ENGLISH

LZ-2290C-F/SC-955A
INSTRUCTION MANUAL

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1. SPECIFICATIONS

1-1. Specifications of the sewing machine head

Model	LZ-2290CF-7
Application	Light-weight materials to medium-weight materials
Max. sewing speed	5,000 sti/min (*1)
Max. zigzag width	10 mm (*2)
Max. feed pitch	5 mm (normal/reverse feed) (*3)
Stitch pattern	15 kinds 21 patterns
Needle	SCHMETZ 438 #75 (Needle at the time of delivery)
Lubricating oil	JUKI New Defrix Oil No. 1
Multi-layered portion detection function	With
Horizontal feed control	Electronic control
Alternate vertical feed control	Electronic control
Active tension function	With
Thread trimmer	With
Wiper method	Front sweeping method
Noise	- Equivalent continuous emission sound pressure level (L_{pA}) at the workstation : A-weighted value of 81.5 dB; (Includes K_{pA} = 2.5 dB); according to ISO 10821- C.6.2 -ISO 11204 GR2 at 4,000 sti/min.

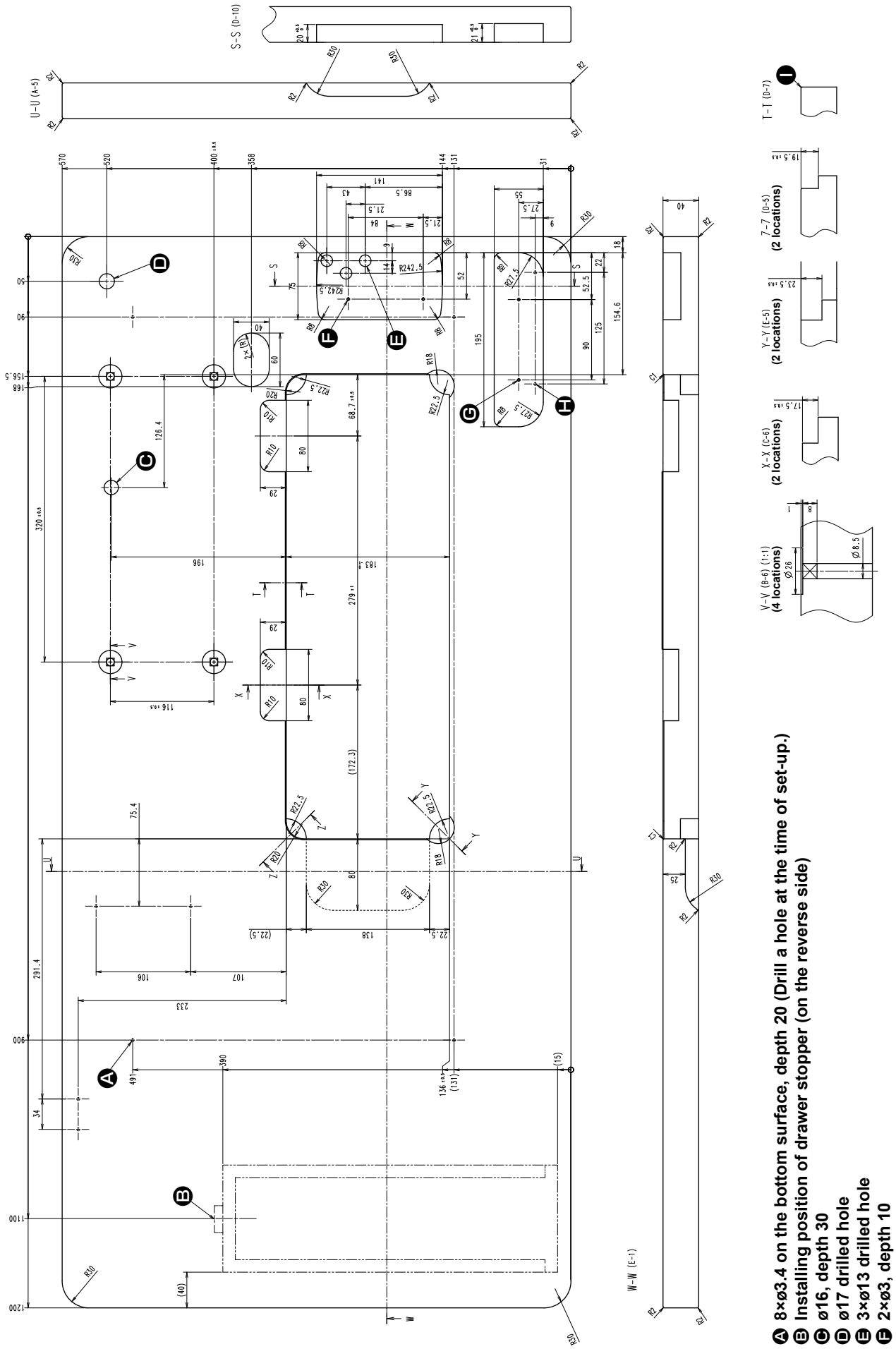
* 1. The max. sewing speed is set to 4,000 sti/min at the time of delivery (depending on the delivery area).
  - The speed is limited by setting of the zigzag width of the sewing pattern and feed amount since the speed is controlled by the amount of zigzag width per stitch and feed amount.
  - Properly set the number of revolution in accordance with the product to be sewn and process.
* 2. Max. zigzag width is limited to 8 mm at the time of standard delivery.
* 3. Standard feed amount has been factory-set to 2.5 mm at the time of shipment.

1-2. Specifications of the control box

Model	SC-955A			
Supply voltage	Single phase 100 to 120V	3-phase 200 to 240V	Single phase 220 to 240V	Single phase 220 to 240V CE
Frequency	50Hz/60Hz	50Hz/60Hz	50Hz/60Hz	50Hz/60Hz
Operating environment	Temperature : 0 to 35˚C Humidity : 90% or less	Temperature : 0 to 35˚C Humidity : 90% or less	Temperature : 0 to 35˚C Humidity : 90% or less	Temperature : 0 to 35˚C Humidity : 90% or less
Input	600VA	600VA	600VA	600VA

2. SET UP

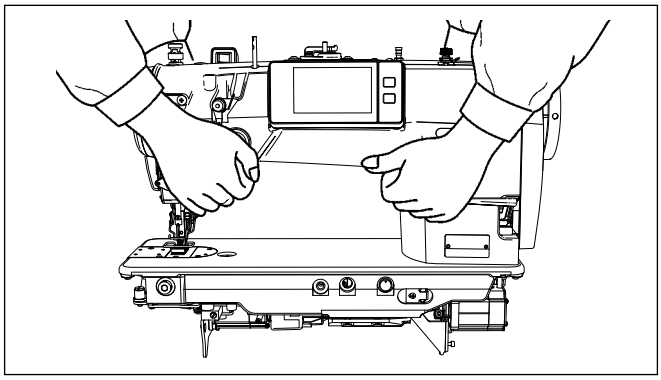
2-1. Drawing of table



Ⓐ 8×ø3.4 on the bottom surface, depth 20 (Drill a hole at the time of set-up.)
Ⓑ Installing position of drawer stopper (on the reverse side)
Ⓒ ø16, depth 30
Ⓓ ø17 drilled hole
Ⓔ 3×ø13 drilled hole
Ⓕ 2×ø3, depth 10
Ⓖ 2×ø3, depth 10
Ⓗ 2×ø3.4 on the bottom surface, depth 10 (Drill a hole at the time of set-up.)
Ⓘ C1.5 to C2.5 (hinge side only)

2-2. Cautions when setting up the sewing machine

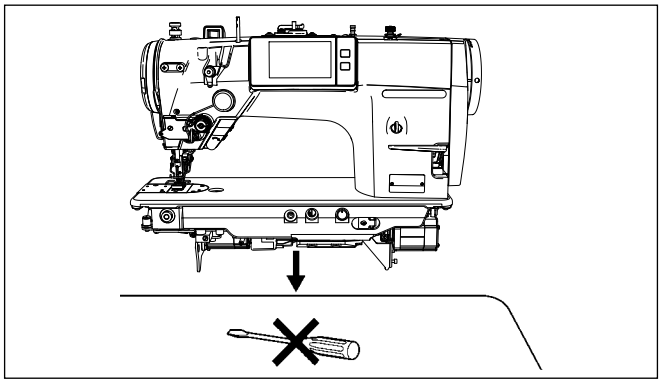
Thank you very much for the purchase of JUKI Industrial Sewing Machine this time. Make sure of items 2-1 through 2-19 before operating to use this sewing machine with ease.



2-2-1. How to carry the sewing machine

Carry the sewing machine while holding the machine arm with two persons as shown in the figure.

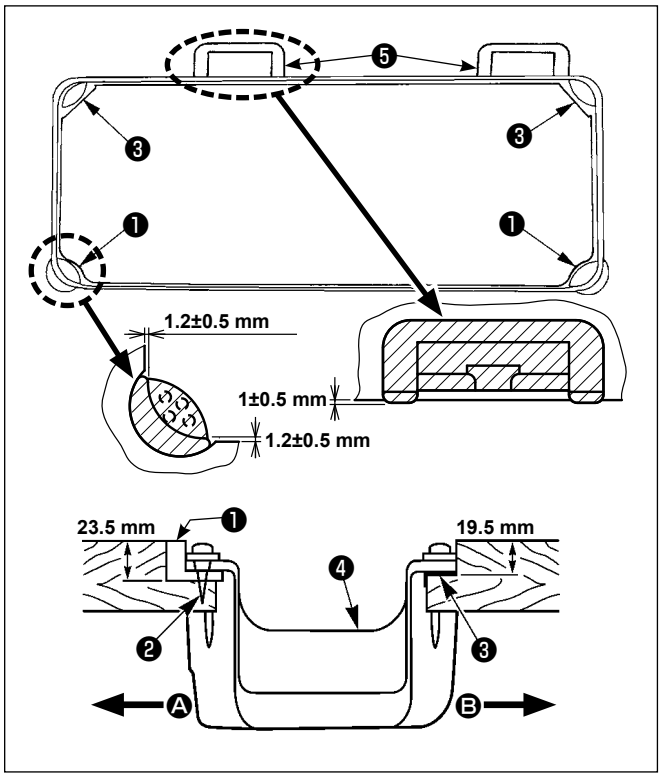
1. Never hold the handwheel since it rotates.
2. Be sure to handle the sewing machine with two persons or more since the sewing machine weighs 49.5 kg or more.
3. Do not hold the operation panel portion when you setting up the sewing machine head.



2-2-2. Caution when placing the sewing machine

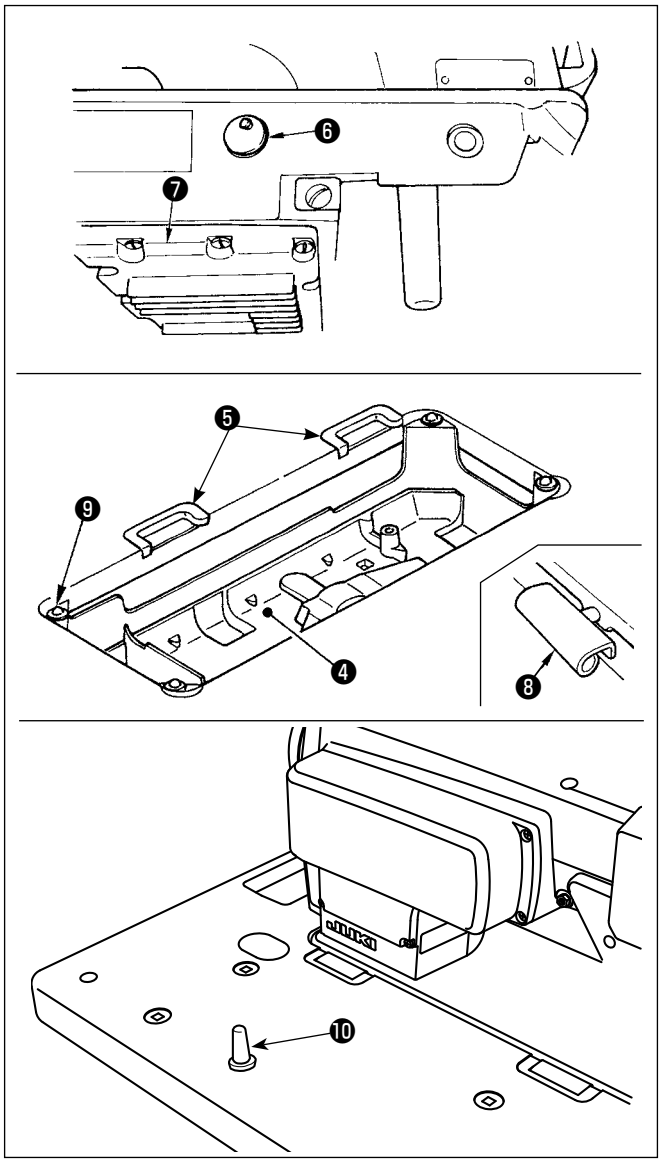
Place the sewing machine on a horizontal and plane place when placing it and do not place any protruding thing such as a screwdriver or the like.

2-3. Installation



1) The under cover ❹ should rest on the four corners of the machine table groove. Mount rubber hinge seat ❺ on the table and fix it on the table with a nail.

2) Fix two rubber seats ❶ on side Ⓐ (operator's side) using nails ❷ as illustrated above. Fix two cushion seats ❸ on side Ⓑ (hinged side) using a rubber-based adhesive. Then place under cover ❹ on the fixed seats.



3) Remove air vent cap ❻ attached to the machine bed. (Be sure to attach cap ❻ when transporting the machine head in the state that the machine head is removed from the machine table.)

Caution

If the sewing machine is operated without removing air vent cap ❻ , oil leakage from gear box portion ❼ may occur.

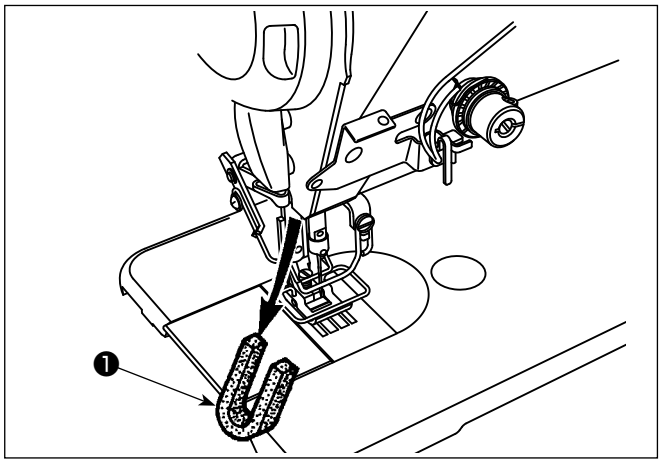
4) Fit hinge ❽ into the opening in the machine bed, and fit the machine head to table rubber hinge ❺ before placing the machine head on cushions ❾ on the four corners.

Caution

Do not hold the handwheel.

5) Attach head support rod ❿ to the machine table.

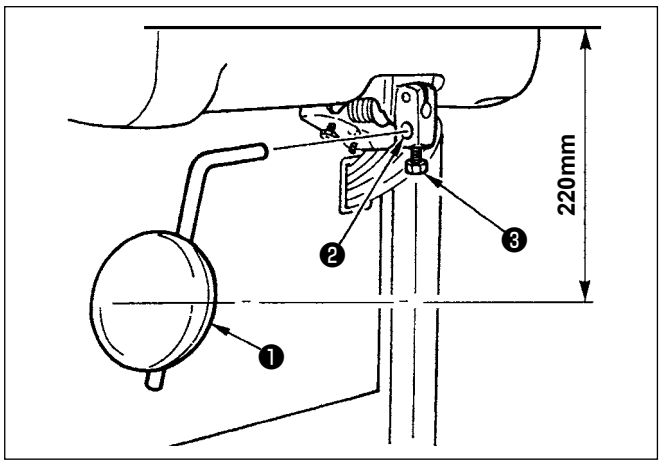
2-4. Removing the needle bar stopper



Remove needle bar stopper ❶ for transportation.

Keep the needle bar stopper which has been removed, and install this needle bar stopper when transporting the sewing machine. The needle bar stopper may be cut when it is strongly drawn out. Slightly move the needle bar to the right or left and slowly draw out the needle bar stopper.

2-5. Attaching the knee-lifter

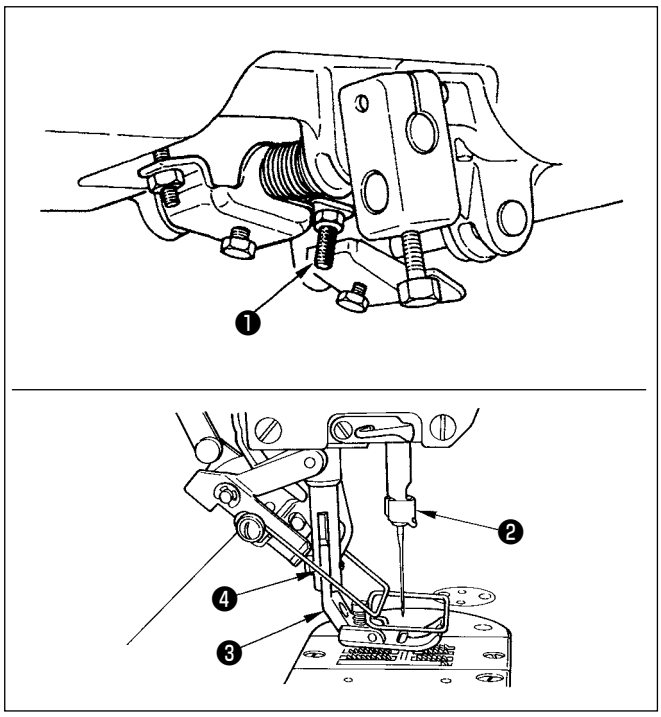


Insert knee-lifter into attaching hole ❷ and tighten it with bolt ❸ .

* Adjust the position of knee lifter pad ❶ to a convenient place. For the reference dimension, the position is 220 mm from the bottom face of table.

* For the LZ-2290CF/AK156, this work is not necessary.

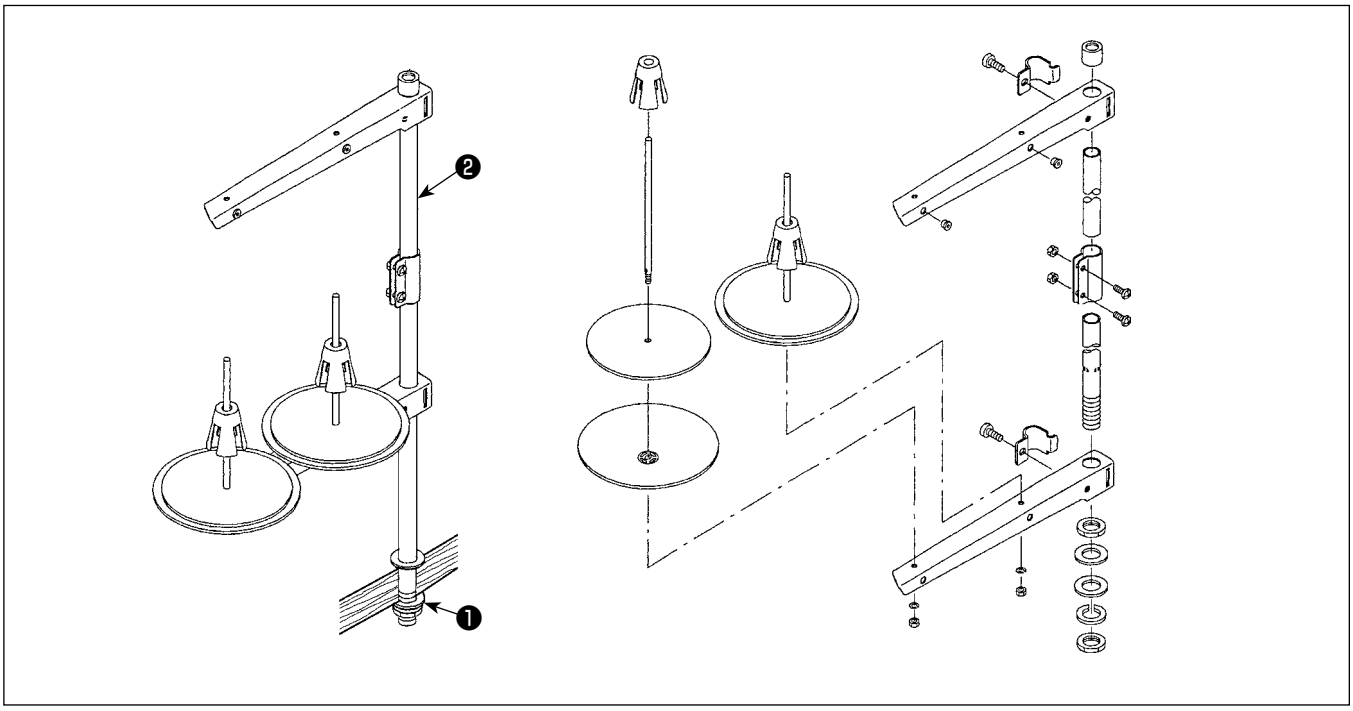
2-6. Adjusting the height of the knee lifter



1) The standard height of the presser foot lifted using the knee lifter is 10 mm.
2) The lift of the presser foot can be adjusted with knee lifter adjustment screw ❶ .

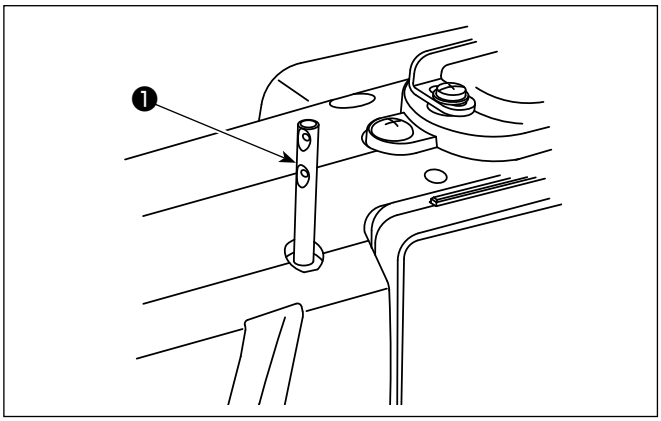
Do not operate the sewing machine in the state that presser foot ❸ is lifted by 10 mm or more since needle bar ❷ and presser foot ❸ , or wiper ❹ and presser foot ❸ come in contact with each other.

2-7. Installing the thread stand



1) Assemble the thread stand unit, and insert it in the hole in the machine table.
2) Tighten nut ❶ .
3) For ceiling wiring, pass the power cord through spool rest rod ❷ .

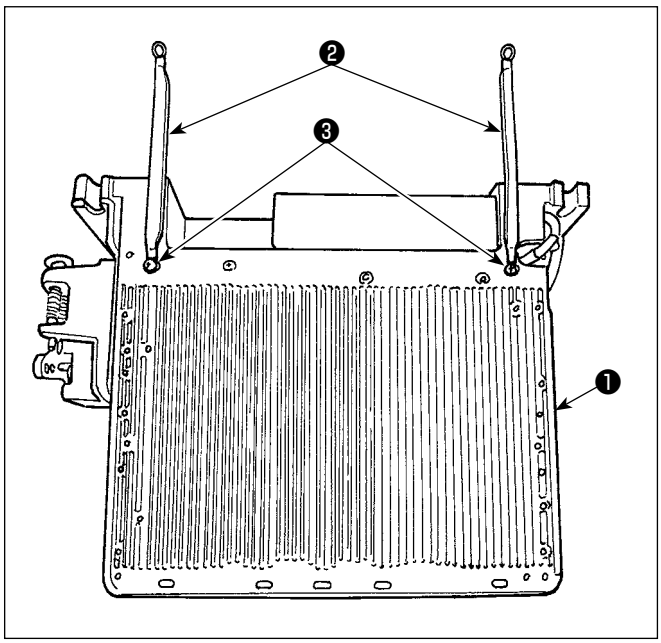
2-8. Installing the thread guide pin



Insert needle thread guide pin ❶ into the slot on the machine head.

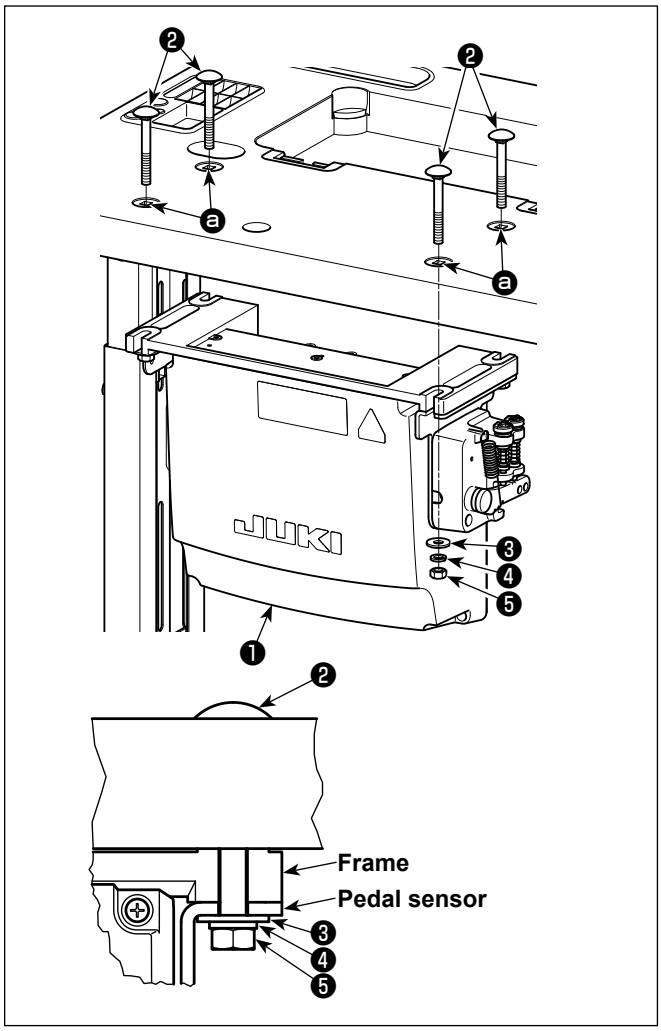
2-9. Installing the electrical box

2-9-1. Preparing for installation of the control box (Only for the EU type models)



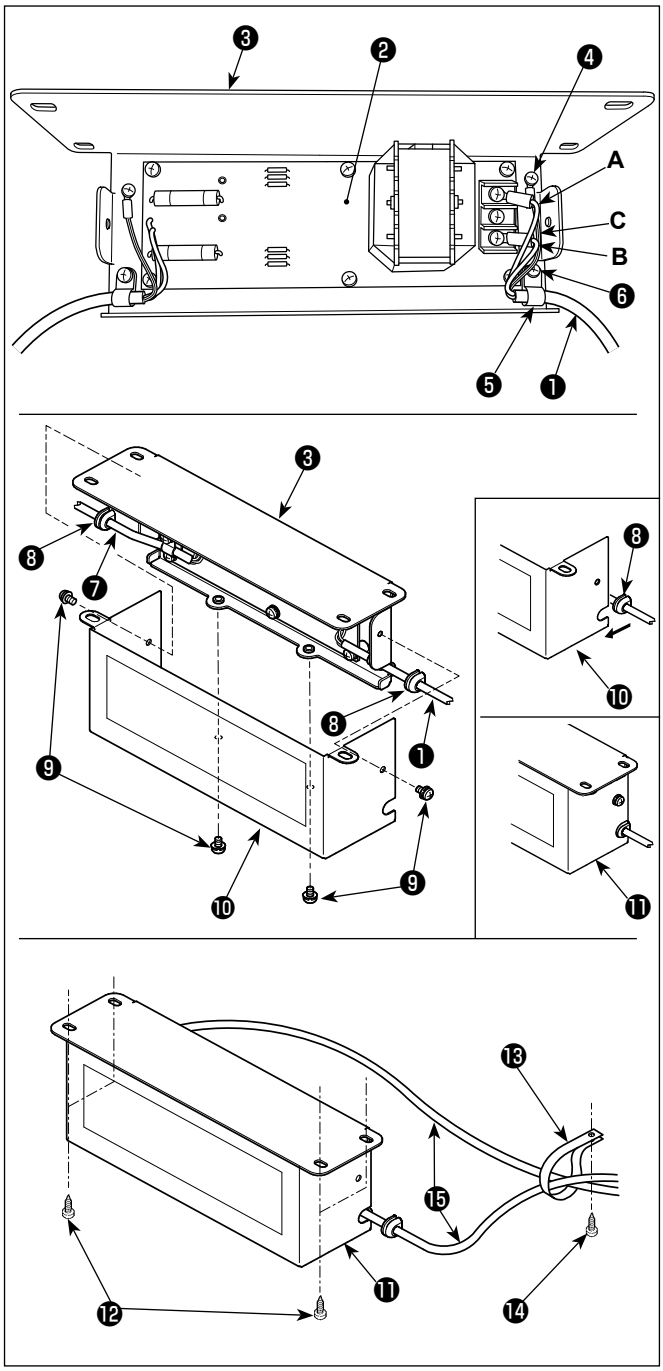
1) Underside cover ground wires ❷ are attached to the underside cover. Secure underside cover ground wired ❷ on electrical box ❶ with screws. At this time, remove once the mounting screws from the underside cover.
Install the electrical box to the frame located behind the electrical box in the upward direction as shown in the figure. Use mounting screws ❸ that has been preliminarily attached to the frame.

2-9-2. Installing the electrical box



Install control box ❶ on the table using four holes ⓐ in the table. Secure the control box with four bolts ❷, four plain washers ❸ , four spring washers ❹ and four hexagonal nuts ❺ supplied with the control box. At this time, insert the nut and washer supplied with the unit as accessories as shown in the figure so that the control box is securely fixed.

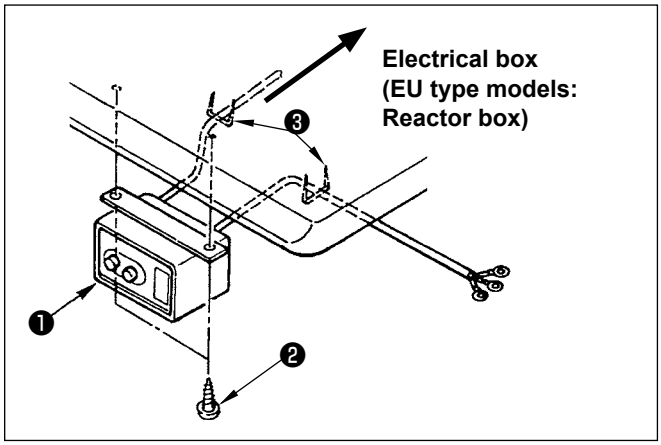
2-10. Installing the reactor box (Only for the EU type models)



1) Attach the terminals of power cord ❶ coming from the electrical box to reactor box PCB asm. ❷ and reactor box mounting plate ❸ .
   Connect brown wire **A** to the first connector and blue wire **B** to the third connector respectively from the top of terminal block on the reactor box PCB asm. using screws. Connect green/yellow wire **C** to reactor box mounting plate ❸ with earth setscrew ❹ .
2) Attach cable clip ❺ to the power cord coming from the electrical box. Then, attach the power cord together with the cable clip to reactor box mounting plate ❸ with cable clip setscrew ❻ .
3) Attach cord bushes ❽ to input/output cables ❶ and ❼ of the reactor box. Attach both bushes in the same manner.
4) Attach reactor box cover ❿ to reactor box mounting plate ❸ with four reactor-box cover setscrews ❾ .
   At this time, fix cord bushes ❽ attached to input/output cables ❶ and ❼ in the concave section on reactor box cover ❿ to eliminate a gap between reactor box ⓫ and cover ❿ .
5) Secure reactor box ⓫ to the undersurface of table with four accessory wood screws ⓬ .
6) Secure two cables ⓯ coming from reactor box ⓫ to the table with accessory cable clip ⓭ and wood screw ⓮ .

2-11. Connecting the power switch cable

2-11-1. Installing the power switch

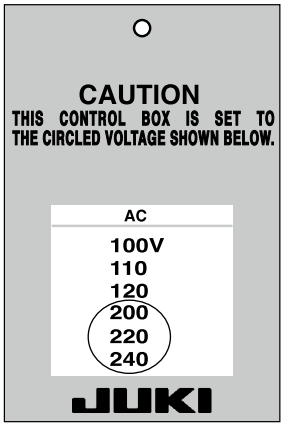


Fix power switch ❶ under the machine table with wood screws ❷ .
Fix the cable with staples ❸ supplied with the machine as accessories in accordance with the forms of use.

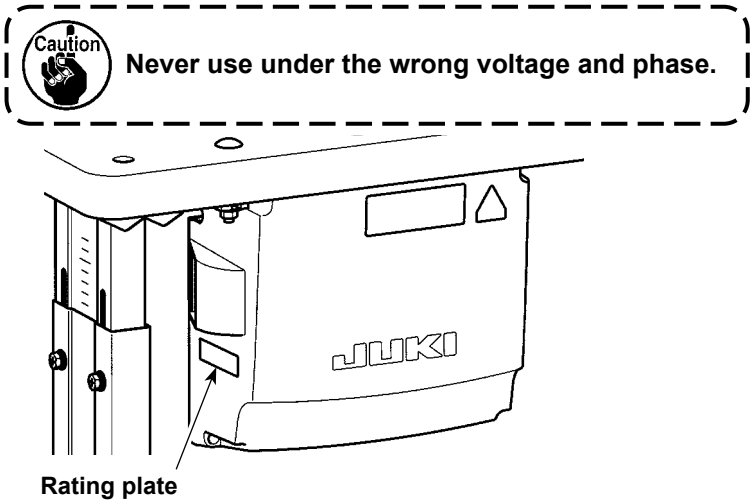
2-11-2. Connecting the power source cord

Voltage specifications at the time of delivery from the factory are indicated on the voltage indication seal. Connect the cord in accordance with the specifications.

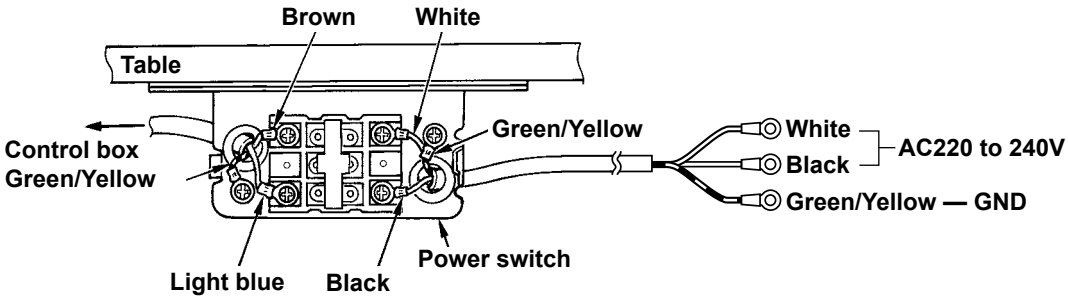
Power indication tag



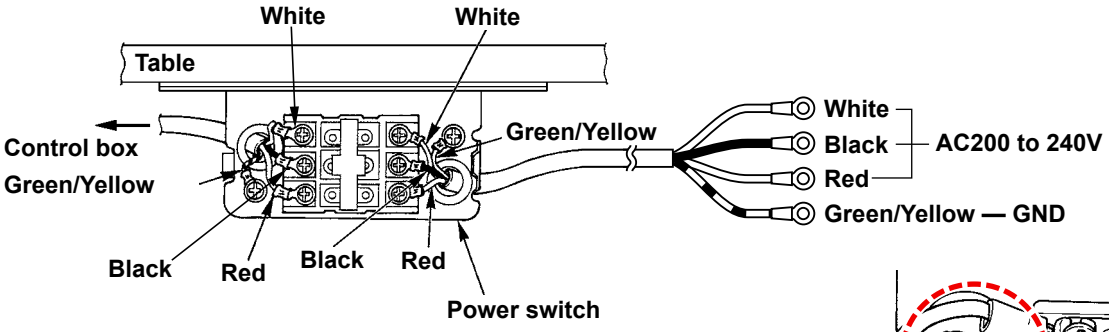
(For example : In the case of 200V)



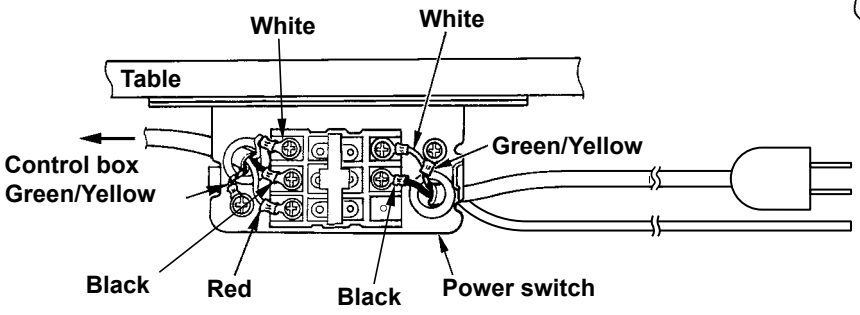
• Connecting single phase 220 to 240V

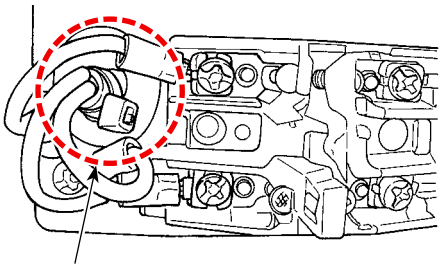


• Connecting 3-phase 200 to 240V



• Connecting single phase 100 to 120V





After screwing the cable to the power switch, bind the cable sheath portion with an accessory clip band inside the power switch.

2-12. Installing the accessory ring core (Only for the EU type models)

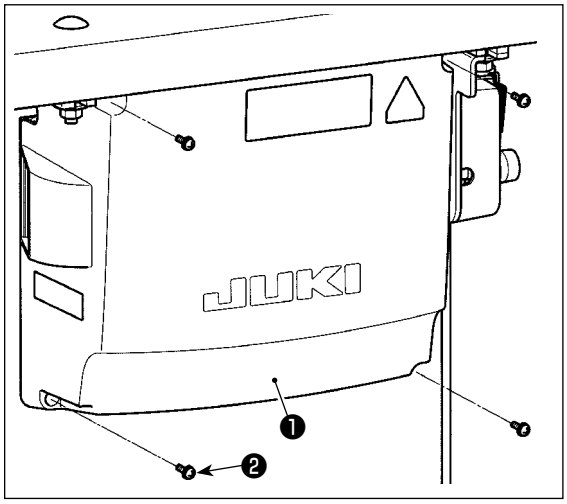
2-12-1. Installing the accessory ring core supplied with the electrical box

Refer to accessory manual for "Installing the accessory ring core" supplied with the electrical box for how to install the ring core.

2-13. Connecting the cords

DANGER :
1. To prevent personal injuries caused by electric shock hazards or abrupt start of the sewing machine, carry out the work after turning OFF the power switch and a lapse of 5 minutes or more.
2. To prevent accidents caused by unaccustomed work or electric shock, request the electric expert or engineer of our dealers when adjusting the electrical components.

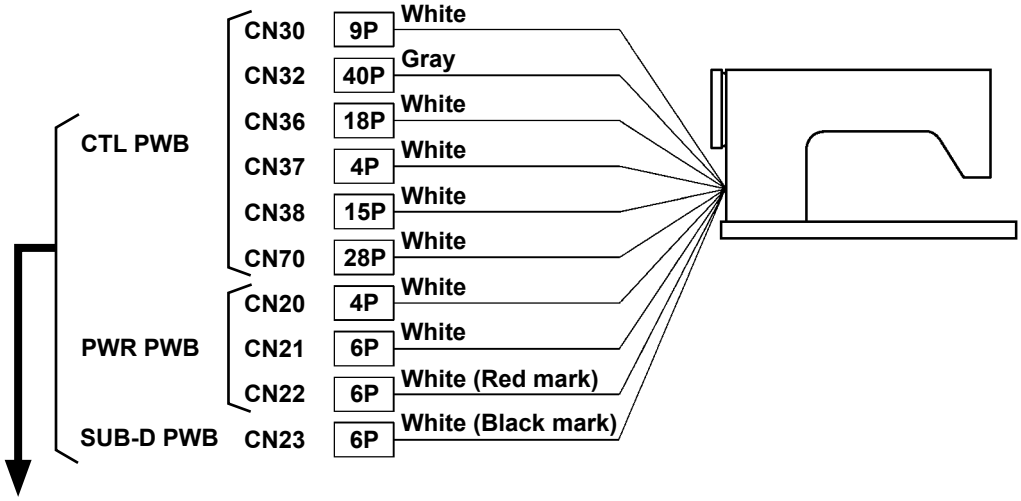
2-13-1. Connecting the cords coming from the sewing machine



1) Loosen four setscrews ❷ of control box cover ❶ . Remove control box cover ❶ .
2) Connect the respective cords to the corresponding connectors of CTL PCB, PWR PCB and SUB-D PCB. (Fig. 1)

Caution
Take care not to incorrectly connect the connectors CN21, CN22 and CN23.
The connector CN22 is provided with a red marking and the connector CN23 is provided with a black marking.

3) Fix the ground wire ❹ on position Ⓐ of the control box with a screw. (Fig. 2)



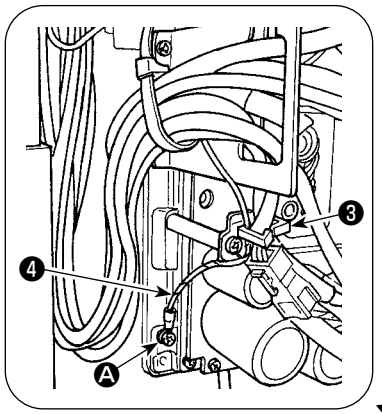


Fig. 2

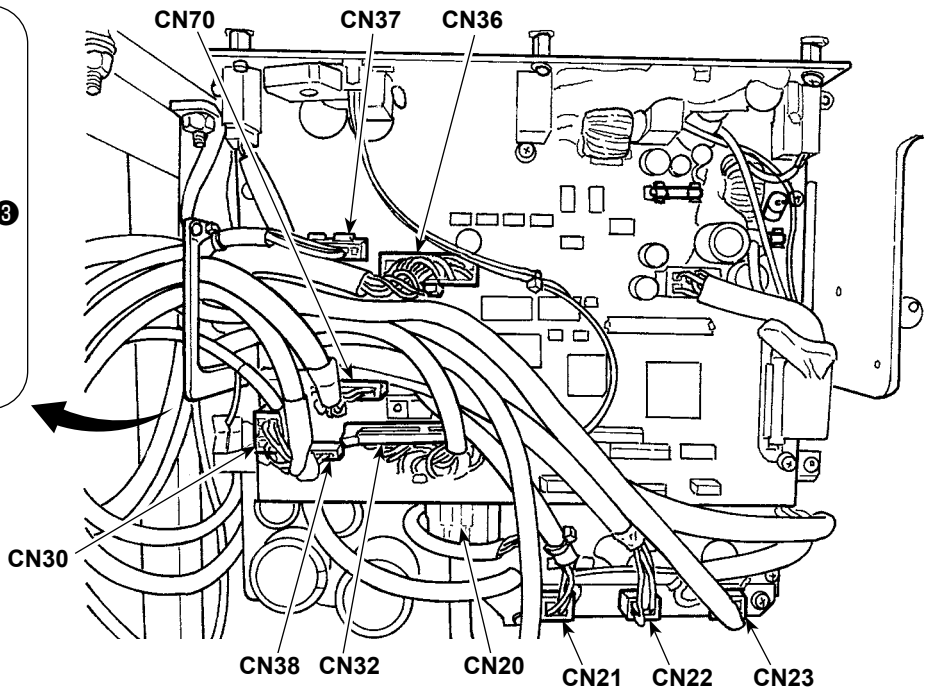


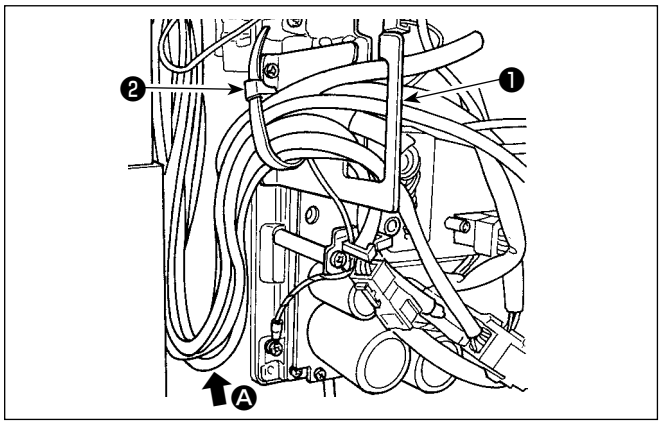
Fig. 1

2-13-2. Screwing the underside cover ground wire to the underside cover (Only for the EU type models)

Re-tighten the underside cover ground wire that you have removed in **"2-9-1. Preparing for installation of the control box (Only for the EU type models)" p.7**.

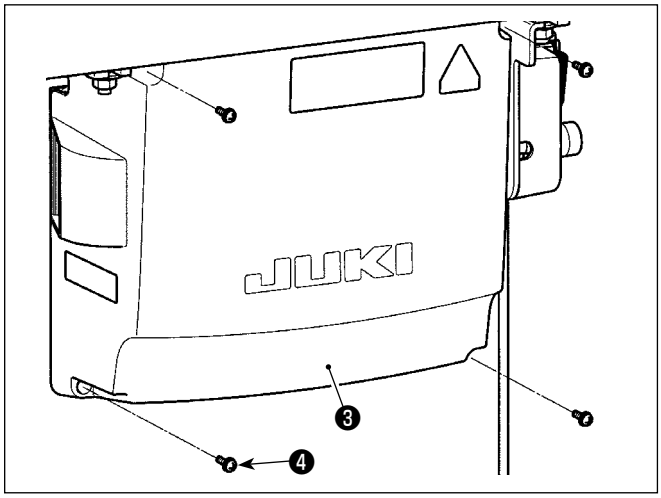
2-14. Handling the cords

DANGER :
1. **To prevent personal injuries caused by electric shock hazards or abrupt start of the sewing machine, carry out the work after turning OFF the power switch and a lapse of 5 minutes or more.**
2. **To prevent accidents caused by unaccustomed work or electric shock, request the electric expert or engineer of our dealers when adjusting the electrical components.**



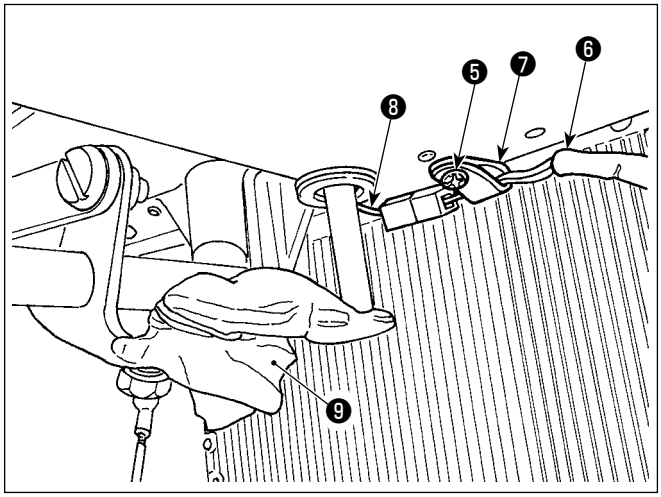
1) Bring the cords under the table into the control box.
2) Put the cord brought into the control box through cord exit plate ❶ and fix cable clip band ❷ .

Caution
Arrange the cord so that it is not tensed or hitched even when the machine head is tilted. (See Ⓐ section.)



3) Install control box cover ❸ with four setscrews ❹ .

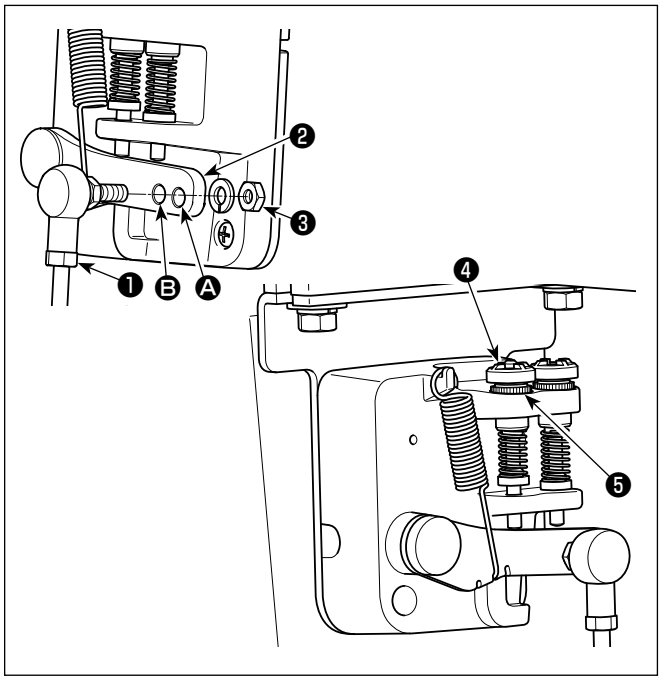
Caution
For the purpose of preventing the cord breakage, take care not to allow the cords to be caught between the control box and control box cover ❸ when attaching the latter.



4) Remove cord clamp setscrew ❺ of the underside cover. Pass fan cord ❻ on the machine head side through cord clamp ❼ . Then, secure the cord clamp with setscrew ❺ again.
5) Connect fan cord ❻ on the machine head side to fan cord ❽ on the underside cover side.
6) Detach vinyl wrap film ❾ from the knee lifter actuation arm.

2-15. Attaching the connecting rod

WARNING :
To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and a lapse of 5 minutes or more.



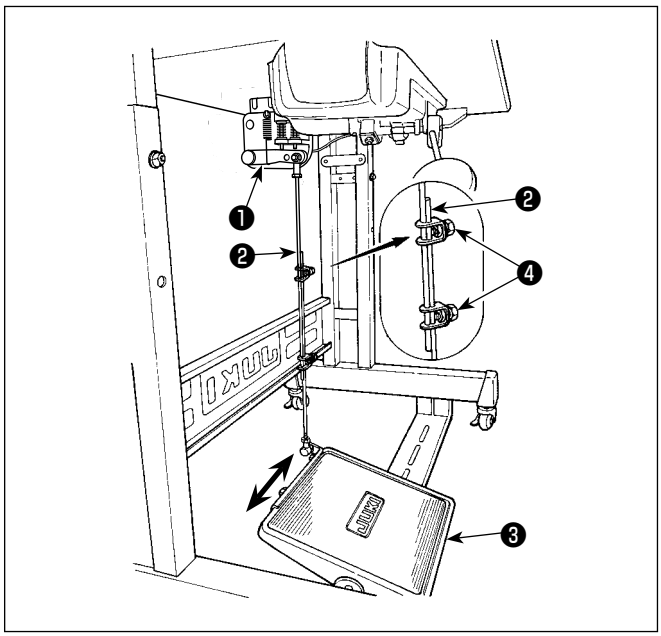
1) Fix connecting rod ❶ to installing hole Ⓑ of pedal lever ❷ with nut ❸ .
2) Installing connecting rod ❶ to installing hole Ⓐ will lengthen the pedal depressing stroke, and the pedal operation at a medium speed will be easier.
3) The pressure increases as you turn reverse depressing regulator screw ❹ in, and decreases as you turn the screw out.

Caution

1. If the screw is excessively loosened, the spring will come off. Loosen the screw to such an extent that the top of the screw can be observed from the case.
2. Whenever you have adjusted the screw, be sure to secure the screw by tightening metal nut ❺ to prevent the screw from loosening.

2-16. Adjustment of the pedal

WARNING :
Turn OFF the power before starting the work so as to prevent accidents caused by abrupt start of the sewing machine.



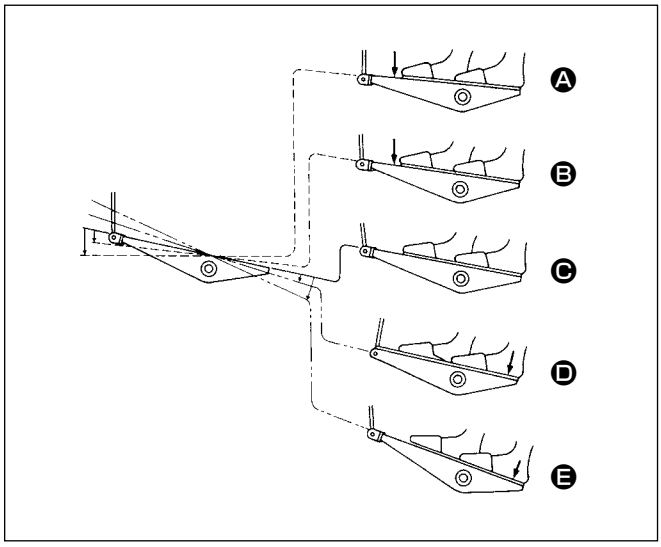
2-16-1. Installing the connecting rod

1) Move pedal ❸ to the right or left as illustrated by the arrows so that motor control lever ❶ and connecting rod ❷ are straightened.

2-16-2. Adjusting the pedal angle

1) The pedal tilt can be freely adjusted by changing the length of the connecting rod ❷ .
2) Loosen adjust screw ❹ , and adjust the length of connecting rod ❷ .

2-17. Pedal operation



The pedal is operated in the following four steps:

1) The machine runs at low sewing speed when you lightly depress the front part of the pedal. Ⓑ
2) The machine runs at high sewing speed when you further depress the front part of the pedal. Ⓐ (If the automatic reverse feed stitching has been preset, the machine runs at high speed after it completes reverse feed stitching.)
3) The machine stops (with its needle up or down) when you reset the pedal to its original position. Ⓒ
4) The machine trims threads when you fully depress the back part of the pedal. Ⓔ

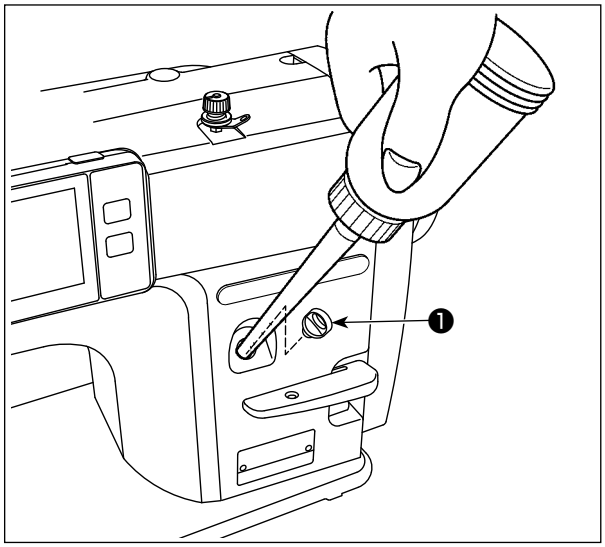
* When the auto-lifer (AK device) is used, one more operating switch is provided between the sewing machine stop switch and thread trimming switch.
The presser foot goes up when you lightly depress the back part of the pedal Ⓓ, and if you further depress the back part, the thread trimmer is actuated.
When starting sewing from the state that the presser foot has been lifted with the Auto-lifter and you depress the back part of the pedal, the presser foot only comes down.

- If you reset the pedal to its neutral position during the automatic reverse feed stitching at seam start, the machine stops after it completes the reverse feed stitching.
- The machine will perform normal thread trimming even if you depress the back part of the pedal immediately following high or low speed sewing.
- The machine will completely perform thread trimming even if you reset the pedal to its neutral position immediately after the machine started thread trimming action.

2-18. Lubrication

WARNING :

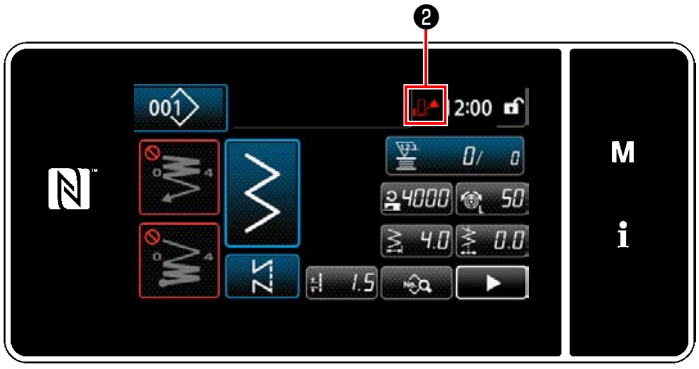
1. **To prevent the occurrence of an inflammation or rash, immediately wash the related portions if oil adheres to your eyes or other parts of your body.**
2. **If oil is mistakenly swallowed, diarrhea or vomitting may occur. Put oil in a place where children cannot reach.**



Fill the oil tank with oil before operating the sewing machine.

1) Remove oil hole cap ❶ and fill the oil tank with JUKI NEW DEFRIX OIL No.1 (part number : MD-FRX1600C0) or JUKI MACHINE OIL #7 (part number : MML007600CA) using the oiler supplied with the machine.

   When you feed oil to the sewing machine for the first time after purchase, fill up the oil tank (approximately 100 ml). (It is the adequate quantity of oil.)



2) Pour oil into the oil tank unit until empty mark ❷ displayed on the upper right portion of the operation panel changes from Normal to Full .

   Stop pouring oil immediately after the empty mark changes to Full .

   Be aware that, if you pour an excessive quantity of oil into the oil tank, oil can leak through air vents in the oil tank or may fail to supply oil properly to the sewing machine.

   Be aware, in addition, oil may spill out from the oil hole if you pour oil into the oil tank vigorously.

3) Replenish oil when Empty mark ❷ is displayed on the operation panel while the sewing machine is in use.

Caution

1. **When using a new sewing machine for the first time or using the sewing machine which has not been used for a long time, run in the sewing machine at a sewing speed of 1,000 sti/min or less and check the oil quantity in the hook before use.**
   In the case the oil does not come from the hook, turn the oil amount adjusting screw counterclockwise to make sure that the oil is fed from the hook. After that, adjust the amount of the oil fed from the hook appropriately. (Refer to "4-11. Adjusting the amount of oil in the hook" p.40)
2. **For the oil for hook lubrication, purchase JUKI NEW DEFRIX OIL No. 1 (Part No. : MD-FRX1600C0) or JUKI MACHINE OIL #7 (Part No. : MML007600CA).**
3. **Be sure to lubricate clean oil.**
4. **Do not operate the machine with the oil hole cap ❶ removed. Never remove cap ❶ from the oil inlet in any case other than oiling. In addition, take care not to lose it.**

2-19. How to use the operation panel (Basic explanation)

2-19-1. Selection of the language (operation to be done at first)

Select the language to be displayed on the operation panel when you turn ON the power to your sewing machine for the first time after the purchase. Note that, if you turn the power OFF without selecting the language, the language selection screen will be displayed every time you turn ON the power to the sewing machine.

① Turning ON the power switch

Be aware that the needle bar may move automatically, according to the settings of the sewing machine, when the power is turned ON. The needle bar can also be set so that it does not move automatically. Refer to "5-7. List of memory switch data" p. 109 for details.

<Welcome screen>

Firstly, the welcome screen is displayed on the panel. Then, the language selection screen is displayed.

* If you turn ON the power to the sewing machine again immediately after having turned it OFF, the sewing machine may sometimes fail to start. It is therefore recommended to wait for a while after you have turned OFF the power to the sewing machine before re-turning it ON.

② Selecting the language

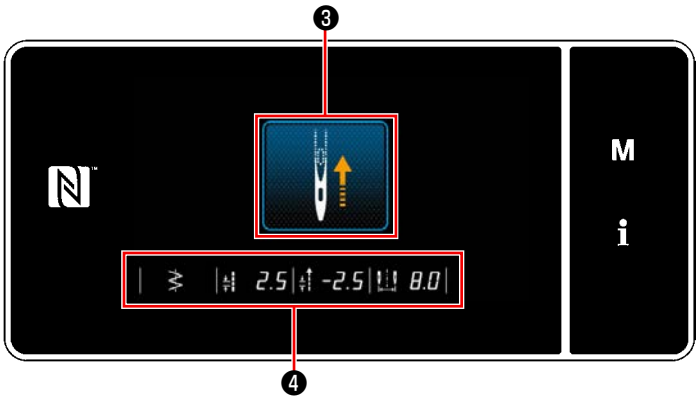
<Language selection screen>

Select the language you want to use and press corresponding language button ❶ . Then, press  ❷ .

This determines the language to be displayed on the panel.

The language to be displayed on the operation panel can be changed using the memory switch U406. Refer to **"5-7. List of memory switch data" p. 109** for details.

③ Retrieval of the origin



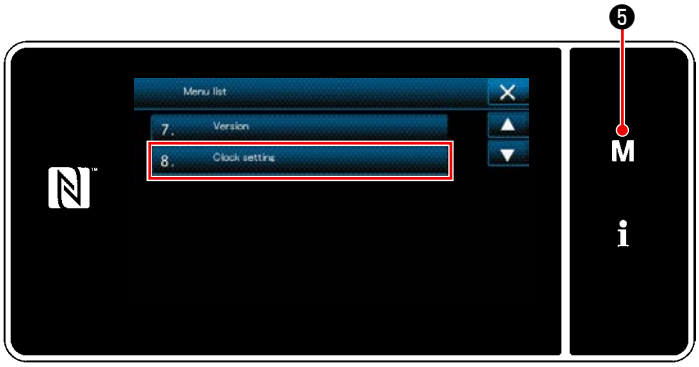
<Origin retrieval screen>

When ❸ is pressed, the sewing machine retrieves the origin and lifts the needle bar to its upper position.

* In the case "U090 Initial operation upper position stop function" is set to "1", the screen shown on the left is not displayed, but the needle bar automatically goes up to its upper position.

When ❹ is pressed, the stitch baseline, limit values of normal / reverse feed stitching and limit value of zigzag width are displayed.

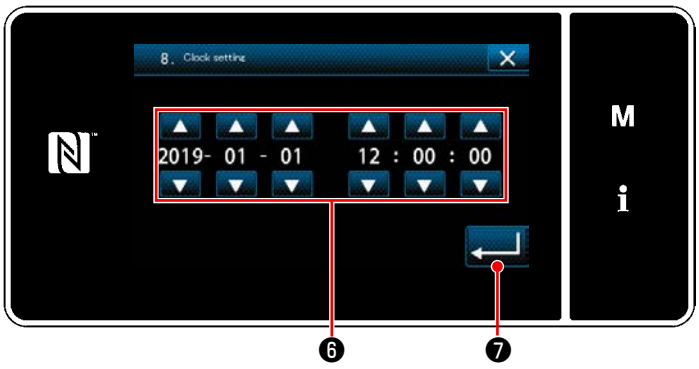
④ Setting the clock



<Mode screen>

1) Press M ❺ .

   The "mode screen" is displayed.
2) Select the "8. Clock setting".
   The "clock setting screen" is displayed.



<Clock setting screen>

3) Enter year/month/day/hour/minute/second with ▲▼ ❻ .

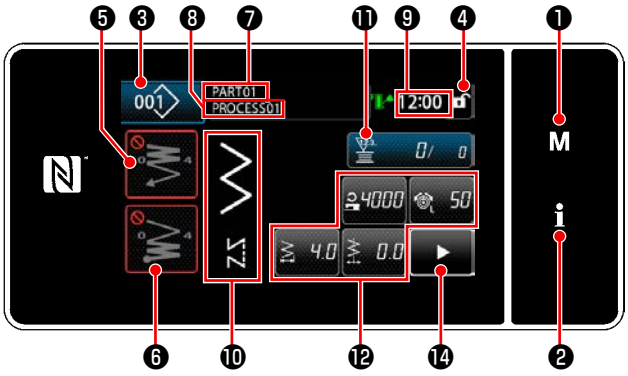
   The time entered is displayed in 24-hour notation.
4) Press ↵ ❼ to confirm the clock setting.

   Then, the current screen returns to the previous screen.

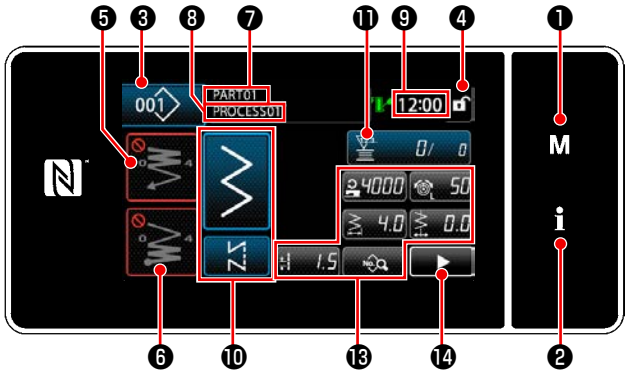
2-19-2. Names and functions of the panel keys

* Changeover between the operator mode and the maintenance personnel mode is carried out by pressing M ❶ and i ❷ simultaneously.

<Operator mode>



<Maintenance personnel mode>



	Switch/display	Description
❶	Mode key	This switch is used for displaying the menu screen.
❷	Information key	This switch is used for displaying the information screen.
❸	Sewing pattern No. button	This switch is used for displaying the number of the sewing pattern.
❹	Simplified screen lock button	This button is used for displaying the simplified lock status of the screen on it. Locked: Unlocked:
❺	Sewing-start reverse-feed stitch button	This switch is used for changing the ON/OFF status of the reverse feed stitching at the beginning of sewing. When reverse feed stitching at the beginning of sewing is placed in the OFF state, mark is displayed at the upper left of the button.
❻	Sewing-end reverse-feed stitch button	This switch is used for changing the ON/OFF status of reverse feed stitching at the end of sewing. When reverse feed stitching at the end of sewing is placed in the OFF state, mark is displayed at the upper left of the button.
❼	Part number	In the case the part number/process display is selected with U404, the part number is displayed. In the case the comment display is selected, the comment is displayed.
❽	Process/comment	In the case the part number/process display is selected with U404, the process is displayed. In the case the comment display is selected, the comment is displayed.
❾	Clock display	The time set on the sewing machine is displayed in this field in 24-hour system.
❿	Sewing pattern display	The selected sewing pattern is displayed in this field.
⓫	Customization button 1	A selected function can be allocated to and registered with this button. Initially, the sewing counter has been factory-allocate and -registered.
⓬	Customization buttons 2 - 7	A selected function can be allocated to and registered with this button.
⓭	Customization buttons 2 - 11	A selected function can be allocated to and registered with this button.
⓮	Second sewing screen button	The second sewing screen is displayed.

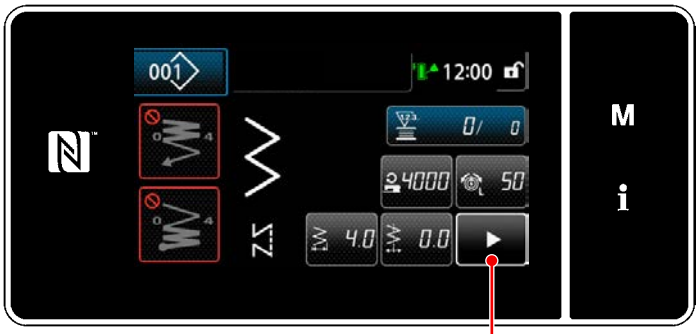
*** Confirmation of data**

To change the pattern number, select the pattern you want to use first.

Then, confirm your selection by pressing .

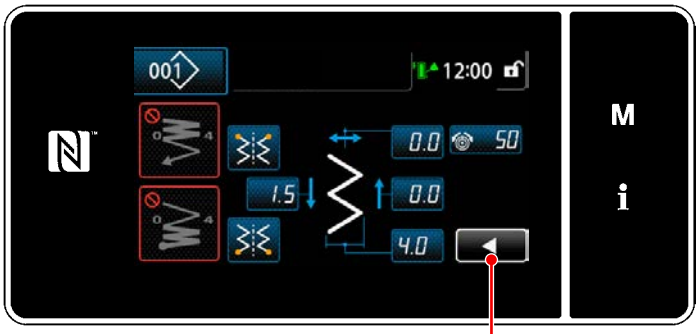
For the setting items of the Memory switch or sewing pattern, change the target data and press to confirm the change.

After the setting data on the number of stitches of reverse-feed stitching or the number of stitches of multi-layer stitching has been changed, the changed setting data is confirmed by pressing .



<Sewing screen> ❶

When ▶ ❶ is pressed on the sewing screen, the "second sewing screen" is displayed.



<Second sewing screen> ❷

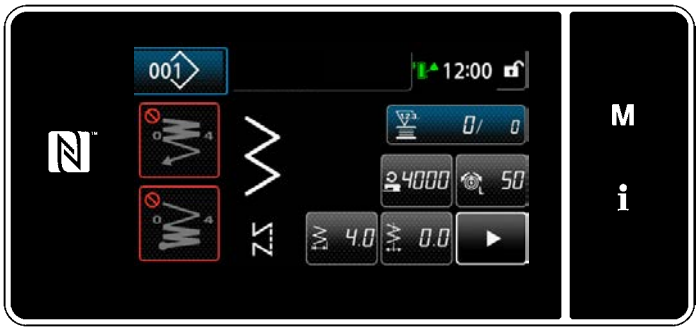
Enter settings as desired on this screen. Then, return the screen to the sewing screen by pressing ◀ ❷ .

2-19-3. Basic operation

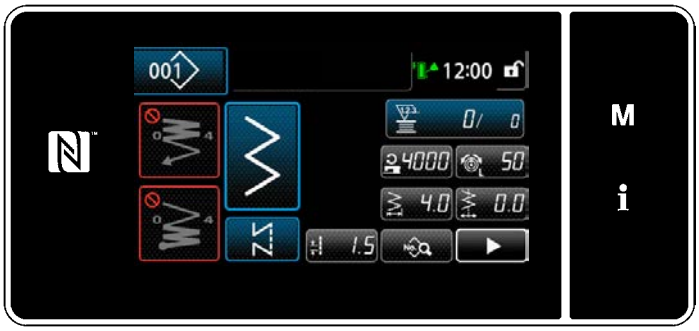
① Turning ON the power switch

When you turn ON the power switch, the welcome screen is displayed.

② Selecting a sewing pattern



<Sewing screen (Operator mode)>

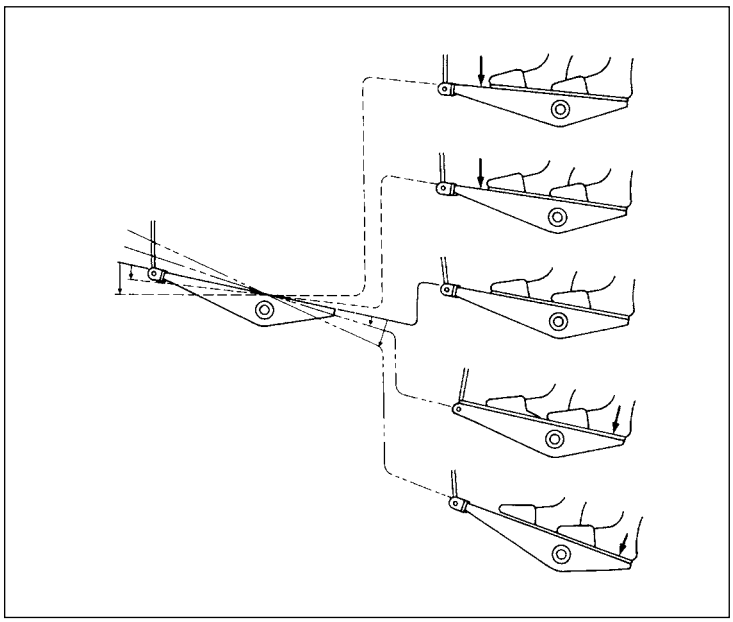


<Sewing screen (Maintenance personnel mode)>

The sewing screen is displayed.

