elna
SWISS DESIGN

eXpressive 808

| Instruction Book |



IMPORTANT SAFETY INSTRUCTIONS

When using an electrical appliance, basic safety precautions should always be followed, including the following:

This sewing machine is designed and manufactured for household use only.

Read all instructions before using this sewing machine.

DANGER— To reduce the risk of electric shock:

1. An appliance should never be left unattended when plugged in. Always unplug this sewing machine from the electric outlet immediately after using and before cleaning

WARNING— To reduce the risk of burns, fire, electric shock, or injury to persons:

1. Do not allow to be used as a toy. Close attention is necessary when this sewing machine is used by or near children.
2. Use this appliance only for its intended use as described in this owner's manual.
   Use only attachments recommended by the manufacturer as contained in this owner's manual.
3. Never operate this sewing machine if it has a damaged cord or plug, if it is not working properly, if it has been dropped or damaged, or dropped into water.
   Return this sewing machine to the nearest authorized dealer or service center for examination, repair, electrical or mechanical adjustment.
4. Never operate the appliance with any air opening blocked. Keep ventilation openings of this sewing machine and foot controller free from accumulation of lint, dust and loose cloth.
5. Never drop or insert any object into any opening.
6. Do not use outdoors.
7. Do not operate where aerosol (spray) products are being used or where oxygen is being administered.
8. To disconnect, turn all controls to the off ("O") position, then remove plug from outlet.
9. Do not unplug by pulling on cord. To unplug, grasp the plug, not the cord.
10. Keep fingers away from all moving parts. Special care is required around the sewing machine needle and/or cutting blade.
11. Always use the proper needle plate. The wrong plate can cause the needle to break.
12. Do not use bent needles.
13. Do not pull or push fabric while stitching. It may deflect the needle causing it to break.
14. Switch this sewing machine off ("O") when making any adjustment in the needle area, such as threading the needle, changing the needle, threading the bobbin or changing the presser foot, and the like.
15. Always unplug this sewing machine from the electrical outlet when removing covers, lubricating, or when making any other adjustments mentioned in this owner's manual.

SAVE THESE INSTRUCTIONS

For Europe only:
This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

For outside Europe (except U.S.A.):
This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
Children should be supervised to ensure that they do not play with the appliance.



Please note that on disposal, this product must be safely recycled in accordance with relevant National legislation relating to electrical/electronic products. If in doubt please contact your retailer for guidance. (EEA (European Economic Area) and UK)

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STITCH CHART

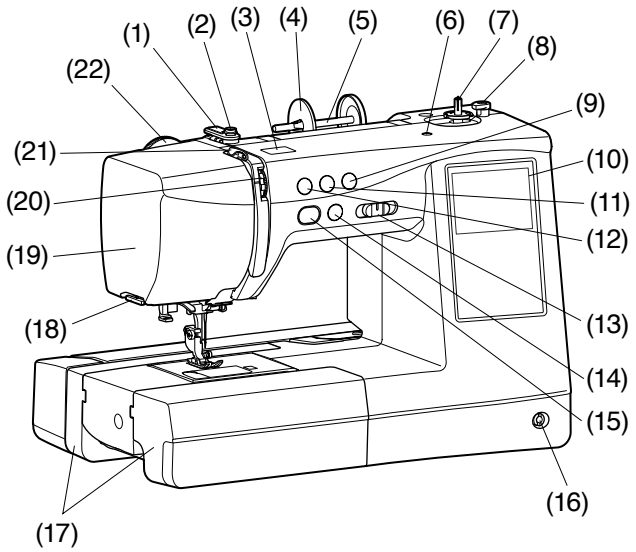
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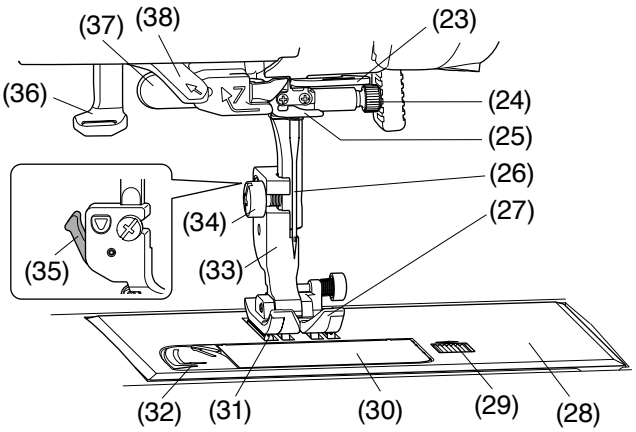
DESIGN CHART

