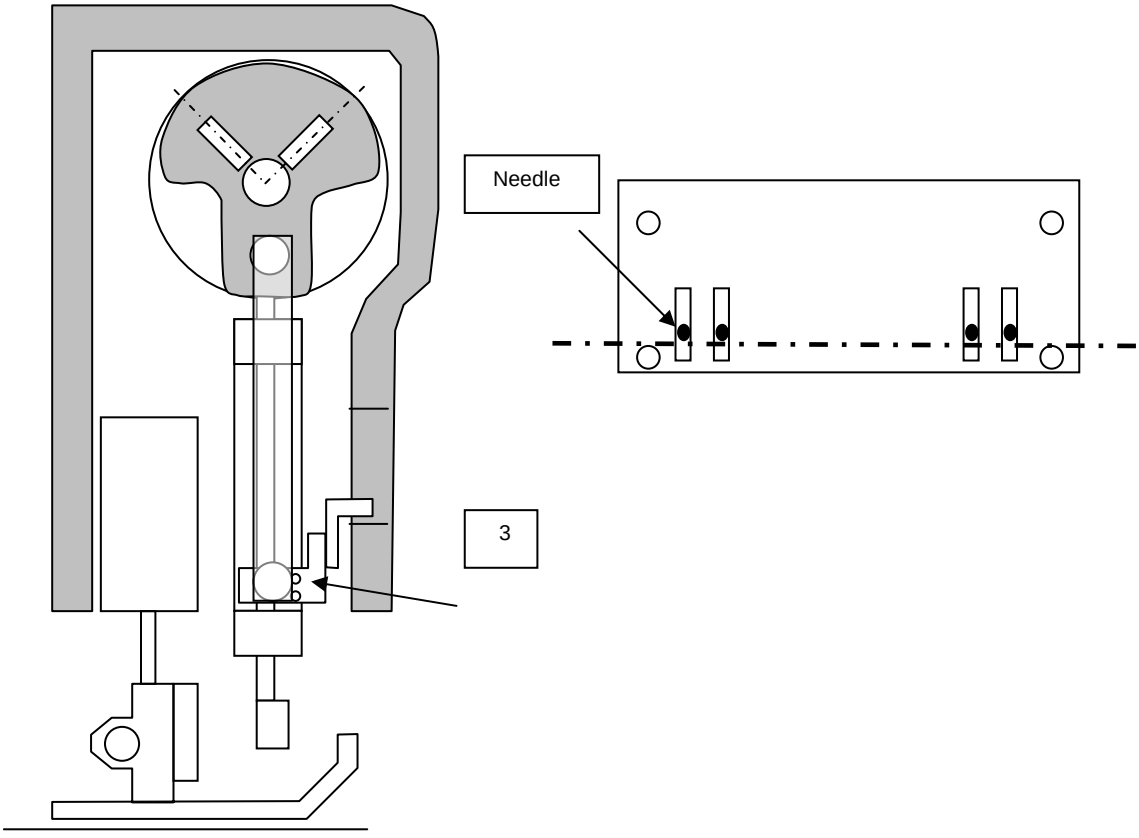
The 3022 automatic unit uses a new sewing head expressely realized for this type of seam by VI.BE.MAC. Spa.
The operator MUST always switch off the machine, following procedure 5. STOPPING THE MACHINE before accessing any sewing unit.
Below is a list of the most common adjustments to be made to the machine in the event of malfunction. Remember that only the personnel selected by VI.BE.MAC. Spa is qualified for repairing the machine.
For any problem that can't be immediatly solved or to require further information please contact immediately Your nearest VI.BE.MAC. dealer or our Technical Office.

19.1.NEEDLE BAR HEIGHT

For the correct adjustment of the sewing head, place the Needle Bar in the Top Dead Centre. The hole on the Needle in the Lock stitch side must be free for the upper 1/3 hole.
Check that the distance from the needle top to the needle plate is about 10,5mm, as illustred in the figure below:
Loosen the nut (2) and screw (1) to change the height of the Needle if required on the LOCK STITCK side.



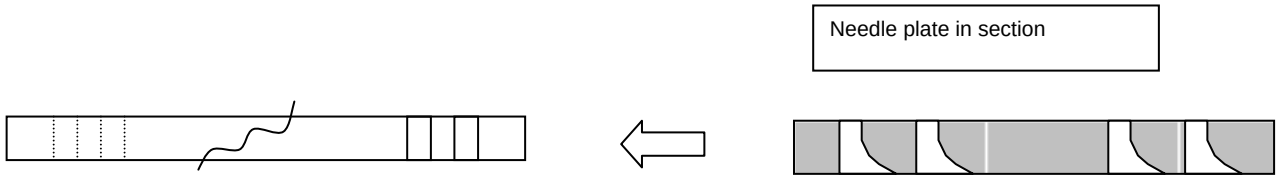
If the 4 needles are not perfectly lined up rotate the Needle Bar to obtain the same distance for the external needles.
Loosen the screws (3) on the Needle Bar fixing clamp and sligthly rotate the Needle Bar to position the needles correctly.
Fix the screws (3) on the Needle Bar fixing clamp and check again if the position of the pendulum is correct.



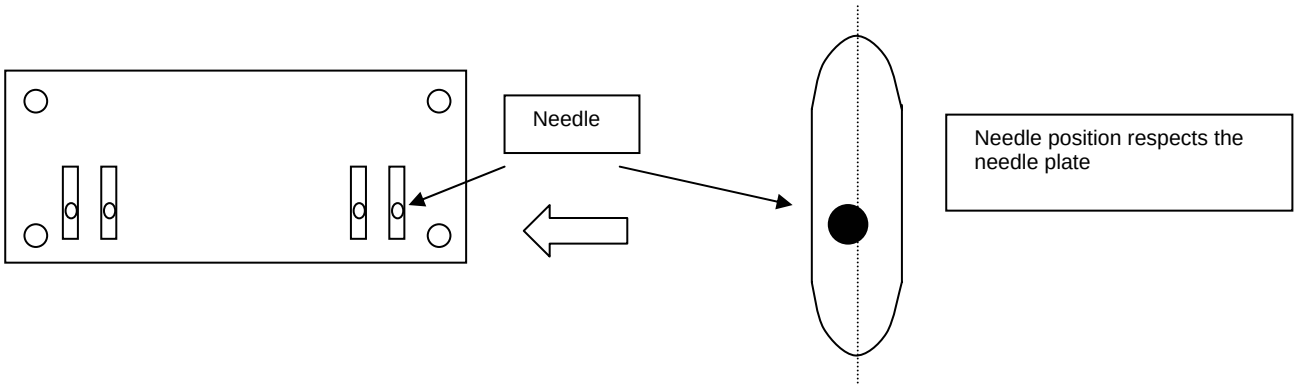
19.2.NEEDLE PLATE

For the correct adjustment of the sewing head, check the distances between the various mechanical parts as illustrated in the figure below:

Slightly chamfer the hole of the needle in the right lower corner

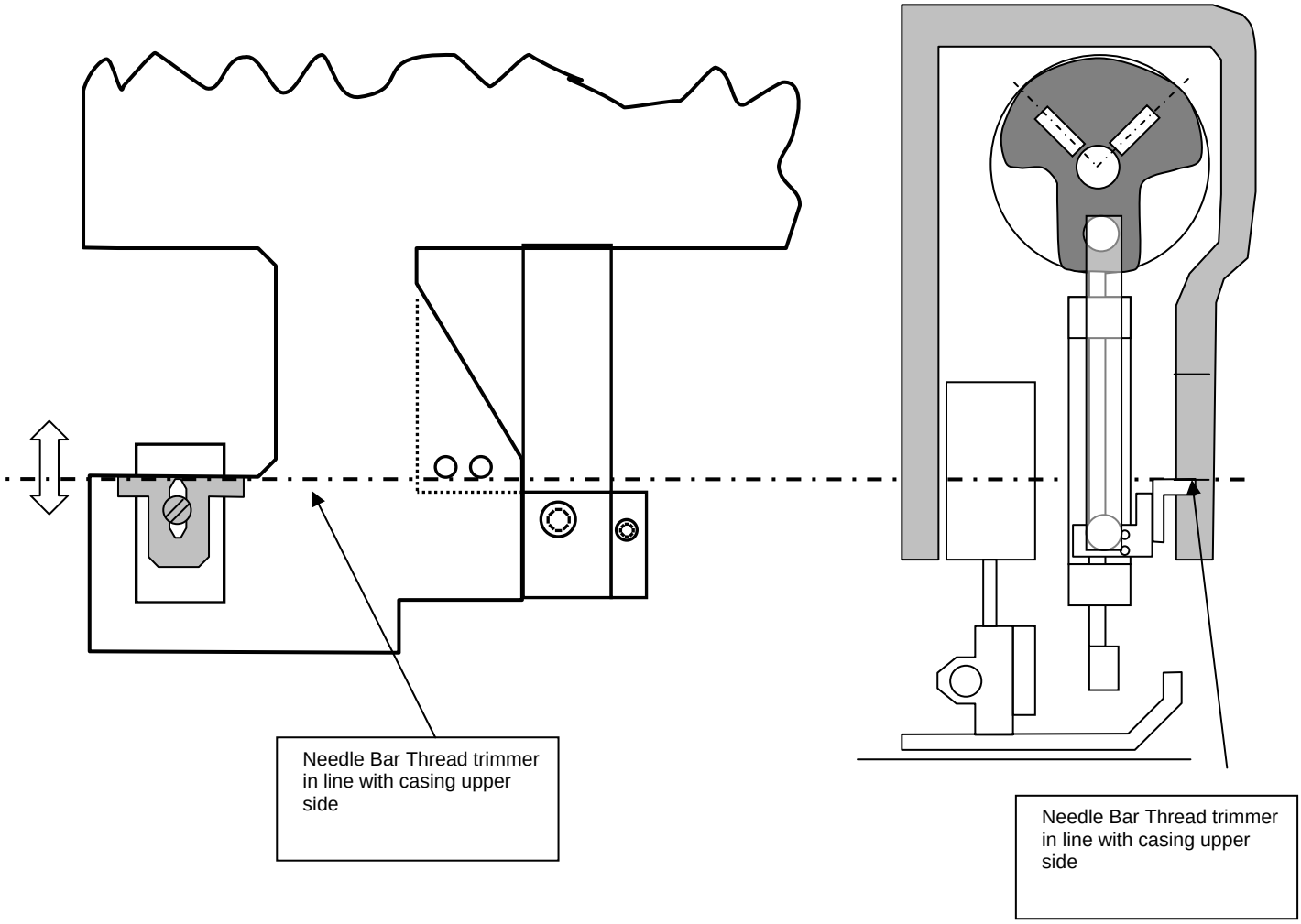


Place the needle plate toward right so that the needle is slightly out of centre in respect to its hole, as illustrated in the figure below:



19.3.POSITION AND HEIGHT OF THE NEEDLE BAR THREAD TRIMMER

The position of the Bar Thread trimmer fixed to the Needle Bar is as follows:
Position the Needle Bar in the Bottom Dead Centre



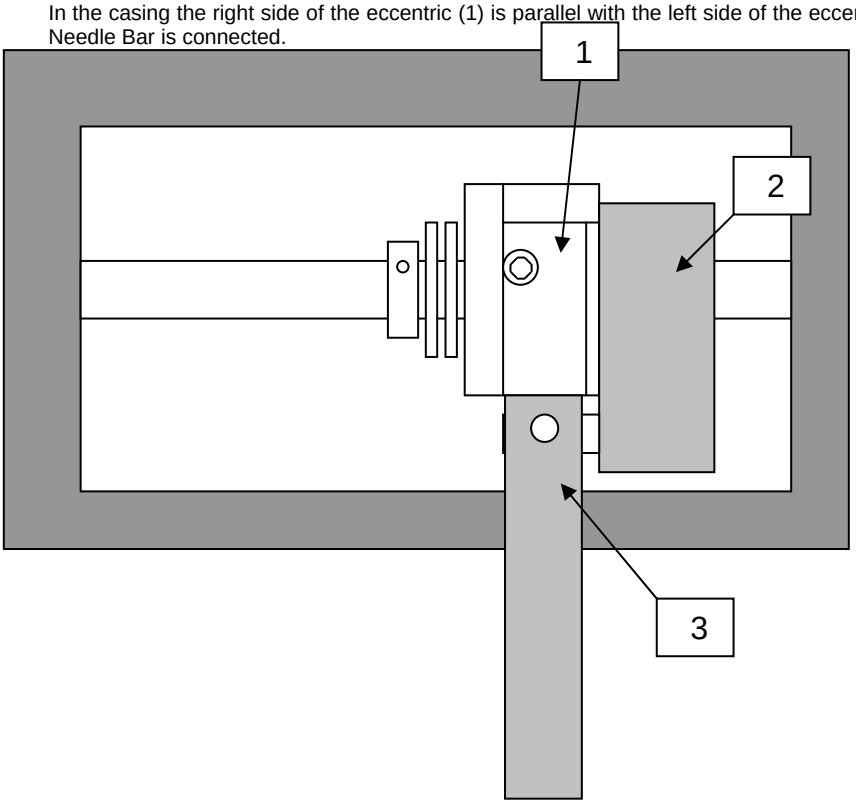
19.4.NEEDLE BAR TRANSLATION MOVEMENT ECCENTRIC

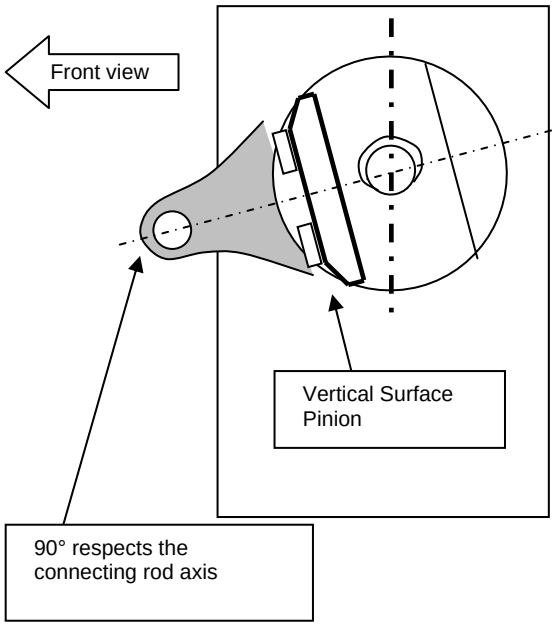
The function of this eccentric is to move the needle in synchrony with the material.

19.4.1.POSITION

Position The Needle Bar in the Bottom Dead Centre, in order to find the correct position of the Needle Bar Translation eccentric, in respect to the Upper shaft into the sewing head,
In this way movement is perfectly symmetric with the hole of the needle plate.
The eccentric is positioned with the vertical surface towards the outside.
Check its position with the two pictures below:

In the rear view you can see:
In the casing the right side of the eccentric (1) is parallel with the left side of the eccentric (2) where the lever (3) which moves the pendulum of the Needle Bar is connected.





In the front view from the Needle Bar structure the eccentric (1) in the casing is parallel with the shaft axis

19.4.2.MOVEMENT LENGTH

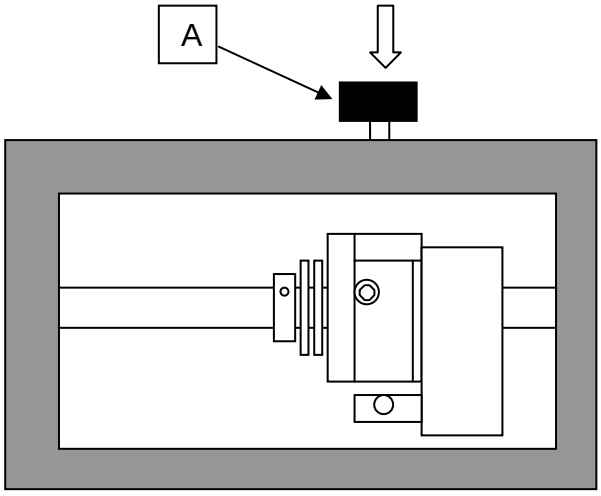
Always adjust the movement of the Translation of the Needle Bar according to the Stitch Length mounted, press button A on the Upper part of the Head and turn the handwheel.

When button A falls into the slot, turn it in a clockwise direction to block it.

· by turning the handwheel towards the operator (Anticlockwise direction) the movement of the Needle Bar is lengthened.
· by turning the handwheel towards the operator (Clockwise direction) the movement of the Needle Bar is shortened.
Disconnect the button by turning it in an Anticlockwise direction to pull it from the slot.
Insert a piece of paper of about 40cm, perform a seam to verify if the needle perfeclty punches the paper, or, the paper has been teared (elliptic hole)
Adjust the movement of the length until the hole is perfectly performed

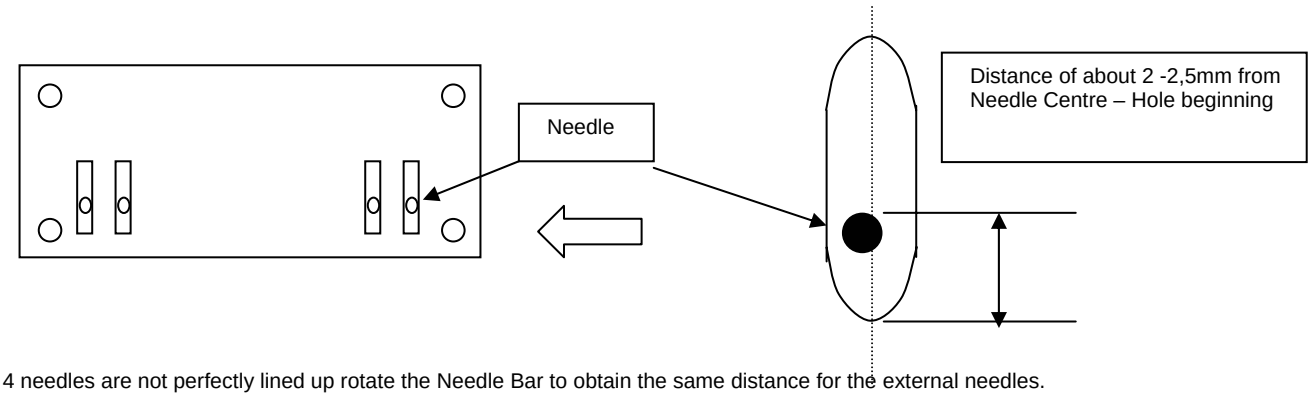
ATTENTION

Never press button A while the machine is turning.
Before starting the machine make sure that button A is disconnected

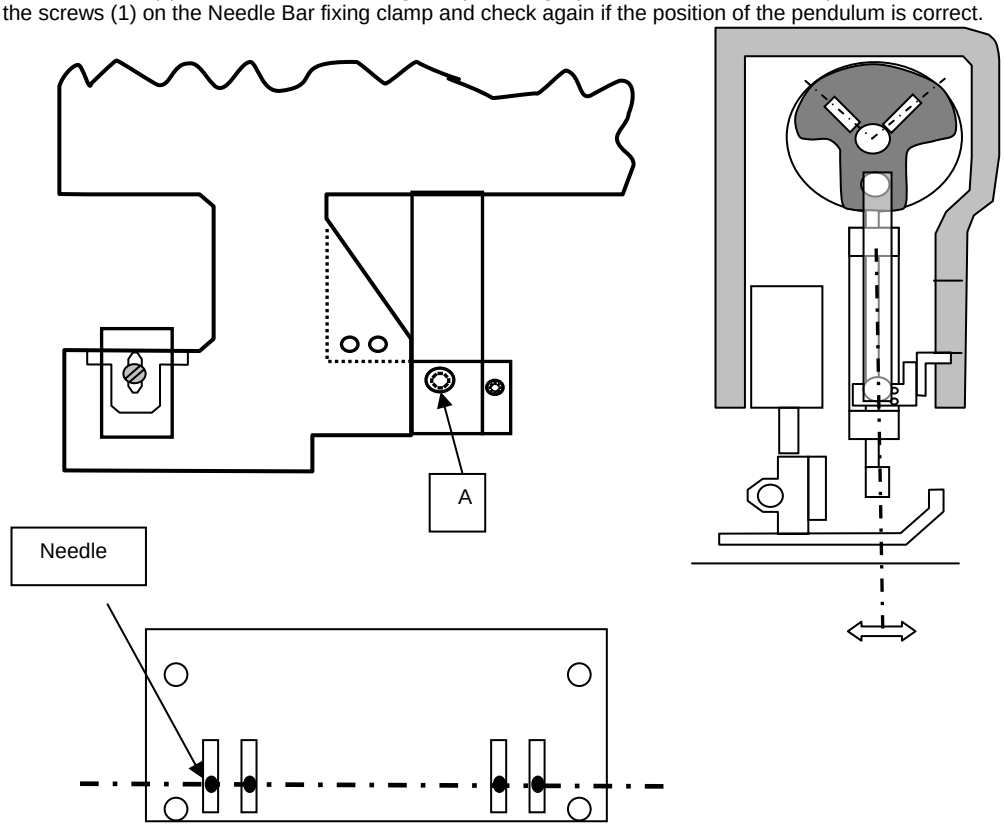


19.5.NEEDLE BAR PENDULUM POSITION

The adjustment of the position of needles in respect to the hole of the Needle Plate is very important, if not performed correctly it may cause the breaking of the skip stitch plate or problems during the sewing (skipping of the stitch).
Turn the handwheel by hand, with the needle movement towards the lower side, when the hole on the needle is on the same level of the plate loosen the fixing screw (1) of the Needle Bar pendulum.
Move now the needles to the specific measure, 2 -2,5mm as illustrated in the picture below and then tighten again the fixing screw (1):



If the 4 needles are not perfectly lined up rotate the Needle Bar to obtain the same distance for the external needles.
Loosen the screws (1) on the Needle Bar fixing clamp and sligthly rotate the Needle Bar to position the needles correctly.
Fix the screws (1) on the Needle Bar fixing clamp and check again if the position of the pendulum is correct.