- Select a sewing pattern.
  Refer to **"5-2. Sewing patterns" p. 45** for details.
- Configure settings of each function which is assigned according to **"8-11. Key customization" p. 176**.
- Set up functions for the selected sewing pattern. (* Only for the maintenance personnel mode)
  Refer to **"5-2-5. Editing the sewing patterns" p. 55** and **"5-2-6. List of pattern functions" p. 58** for details.

③ Starting sewing

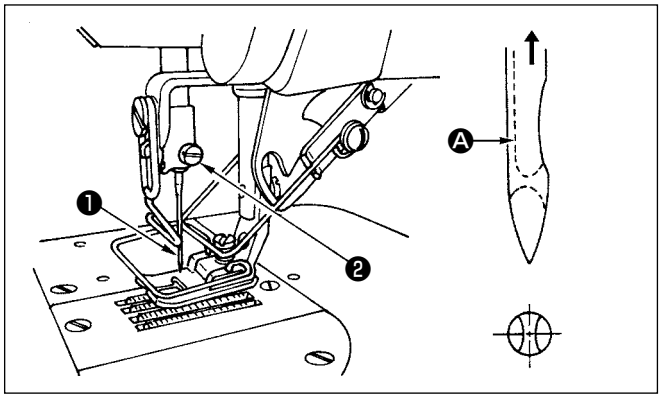


When you depress the pedal, the sewing machine starts sewing.
Refer to **"2-17. Pedal operation" p. 13**.

3. PREPARATION BEFORE SEWING

3-1. Attaching the needle

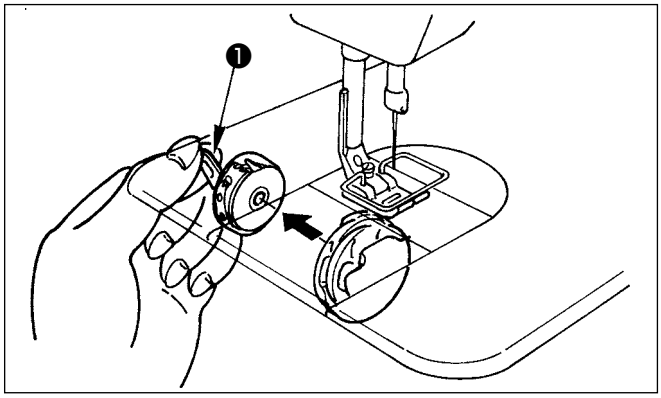
WARNING :
To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.



1) Turn the handwheel by hand to raise the needle to its highest position.
2) Loosen the needle clamp screw ❷ . Hold the needle ❶ so that the long groove Ⓐ on the needle is facing exactly toward you.
3) Insert the needle deep into the hole of the needle bar in the direction of the arrow until it will go no further.
4) Securely tighten the screw ❷ .
5) Confirm that the long groove Ⓐ on the needle faces toward you.

3-2. Removing the bobbin case

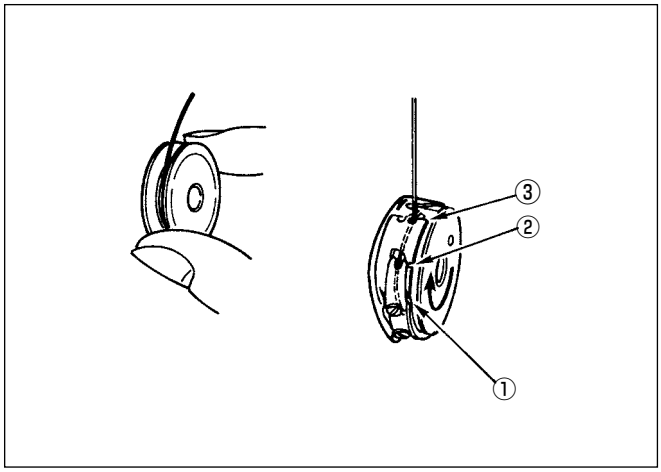
WARNING :
To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.



1) Turn the handwheel by hand to raise the needle to its highest position.
2) Raise bobbin case latch ❶ and remove the bobbin case.

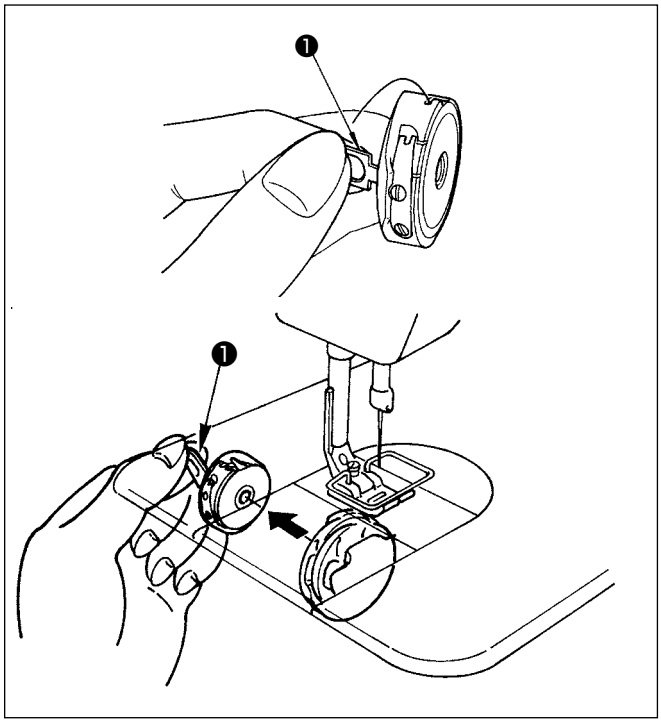
3-3. How to place a bobbin in the bobbin case

WARNING :
To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.



Placing a bobbin in the bobbin case

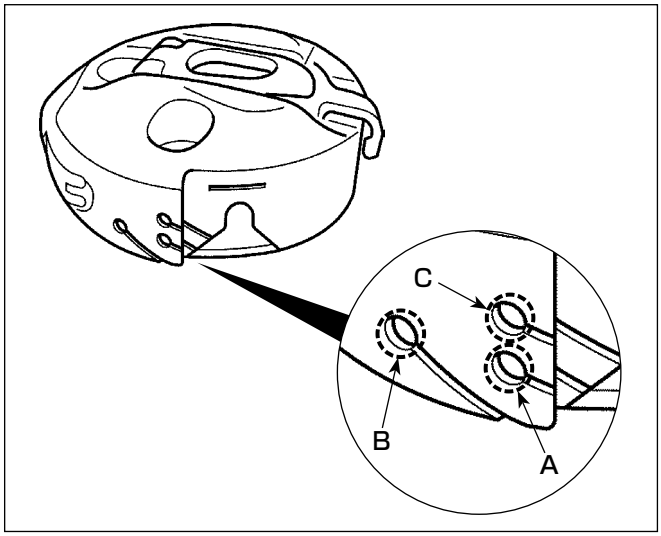
1) Drawing the thread wound on the bobbin by approximately 5 cm by hand, place the bobbin in the bobbin case as illustrated in the figure.
2) Thread the bobbin case in the order of the numbers and pull it out through the thread path as illustrated.
3) When the bobbin is correctly placed in the bobbin case, the bobbin in the bobbin case rotates in the direction of the arrow when you draw the bobbin thread.



Installing/removing the bobbin case

1) Turn the handwheel to bring the needle to its higher position.
2) Hold the bobbin case while raising latch ❶ of the bobbin case.
3) Insert the bobbin case into the hook shaft as far as it will go by putting your hand from under the oil pan.
4) Release the bobbin case latch to let it steadily rest in the closing position.

* **When removing the bobbin case, reverse the installation procedure while raising the bobbin case latch.**



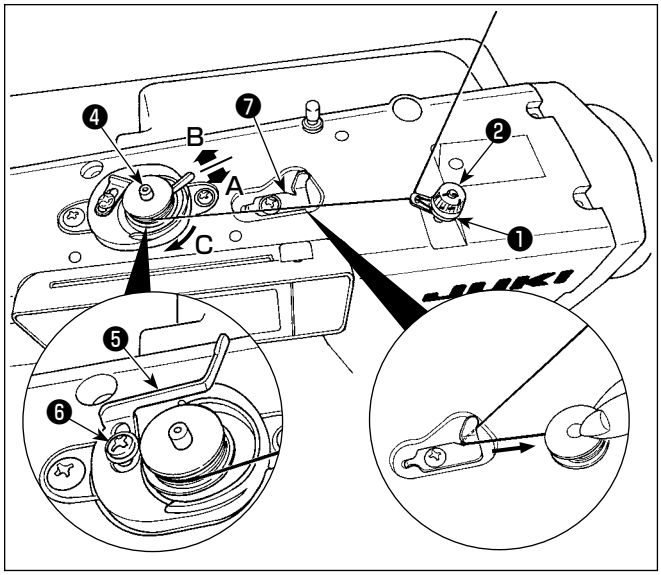
How to use the bobbin case thread hole

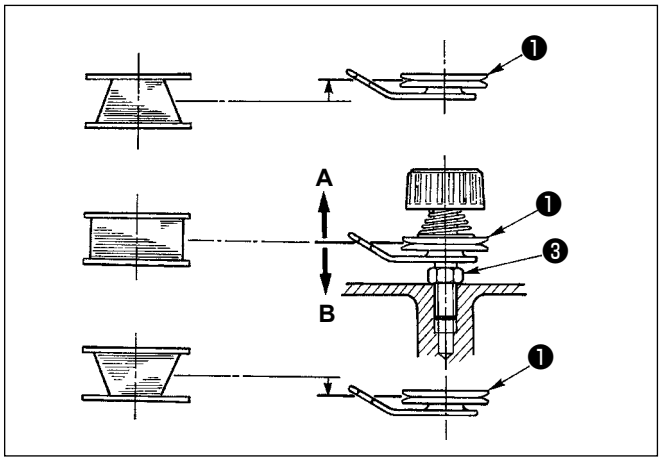
1) For normal sewing, use hole **A**. Use hole **B** if you want to tense the thread when the needle throws to the left.(Hole **C** is used for special processes.)

There may be a case where several stitches at the start of sewing are difficult to be knotted when thread trimmer is used with thin filament thread such as (#50, #60 or #80) using hole B. At this time, use the other hole or perform the sewing starting from the right.

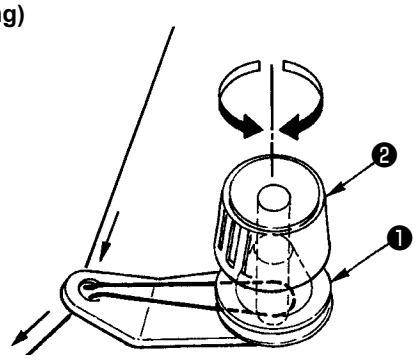
3-4. Winding a bobbin

WARNING :
To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.





(Threading)



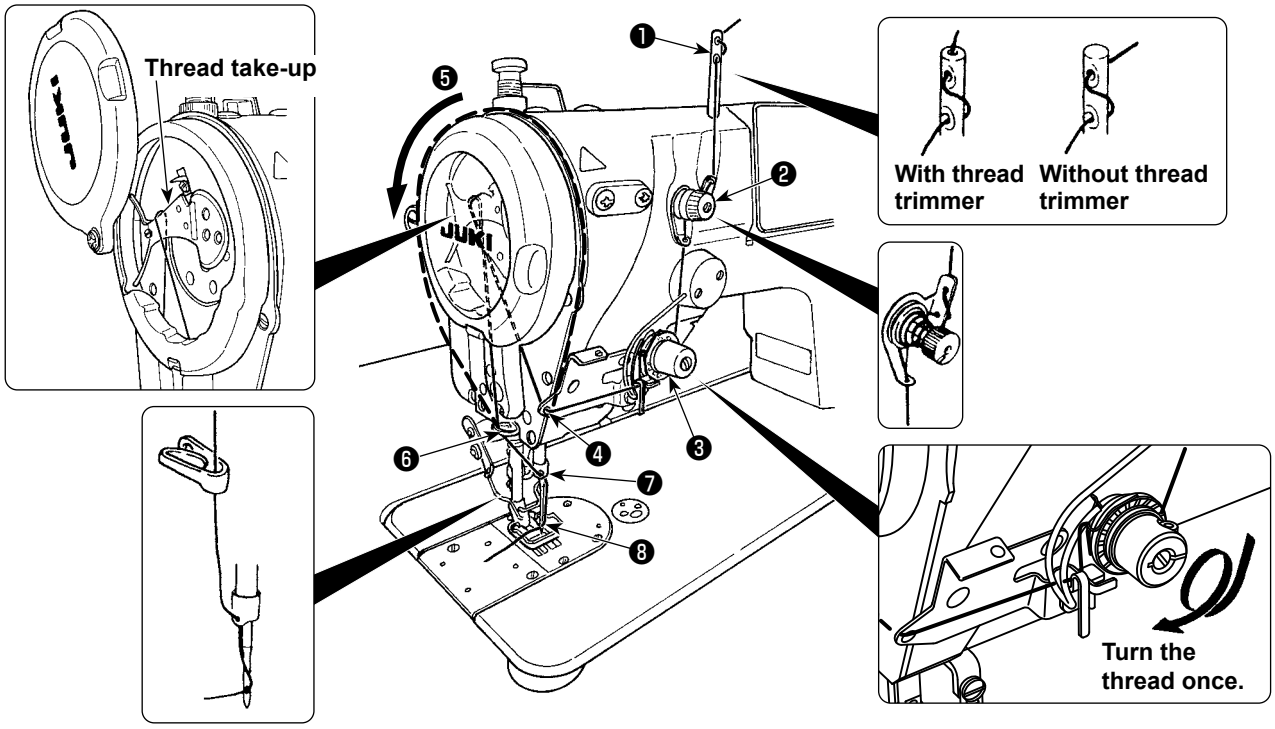
1) Insert the bobbin deep into the bobbin winder spindle ❹ until it will go no further.
2) Pass the bobbin thread pulled out from the spool rested on the right side of the thread stand following the order from ❶ as shown in the figure on the left. Then, wind the end of the bobbin thread on the bobbin several times.
3) Press the bobbin winder adjusting plate ❺ in the direction of **A** and start the sewing machine. The bobbin rotates in the direction of **C** and the bobbin thread is wound up. The bobbin winder spindle ❹ will automatically stop as soon as the winding is finished.
4) Remove the bobbin and cut the bobbin thread with the thread cut retainer ❼ .
5) To adjust the winding amount of the bobbin thread, loosen setscrew ❻ and move bobbin winder adjusting plate ❺ to the direction of **A** or **B**. Then, tighten setscrew ❻ .
   To the direction **A**: The amount is decreased.
   To the direction **B**: The amount is increased.
6) In case that the bobbin thread is not wound evenly on the bobbin, loosen the nut ❸ and turn the bobbin thread tension to adjust the height of the thread tension disk ❶ .
   - It is the standard that the center of the bobbin is as high as the center of the thread tension disk.
   - Move the position of the thread tension disk ❶ to the direction **A** as shown in the figure on the left when the winding amount of the bobbin thread on the lower part of the bobbin is excessive and to the direction **B** as shown in the figure on the left when the winding amount of the bobbin thread on the upper part of the bobbin is excessive.

   After the adjustment, tighten the nut ❸ .
7) Turn the thread tension nut ❷ to adjust the tension of the bobbin thread winder.

Caution
1. **When winding the bobbin thread, start the winding in the state that the thread between the bobbin and thread tension disk ❶ is tense.**
2. **When winding the bobbin thread in the state that sewing is not performed, remove the needle thread from the thread path of thread take-up and remove the bobbin from the hook.**

3-5. Threading the machine head

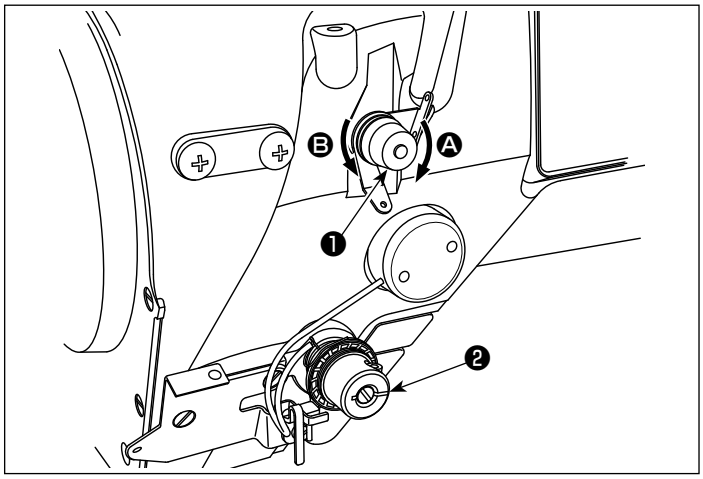
WARNING :
To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.



1) Turn the handwheel by hand to bring the needle to the most raised position.
2) Pass the thread in the order of the numbers as illustrated.
3) For threading portion ❺ , the thread take-up lever is threaded by guiding the thread along the groove.
4) Pull out the thread about 10 cm from the needle after passing it through the needle.

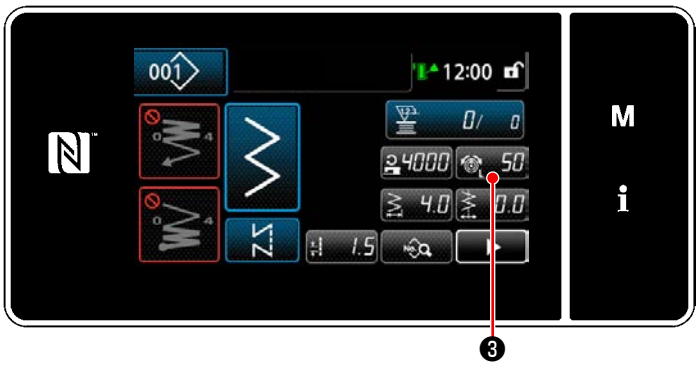
4. ADJUSTING THE SEWING MACHINE

4-1. Thread tension



4-1-1. Adjusting the thread tension No. 1 tension

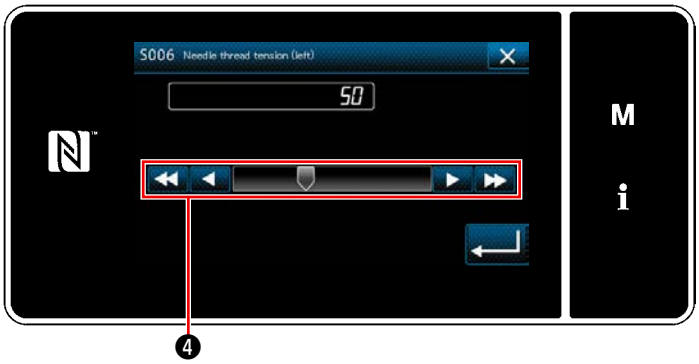
1) Turn thread tension No. 1 nut ❶ clockwise (in direction Ⓐ), to shorten the thread length remaining on the needle after thread trimming or counterclockwise (in direction Ⓑ), to lengthen the thread length.



4-1-2. Adjusting the needle thread tension (Active tension)

Active tension ❷ permits setting of the needle thread tension on the operation panel according to each sewing condition. In addition, the data can be stored in memory.

1) Press 50 ❸ to display the needle thread tension input screen. (The numeric value displayed on the screen is the current needle thread tension value.)

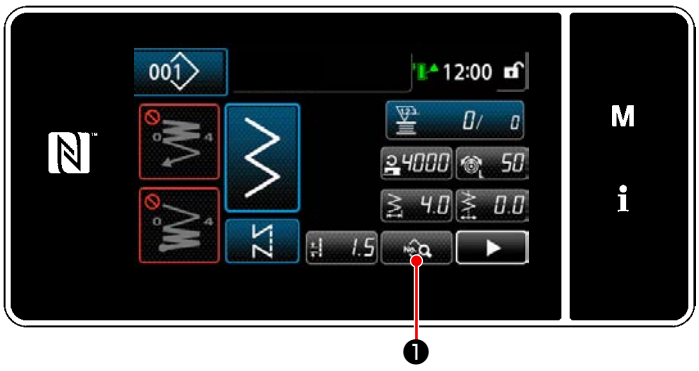


2) Change the needle thread tension as desired by pressing ❹ .
3) There is a setting range of 0 to 200.
When the set value is increased, the tension becomes higher.

* The needle thread tension has been factory-adjusted to 0.6N (S-core #70) for the setting "60", at the time of shipment of the sewing machine with standard specifications. (Reference value)

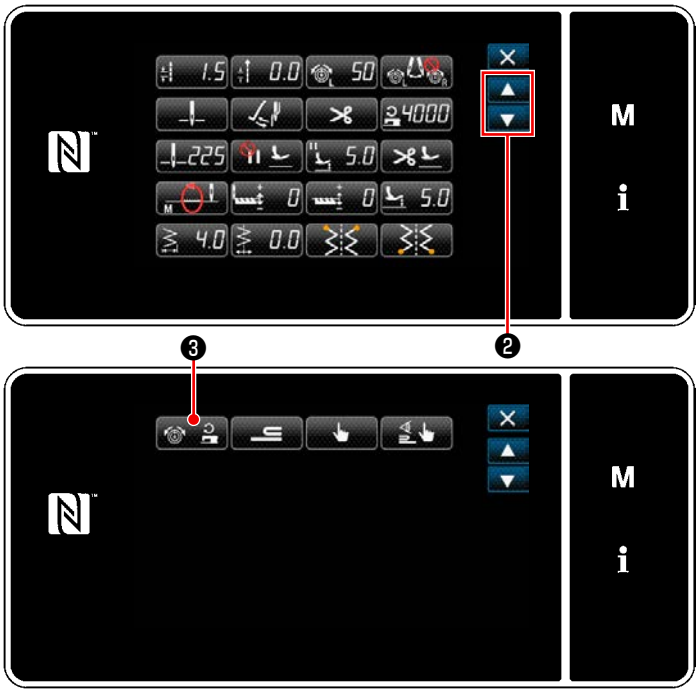
4-1-3. Tension correction (with respect to sewing speed)

The needle thread tension can be corrected according to the sewing speed.
The needle thread tension can also be set on the operation panel. The needle thread tension data is stored in memory.



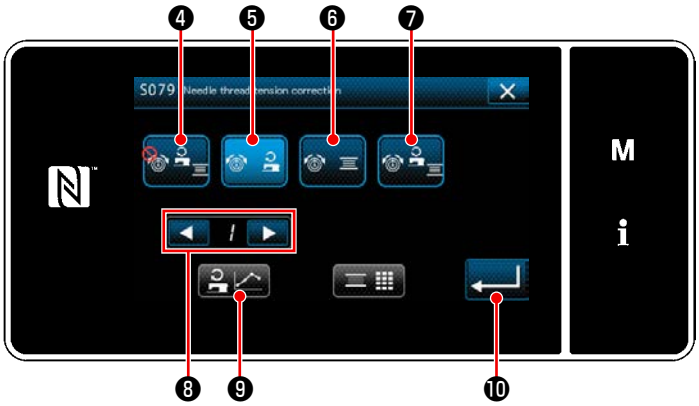
<Sewing screen (Maintenance personnel mode)>

1) Press ❶ on the sewing screen under the maintenance personnel mode.
The "sewing data edit screen" is displayed.



<Sewing data edit screen>

2) Press ❷ to proceed to the next page.
Press ❸.
The "S079 Needle thread tension correction screen" is displayed.



<S079 Needle thread tension correction screen>

3) Select the thread tension correction method you want to use from the four methods described below:

❹ Not use

❺ Sewing speed (initial setting)

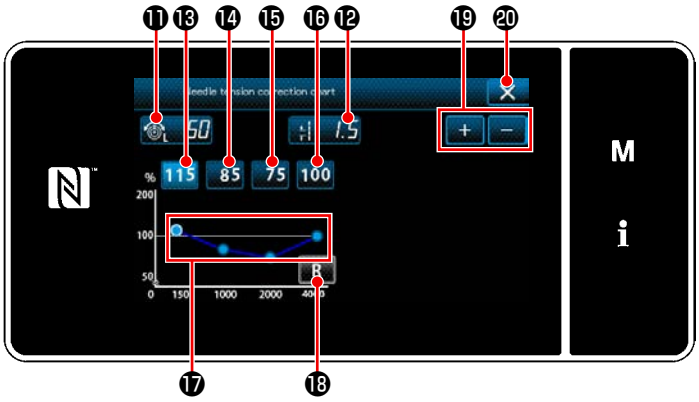
❻ Bobbin thread remaining amount

❼ Both (the sewing speed and the bobbin thread remaining amount)

Refer to **"4-1-4. Tension correction (with respect to the bobbin thread remaining amount)" p.27** for the bobbin thread remaining amount.

4) When you want to edit the thread tension correction data (sewing speed), select the number of chart you want to store in memory from the chart numbers 1 - 4 with ❽, then press ❾.

* When you press ❿, the content you have entered is confirmed and the screen is returned to the "Sewing data edit screen".



5) The set values of needle thread tension 50 ⓫ and stitch length 1.5 ⓬ can be increased / decreased with + − ⓳ .

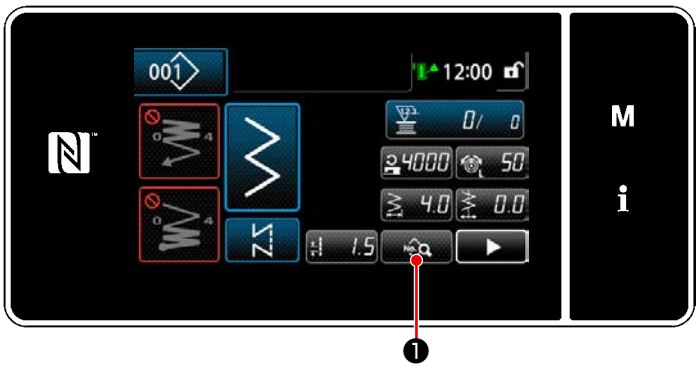
* Needle thread tension ⓫ set in the aforementioned procedure is used for setting the correction chart. It is not reflected to the needle thread tension that can be set in the sewing pattern data.

6) Correction value [%] to be employed when the sewing machine runs at 150 sti/min can be set by pressing 115 ⓭ . This value can be increased / decreased with + − ⓳ .
When the pedal is depressed in the case of selecting 115 ⓭ , the sewing machine performs sewing at the maximum sewing speed of 150 sti/min using set needle thread tension 50 ⓫ and stitch length 1.5 ⓬ .
7) Correction value [%] to be employed when the sewing machine runs at 1000 sti/min can be set by pressing 85 ⓮ .
As in the case of 6), the sewing machine is able to perform sewing at the maximum sewing speed of 1000 sti/min.
8) When 75 ⓯ is selected, the correction value [%] to be employed when the sewing machine runs at 2000 sti/min can be set.
As in the case of 6), the sewing machine is able to perform sewing at the maximum sewing speed of 2000 sti/min.
9) When 100 ⓰ is selected, a correction value [%] for the number of revolutions set with U044 "Max. sewing speed position" can be set.
As in the case of 6), the sewing machine is able to perform sewing at the maximum sewing speed set with U044 "Max. sewing speed position".

10) The aforementioned result of settings can be checked on thread tension chart ⓱ .
11) Set values ⓭ through ⓰ can be reset to the initial value of 100 by pressing R ⓲ .
12) ✕ ⓴ is disabled during sewing. After the completion of thread trimming, it becomes enabled and can be pressed to return the screen to the "S079 Needle thread tension correction screen".

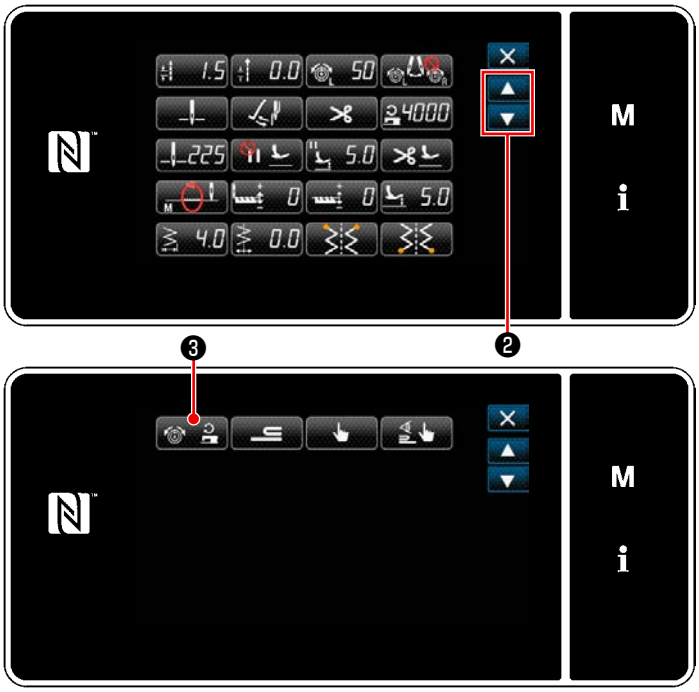
4-1-4. Tension correction (with respect to the bobbin thread remaining amount)

The needle thread tension can be corrected according to the bobbin thread remaining amount.
The needle thread tension can also be set on the operation panel. The needle thread tension data is stored in memory.



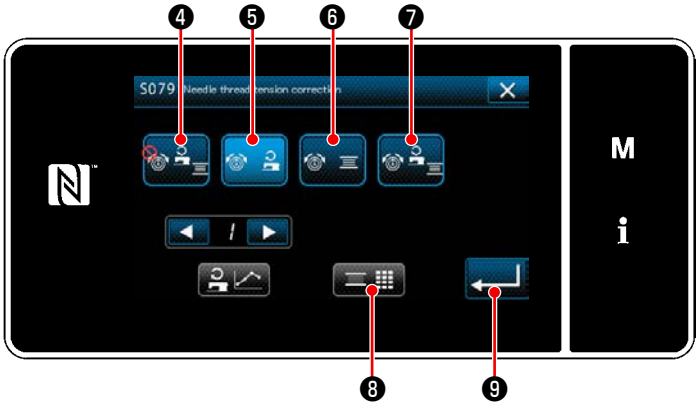
<Sewing screen (Maintenance personnel mode)>

1) Press ❶ on the sewing screen under the maintenance personnel mode.
The "sewing data edit screen" is displayed.



<Sewing data edit screen>

2) Press ❷ to proceed to the next page.
Press ❸.
The "S079 Needle thread tension correction screen" is displayed.



<S079 Needle thread tension correction screen>

3) Select the thread tension correction method you want to use from the four methods described below:

❹ Not use

❺ Sewing speed (initial setting)

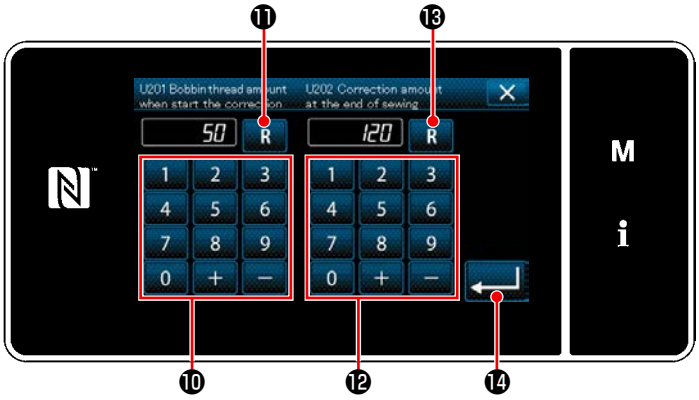
❻ Bobbin thread remaining amount

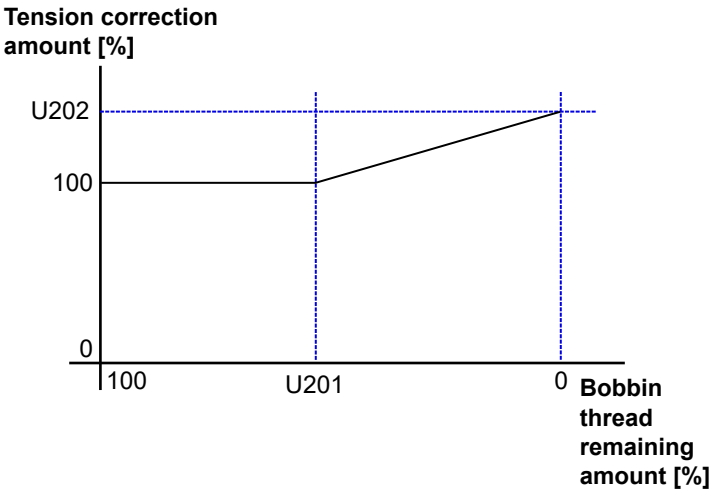
❼ Both (the sewing speed and the bobbin thread remaining amount)

Refer to **"4-1-3. Tension correction (with respect to sewing speed)" p.25** for the sewing speed.

4) When you want to change the tension correction data (with respect to the bobbin thread remaining amount), press ❽.

* When you press ❾, the content you have entered is confirmed and the screen is returned to the "Sewing data edit screen".





5) Set "U201 Bobbin thread remaining amount for starting correction" with numeric keypad ⓾ .
Using the aforementioned set value, determine the remaining amount of bobbin thread indicated on the bobbin counter for starting the needle thread correction.
Refer to **"5-5. Counter function" p.103** for how to set the bobbin counter.
The set value can be reset to the initial value of 50 by pressing R ⓫ .

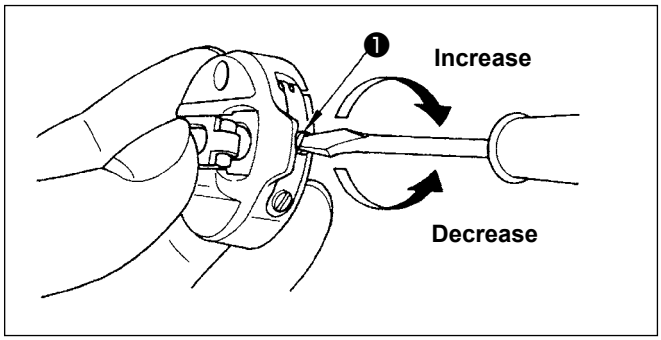
6) Set "U202 Final correction amount" with the numeric keypad ⓬ .
Using the aforementioned set value, determine the correction ratio of the needle thread tension.
The set value can be reset to the initial value of 120 by pressing R ⓭ .

7) When ↵ ⓮ is pressed, the entered value is confirmed and the screen is returned to the "S079 Needle thread tension correction screen".

* Refer to the figure on the left for the relation between "U201 Bobbin thread remaining amount for starting correction" and "U202 Final correction amount".

4-1-5. Right / left tension correction

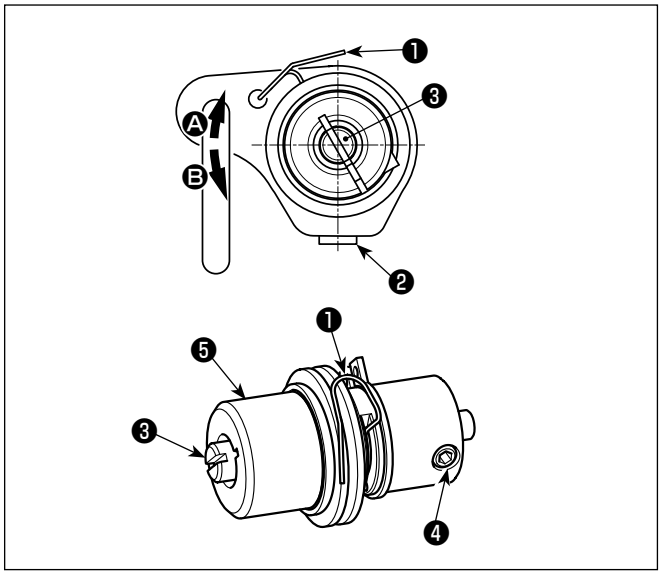
Use the right / left tension correction according to the material, thread and application.



4-1-6. Adjusting the bobbin thread tension

1) The tension of the bobbin thread is adjusted by turning the tension adjusting screw ❶ .
   Turn it clockwise to increase.
   Turn it counterclockwise to decrease.

4-2. Thread take-up spring



4-2-1. Adjusting the stroke of thread take-up spring ❶

1) Loosen setscrew ❷ .
2) Turn tension post ❸ clockwise (in direction Ⓐ), the stroke of the thread take-up spring will be increased, and turn the post ❸ counterclockwise (in direction Ⓑ), the stroke will be decreased.

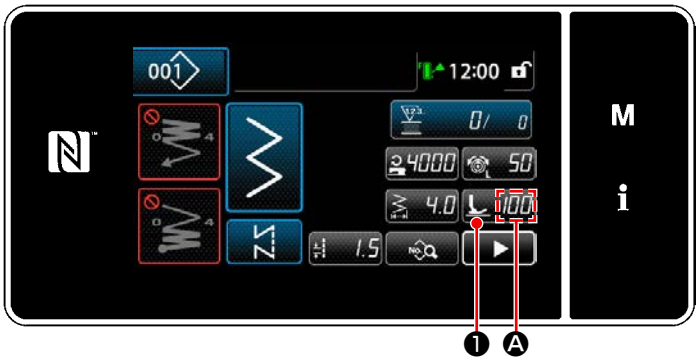
4-2-2. Adjusting the pressure of thread take-up spring ❶

1) Loosen setscrew ❷ , and remove thread tension (asm.) ❺ .
2) Loosen tension post setscrew ❹ .
3) Turn tension post ❸ clockwise (in direction Ⓐ), the pressure will be increased, and turn the post ❸ counterclockwise (in direction Ⓑ), the pressure will be decreased.

4-3. Presser foot(Active presser device)

WARNING :
Do not place anything under the presser foot when turning the power ON. If the power is turned ON while placing something under the presser foot, the sewing machine displays E910.

If the power to the sewing machine is turned ON while the material, etc. is placed under the presser foot, the presser stepping motor will generate a specific sound during origin retrieval. It should be noted that this phenomenon is not a fault.

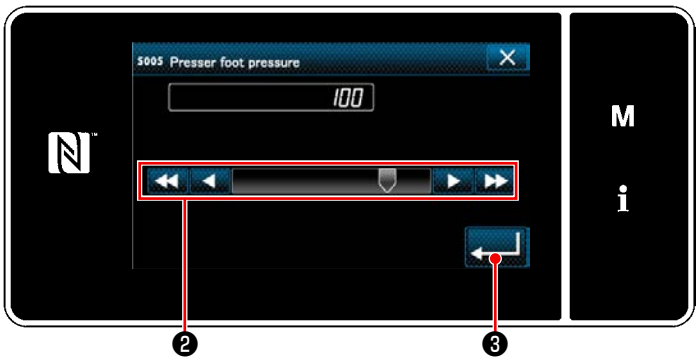


4-3-1. Presser foot pressure

The presser foot pressure is displayed in section Ⓐ on the panel. (Example of display : 100)

[How to change]

1) Display the presser foot pressure entry screen by pressing ❶.

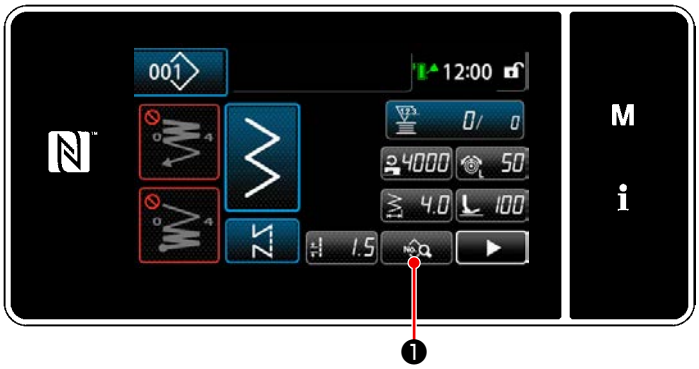


2) Change the presser foot pressure as desired by pressing ❷. (Range of input values on the panel is from -20 to 200.)
   * Refer to the following for a rough indication of the input value on the panel and the presser foot pressure.
3) Confirm your entry by pressing ❸.
   Then, the sewing screen is displayed.

Input value on the panel	Presser foot pressure (Reference)
100	Approx. 15N (1.5 kg)

1. To avoid personal injury, never put your fingers under the presser foot.
2. Be aware that the presser foot pressure varies when the presser foot or the throat plate is changed.

1. Be sure to input a positive value on the operation panel in the case the micro-lifter function is not used. If not, the presser foot is slightly raised and the feed dog is unable to provide a sufficient efficiency of feed.
2. In the case of using the micro-lifter function, the efficiency of feed is likely to be insufficient. To achieve the sufficient efficiency of feed, reduce the sewing speed or help feed the material by hand.
3. In the case the set value on the operation panel is a negative value, the presser foot will go up slightly during sewing.
4. In the case of slightly lifting the presser foot during sewing, the efficiency of feed is likely to be inadequate. To compensate the reduced efficiency of feed, lower the sewing speed or support the material feed by hand.
5. In the case the presser foot is lifted while the set value on the operation panel is a negative value, the related parts can interfere with each other. So, be careful.
6. When you use the wiper with the sewing machine, the maximum lift of the presser foot should be 8.5 mm or less.

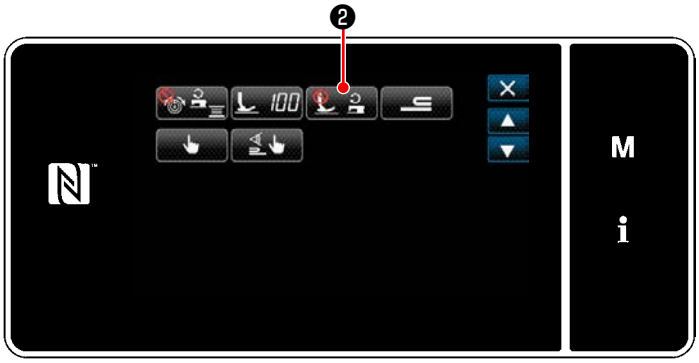


4-3-2. Correction of the presser foot pressure

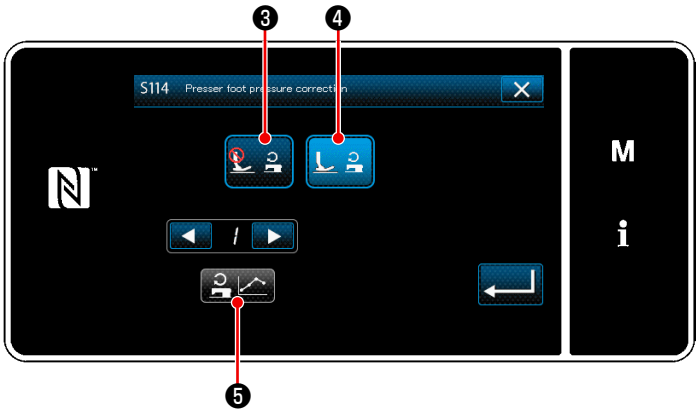
Presser foot pressure can be set according to the sewing speed. (This adjustment effectively prevents jumping of the presser foot.)

[How to change]

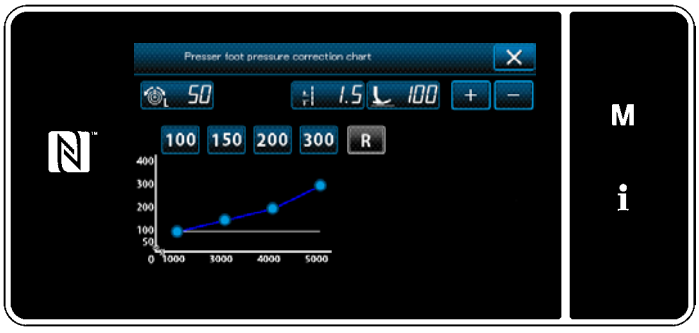
1) Display the sewing data edit screen by pressing ❶.



2) Press ❷ to display the presser foot presser correction function selection screen.

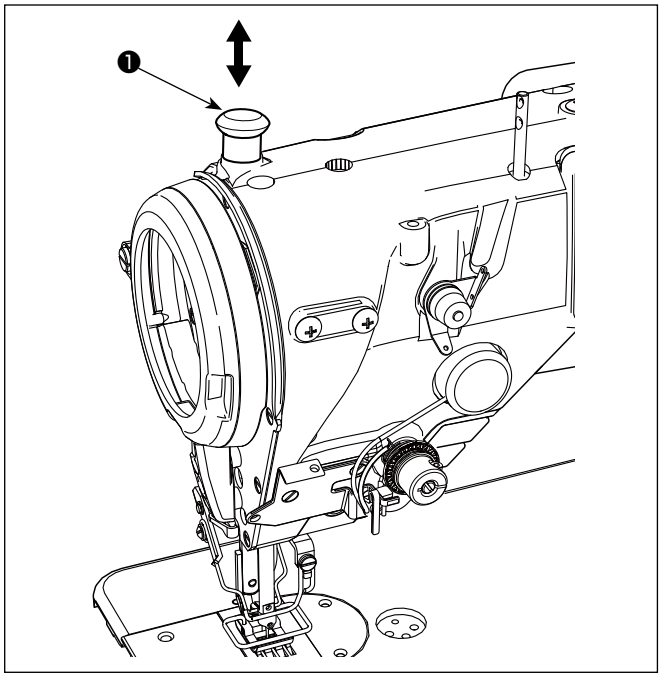


3) Select the status (enable/disable) of the presser foot pressure correction function using ❸ or ❹. When you have selected "enable", the presser foot pressure correction screen is displayed by pressing ❺.



The standard presser foot pressure for the sewing speed of 1000 sti/min is taken as 100 %. The presser foot pressure can be changed for the sewing speed of 3000 sti/min, 4000 sti/min and 5000 sti/min.

WARNING :
To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.

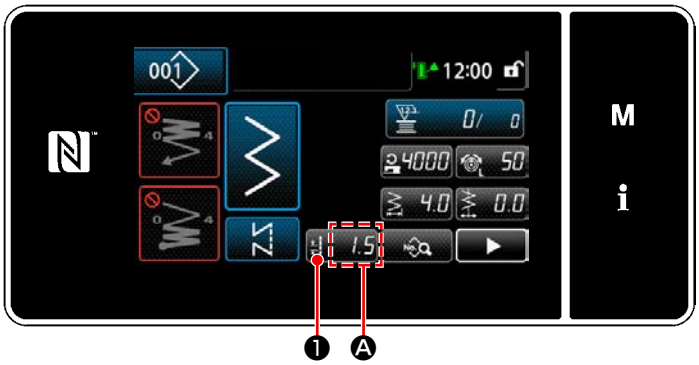


4-3-3. Manual lifter

The presser foot can be manually lifted/lowered by moving presser bar cap ❶ up and down while the power to the sewing machine is in the OFF state. Use this manual lifting feature when replacing the gauge or adjusting the needle entry area.

4-4. Adjusting the stitch length

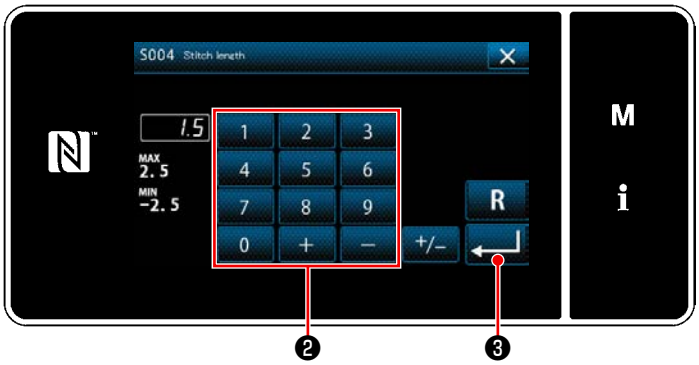
1. There may be the cases where the feed amount of the operation panel and the actual sewing stitch length are different from each other in case of the use in the state other than the standard delivery or material used. Compensate the stitch length in accordance with the sewing product.
2. Be aware that interference between the throat plate and feed dog can occur depending on the gauge used. Be sure to check the clearance in the gauge to be used. (The clearance must be 0.5 mm or more.)
3. When you have changed the stitch length, feed dog height or feed timing, run the sewing machine at a low speed to make sure that the gauge does not interfere with the changed part.



Stitch length is displayed in section Ⓐ on the panel. (Example of display : 1.5 mm)

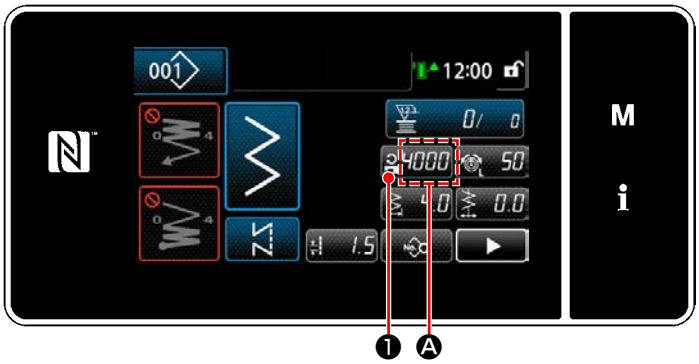
[How to adjust]

1) When 1.5 ❶ is pressed, the stitch length input screen is displayed.



2) Change the stitch length by pressing numeric keypad ❷ .
(Input unit: 0.1 mm; Input range: -2.5 to 2.5)
3) Confirm your entry by pressing ↵ ❸ .
Then, the sewing screen is displayed.

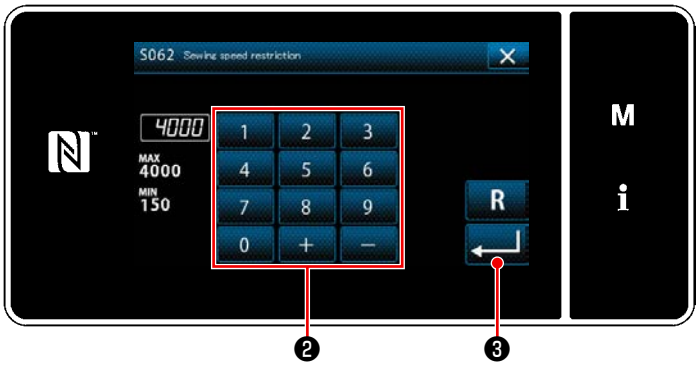
4-5. Changing the sewing speed



The sewing speed is displayed in section Ⓐ on the panel. (Example of display : 4,000 sti/min)

[How to change]

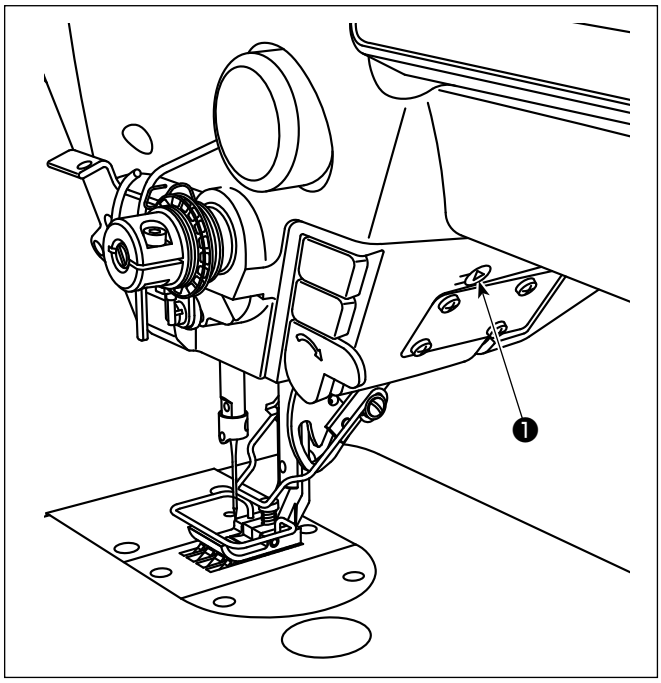
1) Display the sewing speed entry screen by pressing 4000 ❶ .



2) Change the sewing speed as desired by pressing ten keys ❷ .
3) Confirm your entry by pressing ↵ ❸ .
Then, the sewing screen is displayed.

4-6. LED hand light

WARNING :
In order to protect against personal injury due to unexpected start of the sewing machine, never bring hands near the needle entry area or place foot on the pedal during the adjustment of intensity of the LED.



*** This LED is intended to improve operability of the sewing machine and is not intended for maintenance.**

Intensity adjustment and turn-off of the light is carried out by pressing switch ❶ . Every time the switch is pressed, the light is adjusted in intensity in six steps and is turned off in turn.

[Change of intensity]

1 ⇒ ..... 5 ⇒ 6 ⇒ 1
Bright ⇒ ..... Dim ⇒ Off ⇒ Bright

In this way, every time the switch ❶ is pressed, the hand lamp status is changed in repetition.

The color of LED hand light can be adjusted to one of the three different ones, as described below, by keeping the switch held pressed.

[Change in color of the LED light]

White ⇒ Light bulb color ⇒ Light up in both colors

4-7. Reverse feed stitching

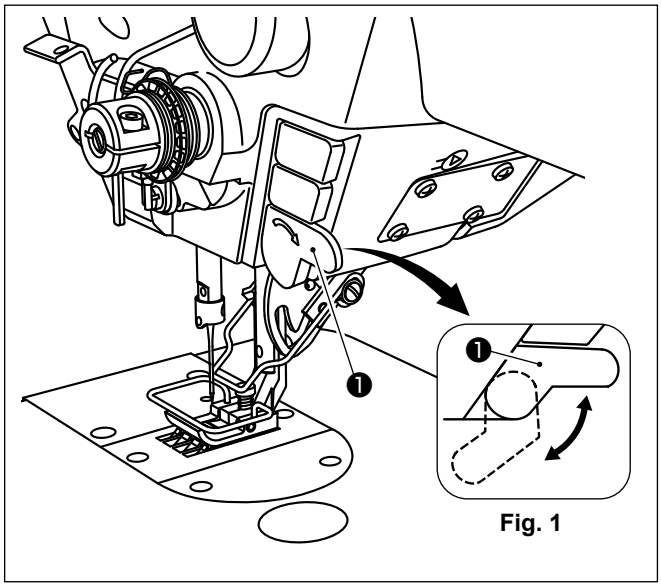


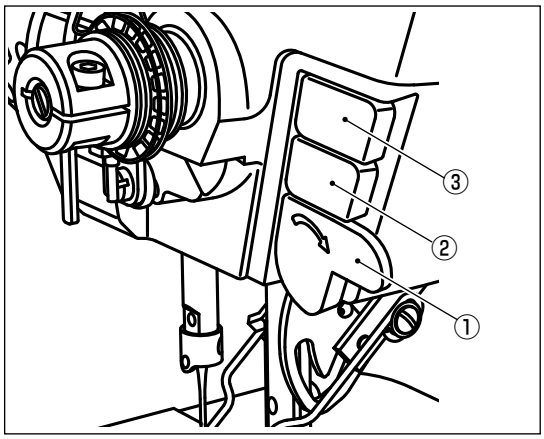
Fig. 1

[One-touch type reverse feed stitching mechanism]

The hand switch ❶ is pressed, the machine performs reverse feed stitching.
The machine resumes normal feed stitching the moment the switch lever is released.

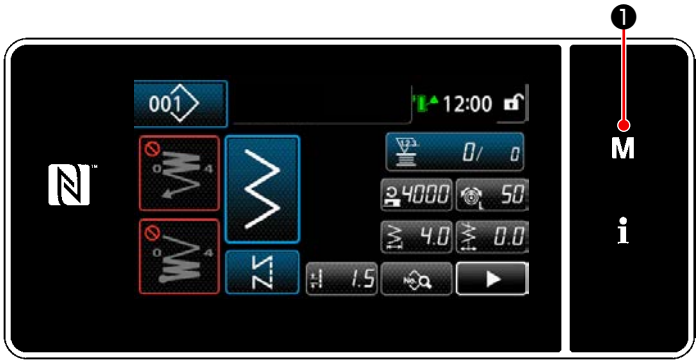
* The hand switch ❶ can be used at two different positions by turning it. (Fig. 1)

4-8. Custom switch



Various operations can be allocated to hand switch ① and machine head switches ② and ③ .

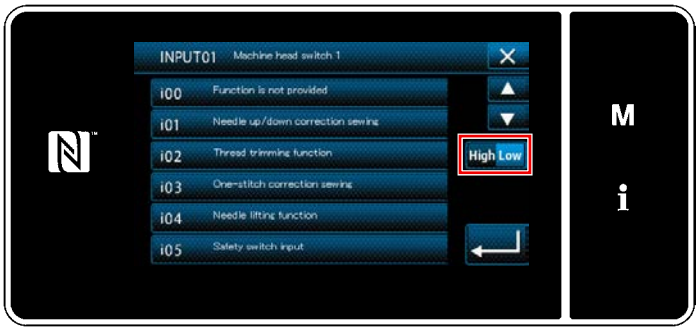
The initial values (states) are as described below.
① Hand switch: Reverse feed stitching switch, input
② Machine head switch 1: One-touch type changeover switch
③ Machine head switch 2: Mirror inversion switch, input



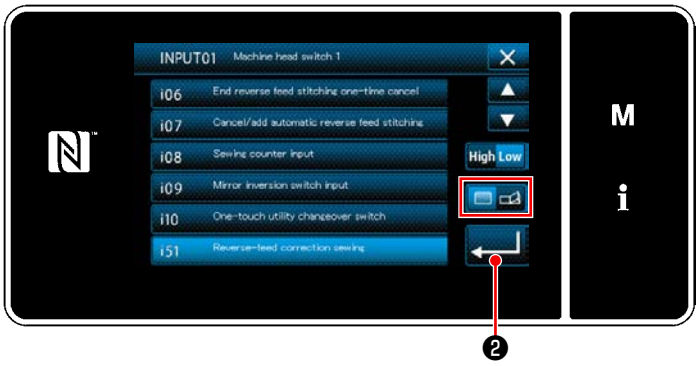
1) Keep **M** ❶ held pressed for three second.
The "mode screen" is displayed.

2) Select the "13. Hand switch setting".

3) Select the switch to be set.



4) Select the function item to be assigned to the switch. Then, select the input signal status (**High** / **Low**) .



In the case the function item i51 or beyond is selected, the operation to be carried out when the button is pressed is set.

: Function is enabled while the button is held pressed.

: Enable/disable of the function is changed over by pressing the button.

5) Press ❷.

[Description of operations of the custom switch]

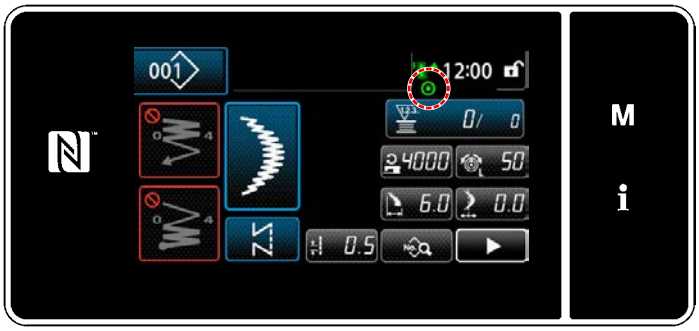
	Function item
i00	Not provided with the option input function
i01	Needle up / down correction stitch
i02	Thread trimming function
i03	One-stitch correction stitch
i04	Needle lifting function
i05	Safety switch, input
i06	Function for cancelling reverse feed stitching at the end of sewing once
i07	Cancellation / addition of automatic reverse feed stitching
i08	Sewing counter, input
i09	Mirror inversion switch, input
i10	One-touch type changeover switch

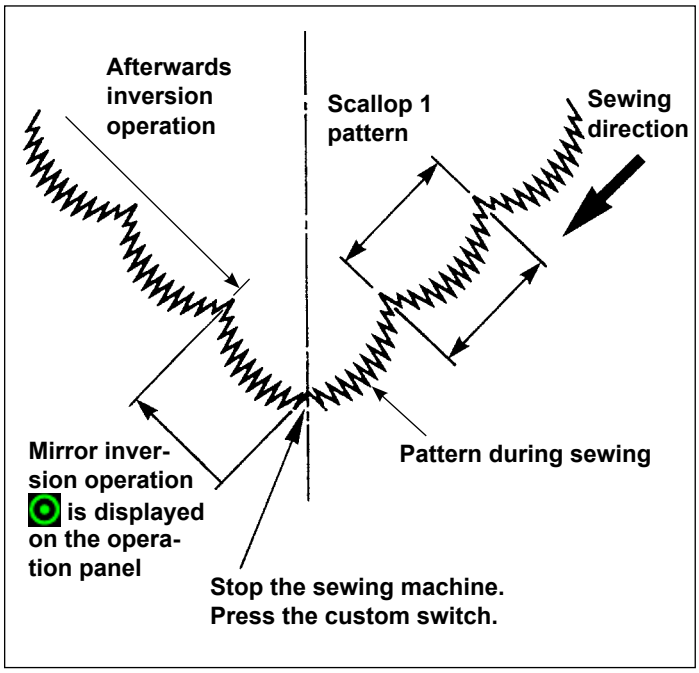
	Function item
i51	Reverse-feed correction stitch
i52	Presser foot lifting function
i53	Function for cancelling reverse feed stitching at the start of sewing
i54	Function for prohibiting depress on the front part of pedal
i55	Function for prohibiting output of thread trimming
i56	Low-speed command input
i57	High-speed command input
i58	Reverse feed stitching switch, input
i59	Sewing speed limit for soft start
i60	One-shot sewing speed command
i61	Reverse-feed one-shot sewing speed command

4-9. Mirror stitching

The mirror inversion is the function for sewing a pattern that is inverted during sewing. When the custom switch (i09: Already allocated with the function for inputting the mirror inversion switch) is pressed during sewing, the sewing machine starts sewing while inverting the sewn pattern. (Refer to **"4-8. Custom switch" p.35** for details.)

■ Sewing procedure (Example : scallop)

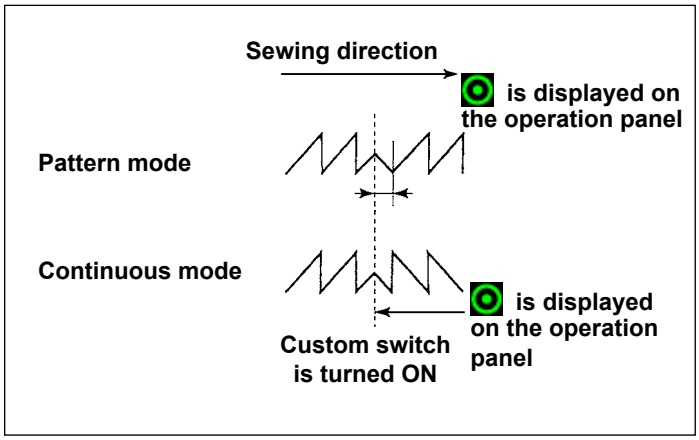




1) Stop the sewing machine at the position you desire to perform mirror inversion during sewing.
2) Press the custom switch (i09: Already allocated with the function for inputting the mirror inversion switch). Once the sewing machine accepts the input of the mirror inversion switch, is displayed on the upper portion of operation panel.
   (The switch can receive only when the sewing machine stops and dose not receive when the sewing machine is running.)
3) Perform mirror inversion sewing with the sewing machine.
4) Perform thread trimming or press again the mirror inversion switch to complete the inversion sewing.

■ Mirror function setting

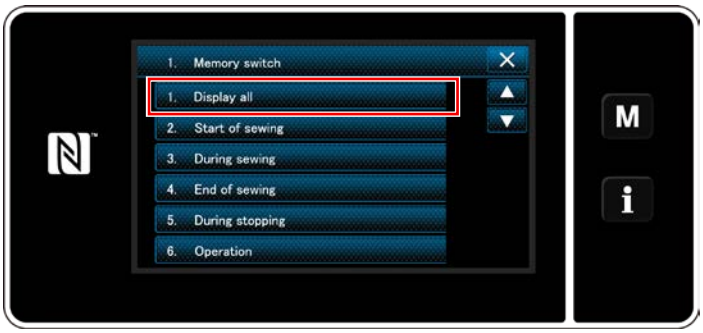
For the mirror inversion, there are two settings below.



1) 1 pattern : Mirror inversion is “1” pattern only. After completion of inversion pattern, the pattern returns to the original one.
2) Continuous : The machine continuously operates the inversion pattern after the inversion until thread trimming is performed or, the mirror switch is pressed again.

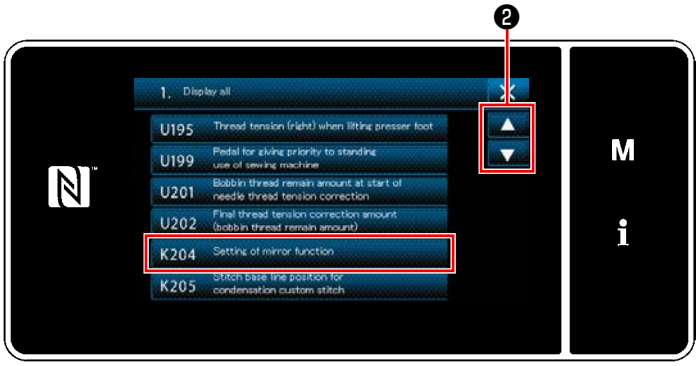
<Mode screen>

1) When **M** ❶ is held pressed for three seconds on the sewing screen, the "Mode screen" is displayed.
2) Select the "1. Memory switch".
   The "memory switch type selection screen" is displayed.



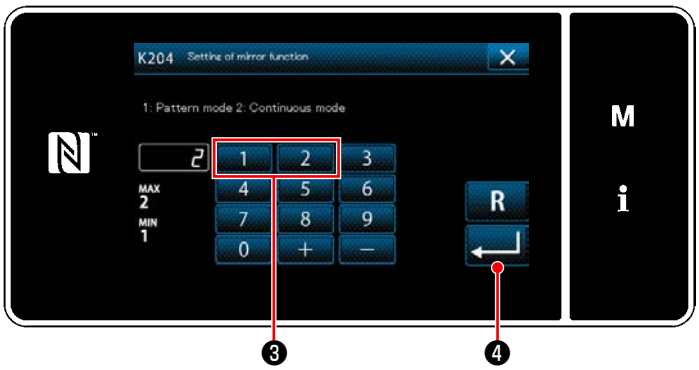
<Memory switch type selection screen>

3) Select the "1. Display all".
   The "memory switch edit screen" is displayed.



<Memory switch edit screen>

4) Select "K204 Setting of mirror function" by pressing  ❷ .



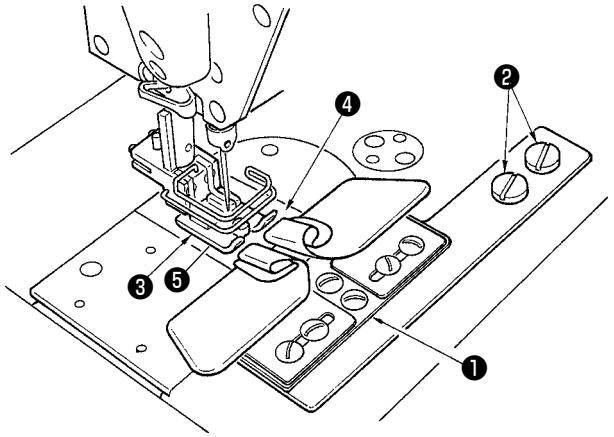
5) Select "1: Pattern mode" or "2: Continuous mode" by pressing numeric key ❸ .
   * The initial value has been set to "2: Continuous mode".

6) Press  ❹ to confirm the setting.
   The "memory switch edit screen" is displayed.

4-10. Fagot stitch

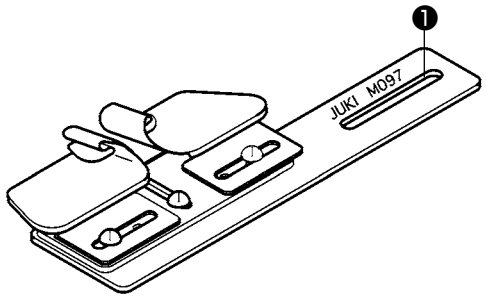
When performing the fagoting sewing, use the optional gauge for fagoting below.
Refer to **"5-3-8. Pattern 2 (fagoting)" p.92** for details.

[Example of installing optional gauge for fagoting]



1. When using the optional gauge for fagoting, the wiper device can not be used.
2. When performing fagoting sewing using optional fagoting gauge, set presser ❸ so that the pressure of right and left soles of the presser is equal and perform micro lifting by approximately a sheet of paper. Then the slippage of right- and left-hand side materials can be prevented.

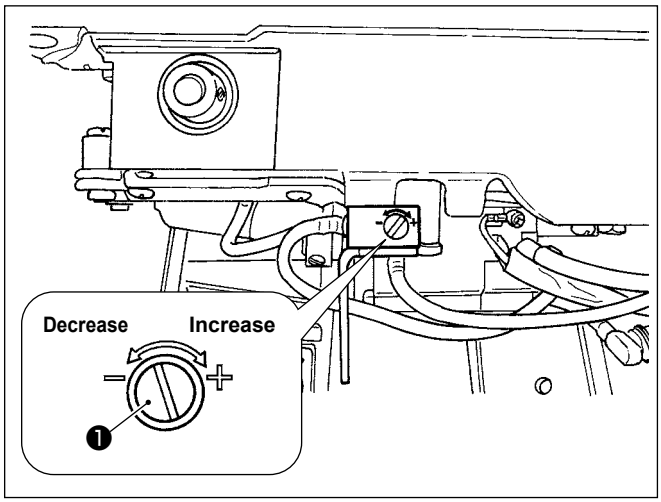
	Part No.	Description	Q'ty
❶	MAM09700BA0	Upturn folder for fagoting (asm.)	1
❷	SS5110710SP	Setscrew for the above folder	2
❸	22591564	Presser (asm.)	1
❹	10061554	Throat plate (asm.)	1
❺	10064004	Feed dog	1



Downturn folder type for fagoting (asm.) can be supplied as well.
Part No. : MAM097000A0

4-11. Adjusting the amount of oil in the hook

WARNING :
To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.



Adjustment of the amount of oil in the hook is performed with oil amount adjustment screw ❶ .

● **Adjustment procedure**

Tighten (turn clockwise) oil amount adjustment screw ❶ to increase the amount of oil in the hook, or loosen (turn counterclockwise) to decrease it.