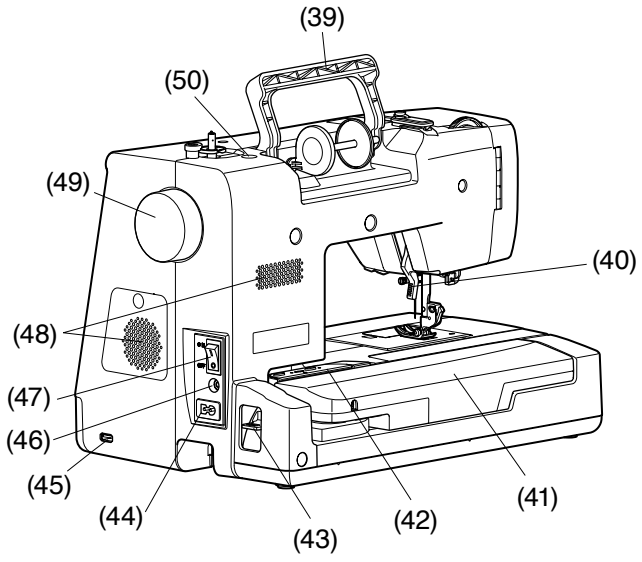
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ESSENTIAL PARTS

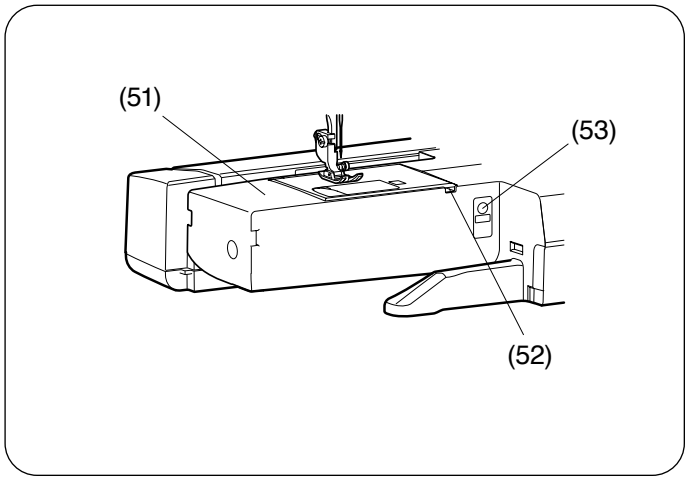
Names of Parts

(1) Upper thread guide
(2) Bobbin winding tension disk
(3) Cover
(4) Spool holder (large)
(5) Spool pin
(6) Hole for extra spool pin
(7) Bobbin winder spindle
(8) Bobbin winder stopper
(9) Thread cutter button
(10) Visual touch screen
(11) Needle up/down button
(12) Auto-lock button
(13) Speed control slider
(14) Reverse button
(15) Start/stop button
(16) Knee lifter socket
(17) Extension table (accessory storage)
(18) Thread cutter/holder
(19) Face cover
(20) Thread tension dial
(21) Thread take-up lever
(22) Presser foot pressure dial