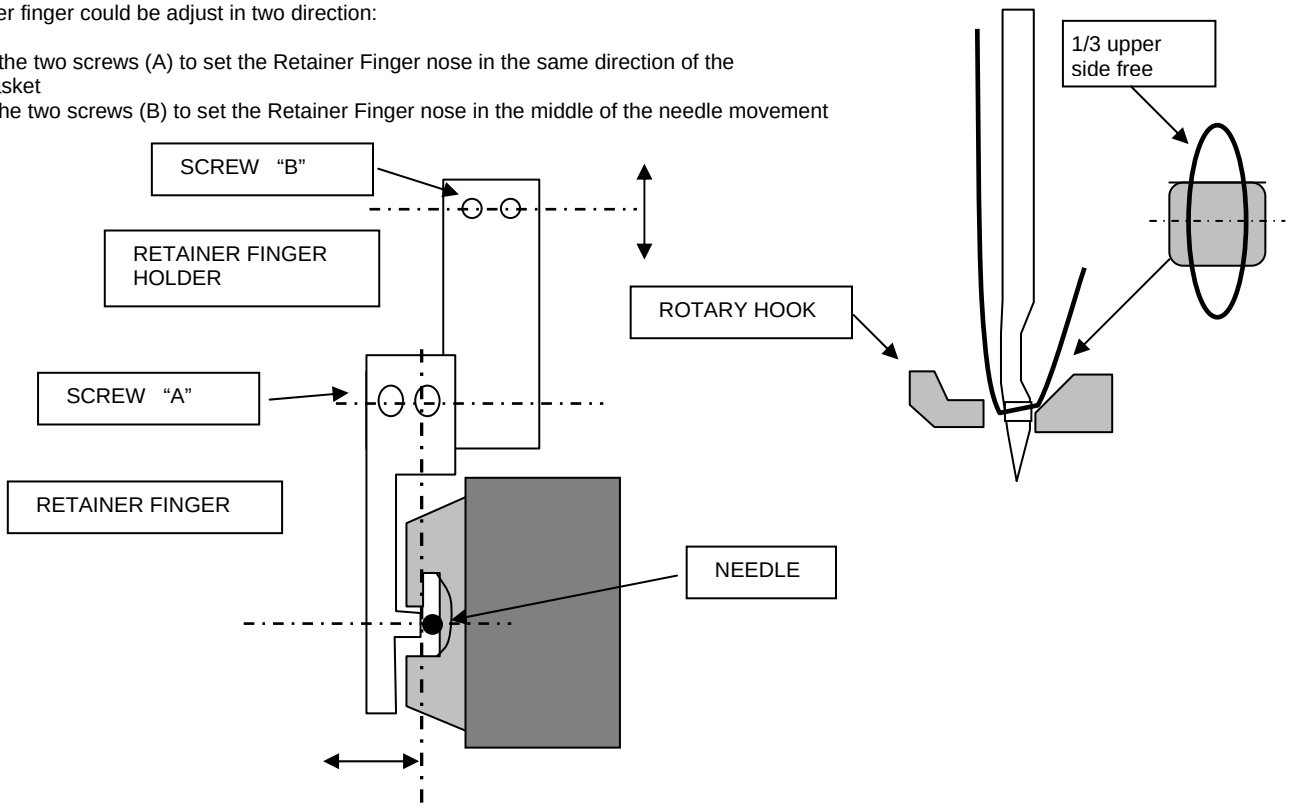
19.6.ROTARY HOOK TIMING

The automatic unit has a big bobbin rotare hook type and use a 135x7 o 134 in **MR needle type**.

Verify the Needle Bar heigher, normally in the Lower Dead Point:
the needle hole must be open for the upper **1/3 side** and for the **2/3 side** must be cover from the needle guard see the below pitcure.
Threading the needle, stops the needle bar at the Lower Dead Point the needle thread must be light fractioned or free to move pulling it
Take out the Retainer Finger, the Bobbin Case, and the bobbin and turn down the Inner Basket.

The Needle Bar from the L.D.P. lift from 2 to 2.2 mm, the Rotare hook point must be at the middle of the needleand the clearance in between the parts must be about 0.0 - 0.05mm. Tight the screw to fix the Rotary Hook.
Lift the Needle bar and insert again the Retainger finger on its position.
The Retainer finger could be adjust in two direction:

1) Loosen the two screws (A) to set the Retainer Finger nose in the same direction of the Inner Basket
2) Loosen the two screws (B) to set the Retainer Finger nose in the middle of the needle movement



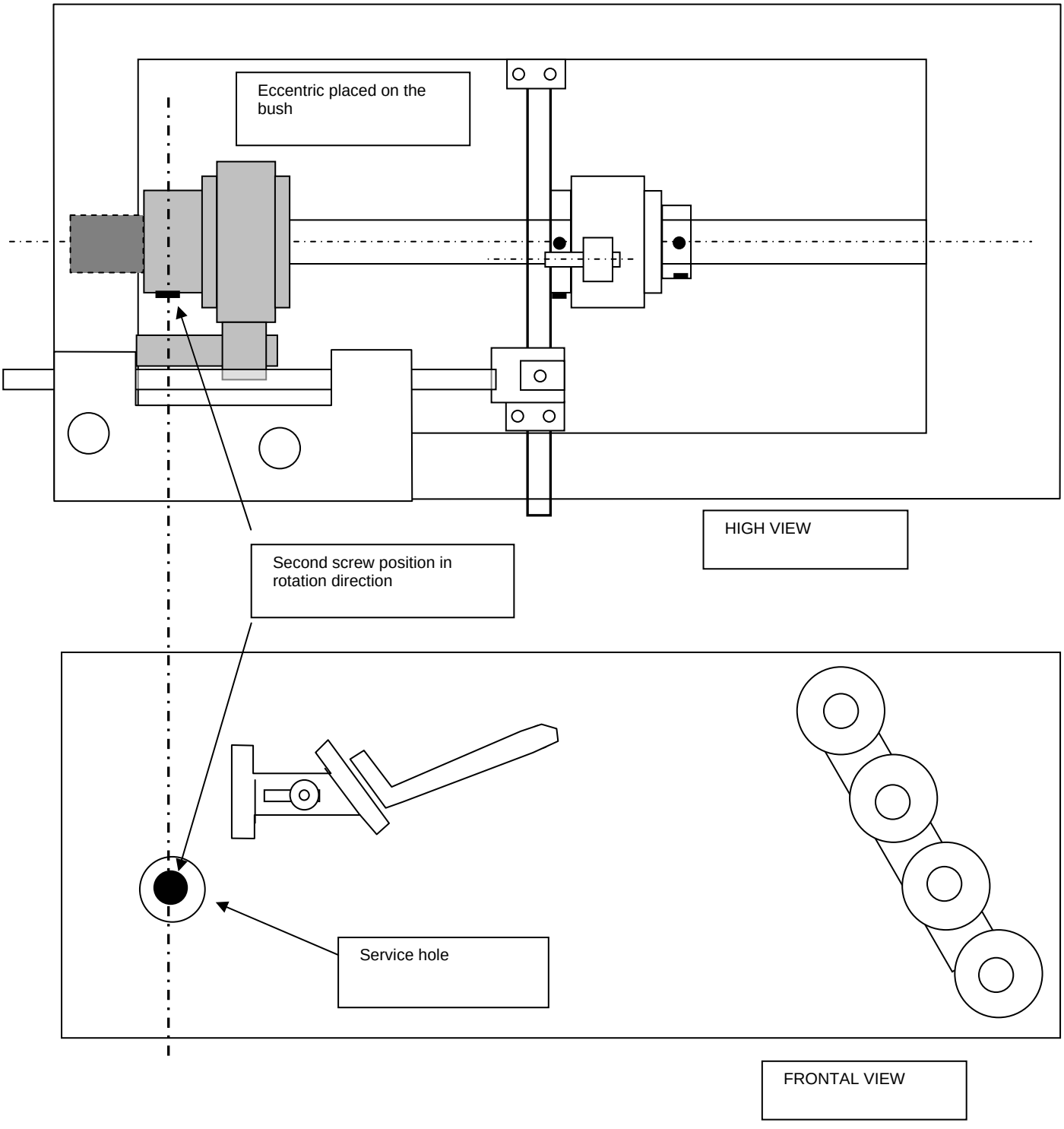
Controllare la posizione del crochet verificando che la punta dell'ago, quando entra nel salva ago non lo tocchi (L'ago deve toccare il salva ago dopo circa 1 mm)
Nel caso limare, leggermente, con una limetta diamantata il salva ago.

19.7.LOOPER STARTING MOVEMENT ECCENTRIC

The function of this eccentric is to move the looper in syncrony with the needle, starting of descent movement of the needle bar with looper return stroke starting and vice-versa.