1. **When adjusting the amount of oil in the hook, perform the adjustment in a way of reducing the oil amount after somewhat increasing it.**
2. **The amount of oil in the hook has been adjusted at the max. sewing speed at the time of delivery. When you always use the sewing machine at low sewing speed, there is a possibility that trouble occurs due to the lack of amount of oil in the hook. When the sewing machine is used always at low sewing speed, perform the adjustment of the amount of oil in the hook.**

Caution

3. **There is a possibility of causing oil leakage from the hook shaft section since oil does not return to the oil tank when oil amount adjustment screw ❶ is used in fully-tightened state. Do not use the screw in fully-tightened state. In addition, when the amount of oil in the hook is not obtained unless oil amount adjustment screw ❶ is near in fully-tightened state, it is considered that hook shaft oil wick (JUKI Part No. 11015906) is clogged or the like. Replace the hook shaft oil wick.**
   For the replacing procedure, refer to "6-1-3. Replacing procedure of the hook shaft oil wick" p.122.

5. HOW TO USE THE OPERATION PANEL

5-1. Explanation of the sewing screen (when selecting a sewing pattern)

On the sewing screen, the shape and set values of the currently-sewn sewing pattern are displayed.
The display and button operation differ according to the selected sewing pattern.
Note that the sewing screen shows two different displays, i.e., the sewing pattern display and the counter display. Refer to **"5-5. Counter function" p. 103** for the description of the counter display.

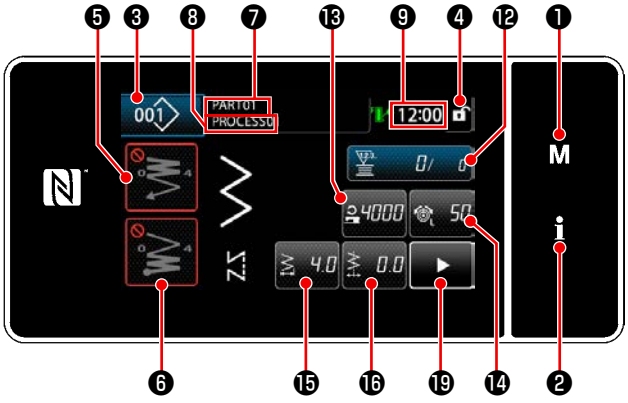
There are two different screen display modes; i.e., **<Operator mode>** and **<Maintenance personnel mode>**.
The mode can be changed over between the operator mode and the maintenance personnel mode by simultaneously pressing M ❶ and i ❷ .

The screen display mode can also be changed with the memory switch "U400: Operate usage mode".
Refer to **"5-7. List of memory switch data" p. 109** for details.

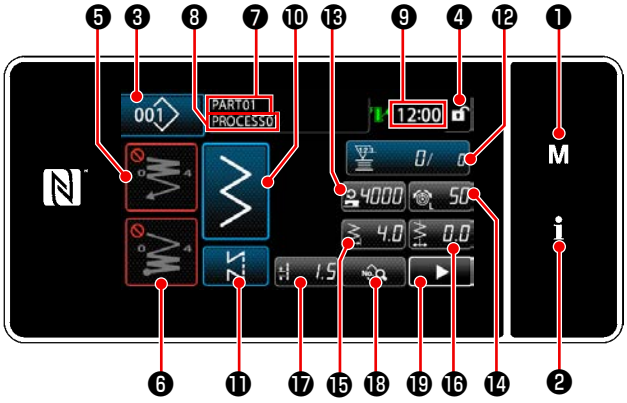
(1) Sewing screen (when selecting a sewing pattern)

Sewing pattern can be selected with ⓫ . Five different sewing patterns are available as described below.

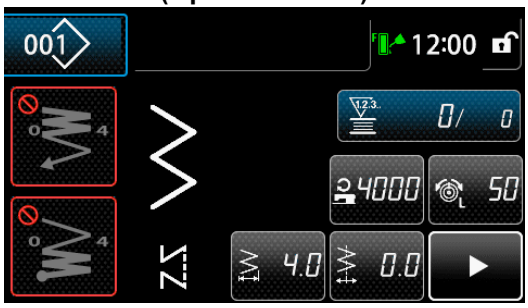
<Operator mode>



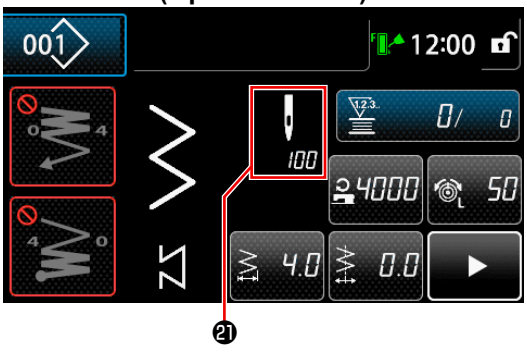
<Maintenance personnel mode>



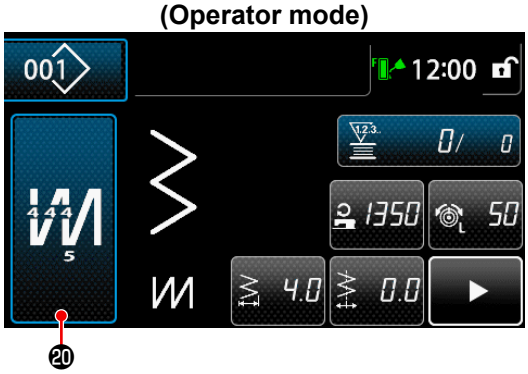
Free stitching pattern (Operator mode)



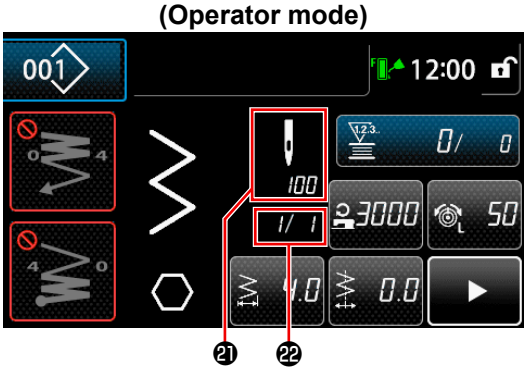
Constant-dimension sewing pattern (Operator mode)



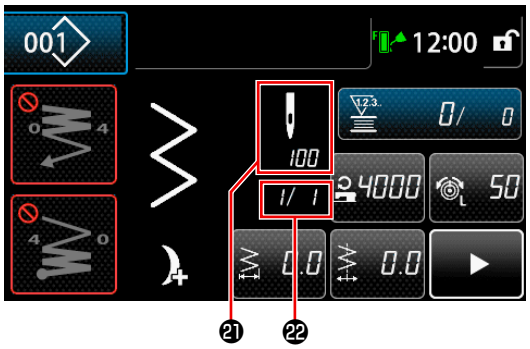
Multi-layer stitching pattern (Operator mode)



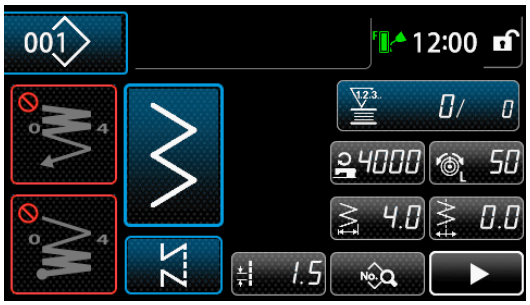
Polygonal-shape stitching pattern (Operator mode)



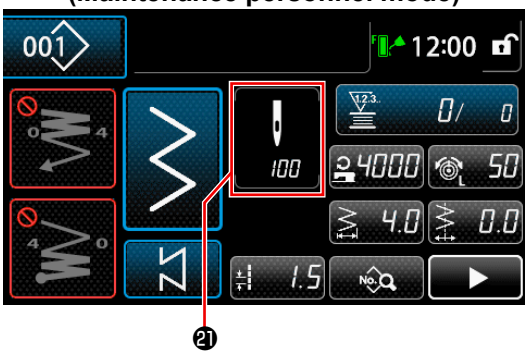
Continuous sewing pattern (Operator mode)



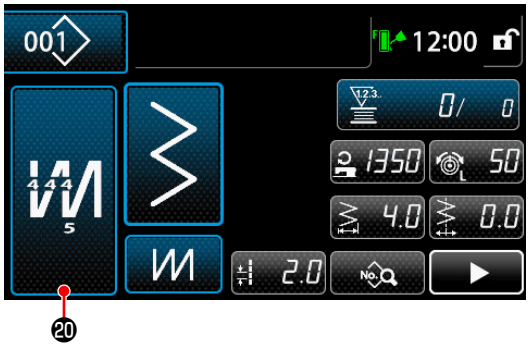
Free stitching pattern (Maintenance personnel mode)



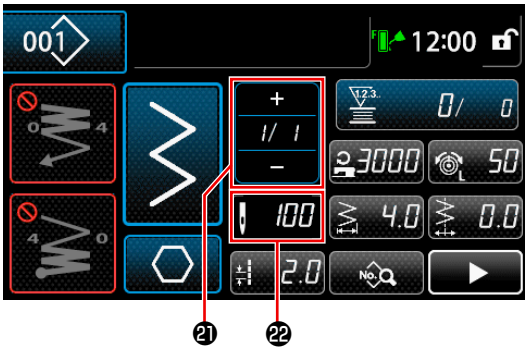
Constant-dimension sewing pattern (Maintenance personnel mode)



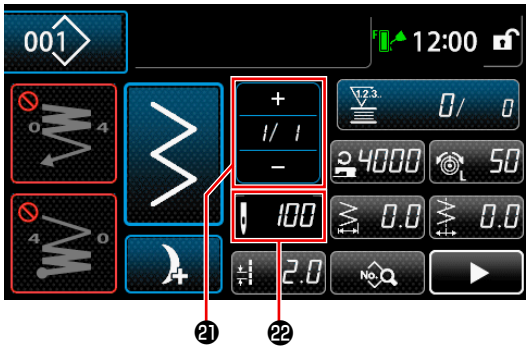
Multi-layer stitching pattern (Maintenance personnel mode)



Polygonal-shape stitching pattern (Maintenance personnel mode)



Continuous sewing pattern (Maintenance personnel mode)



	Switch/display	Description
❶	Mode key	This switch is used for displaying the menu screen. The mode is changed over between the operator mode and maintenance personnel mode by pressing the Mode key and the Information key simultaneously.
❷	Information key	This switch is used for displaying the information screen. The mode is changed over between the operator mode and maintenance personnel mode by pressing the Information key and the Mode key simultaneously.
❸	Sewing pattern No. button	Sewing pattern list screen is displayed. The currently-selected sewing pattern number is displayed on this button.
❹	Simplified screen lock button	This is button is used for changing over the operation status of buttons displayed on the screen between enable and disable. This button is used for displaying the simplified lock status of the screen on it. Locked:  Unlocked:  Once the button operation is locked using the simplified screen lock button, operation of the buttons displayed on the screen, excluding this button will be disabled.
❺	Sewing-start reverse-feed stitch button	This button is used for changing "with or without" of the reverse feed stitching at the beginning of sewing for the sewing pattern displayed on the operation panel. When reverse feed stitching at the beginning of sewing is placed in the OFF state,  mark is displayed at the upper left of the button. The reverse feed stitching (at start) edit screen is displayed by keeping this key held pressed for one second. → The aforementioned edit screen is displayed in the case of the free stitching, constant-dimension sewing, polygonal-shape stitching and continuous sewing, On this screen, this button is used for changing "with or without" of the reverse feed stitching at the end of sewing.
❻	Sewing-end reverse-feed stitch button	This button is used for changing over "with/without" reverse feed stitching at the end of sewing of the sewing pattern displayed. When reverse feed stitching at the end of sewing is placed in the OFF state,  mark is displayed at the upper left of the button. The reverse feed stitching (at end) edit screen is displayed by keeping this key held pressed for one second. → The aforementioned edit screen is displayed in the case of the free stitching, constant-dimension sewing, polygonal-shape stitching and continuous sewing, On this screen, this button is used for changing "with or without" of the reverse feed stitching at the end of sewing.
❼	Part number	The part number is displayed in this field. The number of characters that can be entered as a part number is 24. As many as 19 characters can be displayed on the upper portion of operation panel.
❽	Process/comment	Depending on the setting of memory switch U404, the process or comment is displayed in this field. The number of characters that can be entered as a process is 24. As many as 19 characters can be displayed on the upper portion of operation panel. The number of characters that can be entered as a comment is 50. As many as 37 characters can be displayed on the upper portion of operation panel. * For the cycle sewing, only the comment can be entered.
❾	Clock display	The time set on the sewing machine is displayed in this field in 24-hour system.
❿ *	Sewing shape button	The selected sewing shape is displayed on the operation panel. Refer to **"5-3. Setting of the sewing shape" p. 78**. The shape selection screen is displayed by pressing this button.

	Switch/display	Description
⓫ *	Sewing pattern button	Selected sewing pattern is displayed on this screen. Five different sewing patterns such as free sewing patterns, constant-dimension sewing patterns, overlapped stitching pattern, polygonal-shape stitching patterns and continuous sewing patterns are available. The sewing pattern selection screen is displayed by pressing the sewing pattern button.
⓬	Customization button	A selected function can be allocated to and registered with this button. This button has been initially set to the "Bobbin thread / sewing counter". Refer to **"5-2-6. List of pattern functions" p. 58**.
⓭	Customization button	A selected function can be allocated to and registered with this button. This button has been initially set to the "Sewing speed". Refer to **"5-2-6. List of pattern functions" p. 58**.
⓮	Customization button	A selected function can be allocated to and registered with this button. This button has been initially set to the "Thread tension". Refer to **"5-2-6. List of pattern functions" p. 58**.
⓯	Customization button	A selected function can be allocated to and registered with this button. This button has been initially set to the "Zigzag width". Refer to **"5-2-6. List of pattern functions" p. 58**.
⓰	Customization button	A selected function can be allocated to and registered with this button. This button has been initially set to the "Stitch baseline". Refer to **"5-2-6. List of pattern functions" p. 58**.
⓱ *	Customization button	A selected function can be allocated to and registered with this button. This button has been initially set to the "Stitch length". Refer to **"5-2-6. List of pattern functions" p. 58**.
⓲ *	Customization button	A selected function can be allocated to and registered with this button. This button has been initially set to the "Sewing data list". Refer to **"5-2-6. List of pattern functions" p. 58**.
⓳	Customization button	A selected function can be allocated to and registered with this button. This button has been initially set to the "Second sewing screen". Refer to **"5-2-6. List of pattern functions" p. 58**.
⓴	Multi-layer stitching button	The multi-layer stitching setting screen is displayed by keeping this button held pressed for one second. Refer to **"5-2-5. Editing the sewing patterns" p. 55**. → This button is displayed when multi-layer stitching is selected.
㉑	Number of stitches	The number of stitches for the constant-dimension sewing, and the number of stitches registered for each step of polygonal-shape stitching and continuous sewing are displayed. → The number of stitches is displayed in the case the constant-dimension sewing, polygonal-shape stitching or continuous sewing is selected.
㉒	Display of the number of pattern steps	The current step is displayed on the left portion and the total number of steps is displayed on the right portion of the operation panel. "1 - 30" is displayed as the number of pattern steps in the case of the polygonal-shape stitching, or "1 - 20" is displayed in the case of the continuous sewing. → "Display of the number of pattern steps" is displayed in the case the polygonal-shape stitching or continuous sewing is selected.

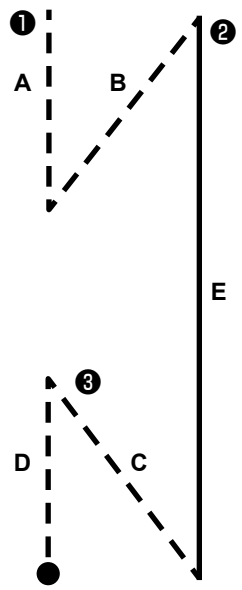
*** Only in the case the maintenance personnel mode is selected.**

5-2. Sewing patterns

Patterns which are frequently sewn can be registered as sewing patterns.
Once the patterns are registered as sewing patterns, the desired sewing pattern can be called up only by selecting its sewing pattern number.
As many as 200 different patterns can be registered as sewing patterns.

5-2-1. Sewing pattern configuration

One sewing pattern consists of four elements, i.e., reverse feed stitching (at start), main stitching, reverse feed stitching (at end) and pattern function.

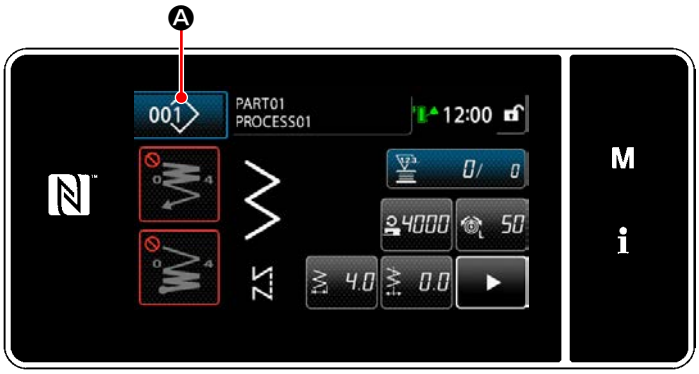


	Pattern No. 1 - No. 200
❶	Reverse feed stitching (at start) section Refer to **"5-2-3. Reverse feed stitching (at start) pattern" p. 48**.
❷	Main stitching section · Free stitching · Constant-dimension sewing · Multi-layer stitching · Polygonal-shape stitching · Continuous sewing Refer to **"5-2-5. Editing the sewing patterns" p. 55** and **"8-2. Setting up the polygonal-shape stitching" p. 141**.
❸	Reverse feed stitching (at end) section Refer to **"5-2-4. Reverse feed stitching (at end) pattern" p. 54**.

❹	Pattern function Refer to **"5-2-5. Editing the sewing patterns" p. 55**.

5-2-2. List of sewing patterns

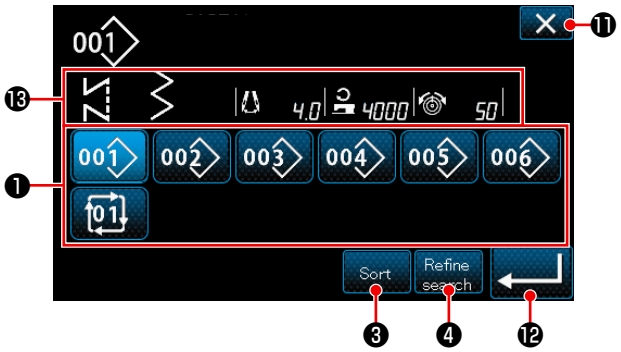
The list of stored sewing patterns are displayed on the screen. Under the maintenance personnel mode, sewing patterns can be created, copied and deleted.



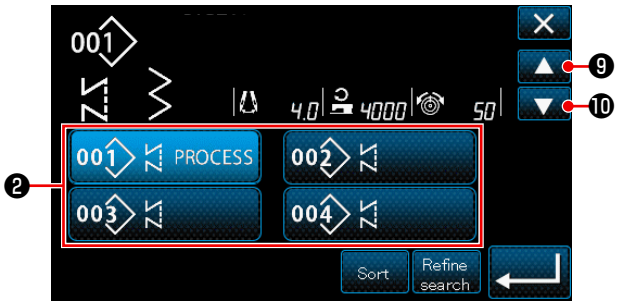
<Sewing screen (operator mode)>

Press 001 Ⓐ on the sewing screen of each mode.
The sewing pattern number list screen is displayed.

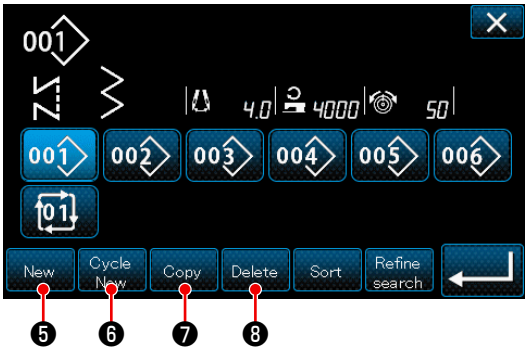
Pattern list screen: In numerical order (Operator mode)



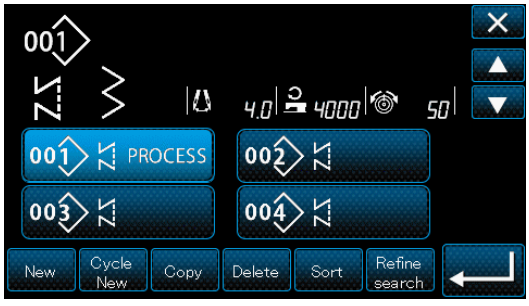
Pattern list screen: In alphabetical order (Operator mode)



Pattern list screen: In numerical order (Maintenance personnel mode)



Pattern list screen: In alphabetical order (Maintenance personnel mode)

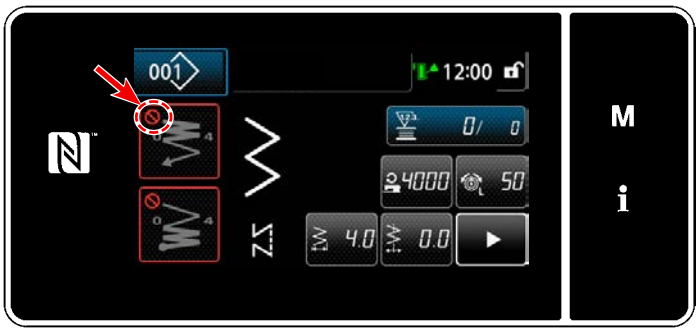


	Name	Function
❶	Pattern No. button	This button is used for displaying numbers of the registered sewing patterns and cycle patterns. (Cycle pattern numbers that are not registered are not displayed.) When this button is pressed, the sewing pattern is put into the selected state. Display range: Sewing pattern numbers 1 to 200 and cycle patterns 1 to 20.
❷	Pattern number (in the order of registration of characters) button	Sewing pattern is displayed and the pattern is put into the selected state by pressing this button.
❸	Sorting button	This button is used for sorting the registered patterns in the order of sewing pattern number, process, part number or comment. Pattern No. display range: Sewing pattern numbers 1 to 200 and cycle patterns 1 to 20. Registration of characters display range: Sewing pattern numbers 1 to 200.
❹	Refining button	This button is used for displaying the refiner setting screen.
❺	New sewing pattern creation button	This button is used for creating a new sewing pattern. Refer to **"8-1-1. Creation of a new pattern" p. 137**. * This button is only displayed under the maintenance personnel mode.
❻	New cycle pattern creation button	This button is used for creating a new cycle pattern. Refer to **"8-4. Cycle pattern" p. 153**. * This button is only displayed under the maintenance personnel mode.
❼	Pattern copy button	This button is used for copying a sewing pattern or cycle pattern and registering the copied pattern with new number. Refer to **"8-1-2. Copying a pattern" p. 139**. * This button is only displayed under the maintenance personnel mode.
❽	Pattern delete button	This button is used for displaying the pattern deletion confirmation message. In the case there is only one registered pattern, the pattern cannot be deleted. * This button is only displayed under the maintenance personnel mode.
❾	Scroll (up) button	This button is used for displaying the previous page.
❿	Scroll (down) button	This button is used for displaying the next page.
⓫	Close button	This button is used for cancelling the selected pattern and displaying the sewing screen.
⓬	Enter button	This button is used for confirming the selected pattern and displaying the sewing screen.
⓭	Display of pattern data being selected	This button is used for displaying data on the pattern that is being selected.

5-2-3. Reverse feed stitching (at start) pattern

The sewing-start reverse feed stitching pattern is set as described below.

(1) Enabling the reverse feed stitching (at start) pattern

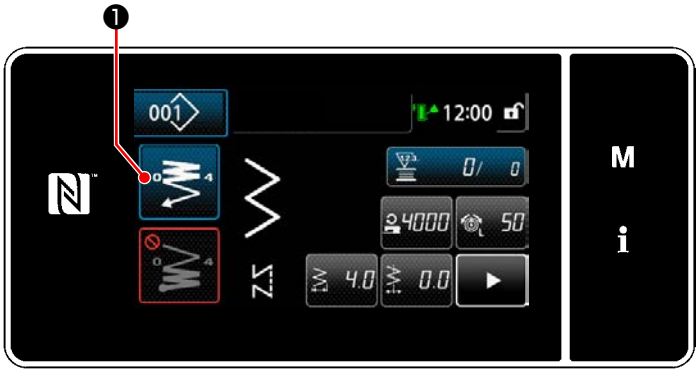


The sewing-start reverse feed stitching pattern can be operated when the sewing-start reverse feed stitching function is placed in the ON state (mark is not displayed).
If this function is placed in the OFF state, press the sewing start reverse feed stitch button to switch off mark display to enable the sewing-start reverse feed stitching function.

(2) Changing the number of stitches and stitch length of reverse feed stitching (at start) pattern

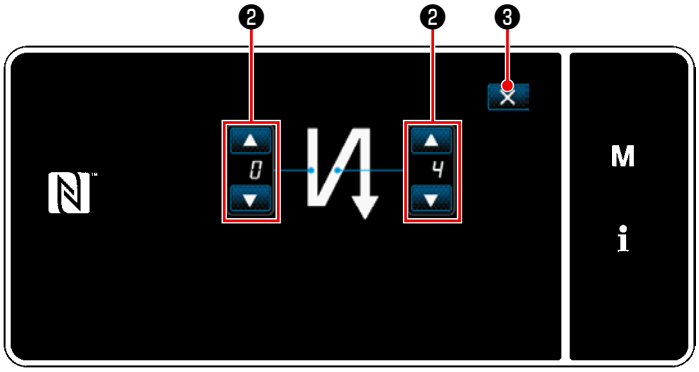
◆ **In the case of operator mode**

① **Displaying the edit screen for reverse feed stitching (at start)**



Keep ❶ held pressed for one second.
The reverse feed stitching (at start) edit screen is displayed.

② **Setting the number of stitches and the number of repetitions of reverse feed stitching at the beginning of sewing**

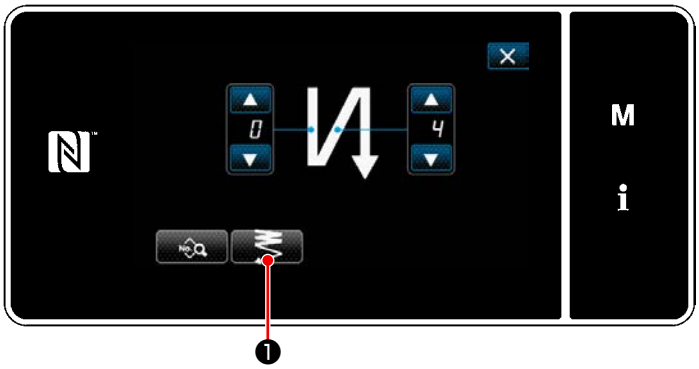


<Edit screen for reverse feed stitching (start) (operator mode)>

Change the number of reverse feed stitches with ❷.
The value you have entered is confirmed by pressing ❸. Then, the sewing screen is displayed.

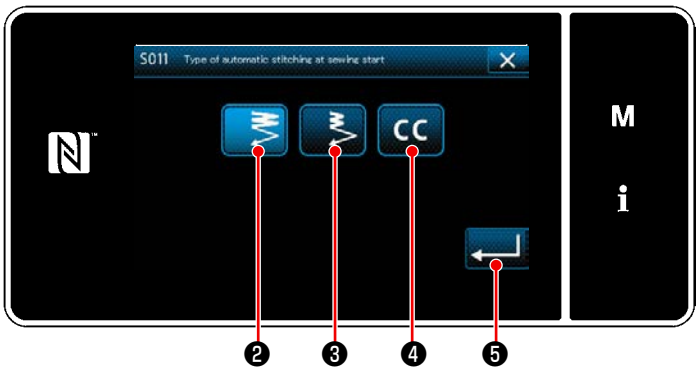
◆ **In the case of maintenance personnel mode**

① **Selecting the type of reverse feed stitching at the beginning of sewing**



<Edit screen for reverse feed stitching (start) (maintenance personnel mode)>

1) Display the "edit screen for reverse feed stitching (start)" referring to the case of the operator mode.
2) Press ❶ to display the "type of reverse-feed stitching input screen".



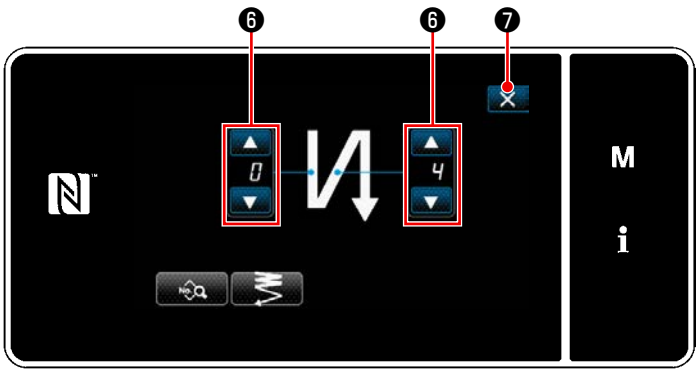
<Type of reverse-feed stitching input screen (maintenance personnel mode)>

3) Select one of the reverse feed stitching patterns to be used at the beginning of sewing:
   · Normal condensation stitch ❷
   · 2-point condensation stitch ❸
   · Condensation custom stitch CC ❹

   Press ❺ to confirm the aforementioned operation and return the current screen to the "sewing-start reverse-feed stitching screen".

② **Setting the sewing-start reverse feed stitching pattern**

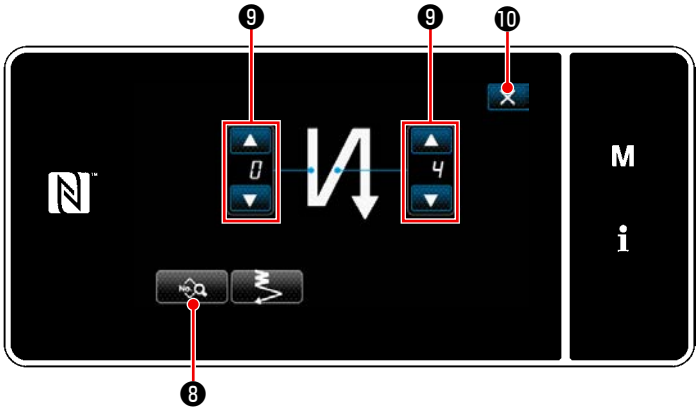
· **In the case normal condensation stitch** ❷



Change the number of reverse feed stitches with ❻.

The value you have entered is confirmed by pressing ❼ Then, the sewing screen is displayed.

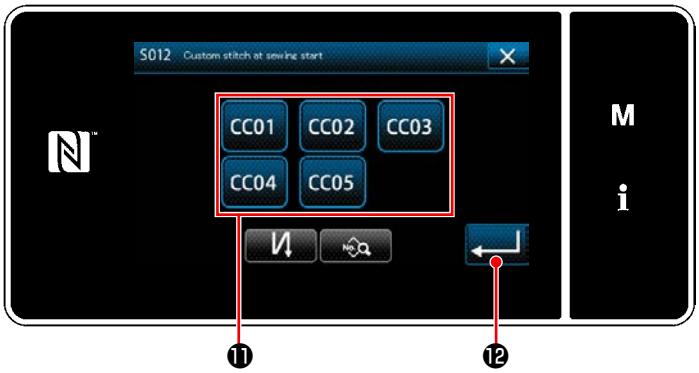
- **In the case 2-point condensation stitch** ❸



The stitch length, etc. can be set with ❽. Change the number of condensation stitches with ❾.

The value you have entered is confirmed by pressing ❿ Then, the sewing screen is displayed.

- **In the case of selecting condensation custom stitch** CC ❹

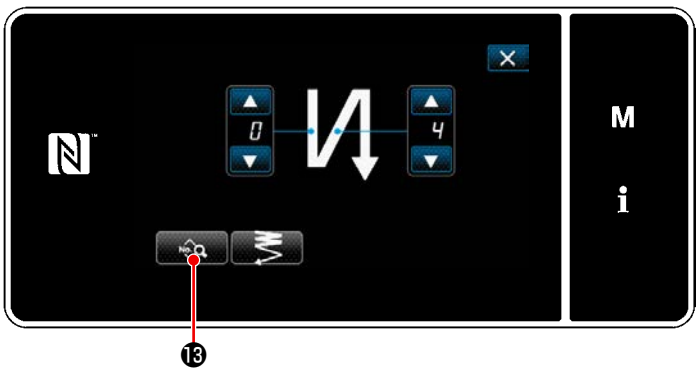


Press button ⓫ to select the condensation custom.

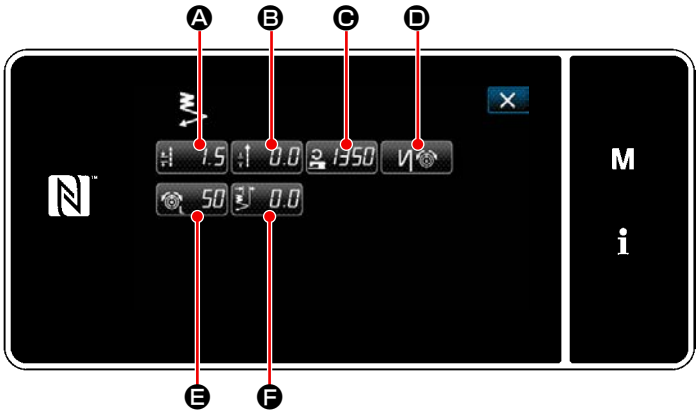
Press ⓬ to confirm the aforementioned operation and return the current screen to the sewing-start reverse-feed stitching screen.

* Refer to **"8-6. Condensation custom pattern" p. 165** for details of the condensation custom stitching.

③ Editing the data on reverse feed stitching at the beginning of sewing

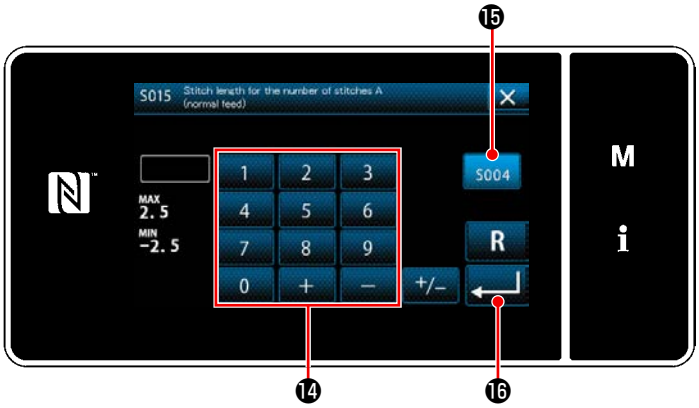


1) When  ⓭ is pressed on the sewing-start reverse feed stitching screen, the "sewing-start reverse feed stitching data edit screen" is displayed.



<Sewing-start reverse feed stitching data edit screen>

- **Inputting the stitch length (normal feed) (Ⓐ)**



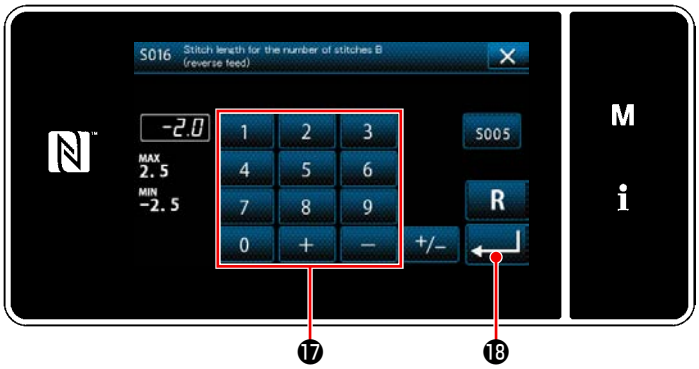
<Stitch length (normal feed) input screen>

1) When  Ⓐ is pressed, the "Stitch length (normal feed) input screen" is displayed.
2) When  ⓯ is pressed, input of the stitch length (normal feed) is enabled.
3) Enter the stitch length (normal feed) with numeric keypad ⓮ . (-2.5 to 2.5)

* In the case ⓯ is selected, the stitch length will be the one employed for normal feed stitching section.

4) When  ⓰ is pressed, the value you have input is confirmed and the screen returns to the "sewing-start reverse feed stitching data edit screen".

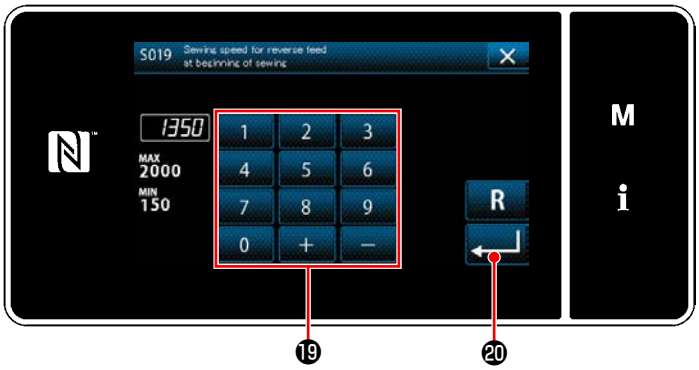
- **Inputting the stitch length (reverse feed) (Ⓑ)**



<Stitch length (reverse feed) input screen>

1) When 0.0 Ⓑ is pressed, the "Stitch length (reverse feed) input screen" is displayed.
2) Enter the stitch length (reverse feed) with numeric keypad ⓱ . (-2.5 to 2.5)
3) When ⓲ is pressed, the value you have input is confirmed and the screen returns to the "sewing-start reverse feed stitching data edit screen".

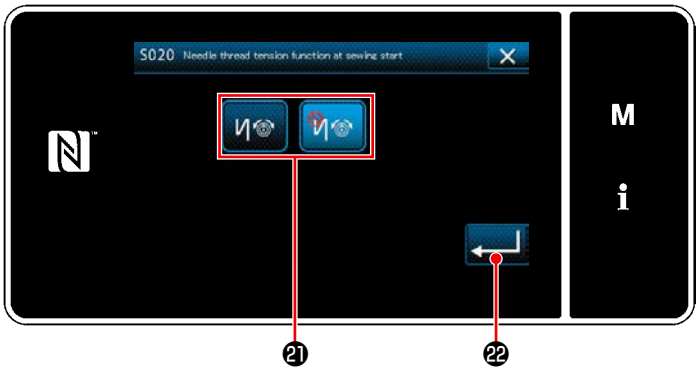
- **Inputting the sewing speed for the reverse feed stitching at the beginning of sewing (Ⓒ)**



<Sewing speed for reverse feed stitching input screen>

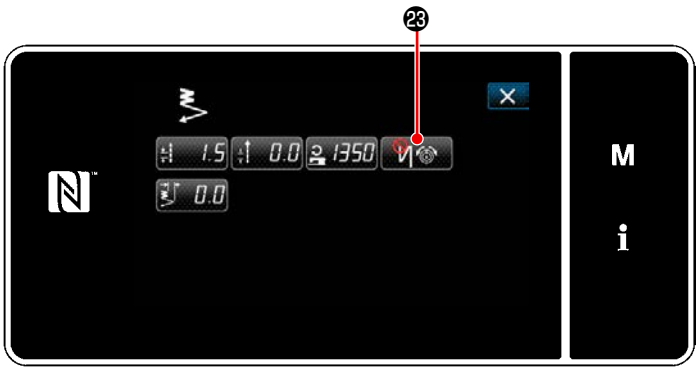
1) When 1350 Ⓒ is pressed, the "Sewing speed for reverse feed stitching input screen" is displayed.
2) Input a sewing speed with numeric keypad ⓳. (150 to 2000)
3) When ⓴ is pressed, the value you have input is confirmed and the screen returns to the "sewing-start reverse feed stitching data edit screen".

- **Setting the needle thread tension function (Ⓓ)**



<Needle thread tension function selection screen>

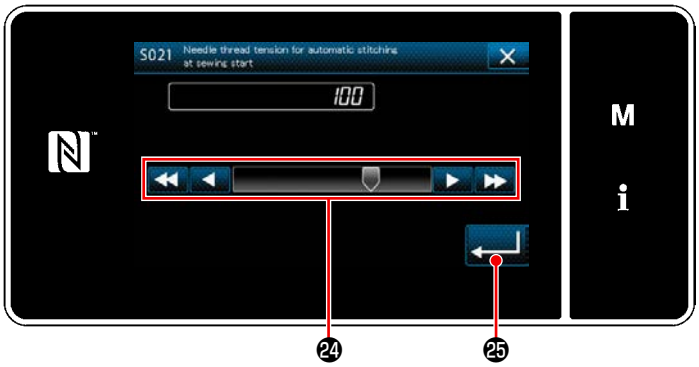
1) When Ⓓ is pressed, the needle thread tension function selection screen is displayed.
2) Select the status (enable/disable) of the needle thread tension function with button ㉑ .
3) When ㉒ is pressed, the value you have input is confirmed and the screen returns to the "sewing-start reverse feed stitching data edit screen".



<Sewing-start reverse feed stitching data edit screen>

* In the case (enable) is selected in the aforementioned item number 2, needle thread tension edit button ㉓ is displayed on the sewing-start reverse feed stitching data edit screen.

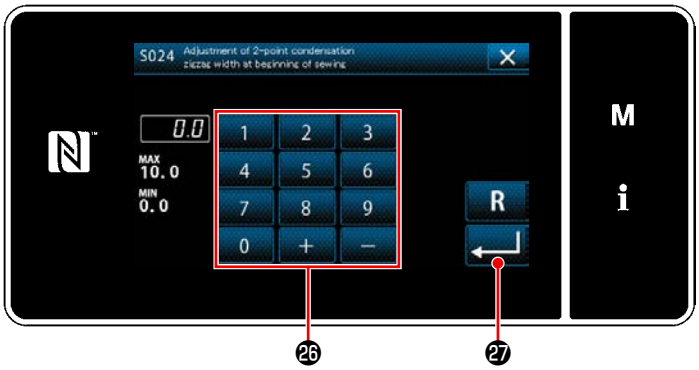
- **Setting the needle thread tension to be employed at the beginning of sewing (Ⓔ)**



<Sewing-start needle thread tension input screen>

1) When 50 Ⓔ is pressed, the "Sewing-start needle thread tension input screen" is displayed.
2) Enter the needle thread tension to be employed at the beginning of sewing with button ㉔ . (0 to 140)
3) When ㉕ is pressed, the value you have input is confirmed and the screen returns to the "sewing-start reverse feed stitching data edit screen".

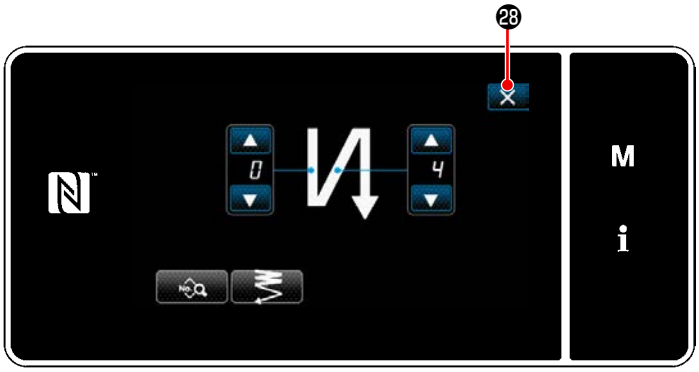
- **Adjusting the sewing-start 2-point condensation stitch width (Ⓕ)**



<Sewing-start 2-point condensation stitch width adjustment screen>

1) When 0.0 Ⓕ is pressed, the "Sewing-start 2-point condensation stitch width adjustment screen" is displayed.
2) Enter the 2-point condensation stitch width to be employed at the beginning of sewing with button ㉖ .
3) When ㉗ is pressed, the value you have input is confirmed and the screen returns to the "sewing-start reverse feed stitching data edit screen".

④ Applying the changed items



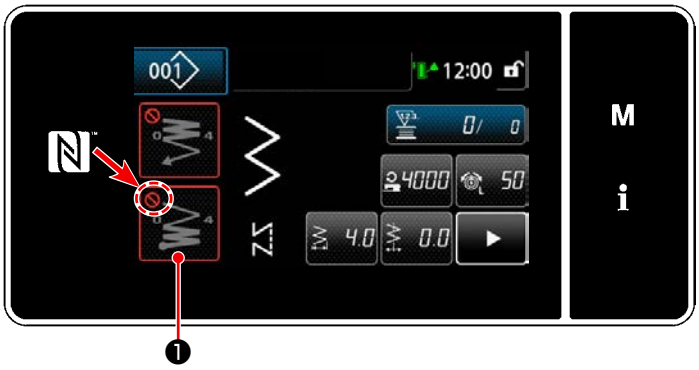
<Sewing-start reverse-feed stitching screen (maintenance personnel mode)>

Press ㉘ to confirm the aforementioned operation and return the current screen to the sewing screen.

5-2-4. Reverse feed stitching (at end) pattern

A sewing-end reverse feed stitching pattern is set as described below.

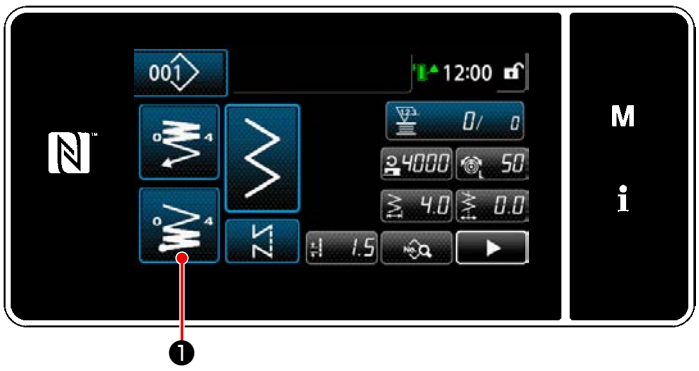
(1) Enabling the reverse feed stitching (at end) pattern



The sewing-end reverse feed stitching pattern can be operated when the sewing-end reverse feed stitching function is placed in the ON state (mark is not displayed).
If this function is placed in the OFF state press the sewing end reverse feed stitch button to switch off mark display to enable the sewing-end reverse feed stitching function.

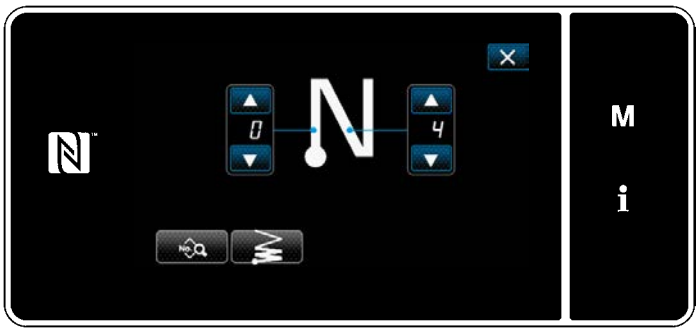
(2) Changing the number of stitches and stitch length of reverse feed stitching (at end) pattern

① Displaying the edit screen for reverse feed stitching (at end)



Keep  ❶ held pressed for one second.

The reverse feed stitching (at end) edit screen is displayed.



<Sewing-end reverse feed stitching edit screen>

* From the next item number and beyond, set the function items in the same manner as the functions for sewing-start reverse feed stitching. (Refer to **"5-2-3. Reverse feed stitching (at start) pattern" p. 48**.)

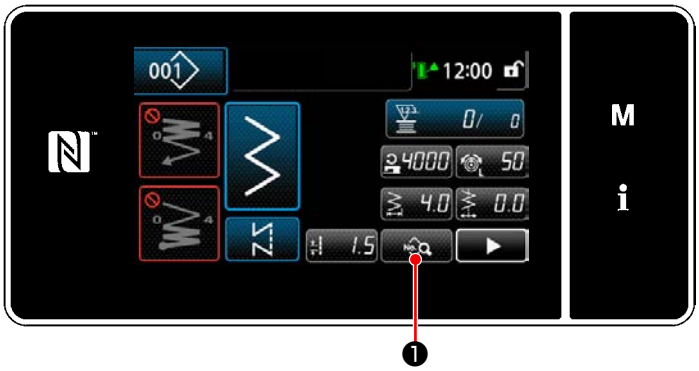
5-2-5. Editing the sewing patterns

(1) Edit method (in the case free stitching, constant-dimension sewing or multi-layer stitching is selected)

* In the case polygonal-shape stitching is selected, refer to **"8-2. Setting up the polygonal-shape stitching" p. 141**.

* In the case Continuous sewing is selected, refer to **"8-3. Continuous sewing pattern" p. 148**.

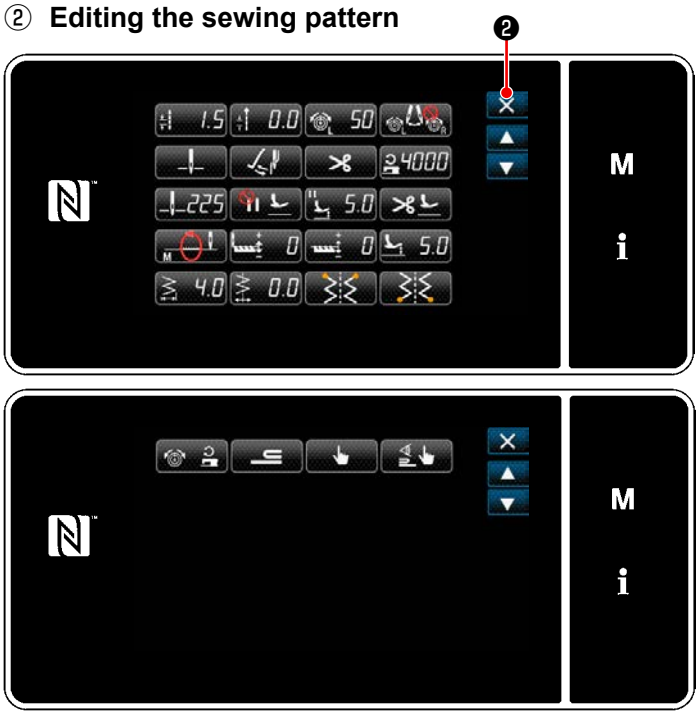
① Displaying the sewing data edit screen



<Sewing screen (Maintenance personnel mode)>

Press ❶ on the sewing screen under the maintenance personnel mode.
The "sewing data edit screen" is displayed.

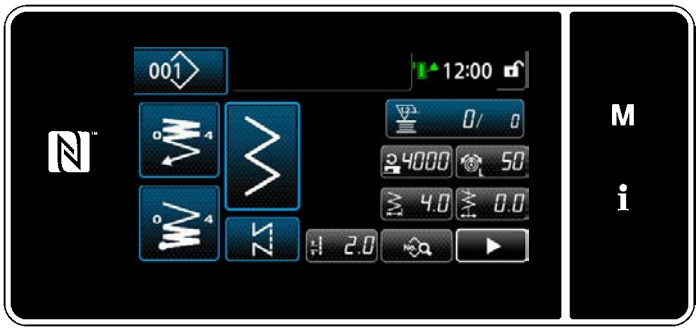
② Editing the sewing pattern



<Sewing data edit screen>

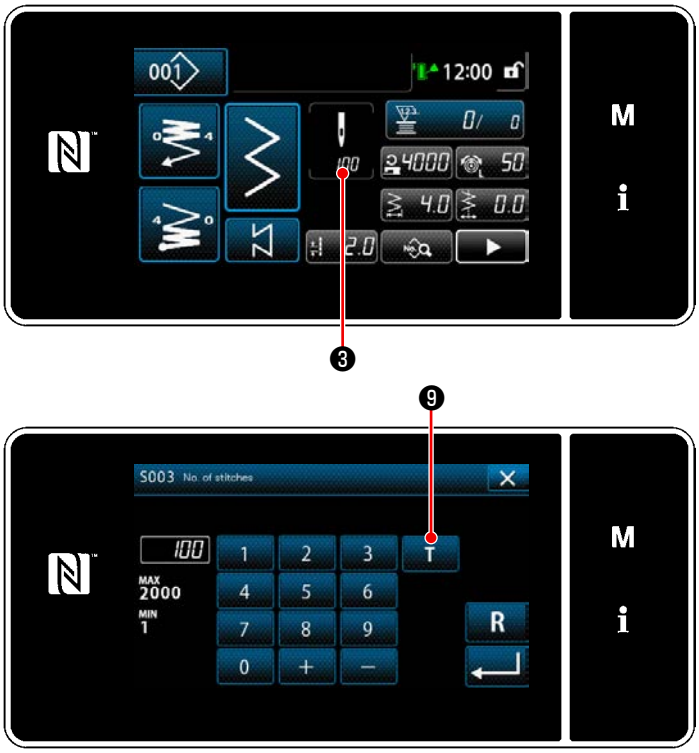
On this screen, the pattern functions can be edited separately.
Refer to **"5-2-6. List of pattern functions" p. 58** for the function items that can be edited.
Change the respective items and press to confirm the change.
Press ❷ to display the "sewing screen".

③ Performing sewing using the edited sewing pattern



<Sewing screen>

Data you have changed is displayed on the screen.

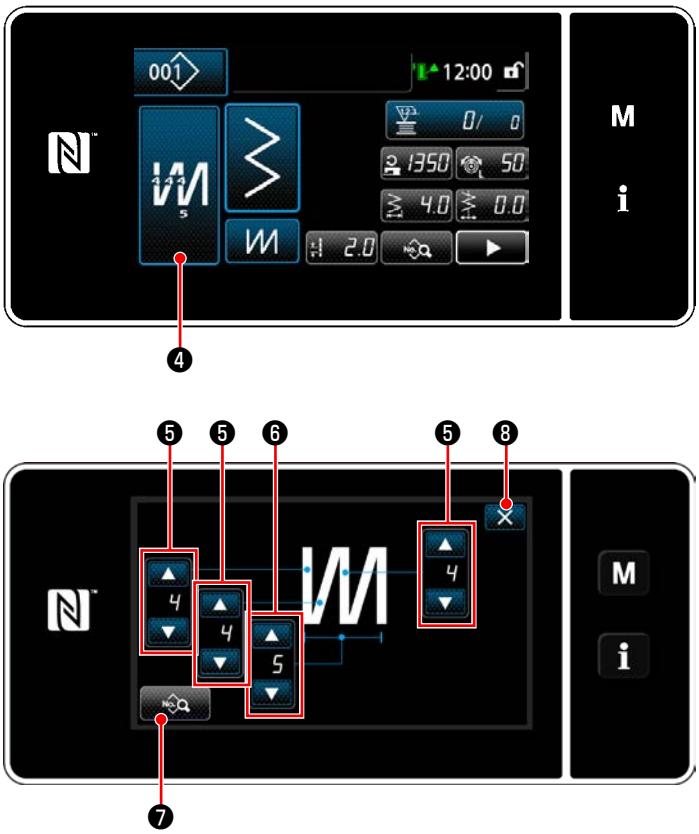


<Number of stitches input screen>

* In the case a constant-dimension sewing pattern is selected, the "number of stitches input screen" is displayed by pressing ❸ at the time of setting the number of stitches. (Only in the case the number of stitches can be changed)

When T ❾ is pressed, the teaching function is turned ON.

Refer to **"5-2-7. Teaching function" p. 71** for the teaching function.



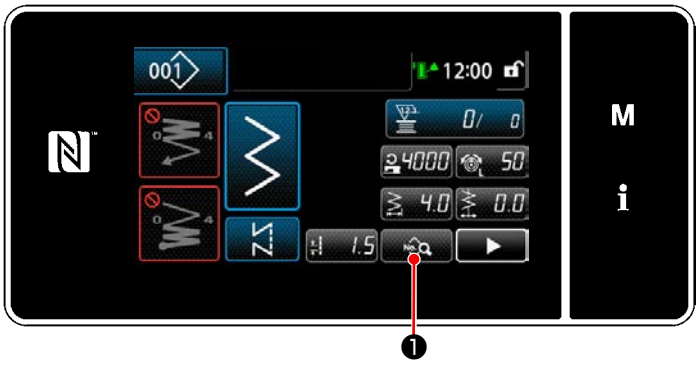
<Multi-layer stitching edit screen>

* When ❹ is pressed while selecting the multi-layered sewing pattern, the "multi-layer stitching edit screen" is displayed.

1) Set the number of stitches with ❺.
2) Set the number of times of double reverse feed stitching with ❻.
3) Multi-layered sewing data can be edited by pressing ❼.
4) Press ❽ to confirm the set value and return the current screen to the "sewing screen".

(2) Adjusting the lower stop position

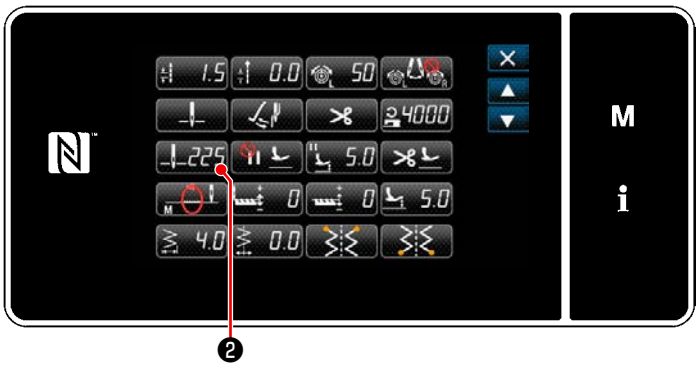
WARNING :
The needle bar moves during adjustment of this item. Be careful not to place your fingers under the needle.



❶

<Sewing screen (Maintenance personnel mode)>

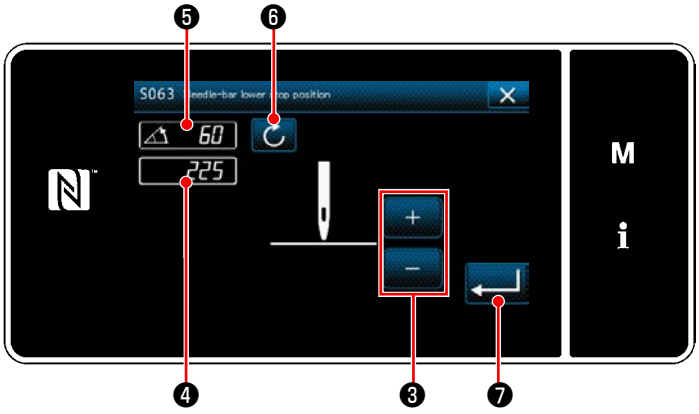
1) Press ❶ on the sewing screen under the maintenance personnel mode.
The "sewing data edit screen" is displayed.



❷

<Sewing data edit screen>

2) Press ❷ .
The "needle bar lower stop position setting screen" is displayed.



❺ ❻ ❹ ❸ ❼

<Needle bar lower stop position setting screen>

3) Adjust the lower stop position of the needle bar following two different adjustment procedures described below.

[Adjustment with the + / - key]

Adjust the needle bar position with ❸ .
(Value shown in display ❹ will change accordingly.)

[Adjustment with the main-shaft angle]
Adjust the position of the needle bar by turning the main shaft. (Value shown in display ❺ will change accordingly.)
Press ❻ to reflect the adjustment value to ❹ .

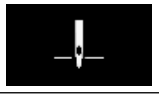
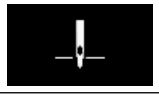
4) The operation is confirmed by pressing ❼ . Then, the screen returns to the "sewing data edit screen".

5-2-6. List of pattern functions

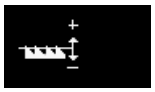
(1) Setting items under the pattern sewing mode

Data No.	Item name	Unit of change	Input range
S001	Sewing pattern	—	Free  / Constant dimension  / Multi-layered  / Polygonal shape  / Continuous 
S002	Sewing shape	—	 : Straight stich  : Left standard scallop  : Right standard scallop  : Left blind stitch  : Pattern 1  : Standard zigzag  : Left crescent  : Right crescent  : Right blind stitch  : Pattern 2 (fagot)  : 2-step zigzag  : Left equal-width scallop (24 stitches)  : Right equal-width scallop (24 stitches)  : Left T stitch  : Pattern 3  : 3-step zigzag  : Left standard scallop (12 stitches)  : Right standard scallop (12 stitches)  : Right T stitch  : Pattern 4  : Custom pattern (Nos. 1 to 200)  : Pattern 5
S003	Number of stitches	1 stitch	— /  1 to 2000 / 1 to 15 / —
S004	Stitch length	0.1 mm	 -5.0 to 5.0 / Custom pattern Nos. 1 to 200
S005	Reverse feed stitch length	0.1 mm	 -5.0 to 5.0
S006	Needle thread tension, left	1	 0 to 200
S007	Needle thread tension, right	1	 0 to 200
S008	Right and left thread tensions, changeover	—	 OFF  ON

	Data No.	Item name	Unit of change	Input range		
	S009	Stitch length 2	0.1 mm	 -5.0 to 5.0		
Reverse feed stitching at the beginning of sewing	S010	Stitch ON/OFF at the beginning of sewing	—	ON / OFF	—	ON / OFF
	S011	Shape of reverse feed stitching at the beginning of sewing	—	 : Normal condensation stitch  : 2-point condensation stitch  : Condensation custom	—	 : Normal condensation stitch  : 2-point condensation stitch  : Condensation custom
	S012	Custom stitching at the beginning of sewing	—	Condensation custom No.1 to 20	—	Condensation custom No.1 to 20
	S013	Number of stitches A	1 stitch	0 to 99		
	S014	Number of stitches B	1 stitch	0 to 99		
	S015	→ Number of stitches A, stitch length (normal feed)	0.1 mm	 -5.0 to 5.0 / Common setting S004	—	 -5.0 to 5.0 / Common setting S004
	S016	→ Number of stitches B, stitch length (reverse feed)	0.1 mm	 -5.0 to 5.0 / Common setting S005		
	S017	→ Stitch length 2 at beginning of sewing	0.1 mm	 -5.0 to 5.0 / Common setting S009	—	 -5.0 to 5.0 / Common setting S009
	S019	→ Reverse feed stitching speed at the beginning of sewing	10 sti/min	 150 to 2000		
	S020	→ Needle thread tension Common setting ON/OFF	—	 : OFF  : ON	—	 : OFF  : ON
	S021	→ Needle thread tension	1	 0 to 200	—	 0 to 200
	S023	→ Sewing-start condensation custom stitch width	0.1 mm	 0.0 to 10.0	—	 0.0 to 10.0
	S024	→ Sewing-start 2-point condensation stitch width	0.1 mm	 0.0 to 10.0	—	 0.0 to 10.0

	Data No.	Item name	Unit of change	Input range		
Reverse feed stitching at the end of sewing	S030	Reverse feed stitching ON/OFF at the end of sewing	—	ON / OFF	—	ON / OFF
	S031	Shape of reverse feed stitching at the end of sewing	—	 : Normal condensation stitch  : 2-point condensation stitch  : Condensation custom	—	 : Normal condensation stitch  : 2-point condensation stitch  : Condensation custom
	S032	Custom stitching at the end of sewing	—	Condensation custom No.1 to 20	—	Condensation custom No.1 to 20
	S033	Number of stitches C	1 stitch	0 to 99		
	S034	Number of stitches D	1 stitch	0 to 99		
	S035	→ Number of stitches C, stitch length (reverse feed)	0.1 mm	 -5.0 to 5.0 / Common setting S005	—	 -5.0 to 5.0 / Common setting S005
	S036	→ Number of stitches D, stitch length (normal feed)	0.1 mm	 -5.0 to 5.0 / Common setting S004	—	 -5.0 to 5.0 / Common setting S004
	S037	→ Stitch length 2 at end of sewing	0.1 mm	 -5.0 to 5.0 / Common setting S009	—	 -5.0 to 5.0 / Common setting S009
	S039	→ Reverse feed stitching speed at the end of sewing	50 sti/min	 150 to 2000	—	 150 to 2000
	S040	→ Needle thread tension Common setting ON/OFF	—	 : OFF  : ON	—	 : OFF  : ON
	S041	→ Needle thread tension	1	 0 to 200	—	 0 to 200
	S043	→ Sewing-end condensation custom stitch width	0.1 mm	 0.0 to 10.0	—	 0.0 to 10.0
	S044	→ Sewing-end 2-point condensation stitch width	0.1 mm	 0.0 to 10.0	—	 0.0 to 10.0
	S050	Needle bar stop position	—	 : Stop with the needle up  : Stop with the needle down	—	 : Stop with the needle up  : Stop with the needle down
	S051	Wiper ON/OFF	—	 : OFF  : ON		

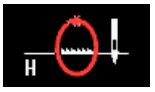
Data No.	Item name	Unit of change	Input range				
S052	Thread trimmer ON/OFF	—	 : OFF	 : ON			
S053	One shot	—	—	 : OFF  : ON	—	—	—
S054	Automatic thread trimmer ON/OFF	—	 : OFF  : ON		—	 : OFF  : ON	
S058	Multi-layered section sensor ON/OFF	—	 : OFF  : ON		—	—	—
S059	Sensor value to turn ON the multi-layered section changeover function	1	 1000 to 3000		—	—	—
S060	Sensor value to turn OFF the multi-layered section changeover function	1	 1000 to 3000		—	—	—
S062	Sewing speed limit	50 sti/min	 150 to U096		—	—	—
S063	Needle bar: Lower stop position	1 deg	 190 to 230				
S065	Presser foot lifting during intermediate stop:	—	 : OFF  : ON		—	—	 : OFF  : ON
S066	Presser foot lifting height during intermediate stop:	0.1 mm	 0.0 to 10.0		—	—	 0.0 to 10.0
S067	Presser foot lifting after thread trimming:	—	 : OFF	 : ON			

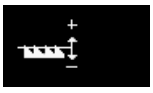
Data No.	Item name	Unit of change	Input range		
S068	Feed locus	—	 : Standard  : Light-weight materials  : Heavy-weight materials  : Thread slippage prevention	—	 : Standard  : Light-weight materials  : Heavy-weight materials  : Thread slippage prevention
S069	Feed timing	1 deg	 -30 to 30		
S070	Feed dog height	1	 -4 to 8		
S071	Presser foot lifting height after thread trimming	0.1 mm	 0.0 to 10.0		
S072	Zigzag width	0.1 mm	 0.0 to 10.0 : Zigzag stitch  0.0 to 10.0 : Left blind stitch  0.0 to 10.0 : Pattern 1  0.0 to 10.0 : Left scallop  0.0 to 10.0 : Right blind stitch  0.0 to 10.0 : Pattern 2 (fagot)  0.0 to 10.0 : Right scallop  0.0 to 10.0 : Left T stitch  0.0 to 10.0 : Pattern 3  0.0 to 10.0 : Custom pattern  0.0 to 10.0 : Right T stitch  0.0 to 10.0 : Pattern 4  0.0 to 10.0 : Pattern 5	—	

Data No.	Item name	Unit of change	Input range			
S073	Stitch baseline position	0.1 mm	 -5.0 to 5.0 : Straight stich	 -5.0 to 5.0 : Left blind stitch	 -5.0 to 5.0 : Pattern 1	
			 -5.0 to 5.0 : Zigzag stitch	 -5.0 to 5.0 : Right blind stitch	 -5.0 to 5.0 : Pattern 2 (fagot)	
			 -5.0 to 5.0 : Left scallop	 -5.0 to 5.0 : Left T stitch	 -5.0 to 5.0 : Pattern 3	
			 -5.0 to 5.0 : Right scallop	 -5.0 to 5.0 : Right T stitch	 -5.0 to 5.0 : Pattern 4	 -5.0 to 5.0 : Pattern 5
S074	Start position of scallop stitch	—	 : Bottom of crescent scallop  : Apex of crescent scallop			—
S075	Stop position of scallop stitch	—	 : Optional  : Bottom of crescent scallop  : Apex of crescent scallop			—
S076	Number of blind stitches	1 stitch	 3 to 250	—	 3 to 250	—

	Data No.	Item name	Unit of change	Input range	
	S077	Sewing starting position	—	 Optional : Zigzag stitch  Optional : Left T stitch  Optional : Right T stitch  Left : Zigzag stitch  Left : Left T stitch  Right : Right T stitch  Right 1 : Zigzag stitch  Right 1 : Left T stitch  Left 1 : Right T stitch  Right 2 : Left T stitch  Left 2 : Right T stitch  Optional : Pattern 1  Optional : Pattern 2 (fagot)  Optional : Pattern 3  Optional : Pattern 4  Optional : Pattern 5  Center 1 : Pattern 1  Right 1 : Pattern 2 (fagot)  Right 1 : Pattern 3  Left 1 : Pattern 4  Right 1 : Pattern 5  Center 2 : Pattern 1  Center 1 : Pattern 2 (fagot)  Center 1 : Pattern 3  Left 2 : Pattern 4  Center 1 : Pattern 5  Left : Pattern 1  Left 1 : Pattern 2 (fagot)  Left 1 : Pattern 3  Right 1 : Pattern 4  Left 1 : Pattern 5  Center 3 : Pattern 1  Left 2 : Pattern 2 (fagot)  Left 2 : Pattern 3  Right 2 : Pattern 4  Left 2 : Pattern 5  Right : Pattern 1  Center 2 : Pattern 2 (fagot)  Center 2 : Pattern 3  Right 3 : Pattern 4 Center 2 : Pattern 5 Right 2 : Pattern 2 (fagot) Right 2 : Pattern 3 Left 3 : Pattern 4 Right 2 : Pattern 5	—

	Data No.	Item name	Unit of change	Input range	
	S078	Sewing end position	—	 Optional : Zigzag stitch  Optional : Scallop  Optional : Left T stitch  Optional : Right T stitch  Left : Zigzag stitch  Left : Scallop  Left : Left T stitch  Right : Right T stitch  Right : Zigzag stitch  Right : Scallop  Right 1 : Left T stitch  Left 1 : Right T stitch  Right 2 : Left T stitch  Left 2 : Right T stitch  Optional : Pattern 1  Optional : Pattern 2 (fagot)  Optional : Pattern 3  Optional : Pattern 4  Optional : Pattern 5  Center 1 : Pattern 1  Right 1 : Pattern 2 (fagot)  Right 1 : Pattern 3  Left 1 : Pattern 4  Right 1 : Pattern 5  Center 2 : Pattern 1  Center 1 : Pattern 2 (fagot)  Center 1 : Pattern 3  Left 2 : Pattern 4  Center 1 : Pattern 5  Left : Pattern 1  Left 1 : Pattern 2 (fagot)  Left 1 : Pattern 3  Right 1 : Pattern 4  Left 1 : Pattern 5  Center 3 : Pattern 1  Left 2 : Pattern 2 (fagot)  Left 2 : Pattern 3  Right 2 : Pattern 4  Left 2 : Pattern 5  Right : Pattern 1 Center 2 : Pattern 2 (fagot) Center 2 : Pattern 3 Right 3 : Pattern 4 Center 2 : Pattern 5 Right 2 : Pattern 2 (fagot) Right 2 : Pattern 3 Left 3 : Pattern 4 Right 2 : Pattern 5	—

	Data No.	Item name	Unit of change	Input range			
	S079	Needle thread tension correction	—	 : OFF  : Sewing speed  : Bobbin thread remaining amount  : Both			
		One-touch changeover			—	—	
	S080	One-touch type changeover, sewing speed limit	10 sti/min	 150 to U096 / Common setting S062	—	—	 150 to U096 / Common setting S062
	S081	One-touch type changeover, stitch length	0.1 mm	 -5.0 to 5.0 / Common setting S004	—	—	—
	S082	One-touch type changeover, needle thread tension, left	1	 0 to 200 / Common setting S006	—	—	 0 to 200 / Common setting S006
	S083	One-touch type changeover, needle thread tension, right	1	 0 to 200 / Common setting S007	—	—	 0 to 200 / Common setting S007
	S085	Feed locus	—	 : Standard  : Light-weight materials  : Heavy-weight materials  : Thread slippage prevention	—	—	 : Standard  : Light-weight materials  : Heavy-weight materials  : Thread slippage prevention
	S086	Feed dog height	1	 -4 to 8	—	—	 -4 to 8

	Data No.	Item name	Unit of change	Input range			
	S087	One-touch type changeover, number of stitches to be sewn before turning OFF the changeover function	1 stitch	 0 to 200	—	—	 0 to 200
		Multi-layered portion changeover			—	—	
	S090	Multi-layered portion changeover, sewing speed limit	10 sti/min	 150 to U096 / Common setting S062	—	—	 150 to U096 / Common setting S062
	S091	Multi-layered portion changeover, stitch length	0.1 mm	 -5.0 to 5.0 / Common setting S004	—	—	—
	S092	Multi-layered portion changeover, needle thread tension, left	1	 0 to 200 / Common setting S006	—	—	 0 to 200 / Common setting S006
	S093	Multi-layered portion changeover, needle thread tension, right	1	 0 to 200 / Common setting S007	—	—	 0 to 200 / Common setting S007
	S095	Feed locus	—	 : Standard  : Light-weight materials  : Heavy-weight materials  : Thread slippage prevention	—	—	 : Standard  : Light-weight materials  : Heavy-weight materials  : Thread slippage prevention
	S096	Feed dog height	1	 -4 to 8	—	—	 -4 to 8

	Data No.	Item name	Unit of change	Input range			
	S097	Multi-layered portion changeover, number of stitches to be sewn before turning OFF the changeover function	1 stitch	 0 to 200	—	—	 0 to 200
	S100	Tension correction speed chart	—				

* **Refer to "5-2-8. One-touch utility changeover function" p. 73 for the detailed function of one-touch changeover.**

(2) Setting items for the polygonal-shape stitching steps

Data No.	Item name	Unit of change	Input range
Step 01			
S201	Step changeover	—	 : Number of stitches  : One-touch switch  : Multi-layered part
S203	Sensor value to change over the step	1	 1000 to 3000
S204	Number of stitches (seam length in mm)	1 stitch	 1 to 10000
S205	Stitch length (the number of stitches per inch, the number of stitches per 3 cm)	0.1 mm	 -5.0 to 5.0
S206	Reverse feed stitch length	0.1 mm	 -5.0 to 5.0
S207	Needle thread tension, left	1	 0 to 200
S208	Needle thread tension, right	1	 0 to 200
S210	Stitch length 2	0.1 mm	 -5.0 to 5.0
S211	Needle bar stop position at the time of pause	—	 : Stop with the needle up  : Stop with the needle down

Data No.	Item name	Unit of change	Input range
S212	Needle entry alignment position of the needle bar	—	 : OFF  : ON
S213	Presser foot lifting during intermediate stop:	0.1 mm	 0.0 to 10.0
S214	Needle bar stop position at the time of stop	—	 : Stop with the needle up  : Stop with the needle down  : Thread trimming  : Continuity
S215	Stop and presser foot lifting		 : OFF  : ON
S216	Lifting height of presser foot when the sewing machine stops	0.1 mm	 0.0 to 10.0
S217	One shot		 : OFF  : ON
S219	Sewing speed	10 sti/min	 150 to U096
Step 02			
:			
Step 30			

* Setting items and the input range are same as those of step 01.
* Step numbers can be set to Step 30.

(3) Setting items for steps of a continuous sewing pattern

Data No.	Item name	Unit of change	Input range
Step 01			
S611	Sewing shape	—	Refer to S002
S612	Number of stitches	1 stitch	 1 to 2000
S613	Zigzag width	0.1 mm	Refer to S072
S614	Stitch length	0.1 mm	 -5.0 to 5.0
S615	Reverse feed stitch length	0.1 mm	 -5.0 to 5.0
S616	Start position of scallop stitch	—	 : Bottom of crescent scallop  : Apex of crescent scallop
S617	Stop position of scallop stitch	—	 : Optional  : Bottom of crescent scallop
S618	Number of blind stitches	1 stitch	 3 to 250
S619	Sewing starting position	—	Refer to S077
S620	Sewing end position	—	Refer to S078
S625	Stitch length 2	0.1 mm	 -5.0 to 5.0
Step 02			
		:	
Step 20			

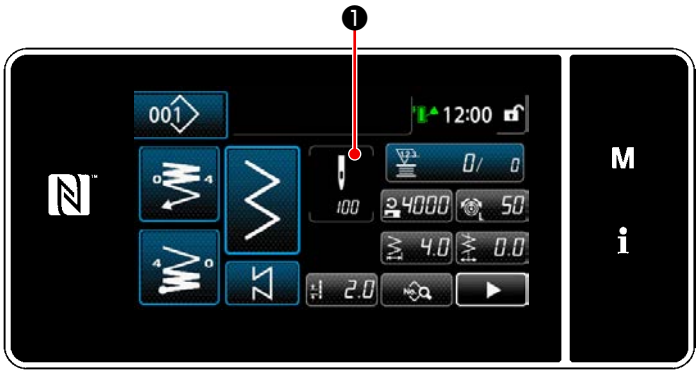
* Setting items and the input range are same as those of step 01.
* Step numbers can be set to Step 20.

5-2-7. Teaching function

This is the function that enables entry of the number of stitches of a sewing pattern using the actual number of stitches sewn.
This function screen can be displayed from the sewing data edit screen.

* The teaching function can be used in the case the "constant-dimension sewing" or "polygonal-shape stitching" is selected.

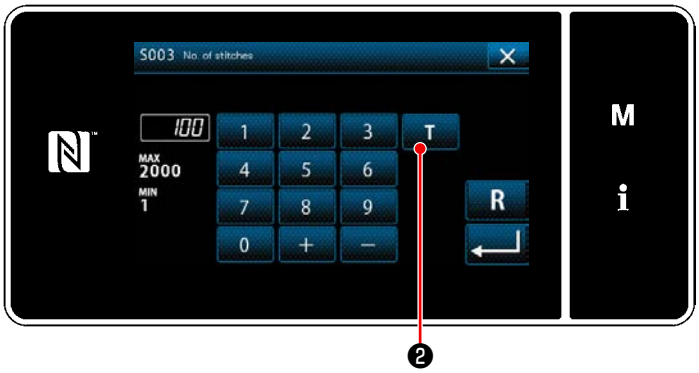
(1) How to set (constant-dimension sewing)



<Sewing screen (constant-dimension sewing) (Maintenance personnel mode)>

① Displaying the number of stitches input screen

Press ❶ on the sewing data list screen.
Then, the "number of stitches input screen" is displayed.



<Number of stitches input screen>

② Turning ON the teaching function

Press T ❷ to turn ON the teaching function.

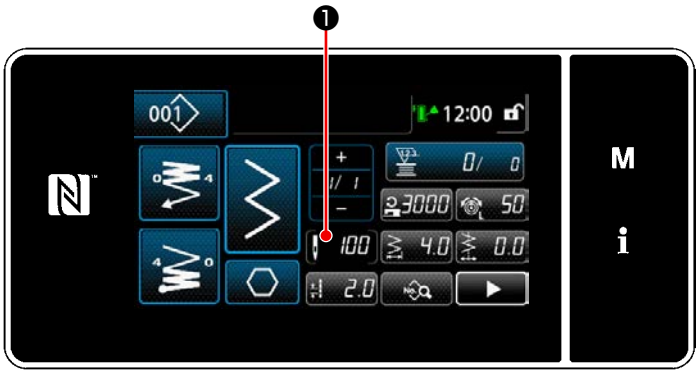
③ Starting teaching

The input value is set to 0 (zero). Carry out sewing until the needle entry position at which you want to finish sewing by depressing the pedal. Then, count the number of stitches sewn using the teaching function.

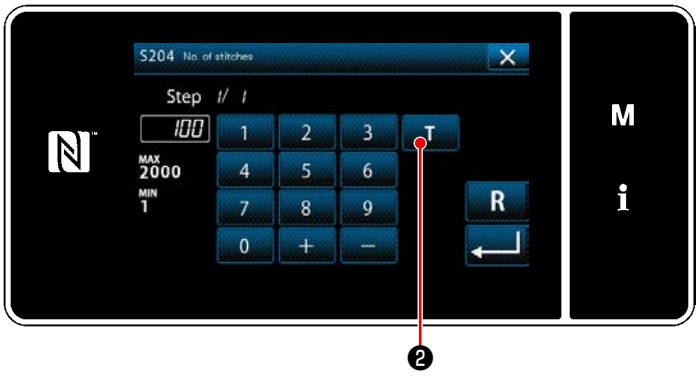
④ Confirming the data entered under the teaching mode

Confirm the content of teaching by carrying out thread trimming.
Return the current screen to the "sewing screen (constant-dimension sewing) (maintenance personnel mode)".

(2) How to set (polygonal-shape stitching)



<Sewing screen (polygonal-shape stitching) (Maintenance personnel mode)>



<Number of stitches input screen>

① Displaying the number of stitches input screen

Press ❶ on the sewing data list screen.
Then, the "number of stitches input screen" is displayed.

② Turning ON the teaching function

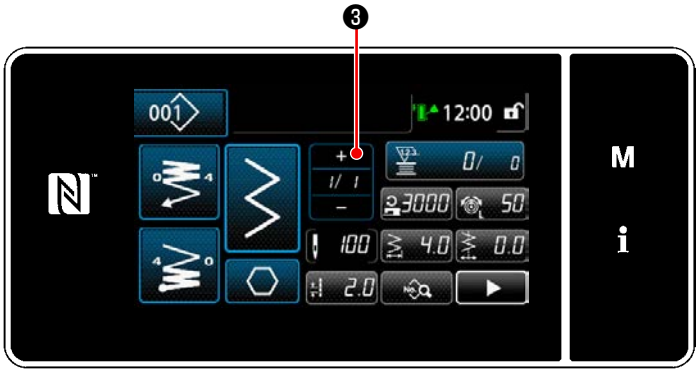
Press [T] ❷ to turn ON the teaching function.

③ Starting teaching

The input value is set to 0 (zero). Carry out sewing until the needle entry position at which you want to finish sewing by depressing the pedal. Then, count the number of stitches sewn using the teaching function.

④ Confirming the teaching content

Carry out sewing until the end (last stitch) of sewing step is reached. Then, carry out thread trimming to confirm the content of teaching.
Return the current screen to the "sewing screen (polygonal-shape stitching) (Maintenance personnel mode)".



⑤ Proceeding to the next step

When [+ // 1 −] ❸ is pressed, the sewing step is proceeded to the next one.
Carry out the steps of setting procedure ① through ⑤ in repetition.

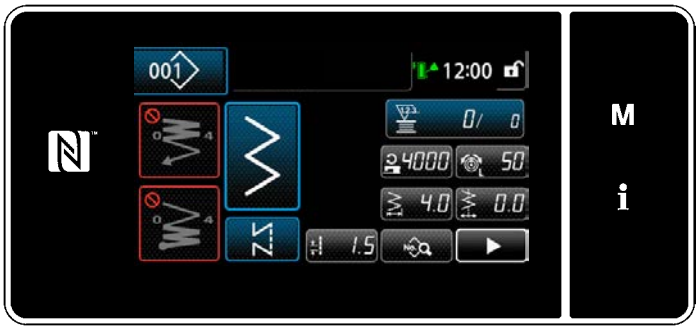
* If there is no step available for registration, the transition to the next step cannot be carried out.

5-2-8. One-touch utility changeover function

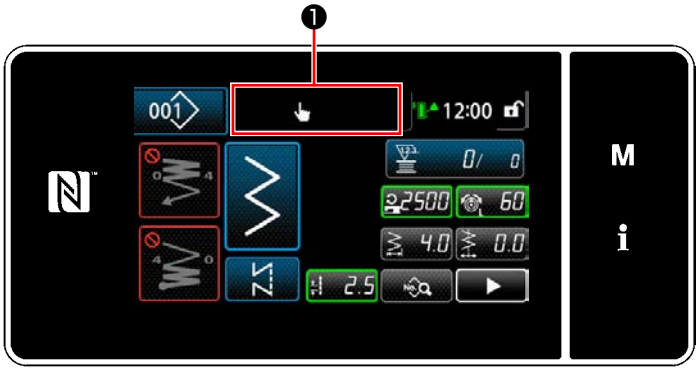
In the case the one-touch changeover function is assigned to the custom switch, the stitch length, sewing speed, etc. can be changed over by pressing the custom switch.
* The one-touch function has been factory-allocated to the machine head switch 1 at the time of shipment.

Data that is changed over with the one-touch changeover function
· Sewing speed
· Stitch length
· Needle thread tension
· Feed locus
· Feed dog height
· The number of stitches to be sewn before turning OFF the changeover function

Refer to **"4-8. Custom switch" p. 35**.



During one-touch type changeover

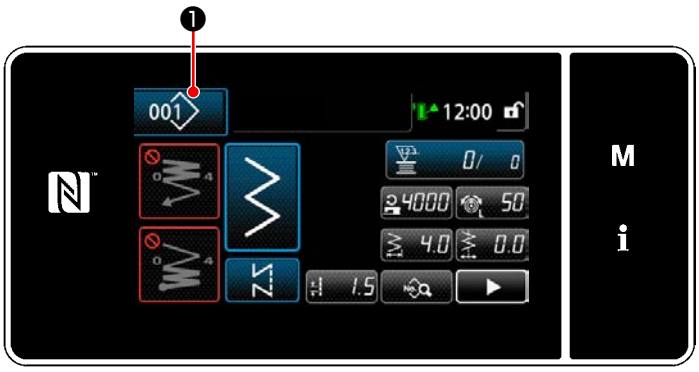


While the one-touch type changeover is being carried out, the object data display is changed, and the one-touch type changeover icon is displayed on ❶ .

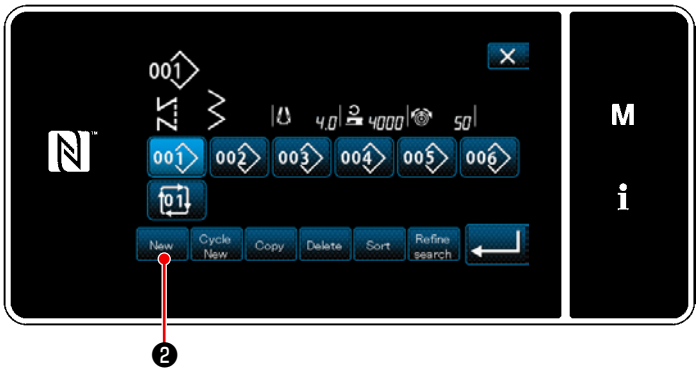
5-2-9. Registration of a new sewing pattern

A newly-created sewing pattern is registered by following the steps of procedure described below.

① Selecting the new-pattern creating function

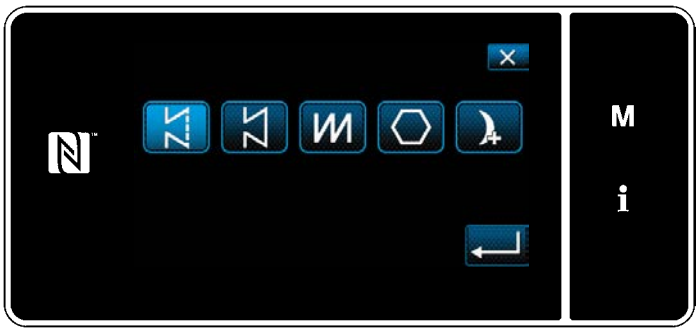


1) Press 001 ❶ to display the "sewing pattern management screen".



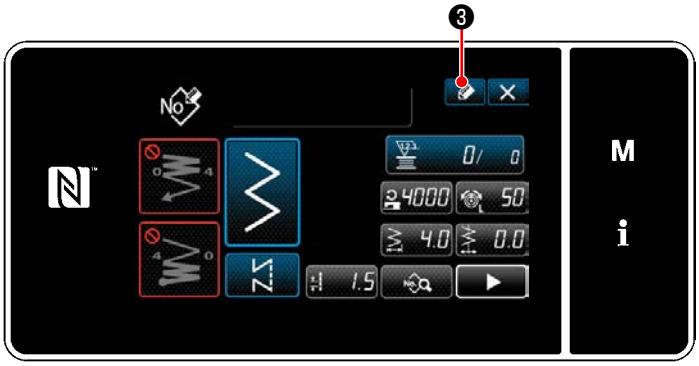
<Sewing pattern management screen>

2) Press New ❷ .

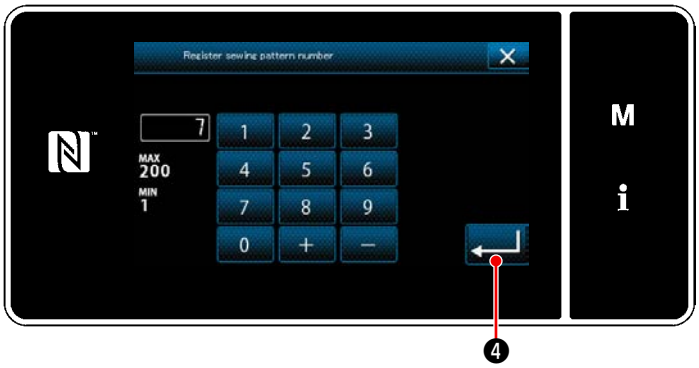


3) Select the sewing pattern (free stitching, constant-dimension sewing, overlapped stitching, polygonal-shape stitching, continuous sewing).

② Confirming the data on the created sewing pattern



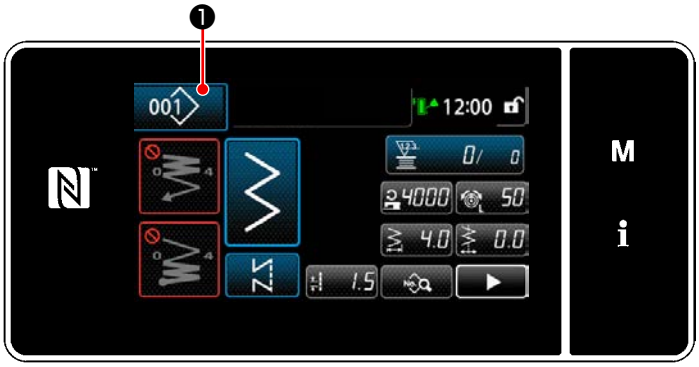
1) Press  ❸ to display the sewing pattern No. registration.



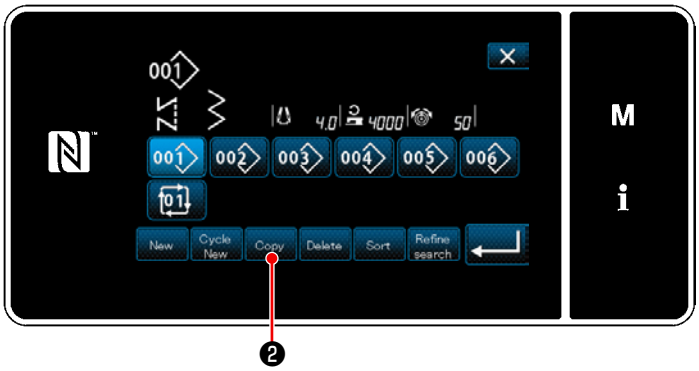
2) Enter the pattern number to be registered using the numeric keypad.

3) Press  ❹ to confirm the pattern number you have entered.
The "sewing pattern management screen" is displayed.

5-2-10. Copying a pattern

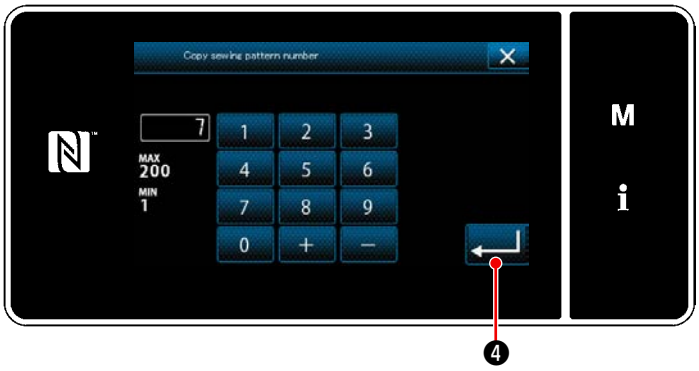


1) Press 001 ❶ to display the "sewing pattern management screen".



2) Press Copy ❷ .

<Sewing pattern management screen>



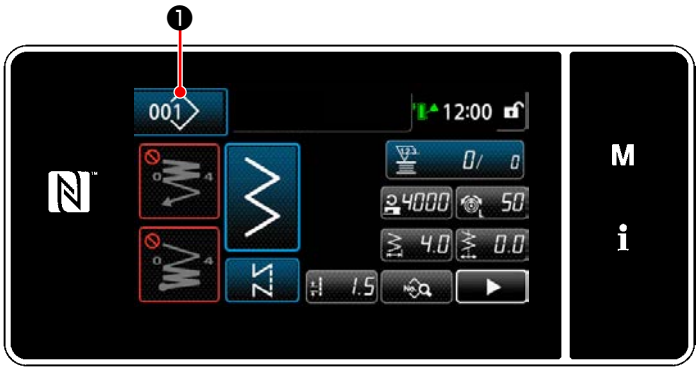
3) Input a copy pattern number with the numeric keypad.

4) Press ↵ ❹ to confirm the pattern number you have entered.
The "sewing pattern management screen" is displayed.

5-2-11. Narrow-down function

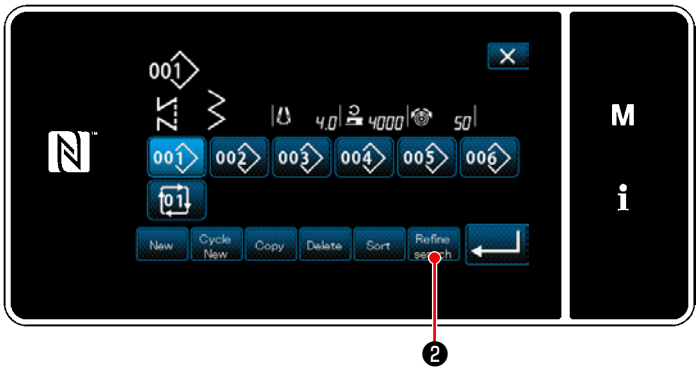
It is possible to select and display sewing pattern(s) which include target characters from the sewing patterns stored in memory by entering the target characters such as the product number, process or comment. This function can be used both under the operator mode and maintenance personnel mode.

① Selecting the new-pattern creating function



<Sewing screen (maintenance personnel mode)>

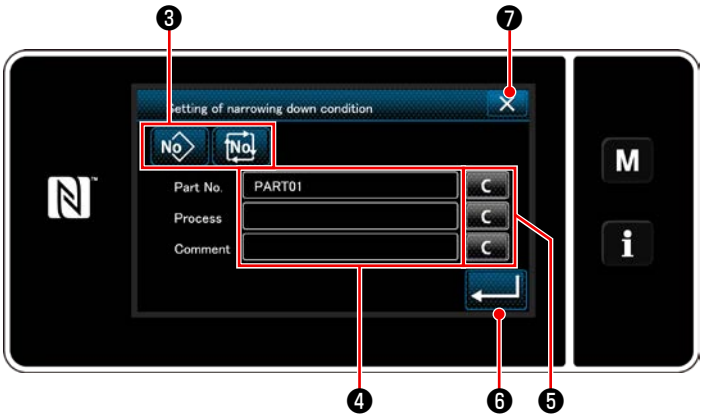
1) Press 001 ❶ to display the "sewing pattern management screen".



<Sewing pattern management screen>

2) Press Refine search ❷ .

② Select the target pattern to be narrowed down



<Narrow-down condition setting screen>

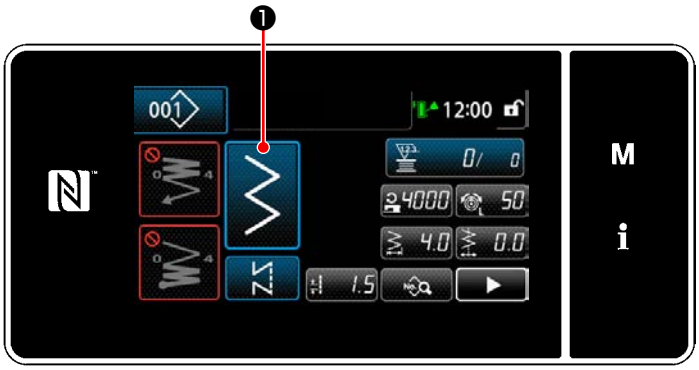
1) Select sewing patterns from which a desired pattern is narrowed down using button No No ❸ .
2) The character input screen is displayed by pressing ❹ .
   It is possible to enter a character(s) which is to be used for narrow-down operation with the character string button.
3) The entered characters are erased by pressing button C ❺ .
4) The "Sewing pattern management screen" containing only the patterns which include the entered character(s) are displayed by pressing ↵ ❻ .
5) Narrow-down operation is not carried out by pressing ✕ ❼ . Then, the "Sewing pattern management screen" is displayed.

* In the case characters are entered for two or more items on the narrow-down condition setting screen, only the patterns which satisfy all the entered conditions are displayed. For cycle sewing patterns, a comment is only used as the narrow-down condition.

5-3. Setting of the sewing shape

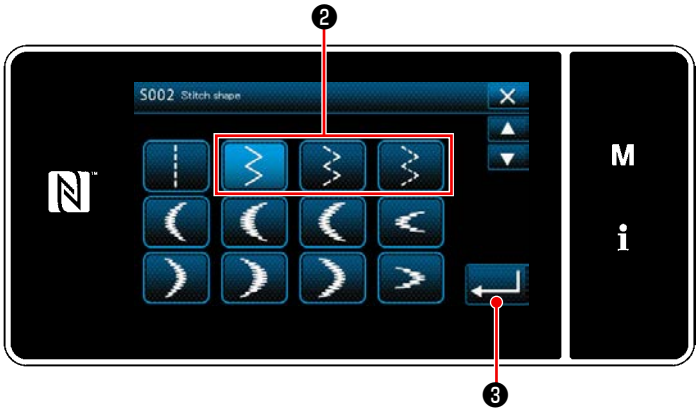
- Zigzag width can be set from “0” to 10 mm. (Set value is limited by the max. zigzag width limitation.)
- Stitch base line can be set as follows. When the center of zigzag is “0.0”, Right side: “+” Left side : “–”.

5-3-1. 2-step zigzag, 3-step zigzag and 4-step zigzag stitch



<Sewing screen (Maintenance personnel mode)>

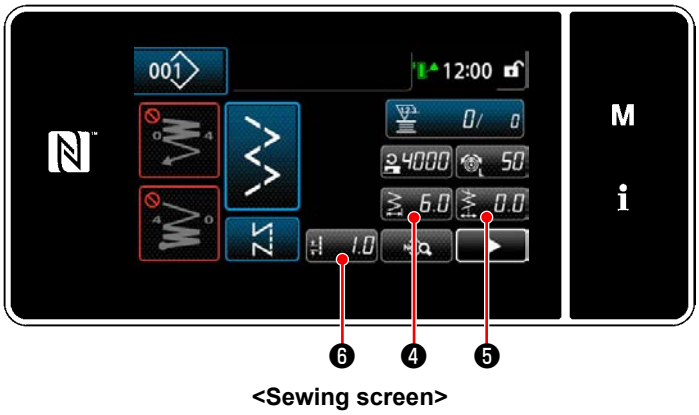
1) Press ❶ on the sewing screen under the maintenance personnel mode. "Sewing shape selection screen" is displayed.



<Sewing shape selection screen>

2) Select 2-step (3-step or 4-step) zigzag stitch ❷.

3) When ❸ is pressed, the selection you have made is confirmed and the screen is returned to the "sewing screen".



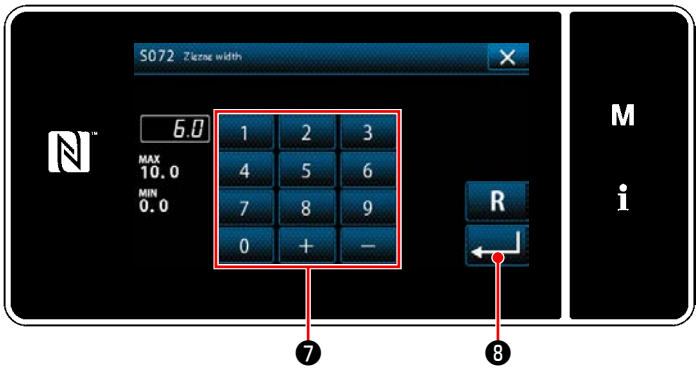
<Sewing screen>

4) Setting the zigzag width, stitch baseline and stitch length.

* For a pattern other than the zigzag stitch pattern, the zigzag width, stitch baseline and stitch length can be set following the same steps of procedure.

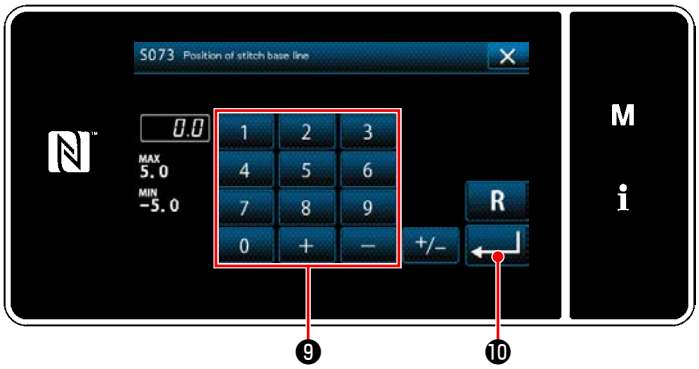
[Setting the zigzag width]

- Press 6.0 ❹ on the sewing screen.
  The "Zigzag width input screen" is displayed.



<Zigzag width input screen>

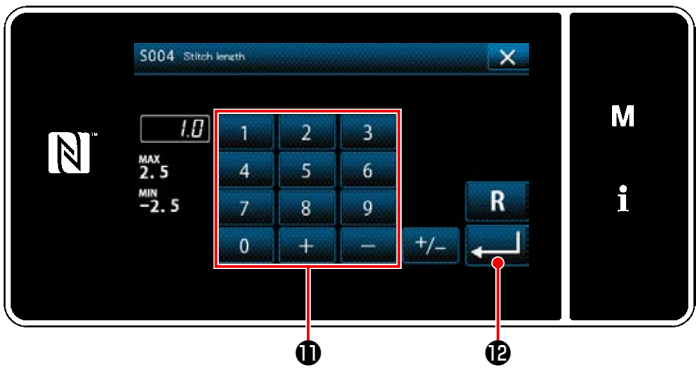
- Enter the zigzag width with numeric keypad ❼ . (0.0 to 10.0)
- When ↵ ❽ is pressed, the entered value is confirmed and the screen is returned to the "Sewing screen".



<Stitch baseline input screen>

[Setting of the position of stitch base line]

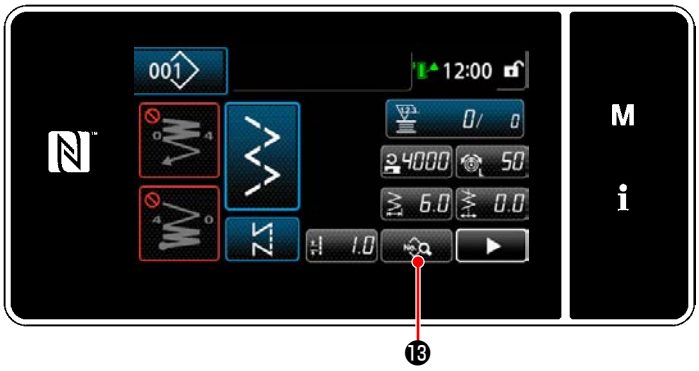
- Press 0.0 ❺ on the sewing screen.
  The "Stitch baseline input screen" is displayed.
- Enter the stitch baseline position with numeric keypad ❾ . (-5.0 to 5.0)
- When ↵ ❿ is pressed, the entered value is confirmed and the screen is returned to the "Sewing screen".



<Stitch length input screen>

[Setting the stitch length]

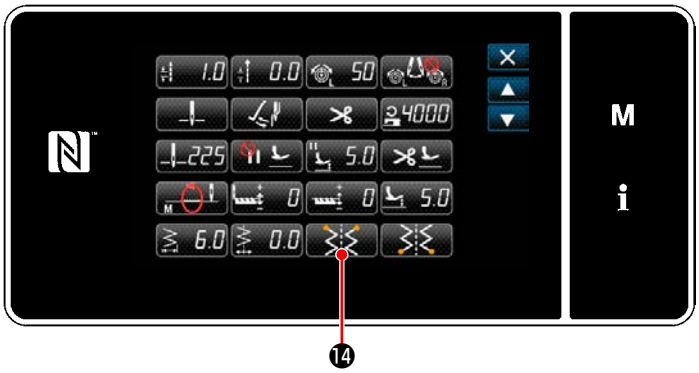
- Press 1.0 ❻ on the sewing screen.
  The "Stitch length input screen" is displayed.
- Enter the stitch length with numeric keypad ⓫ . (-2.5 to 2.5)
- When ↵ ⓬ is pressed, the entered value is confirmed and the screen is returned to the "Sewing screen".



<Sewing screen>

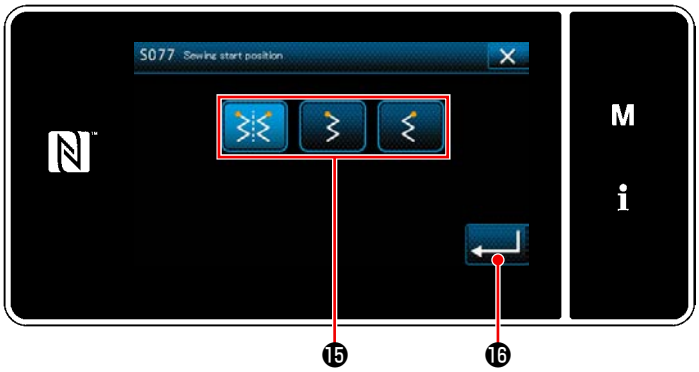
5) Setting of the position of sewing start.

- Press ⓭ on the sewing screen.
  The "Sewing data edit screen" is displayed.



<Sewing data edit screen>

- When ⓮ is pressed, the "Sewing starting position selection screen" is displayed.



<Sewing starting position selection screen>

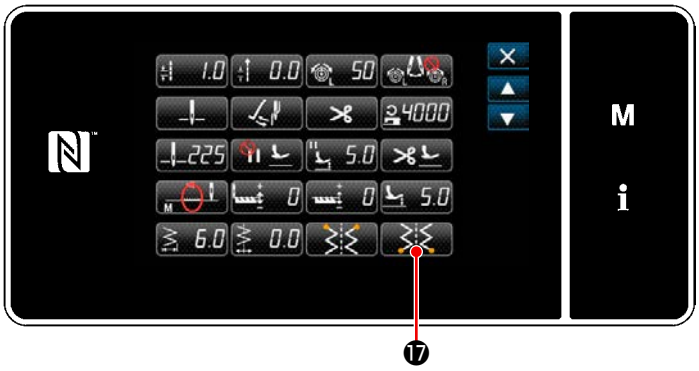
- Select the sewing starting position ⓯ .

: Sewing starting position, optional

: Sewing starting position, left

: Sewing starting position, right

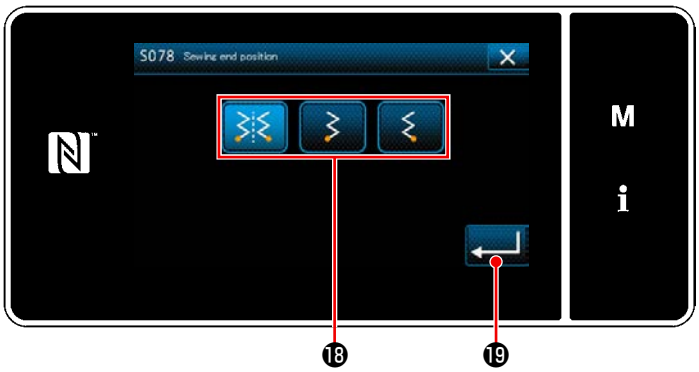
- When ⓰ is pressed, the entered value is confirmed and the screen is returned to the "Sewing data edit screen".



<Sewing data edit screen>

6) Setting the sewing end position.

- Press ⓱ on the sewing data edit screen "Sewing end position selection screen" is displayed.



<Sewing end position selection screen>

- Select the sewing end position ⓲ .

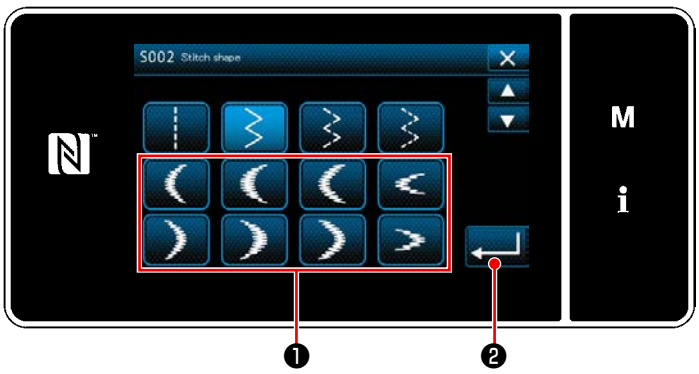
: Sewing end position, optional

: Sewing end position, left

: Sewing end position, right

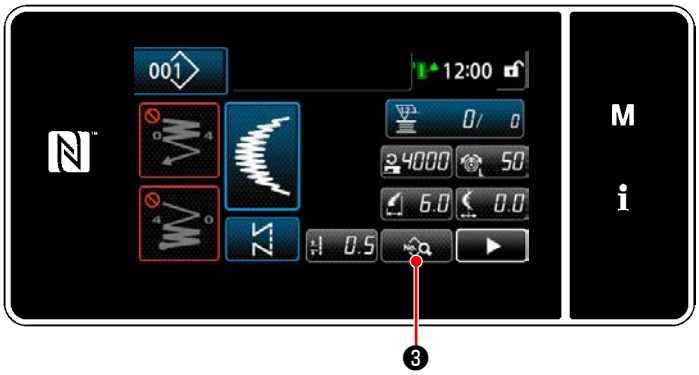
- When ⓳ is pressed, the entered value is confirmed and the screen is returned to the "Sewing data edit screen".

5-3-2. Scallop stitching



<Sewing shape selection screen>

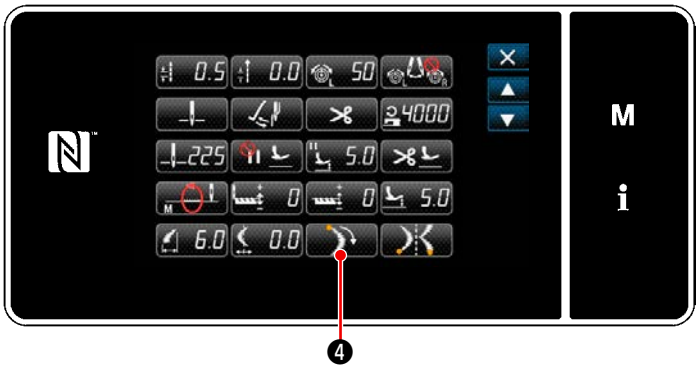
1) Select scallop stitch ❶ on the sewing shape selection screen.
2) When  ❷ is pressed, the entered value is confirmed and the screen is returned to the "Sewing screen".



<Sewing screen>

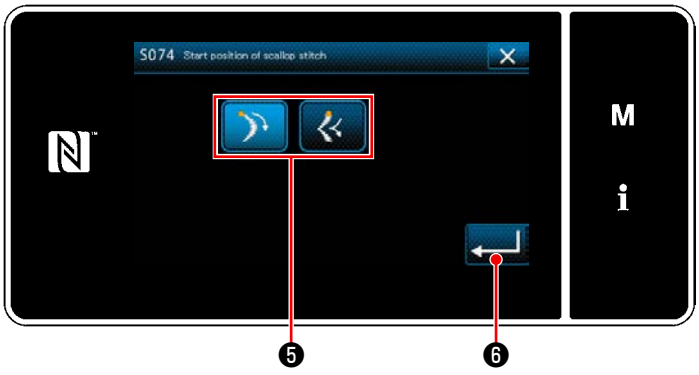
3) Setting of the position of sewing start.
   - Press  ❸ on the sewing screen.
     The "Sewing data edit screen" is displayed.

* Refer to **"5-3-1. 4) Setting the zigzag width, stitch baseline and stitch length." p. 78** for the zigzag width, stitch baseline position and stitch length.



<Sewing data edit screen>

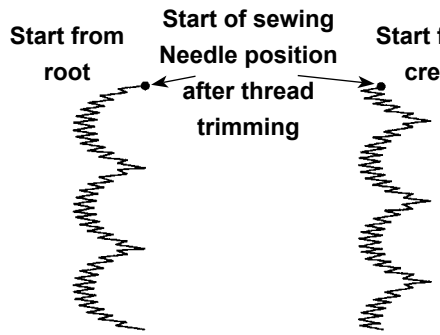
- When  ❹ is pressed, the "Scallop stitch starting position selection screen" is displayed.



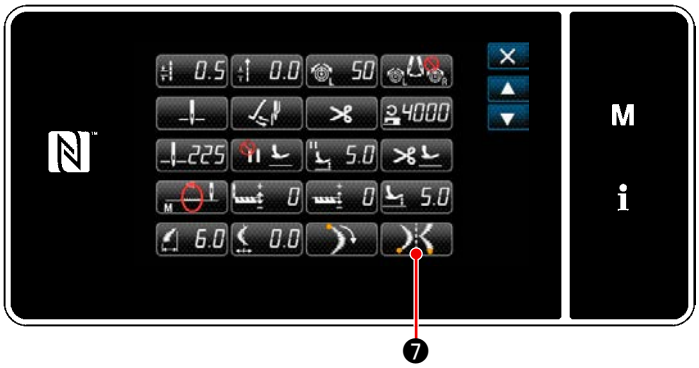
<Scallop stitch starting position selection screen>

- Select scallop stitch starting position ❺ .
   : Scallop stitch starting position, bottom
   : Scallop stitch starting position, apex
- When  ❻ is pressed, the entered value is confirmed and the screen is returned to the "Sewing data edit screen".

● **Start from crest and start from root of scallop**



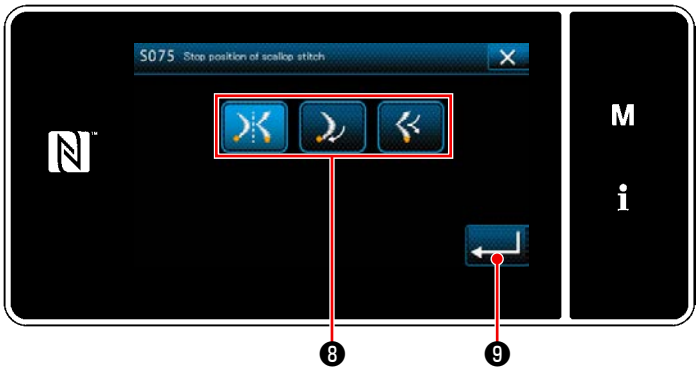
Normally, scallop starts the sewing with the pattern of start from root. However, start from crest can be selected by changing the setting.



<Sewing data edit screen>

4) Setting the sewing end position.

- Press ❼ on the sewing data edit screen "Scallop stitch stop position selection screen" is displayed.



<Scallop stitch stop position selection screen>

- Select the scallop stitch end position ❽.

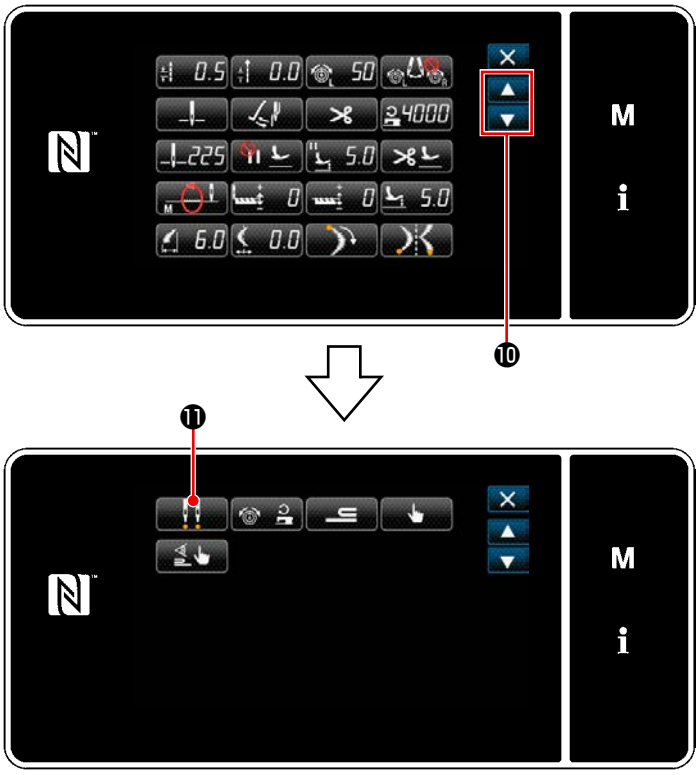
  : Sewing starting position, optional

  : Sewing starting position, bottom

  : Sewing starting position, apex

- When ❾ is pressed, the entered value is confirmed and the screen is returned to the "Sewing data edit screen".

Refer to "4-9. Mirror stitching" p. 37 for the mirror stitching.

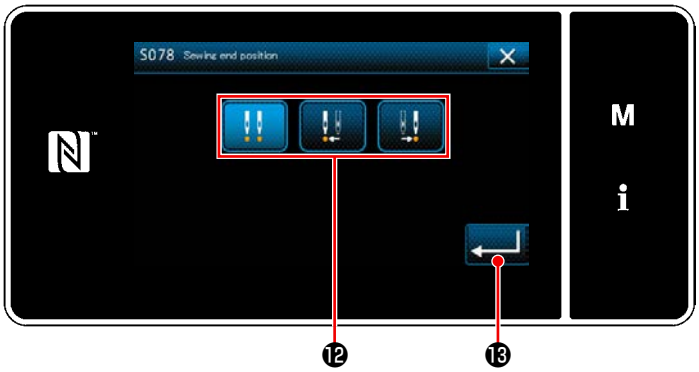


<Sewing data edit screen>

5) Setting the sewing end position.

- Press ▲▼ ❿ to proceed to the next page.

- Press ❶❶ ⓫ on the sewing data edit screen "Sewing end position selection screen" is displayed.



<Sewing end position selection screen>

- Select the sewing end position ⓬ .

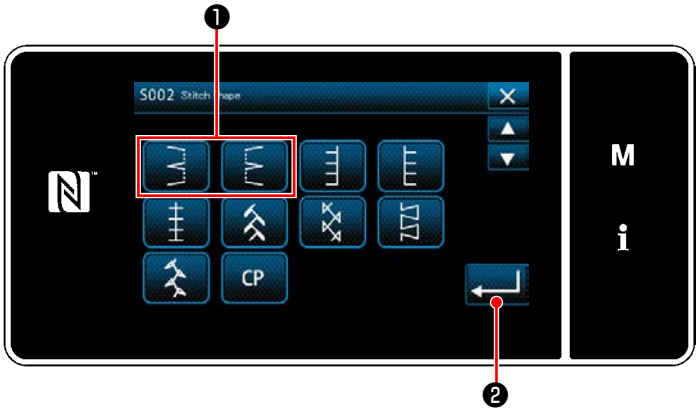
  ❶❶ : Sewing end position, optional

  ❶❶ : Sewing end position, left

  ❶❶ : Sewing end position, right

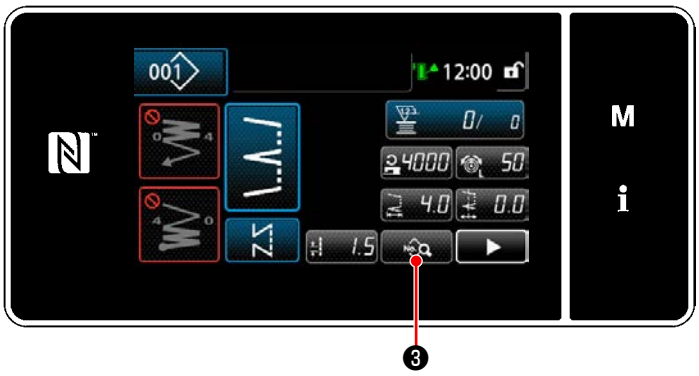
- When ↵ ⓭ is pressed, the entered value is confirmed and the screen is returned to the "Sewing data edit screen".

5-3-3. Blind stitch sewing



<Sewing shape selection screen>

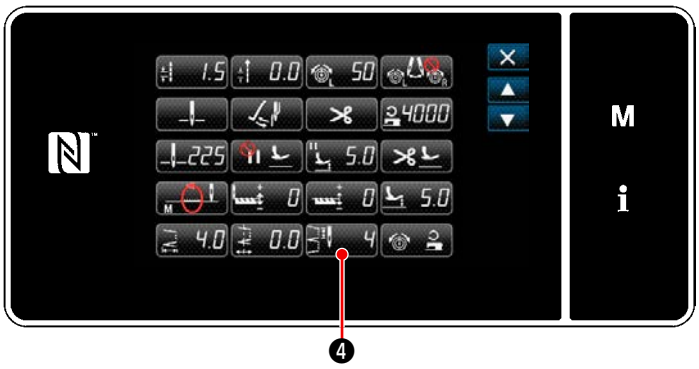
1) Select blind stitch ❶ on the sewing shape selection screen.
2) When  ❷ is pressed, the entered value is confirmed and the screen is returned to the "Sewing screen".



<Sewing screen>

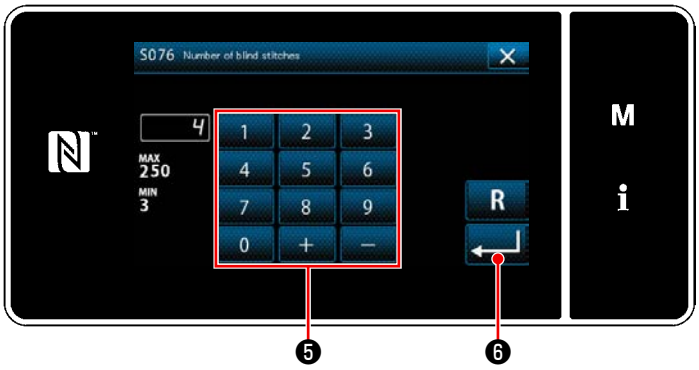
3) Setting the number of blind stitches.
   - Press  ❸ on the sewing screen.
     The "Sewing data edit screen" is displayed.

* Refer to **"5-3-1. 4) Setting the zigzag width, stitch baseline and stitch length." p. 78** for the zigzag width, stitch baseline position and stitch length.



<Sewing data edit screen>

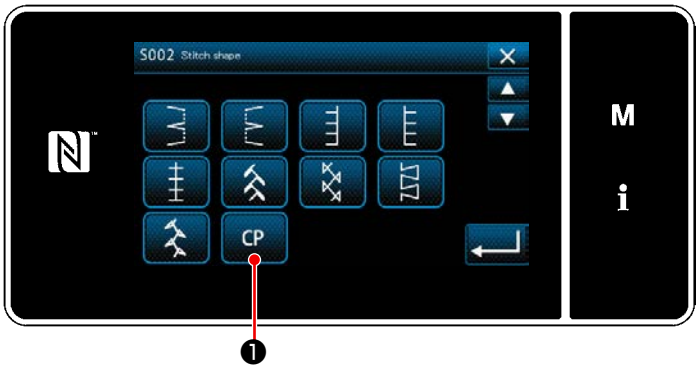
- When  ❹ is pressed, the "Number of blind stitches input screen" is displayed.



<Number of blind stitches input screen>

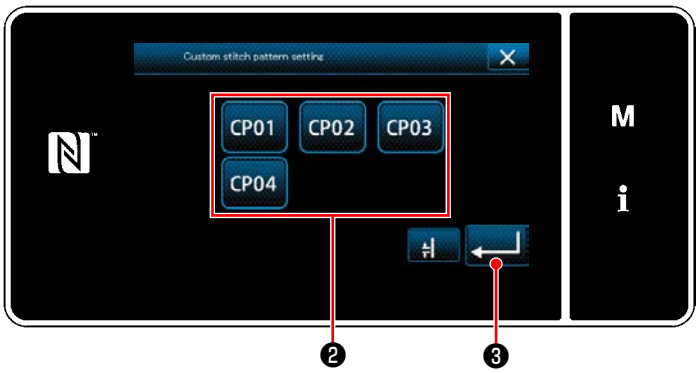
- Enter the number of blind stitching with numeric keypad ❺ . (3 to 250)
- When  ❻ is pressed, the entered value is confirmed and the screen is returned to the "Sewing data edit screen".

5-3-4. Custom pattern stitching



<Sewing shape selection screen>

1) Press CP ❶ on the sewing shape selection screen.
The "Custom pattern setting screen" is displayed.



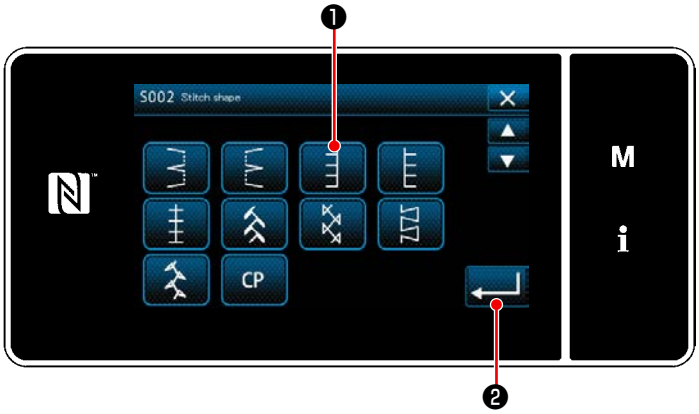
<Custom pattern setting screen>

2) Select custom pattern ❷ .

3) When ↵ ❸ is pressed, the entered value is confirmed and the screen is returned to the "Sewing screen".

* Refer to **"8-5. Custom pattern" p. 158** for details of the custom pattern.

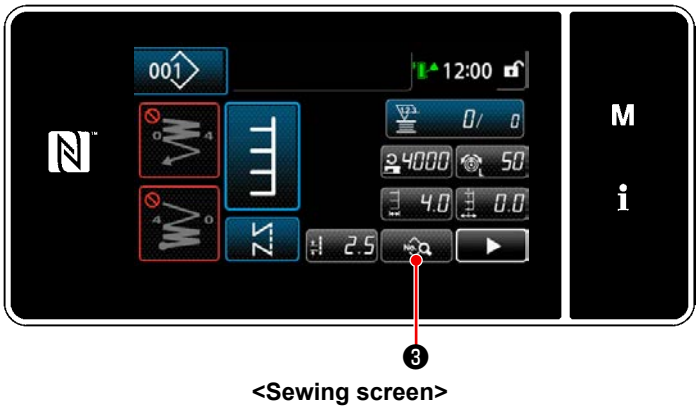
5-3-5. T stitch, left



<Sewing shape selection screen>

1) Select T stitch, left ❶ on the sewing shape selection screen.

2) When ↵ ❷ is pressed, the entered value is confirmed and the screen is returned to the "Sewing screen".

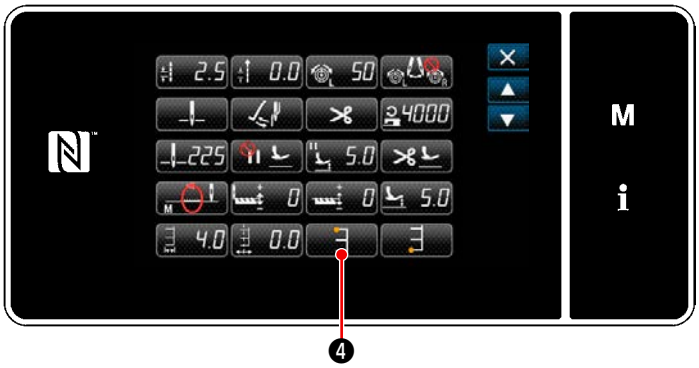


<Sewing screen>

3) Setting of the position of sewing start.

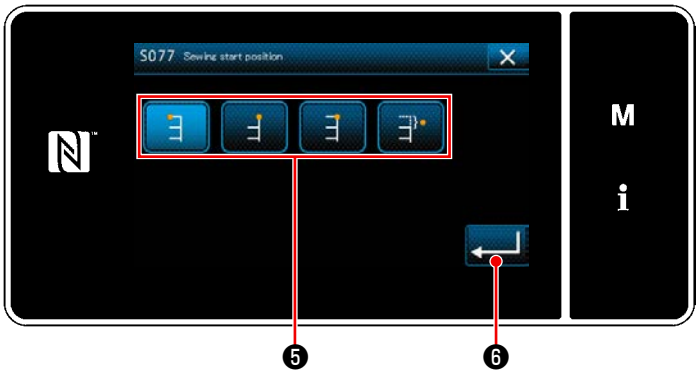
- Press ❸ on the sewing screen.
The "Sewing data edit screen" is displayed.

* Refer to **"5-3-1. 4) Setting the zigzag width, stitch baseline and stitch length." p. 78** for the zigzag width, stitch baseline position and stitch length.



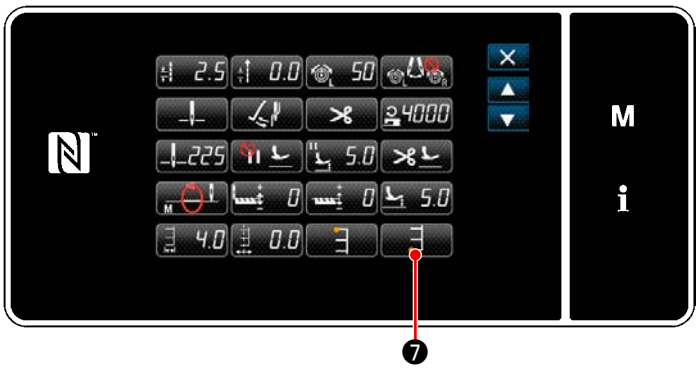
<Sewing data edit screen>

- When ❹ is pressed, the "Sewing starting position selection screen" is displayed.



<Sewing starting position selection screen>

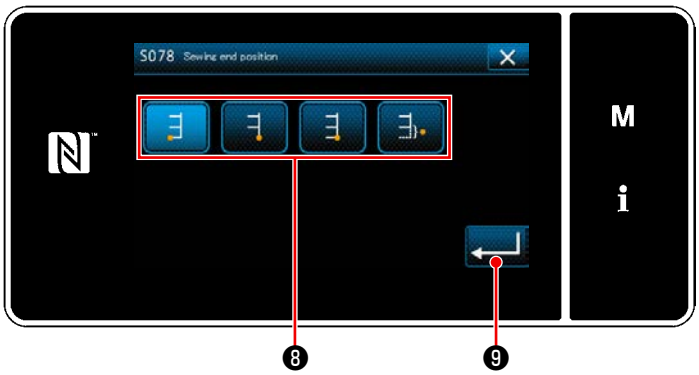
- Select the sewing starting position ❺.
  - : Sewing starting position, left
  - : Sewing starting position, right 1
  - : Sewing starting position, right 2
  - : Sewing starting position, optional
- When ❻ is pressed, the entered value is confirmed and the screen is returned to the "Sewing data edit screen".



<Sewing data edit screen>

4) Setting the sewing end position.

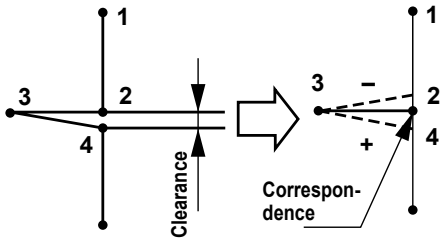
- Press ❼ on the sewing data edit screen "Sewing end position selection screen" is displayed.

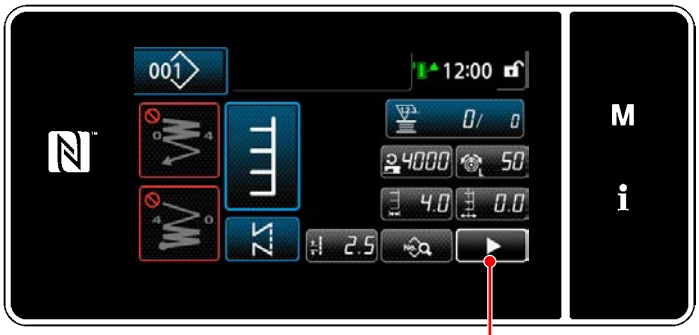


<Sewing end position selection screen>

- Select the sewing end position ❽.
  - : Sewing end position, left
  - : Sewing end position, right 1
  - : Sewing end position, right 2
  - : Sewing end position, optional
- When ❾ is pressed, the entered value is confirmed and the screen is returned to the "Sewing data edit screen".

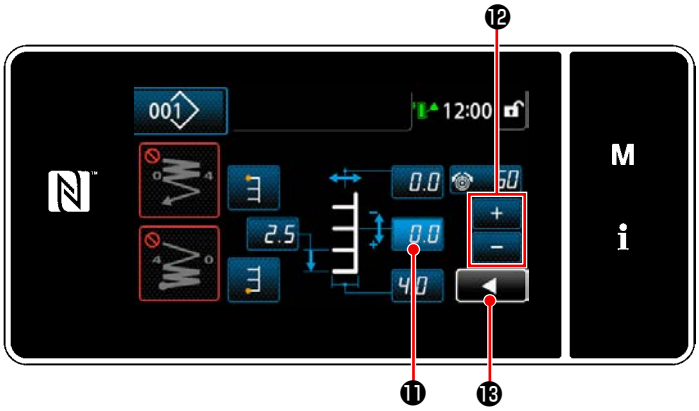
The feed amount cannot be set to 0 and the T stitch pattern may be deformed due to materials, height of fed dog or gauges. (2nd stitch does not correspond with 4th stitch.)
In this case, carry out correction following the steps of procedure described below so as to align the needle entry positions of the second and fourth stitches in the case the feed amount is 0 (zero).





<Sewing screen>

5) Press ▶ ❿ on the sewing screen.
The "Second sewing screen" is displayed.

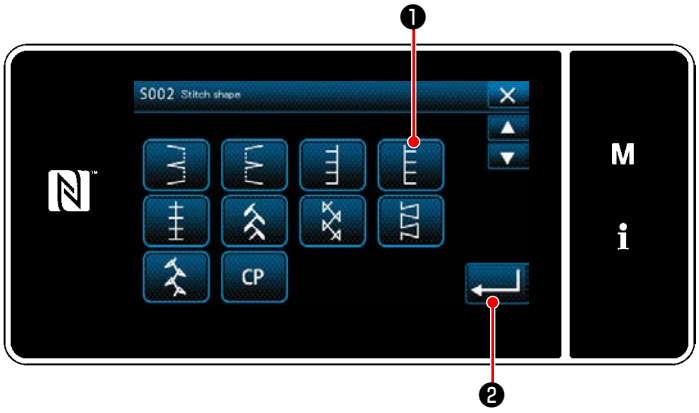


<Second sewing screen>

6) When 0.0 ⓫ is pressed, + – ⓬ is displayed. Now, enter a correction value.

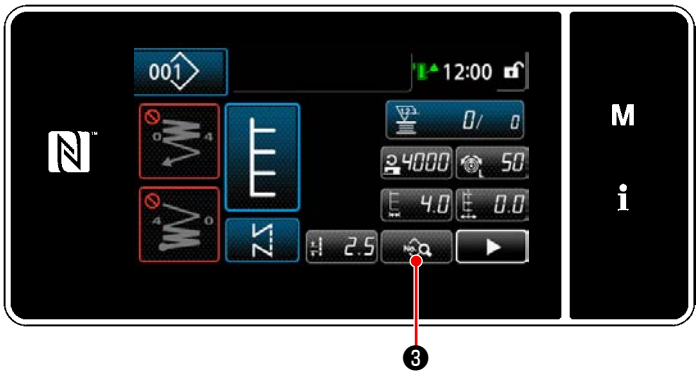
7) When ◀ ⓭ is pressed, the entered value is confirmed and the screen is returned to the "Sewing screen".

5-3-6. T stitch, right



<Sewing shape selection screen>

1) Select T stitch, right ❶ on the sewing shape selection screen.
2) When ↵ ❷ is pressed, the entered value is confirmed and the screen is returned to the "Sewing screen".

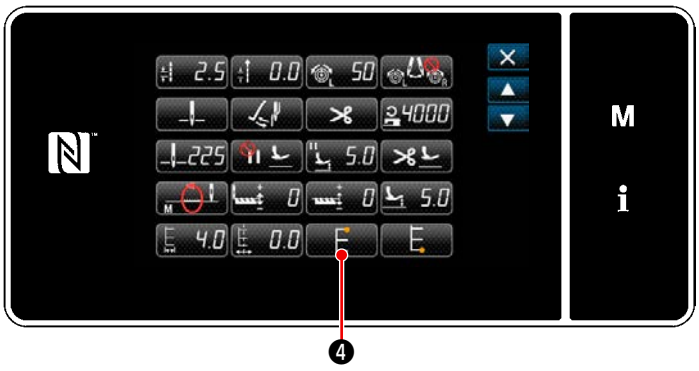


<Sewing screen>

3) Setting of the position of sewing start.

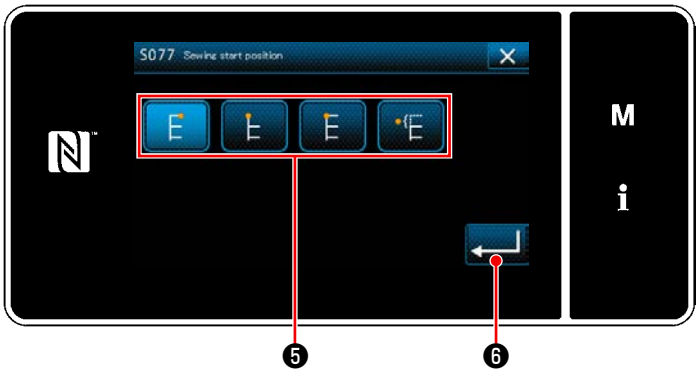
- Press ❸ on the sewing screen.
  The "Sewing data edit screen" is displayed.

* Refer to **"5-3-1. 4) Setting the zigzag width, stitch baseline and stitch length." p. 78** for the zigzag width, stitch baseline position and stitch length.



<Sewing data edit screen>

- When ❹ is pressed, the "Sewing starting position selection screen" is displayed.



<Sewing starting position selection screen>

- Select the sewing starting position ❺

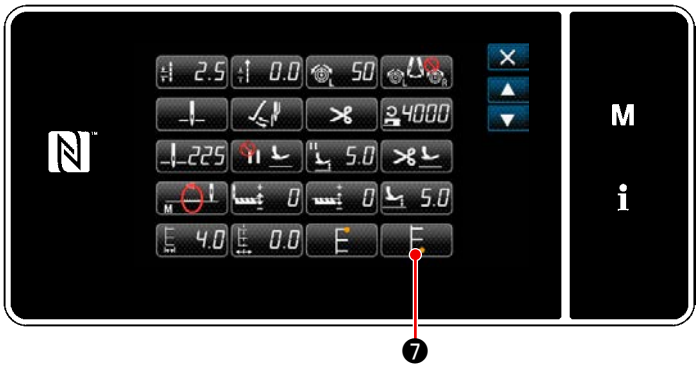
  : Sewing starting position, left

  : Sewing starting position, right 1

  : Sewing starting position, right 2

  : Sewing starting position, optional

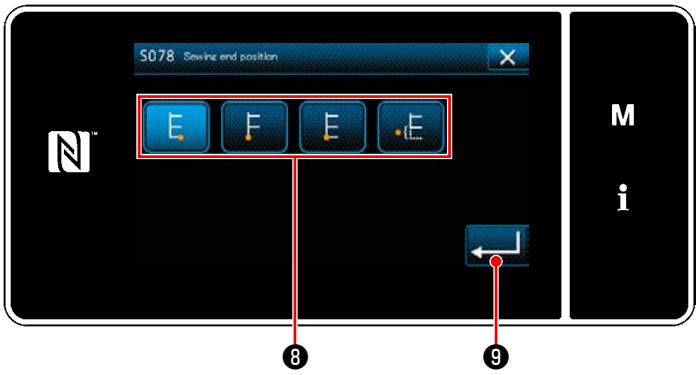
- When ❻ is pressed, the entered value is confirmed and the screen is returned to the "Sewing data edit screen".



<Sewing data edit screen>

4) Setting the sewing end position.

- Press ❼ on the sewing data edit screen "Sewing end position selection screen" is displayed.



<Sewing end position selection screen>

- Select the sewing end position ❽ .

  : Sewing end position, left

  : Sewing end position, right 1

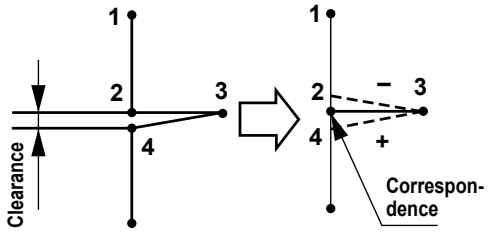
  : Sewing end position, right 2

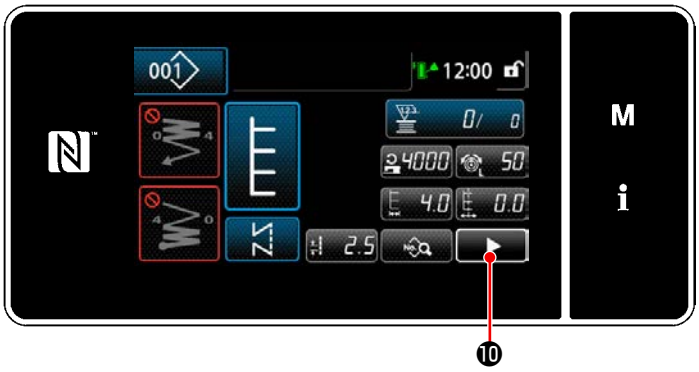
  : Sewing end position, optional

- When ❾ is pressed, the entered value is confirmed and the screen is returned to the "Sewing data edit screen".