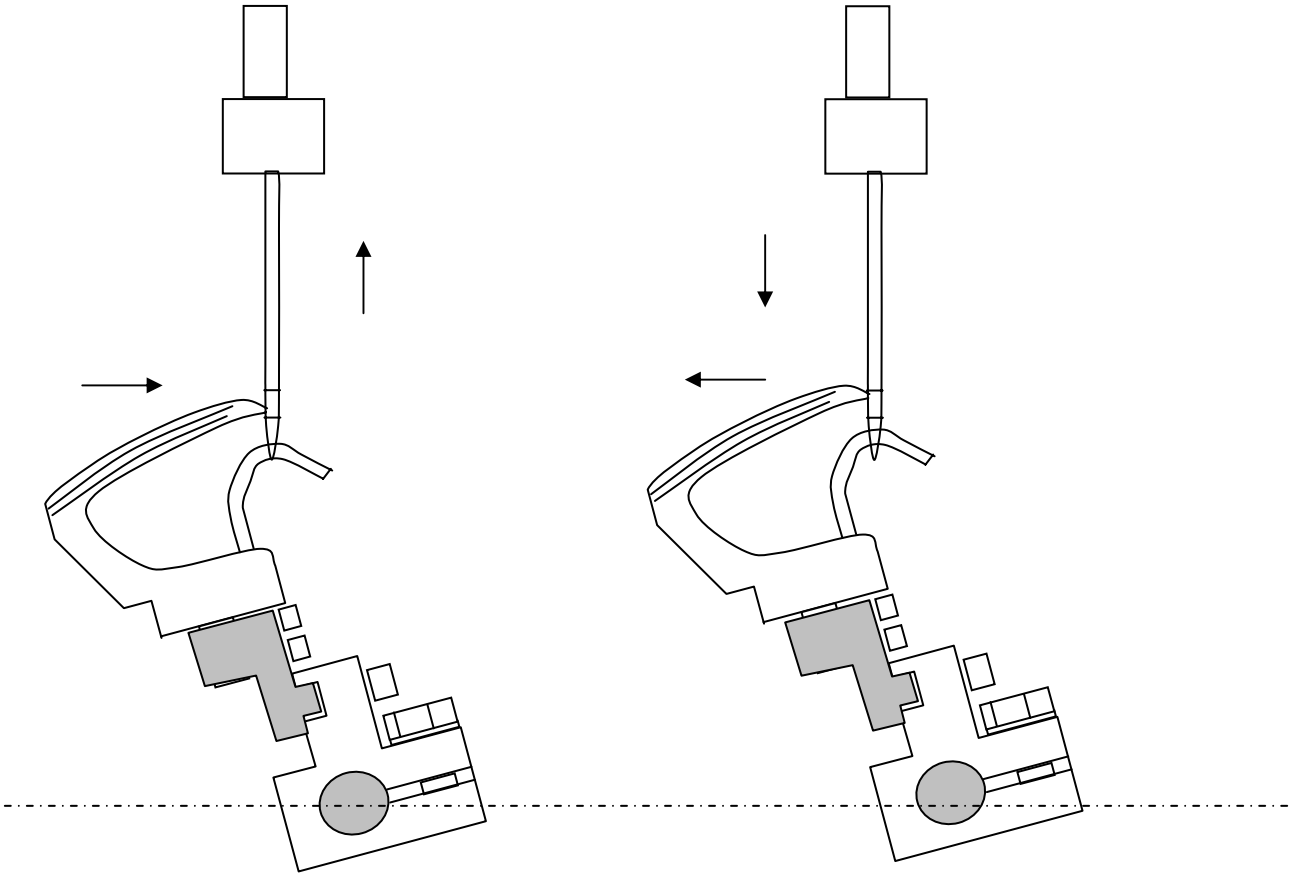
19.7.1.POSITION

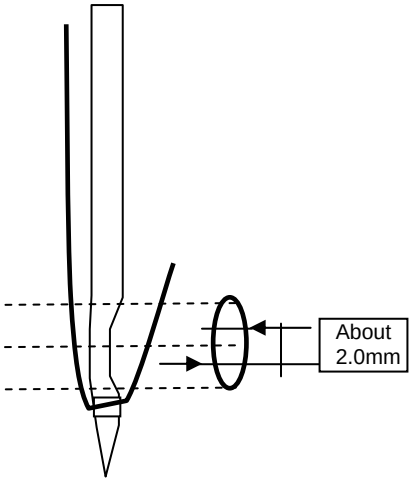
To correctly position the eccentric of the looper movement Starting in respect to the needle **position the Needle Bar in the Bottom Dead Centre.**
The eccentric is positioned with the second screw in rotation direction toward the outside, check its position with the two pictures below:



In this way the top of the looper passes in respect to the slot in the needle:

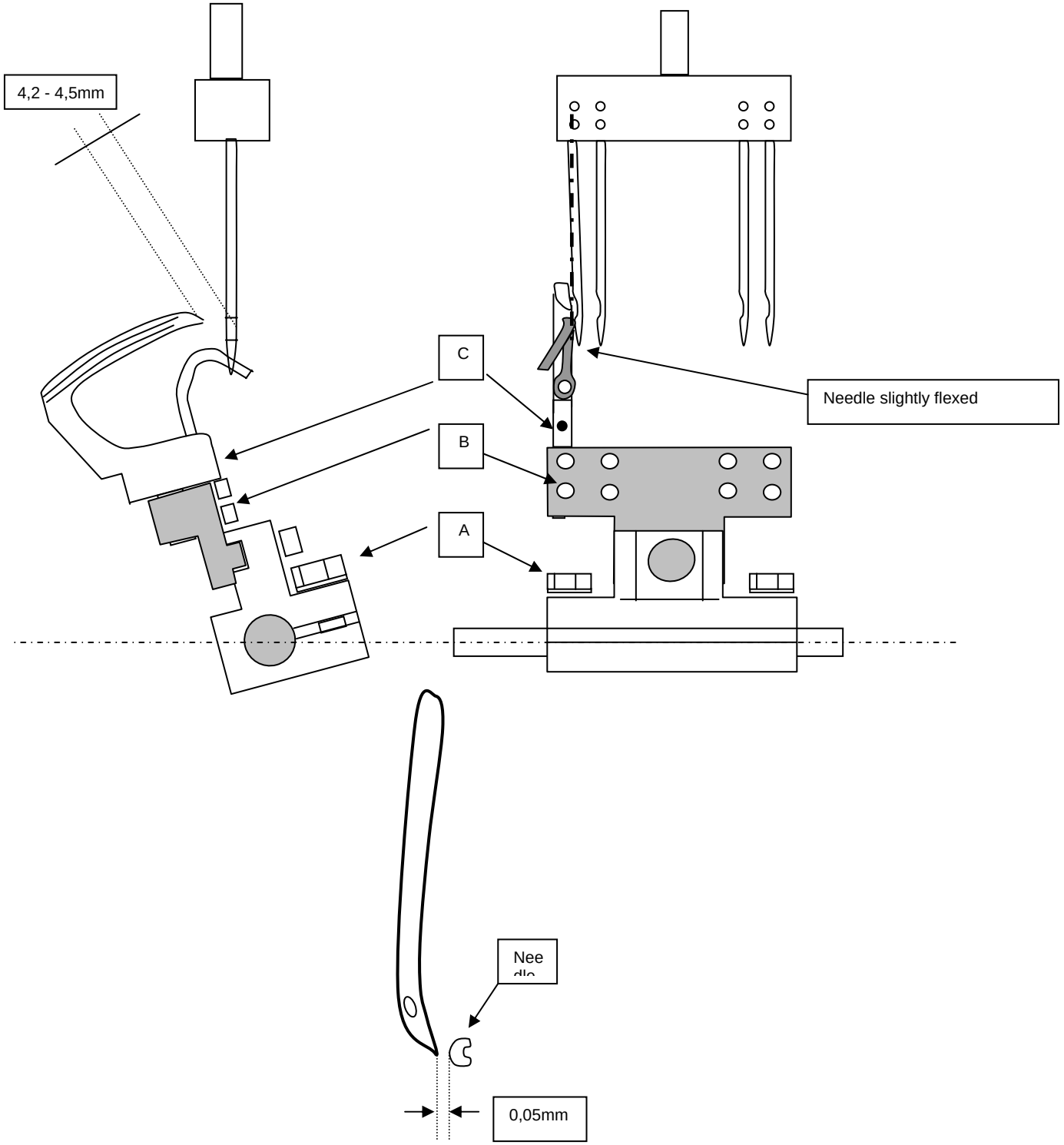
- in the forward movement of the looper lower than the centre line
- in the back movement higher than the centre line of the slot





19.8.LOOPER – NEEDLE DISTANCE

To correctly position the looper unit in respect to the needle position the Needle Bar in the Bottom Dead Centre.
Loosen the two screws (A) (exhagonal head) that fix the clamp to the shaft and check that the distance between the needle centre and the top of the looper is 5mm. Fix the screws at the end of the operation.
Loosen the clamping screws of the looper (B) and of the needle protector (C) and turn them left slightly.
Rotate the handwheel by hand and move the top of the looper to the centre of the needle.
Check that the top of the looper touches the needle without making it deflect and thereby fix the screw (B).
Move the needle protector toward the needle and let the needle flex slightly, the distance between the top of the looper and the needle is 0,05mm.
Check the distances between the various mechanical parts as illustrated in the figure below:

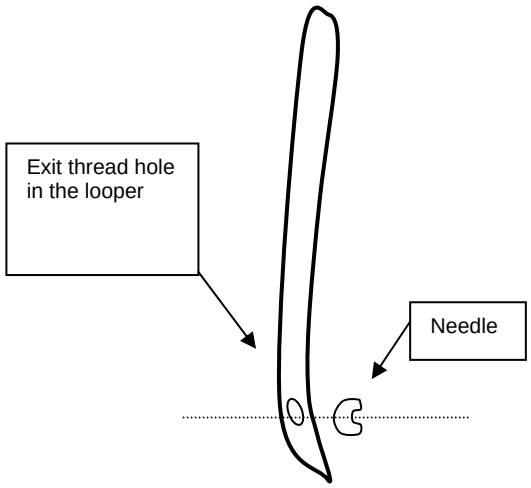


19.9.LOOP SPREADER PHASE

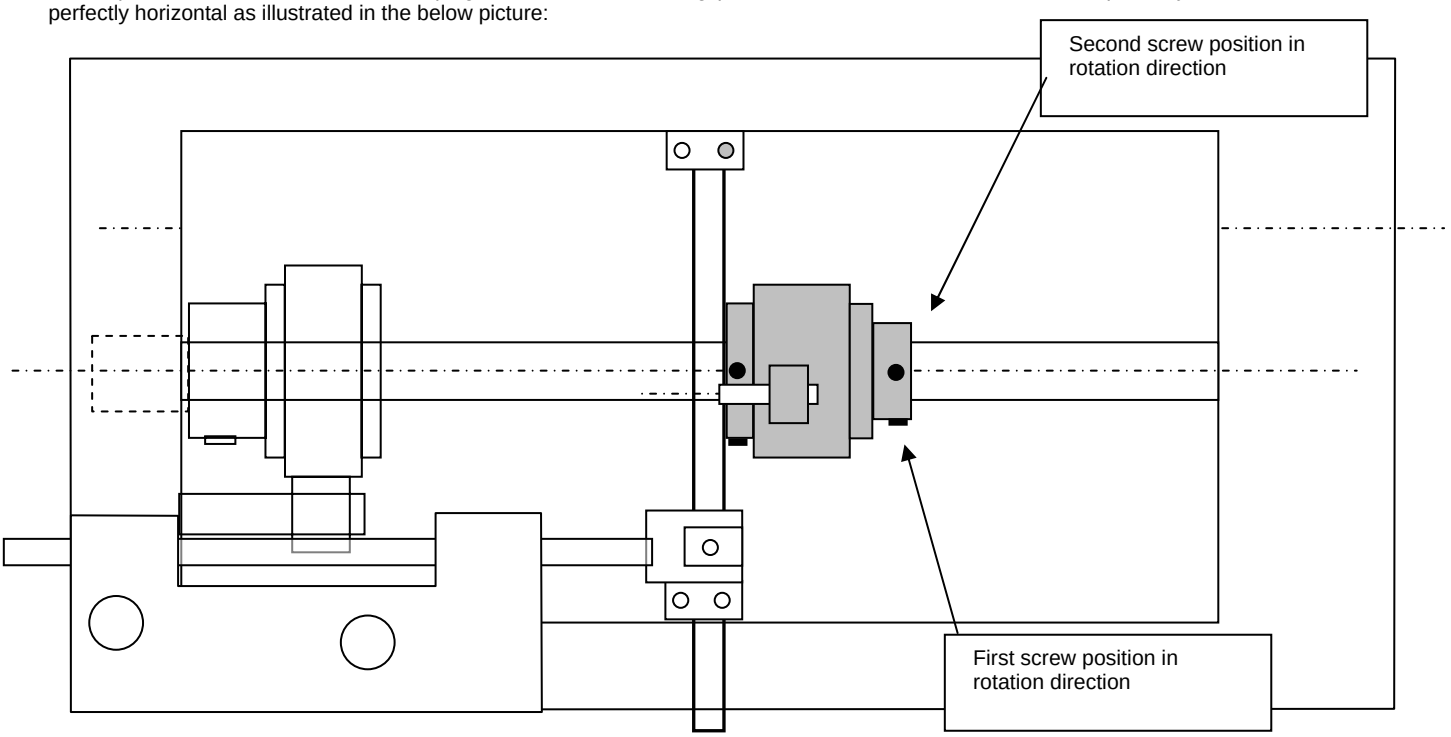
The function of this eccentric is to move the Loop enlarger stripping plate in syncrony with the movement of the needle and the loopers.

19.9.1.POSITION

To correctly position the eccentric of the Loop enlarger movement Starting place the Needle Bar in the following Phase Stitch.
Turn the handwheel until the exit hole of the thread on the upper part of the looper crosses the needle centre line, with the Needle Bar in descent.



In this point the eccentric has the clamping screws in the following position, the first with rotation direction perfectly vertical while the second perfectly horizontal as illustrated in the below picture:

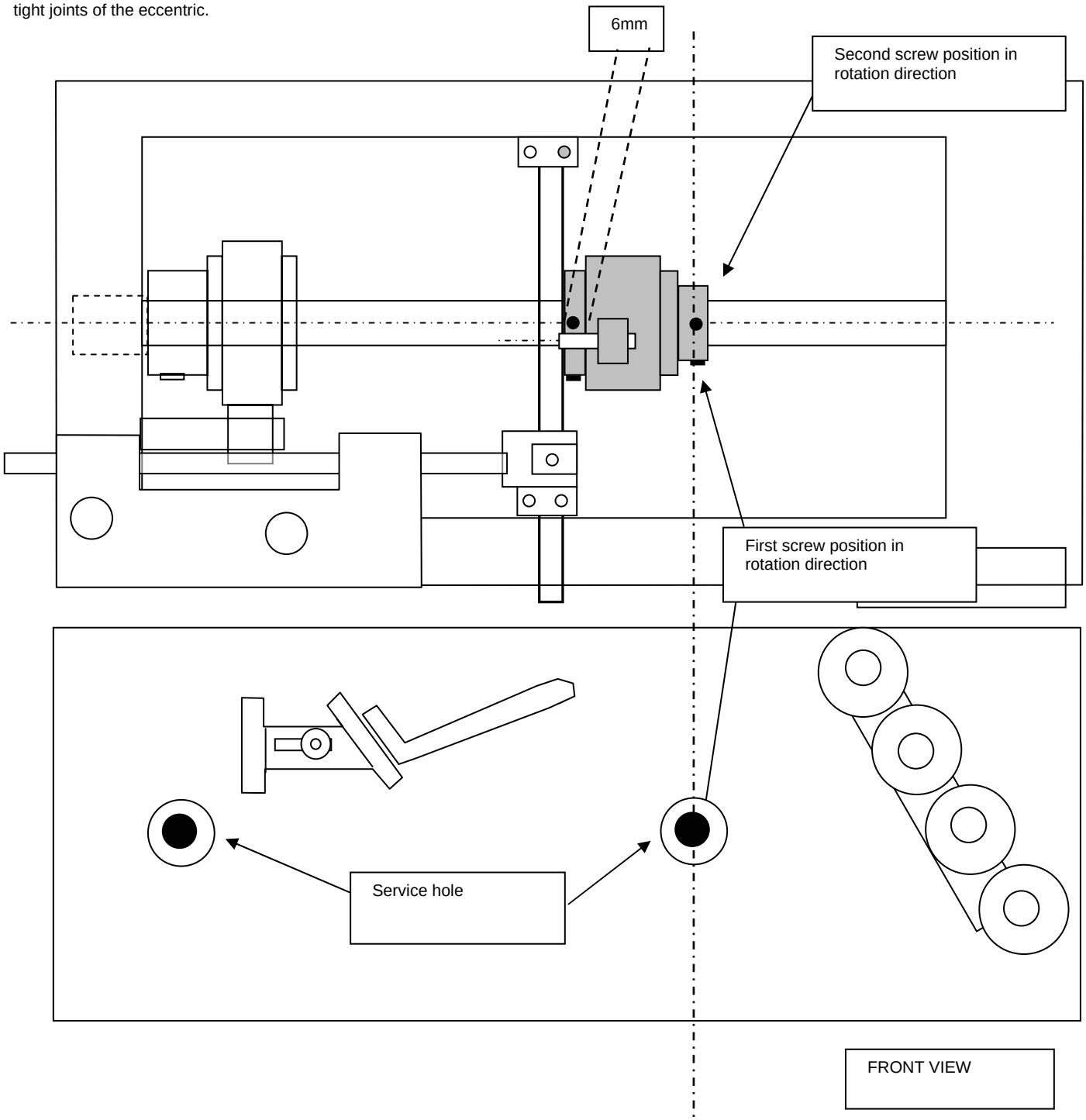


Check also that no slack is present between the eccentric and the left shearing, tightly block in order to avoid malfunctions and oil outlet from the tight joints of the eccentric.

19.9.2.MOVEMENT LENGTH

To adjust the movement of the Loop enlarger Translation as wide as possible. The position of the eccentric in respect to the transversal shaft determines the support bracket and thereby the total movement of the Loop enlarger. Always position the clamping screw of the eccentric as in below picture and then move right or left the eccentric. The correct measure is 6mm between the left side of the eccentric and the transversal shaft

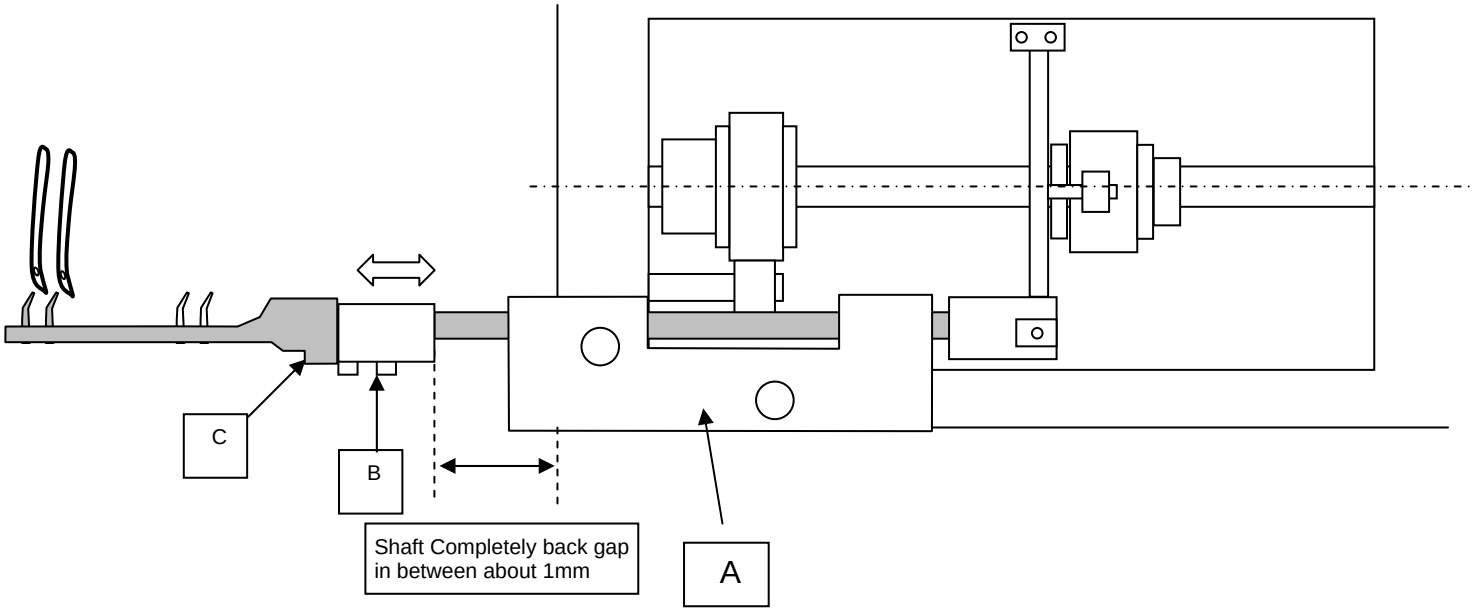
Check also that no slack is present between the eccentric and the left Shearing, tightly block in order to avoid malfunctions and oil outlet from the tight joints of the eccentric.