Caution

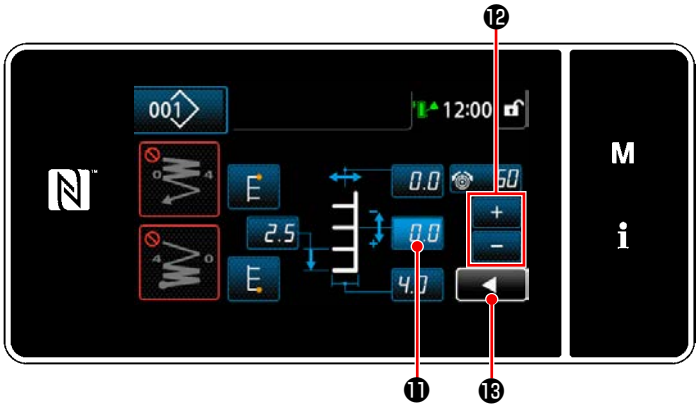
The feed amount cannot be set to 0 and the T stitch pattern may be deformed due to materials, height of fed dog or gauges. (2nd stitch does not correspond with 4th stitch.)
In this case, carry out correction following the steps of procedure described below so as to align the needle entry positions of the second and fourth stitches in the case the feed amount is 0 (zero).





<Sewing screen>

5) Press ▶ ❿ on the sewing screen.
The "Second sewing screen" is displayed.

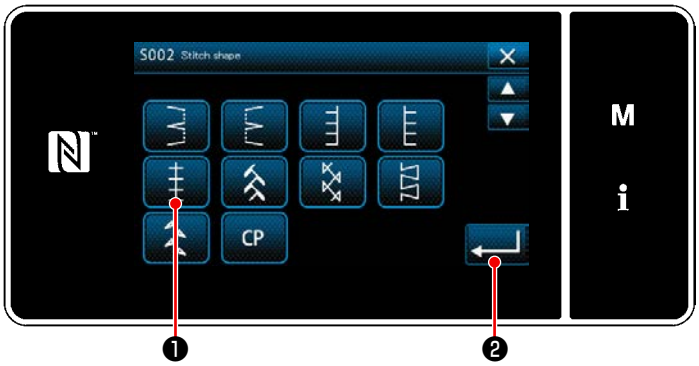


<Second sewing screen>

6) When 0.0 ⓫ is pressed, + – ⓬ is displayed. Now, enter a correction value.

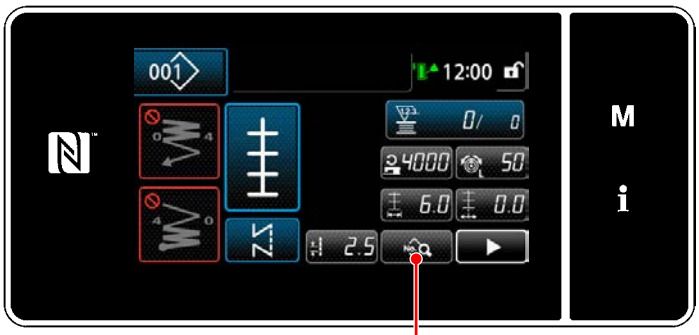
7) When ◀ ⓭ is pressed, the entered value is confirmed and the screen is returned to the "Sewing screen".

5-3-7. Pattern 1



<Sewing shape selection screen>

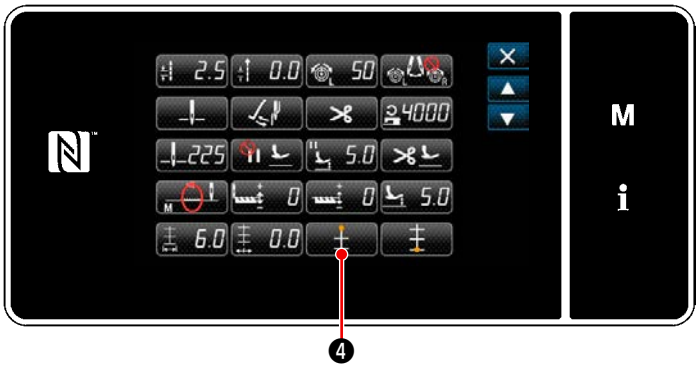
1) Select pattern 1 stitch ❶ on the sewing shape selection screen.
2) When  ❷ is pressed, the entered value is confirmed and the screen is returned to the "Sewing screen".



<Sewing screen>

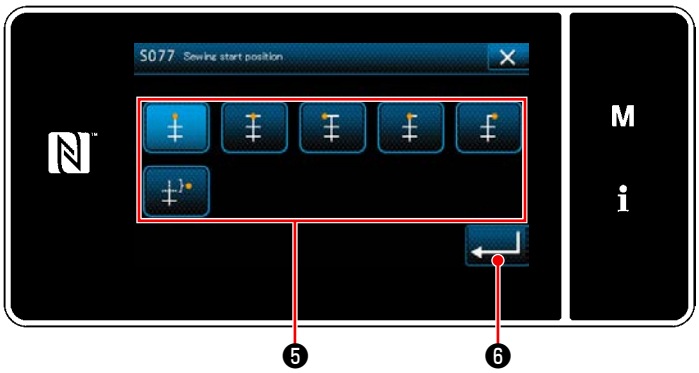
3) Setting of the position of sewing start.
   - Press  ❸ on the sewing screen.
     The "Sewing data edit screen" is displayed.

* Refer to **"5-3-1. 4) Setting the zigzag width, stitch baseline and stitch length." p. 78** for the zigzag width, stitch baseline position and stitch length.



<Sewing data edit screen>

- When  ❹ is pressed, the "Sewing starting position selection screen" is displayed.



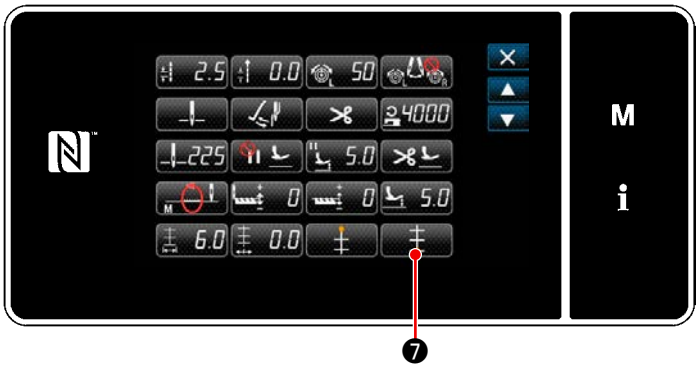
<Sewing starting position selection screen>

- Select the sewing starting position ❺ .
  -  : Sewing starting position, center 1
  -  : Sewing starting position, center 2
  -  : Sewing starting position, left
  -  : Sewing starting position, center 3
  -  : Sewing starting position, right
  -  : Sewing starting position, optional

Reference

In the case of "Sewing starting position, optional", the sewing machine starts sewing from the next needle entry after the completion of thread trimming.

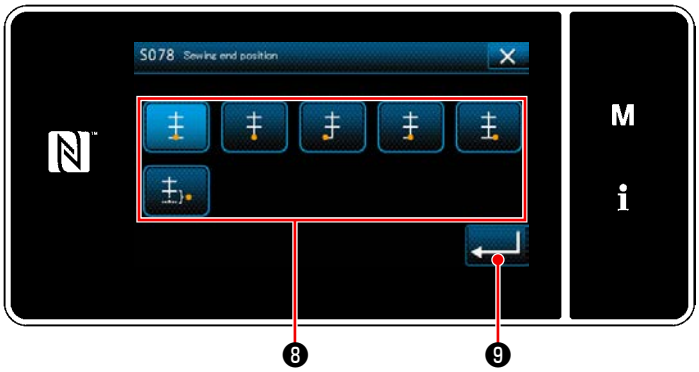
- When  ❻ is pressed, the entered value is confirmed and the screen is returned to the "Sewing data edit screen".



<Sewing data edit screen>

4) Setting the sewing end position.

- Press ❼ is pressed, the "Sewing starting position selection screen" is displayed.



<Sewing starting position selection screen>

- Select the sewing end position ❽ .

: Sewing end position, center 1

: Sewing end position, center 2

: Sewing end position, left

: Sewing end position, center 3

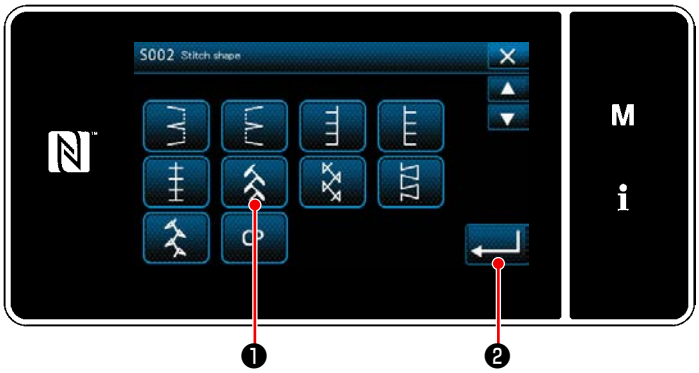
: Sewing end position, right

: Sewing end position, optional

- When ❾ is pressed, the entered value is confirmed and the screen is returned to the "Sewing data edit screen".

5-3-8. Pattern 2 (fagoting)

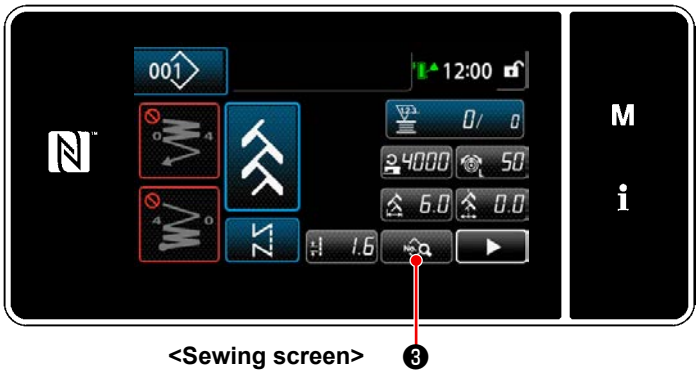
When performing fagoting sewing, exclusive gauge is necessary.
Refer to "4-10. Fagot stitch" p. 39.



<Sewing shape selection screen>

1) Select pattern 2 stitch ❶ on the sewing shape selection screen.
2) When  ❷ is pressed, the entered value is confirmed and the screen is returned to the "Sewing screen".

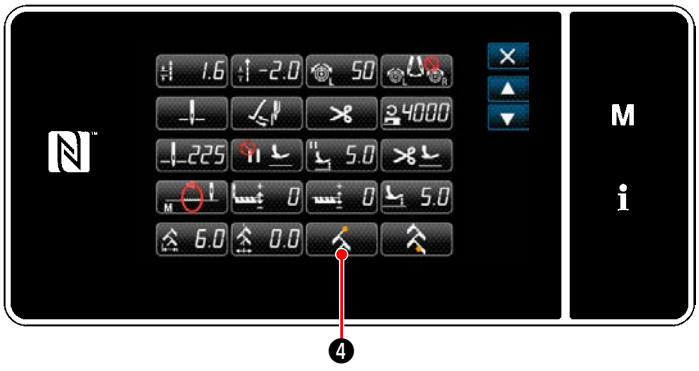
Feed amount becomes "0" when the hand switch is pressed.



<Sewing screen>

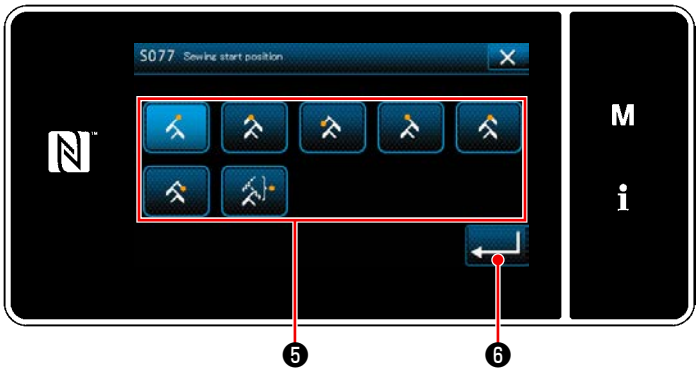
3) Setting of the position of sewing start.
   - Press  ❸ on the sewing screen.
     The "Sewing data edit screen" is displayed.

* Refer to **"5-3-1. 4) Setting the zigzag width, stitch baseline and stitch length." p. 78** for the zigzag width, stitch baseline position and stitch length.



<Sewing data edit screen>

- When  ❹ is pressed, the "Sewing starting position selection screen" is displayed.



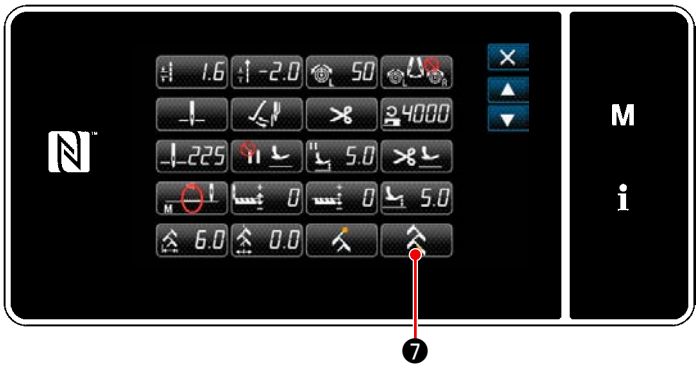
<Sewing starting position selection screen>

- Select the sewing starting position ❺.
  - : Sewing starting position, right 1
  - : Sewing starting position, center 1
  - : Sewing starting position, left 1
  - : Sewing starting position, left 2
  - : Sewing starting position, center 2
  - : Sewing starting position, right 2
  - : Sewing starting position, optional

Reference

In the case of "Sewing starting position, optional", the sewing machine starts sewing from the next needle entry after the completion of thread trimming.

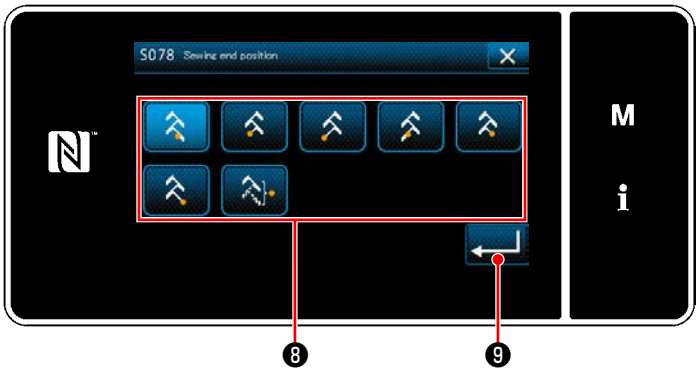
- When ❻ is pressed, the entered value is confirmed and the screen is returned to the "Sewing data edit screen".



<Sewing data edit screen>

4) Setting the sewing end position.

- Press ❼ on the sewing data edit screen "Sewing end position selection screen" is displayed.

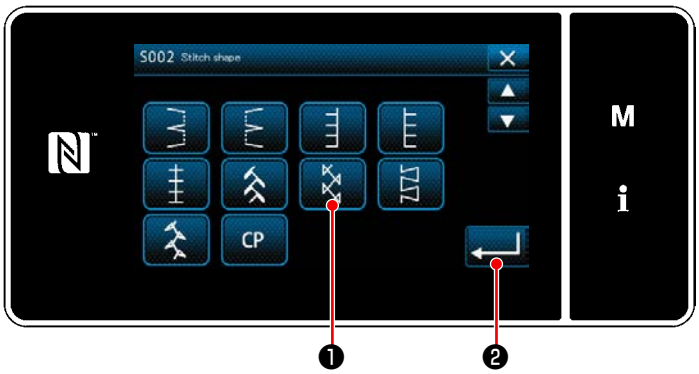


<Sewing end position selection screen>

- Select the sewing end position ❽.
  - : Sewing end position, right 1
  - : Sewing end position, center 1
  - : Sewing end position, left 1
  - : Sewing end position, left 2
  - : Sewing end position, center 2
  - : Sewing end position, right 2
  - : Sewing end position, optional

- When ❾ is pressed, the entered value is confirmed and the screen is returned to the "Sewing data edit screen".

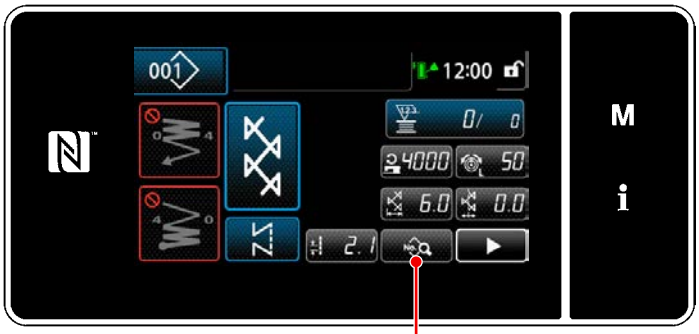
5-3-9. Pattern 3



<Sewing shape selection screen>

1) Select pattern 3 stitch ❶ on the sewing shape selection screen.
2) When  ❷ is pressed, the entered value is confirmed and the screen is returned to the "Sewing screen".

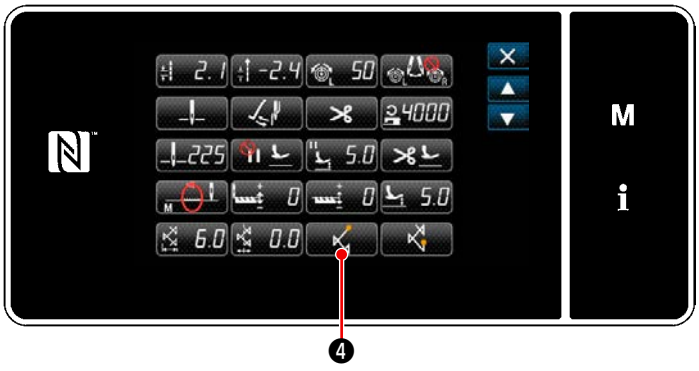
Caution **Feed amount becomes “0” when the hand switch is pressed.**



<Sewing screen>

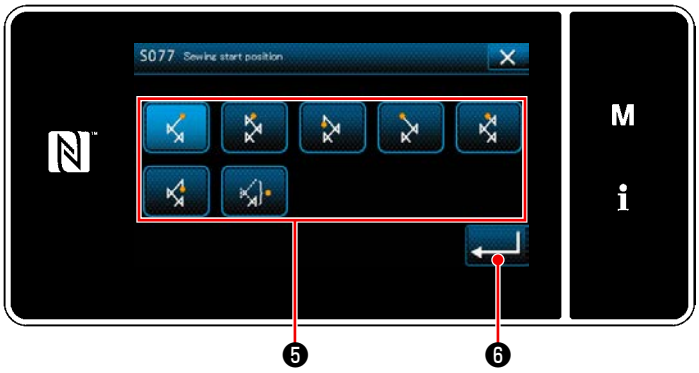
3) Setting of the position of sewing start.
   - Press  ❸ on the sewing screen.
     The "Sewing data edit screen" is displayed.

* Refer to **"5-3-1. 4) Setting the zigzag width, stitch baseline and stitch length." p. 78** for the zigzag width, stitch baseline position and stitch length.



<Sewing data edit screen>

- When  ❹ is pressed, the "Sewing starting position selection screen" is displayed.



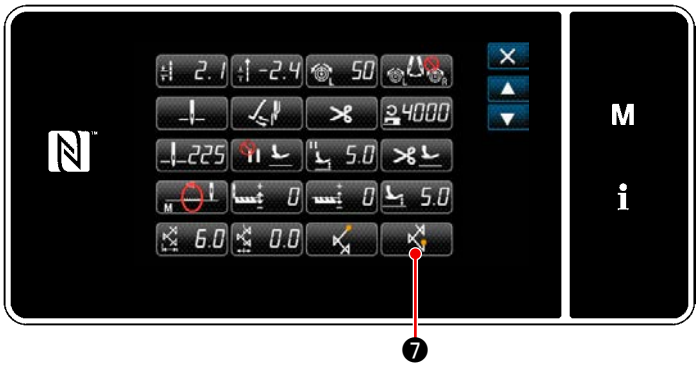
<Sewing starting position selection screen>

- Select the sewing starting position ❺.
  - : Sewing starting position, right 1
  - : Sewing starting position, center 1
  - : Sewing starting position, left 1
  - : Sewing starting position, left 2
  - : Sewing starting position, center 2
  - : Sewing starting position, right 2
  - : Sewing starting position, optional

Reference

In the case of "Sewing starting position, optional", the sewing machine starts sewing from the next needle entry after the completion of thread trimming.

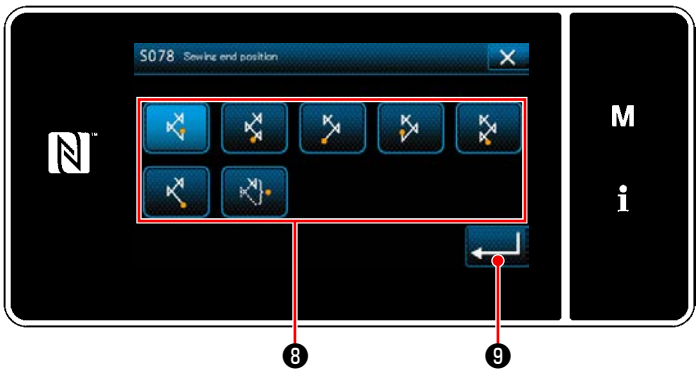
- When ❻ is pressed, the entered value is confirmed and the screen is returned to the "Sewing data edit screen".



<Sewing data edit screen>

4) Setting the sewing end position.

- Press ❼ on the sewing data edit screen "Sewing end position selection screen" is displayed.

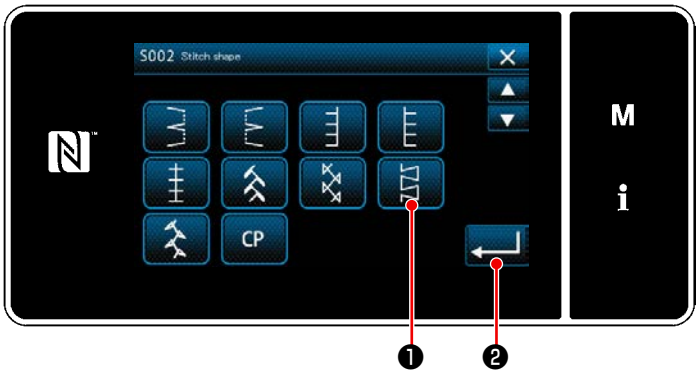


<Sewing end position selection screen>

- Select the sewing end position ❽.
  - : Sewing end position, right 1
  - : Sewing end position, center 1
  - : Sewing end position, left 1
  - : Sewing end position, left 2
  - : Sewing end position, center 2
  - : Sewing end position, right 2
  - : Sewing end position, optional

- When ❾ is pressed, the entered value is confirmed and the screen is returned to the "Sewing data edit screen".

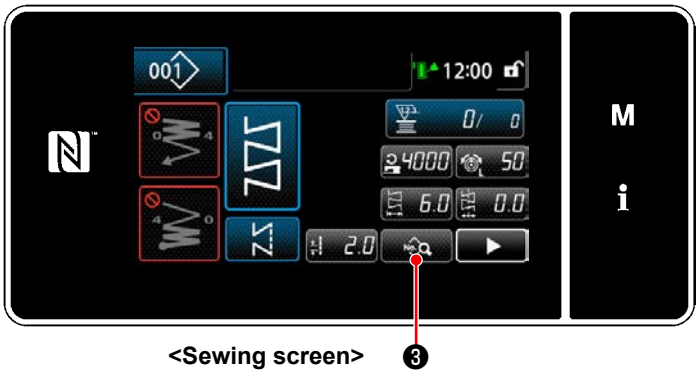
5-3-10. Pattern 4



<Sewing shape selection screen>

1) Select pattern 4 stitch ❶ on the sewing shape selection screen.
2) When  ❷ is pressed, the entered value is confirmed and the screen is returned to the "Sewing screen".

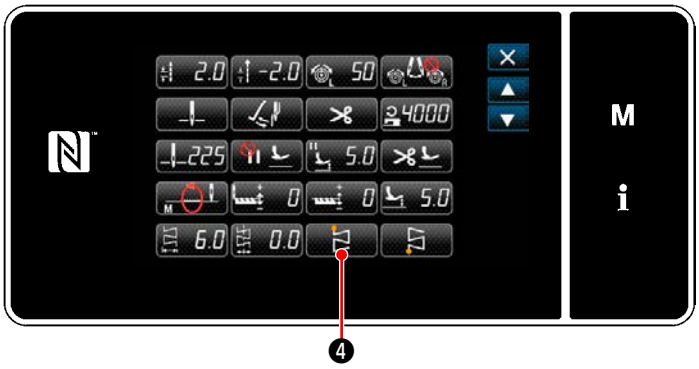
> **Caution** **Feed amount becomes “0” when the hand switch is pressed.**



<Sewing screen>

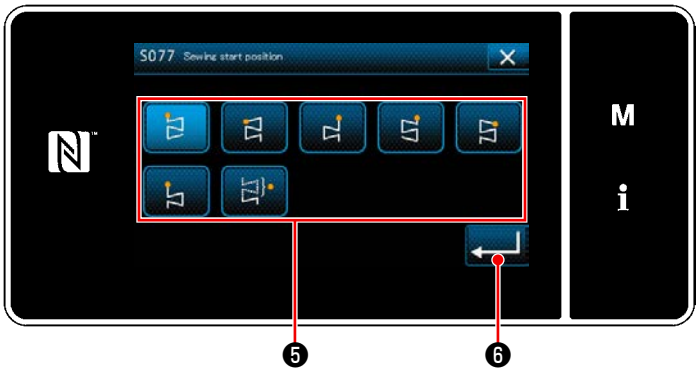
3) Setting of the position of sewing start.
   - Press  ❸ on the sewing screen.
     The "Sewing data edit screen" is displayed.

* Refer to **"5-3-1. 4) Setting the zigzag width, stitch baseline and stitch length." p. 78** for the zigzag width, stitch baseline position and stitch length.



<Sewing data edit screen>

- When  ❹ is pressed, the "Sewing starting position selection screen" is displayed.



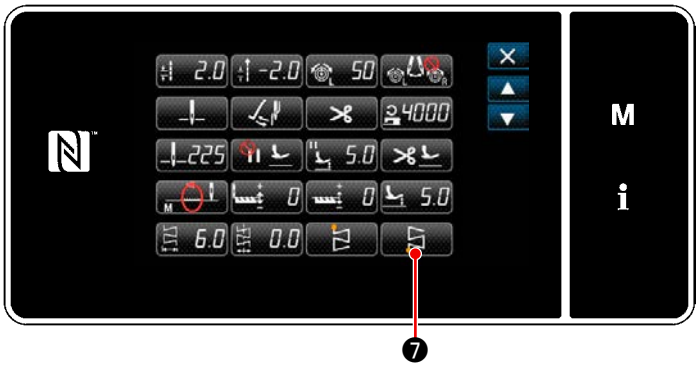
<Sewing starting position selection screen>

- Select the sewing starting position ❺.
  - : Sewing starting position, left 1
  - : Sewing starting position, left 2
  - : Sewing starting position, right 1
  - : Sewing starting position, right 2
  - : Sewing starting position, right 3
  - : Sewing starting position, left 3
  - : Sewing starting position, optional

Reference

In the case of "Sewing starting position, optional", the sewing machine starts sewing from the next needle entry after the completion of thread trimming.

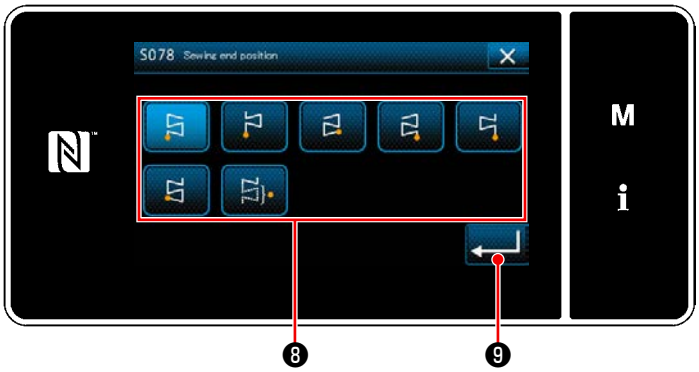
- When ❻ is pressed, the entered value is confirmed and the screen is returned to the "Sewing data edit screen".



<Sewing data edit screen>

4) Setting the sewing end position.

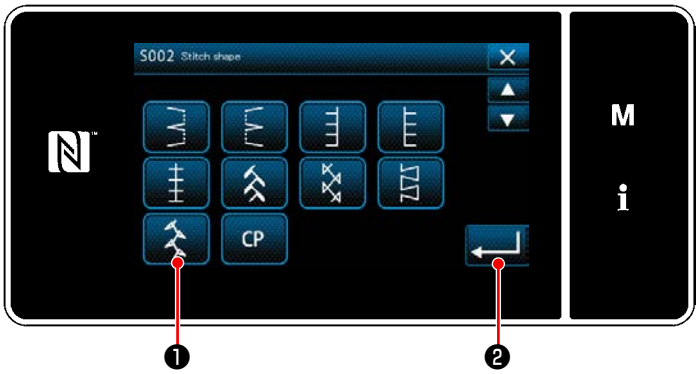
- Press ❼ on the sewing data edit screen "Sewing end position selection screen" is displayed.



<Sewing end position selection screen>

- Select the sewing end position ❽.
  - : Sewing end position, left 1
  - : Sewing end position, left 2
  - : Sewing end position, right 1
  - : Sewing end position, right 2
  - : Sewing end position, right 3
  - : Sewing end position, left 3
  - : Sewing end position, optional
- When ❾ is pressed, the entered value is confirmed and the screen is returned to the "Sewing data edit screen".

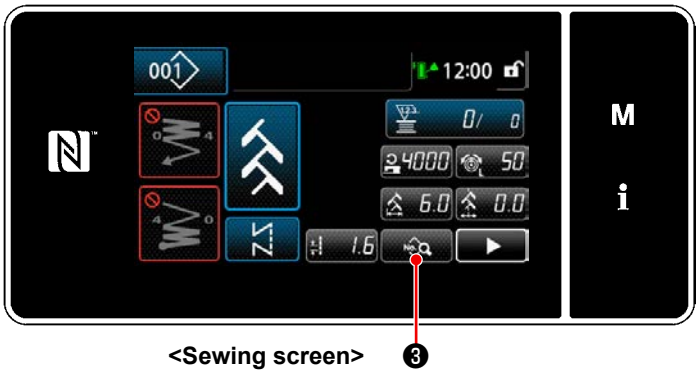
5-3-11. Pattern 5



<Sewing shape selection screen>

1) Select pattern 5 stitch ❶ on the sewing shape selection screen.
2) When  ❷ is pressed, the entered value is confirmed and the screen is returned to the "Sewing screen".

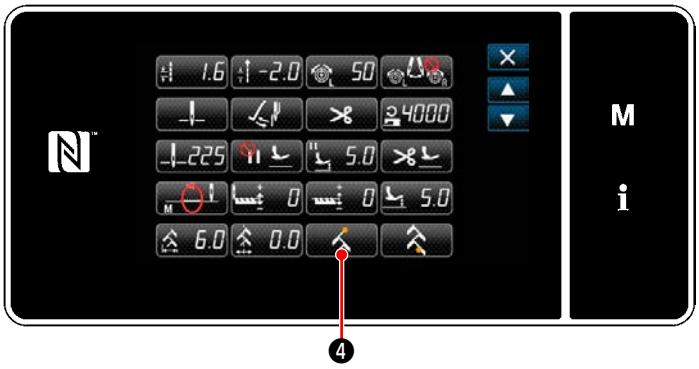
Caution **Feed amount becomes “0” when the hand switch is pressed.**



<Sewing screen>

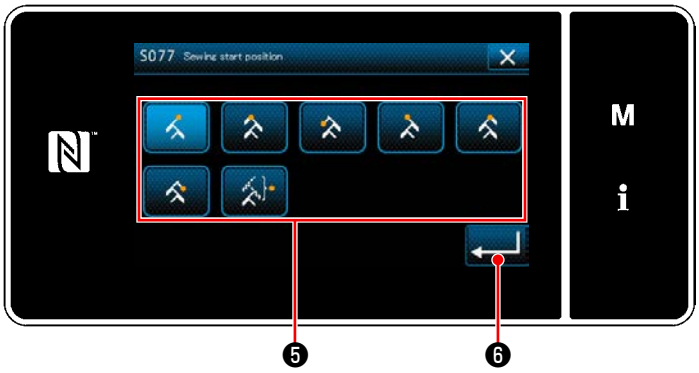
3) Setting of the position of sewing start.
   - Press  ❸ on the sewing screen.
     The "Sewing data edit screen" is displayed.

* Refer to **"5-3-1. 4) Setting the zigzag width, stitch baseline and stitch length." p. 78** for the zigzag width, stitch baseline position and stitch length.



<Sewing data edit screen>

- When  ❹ is pressed, the "Sewing starting position selection screen" is displayed.



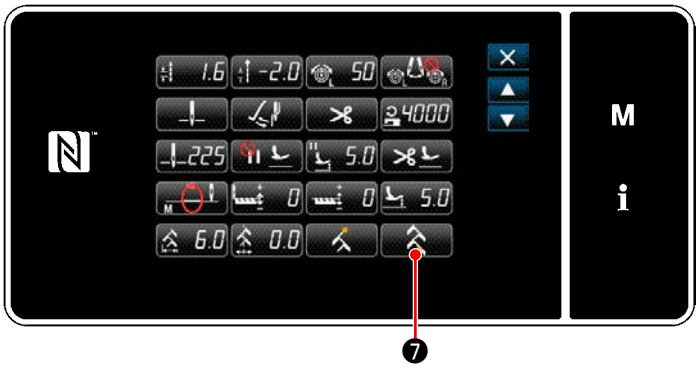
<Sewing starting position selection screen>

- Select the sewing starting position ❺.
  - : Sewing starting position, right 1
  - : Sewing starting position, center 1
  - : Sewing starting position, left 1
  - : Sewing starting position, left 2
  - : Sewing starting position, center 2
  - : Sewing starting position, right 2
  - : Sewing starting position, optional

Reference

In the case of "Sewing starting position, optional", the sewing machine starts sewing from the next needle entry after the completion of thread trimming.

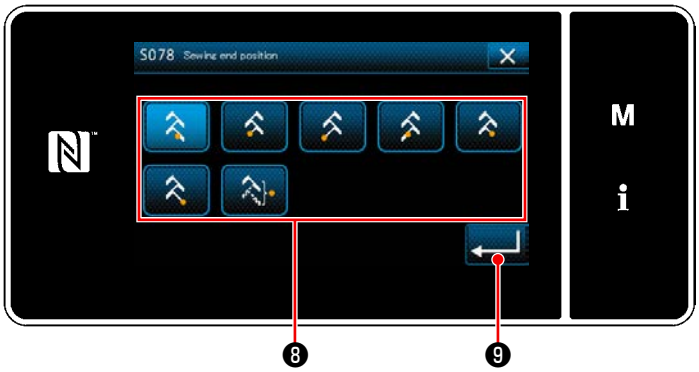
- When ❻ is pressed, the entered value is confirmed and the screen is returned to the "Sewing data edit screen".



<Sewing data edit screen>

4) Setting the sewing end position.

- Press ❼ on the sewing data edit screen "Sewing end position selection screen" is displayed.



<Sewing end position selection screen>

- Select the sewing end position ❽.
  - : Sewing end position, right 1
  - : Sewing end position, center 1
  - : Sewing end position, left 1
  - : Sewing end position, left 2
  - : Sewing end position, center 2
  - : Sewing end position, right 2
  - : Sewing end position, optional

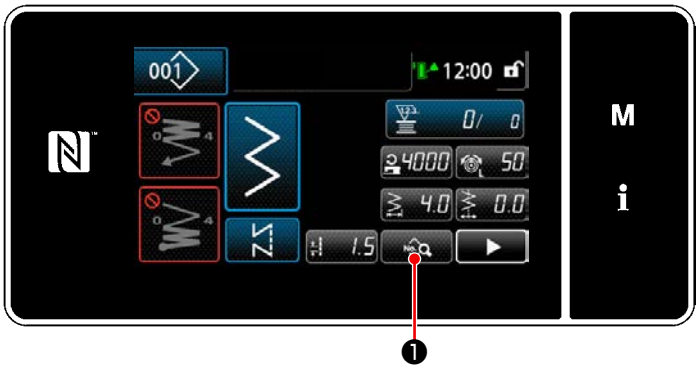
- When ❾ is pressed, the entered value is confirmed and the screen is returned to the "Sewing data edit screen".

5-4. Setting the feed locus

5-4-1. Adjusting the feed dog height

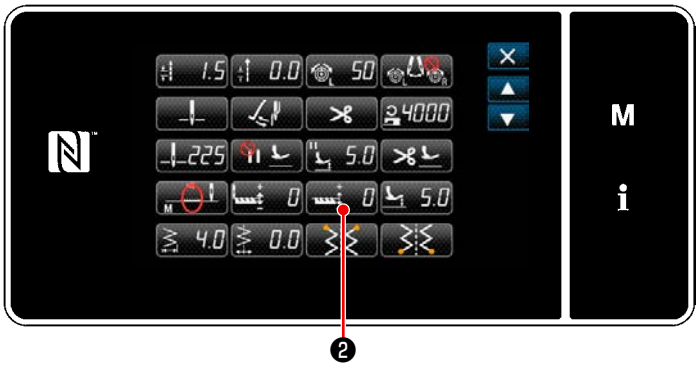
Caution

1. **Be aware that interference between the throat plate and feed dog can occur depending onthe gauge used. Be sure to check the clearance in the gauge to be used. (The clearancemust be 0.5 mm or more.)**
2. **When you have changed the stitch length, feed dog height or feed timing, run the sewingmachine at a low speed to make sure that the gauge does not interfere with the changedpart.**

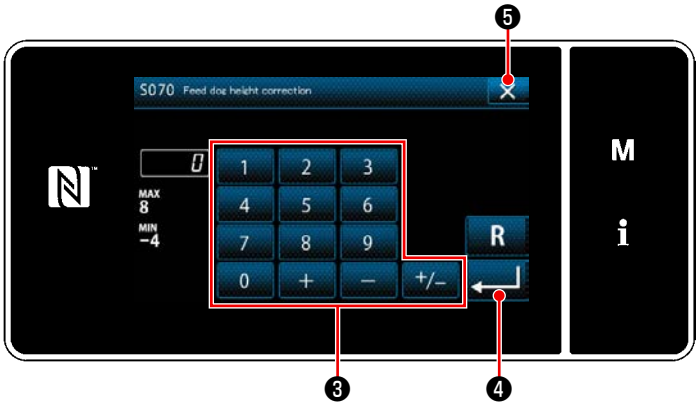


[How to adjust]

1) Display the sewing data edit screen bypressing ❶.



2) Display "S070 Feed dog height correction" by pressing ❷.



3) Change the feed dog height by pressing tenkeys and + − ❸.
   * Refer to the following for the adjustablerange of the feed dog height.
4) Confirm your entry by pressing ❹.
5) Display the sewing screen by pressing ❺.

Feed dog height (mm)	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70
Input value on the panel	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8

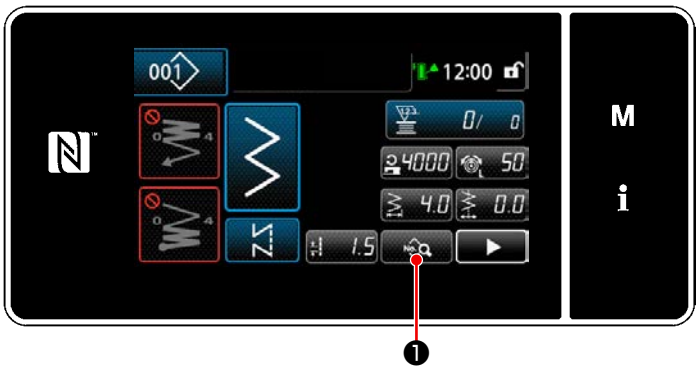
Low ←←← ↑ →→→ High

Standard
(Factory-setting at the time of shipment)

* Range of input values on the panel is from -4 to 8.

5-4-2. Operating timing of the feed

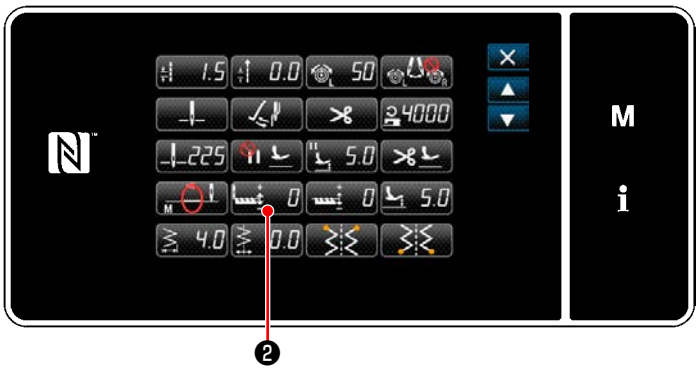
When you have changed the stitch length, feed dog height or feed timing, run the sewing machine at a low speed to make sure that the gauge does not interfere with the changed part.



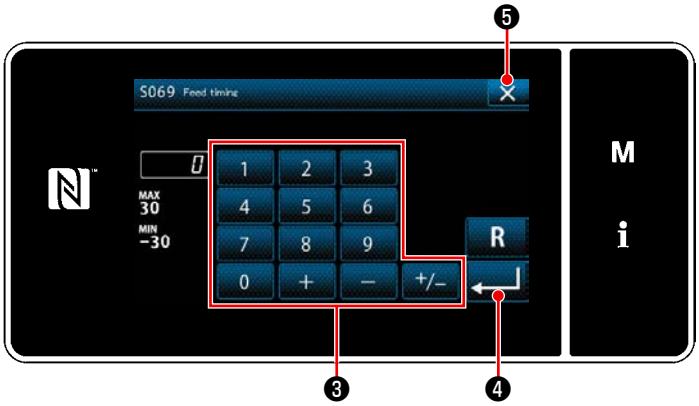
Timing between the needle and feed can be adjusted on the operation panel.

[How to adjust]

1) Display the sewing data edit screen by pressing ❶.

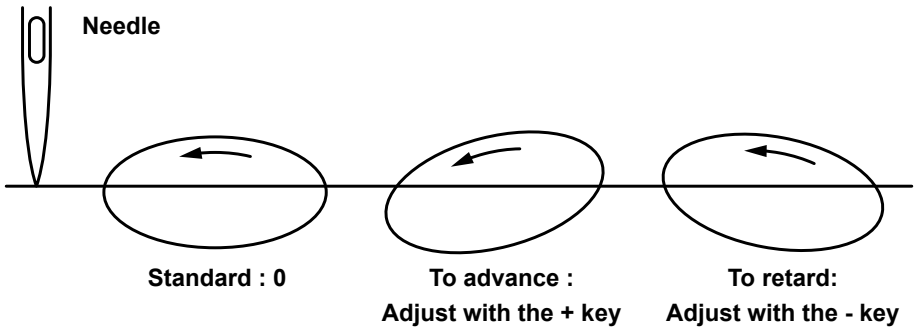


2) Display "S069 Feed timing" by pressing ❷.



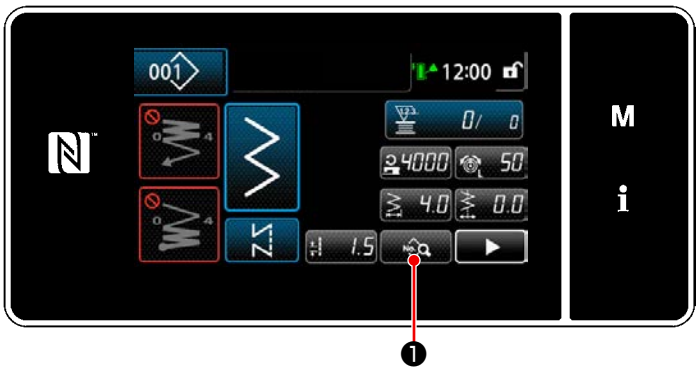
3) Change the feed timing by pressing ten keys and + − ❸.
(+ : To advance; - : To retard)
4) Confirm your entry by pressing ❹.
5) Display the sewing screen by pressing ❺.

* Range of input values on the panel is from -30 to 30.



1. **The feed timing differs with the set value. (Image figure as observed from the face plate side)**
2. **The stitch length changes by adjusting the feed timing. Carry out adjustment while actually carrying out sewing for the purpose of checking the stitch length.**

5-4-3. Changing the feed locus

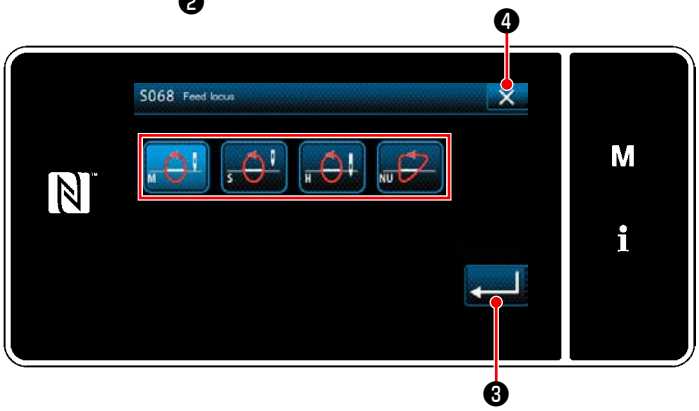


The feed locus can be changed according to the item to be sewn.

[How to change]

1) Display the sewing data edit screen bypressing ❶.

2) Display "S068 Feed locus" by pressing ❷.



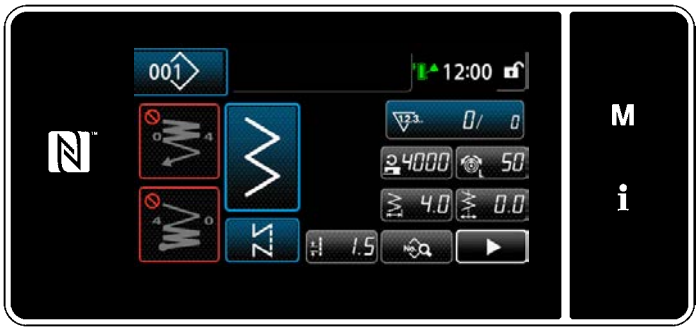
3) Change the feed locus.
   * Refer to the following for the types of feed-locus.
4) Confirm your entry by pressing ❸.
5) Display the sewing screen by pressing ❹.

Name	Characteristics	Standard height	Image of operation	Stitch length and sewing speed
M	Goes up straight and comes down straight. This feed locus provides the general-purpose timing.	1.3 mm		0 to 4.00 mm : 5,000 sti/min 4.05 to 5.00 mm : 4,000 sti/min
S	The feed timing of this locus is earlier than the other settings. This feed locus is suitable for light-weight materials.	1.3 mm		0 to 5.00 mm : 4,000 sti/min
H	The feed timing of this locus is later than the other settings. This feed locus permits easy formation of angular shapes of zigzag stitches.	1.3 mm		0 to 5.00 mm : 4,000 sti/min
NU	This feed locus is suitable for stretch materials since it reduces slippage between materials. Use this feed locus since backward feed is likely to occur.	1.3 mm		0 to 5.00 mm : 2,500 sti/min

5-5. Counter function

This function counts sewing in the predetermined unit and gives a visible alarm on the screen when the preset value is reached.

5-5-1. Displaying the sewing screen under the counter display mode



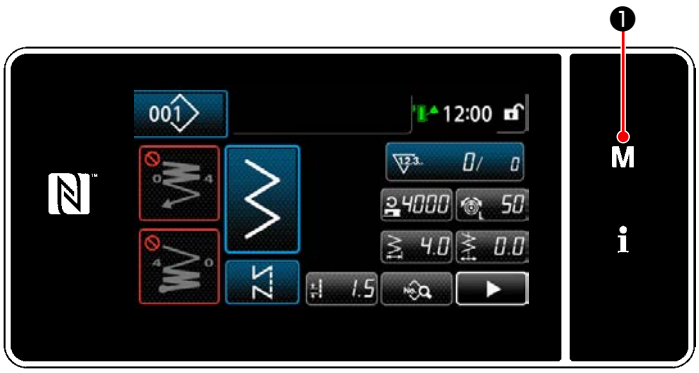
Three different types of the counter are available, i.e., the bobbin thread counter, the sewing counter and the pitch time counter.

5-5-2. Types of the counter

	**Bobbin thread counter** The bobbin thread counter adds one to its current value every time the sewing machine sews 10 stitches. When the preset value is reached, the count-completion screen is displayed. * Refer to **"5-5-4. How to reset the count-completion state" p. 107**.
	**Sewing counter** The sewing counter adds one to its current value every time one stitch shape is sewn. When the preset value is reached, the count-completion screen is displayed. * Refer to **"5-5-4. How to reset the count-completion state" p. 107**.
	**Pitch time counter** The pitch time counter adds one to its current value every time one stitch shape is sewn. When the type of counter is set to the pitch time counter,  is displayed on the counter setting screen (refer to **"5-5-3. How to set the counter" p. 104**). When the period of time set with  is reached, the counter adds "1 (one)" to the target value (unit: sec).

5-5-3. How to set the counter

① Selecting the counter setting



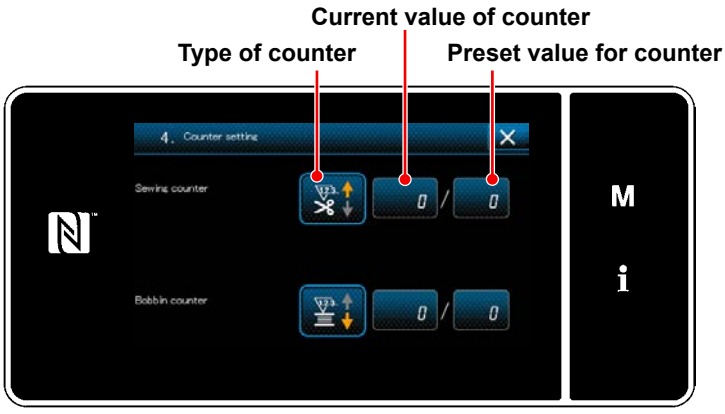
1) Display the mode screen by pressing M ❶.

<Mode screen>

2) Select the "4. Counter setting".

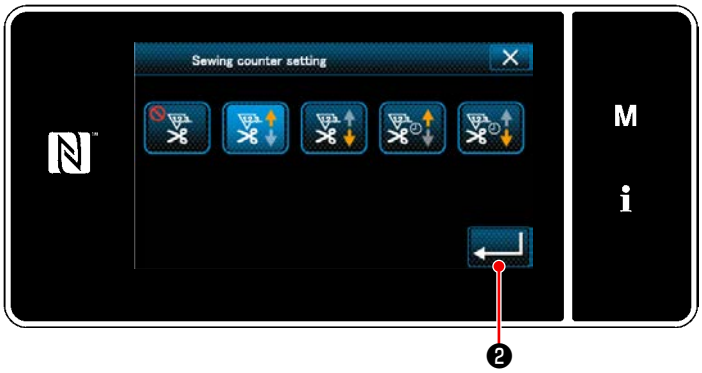
② Setting the type of counter, current value of counter and preset value for counter

The sewing counter and the bobbin counter should be set following the same procedure.



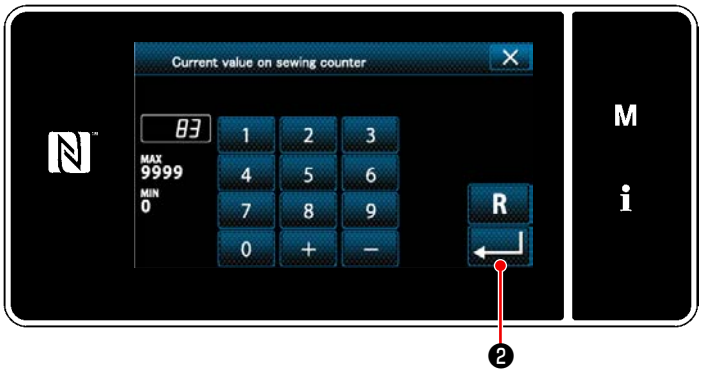
<Counter setting screen>

1) The counter setting screen is displayed to enable setting.
2) Press the button of the desired item. Then, the change screen corresponding to that item is displayed.



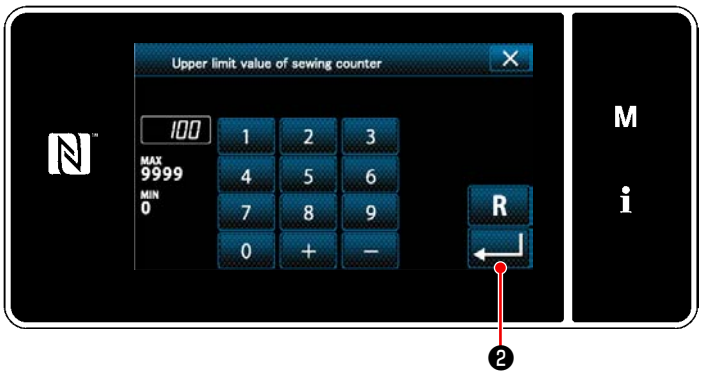
<Counter type screen>

1) Select the desired type of counter.
2) Press ↵ ❷ to confirm the type of counter you have selected.



<Current counter value screen>

1) Select the current counter value.
2) Enter with the numeric keypad.
3) Press ↵ ❷ to confirm the type of counter you have selected.



<Counter set value screen>

1) Select the counter set value.
2) Enter with the numeric keypad.
3) Press ↵ ❷ to confirm the type of counter you have selected.

Bobbin thread counter	
	**UP counter (adding method):** The bobbin thread counter adds one to its current value every time the sewing machine sews 10 stitches. When the current value reaches the preset value, the count-completion screen is displayed.
	**DOWN counter (subtracting method):** The bobbin thread counter subtracts one from its current value every time the sewing machine sews 10 stitches. When the current value becomes 0 (zero), the count-completion screen is displayed.
—	**Disuse of counter:** The bobbin thread counter counts nothing even when the sewing machine performs sewing. The count-completion screen is, therefore, not displayed.

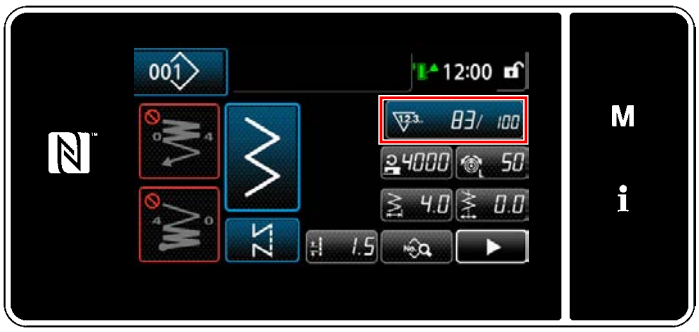
Sewing counter	
	**UP counter (adding method):** The counter adds one to its current value every time the sewing machine sews one stitch shape. When the current value reaches the preset value, the count-completion screen is displayed.
	**DOWN counter (subtracting method):** The counter subtracts one from its current value every time the sewing machine sews one stitch shape. When the current value becomes 0 (zero), the count-completion screen is displayed.
—	**Disuse of counter:** The sewing counter counts nothing even when the sewing machine performs sewing. The count-completion screen is, therefore, not displayed.

Pitch time counter	
	**UP counter (adding method):** The counter adds one to its current value every time the sewing machine sews one stitch shape.
	**DOWN counter (subtracting method):** The counter subtracts one from its current value every time the sewing machine sews one stitch shape.
—	**Disuse of counter:** The sewing counter counts nothing even when the sewing machine performs sewing. The count-completion screen is, therefore, not displayed.

③ Confirming the data entered

<Mode screen>

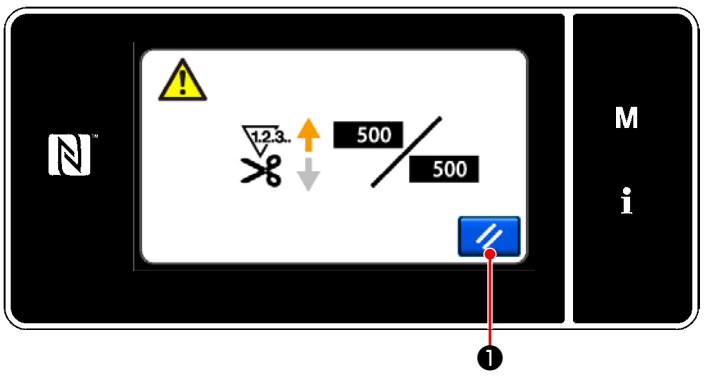
Confirm the data on counter setting items you have entered. Then, press ✕ ❸ to return the screen to the mode screen.
When you press ✕ ❸ again, the screen is returned to the sewing screen.



<Sewing screen (counter)>

The data on the counter function entered is displayed.

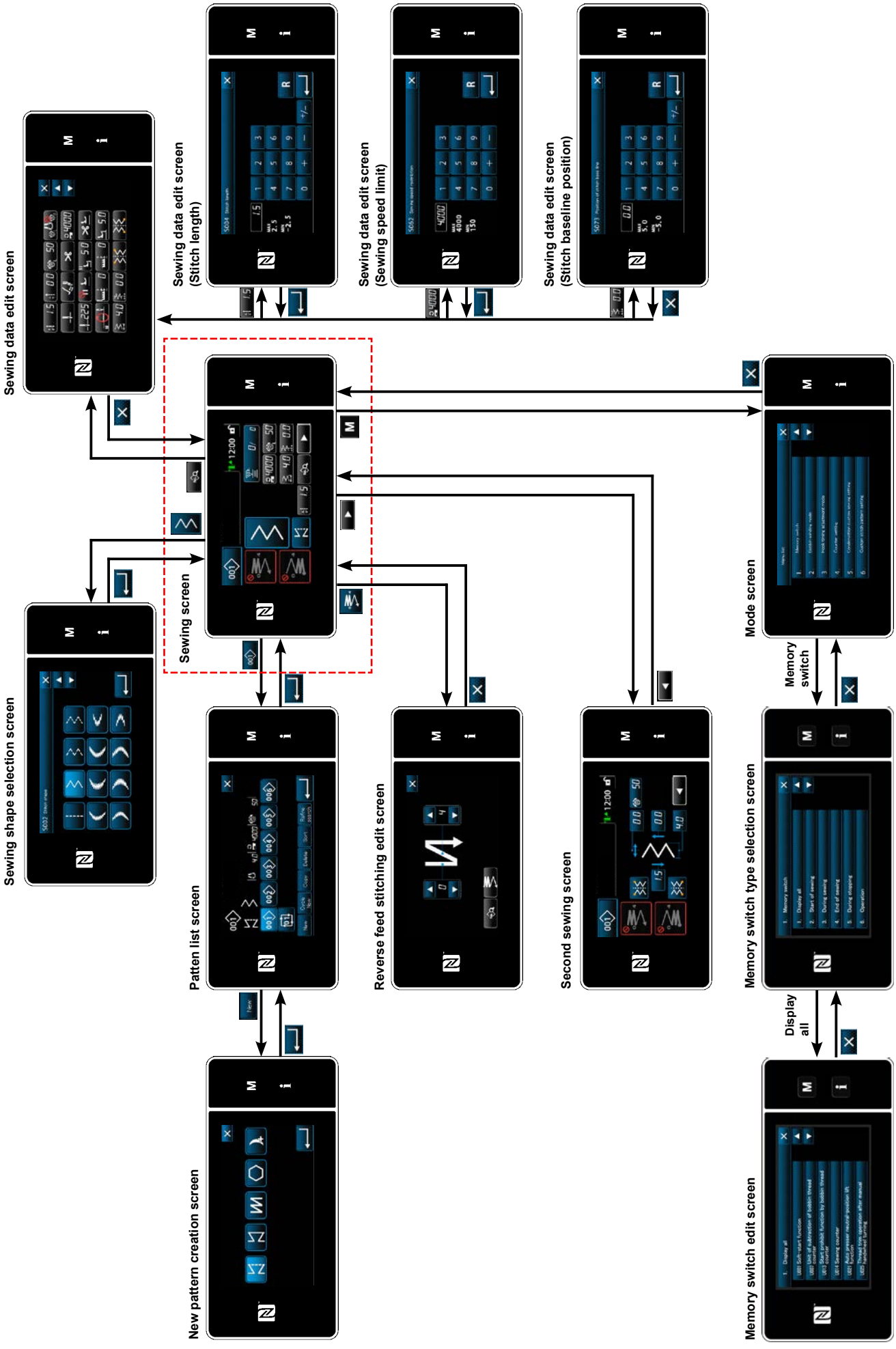
5-5-4. How to reset the count-completion state



<Count-completion screen>

When the predetermined conditions are satisfied during sewing, the count-completion screen is displayed.
The counter is reset by pressing ❶.
Then, the mode is returned to the sewing mode. In this mode, the counter starts counting again.

5-6. Simplified chart of panel displays



5-7. List of memory switch data

No.	Item	Setting range	Unit
U001	**Soft-start function** The initial value differs with the machine head. (0: OFF)	0 to 9	Stitch
U007	**Bobbin thread count-down unit** 0: 10 stitches / 1: 15 stitches / 2: 20 stitches	0 to 2	Stitch
U013	**Bobbin thread count stop function** 0: Sewing machine start prohibition function is disabled even when the counter completes counting (negative value). 1: When the counter completes counting, the sewing machine start after thread trimming is prohibited. 2: When the counter completes counting, the sewing machine temporarily stops and the start of sewing machine after thread trimming is prohibited. * Note that the prohibition function is disabled in the case the initial value of counter is 0 (zero).	0 to 2	—
U014	**Sewing count function** 1: Automatic sewing counter / 2: Sewing counter switch input	1 to 2	—
U021	**Presser foot lift when the pedal is in its neutral position** 0: Disabled / 1: Enabled / 2: Enabled only when the presser foot is at its lower position / 3: Alternating vertical movement by depressing the back part of pedal	0 to 3	—
U025	**Operation after manual turning (thread trimming)** This memory switch is used for setting the thread trimmer operation after the sewing machine has moved from its upper/lower stop position by manual turning of handwheel. 0: Permitted / 1: Prohibited	0 to 1	—
U030	**Middle-of-sewing reverse feed stitching function** Midpoint-of-sewing reverse feed stitching function is set. 0: Without the midpoint-of-sewing reverse feed stitching function / 1: With the midpoint-of-sewing reverse feed stitching function	0 to 1	—
U031	**Number of stitches of middle-of-sewing reverse feed stitching** Number of midpoint-of-sewing reverse feed stitches is set.	1 to 19	Stitch
U032	**Condition of enabling middle-of-sewing reverse feed stitching while sewing machine is at rest** Midpoint-of-sewing reverse feed stitching function enable condition 0: Disabled when the swing machine is at rest / 1: Enabled when the sewing machine is at rest	0 to 1	—
U033	**Thread trimming activated by middle-of-sewing reverse feed stitching** Thread trimming function after the completion of midpoint-of-sewing reverse feed stitching is set. 0: Without automatic thread trimming function / 1: With automatic thread trimming function	0 to 1	—
U035	**Minimum speed of the pedal** The initial value varies with the machine head.	150 to 250	sti/min
U036	**Thread trimming sewing speed** The initial value varies with the machine head.	100 to 250	sti/min
U037	**Speed during soft start** The number of revolutions set with this memory switch is given precedence even if it is lower than the lowest speed by pedal. The initial value varies with the machine head. (0:OFF) One needle: 170 sti/min Two needles: 200 sti/min	100 to 5000	sti/min

No.	Item	Setting range	Unit
U038	**Speed during one-shot stitching** The maximum number of revolutions during soft start differs with the machine head.	100 to 5000	sti/min
U039	**Start position of rotation** Set start position from neutral pedal position. (Pedal Stroke)	10 to 1000	—
U040	**Start position of acceleration** Set accelerating position from neutral pedal position. (Pedal Stroke)	10 to 1000	—
U041	**Start position of lifting of presser foot** Set work clamp lift position from neutral pedal position. (Pedal Stroke)	-500 to -10	—
U042	**Start position of lowering of presser foot** Set work clamp fall position from neutral pedal position. (Pedal Stroke)	10 to 500	—
U043	**Start position of thread trimming** Set thread trimming starting position from neutral pedal position. (Pedal Stroke)	-1000 to -100	—
U044	**Position that maximum sewing speed is reached** Set maximum speed reaching position from neutral pedal position. (Pedal Stroke)	10 to 15000	—
U045	**Pedal neutral-position correction value** Set neutral position of pedal sensor.	-150 to 150	—
U047	**Presser-foot lift finishing position** The position to which the presser foot goes up when the back part of the pedal is depressed to its first step. (1st-step spring position)	-1000 to -100	—
U048	**Function of lifting the presser foot by depressing the pedal** Whether or not the presser-foot lifting operation is carried out by depressing the back part of pedal is set. 0: No operation / 1: Operation	0 to 1	—
U049	**Presser foot lowering time** The initial value differs depending on the machine head.	0 to 500	ms
U051	**Correction of turning-ON of reverse feed stitching (at start)**	-50 to 50	Degree
U052	**Correction of turning-OFF of reverse feed stitching (at start)**	-50 to 50	Degree
U053	**Correction of turning-OFF of reverse feed stitching (at end)**	-50 to 50	Degree
U054	**Standby time until the presser foot starts going up** Time to be elapsed from the moment the pedal is depressed to the 1st step to the moment the presser foot starts going up.	0 to 200	ms
U056	**Reverse-rotation needle-up after thread trimming** The initial value differs with the machine head. 0: Reverse-rotation needle-up is not performed / 1: Reverse-rotation needle-up is performed	0 to 1	—
U057	**Feed dog position at thread trimming** The feed dog height is fixed to 0 (zero) at the time of thread trimming. 0: Not fixed / 1: Fixed	0 to 1	—
U059	**Selection of revere feed stitching (at start) operation** 0: By manually operating the pedal, etc. / 1: According to the preset reverse feed sewing speed	0 to 1	—
U060	**Stop after reverse feed stitching (at start)** The stop function stops the sewing machine temporarily regardless of the operating status of the pedal. 0: OFF / 1: ON	0 to 1	—
U064	**Sewing-end reverse feed stitching, changeover speed**	150 to 1000	sti/min

No.	Item	Setting range	Unit
U068	**Presser foot lifting operation changeover** The presser foot lifting operation when depressing the back part of pedal is changed over. 0: 2-step operation / 1: Manual operation depending on the pedal stroke when the back part of pedal is depressed	0 to 1	—
U070	**Second presser foot height** The presser foot height when the back part of the pedal is depressed to the thread trimming position	85 to 120	—
U087	**Pedal acceleration characteristic** 0: Standard / -1 to -10: Low-frequency low acceleration / 1 to 10: Low-frequency high acceleration The set value is expressed in terms of a multiplying factor.	-10 to 10	—
U090	**Initial-start upper-position stopping function** 0: The sewing machine stops with its needle up after checking the panel. 1: The machine automatically stops with its needle up.	0 to 1	—
U091	**Function for prohibiting correction operation after turning the sewing machine by hand**	0 to 1	—
U092	**Speed reducing function for reverse feed stitching at beginning of sewing** Speed reduction function after the completion of start reverse feed stitching is set. 0: Speed is not reduced. / 1: Speed is reduced	0 to 1	—
U093	**Needle up/down correction switch adding function** Needle up/down correction switch operation after the power-ON or after thread trimming is set. 0: Normal / 1: One-stitch correction after thread trimming	0 to 1	—
U096	**Maximum sewing speed** The initial value differs with the machine head.	150 to 5000	sti/min
U120	**Main shaft reference angle correction** The main shaft reference signal angle (0 degree) is corrected with the value set using this memory switch.	-60 to 60	Degree
U121	**Upper position angle correction** The position at which the sewing machine stops with its needle up is corrected.	-15 to 15	Degree
U122	**Lower position angle correction** The position at which the sewing machine stops with its needle down is corrected.	-15 to 15	Degree
U150	**Automatic knee-lifter function** 0: Function is not provided / 1: Automatic knee-lifter function is provided	0 to 1	—
U151	**Adjustment of position to start automatic knee-lifter operation** The knee-lifter position at which the presser foot operates is corrected.	-1000 to 1000	—
U152	**Adjustment of position to maximize the presser foot lift by automatic knee-lifter** The knee-lifter position at which the presser foot lifting height is maximized is corrected.	-200 to 1000	—
U164	**Pedal input high-speed switch function** 0: Normal pedal / 1: To be used as the high-speed switch	0 to 1	—

No.	Item	Setting range	Unit
U182	**Sewing counter stopping function** 0: The sewing machine does not stop even when the sewing counter completes counting. 1: When the counter completes counting, the sewing machine start after thread trimming is prohibited. * Note that the prohibition function is disabled in the case the initial value of counter is 0 (zero). In addition, the prohibition function is also disabled when the pitch time is selected.	0 to 1	—
U183	**Number of times of thread trimming for sewing counter**	1 to 20	—
U194	**Thread tension changeover setting when lifting the presser foot** 0: OFF / 1: Normally ON / 2: Only after thread trimming / 3: Only during the immediate stop	0 to 3	—
U195	**Thread tension when lifting the presser foot (right)**	0 to 200	—
U199	**Pedal giving priority to sewing machine for standing work** The switch which is given priority when the pedal is used for sewing machine for standing work is set. 0: Start switch is given priority / 1: Start switch is not given priority	0 to 1	—
U201	**Bobbin thread remaining amount to start the tension correction (bobbin thread remaining amount)** The bobbin thread remaining amount to start the tension correction is set.	0 to 100	%
U202	**Final tension correction amount (bobbin thread remaining amount)** The tension correction amount for the case the bobbin thread remaining amount is minimized is set.	50 to 200	%
U210	**Max. zigzag width limiting method** Method to set the maximum zigzag width limit 1: Center / 2: Right and left	1 to 2	—
U211	**Max. zigzag width limit value (center)** The maximum zigzag width limit value in the case the method to set the maximum zigzag width limit is set to "Center"	0 to 100	—
U212	**Max. zigzag width limit value (right)** The maximum zigzag width limit value (right side) in the case the method to set the maximum zigzag width limit is set to "Right and left"	0 to 50	—
U213	**Max. zigzag width limit value (left)** The maximum zigzag width limit value (left side) in the case the method to set the maximum zigzag width limit is set to "Right and left"	-50 to 0	—
U214	**Stitch baseline reference position** The reference position of the stitch baseline is set. 0: Left / 1: Center / 2: Right	0 to 2	—
U273	**Start enable/disable setting when lifting the presser foot** Enable/disable of input for starting the sewing machine after lowering the presser foot which is placed in its upper position is changed over. 0: Enable / 1: Disable	0 to 1	—
U318	**Correction of position to start the reverse feed lever operation** The position at which the reverse feed lever operation is enabled is set.	-40 to 40	—
U319	**Correction of position at which the reverse feed lever operating amount is maximized** The position at which the reverse feed lever operating amount is maximized is adjusted.	-40 to 40	—

No.	Item	Setting range	Unit
U326	**Feed dog position when lifting the presser foot** Feed dog height is set to 0 (zero) when lifting the presser foot. This allows the operator to handle the material with ease. 0: Up / 1: Down	0 to 1	—
U400	**Panel operation mode** This memory switch is used for specifying the mode of the sewing screen that is displayed at the time of startup. 0: Maintenance personnel mode / 1: Operator mode	0 to 1	—
U401	**Input unit of stitch length** 0: Stitch length (mm) / 1: Number of stitches per inch 2: Number of stitches in 3 cm	0 to 2	—
U402	**Automatic lock time** The sewing machine is automatically locked in the case the operation panel is not operated for a predetermined period of time.	0 to 300	Second
U403	**Auto-OFF of back light** Back light of the panel is automatically turned off in the case the operation panel is not operated for a certain period of time.	0 to 20	
U404	**Selection of part number and process / comment display** This memory switch is used for specifying either the part number/process is displayed or comment is displayed on the sewing screen. 0: Part number/process / 1: Comment	0 to 1	—
U406	**Language selection** 0: Not yet selected / 1: Japanese / 2: English / 3: Simplified Chinese / 4: Traditional Chinese / 5: German / 6: Spanish / 7: French / 8: Indonesian / 9: Italian / 10: Khmer / 11: Korean / 12: Portuguese / 13: Turkish / 14: Vietnamese / 15: Bengali / 16: Russian / 17: Arabic / 18: Additional language edit mode	0 to 18	—
U407	**Operating sound of panel** 0: OFF / 1: ON	0 to 1	—
U410	**Input unit of the number of stitches** Method to input the seam length for the constant-dimension sewing and polygonal-shape stitching is set. 0: Number of stitches / 1: Length (mm)	0 to 1	—

5-8. List of errors

Error code	Description of error	Cause	Item to be checked
E000	Execution of data initialization (This is not an error.)	• The existing control box has been removed and a new one is mounted. • In the case the initialization operation is executed.	This is not a failure.
E007	Motor overload	• In the case the machine head is locked. • In the case of sewing extra-heavy weight material that exceeds the guaranteed material thickness. • In the case the motor fails to rotate. • In the case of the motor or driver failure.	• Check whether the pulley is entangled with thread. • Check whether the motor output connector (4P) has loosened. • Check whether the motor can be turned smoothly by hand.
E009	Overtime of solenoid energization	• In the case the length of solenoid energizing time has exceeded the assumed one.	
E011	Media is not inserted	• In the case no media is inserted.	• Turn the power OFF and check for a media.
E012	Read error	• In the case data stored on the media cannot be read.	• Turn the power OFF and check for a media.
E013	Write error	• In the case data cannot be written on the media.	• Turn the power OFF and check for a media.
E014	Write protect	• In the case the media is placed in the write-prohibition state.	• Turn the power OFF and check for a media.
E015	Format error	• In the case formatting of the media cannot be carried out.	• Turn the power OFF and check for a media.
E016	External media over-capacity	• In the case the capacity of media is not enough.	• Turn the power OFF and check for a media.
E019	File size over	• In the case of attempting to read the custom pattern data or condensation custom data which exceeds the maximum permissible data size into the memory of sewing machine from the USB thumb drive.	• Turn the power OFF and check the USB thumb drive.
E022	File undetected	• In the case of attempting to read a file which is not stored in the USB thumb drive into the operation panel.	
E024	Pattern data size error	• In the case the number of stitches contained in data is too large when attempting to read the condensation custom pattern data from the USB thumb drive.	
E032	File compatibility error	• In the case the file is not compatible.	• Turn the power OFF and check for a media.
E071	Motor output connector slip-off	• In the case the motor connector has slipped off.	• Check for looseness and slip-off of the motor output connector.
E072	Motor overload when the thread trimmer operates	• Same as E007.	• Same as E007.
E079	Overload operation error	• Load applied to the main shaft motor is excessively large.	

Error code	Description of error	Cause	Item to be checked
E081	Feed driving motor lock	• In the case the feed driving motor is locked.	• Check whether the feed driving motor operates smoothly.
E204	USB insertion	• In the case the sewing machine is started up without removing the USB thumb drive.	• Remove the USB thumb drive.
E220	Warning against shortage of grease	• When the predetermined number of stitches is reached.	• Add grease to the specified points of sewing machine and reset the error.
E221	Grease-shortage error	• In the case the sewing machine cannot continue sewing since the predetermined number of stitches is reached.	• Add grease to the specified points of sewing machine and reset the error.
E302	Head-tilt detection error (When the safety switch operates)	• In the case the Tilt detection switch is turned ON when the power to the sewing machine remains ON.	• Check whether the machine head is tilted before turning OFF the power switch (The sewing machine operation is prohibited for the sake of safety.)
E303	Meniscus sensor error	• In the case the meniscus sensor signal cannot be detected.	• Check for a break in the motor encoder connector.
E402	Deletion disabled error	• In the case of attempting to delete the pattern which is used in a cycle pattern. • In the case of attempting to delete the custom pattern or condensation custom which is used in a pattern.	
E407	Wrong password	• In the case the password entered is wrong.	
E408	Shortage of number of password characters	• In the case the number of password characters entered is not enough.	
E411	Polygonal stitching pattern registration disabled error	• In the case of attempting to create eleven or more polygonal stitching patterns.	
E412	Custom pattern unregistered error	• In the case the custom pattern number is faulty.	
E413	Condensation custom unregistered error	• In the case the condensation custom number is faulty.	
E421	Continuous sewing pattern registration rejection error	• In the case of attempting to create 11 or more continuous sewing patterns.	
E487	Condensation portion, feed amount error	• In the case the feed amount at the condensation portion exceeds the specified feed range.	• Reset the error. Then, re-input the data. • Adjust the feed amount at the condensation portion of the pattern to a value within the limit range.
E488	Normal stitch portion, reverse feed amount error	• In the case the reverse feed amount at the normal portion exceeds the specified feed range.	• Reset the error. Then, re-input the data. • Adjust the reverse feed amount at the normal portion of the pattern to a value within the limit range.

Error code	Description of error	Cause	Item to be checked
E489	Normal stitch portion, normal feed amount error	• In the case the normal feed amount at the normal portion exceeds the specified feed range.	• Reset the error. Then, re-input the data. • Adjust the normal feed amount at the normal portion of the pattern to a value that falls within the limit range.
E490	Continuous sewing, cycle sewing setting error	• In the case the number of stitches of 1st step is 0 (zero) of continuous sewing pattern.	• Reset the error. Then, re-input the data.
E491	Cycle sewing pattern error	• In the case the pattern used for cycle sewing invites an error.	• Reset the error. Then, re-input the data. • Re-input the pattern data which has invited the error.
E493	Condensation custom pattern width error	• In the case the zigzag width of the condensation custom pattern exceeds the max. limit.	• Reset the error. Then, re-input the data. • Adjust the zigzag width of the condensation custom pattern to a value which falls within the max. limit.
E497	Max. zigzag width error	• The set zigzag width exceeds the max. zigzag width limit.	• Reset the error. Then, re-input the data. • Adjust the zigzag width to a value that falls within the max. zigzag width limit.
E498	Stitch baseline position error	• In the case, though the set zigzag width falls within the max. zigzag width limit, the needle throwing position exceeds the max. zigzag width limit.	• Reset the error. Then, re-input the data. • Adjust the stitch baseline to the position that falls within the max. zigzag width limit. • In the case a condensation custom pattern is selected, check the condensation position of the pattern and correct it appropriately if necessary.
E499	Simplified program fault		
E704	Data failure (system-version mismatch)	• In the case the system version does not match the machine head setting.	• Re-write the system version to the applicable one.
E731	Motor hole sensor fault	• In the case the motor signal is not input properly.	• Check whether the motor signal connector has loosened or slipped off. • Check whether the motor signal cord has broken by being caught under the machine head. • Check whether the insertion direction of the motor encoder connector is correct.
E733	Reverse rotation of motor	• When the motor runs at a speed of 500 sti/min. or more, the motor runs in the reverse direction of the indicated direction of rotation.	• Check whether the main shaft motor encoder wire connection is correct. • Check whether the main shaft motor wire connection for power is correct.
E750	Sewing machine stops	• In the case the optional-input safety switch is pressed.	

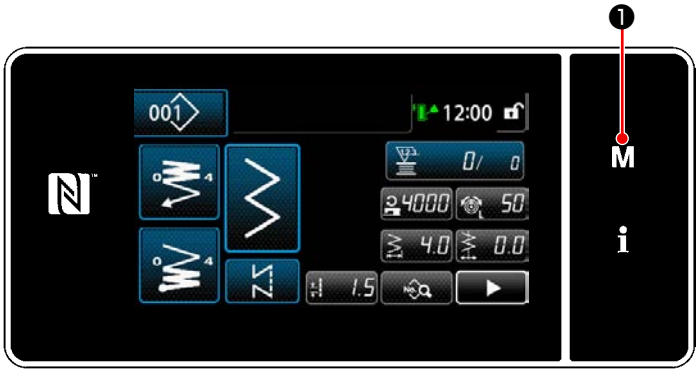
Error code	Description of error	Cause	Item to be checked
E811	Over-voltage	• In the case a voltage that is equal to or more than the guaranteed voltage is input. • In the case a voltage of 200 V is applied though the voltage is set to 100 V. • In the case a voltage of 220 V is input to the box of "JA: 120 V". • In the case a voltage of 400 V is applied to the box of "CE: 230 V".	• Check whether the supply voltage of "rated supply voltage ±10 % or more" is applied. In the case the supply voltage exceeds the aforementioned "rating ±10 %" or more, the power PCB may have broken.
E813	Low voltage		
E815	Regenerative resistor is not connected	• In the case the regenerative resistor is not connected.	• Check whether the regenerative resister is connected to the regenerative resistor connector (CN11).
E900	Main shaft motor IPM overcurrent protection	• Maloperation of the main shaft motor.	
E901	Main shaft motor IPM overload		
E903	85-V power supply fault	• In the case the 85-V voltage is not properly output.	• Check whether the stepping motor is faulty. • Check whether or not the solenoid valve is defective. • Check the F2 fuse.
E904	24-V power supply fault	• In the case the 24-V voltage is not properly output.	• Check whether or not the cooling fan is defective. • Check the F1 fuse.
E910	The presser motor origin retrieval error	• In the case the presser motor has failed to return to its origin.	• Check whether the presser setting is correct (memory switch No. 23). • Check whether the presser motor origin has been correctly adjusted.
E912	Main shaft motor speed detection error		
E915	Operation panel communication error	• In the case communication with the operation panel cannot be carried out.	
E916	MAIN-SUB communication error	• In the case communication between the MAIN PCB and the SUB PCB cannot be carried out.	
E918	Main shaft temperature error	• In the case the temperature of the CTL PCB is excessively high.	
E922	Main shaft control failure	• In the case the main shaft motor is out of control.	
E924	Motor driver fault	• In the case the motor driver has broken.	
E946	Machine-head EEPROM write error	• In the case the machine head PCB is not correctly connected.	• Check whether CN32 has loosened or come off.
E955	Electric current sensor error	• Main motor shaft failure. • Electric current sensor failure.	• Check whether the main shaft motor has short-circuited.
E961	Pitch motor deviation error	• In the case the pitch motor fails to operate because of an excessive load.	• Check whether the pitch motor runs smoothly.

Error code	Description of error	Cause	Item to be checked
E962	Presser motor deviation error	• In the case the presser fails to operate because of an excessive load.	• Check whether the presser motor runs smoothly.
E963	IPM temperature error	• In the case the temperature of the CTL PCB is excessively high.	
E965	Pitch motor temperature error	• In the case the pitch motor is applied with an excessive load.	• Check whether the pitch motor runs smoothly.
E971	Pitch motor IPM overcurrent protection	• Pitch motor maloperation.	
E972	Pitch motor overload	• In the case the pitch motor is applied with an excessive load.	• Check whether the pitch motor runs smoothly.
E973	Feed driving motor IPM overcurrent protection	• Maloperation of the feed driving motor.	
E974	Feed driving motor overload	• In the case an excessive load is applied to the feed driving motor.	• Check whether the feed driving motor operates smoothly.
E975	Presser motor IPM over-current protection	• Presser motor maloperation.	
E976	Presser motor overload	• In the case the presser motor is applied with an excessive load.	• Check whether the presser motor runs smoothly.
E977	CPU fault	• In the case of a program fault.	
E978	Network communication fault	• In the case the data received from the network is damaged.	
E981	Needle rocking motor IPM overcurrent protection	• Mal operation of the needle rocking motor.	
E982	Needle rocking motor overload	• In the case an excessive load is applied to the needle rocking motor.	• Check whether or not the needle rocking motor gets hitched.
E983	Needle rocking motor deviation error	• In the case the needle rocking motor is unable to operate since an excessive load is applied it.	• Check whether or not the needle rocking motor gets hitched.
E985	Pitch / feed driving motor, return-to-origin error	• In the case the pitch motor cannot travel to its origin. • In the case feed driving motor cannot travel to its origin.	• Check whether or not the pitch motor origin is incorrectly adjusted. • Check whether or not the feed driving motor origin is incorrectly adjusted.
E988	Needle rocking motor, return-to-origin error	• In the case the needle rocking motor has failed to return to its origin.	• Check whether or not the origin of the needle rocking motor has been incorrectly adjusted.
E999	Main software rewriting	• In the case of rewriting the main software.	• It is not an error.

5-9. Memory switch data

The memory switch data is the sewing machine operation data which commonly affects all sewing patterns and cycle patterns.

① Selecting the category of the memory switch data

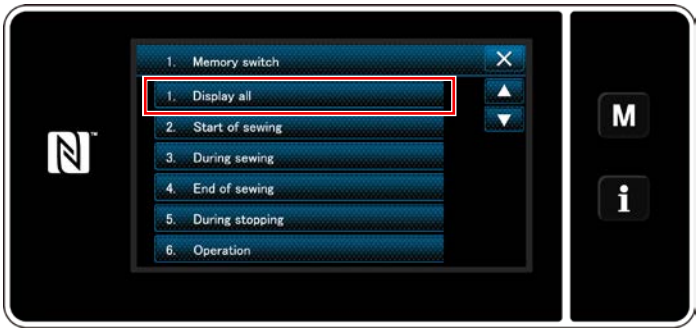


<Sewing screen>

1) Press **M** ❶ on the sewing screen to display the "mode screen".

<Mode screen>

2) Select the "1. Memory switch".
The "memory switch type selection screen" is displayed.

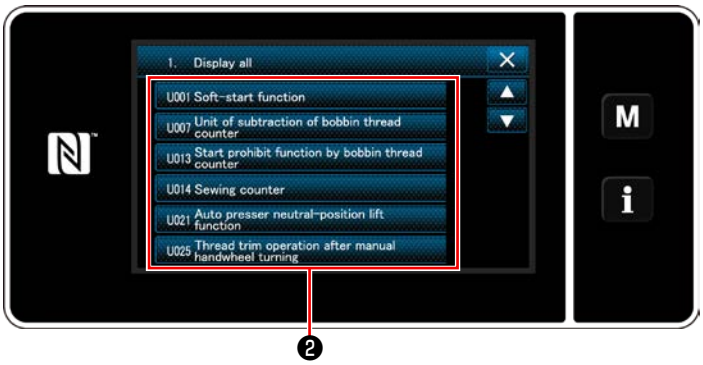


<Memory switch type selection screen>

3) Select the "1. Display all".
The "memory switch edit screen" is displayed.

* In the case any item other than "1. Display all" is selected, only the memory switch which corresponds to the selected item is displayed on the memory switch edit screen.

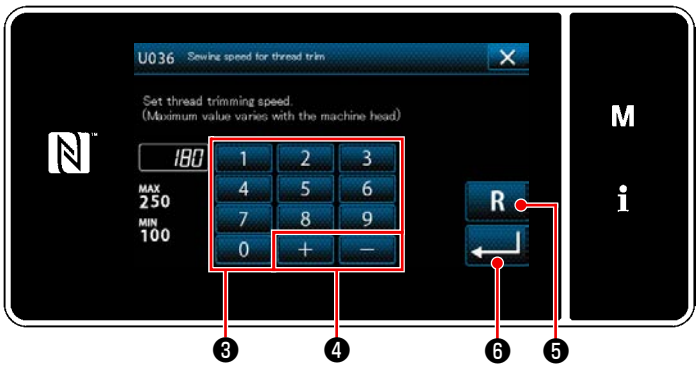
② Setting the memory switch



<Memory switch edit screen>

Select an item to edit from the memory switch list. Press button ❷ .

③ Confirming the data entered



<Input screen>

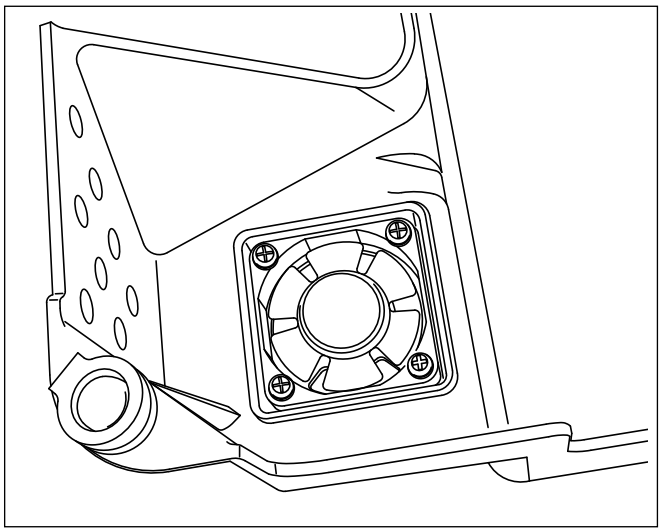
1) Enter a set value with numeric keypad ❸ and + − ❹ .
2) Keep R ❺ held pressed for one second to return the set value to the initial value.
3) Press ↵ ❻ to confirm the setting.
   The "memory switch edit screen" is displayed.

6. CARE

6-1. Cleaning

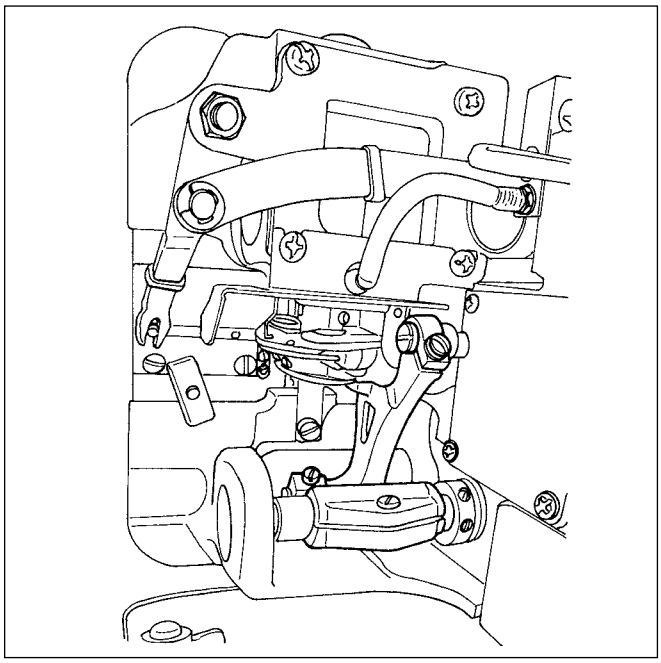
WARNING :
To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.

6-1-1. Cleaning the cooling fan installed on the under cover



The cooling fan may not produce a sufficient cooling effect on the sewing machine head if cloth chips, etc. have gathered in the cooling fan unit that is installed on the bottom of underside cover.
Clean the cooling fan periodically in order to reduce heat generation of the hook.

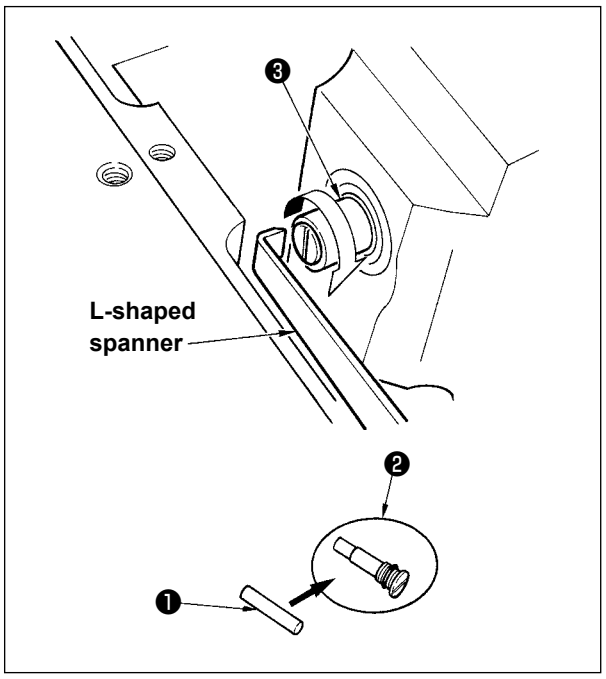
6-1-2. Cleaning the hook section



When cloth waste or the like gathers around or adheres to the hook section, trouble (defective sewing, seizure of hook, etc.) of sewing machine will be caused. Periodically clean the section.

6-1-3. Replacing procedure of the hook shaft oil wick

WARNING :
To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.



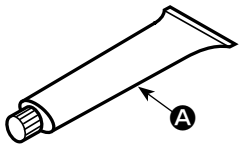
1) Hook shaft oil wick ❶ is mounted on the top end of hook shaft ❸ . Remove the needle and the parts around the needle (presser foot, needle, throat plate, feed plate, hook and woodruff plate), put a spanner, top end of which is L-shaped to the groove section of hook shaft oil wick screw ❷ , turn the handwheel in the normal direction of rotation by hand, and draw out the screw.
2) Draw out hook shaft oil wick ❶ from hook shaft oil wick screw ❷ which has been drawn out and push a new hook shaft oil wick ❶ (JUKI Part No. : 11015906) to hook shaft oil wick screw ❷ (JUKI Part No. B1808552000). At this time, be sure to check that hook shaft oil wick ❶ has entered up to the end of hook shaft oil wick screw ❷ .
* When re-assembling, check that the hole at the top end of hook shaft oil wick screw ❷ is not broken.
3) Securely tighten hook shaft oil wick screw ❷ to the top end of hook shaft ❸ .

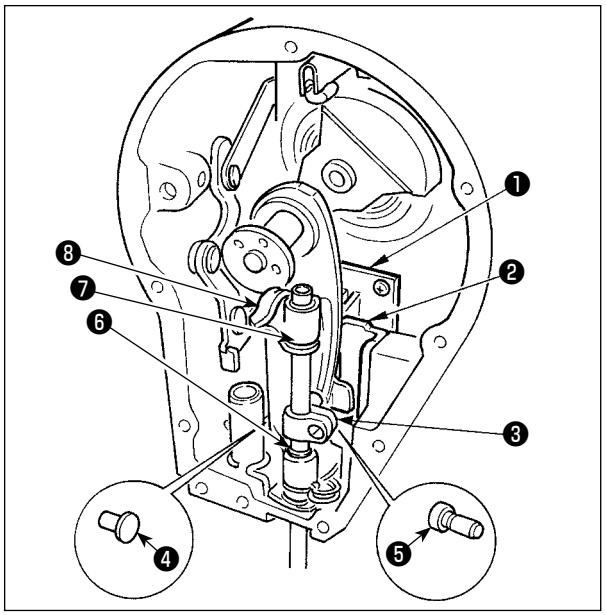
6-2. Applying grease

WARNING :
To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.

Caution

1. **When the machine needs replenishment of grease, an alarm sounds. Once the alarm sounds, replenish grease. In the case the machine is used under harsh environment, it is recommended to replenish grease once a year for ensuring effective greasing.**
2. **Do not apply oil to the sections which are lubricated with grease.**
3. **Be aware that grease can leak from the thread take-up cover and needle bar if the amount of grease is excessive.**
4. **Be sure to use JUKI GREASE A TUBE Ⓐ (part number : 40006323).**

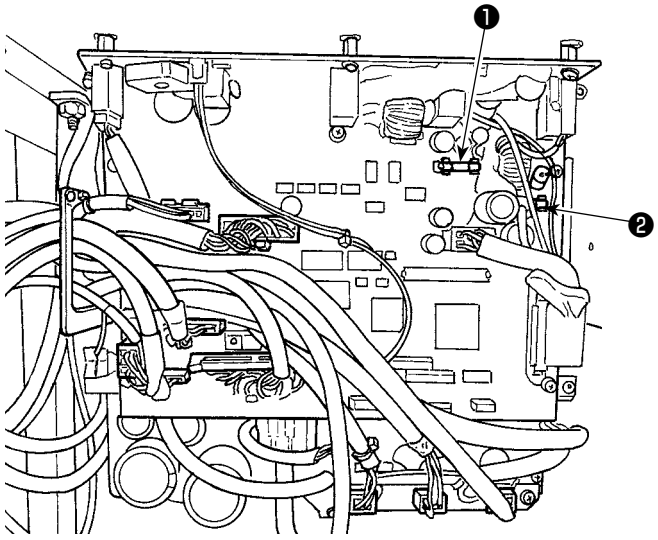




It is effective to periodically replenish the grease using the exclusive grease (grease tube part No. : 40006323) supplied as accessories. (It is not necessary to replenish the grease when the sewing machine is operated under the normal condition. However, when the sewing machine is operated under the severe condition, perform replenishing.)
Apply the exclusive grease supplied as accessories to all of the rocking mechanism components (❶ through ❽) located inside the face plate section. However, do not apply the grease to the needle bar.

6-3. Replacing the fuse

DANGER :
1. To avoid electrical shock hazards, turn OFF the power and open the control box cover after about five minutes have passed.
2. Open the control box cover after turning OFF the power without fail. Then, replace with a new fuse with the specified capacity.



The machine uses the following two fuse.
Both are the same fuses.

CTL PCB

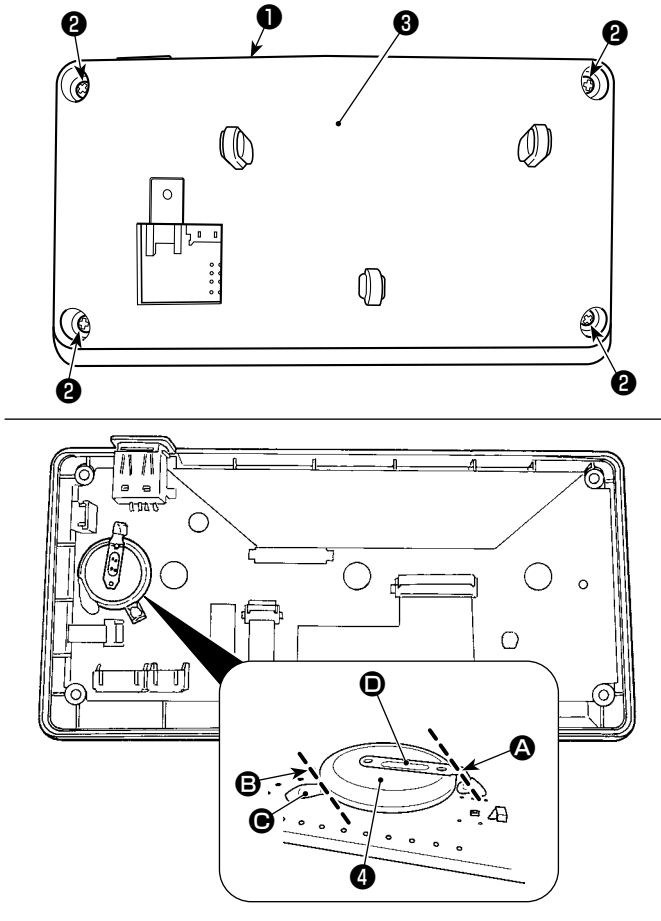
❶ For 85V power supply protection
5A (time-lag fuse)

❷ For 24V power supply protection
5A (time-lag fuse)

6-4. Disposal of batteries

The operation panel has a built-in battery in order to operate the clock even when the power is turned OFF. Be sure to dispose of the battery following the local laws and regulations.

[How to remove the battery]



1) Remove panel ❶ from the main body of sewing machine.
2) Loosen screw ❷ from the rear surface of the operation panel. Detach case ❸ .

3) ❹ is the battery for clock.
Type number: ML2020/F1AK
4) Cut metal plate Ⓓ that secures battery ❹ with nippers or the like at position Ⓐ.
5) Cut metal plate Ⓒ that secures battery ❹ with nippers or the like at position Ⓑ. Then, remove battery ❹ .

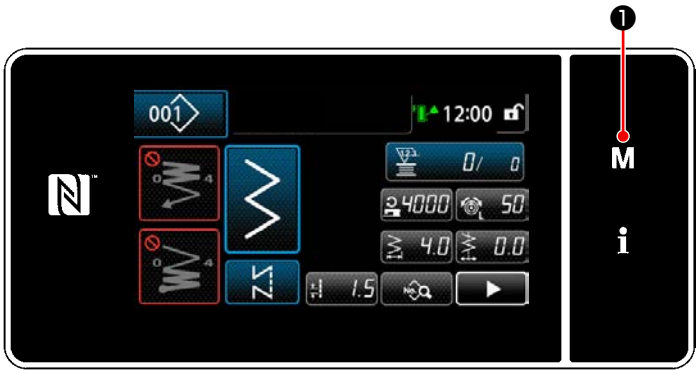
Carefully protect your fingers from being cut with the cut edge of the metal plate.

7. ADJUSTMENT OF THE MACHINE HEAD (APPLICATION)

7-1. Needle-to-hook relation (Hook timing adjustment mode)

WARNING :
To protect against possible personal injury due to abrupt start of the sewing machine, be sure to change over the operation mode to the "hook timing adjustment mode".
The presser foot automatically goes up when changing over the operation mode to the "hook timing adjustment mode". In addition, the presser foot also comes down when the "hook timing adjustment mode" is finished and the power is turned OFF. Be sure carry out the operation while keeping your hands, etc. away from the presser foot.

The hook timing adjustment is used when adjusting the needle-to-hook timing, etc.



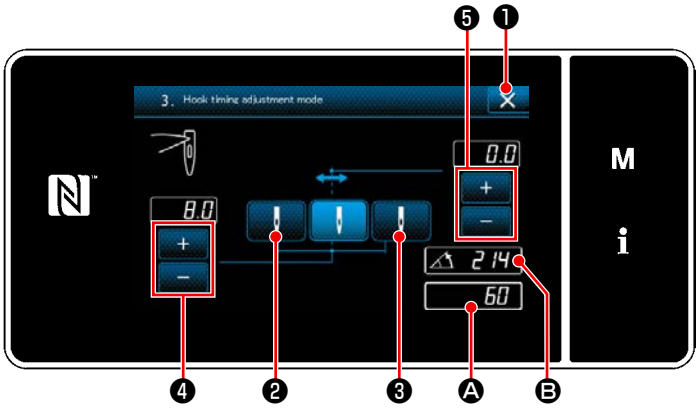
<Sewing screen>

1) Press M ❶ .

The "mode screen" is displayed.

<Mode screen>

2) Select "3. Hook timing adjustment mode".



<Hook timing adjustment mode screen>

3) Turning the pulley, align needle bar position Ⓐ with Ⓑ (214 °: Hook timing adjustment position).

When ✕ ❶ is pressed, the "Hook timing adjustment mode" is completed. Then, turn the power OFF.

Turn the pulley by pressing ❷ to bring the presser foot to the upper dead point. At this time, the needle bar position shifts to the left needle throwing position.

Turn the pulley by pressing ❸ to bring the presser foot to the upper dead point. At this time, the needle bar position shifts to the right needle throwing position.

If you want to change the right/left needle throwing position, adjust it with + − ❹ .

If you want to change the needle throwing origin baseline, adjust it with + − ❺ .

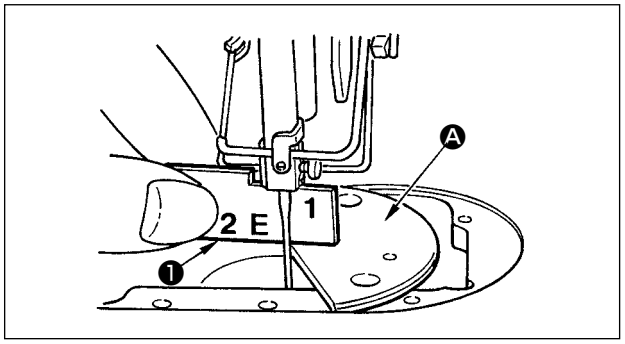
4) Turn ON/OFF the power to return from the hook adjusting mode to the normal sewing mode.

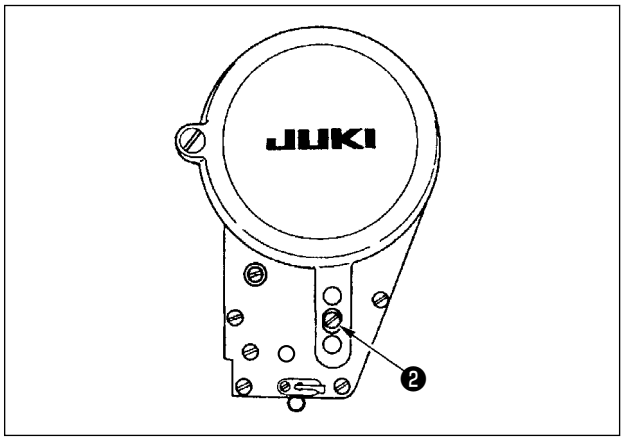
* Sewing machine does not work even when the front part of the pedal is depressed during the hook adjusting mode.
* Needle throwing works by turning the handwheel by hand.
* Needle bar moves when the set value is changed at needle UP position.

It is possible for zigzag width and position of the stitch base line to set up to the width of 10 mm regardless of the max. zigzag width limitation at the time of the hook adjusting mode. When using the hook adjusting mode for the machine to which presser foot, gauge, etc. are attached, be very careful in performing the adjustment.

7-2. Adjusting height of the needle bar

WARNING :
To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.



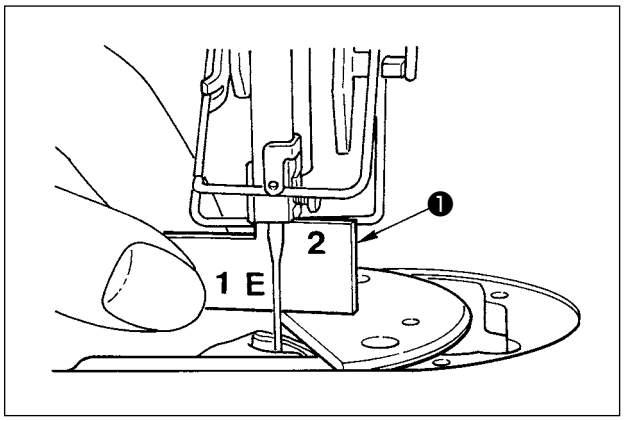


1) Set the zigzag width to “0”. Bring the needle to the center of the zigzag stroke.
2) Remove the presser foot, throat plate, semicircle plate and feed dog.
3) Place a semicircle plate on the plane, to which the throat plate is to be attached, of the bed. Loosen setscrew ❷ , and adjust so that from the top surface of semicircle plate Ⓐ to the bottom end of the needle bar is as high as “1” of timing gauge ❶ .

1. Thickness of the semicircle plate is different from that of the throat plate. Be sure to use the semicircle plate when adjusting the height of the needle bar. Be sure to perform the adjustment with zigzag width set to zero and with the needle positioned at the center of the zigzag stroke.
2. Use the timing gauge on which the indication “E” is engraved which has been supplied as accessories. (Part No. 22536502)

7-3. Adjusting the needle-to-hook timing and the needle guard

WARNING :
To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.

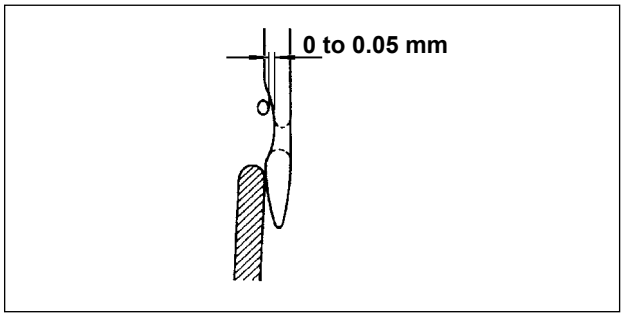


(1) Positioning the hook

1) Referring to **"7-1. Hook timing adjustment mode"**, adjust the hook timing to 214 °. Or, adjust the hook timing by aligning the blade point of hook with the center of needle at the height of "2" of accessory timing gauge ❶ .
2) At this time, the blade point of the hook should slightly come in contact with the needle when the needle guard does not touch the needle.

(2) Confirmation

Bring the needle to the leftmost position of the zigzag stroke at the time of the standard zigzag width of 8 mm, and confirm that the top end of the needle eyelet is spaced 0.2 to 0.5 mm away from the blade point of the hook. If the zigzag width of 10 mm is used or the shape of indented part of the needle is different from that of indented part of the needle at the time of delivery, re-adjust the height of the needle bar.



(3) Adjusting the needle guard

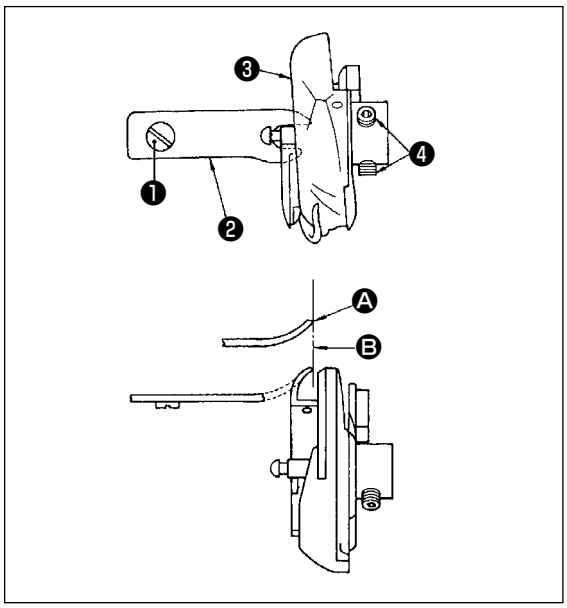
1) Maximize the zigzag width. Bend the needle guard to adjust so that the needle does not come in contact with the blade point of the both at the leftmost and rightmost positions of the zigzag stroke. At this time, adjust the clearance provided between the needle and the blade point of the hook to 0 to 0.05 mm.
2) The needle guard functions to keep the needle away from the blade point of the hook, thereby preventing damage to the blade point of the hook. Whenever you have replaced the hook with a new one, be sure to adjust the position of the needle guard.

Caution

When thread breakage has occurred, there is a case where thread is caught in the hook.
Be sure to perform sewing after removing the thread caught in the hook.

7-4. Attaching / removing the hook

WARNING :
To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.



When you replace the sewing hook, remove it in the following procedures ;

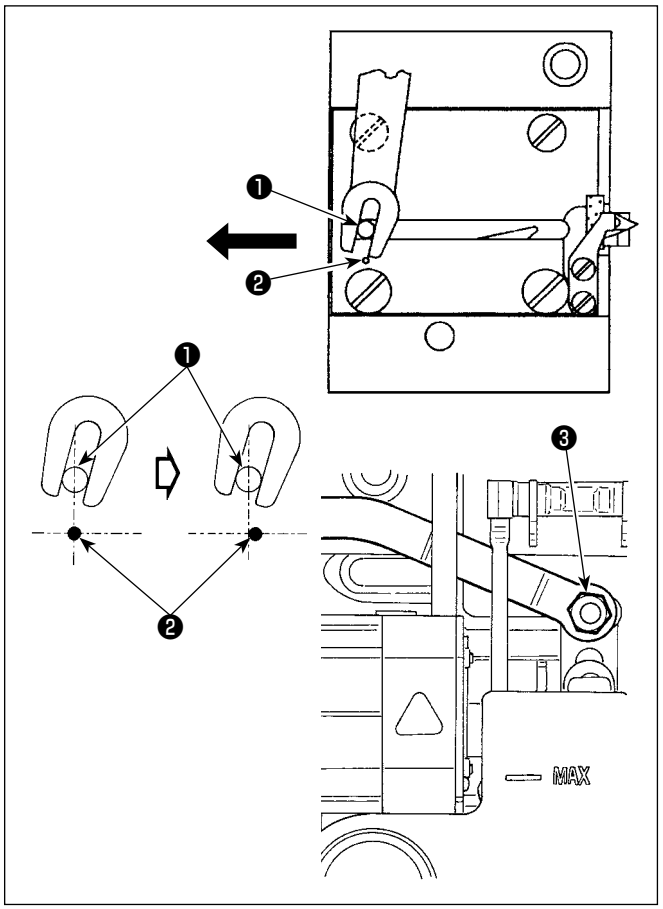
1) Turn the handwheel until the needle reaches to its highest position.
2) Remove the needle, presser foot, throat plate, feed dog and bobbin case from the machine.
3) Remove the setscrew ❶ and take out the bobbin case positioning finger ❷ .
4) Loosen the two screws ❹ and remove the sewing hook ❸ .

Reverse the above procedures when inserting the sewing hook. At this time, make sure that top end Ⓐ of the bobbin case positioning finger is aligned with line Ⓑ. as shown in the figure on the left. Never let Ⓐ protrude from line Ⓑ.

Reference
Part No. of hook ❸ is 22525877.
Do not use the hook other than that designated by JUKI.

7-5. Adjusting the thread trimmer

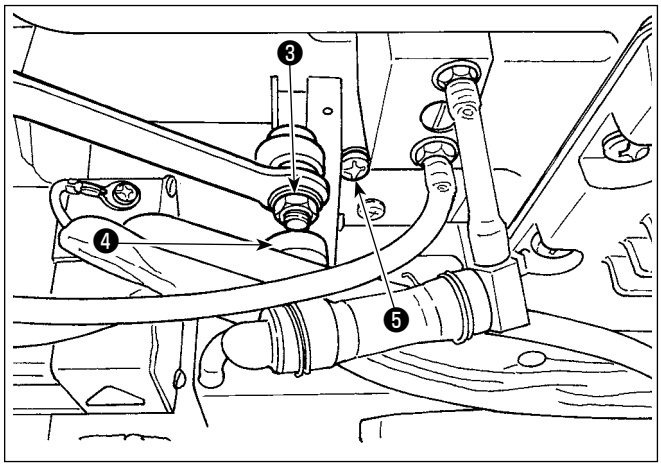
WARNING :
To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.

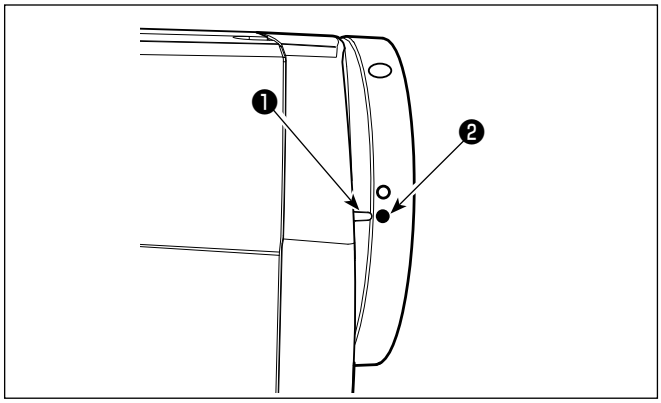


(1) Initial position of the moving knife

When the moving knife is in its initial position, the moving knife pin ❶ should be aligned with the engraved marker dot ❷ as shown in the figure on the left.

Caution
1. **When the gauge size which is more than that delivered as standard or the gauge size of other manufactures is used, and the counter knife interferes with the feed dog, loosen nut ❸ , move the initial position of moving knife pin ❶ to the left from engraved maker dot ❷ by approximately one half of engraved marker dot ❷ and fix the pin.**
2. **Guarantee of the sharpness of the thread trimmer knife unit is #80 to #50. When using thick threads thicker than these Nos., replace the knife with thread trimmer knife unit for thick thread (Part No. : 22556054).**





■ **If the initial position of the moving knife is not correct**

Loosen the nut ❸ , and move the moving knife to the right or left until the pin ❶ meets the marker dot ❷ . Then, tighten the nut ❸ .

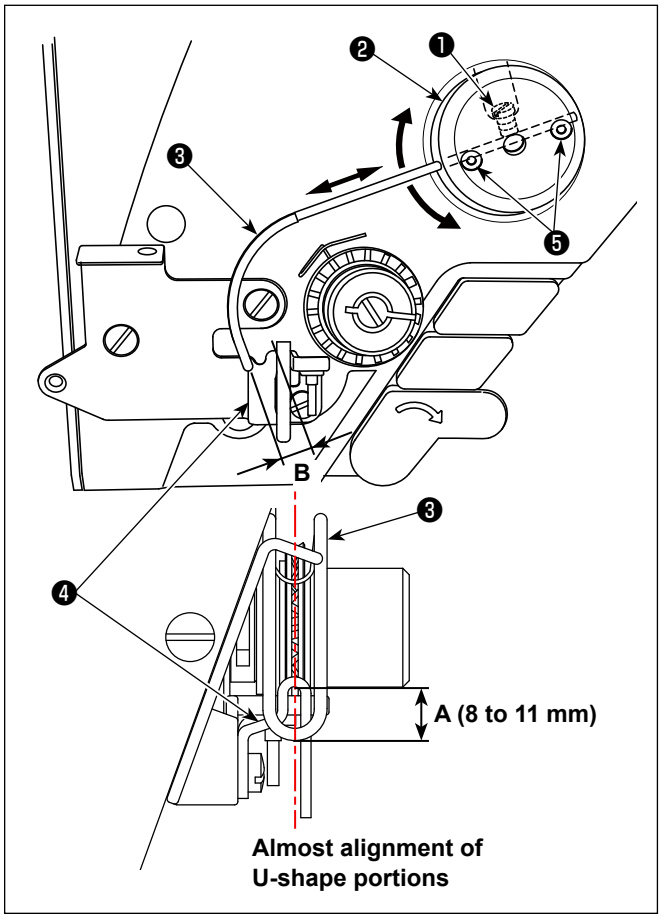
(2) Adjusting the thread trimming timing

Put roller ❹ in the cam groove. Now, gradually turn the handwheel in the reverse direction. The handwheel will go no further when marker dot ❶ engraved on the handwheel cover is aligned with red marker dot ❷ engraved on the handwheel.

To adjust the thread trimmer cam, align the red marker dot on the handwheel cover with the red marker dot on the handwheel, put the roller in the groove of the thread trimming cam, and gradually turn the handwheel in the direction opposite to the direction of rotation of the hook driving shaft until it will go no further. Now, tighten two screws ❺ .

7-6. Adjusting the needle thread feeding device

WARNING :
To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.



■ **Standard position of the feeding wire**

1) Loosen screw ❶ .
2) Turn the feeding wire together with feeding wire installing base ❷ , adjust the installing position of the feeding wire so that a distance of **A** (8 to 11 mm) is provided between the top end of feeding wire ❸ and the guide portion of thread take-up thread guide ❹ , and tighten screw ❶ .

Caution **At this time, adjust so that the center of U-shape portion of feed wire is almost aligned with the center of U-shape portion of thread guide.**

■ **When turning OFF the feeding device :**

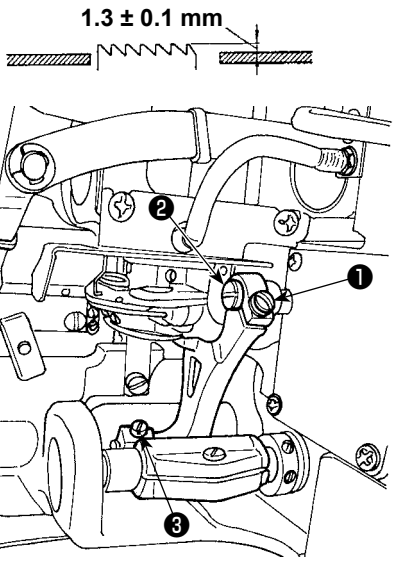
The needle thread feeding device can be placed in OFF by setting the memory switch No. 88 to 0 (zero).

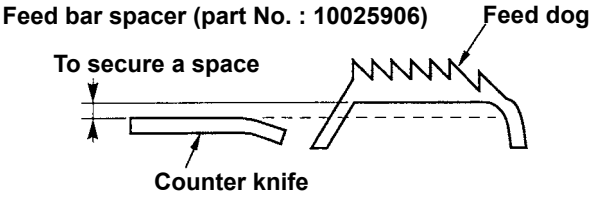
■ **When needle thread feeding amount is desired to be increased :**

- Loosen setscrews ❺ and adjust so that clearance **B** is reduced.
- Loosen setscrew ❶ and when the whole feeding wire installing base ❷ is adjusted to the upward direction (decrease the value, **A**), the feeding amount can be increased.

7-7. Height and inclination of the feed dog

WARNING :
To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.





1) To adjust the height of the feed dog, loosen the screw ❶ and turn the feed driving link pin ❷ using a screwdriver.
2) The standard height of the feed dog is 1.3 ± 0.1 mm.
3) To adjust the inclination of the feed dog, loosen the screw ❸ and turn the eccentric shaft inserting a screwdriver through the adjustment hole in the machine bed.
4) For the machine with a thread trimmer, there can be no space between the counter knife and the underside of the feed dog when adjusting the feed mechanism (change in height and timing) or using a commercially-available feed dog. In this case, place a feed bar spacer (part No. : 10025906) under the feed mechanism and a throat plate spacer (part No. : 22503908) under the throat plate so as to secure a space between the counter knife and the underside of the feed dog.

The standard inclination of the feed dog is obtained by adjusting the feed dog so that it becomes horizontal when it rises above the top surface of the throat plate.

7-8. Multi-layered section detection function

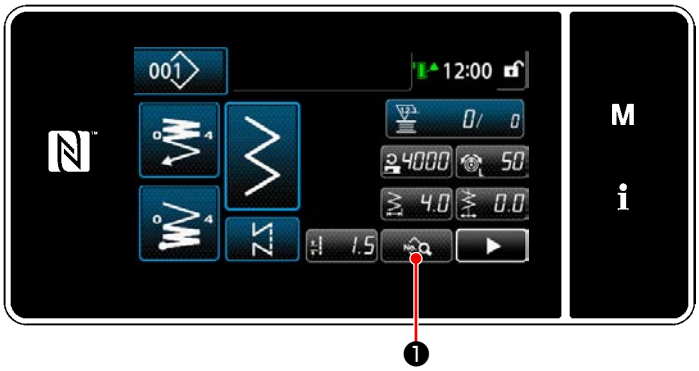
7-8-1. Multi-layered section detection function

When this function is used, the sewing machine detects a multi-layered section of the material, automatically changes over the sewing parameter to one-touch changeover parameter (**"5-2-8. One-touch utility change-over function" p.73**) and carries out sewing. The multi-layered section detection setting can be stored in memory on a pattern-by-pattern basis.

Detectable material thickness : Max. 8 mm
Detection resolution : 0.1 mm

* Multi-layered section of material that is less than 2 mm in thickness is likely to be affected by the feed dog height. Stable detection, therefore, cannot be carried out. It is not possible to detect two or more multi-layered sections thickness of which are different. In such cases, one-touch changeover function or the polygonal-shape stitching function by means of the hand switch should be used.

If the presser foot rests on a multi-layered part of material when turning the power ON, the multi-layered part detection may fail to be turned ON.



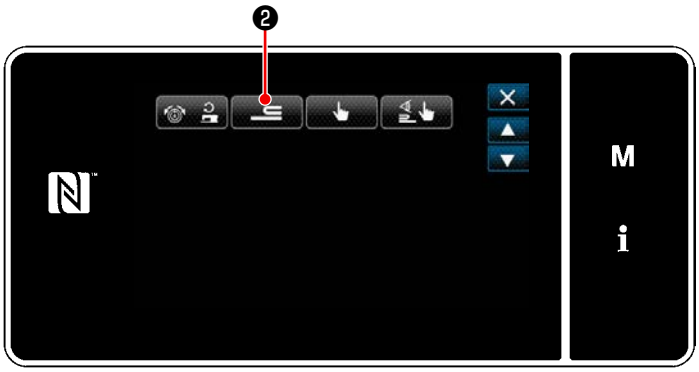
<Sewing screen>

[In order to detect a multi-layered section]

1. Select enable/disable of the multi-layered section detection function.

1) Press ❶.

The "sewing data edit screen" is displayed.



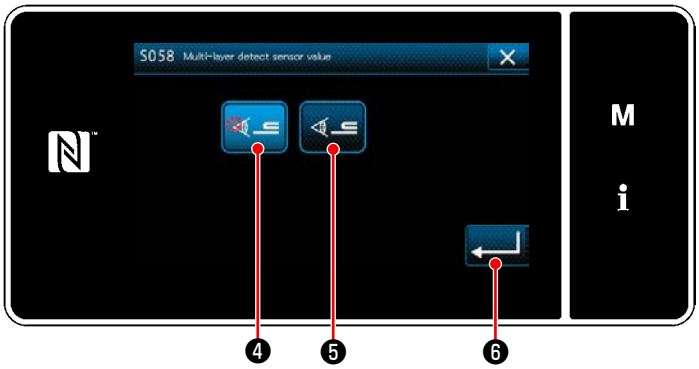
<Sewing data edit screen>

2) Press to proceed to the next page.
Then, press ❷.

<Multi-layered portion detection setting screen>

3) Press ❸.

"S058 Multi-layered part sensor value" is displayed.



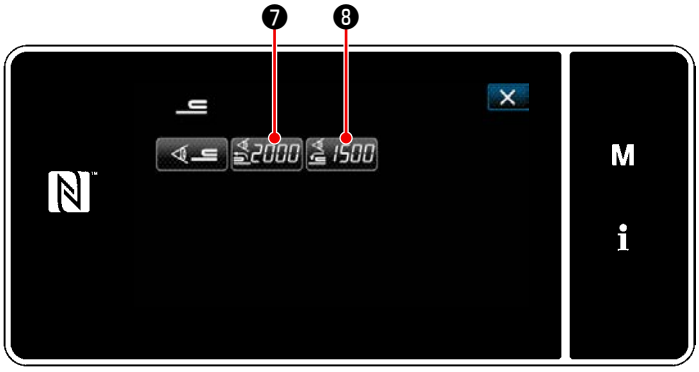
<Multi-layered section detection sensor value screen>

4) Select enable/disable of the multi-layered part detection by pressing ❹ (OFF) or ❺ (ON).

5) Press ❻ to confirm the setting. Then, the sewing data edit screen is displayed. Set the "threshold" for ON/OFF of the multi-layered section detection.

* For the purpose of the multi-layered section detection function, the word "threshold" means the value at which the multi-layered section sensor reacts.

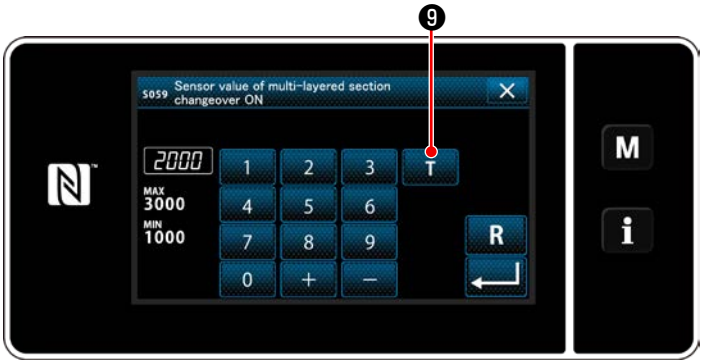
MAX : 3000
MIN : 1000



<Multi-layered portion detection setting screen>

2. Set a "threshold" for the multi-layered section detection.

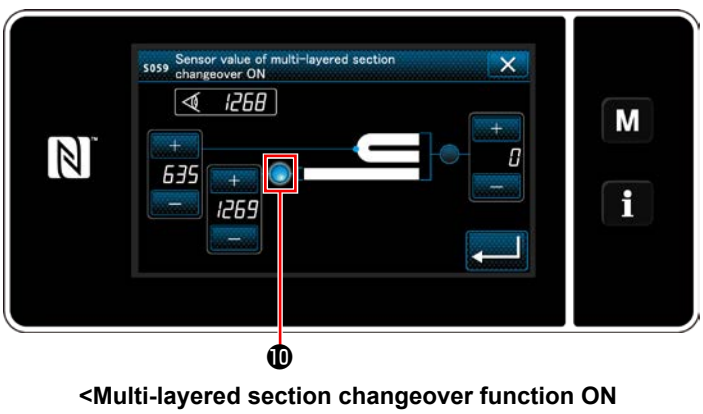
1) Press 2000 ❼.
"Multi-layered section changeover function ON sensor value screen" is displayed.
(For the "threshold" for turning OFF the multi-layered section changeover function, press 1500 ❽ and set the threshold in the same manner as described below.)



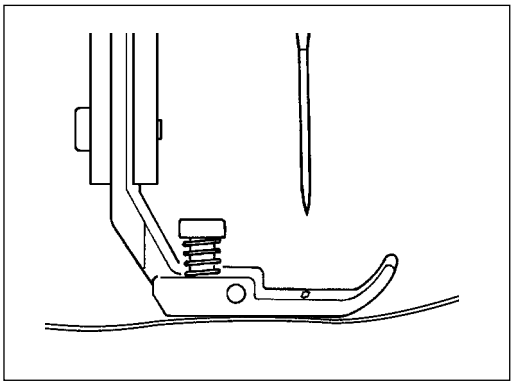
<Multi-layered section changeover function ON sensor value screen>

2) Press T ❾.
"Multi-layered section changeover function ON sensor value teaching screen" is displayed.

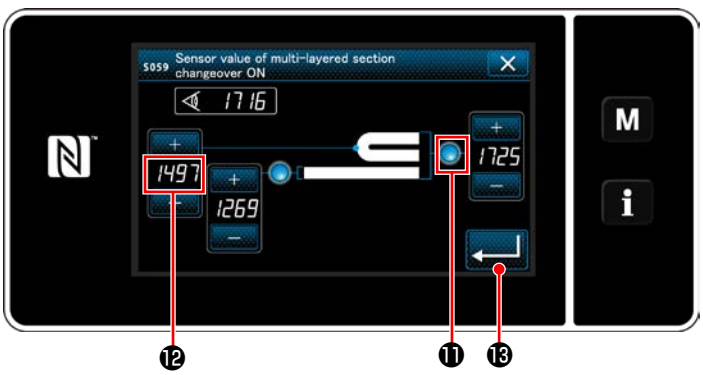
3) Place the normal section of material under the presser foot, and press ❿.
Lift the presser foot by depressing the back part of pedal.

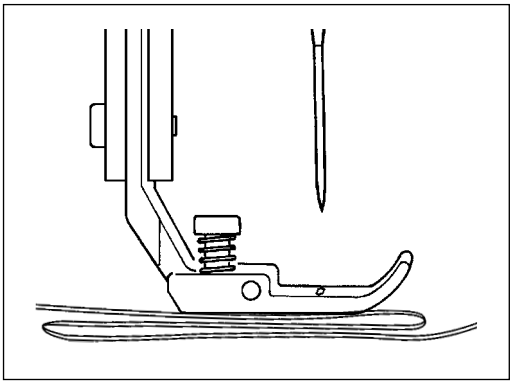


<Multi-layered section changeover function ON sensor value teaching screen>



4) Place the multi-layered section of material under the presser foot, and press ⓫ .



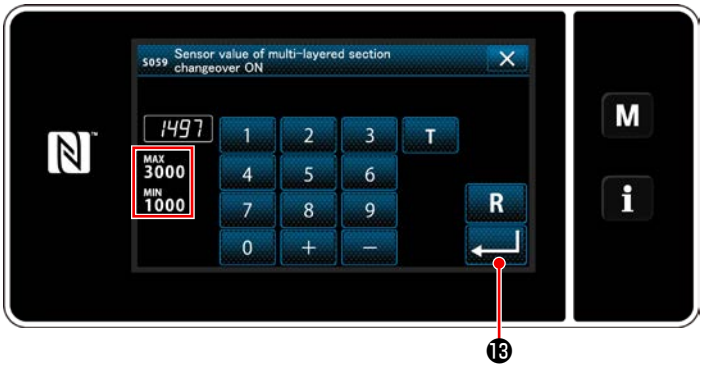


<Multi-layered section changeover function ON sensor value teaching screen>

The value of ⓬ is automatically calculated, and that value becomes the "threshold" for the multi-layered section detection. The value is adjustable with + − according to the sewing item.

If the "threshold" is decreased, the multi-layered section can be detected earlier. Be aware that, excessively decreased threshold can cause a faulty detection.

When ↵ ⓭ is pressed, the "multi-layered section changeover function ON sensor value screen" is displayed.



<Multi-layered section changeover function ON sensor value screen>

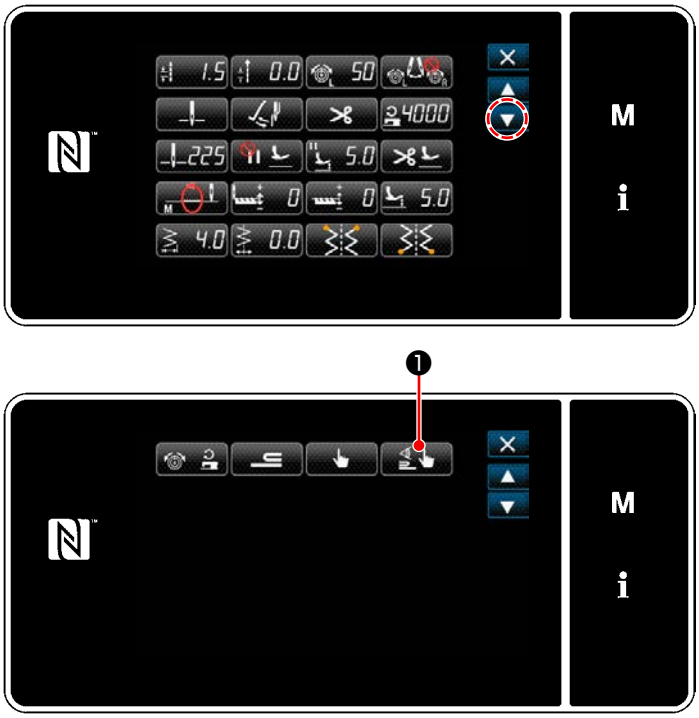
Check that the "threshold" you have set is entered. Then, press ↵ ⓭ again to confirm the setting. Note that the "threshold" can be directly entered or corrected on this screen.

MAX : 3000
MIN : 1000

The initial value of "threshold" for the multi-layered section detection is a rough indication. The threshold should be finely adjusted according to the actual sewing conditions such as the item to be sewn.

7-8-2. Turning OFF the multi-layered section changeover function by the number of stitching

If the sensor value drops below the "multi-layered section changeover function OFF threshold" setting, while the multi-layered section detection is enabled, the sewing parameter automatically returns to the previous one which is used before turning ON the multi-layered section changeover function.
The aforementioned changeover timing can be changed by setting the number of stitches.
Once the number of stitches for turning OFF the multi-layered section changeover function is set, the sensor value returns to the previous one which is used before turning ON the multi-layered section changeover function, after the sewing machine sews the number of stitches from the position at which a multi-layered section is detected even when the detection position is within the multi-layered section of material.
Note that if the sensor value drops below the "multi-layered section changeover function OFF threshold" setting for the multi-layered section detection even within the range of the number of stitches setting, the sewing parameter returns to the previous one which is used before turning ON the multi-layered section changeover function.



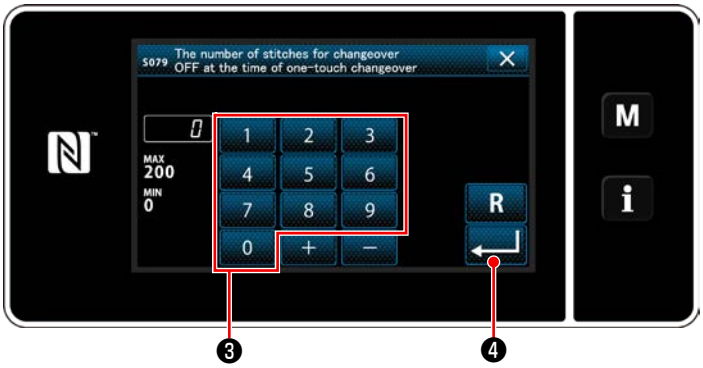
<Sewing data edit screen>

[How to set]

1) Press ❶ on the "Sewing data edit screen".
   The "one-touch changeover function edit screen" is displayed.

<One-touch changeover function edit screen>

2) Press ❷.
   The "number of stitches to turn OFF the changeover function when the one-touch changeover function is enabled" is displayed.



<Number of stitches to turn OFF the changeover function when the one-touch changeover function is enabled>

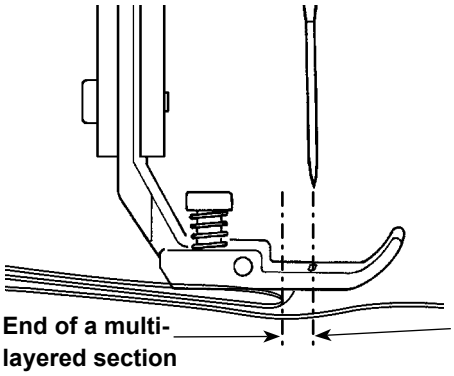
3) Enter the number of stitches with numeric keypad ❸ .

   Press ↵ ❹ to confirm the setting.

Factory-set value at the time of delivery
: 0 (Number of stitches is not set)

Setting range : 0 to 200

* If this value is set to 0 (zero), the multi-layered section changeover OFF function by the number of stitches will be disabled.

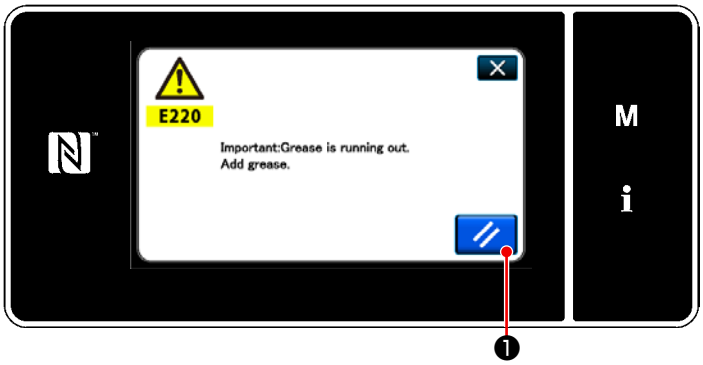


After the sewing machine has finished sewing of a multi-layered section of material, the machine's reaction is also delayed by a several number of stitches.

Caution

After the end of multi-layered section of material is fed, the multi-layered section detection function detects the flat section of material to return the sewing conditions to those for the flat section. However, this reaction sometimes delays according to the sewing conditions.
If such a delay occurs, it can be corrected by setting the number of stitches of the multi-layered section detection.

7-9. Grease shortage alarm



7-9-1. Regarding the grease shortage alarm

When the time of maintenance of grease approaches, the error message "E220 Warning against shortage of grease" is displayed.

This error is reset by pressing ❶. In this state, the sewing machine can be continuously used for a certain period of time.

Caution

Once the error message E220 is displayed, be sure to add grease for maintenance.

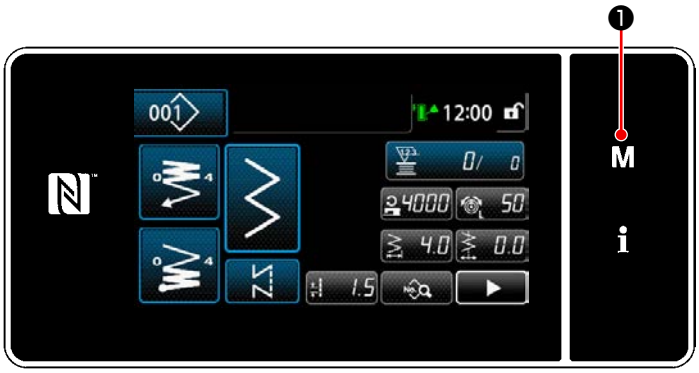
* Refer to **"7-9-3. Regarding K118 error resetting procedure" p. 136** in the case of carrying out error resetting (K118).

7-9-2. E221 Grease-shortage error

If the error message "E220" is not reset, the error message "E221 Grease-shortage error" will be displayed.

In this case, the sewing machine operation is disabled. Be sure to add grease and carry out error resetting (K118).

* Refer to **"7-9-3. Regarding K118 error resetting procedure" p. 136** in the case of carrying out error resetting (K118).



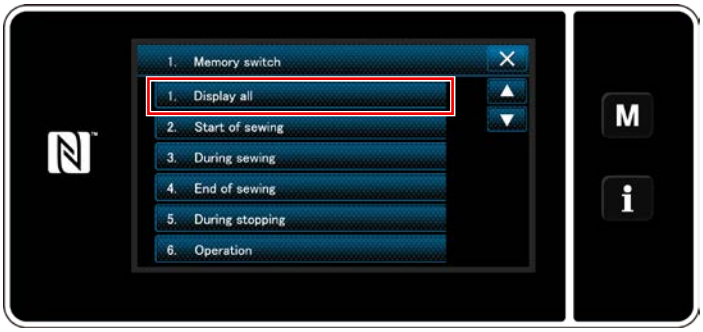
<Sewing screen>

7-9-3. Regarding K118 error resetting procedure

1) Keep M ❶ held pressed for three seconds.
The "mode screen" is displayed.

<Mode screen>

2) Select the "1. Memory switch".
The "memory switch type selection screen" is displayed.

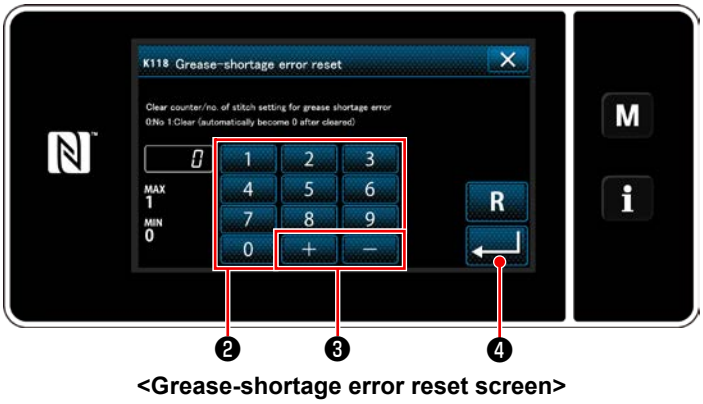


<Memory switch type selection screen>

3) Select the "1. Display all".
The "memory switch edit screen" is displayed.

<Memory switch edit screen>

4) Select the "K118 Grease-shortage error reset".
The "Grease-shortage error reset screen" is displayed.



<Grease-shortage error reset screen>

5) Set the set value to "1" using numeric keypad ❷ and + − ❸ . Press ↵ ❹ to confirm the setting.

This resets the error to bring the sewing machine back to the normal operation. The sewing machine can run normally until the next maintenance period is reached.