19.9.3.LOOP ENLARGER MOVEMENT PIN POSITION

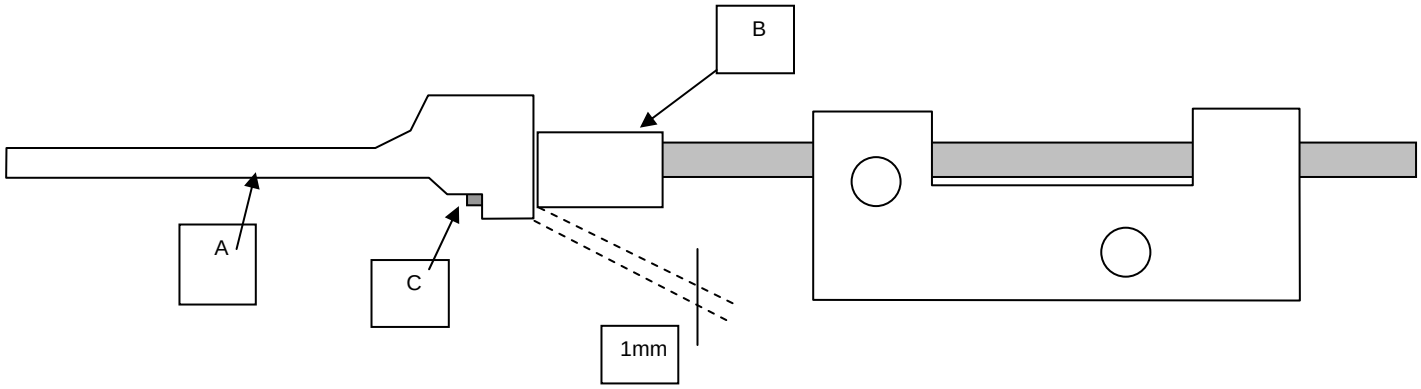
With the Loop enlarger completely moved on the left the distance between the shaft support (A) and the two brackets on its edges is 5mm on the right side and 15mm on the left side.

Loosen the two clamping screws (B) of the support (C) to perform the correct adjustment.



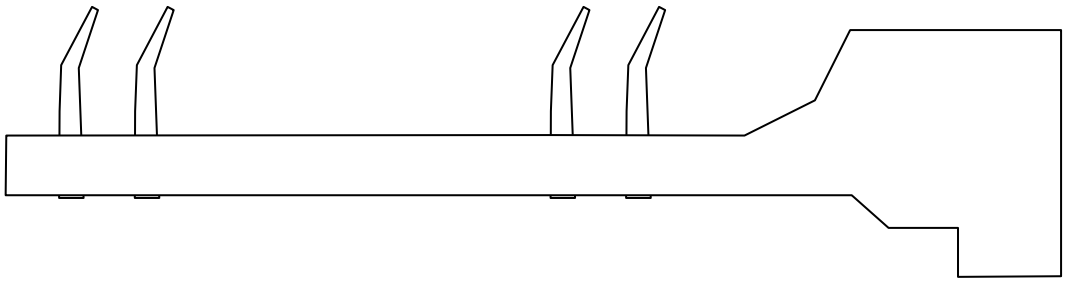
19.9.4.LOOP ENLARGER POSITION

The Loop enlarger (A) is shifted in respect to its support (B) of about 1mm toward the operator. Loosen the clamping screw (C) to perfom the adjustment.



19.9.5. LOOP ENLARGER PINS POSITION

The four pins must be slightly turned right to avoid thread escaping in advance during the discard stage.

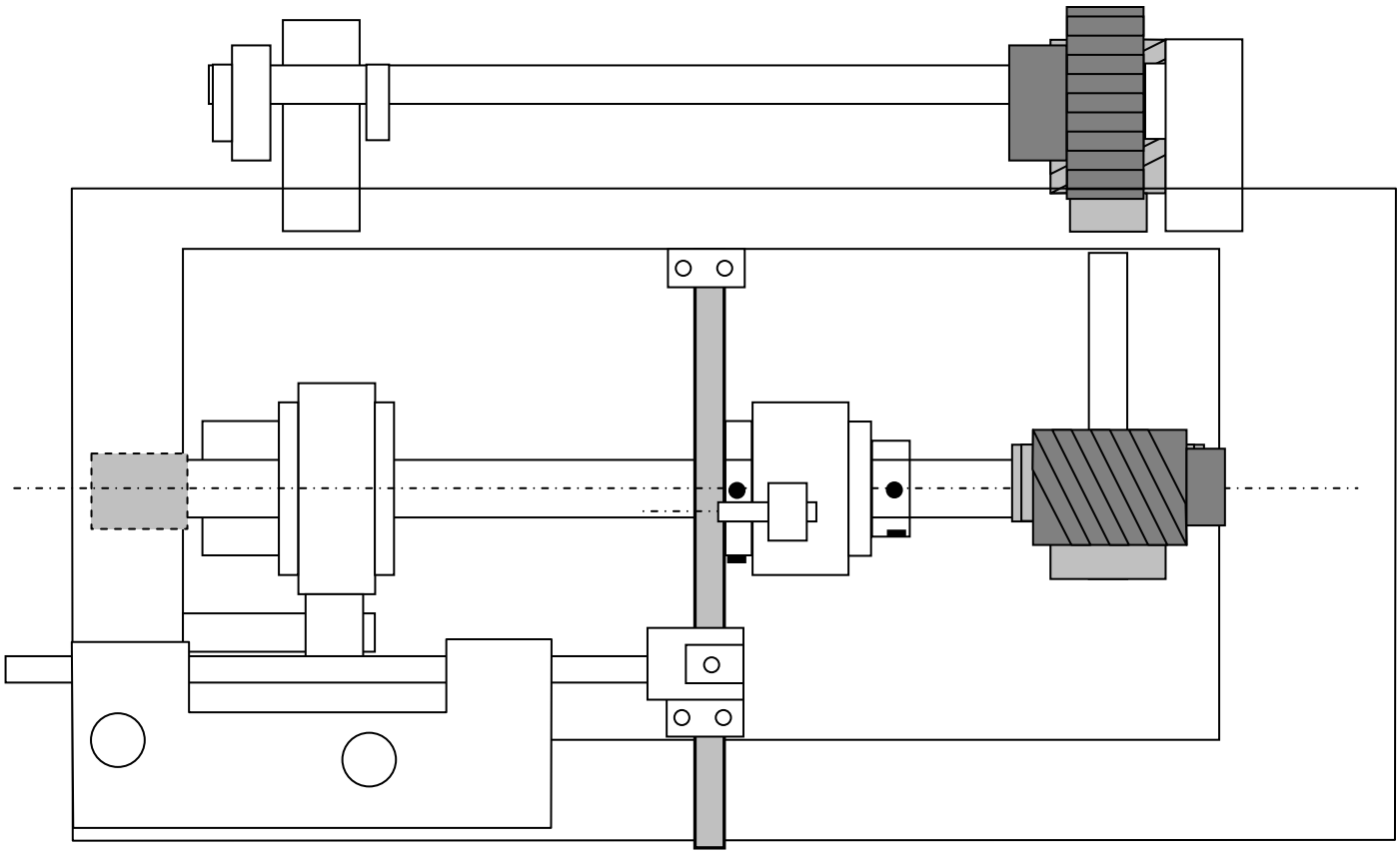


19.10.STITCH LENGTH

The 3022 automatic unit is equipped with a new sewing head expressly realized for this type of sewing by VI.BE.MAC. Spa.

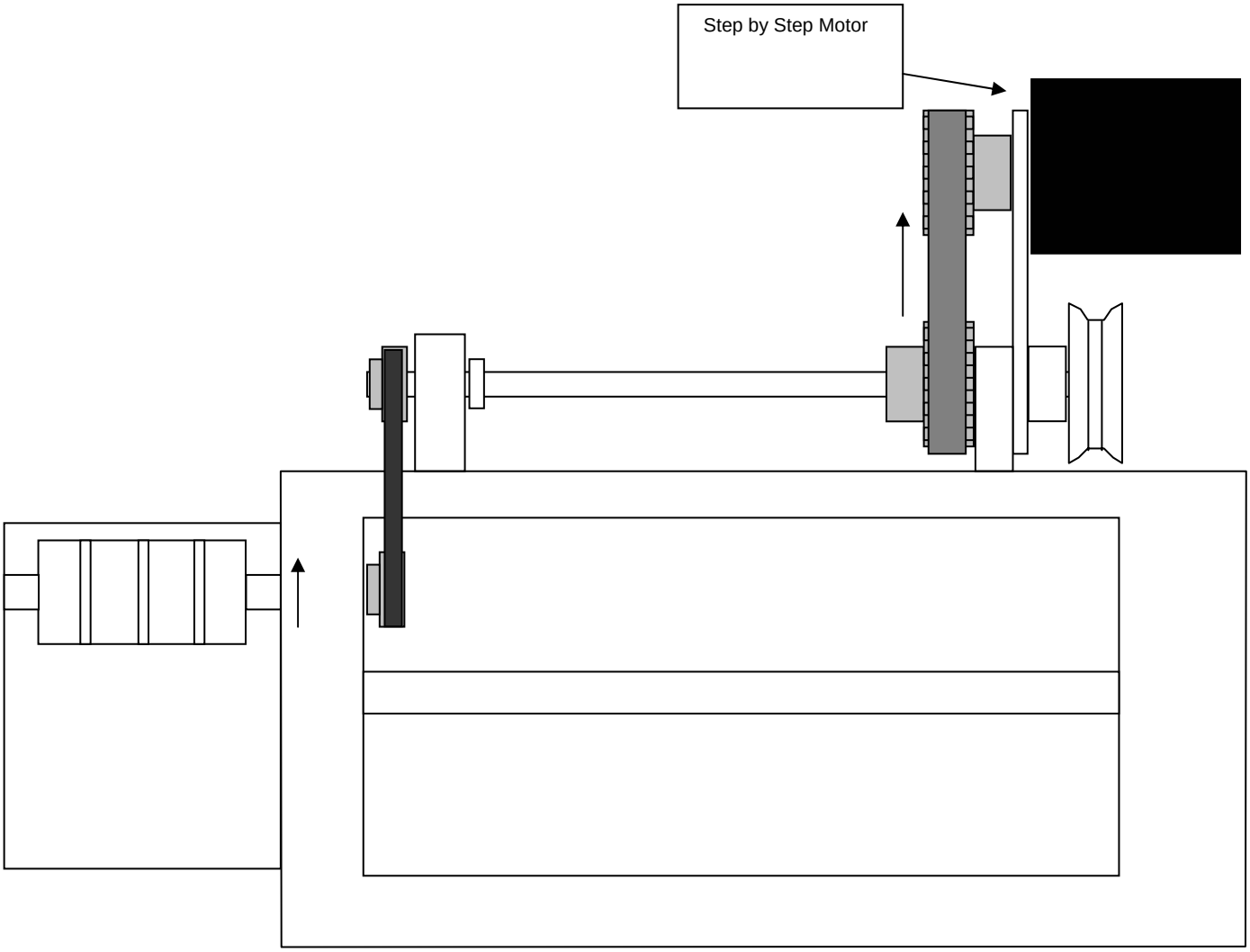
19.10.1.MECHANICAL VERSION

To change the stitch length in the Mechanic version replace the pair of gears fixed to the Back Shaft. Always check matching of the gears and lubricate with a very dense oil (SAE200) every 5 minuts for the first thirty minutes of operation, to avoid that the Endless Screw ruins the gear.
Adjust the movement of Needle Bar Translation according to the Stitch Length mounted.