8. HOW TO USE THE OPERATION PANEL (APPLICATION)

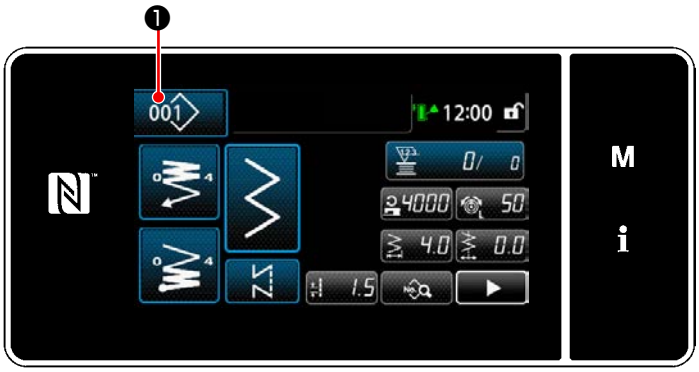
8-1. Management of sewing patterns

8-1-1. Creation of a new pattern

A newly-created sewing pattern is registered by following the steps of procedure described below.

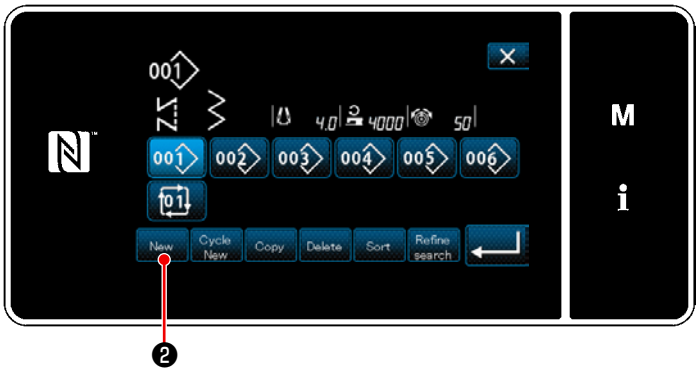
* **This operation is to be carried out under the maintenance personnel mode.**

① Selecting the new-pattern creating function



<Sewing screen (Maintenance personnel mode)>

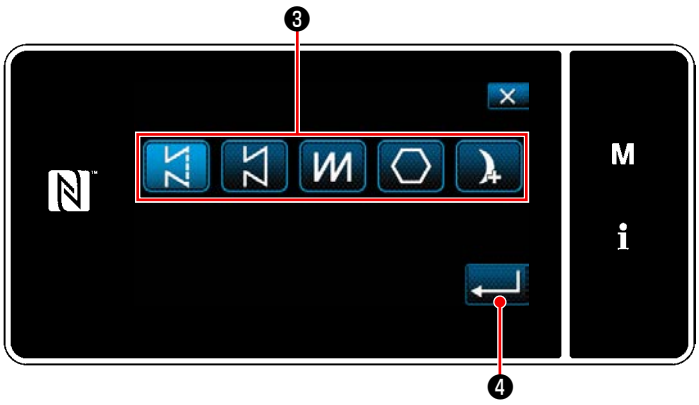
1) Press 001 ❶ on the sewing screen under the maintenance personnel mode.
The "sewing pattern number list screen" is displayed.



<Sewing pattern number list screen>

2) Press New ❷ .
The "new pattern creation screen" is displayed.

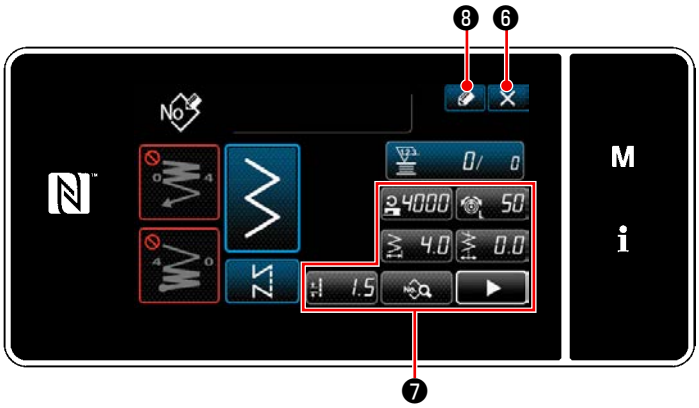
② Setting a sewing pattern



<New pattern creation screen>

1) Select the sewing pattern by pressing sewing pattern selection button ❸ .
2) Press ❹ to confirm the setting.
The "new sewing pattern edit screen" is displayed.

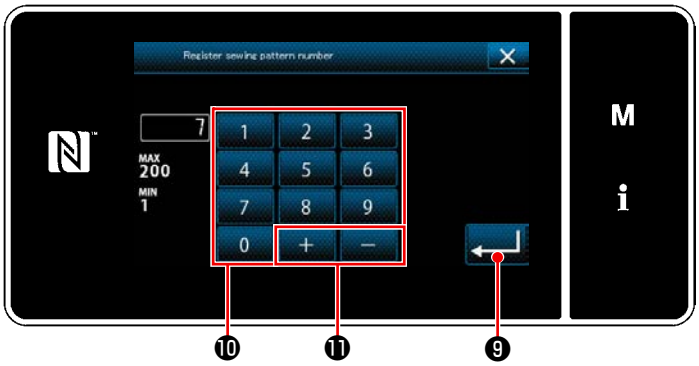
③ Setting the pattern function



<New sewing pattern edit screen>

1) Set the pattern function using buttons ❼ .
   Refer to **"5-2. Sewing patterns" p. 45**.
2) Press  ❽ .
   The "sewing pattern number registration screen" is displayed.
   Press  ❻ to display the data discard confirmation screen.

④ Entering a pattern number and registering the pattern



<Sewing pattern number registration screen>

1) Enter the sewing pattern number to be registered using numeric keypad ❿ .
   An unassigned registration number that is closest to the entered value in the plus/minus direction is displayed by pressing  ⓫ .
2) The created pattern is registered by pressing  ❾ . Then, the current screen returns to the "sewing pattern number list screen".
   In the case the entered number has already been registered, the prompt message for overwrite confirmation is displayed.

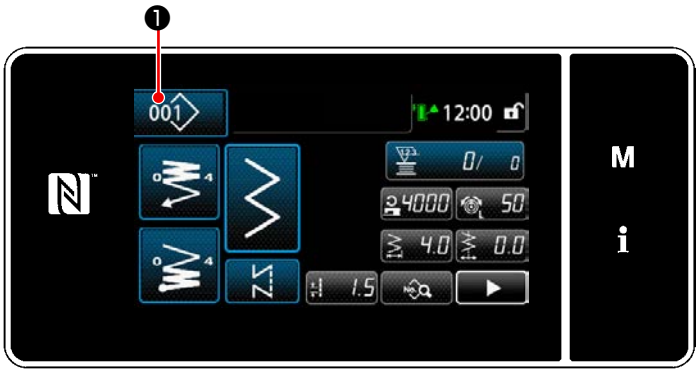
8-1-2. Copying a pattern

The selected pattern (sewing pattern and cycle pattern) can be copied to any other pattern of the specified number.

*** This operation is to be carried out under the maintenance personnel mode.**

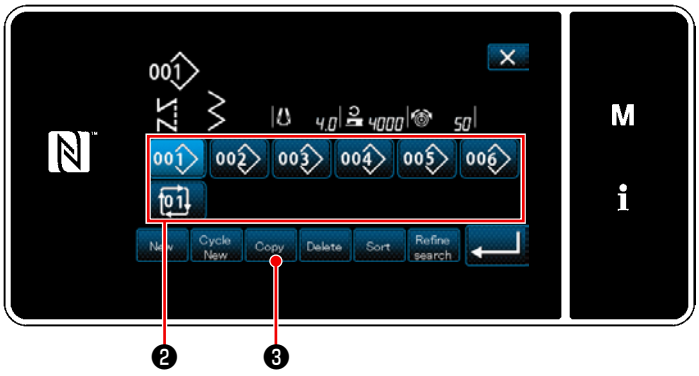
Explanation is given below using copying of a sewing pattern as an example.

① Selecting the sewing pattern copy function



<Sewing screen (Maintenance personnel mode)>

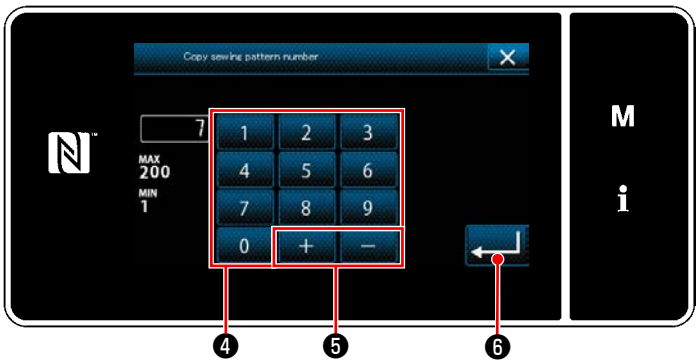
1) Press 001 ❶ on the sewing screen under the maintenance personnel mode.
The "sewing pattern number list screen" is displayed.



<Sewing pattern number list screen>

2) Select the copy source pattern number from list ❷ .
3) Press Copy ❸ .
The "sewing pattern number copy screen" is displayed.

② Select the copy destination pattern number



<Sewing pattern number copy screen>

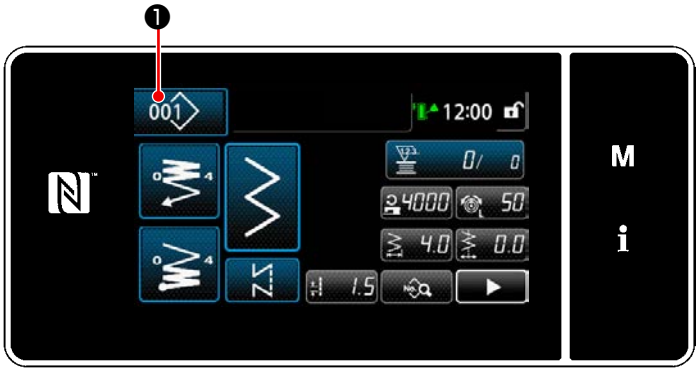
1) Enter the sewing pattern number to be registered using numeric keypad ❹ .
An unassigned registration number that is closest to the entered value in the plus/minus direction is displayed by pressing + – ❺ .
2) The created pattern is registered by pressing ↵ ❻ . Then, the current screen returns to the "sewing pattern number list screen".
In the case the entered number has already been registered, the prompt message for overwrite confirmation is displayed.

8-1-3. Deleting a pattern

This section describes how to delete the selected pattern (sewing pattern, cycle sewing pattern).

* **This operation is to be carried out under the maintenance personnel mode.**

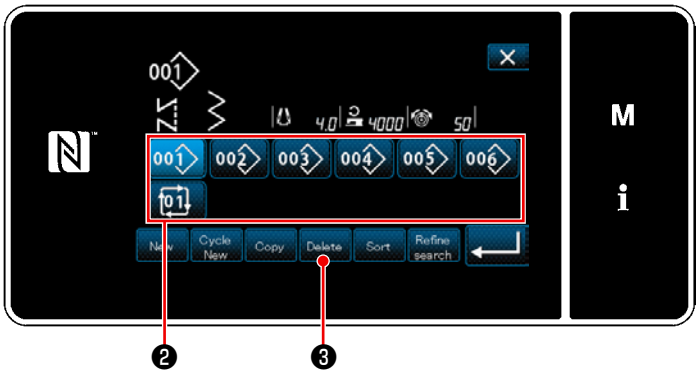
① Selecting the sewing pattern deletion function



<Sewing screen (Maintenance personnel mode)>

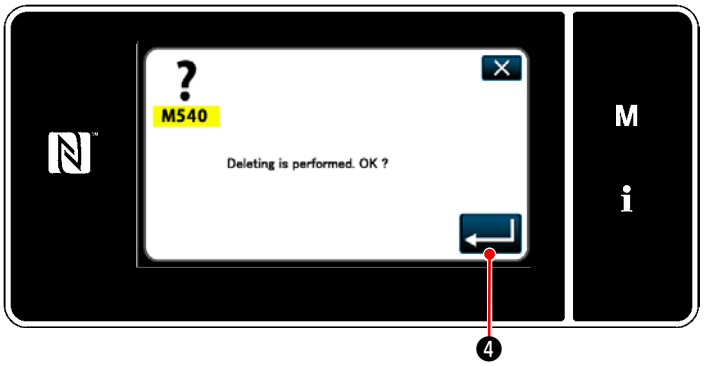
Press 001 ❶ on the sewing screen under the maintenance personnel mode.
The "sewing pattern number list screen" is displayed.

② Selecting the sewing pattern and deleting it



<Sewing pattern number list screen>

1) Select pattern number to delete from list ❷ .
2) Press Delete ❸ .
The "deletion confirmation screen" is displayed.



<Deletion confirmation screen>

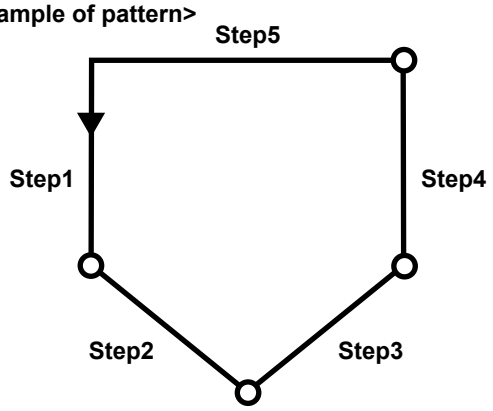
3) The pattern is deleted by pressing ❹ .

8-2. Setting up the polygonal-shape stitching

A polygonal-shape stitching pattern consists of 30 steps (at the maximum) of constant-dimension sewing patterns. Specific sewing conditions can be set on a step-by-step basis.

*** This operation is to be carried out under the maintenance personnel mode.**

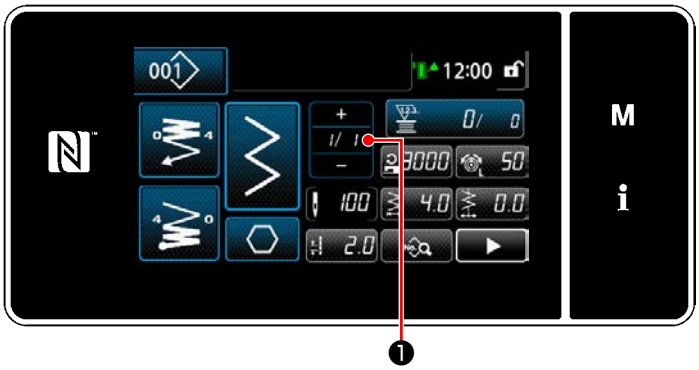
<Example of pattern>



8-2-1. Editing a polygonal-shape stitching pattern

This section describes how to change the number of steps and step-by-step conditions of a polygonal-shape stitching pattern.

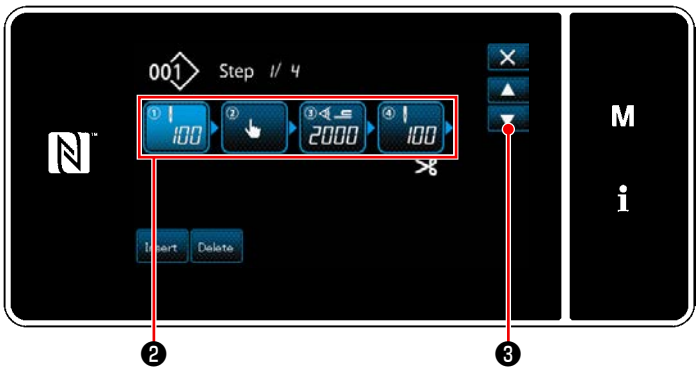
① Displaying the sewing screen (maintenance personnel mode) for the polygonal-shape stitching pattern



<Sewing screen (Maintenance personnel mode)>

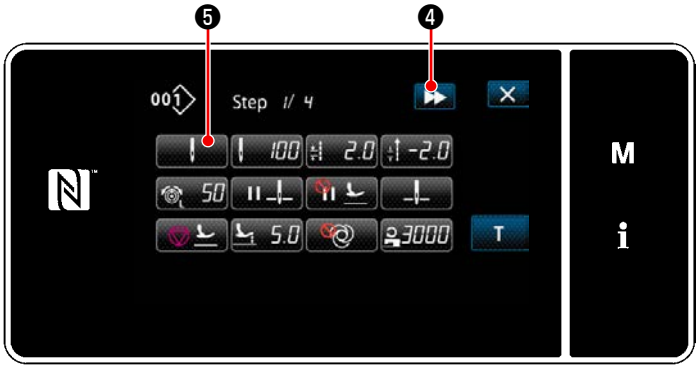
Press 1/ 1 ❶ on the sewing screen under the maintenance personnel mode.
The "polygonal-shape stitching step edit screen" is displayed.

② Editing the number of stitches of polygonal shape stitching and the step changeover condition to be satisfied by a new step



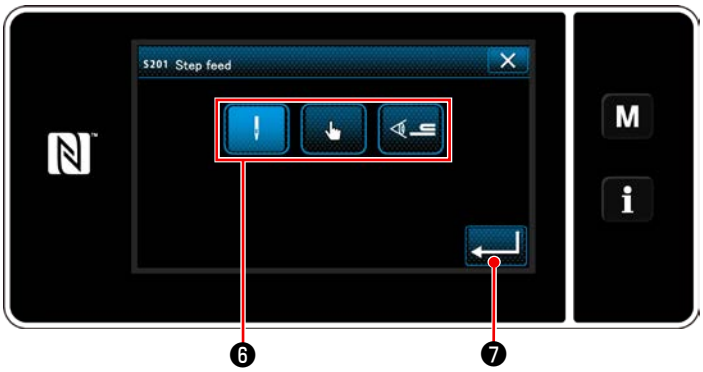
<Polygonal-shape stitching step edit screen>

1) Step changeover condition is displayed in ❷. Press ❷ to place the number of stitches in the selected state.
The screen returns to the previous one or advances to the next one with  ❸.



<Sewing data edit screen>

2) When the selected step is pressed again, the "sewing data edit screen" is displayed.
When  ❹ is pressed, the "sewing data edit screen" for the next step is displayed.
When  ❺ is pressed, the "step changeover reference selection screen" is displayed.



<Step changeover reference selection screen>

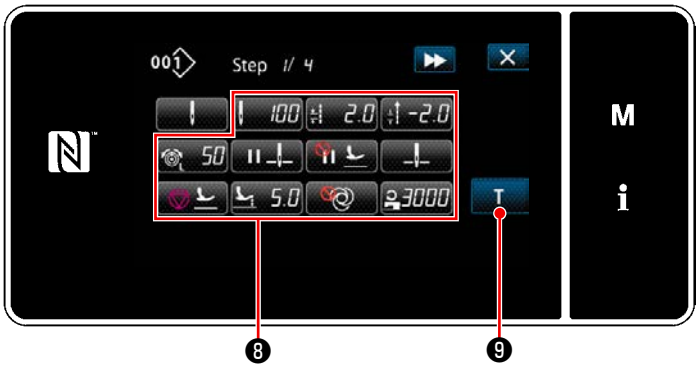
3) Selecting step changeover reference ❻.

 : Number of stitches

 : One-touch changeover

 : Multi-layered section detection

4) When  ❼ is pressed, the operation is confirmed. Then, the screen returns to the "sewing data edit screen".

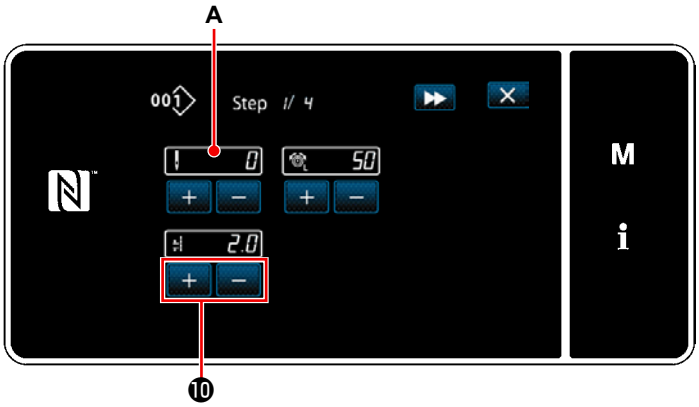


<Sewing data edit screen>

5) Setting other sewing data ❽ .
The type of sewing data displayed on the "sewing data edit screen" changes according to the step changeover reference selected in the aforementioned item number 3. (See the table shown below.)

The presser lifter operates after thread trimming according to the setting of the final step.

	Step changeover reference		
	Number of stitches	Hand switch	Multi-layered part detection
Step changeover sensor value	×	×	○
Number of stitches	○	×	×
Stitch length	○	○	○
Reverse feed stitch length	○	○	○
Needle thread tension	○	○	○
Intermediate stop - Needle bar stop position	○	○	○
Intermediate stop - Presser foot lifting	○	○	○
Stop - Needle bar position	○	○	○
Stop - Presser foot lifting	○	○	○
Stop - Presser foot lifting height	○	○	○
One shot	○	○	○
Sewing speed limit	○	○	○

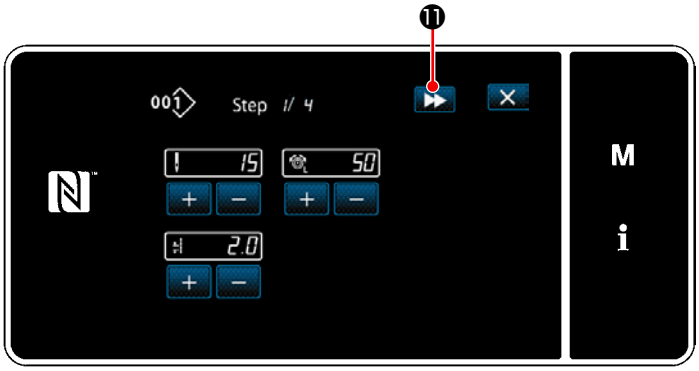


<Teaching input screen - Initial state>

6) When T ❾ is pressed, the "teaching input screen" is displayed.
Input value **A** of the number of stitch becomes 0 (zero).
Depress the pedal to count the number of stitches to be sewn until the sewing machine stops.

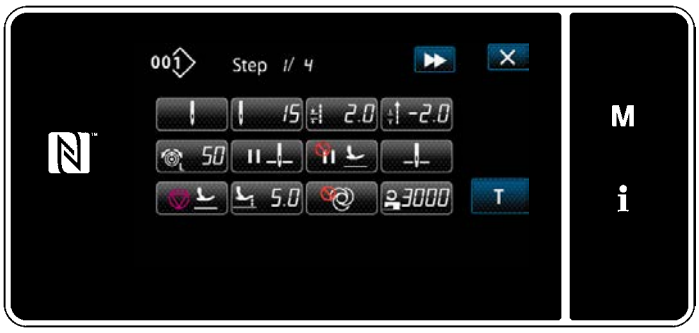
Change the sewing conditions with + − ❿ .

- 6.0 : Stitch length
- 50 : Needle thread tension

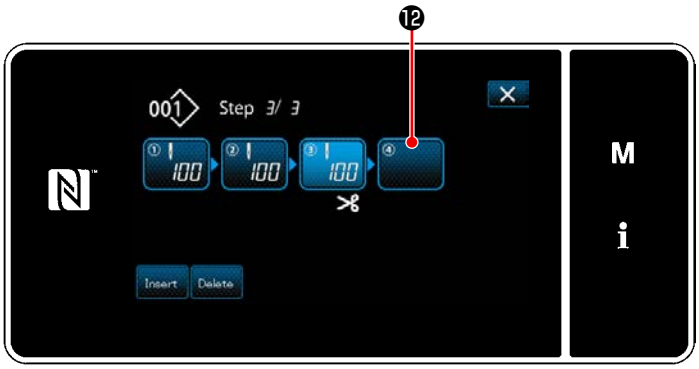


<Teaching input screen - After teaching>

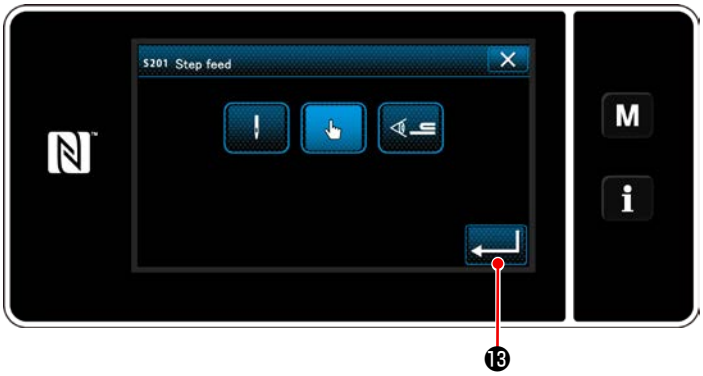
When ▶▶ ⓫ is pressed, the step changes over to the next step.
Confirm the teaching content by performing thread trimming. Then, the screen returns to the "sewing data edit screen" and the sewing condition you have changed is reflected.



<Sewing data edit screen>



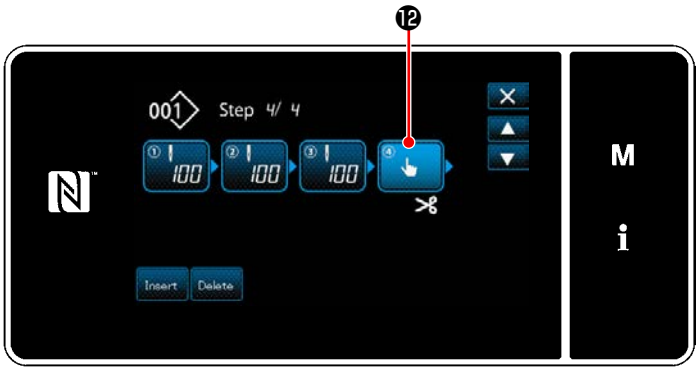
7) In the case a step can be additionally registered to a sewing pattern, step ⓬ which is not yet set is displayed in the last field.



<Step changeover reference selection screen>

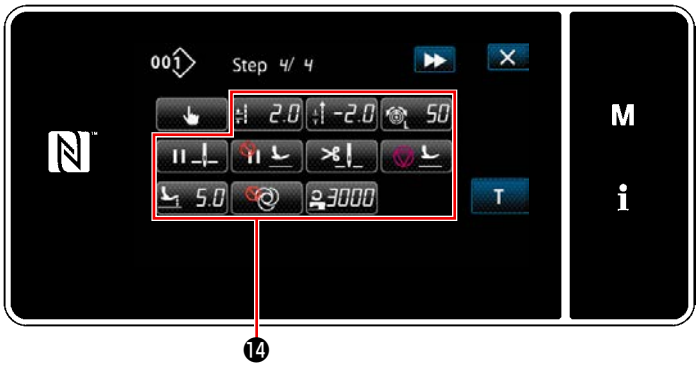
8) When displayed step ⓬ is pressed, the "step changeover reference selection screen" is displayed.
Select the step changeover reference in the same manner as aforementioned item number 3.

9) When ↵ ⓭ is pressed, the operation is confirmed. Then, the screen returns to the "polygonal shape stitching step edit screen".



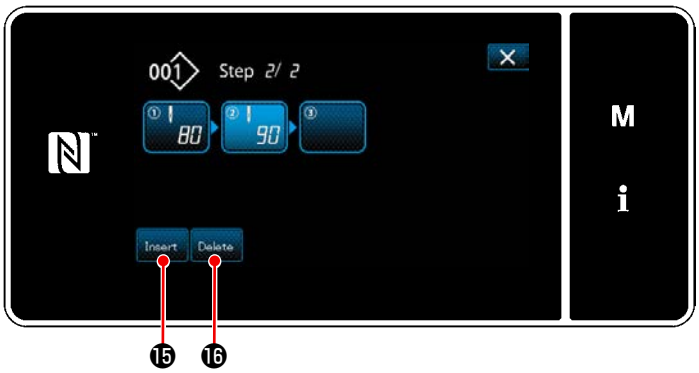
<Polygonal shape stitching step edit screen>

10) When step ⓬ is pressed again, the "sewing data edit screen" is displayed.
Select the step changeover reference in the same manner as aforementioned item number 3.



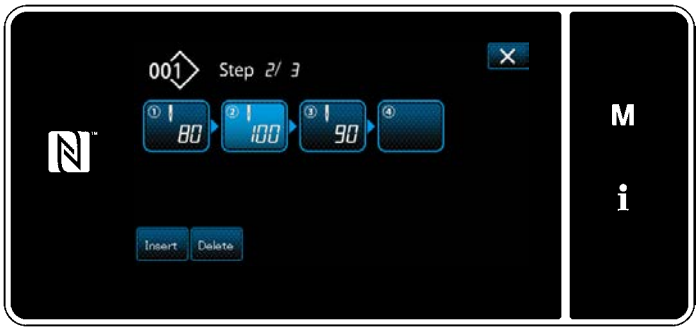
<Sewing data edit screen>

11) Set other sewing data ⓮ in the same manner as item number 5.



12) When Insert ⓯ is pressed, a step containing 100 stitches is inserted immediately before the selected step.
When the inserted step field button is pressed, the "sewing data edit screen" is displayed.
In the same manner as described above, select the step changeover reference and set the sewing data.

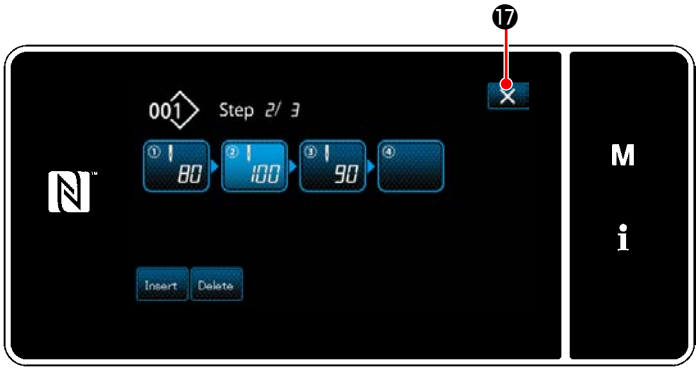
* In the case the maximum number of steps have already been registered, Insert ⓯ is not displayed.



13) When Delete ⓰ is pressed, the selected step is deleted.

* In the case only one step has been registered, Delete ⓰ is not displayed.

③ Confirming the data on the created sewing pattern



<Polygonal-shape stitching step edit screen>

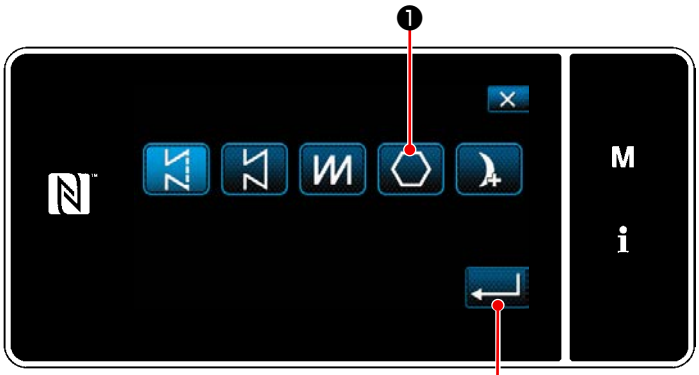
The operation is completed by pressing ✕ ⓱. Then, the current screen returns to the sewing screen under the maintenance personnel mode.

8-2-2. Creating a new polygonal-shape stitching pattern

① Selecting the new-pattern creating function

Display the "new sewing pattern creation screen" referring to ① in **"8-1-1. Creation of a new pattern" p. 137**.

② Creating a polygonal shape stitching pattern

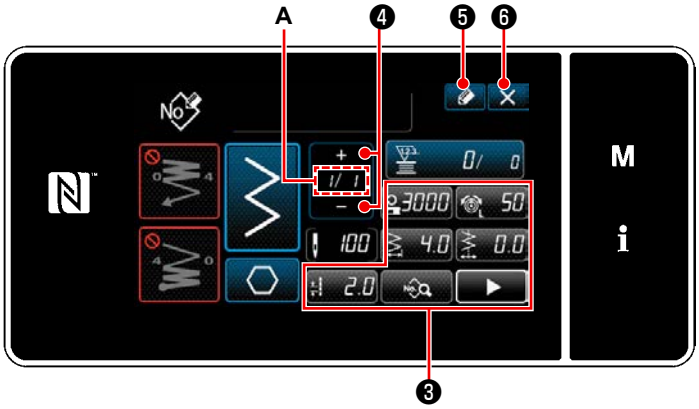


<New pattern creation screen>

Referring to ② in **"8-1-1. Creation of a new pattern" p. 137** , select polygonal-shape stitching pattern ❶ on the sewing pattern selection screen. Then, press ❷ .

The "new sewing pattern edit screen" is displayed.

③ Setting the pattern function on a step-by-step basis



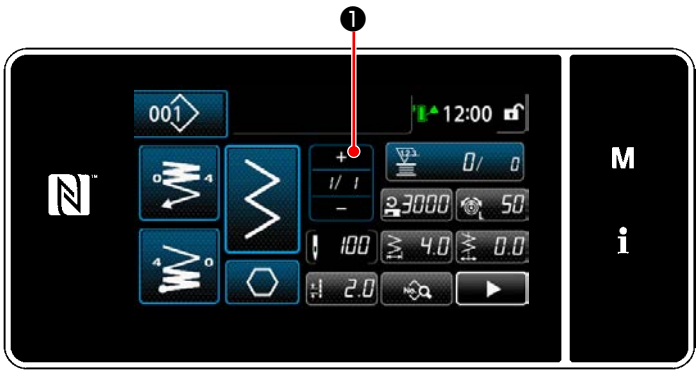
<New sewing pattern edit screen>

1) Set the pattern function with buttons ❸ on a step-by-step basis.
   Refer to **"5-2. Sewing patterns" p. 45**.
2) The total number of steps you have set is displayed on the right of section **A**. The current step is displayed on the left of section **A**. The current step can be changed with ❹ .
3) Press ❺ .
   The "sewing pattern number registration screen" is displayed.
   Press ❻ to display the data discard confirmation screen.

Steps of procedure to be taken after the aforementioned step are same as steps ③ to ④ in **"8-1-1. Creation of a new pattern" p. 137**.

8-2-3. Setting the step from which polygonal-shape stitching is started

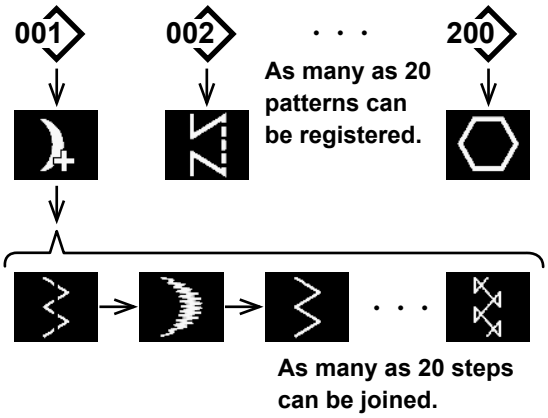
In the case it is necessary to re-sew a pattern from the middle of the pattern after the occurrence of troubles such as thread breakage, it is possible to re-start sewing from an arbitrary step of the pattern.



<Sewing screen (Polygonal-shape stitching pattern)>

The current step can be changed by pressing ❶ on the sewing screen for polygonal-shape stitching pattern.

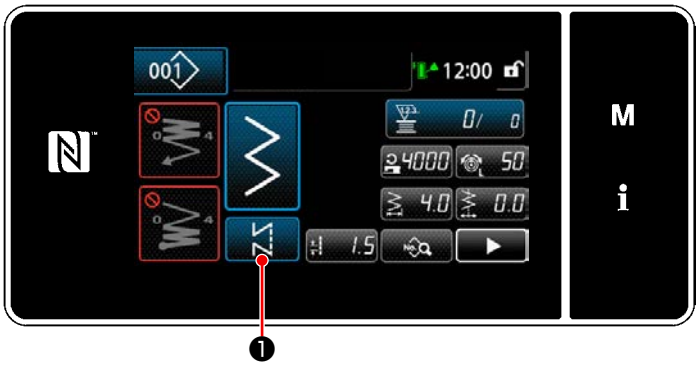
8-3. Continuous sewing pattern



The continuous stitching is a function created by supposing the case where the different patterns are connected and sewn, or the case where the sewing is performed beyond max. number of stitches per pattern, 2000 stitches. Therefore, the connected patterns are recognized as one pattern.
Continuous stitching can sew the different zigzag patterns in combination.
Changeover of the respective patterns can be set with the number of stitches.
Continuous stitching can combine as many as 20 steps and 2000 stitches per step can be set. In addition, up to 20 patterns can be registered.

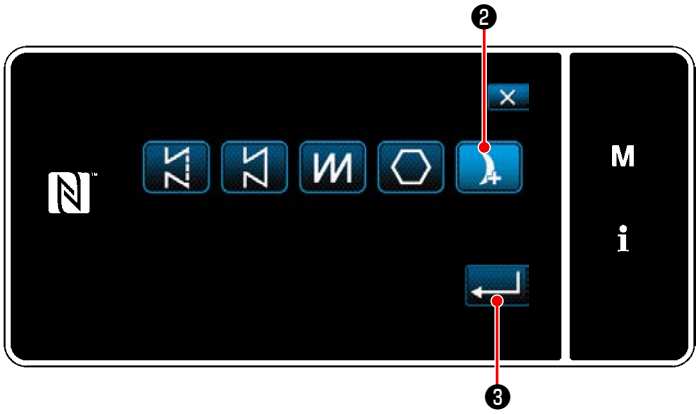
* **This operation is to be carried out under the maintenance personnel mode.**

8-3-1. Selecting the continuous sewing pattern



<Sewing screen (Maintenance personnel mode)>

1) Press ❶ on the sewing screen under the maintenance personnel mode.
The "Sewing pattern selection screen" is displayed.



<Sewing pattern selection screen>

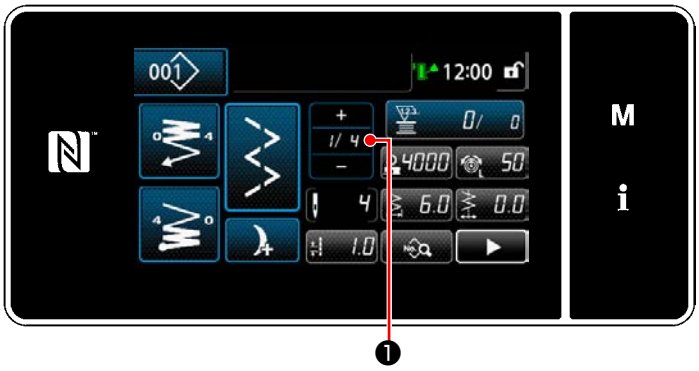
2) Select ❷.

3) When ❸ is pressed, the operation is confirmed. Then, the screen returns to the "sewing screen".

8-3-2. Editing the continuous sewing pattern

The number of steps of and the step-by-step conditions for the continuous sewing pattern are changed following the steps of procedure described below.

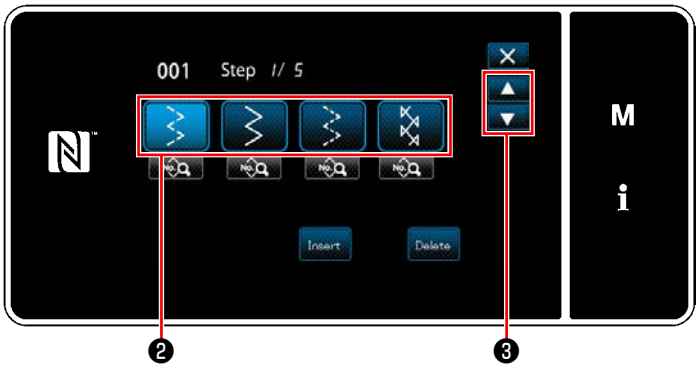
① Displaying the sewing screen (maintenance personnel mode) for the continuous sewing pattern



<Sewing screen (Maintenance personnel mode)>

1) Press // 4 ❶ on the sewing screen under the maintenance personnel mode.
The "Continuous sewing step edit screen" is displayed.

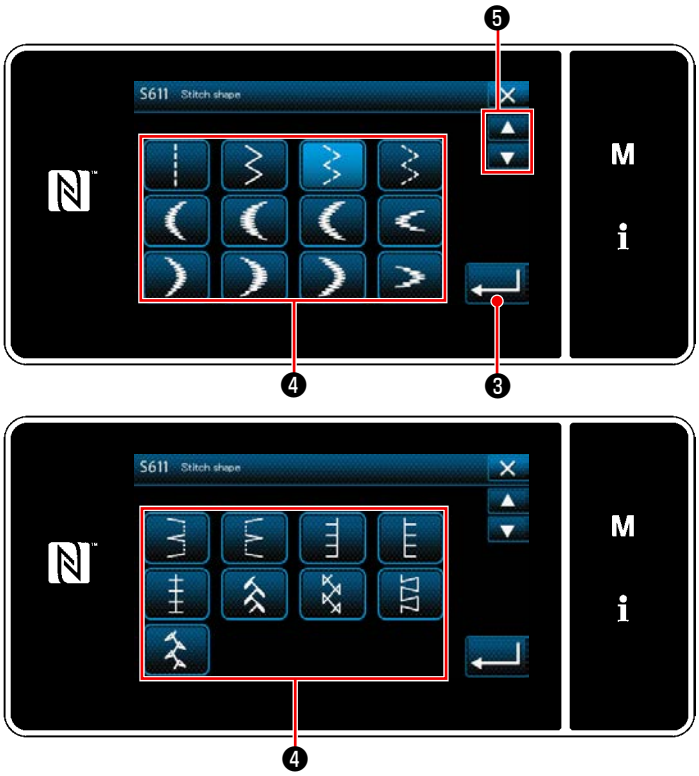
② Editing the number of steps of and the step-by-step conditions for the continuous sewing pattern



<Continuous sewing step edit screen>

2) Step changeover condition is displayed in ❷. Press ❷ to place the number of stitches in the selected state.
The screen returns to the previous one or advances to the next one with ❸.

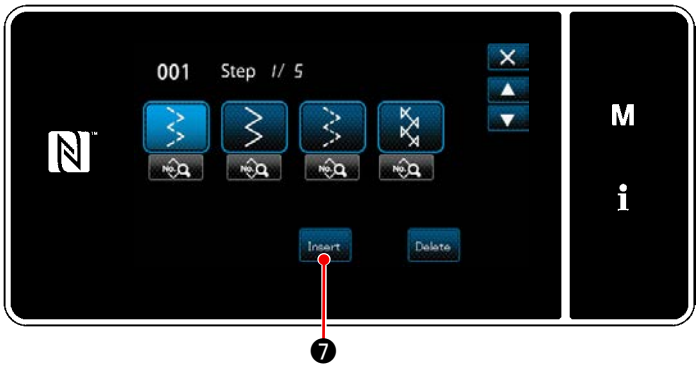
3) When the selected step is pressed again, the "Sewing shape selection screen" is displayed.



<Sewing shape selection screen>

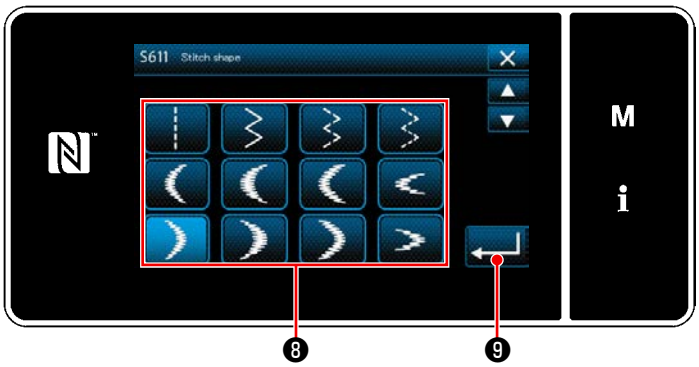
4) Select sewing shape ❹.
The screen returns to the previous one or advances to the next one with ❺.

5) When ❻ is pressed, the operation is confirmed. Then, the screen returns to the "Continuous sewing step edit screen".



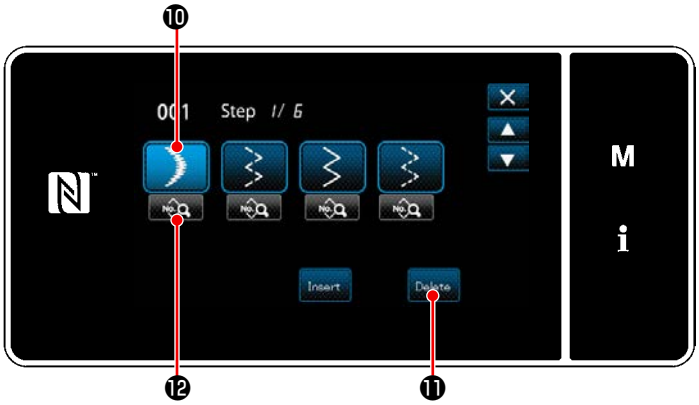
<Continuous sewing step edit screen>

6) When Insert ❼ is pressed, the "Sewing shape selection screen" is displayed.
   * In the case the maximum number of steps have already been registered, Insert ❼ is not displayed.



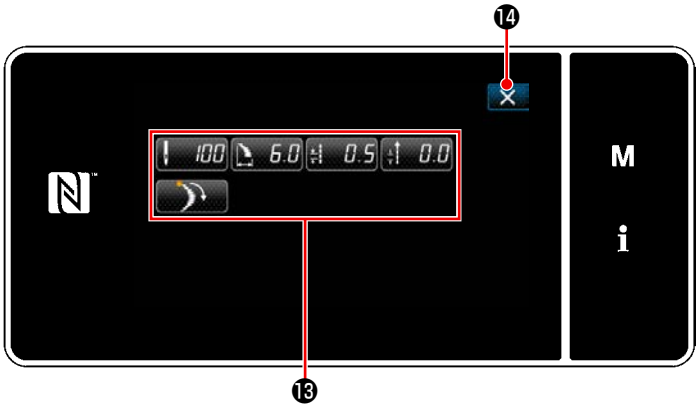
<Sewing shape selection screen>

7) Select sewing shape ❽ .
8) When ↵ ❾ is pressed, the operation is confirmed. Then, the screen returns to the "Continuous sewing step edit screen".



<Continuous sewing step edit screen>

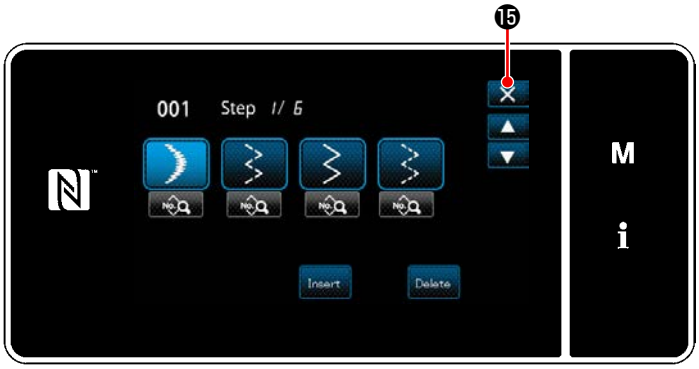
9) New step ❿ is inserted before the step you have selected in 6).
10) When Delete ⓫ is pressed, the selected step is deleted.
    * In the case only one step has been registered, Delete ⓫ is not displayed.
11) When No. ⓬ is pressed, the "sewing data edit screen" is displayed.



<Sewing data edit screen>

12) Select sewing data ⓭ you want to edit. Then, edit the sewing data.

13) When ⓮ is pressed, the operation is completed and the screen returns to the "Continuous sewing step edit screen".



<Continuous sewing step edit screen>

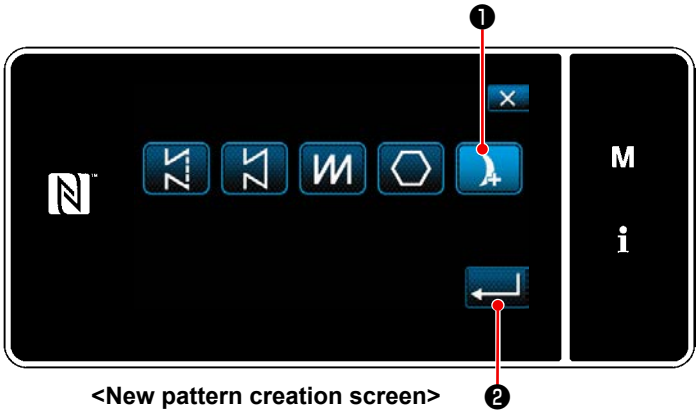
14) The operation is completed by pressing ⓯. Then, the current screen returns to the sewing screen under the maintenance personnel mode.

8-3-3. Creating a new continuous sewing pattern

① Selecting the new-pattern creating function

Display the "new sewing pattern creation screen" referring to ① in **"8-1-1. Creation of a new pattern" p. 137**.

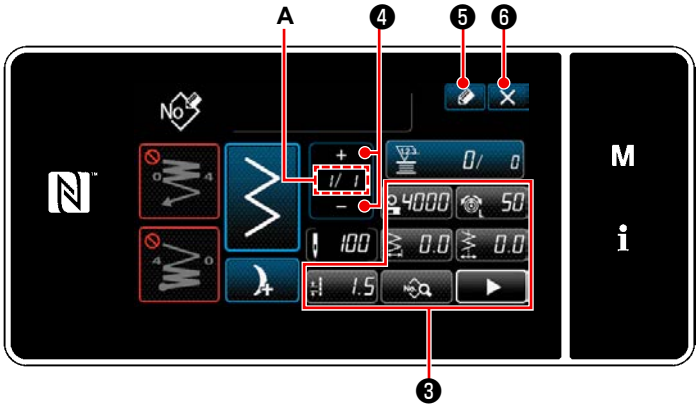
② Creating a continuous sewing pattern



<New pattern creation screen>

Referring to ② in **"8-1-1. Creation of a new pattern" p. 137** , select continuous sewing pattern  ❶ on the sewing pattern selection screen.
Then, press  ❷ .
The "new sewing pattern edit screen" is displayed.

③ Setting the pattern function on a step-by-step basis



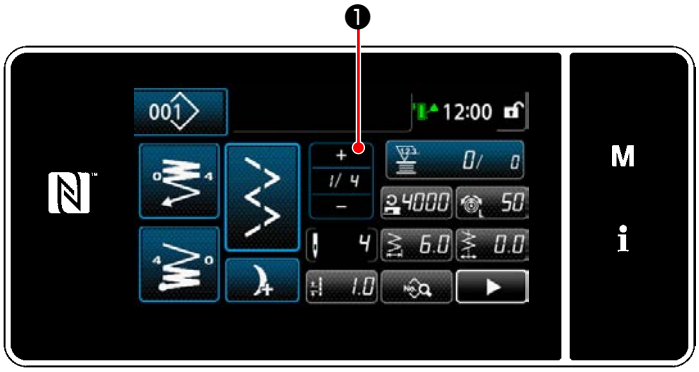
<New sewing pattern edit screen>

1) Set the pattern function with buttons ❸ on a step-by-step basis.
   Refer to **"5-2. Sewing patterns" p. 45**.
2) The total number of steps you have set is displayed on the right of section **A**. The current step is displayed on the left of section **A**. The current step can be changed with  ❹ .
3) Press  ❺ .
   The "sewing pattern number registration screen" is displayed.
   Press  ❻ to display the data discard confirmation screen.

Steps of procedure to be taken after the aforementioned step are same as steps ③ to ④ in **"8-1-1. Creation of a new pattern" p. 137**.

8-3-4. Setting the starting step of the continuous sewing pattern

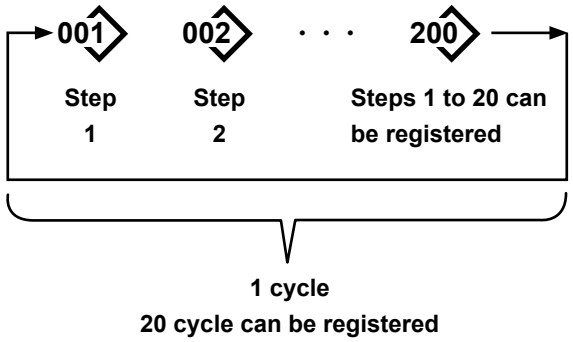
In the case it is necessary to re-sew a pattern from the middle of the pattern after the occurrence of troubles such as thread breakage, it is possible to re-start sewing from an arbitrary step of the pattern.



<Sewing screen (continuous sewing pattern)>

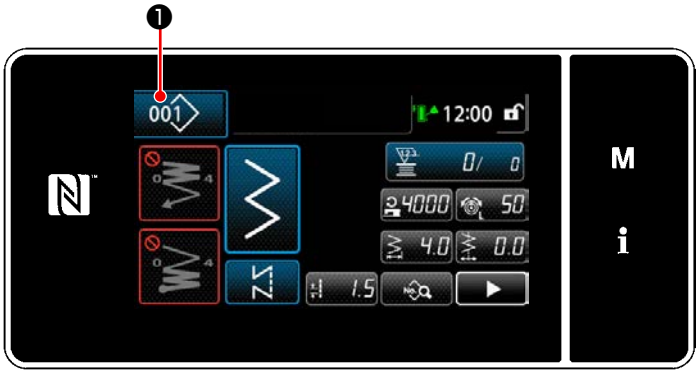
When  ❶ is pressed on the sewing screen for the continuous sewing pattern, the current step can be changed.

8-4. Cycle pattern



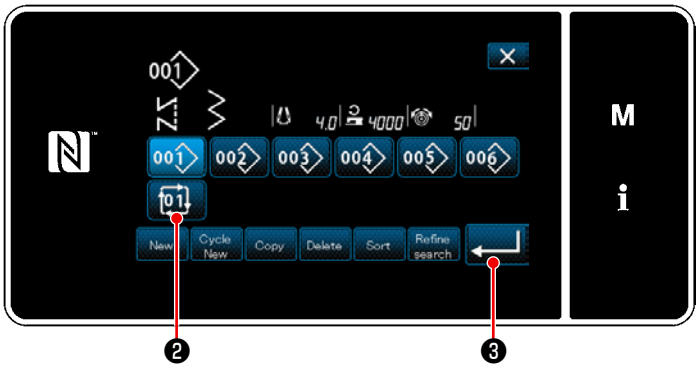
It is possible to combine several different sewing patterns as one cycle pattern for sewing.
As many as 20 steps can be input in one cycle pattern. This function is helpful in the case several different patterns are regularly repeated in a product sewing process.
As many as 20 cycle patterns can be registered.
Copy the cycle pattern when necessary.

8-4-1. Selecting the cycle pattern



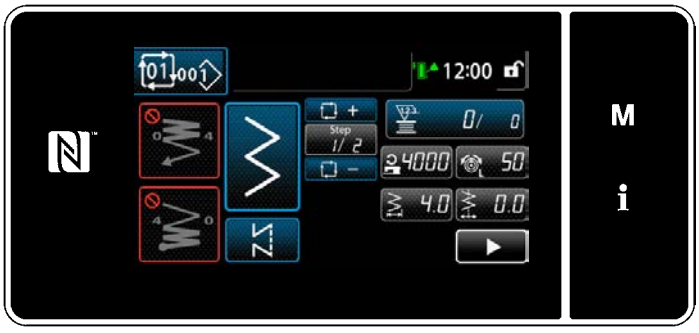
<Sewing screen (Sewing patterns)>

1) Press 001 ❶ on each sewing screen.



<Sewing pattern number management screen (in numerical order)>

2) The "Sewing pattern number management screen (in numerical order)" is displayed.
Cycle pattern(s) is displayed after the registered sewing patterns.
Press a desired cycle sewing data number button 01 ❷ .
Press ↵ ❸ to confirm the setting.
The "cycle sewing screen" is displayed.

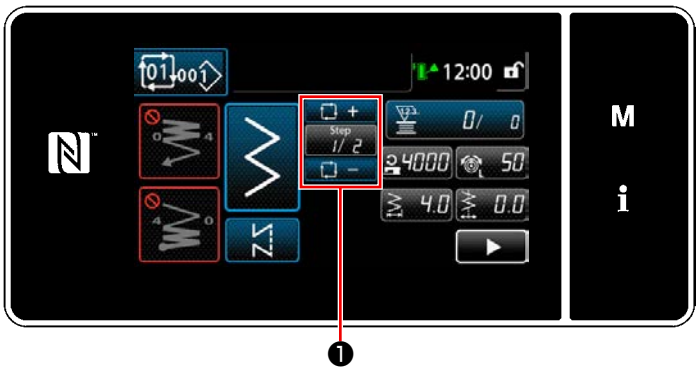


<Sewing screen (Cycle pattern)>

3) Sewing of the selected cycle pattern is enabled.

8-4-2. Editing cycle sewing data

① Displaying the sewing screen (cycle pattern) for cycle pattern

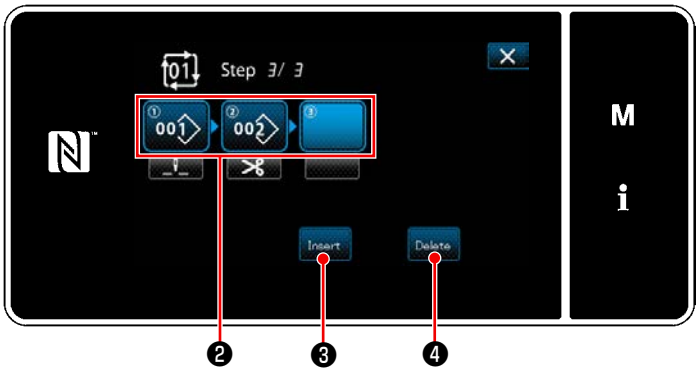


<Sewing screen (Cycle pattern)>

Press Step key ❶ on each sewing screen.

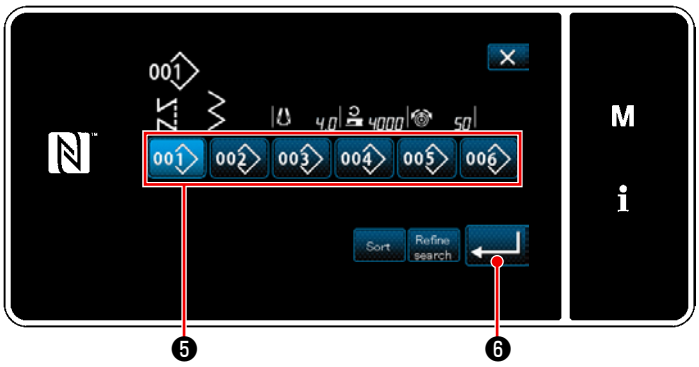
The "Cycle sewing step edit screen" is displayed.

② Setting a cycle sewing pattern



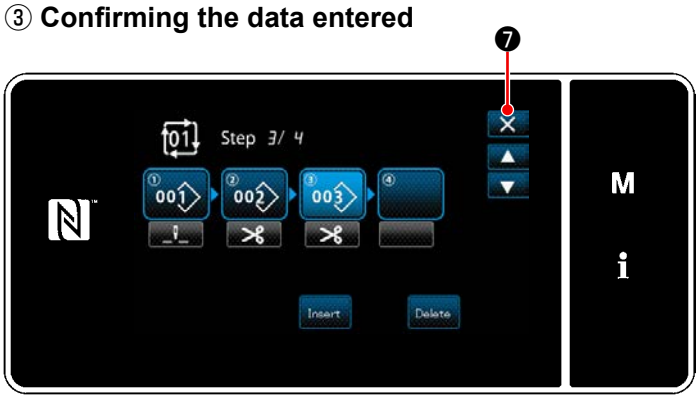
<Cycle sewing step edit screen>

1) Sewing pattern numbers (20 numbers at the maximum) which have registered are displayed in ❷ .
   Press ❷ to confirm the selection.
2) In the case a step can be additionally registered to a sewing pattern, a step which is not yet set is displayed in the last field.
   When the step which is not yet set is pressed, the "Registered cycle pattern selection screen (In numerical order)" is displayed.
3) Select the pattern you want to register from ❺ .
   Press ↵ ❻ to confirm the setting.
4) Press Insert ❸ while selecting a step. Then, the "Registered cycle pattern selection screen (In numerical order)" is displayed.
   Insert a pattern ahead of the selected step.
5) The pattern is deleted by pressing Delete ❹ .



<Registered cycle pattern selection screen (In numerical order)>

③ Confirming the data entered



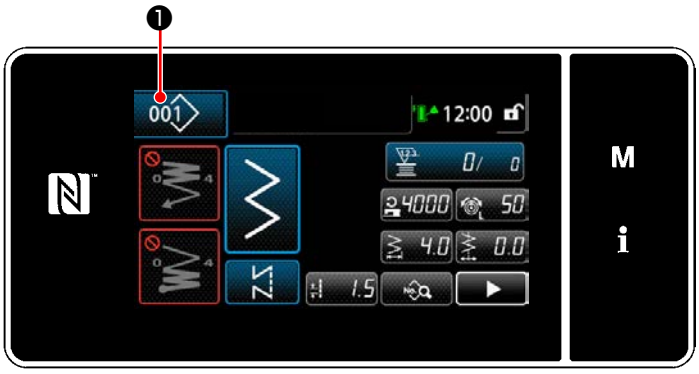
<Cycle sewing step edit screen>

Press ✕ ❼ to complete the operation. Then, the current screen returns to the sewing screen for cycle sewing.

8-4-3. Creating a new cycle pattern

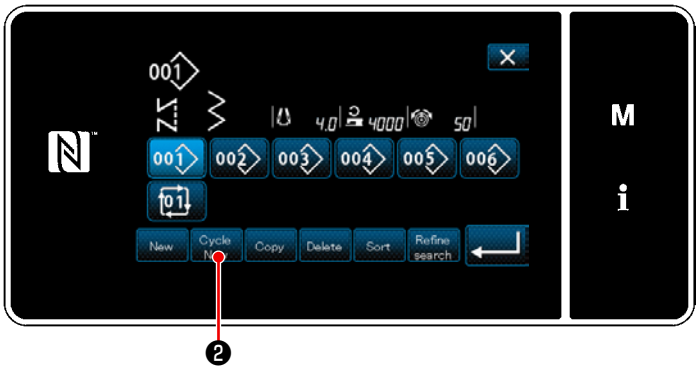
*** This operation is to be carried out under the maintenance personnel mode.**

① Selecting the new cycle pattern creating function



<Sewing screen (Maintenance personnel mode)>

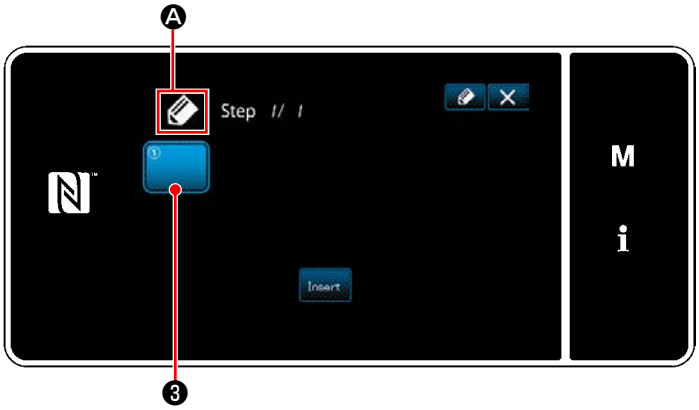
1) Press 001 ❶ on the sewing screen under the maintenance personnel mode.
The "Sewing pattern number management screen (in numerical order)" is displayed.



<Sewing pattern number management screen (in numerical order)>

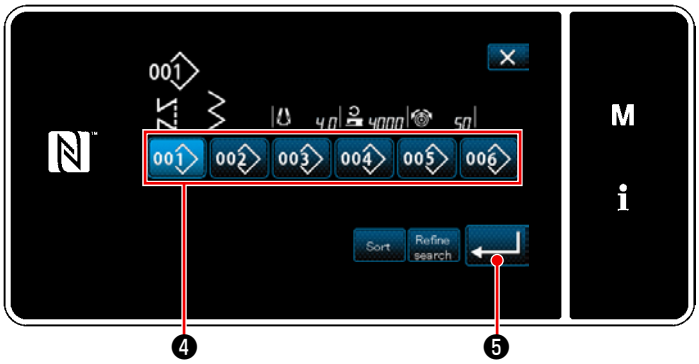
2) Press Cycle New ❷ .
The "New cycle sewing pattern edit screen" is displayed.

② Registering a pattern in new cycle sewing data



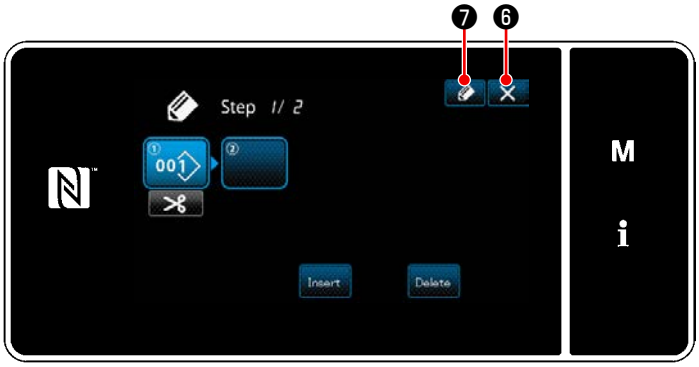
<New cycle sewing pattern edit screen>

1) Ⓐ which indicates that a new pattern is being created is displayed on the screen.
2) Press ❸ .
The "Registered cycle pattern selection screen (In numerical order)" is displayed.



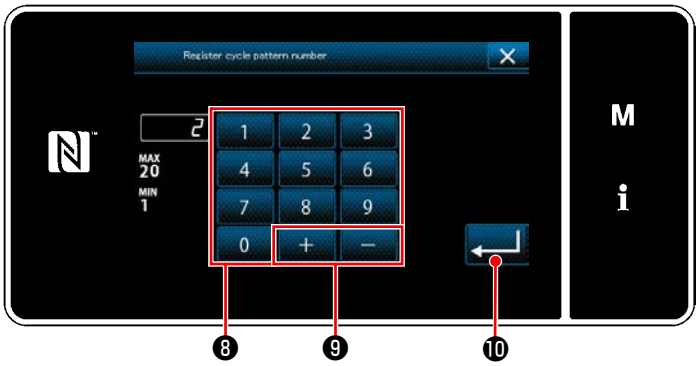
<Registered cycle pattern selection screen (In numerical order)>

3) Press Pattern No. ❹ you want to create.
4) When [↵] ❺ is pressed, the operation is confirmed. Then, the screen returns to the "new cycle sewing pattern edit screen".



<Cycle sewing pattern edit screen>

5) The selected pattern is added to cycle sewing data with [ ] suffixed.
Create the cycle sewing data by repeating steps 2) to 5).
6) Press [✕] ❻ to display the data discard confirmation screen.
7) When [✎] ❼ is pressed, the "cycle sewing pattern number registration screen" is displayed.

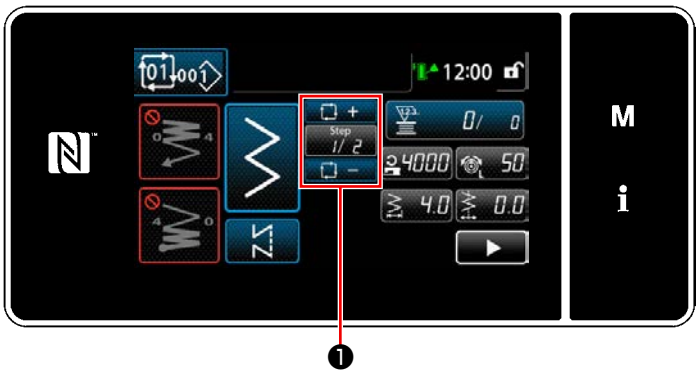


<Cycle sewing pattern number registration screen>

8) Enter the sewing pattern number to be registered using numeric keypad ❽ .
An unassigned registration number that is closest to the entered value in the plus/minus direction is displayed by pressing [+] [−] ❾ .
9) The created pattern is registered by pressing [↵] ❿ .
Then, the current screen returns to the "sewing pattern number list screen". In the case the entered number has already been registered, the prompt message for overwrite confirmation is displayed.

8-4-4. Setting the step from which cycle sewing pattern is started

In the case it is necessary to re-sew a cycle sewing pattern from the middle of the cycle sewing pattern after the occurrence of troubles such as thread breakage, it is possible to re-start sewing from an arbitrary step of the cycle sewing pattern.



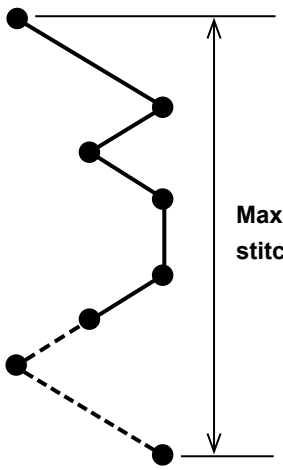
❶

<Sewing screen (Cycle patterns)>

Sewing step can be selected with +/- key of 

❶ .

8-5. Custom pattern



<Figure: Example of the custom pattern>

Free needle entry position can be specified and optional zigzag pattern can be created.
As many as 20 patterns can be created and as many as 500 stitches of each pattern can be inputted.

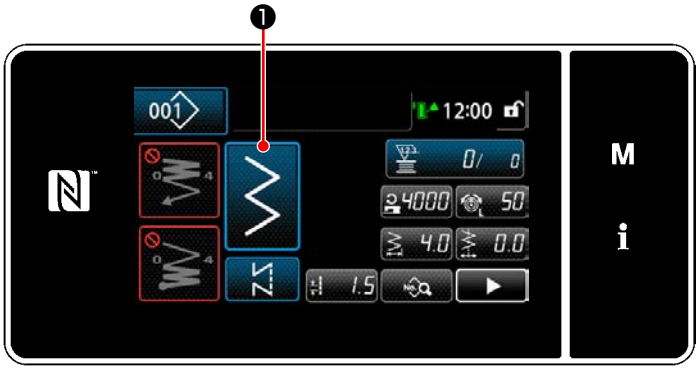
* **This operation is to be carried out under the maintenance personnel mode.**

1. With some combinations of stitch length, direction of feed and sewing speed, the sewing machine may fail to finish a sewing pattern exactly according to the settings.
2. Needle cannot be entered to the same needle entry point when the stitch length is set to 0.0 mm.
3. There are cases where the sewing shapes are not stabilized in case of the patterns which frequently repeat normal and reverse feed stitching. Use the machine at the sewing speed of approximately 2,000 sti/min.
4. There are cases where the value inputted to the operation panel and the actual stitch length are different from each other due to materials and gauges. Perform compensation of the stitch length in accordance with the sewing products.

8-5-1. Selecting the custom pattern

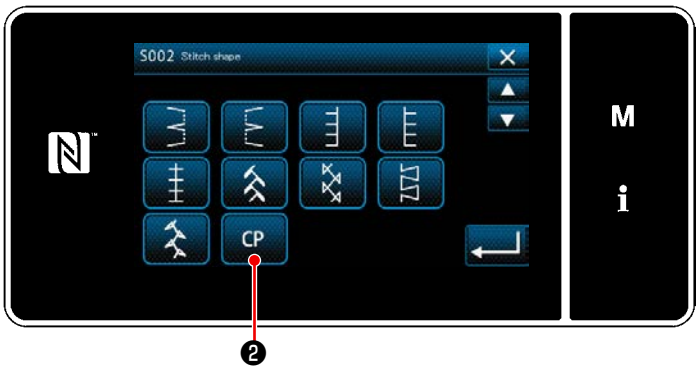
Use the custom pattern which has been made.

① Displaying the custom pattern setting screen



<Sewing screen (Maintenance personnel mode)>

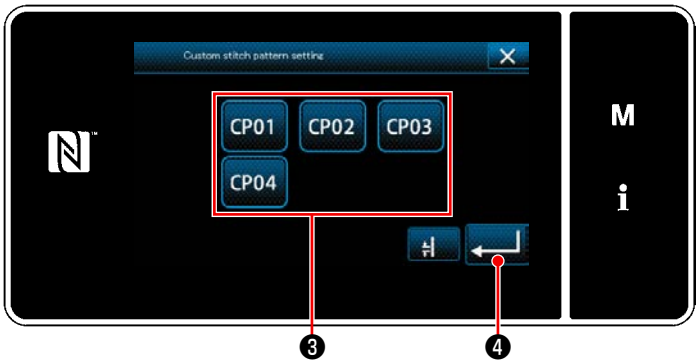
1) Press  ❶ on the sewing screen under the maintenance personnel mode.
The "Sewing shape selection screen" is displayed.



<Sewing shape selection screen>

2) If there are registered custom patterns, CP ❷ will be displayed.
When CP ❷ is pressed, the "Custom pattern setting screen" is displayed.

② Selecting the custom pattern



<Custom pattern setting screen>

The custom patterns that have been registered are displayed. Select custom pattern ❸ .

When  ❹ is pressed, the operation is confirmed. Then, the screen returns to the "sewing screen".

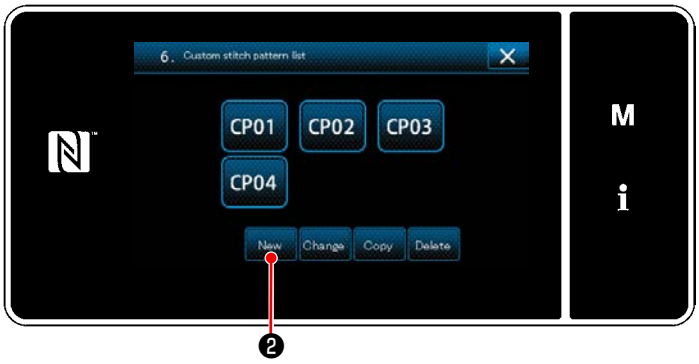
8-5-2. Creating a new custom pattern

① Selecting the "custom pattern setting" on the mode screen

<Mode screen>

1) Press **M** ❶ .
   The "mode screen" is displayed.
2) Select the "6. Custom stitch pattern setting".
   The "Custom pattern list screen" is displayed.

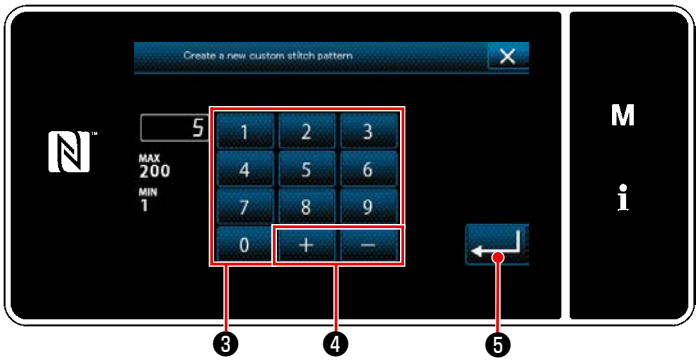
② Selecting the new custom pattern creation function



<Custom pattern list screen>

Registered custom stitch pattern(s) is displayed.
Press **New** ❷ .
The "New custom pattern creation number input screen" is displayed.

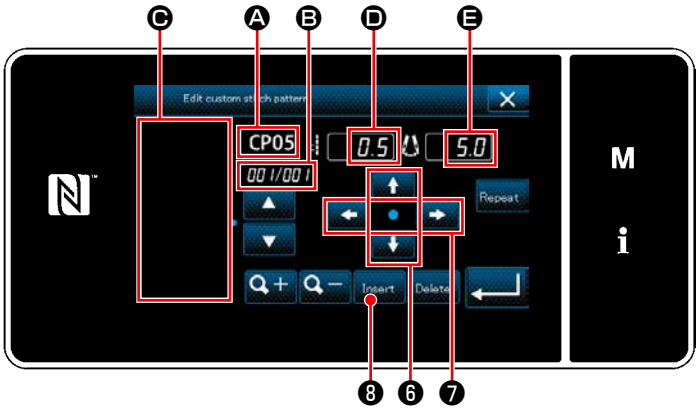
③ Inputting the custom pattern number



<New custom pattern creation number input screen>

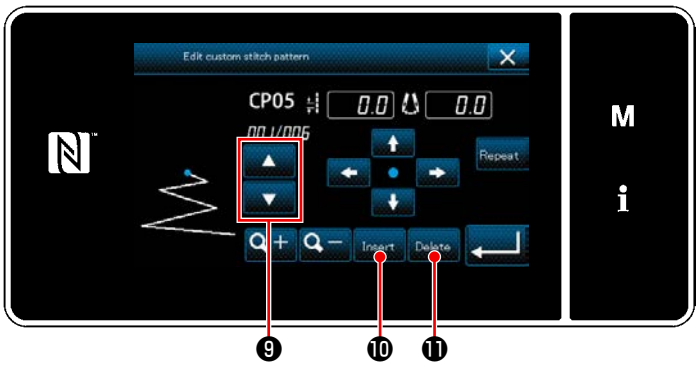
1) Input the custom pattern number with numeric keypad ❸ .
   An unassigned registration number that is closest to the entered value in the plus/minus direction is displayed by pressing **+** **−** ❹ .
2) Press ↵ ❺ .
   The "Custom pattern edit screen" is displayed.
   In the case the entered number has already been registered, the prompt message for overwrite confirmation is displayed.

④ Creating a custom pattern

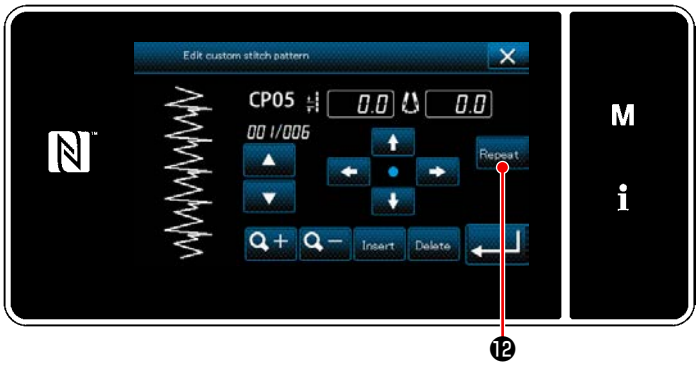


<Custom pattern edit screen>

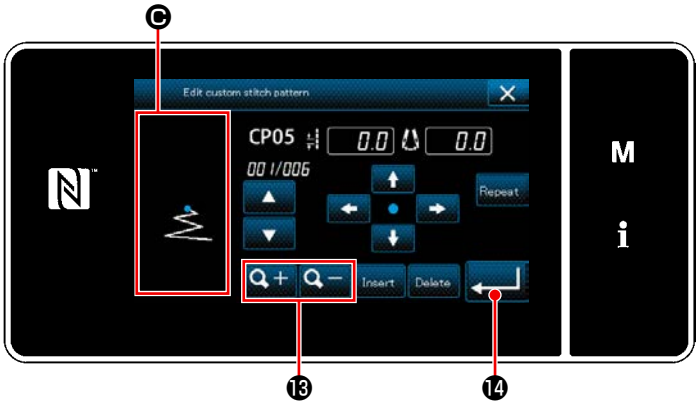
1) Ⓐ : Selected custom pattern number
   Ⓑ : Step number being edited and the total number of steps
   Ⓒ : Display area for the created zigzag pattern
   Ⓓ : Feed amount of each step
   Ⓔ : Stitch baseline of each step
   The aforementioned five items are displayed o the custom pattern edit screen.
2) Set the feed amount by pressing ❻.
   Set the stitch baseline position by pressing ❼.
3) When Insert ❽ is pressed, the needle entry position for step 1 is set and the screen changes over to the step 2 setting screen.



4) Carry out the steps of procedure 2) and 3) successively to set the needle entry position for step 2 and beyond.
5) If you want to insert or delete a step, select the target step by pressing ❾. Then, press Insert ❿ or Delete ⓫.

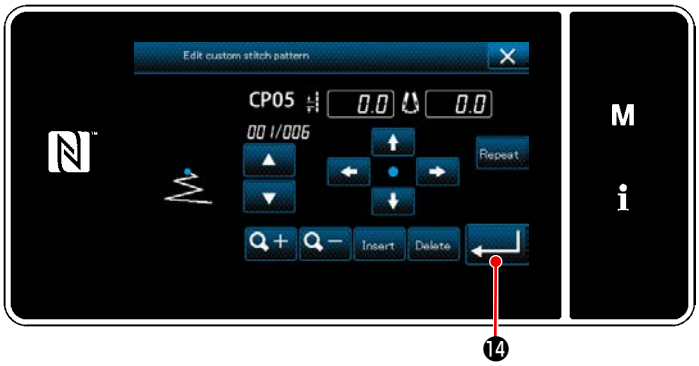


6) When Repeat ❾ is pressed, the created pattern is repeated.



7) When Q+ Q− ⓭ is pressed, the display size of pattern display area Ⓒ is changed over.

⑤ Confirming the numeric value



<Custom pattern edit screen>

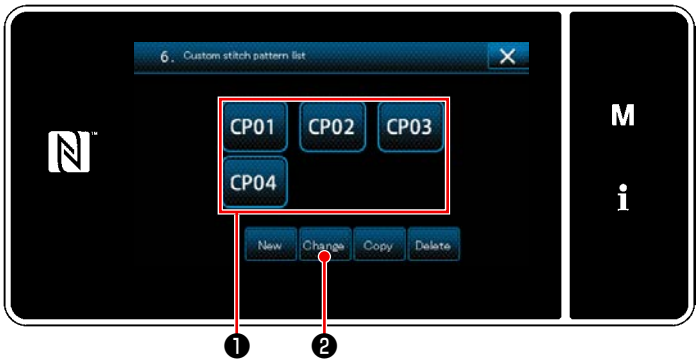
After the completion of editing, press ↵ ⓮ .

<Custom pattern list screen>

Custom pattern value is edited following the steps of procedure described below.

8-5-3. Editing the custom pattern

① Selecting the custom pattern edit function



<Custom pattern list screen>

Display the "Custom pattern list screen" referring to **"8-5-2. Creating a new custom pattern" p. 160**.

② Editing the custom pattern value

Editing the custom pattern value.
Refer to **"8-5-2. Creating a new custom pattern" p. 160** for the explanation of screen.

1) Select custom pattern ❶ you want to edit. Then, press Change ❷ .
   The "Custom pattern edit screen" is displayed.

Steps of procedure to be taken after the aforementioned step are same as those described in **"8-5-2. Creating a new custom pattern" p. 160**.

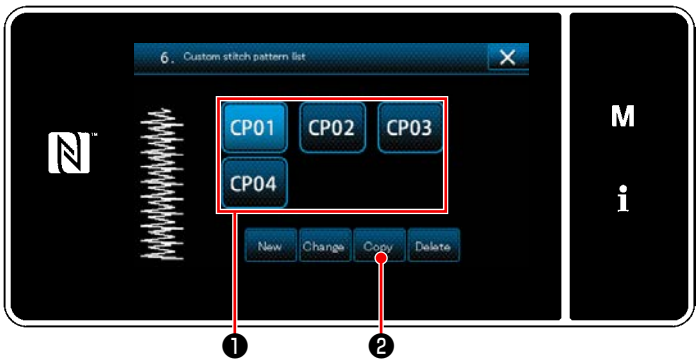
Caution

1. **When the power source is turned OFF without pressing ↵ key, the inputted data returns to the former one. When you desire to determine the data, be sure to press ↵ key.**
2. **When the setting of the feed direction of the custom pattern is set to the reverse direction, the max. speed is limited in accordance with the feed amount used.**
3. **In the case the stitch length differs between the normal feed and the reverse feed, correct the stitch length appropriately with the memory switch K330 (normal direction stitch length correction) and K331 (reverse direction stitch length correction).**

8-5-4. Copying and deleting the custom pattern

(1) Copying the custom pattern

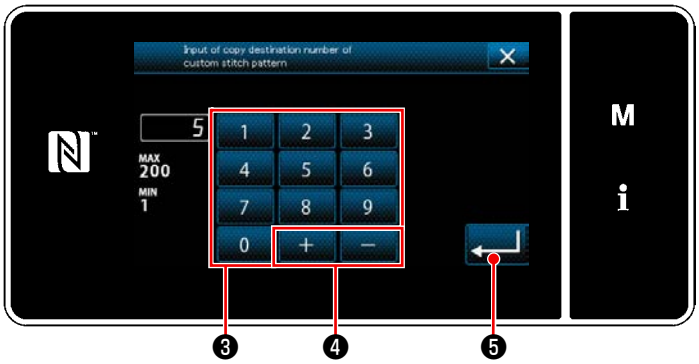
① Displaying the custom pattern list screen



<Custom pattern list screen>

1) Display the "Custom pattern list screen" referring to **"8-5-2. Creating a new custom pattern" p. 160**.
2) Press CP01 ❶ of the copy source to put it in the selected state.
3) Press Copy ❷.
   The "custom pattern copy destination number input screen" is displayed.

② Inputting the custom pattern number



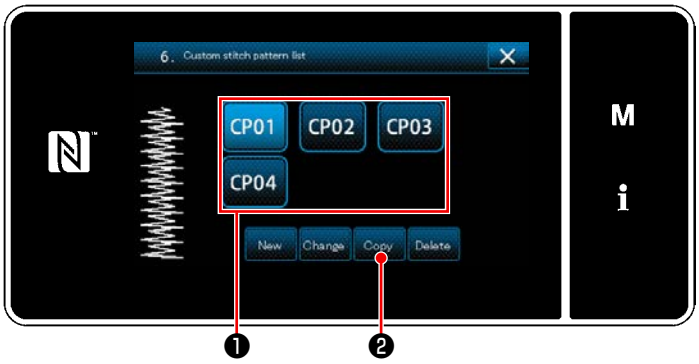
<Custom pattern copy destination number input screen>

Enter the number of destination pattern for copying with numeric keypad ❸ and + − ❹.

Press ↵ ❺.

The copied pattern is registered and the screen returns to the "Custom pattern list screen".
In the case the entered number has already been registered, the prompt message for overwrite confirmation is displayed.

(2) Deleting a custom pattern



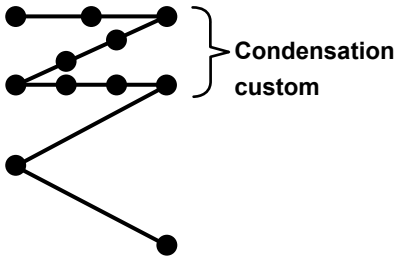
<Custom pattern list screen>

1) Display the "Custom pattern list screen" referring to **"8-5-2. Creating a new custom pattern" p. 160**.
2) Press CP01 ❶ to put the custom pitch to be deleted in the selected state.
3) Press Delete ❷.
   The "deletion confirmation screen" is displayed.
   Press ↵ to confirm the setting.

Caution **Once the data is deleted, it does not return to the former one. Be sure to press ↵ after carefully checking the data.**

Reference **The custom pattern registered in the pattern cannot be deleted.**

8-6. Condensation custom pattern



<Figure: Example of the condensation custom>

Condensation stitches can be sewn while specifying needle entry points as desired, by setting a condensation custom.
As many as 64 stitches can be created.
As many as 20 patterns can be registered.

Caution

1. **With some combinations of stitch length, direction of feed and sewing speed, the sewing machine may fail to finish a sewing pattern exactly according to the settings.**
2. **Needle cannot be entered to the same needle entry point when the stitch length is set to 0.0 mm.**
3. **In the case the stitch length differs between the normal feed and the reverse feed, correct the stitch length appropriately with the memory switch K330 (normal direction stitch length correction) and K331 (reverse direction stitch length correction).**

8-6-1. Selecting the condensation custom

Select condensation custom pattern referring to **"5-2-3. (2) ◆ In the case of maintenance personnel mode" p. 49**.
The condensation custom pattern for reverse-feed stitching at the end of sewing can be set in the similar manner.

8-6-2. Creating a new condensation custom

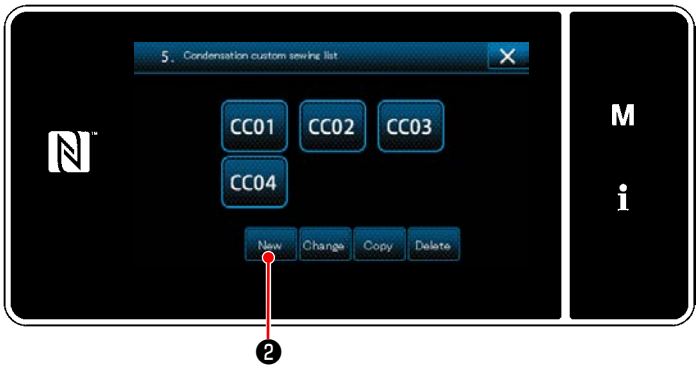
A new condensation custom pattern creation procedure is described as follows using <Figure: Example of the condensation custom> as an example.

① Selecting the condensation custom pattern setting on the mode screen

<Mode screen>

1) Press **M** ❶.
   The "mode screen" is displayed.
2) Select the "5. Condensation custom sewing setting".
   The "condensation custom pattern list screen" is displayed.

② Selecting the new condensation custom creating function



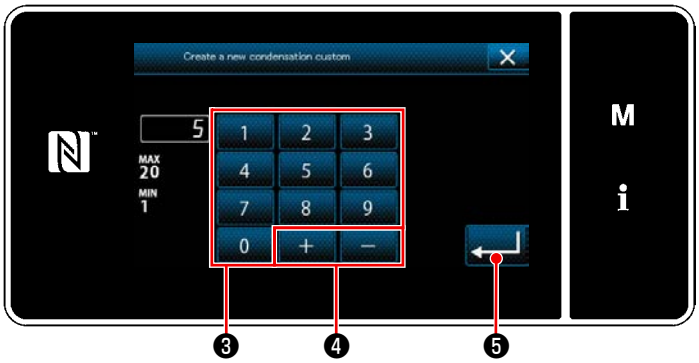
<Condensation custom pattern list screen>

Registered condensation custom patterns are displayed on the screen.

Press New ❷.

The "new condensation custom pattern creation pattern number input screen" is displayed.

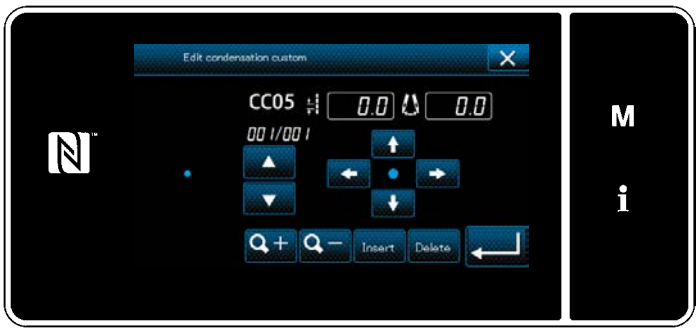
③ Inputting the condensation custom number



<New condensation custom pattern creation pattern number input screen>

1) Enter the pattern number with numeric key-pad ❸.
   An unassigned registration number that is closest to the entered value in the plus/minus direction is displayed by pressing + − ❹.
2) Press ↵ ❺.
   The "condensation custom edit screen" is displayed.
   In the case the entered number has already been registered, the prompt message for overwrite confirmation is displayed.

④ Creating a condensation custom

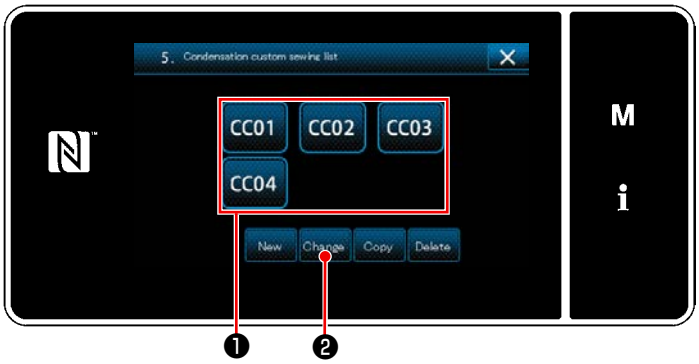


<Condensation custom edit screen>

The method to create a condensation custom pattern is same as in the case of a custom pattern. Refer to **"8-5-2. ④ Creating a custom pattern" p. 161**.

8-6-3. Condensation custom edit function

① Selecting the condensation custom edit function



<Condensation custom pattern list screen>

Display the "Condensation custom pattern list screen" referring to **"8-6-2. Creating a new condensation custom" p. 165**.

② Editing the condensation custom value

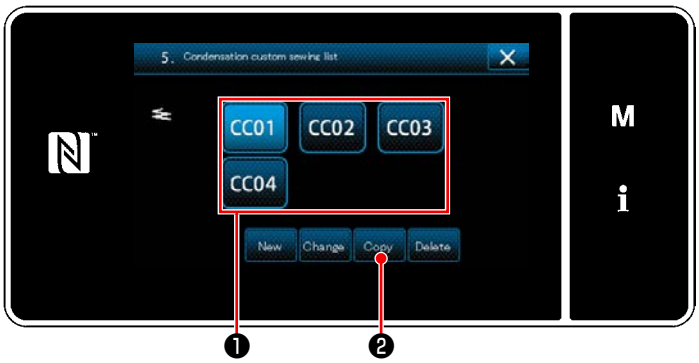
1) Select condensation custom pattern ❶ you want to edit. Then, press Change ❷ . The "Condensation custom edit screen" is displayed.

Steps of procedure to be taken after the aforementioned step are same as those described in **"8-5-2. ④ Creating a custom pattern" p. 161**.

8-6-4. Copying/deleting a condensation custom

(1) Copying a condensation custom

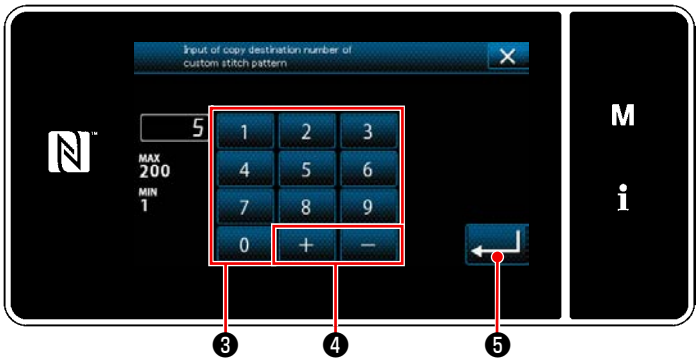
① Displaying the condensation custom pattern list screen



<Condensation custom pattern list screen>

1) Display the "condensation custom pattern list screen" referring to **"8-6-2. Creating a new condensation custom" p. 165**.
2) Press CC01 ❶ of the copy source to put it in the selected state.
3) Press Copy ❷.
The "condensation custom copy destination number input screen" is displayed.

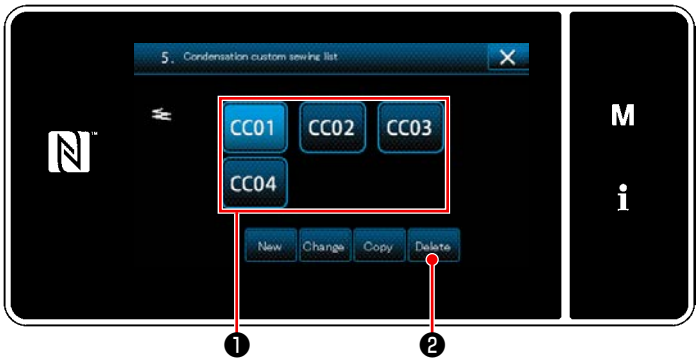
② Inputting the condensation custom pattern number



<Condensation-custom pattern copy destination number input screen>

1) Enter the number of destination pattern for copying with numeric keypad ❸ and + − ❹.
2) Press ↵ ❺.
Copied pattern is registered and the screen returns to the "Condensation custom pattern list screen".
In the case the entered number has already been registered, the prompt message for overwrite confirmation is displayed.

(2) Deleting a condensation custom

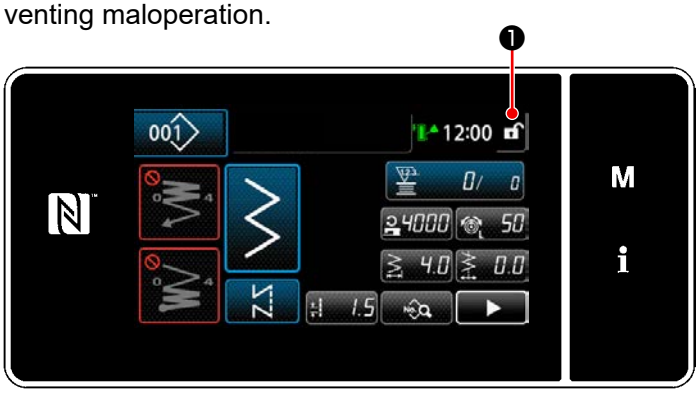


<Condensation custom pattern list screen>

1) Display the "condensation custom pattern list screen" referring to **"8-6-2. Creating a new condensation custom" p. 165**.
2) Press CC01 ❶ to put the custom pitch to be deleted in the selected state.
3) Press Delete ❷.
The "deletion confirmation screen" is displayed.
Press ↵ to confirm the setting.

8-7. Simple lock of the screen

Once the simple lock is enabled, operation of the buttons displayed on the screen is disabled, thereby preventing maloperation.



<Sewing screen>

Simple lock is activated by keeping ❶ held pressed for one second on the sewing screen.
Pictograph display ❶ will be as shown below:

: Simple lock is enabled

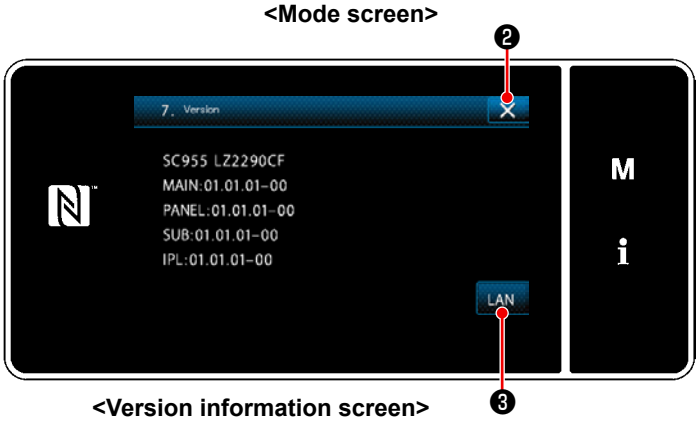
: Simple lock is disabled

* It is possible to set so that the simplified lock is automatically activated according to the elapsed time. (With memory switch U402)
Refer to **"5-7. List of memory switch data" p. 109** for details.

8-8. Version information

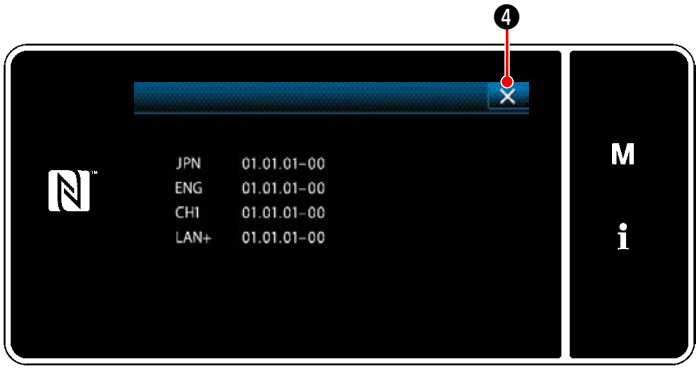
<Mode screen>

1) Press M ❶.
The "mode screen" is displayed.
2) Select the "7. Version".
The "version information screen" is displayed.



<Version information screen>

3) The screen returns to the previous screen by pressing ✕ ❷.
When LAN ❸ is pressed, the "communication version information screen" is displayed.



<Communication version information screen>

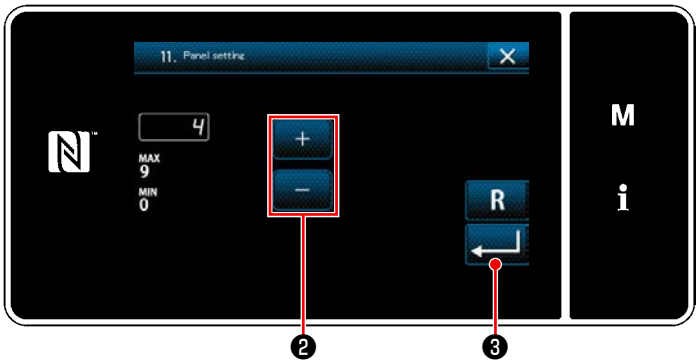
4) When ✕ ❹ is pressed on the "communication version information screen", the screen returns to the "version information screen".

8-9. Adjustment of brightness of the LED panel

Screen brightness of the LED panel can be changed.

<Mode screen>

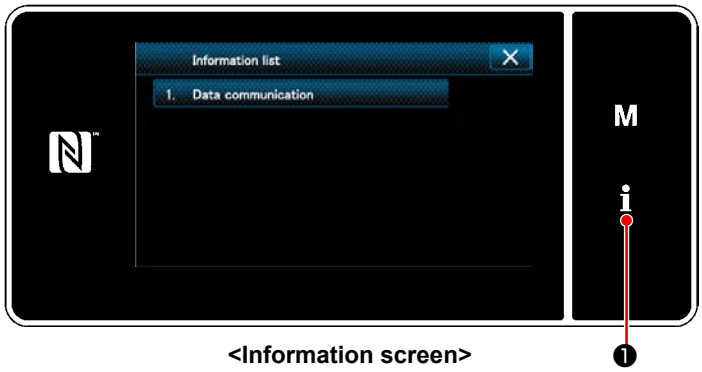
1) Keep M ❶ held pressed for three second.
   The "mode screen" is displayed.
2) Select the "11. Panel setting".
   The "operation panel setting screen" is displayed.



<Operation panel setting screen>

3) Brightness of the operation panel is adjustable with + − ❷ .
4) Press ↵ ❸ to confirm the setting.
   Return the "mode screen".

8-10. Information



<Information screen>

Press i ❶ .

The "information screen" is displayed.

Data communication and production management are carried out on the information screen.

8-10-1. Data communication

Data can be input/output by means of a USB thumb drive.
Data that can be handled on the information screen is as follows:

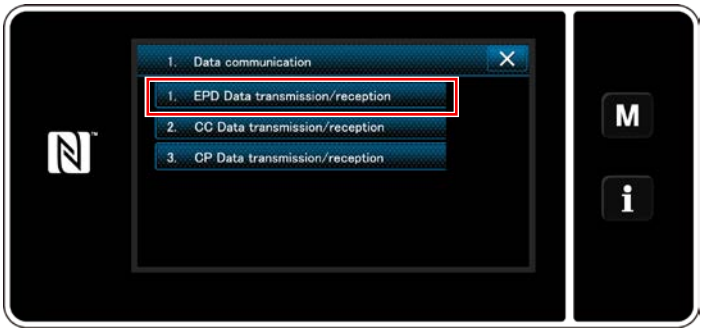
Data name	Extension	Description of data
Sewing data	SC00×××.EPD (×××:001~999)	Model-specific sewing data format of the sewing pattern shape, number of stitches, etc. created on the sewing machine.
Custom pattern data	VD00×××.VDT (×××:001~999)	The data format that can be operated in common between JUKI sewing machines.
Condensation custom data	VD00×××.VDT (×××:001~999)	The data format that can be operated in common between JUKI sewing machines.

(1) Communication method

① Selecting the data format used for communication

<Information screen>

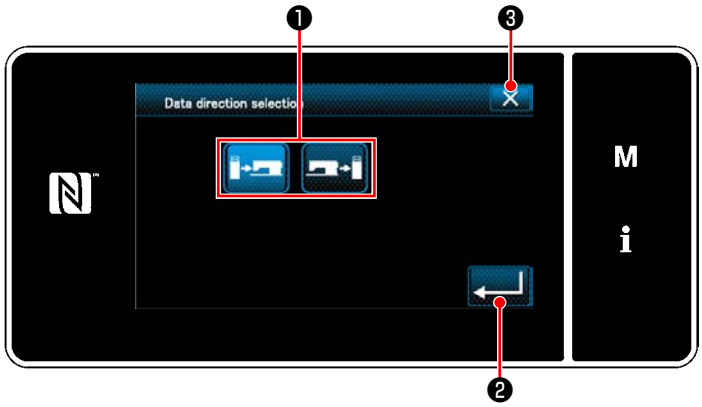
1) Select "1. Data communication" on the "information screen".
The "data communication list screen" is displayed.



<Data communication list screen>

2) Select the transmitting/receiving data format and press the selected data format button.
For example, select "1. EPD data transmission/reception".
The "data direction selection screen" is displayed.

② Selecting the communication direction



<Data direction selection screen>

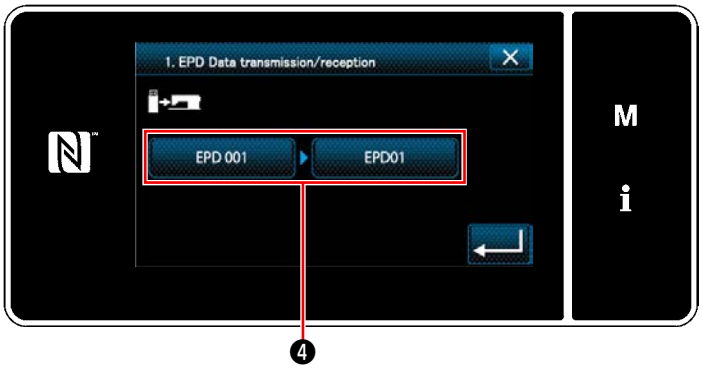
Select the communication direction. Press button ❶ to put the communication direction in the selected state.

Press ↵ ❷ to confirm the setting.

The "data transmission/receipt preparation screen" is displayed.

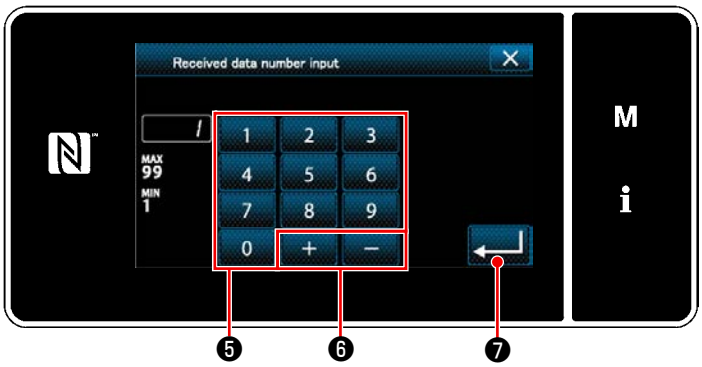
Cancel the operation with ✕ ❸ . The current screen returns to the previous screen.

③ Setting the data number and starting communication



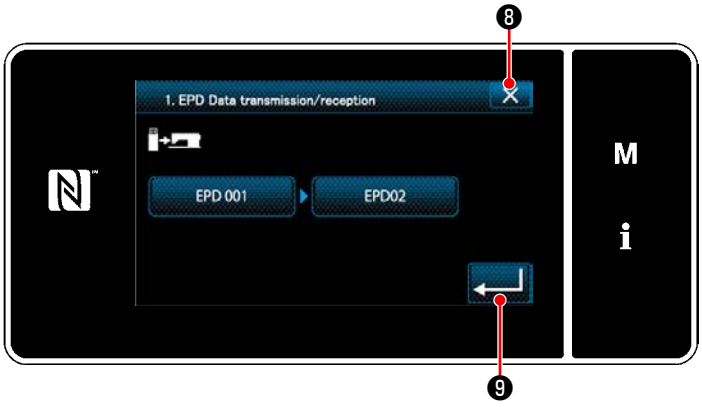
<Data transmission/receipt preparation screen>

1) Press data number button ❹ .
The "data number input screen" is displayed.



<Data number input screen>

2) Enter the source/destination data number with numeric keypad ❺ and + − ❻ .
Press ↵ ❼ to confirm the setting.
The "data transmission/receipt preparation screen" is displayed.



<Data transmission/receipt preparation screen>

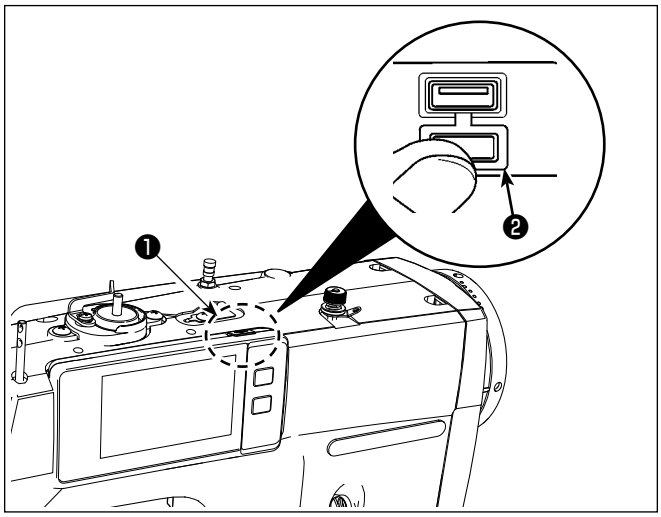
3) Confirm the numeric value with ↵ ❾ to start communication.
"During communication" screen is displayed while the communication is being carried out.
Cancel the operation with ✕ ❽ . The current screen returns to the previous screen.

* If the destination number you have entered has already been registered, the "overwrite confirmation message" screen will be displayed.

8-10-2. USB

Sewing data, custom pattern data and condensation custom data can be copied on a commercially-available USB thumb drive.
Refer to **"8-10-1. Data communication" p. 171** for details of how to copy the sewing data on a USB thumb drive.

① Position of the USB connector



[USB thumb drive insertion position]
The USB connector is provided on top ❶ of the operation panel.
To use a USB thumb drive, remove connector cover ❷ and insert the USB thumb drive into the USB connector.

* In the case a USB thumb drive is not used, the USB connector should be protected with connector cover ❷ without exceptions.

If dust or the like enters the USB connector, a failure can be caused.

② Precautions to be taken when handling USB devices

- Do not connect to the USB connection terminal other than the USB memory.
  It may cause failure.
- Do not leave the USB device or USB cable connected to the USB port while the sewing machine is in operation. The machine vibration can damage the port section resulting in loss of data stored on the USB device or breakage of the USB device or sewing machine.
- Do not insert/remove a USB device during reading a program or sewing data.
  It may cause data breakage or malfunction.
- When the storage space of a USB device is partitioned, only one partition is accessible.
- Never forcefully insert a USB thumb drive into the USB connector while carefully checking the orientation of the USB thumb drive. Forceful insertion of the USB thumb drive can cause failure.
- JUKI does not compensate for loss of data stored on the USB device caused by using it with this sewing machine.
- In principle, connect only one USB thumb drive to the operation panel. When two or more devices/media are connected/inserted, the machine will only recognize one of them. Refer to the USB specifications.
- Do not turn the power OFF while the data on the USB flash drive is being accessed.

③ USB specifications

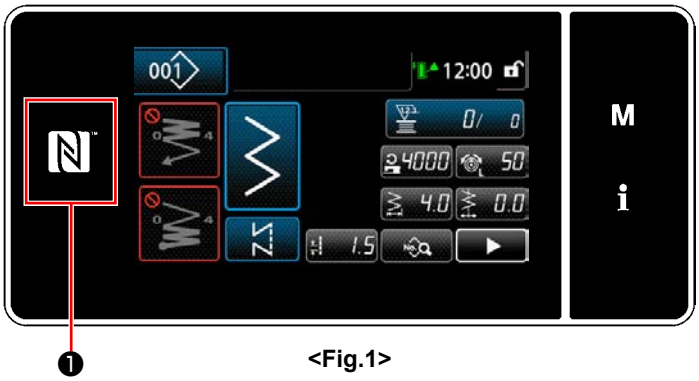
- Conform to USB 1.1 standard
- Applicable devices *1 ____ USB memory
- Format supported _____ FAT 12, FAT 16, FAT 32
- Applicable medium size __ 4.1MB ~ 2TB
- Consumption current ____ The rated consumption current of the applicable USB devices is 500 mA at the maximum.

*1: JUKI does not guarantee operation of all applicable devices. Some device may not operate due to a compatibility problem.

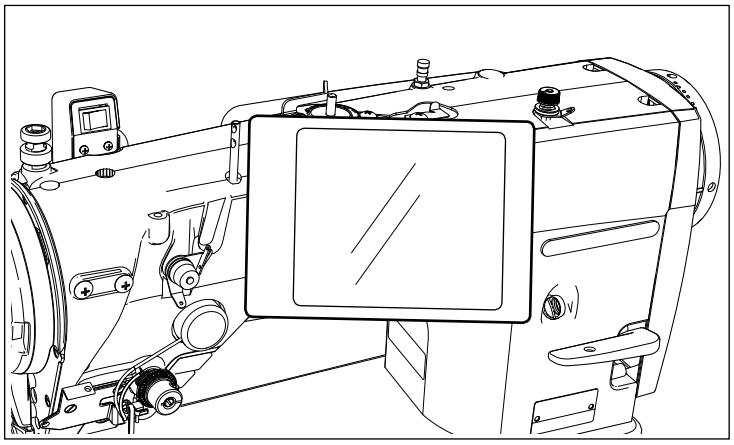
8-10-3. NFC

The operation panel supports NFC (Near Field Communication).
Sewing data, maintenance information or the like can be viewed, edited, copied, etc., on an Android terminal (such as tablet and smartphone) on which JUKI application for Android "JUKI Smart App" has been installed, by means of the NFC communication function.
Refer to the Instruction Manual for JUKI Smart App for details of JUKI application for Android "JUKI Smart App".

① Position of the NFC antenna



<Fig.1>



<Fig.2>

[Position of the NFC antenna]
To conduct the NFC (near field communication) between the sewing machine and the tablet or smartphone, bring the tablet or smartphone to NFC mark ❶ on the operation panel as illustrated in Fig. 2, and hold it there until the data is displayed.

* If the NFC communication has failed, error message will be displayed on the tablet/smartphone screen.

When the error message is displayed on the screen, carry out the NFC communication again.

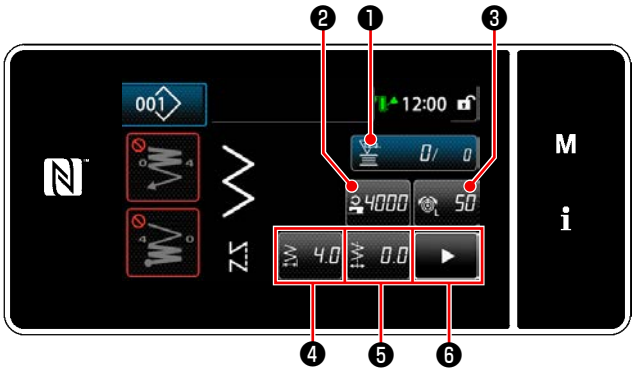
② Precautions to be taken when handling NFC

- The position of the NFC antenna varies according to the tablet/smartphone used.
  Be sure to read the instruction manual of your device before using the NFC communication function.
- To use the NFC communication function, place the NFC communication function setting in "Enable" while referring to the instruction manual for your tablet/smartphone.
- If you use the NFC while the main body of sewing machine is being started, a malfunction can occur.

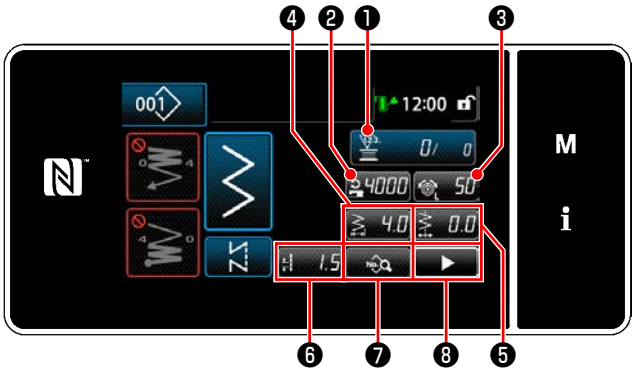
8-11. Key customization

It is possible to register a desired function to a key to customize the peel key arrays. Functions that can be assigned to panel keys are as described below.
The key to which no function is assigned is displayed in blank.

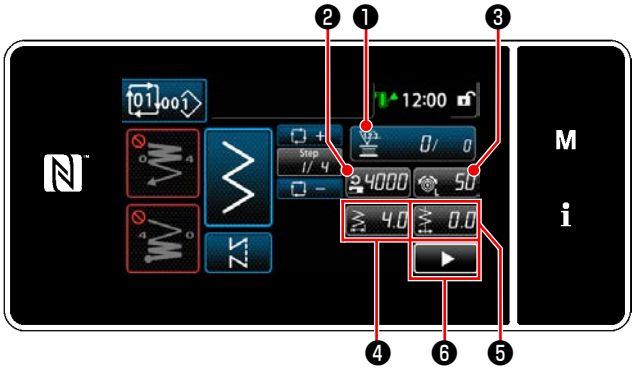
8-11-1. Assignable data



<Sewing screen (Operator mode)>



<Sewing screen (Maintenance personnel mode)>

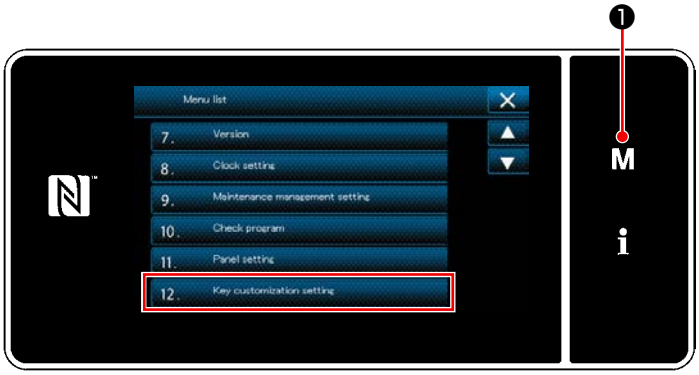


<Sewing screen (Cycle mode)>

	Initial value			Assignable data
	Operator mode	Maintenance personnel mode	Cycle mode	
❶	Counter	Counter	Counter	Pattern data Pattern number Cycle pattern number Memory switch One-touch changeover One-touch type changeover (multi-layered portion) Bobbin winding mode Counter Second sewing screen Function is not provided
❷	Sewing speed	Sewing speed	Sewing speed	Pattern data Pattern number Cycle pattern number Memory switch One-touch changeover One-touch type changeover (multi-layered portion) Bobbin winding mode Second sewing screen Function is not provided
❸	Needle thread tension	Needle thread tension	Needle thread tension	
❹	Zigzag width	Zigzag width	Zigzag width	
❺	Stitch baseline position (other than the straight stitch)	Stitch baseline position (other than the straight stitch)	Stitch baseline position (other than the straight stitch)	
❻	Second sewing screen	Stitch length	Second sewing screen	
❼		Sewing data list		
❽		Second sewing screen		

8-11-2. How to assign a function to a key

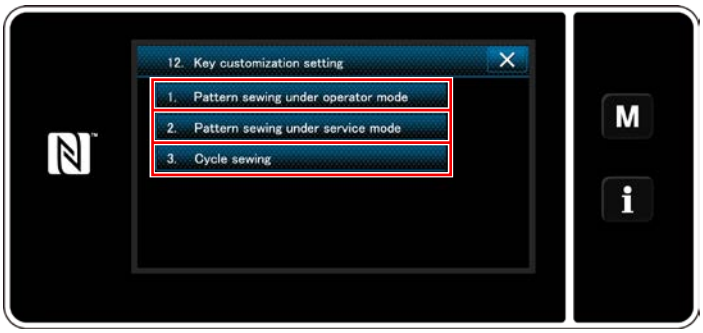
① Displaying the key customization mode list screen



<Mode screen>

1) Keep **M** ❶ held pressed for three second. The "mode screen" is displayed.
2) Select the "12. Key customization setting". The "key customization mode list screen" is displayed.

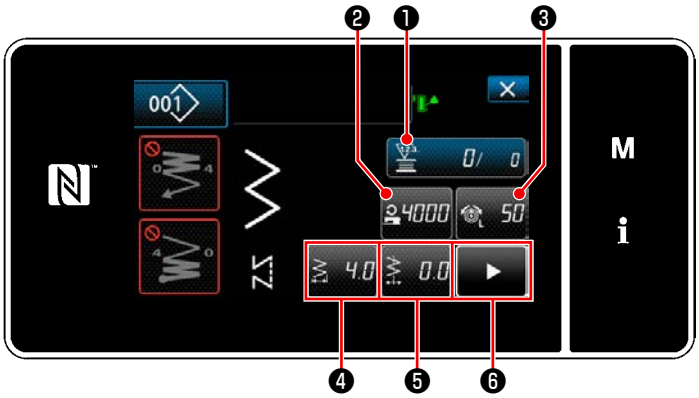
② Setting the key customization



<Key customization mode list screen>

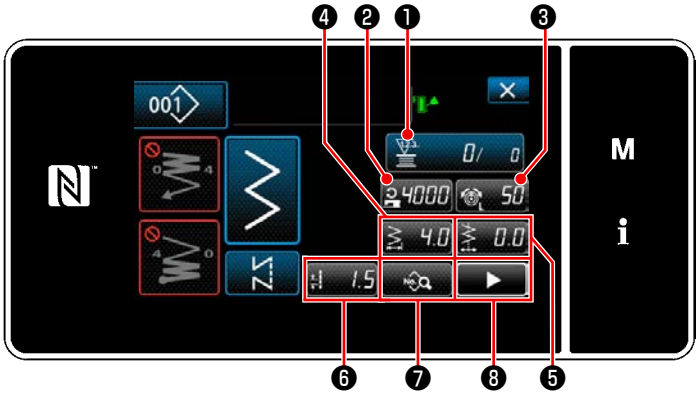
1) Select "1. Pattern sewing under operator mode". Then, "key customization assignment screen (operator mode)" is displayed.
2) Select "2. Pattern sewing under service mode". Then, "key customization assignment screen (Maintenance personnel mode)" is displayed.
3) Select "3. Cycle sewing". Then, "key customization assignment screen (Cycle mode)" is displayed.

③ Selecting a function to be assigned

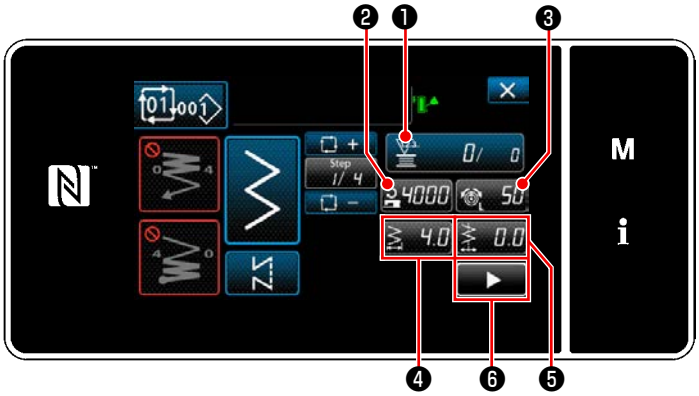


<Key customization assignment screen (Operator mode)>

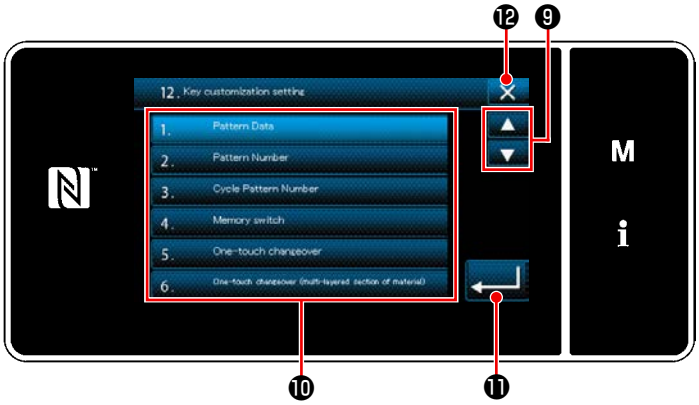
When one of the buttons ❷ to ❽ (❷ to ❻ for the operator mode or cycle mode), the "Key customization selection screen" is displayed.



<Key customization assignment screen
(Maintenance personnel mode)>



<Key customization assignment screen (Cycle mode)>

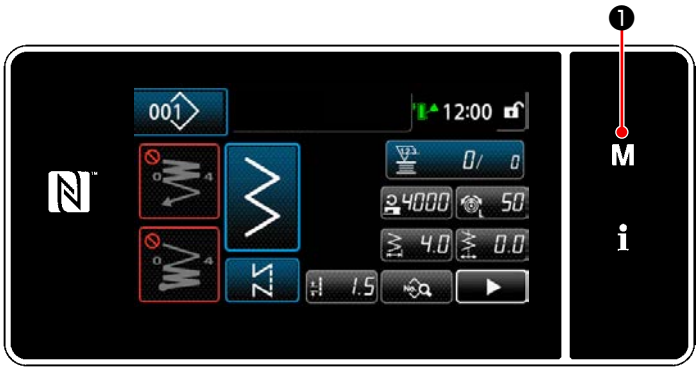


<Key customization assignment screen>

1) Press  ❾ to select the function. Then, press the target function button ❿ to allocate the function to ❷ to ❽ (❷ to ❻ for the operator mode or cycle mode).
2) The counter button is respectively displayed by pressing ❶ .
3) Press  ⓫ to confirm the setting. Cancel the operation with  ⓬ . The current screen returns to the previous screen.

8-12. Maintenance management function

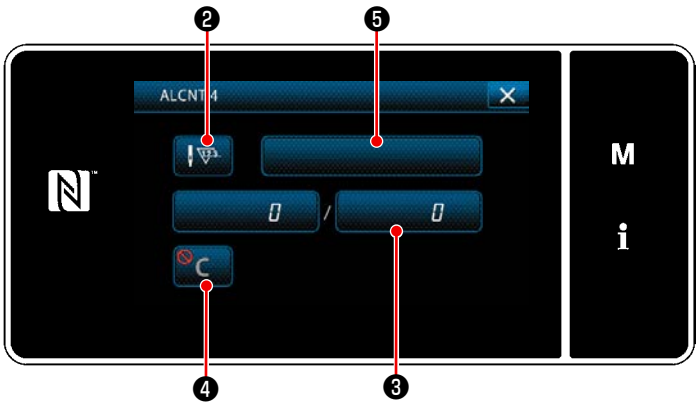
When the set value for the counter is reached, this function gives a warning on the screen. As many as five different set values can be registered for warning.



1) **M** ❶ held pressed for three second.
The "mode screen" is displayed.

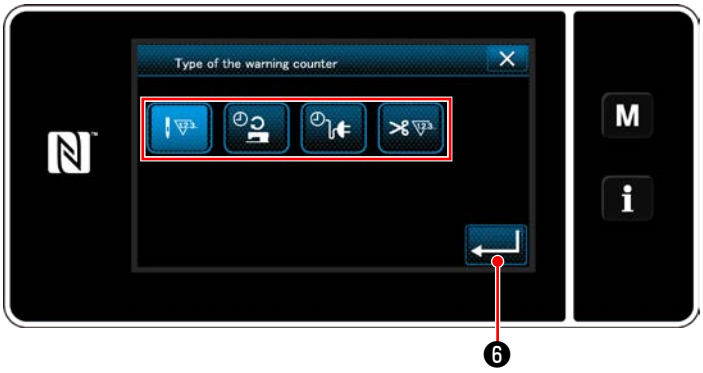
2) Select "9. Maintenance management setting".

3) When the counter for which the set value for warning is selected, the "warning counter setting screen" is displayed.



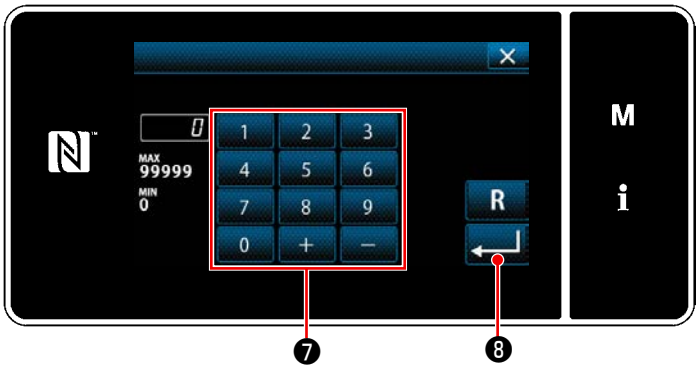
<Warning counter setting screen>

4) When ❷ is pressed, the "warning counter type selection screen" is displayed.



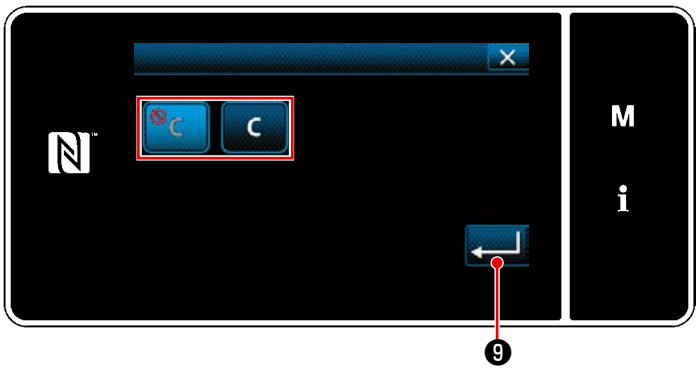
<Warning counter type selection screen>

5) Select the setting condition of the warning counter.
   - : Number of stitches (Unit: 1000 stitches)
   - : Operating time (Unit: Hours)
   - : Energizing time (Unit: Hours)
   - : Number of times of thread trimming (Unit: Number of times)
6) When ❻ is pressed, the operation is confirmed. Then, the screen returns to the "warning counter setting screen".



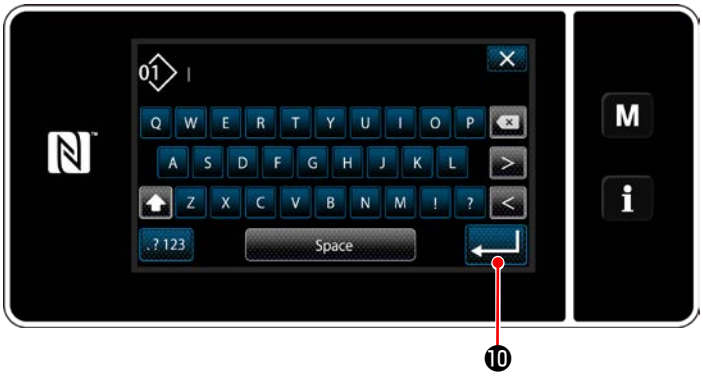
<Warning counter set value input screen>

7) When ❸ on the "warning counter setting screen" is pressed, the "warning counter set value input screen" is displayed.
8) Input the warning counter set value with numeric keypad ❼ .
9) When ❽ is pressed, the operation is confirmed. Then, the screen returns to the "warning counter setting screen".

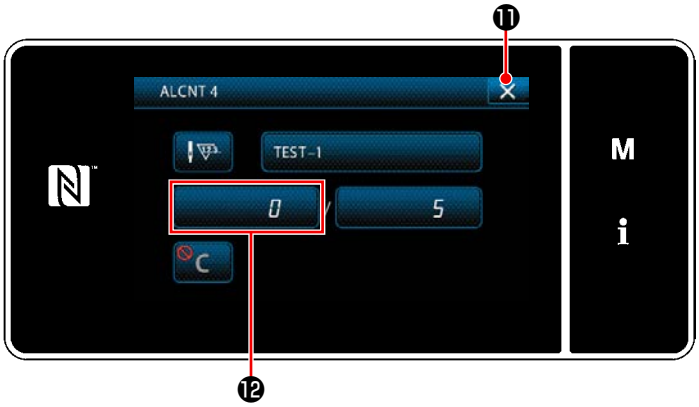


<Warning counter clearing setting screen>

10) When ❹ on the "warning counter setting screen" is pressed, the "warning counter clearing setting screen" is displayed.
11) Select enable/disable of the warning counter clearing displayed on the warning screen.
    - : Disable (Current-value clear key is not displayed on the warning screen)
    - : Enable (Current-value clear key is displayed on the warning screen)
12) When ❾ is pressed, the operation is confirmed. Then, the screen returns to the "warning counter setting screen".

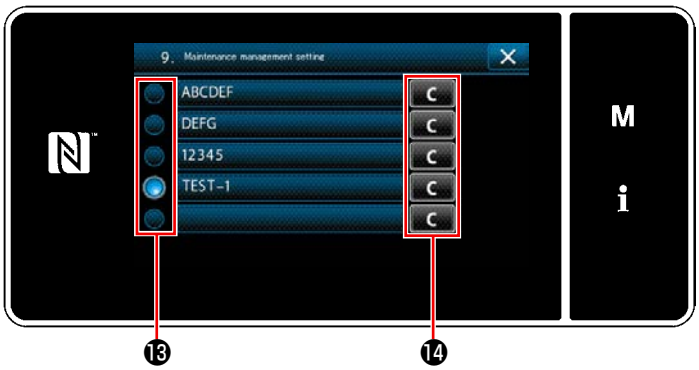


13) When ❺ on the "warning counter setting screen" is pressed, the "keyboard" is displayed.
14) Enter a name of the warning counter.
15) When ↵ ❿ is pressed, the operation is confirmed. Then, the screen returns to the "warning counter setting screen".

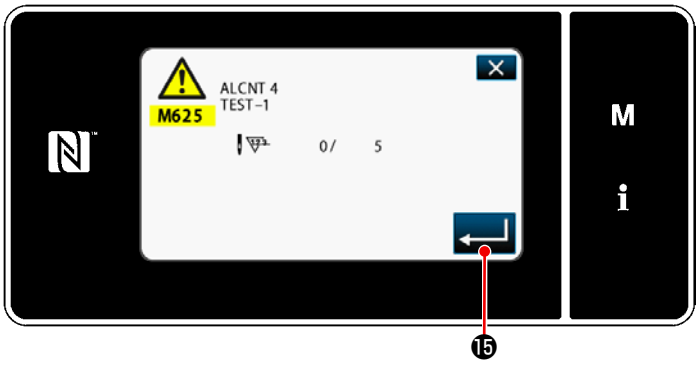


16) When ✕ ⓫ is pressed, the operation is confirmed. Then, the screen returns to the "maintenance management setting screen".

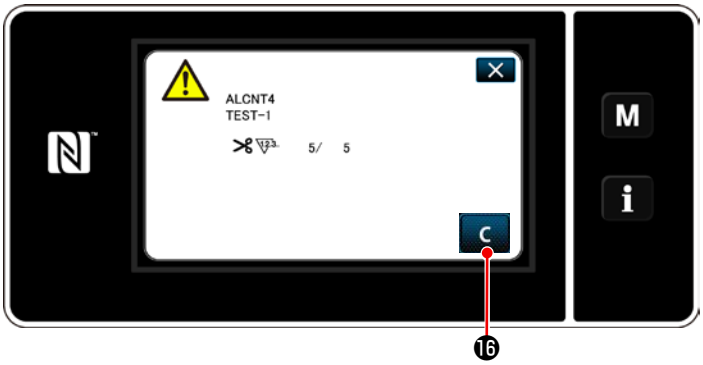
* When the sewing machine performs sewing after the warning counter has been set, number of counts is displayed in ⓬ .



17) The warning counter selected with a check-mark in ⓭ is enabled.
18) When the relevant "C" button in ⓮ is pressed, the number of counts displayed in the corresponding counter field can be cleared.



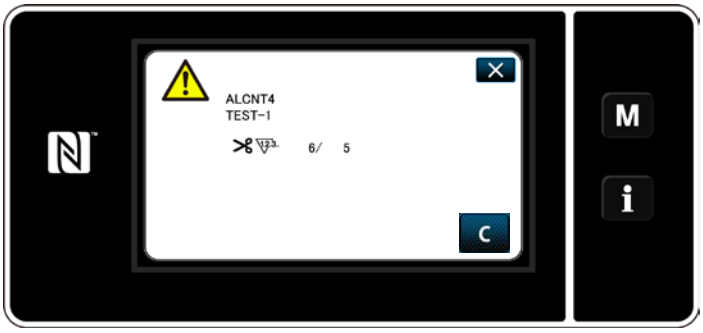
19) When ↵ ⓯ is pressed, the operation is confirmed. Then, the screen returns to the "maintenance management screen".



20) When the preset number of counts for the counter is reached, the warning screen is displayed.

21) Clear the number of counts by pressing C ⓰ .

* If C (disable) is selected in item number 10), C ⓰ will not be displayed.



22) If the number of counts of the counter is not cleared, the warning screen will be displayed again at the time of next count.

9. SEWING SPEED TABLE

Operate the sewing machine at a speed equal to or lower than the maximum sewing speed selected from those shown in the table below according to the sewing conditions.
Speed setting is automatically carried out according to the stitch length and alternating vertical movement amount.

● Zigzag width limit

Zigzag width	Sewing speed (sti/min)
0.0 to 4.0	5,000
4.1 to 5.0	4,000
5.1 to 6.0	3,500
6.1 to 8.0	3,000

● Feed amount limit

Stitch length (mm)	Sewing speed (sti/min)
-5.0	1,800
-4.8	2,200
-4.6	2,500
-4.4	2,500
-4.2	3,800
-4.0	4,000
-3.8	4,100
-3.6	4,200
-3.4	4,300
-3.2	4,400
-3.0	4,500
-2.8	4,500
-2.6	4,700
-2.4	4,800
-2.2	4,900
-2.0	5,000
-1.8	5,000
-1.6	5,000
-1.4	5,000
-1.2	5,000
-1.0	5,000
-0.8	5,000
-0.6	5,000
-0.4	5,000
-0.2	5,000
0.0	5,000

Stitch length (mm)	Sewing speed (sti/min)
0.2	5,000
0.4	5,000
0.6	5,000
0.8	5,000
1.0	5,000
1.2	5,000
1.4	5,000
1.6	5,000
1.8	5,000
2.0	5,000
2.2	5,000
2.4	5,000
2.6	5,000
2.8	5,000
3.0	5,000
3.2	4,800
3.4	4,800
3.6	4,100
3.8	4,000
4.0	3,900
4.2	3,800
4.4	2,700
4.6	2,700
4.8	2,400
5.0	2,200

10. TROUBLES IN SEWING AND CORRECTIVE MEASURES

Phenomenon	Cause	Corrective measures	Page
Thread breakage	① When the thread gets entangled in the thread take-up lever.	○ Remove the entanglement.	23
	② When the needle thread is threaded in a wrong way.	○ Thread it correctly.	23
	③ When the thread gets entangled in the sewing hook.	○ Remove the entanglement.	126
	④ When the needle thread is excessively tight or loose.	○ Adjust the thread tension.	24
	⑤ When the needle thread slips out of the rotary disc.	○ Increase the tension of the pretension disk.	24
	⑥ When the tension of the thread take-up spring is excessively high or low.	○ Adjust the tension of the take-up spring.	29
	⑦ When the stroke of the thread take-up spring is excessively large or small.	○ Adjust the stroke of the take-up spring. (8 to 12 mm)	29
	⑧ When the timing of the sewing hook and the needle is not matched.	○ Adjust the timing.	126
	⑨ When there is a scratch on the thread path of hook, bobbin case, thread take-up lever or any other part.	○ Remove such a scratch or replace the component.	126,127
	⑩ When the thread is not suitable.		
	a. The quality of the thread is poor.	○ Use a thread of good quality.	
	b. The thread is too thick for the needle.	○ Use a suitable thread or needle.	
	c. The thread is broken by heat.	○ Use JUKI Silicone Oil Lubricant unit.	
	⑪ When the stitch is skipped.	○ Refer to the following paragraphs, Stitch skipping.	
Stitch skipping	① When the needle is inserted in a wrong way.		
	a. The needle is not entirely inserted into the needle bar.	○ Fully insert the needle.	20
	b. The needle eye is not facing straight to the operator.	○ Let the needle eye face straight to the operator.	20
	c. The needle is facing backwards.	○ Let the long groove on the needle face to the operator.	20
	② When the needle itself is not suitable.		
	a. The needle is bent.	○ Replace it with a new needle.	20
	b. The quality of the needle is not good.	○ Use a needle of good quality.	
	c. The needle is too thin for the thread.	○ Use a suitable needle or thread.	
	d. Blunt needle is used.	○ Replace it with a new needle.	
	③ When the hook blade point is not sharp enough or damaged.	○ Resharpen the hook or replace it.	126,127
	④ When the timing of the sewing hook and the needle is not matched.	○ Adjust the timing properly.	126
	⑤ When the height of the needle bar is not correct.	○ Adjust the height of the needle bar.	125
	⑥ When the clearance between the needle and the sewing hook is too great.	○ Adjust the clearance.	126
	⑦ When the needle thread slips out of the rotary disc. (For optional auxiliary thread take-up lever type only)	○ Adjust the position of the auxiliary thread take-up lever properly.	128

Phenomenon	Cause	Corrective measures	Page
Loose stitch	① When the needle thread tension is too low.	○ Increase the needle thread tension.	24
	② When the tension of the thread take-up spring is too low.	○ Increase the tension of the spring.	29
	③ When the tension of the bobbin thread is too high.	○ Decrease the bobbin thread tension.	29
	④ When the timing of the sewing hook and the needle is not matched.	○ Adjust the timing correctly.	126
	⑤ When the thread is too thick for the needle.	○ Use a suitable needle or thread.	
	⑥ When the thread slips out of the rotary disc.	○ Increase the tension of the pretension disk.	24
Irregular stitch tightness	① When the bobbin thread tension is too low.	○ Increase the bobbin thread tension.	29
	② When the bobbin thread is not wound correctly.	○ Wind up the bobbin thread evenly.	22
	③ When there is a scratch on the thread path of the sewing hook, bobbin case, thread take-up lever or any other parts.	○ Remove such a scratch or replace the component.	
Needle breakage	① When the needle is bent.	○ Replace it with a new needle.	
	② When the quality of the needle is not good.	○ Use a needle of good quality.	
	③ When the needle is not entirely inserted into the needle bar.	○ Insert the needle into the needle bar as far as it will go.	20
	④ When the needle hits the sewing hook.	○ Adjust the timing and clearance between the needle and the sewing hook and also the position of the needle guard.	126
	⑤ The needle is too thin for the sewing material and thread.	○ Replace a suitable needle.	
	⑥ The needle hole in the throat plate is too narrow.		
	⑦ The needle hits against the throat plate.		
	⑧ The needle hits against the presser foot.		