19.10.2.ELECTRONIC VERSION

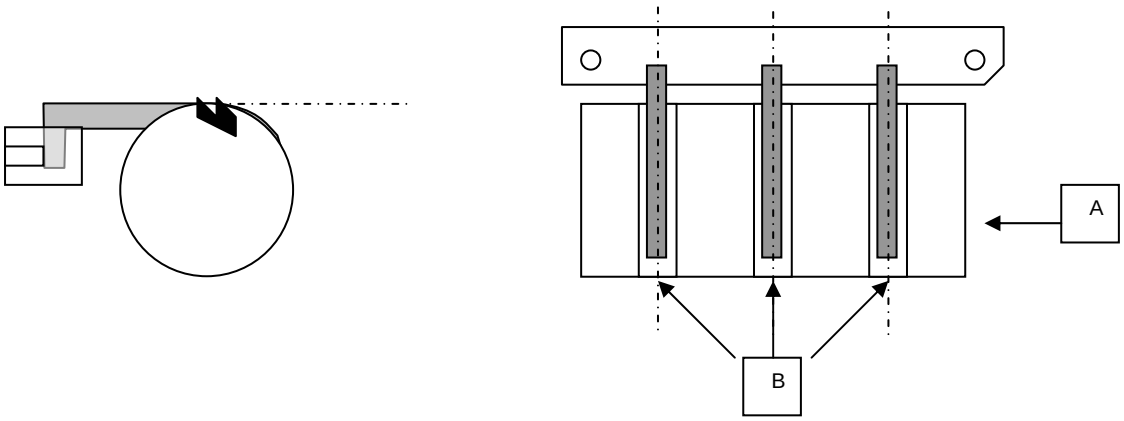
To change the stitch length modify the number of impulses for turn of the Step - by - Step motor following the specific instructions in the section referring to the FMFY motor panel and after insert the same CP parameter value on the LS01 Digital Panel



19.11.LOWER ROLLER SHAPED PINS ADJUSTMENT

On the material transport system a lower geared roller in steel is mounted.
The roller presents 3 slots for 3 special shaped pins.
Their function is to prevent that the roller pulls pieces of material in the machine during rotation, blocking transport or breaking the special "safety screw".
It is very important to check always that the 3 shaped pins are positioned, with their upper side, close to the lower part of the teeth of the roller and perfectly in the centre of the slot in the roller.
Two types are present:

- the standard for pulling strong material (denim) with very sharped spear teeth and to better penetrate between the
- the special for pulling the light material with more and more thin teeth in respect to the standard model.



20. CLEANING

The operator MUST switch off the machine, following procedure 5. STOPPING THE MACHINE.
Clean with compressed air every day:

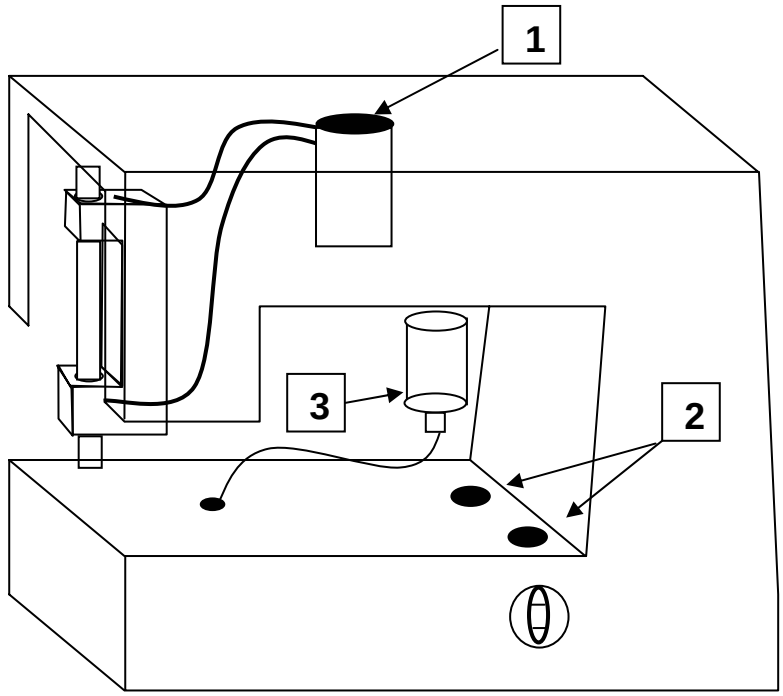
· the machine in general, especially under the needle plate.
· the pair of upper puller rollers of the machine, to get rid of pieces of thread.
· the lower pulling roller of the puller of the machine to get rid of pieces of thread.
· the intake filter of the MITSUBISHI motor.
- the photoelectric cells (clean with a light blast of compressed air and with a piece of cloth).
· The reflecting surface for the photoelectric cells (clean accurately with a piece of cloth).

21. LUBRICATION

The operator MUST switch off the machine, following procedure 5. STOPPING THE MACHINE. Always perform the cleaning operation before the lubrication of the unit.
The 3022 unit is equipped with 3 oil tanks positioned as follows:
1) –SEWING HEAD UPPER PART:
In the centre of the casing behind the upper threads passage, close by a metal plate, is the tank for lubrication of the upper part of the sewing head with the NEEDLE BAR PENDULUM also by two auxiliary oil pipes.
2) - SEWING HEAD LOWER PART:
In the centre of the casting on the surface of the machine a small transparent tube comes out tank for lubrication of the lower part of the sewing head.
3) – ROTARY HOOK :
On the machine surface in the back right corner, close by red plastic cup there is a tank for lubrication the rotary hook.

The unit uses only a very dense oil type SAE220 not detergent, **2 times the day** (Morning and Afternoon) lubricate all the red point and fill in the No.1 and No.2 oil tanks

On the No.3 Oil tank we use an oil type standard SAE 30 not detergent.
See the figure below to check the position of the holes and the points to lubricate in the unit.



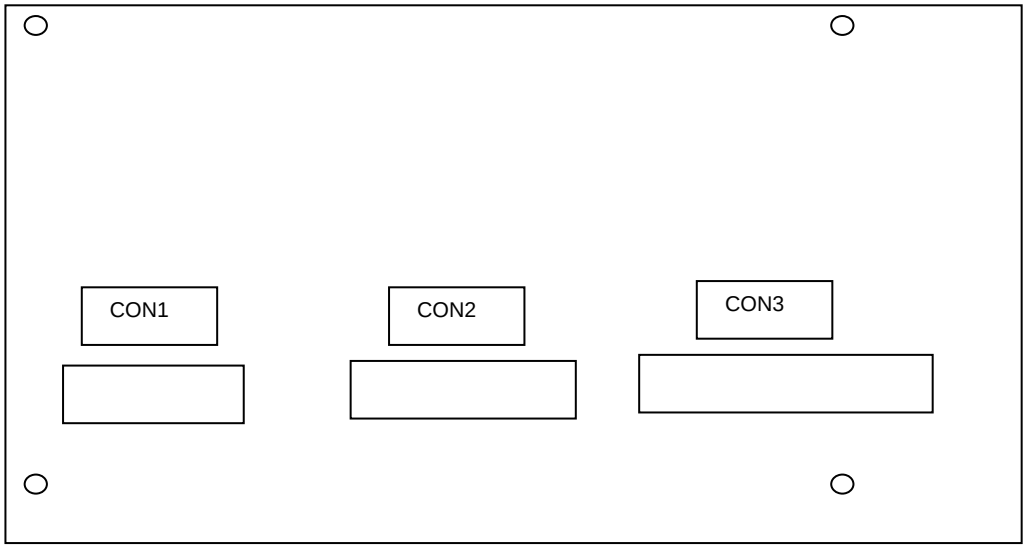
Lubricate the cylinder pins and the cutting device with type SAE32, non-detergent oil **twice a day**.

22. ELECTRICAL CONNECTIONS

22.1. LS01 PANEL

On the back of the LS01/P panel, are three trough connectors. Their function is as follows:

- CON1, trough connector, connects the motor panel to the LS01/P logic panel.
- CON2, 15-pole trough connector, connects the inputs to the LS01/P logic panel.
- CON3, 9-pole trough connector, connects the outputs from the LS01/P logic panel.



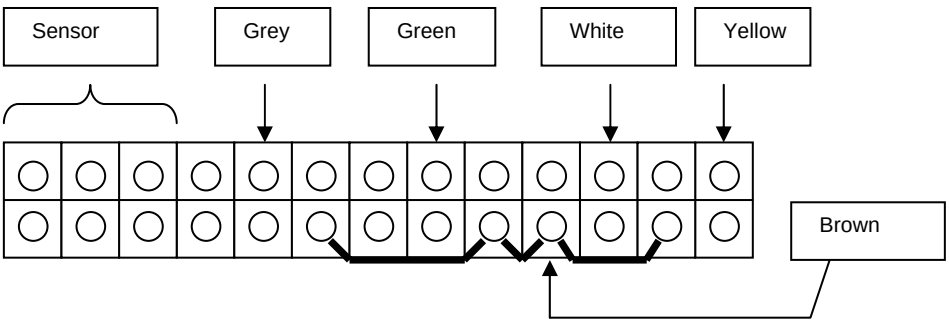
22.1.1. 15 POLE CONNECTOR INPUTS

PIN	FUNCTION		COLOUR
1	SKIP STITCH Photoelectric cell		YELLOW
2	INTERMEDIATE STOP Photoelectric cell		WHITE
3	CUT Photoelectric cell		PINK
5-6	+ 24V	Supply	BROWN
7-8	+ 0V	Photoelectric cell	BLUE/GREEN
9	+ 0V	CUT SAFETY SENSOR VERS.LS01/P	LIGHT BLUE
10	+ 5V		BROWN
11	SIGNAL		BLACK

22.1.2. 9 POLE CONNECTOR OUTPUTS

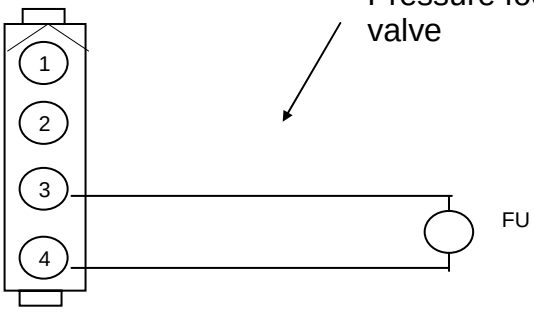
PIN	FUNCTION	COLOUR
1	SKIP STITCH Solenoid valve	YELLOW
2	PULLER Solenoid valve	WHITE
3	CUT Solenoid valve	GREEN
4	SAFETY SENSOR Solenoid valve	BROWN
6-7	+ 24 V COMMUNE Solenoid valve	BROWN

22.1.3. 13 POLE CONNECTOR OUTPUTS ON TABLE



22.2. MITSUBISHI MOTOR

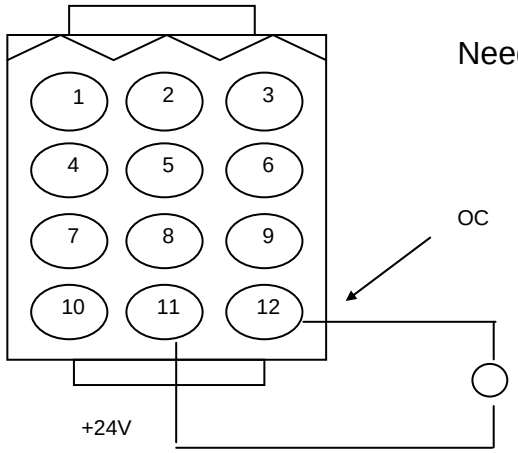
(Pressure foot raise connector)



Pin No.

3)	FU+	: Pressure foot raise
4)	FU -	: Pressure foot raise

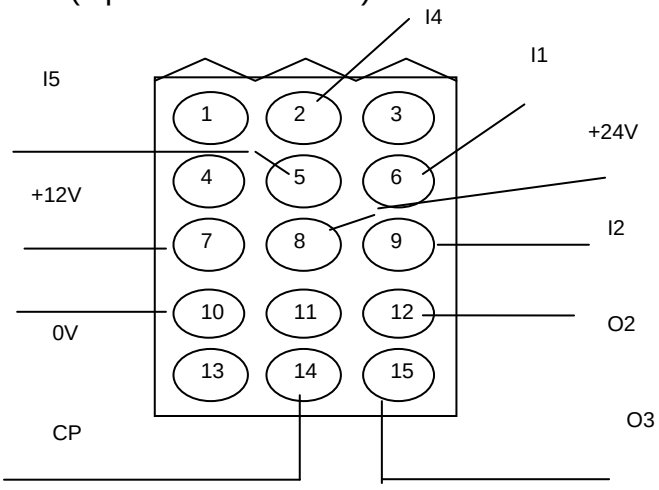
(Sewing Machine Connector)



Pin No.

11)	24V	
12)	OC	: NEEDLES COOLER

(Option B Connector)



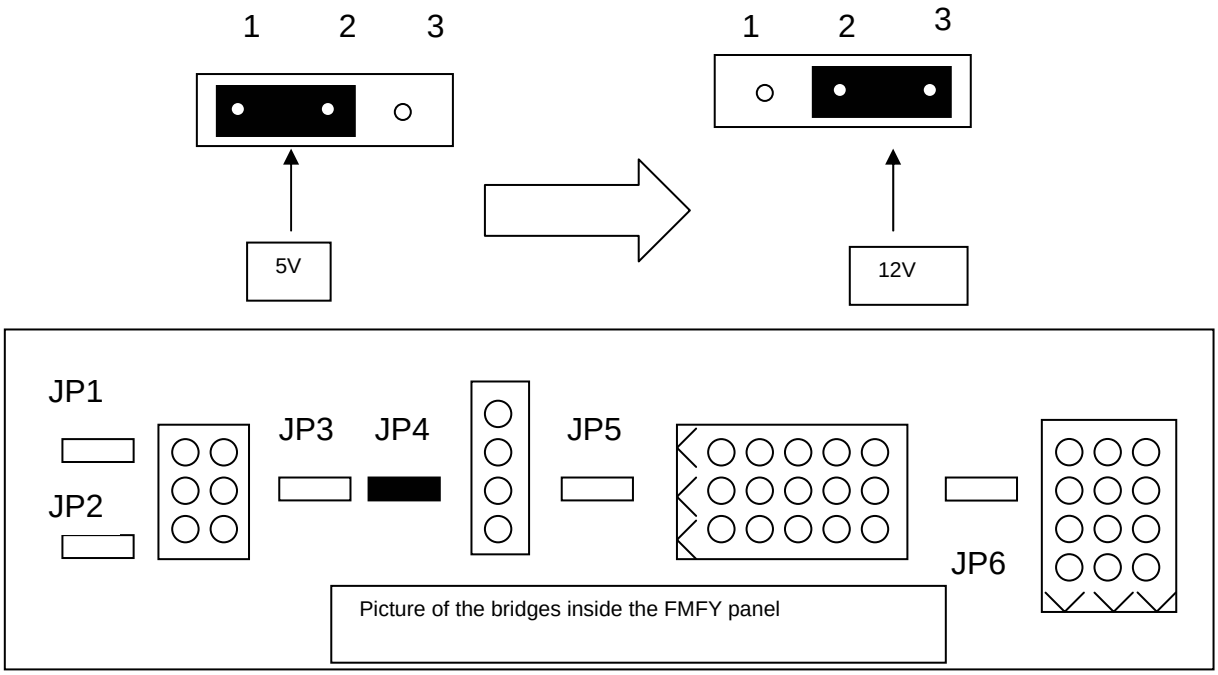
CONNECTION WITH PANEL LS01

Pin No.

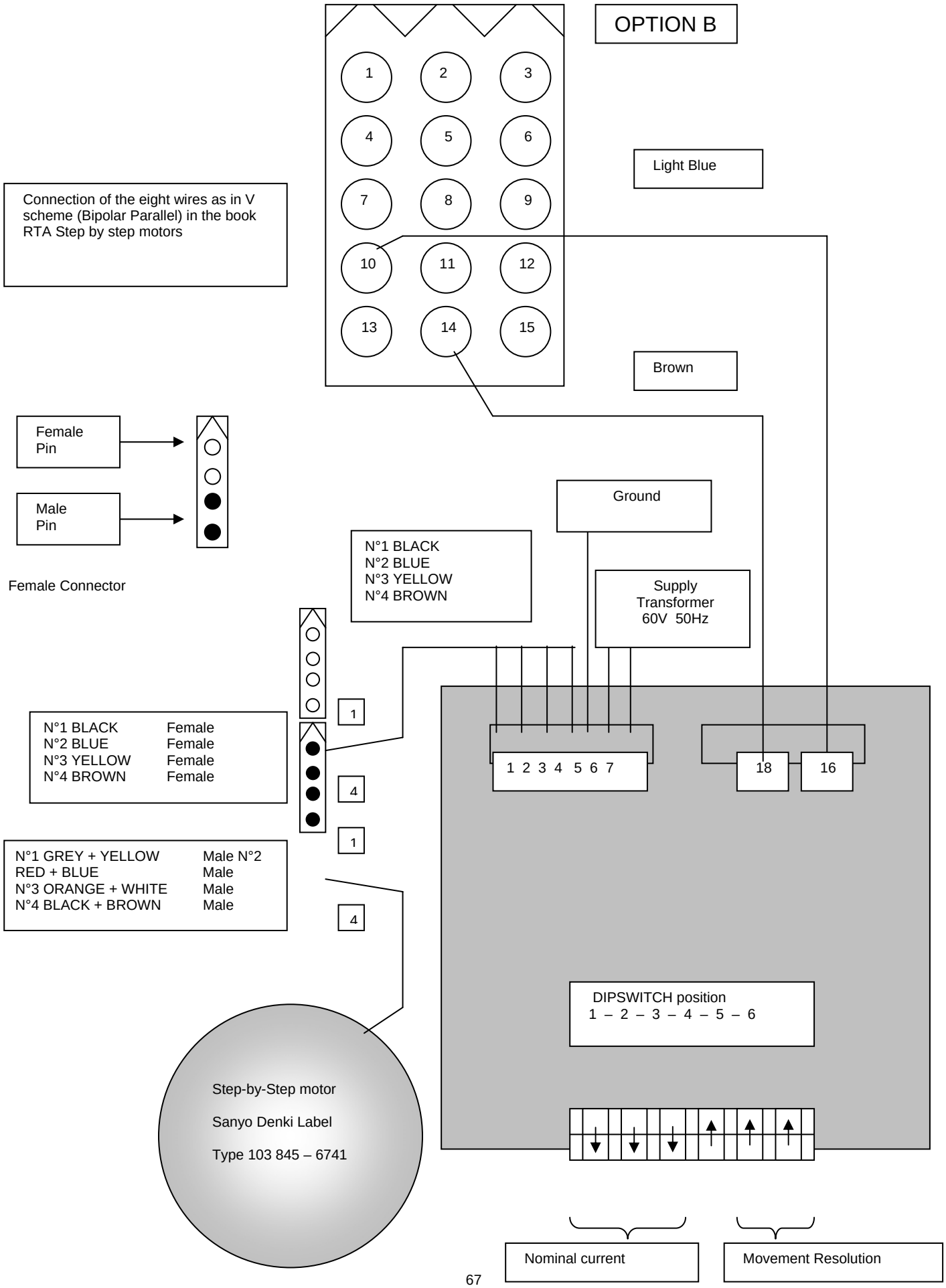
2)	I4	:Speed 1	Red Blue
5)	I5	: Speed 2 End	Green
6)	I1	: Speed 2 Start	Pink
9)	I2	:Stop	Grey
14)	O2	: Step motor pulse	Yellow
15)	O3	: M/c movement	Black
8)	24V		Red
8)	24V		Blue
8)	24V		White
7)	12V		Grey Pink
10)	0V		Brown
10)	0V		Violet
10)	0V		Brown
14)	CP		Light blue

MANAGEMENT CARD STEP BY STEP MOTOR

ATTENTION: Adjust voltage to DC5V=>DC12V on the FMFY panel moving the J4 bridge in the panel as illustrated below:



22.3.MANAGEMENT CARD STEP - BY - STEP MOTOR R.T.A. 3030



23. PNEUMATIC SCHEME