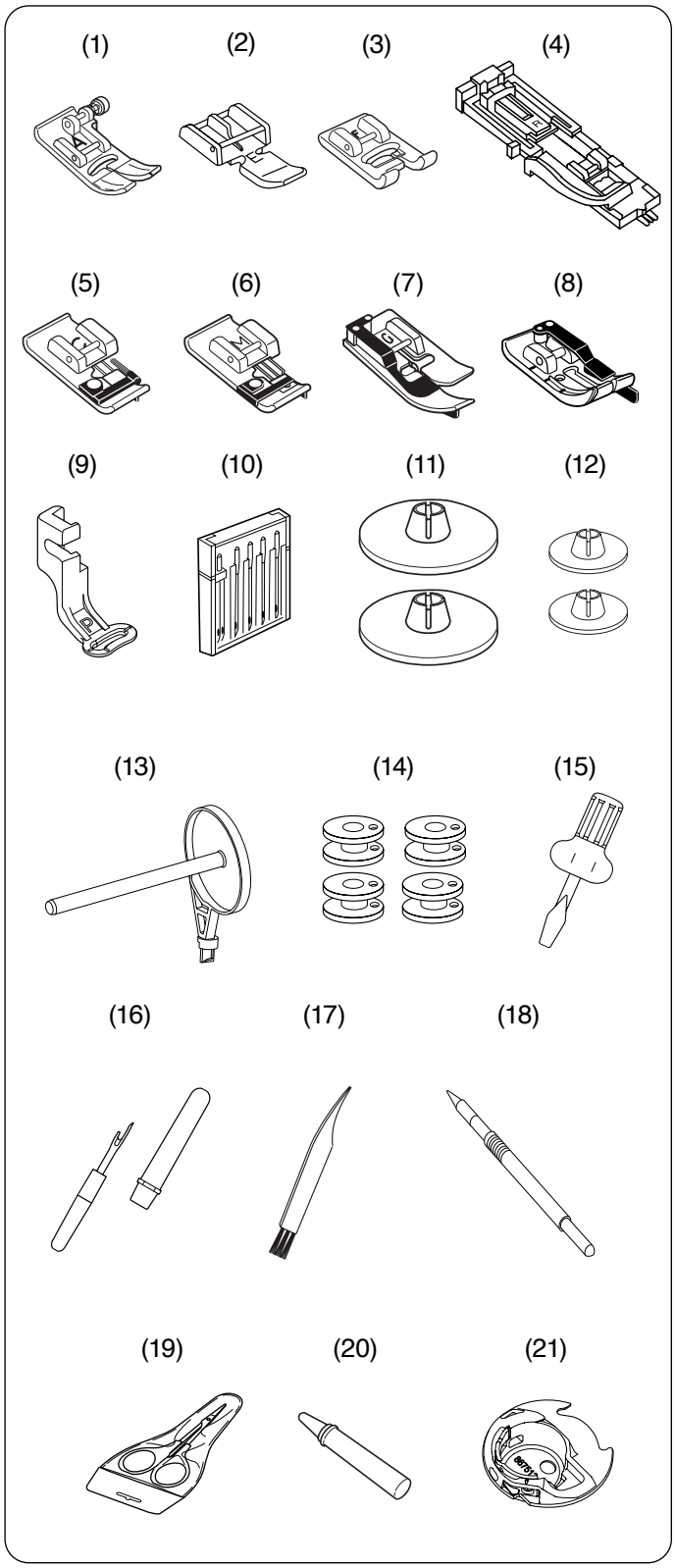
(23) Lower thread guide
(24) Needle clamp screw
(25) Needle bar thread guide
(26) Needle
(27) Zigzag foot A
(28) Needle plate
(29) Hook cover release button
(30) Hook cover plate
(31) Feed dogs
(32) Bobbin thread cutter
(33) Foot holder
(34) Setscrew
(35) Lever
(36) Needle threader lever
(37) Buttonhole lever
(38) Needle threader guide

(39) Carrying handle
(40) Presser foot lifter
(41) Carriage arm
(42) Carriage
(43) Carriage arm release lever
(44) Machine socket
(45) USB port
(46) Foot control jack
(47) Power switch
(48) Ventilation openings
(49) Handwheel
(50) Cap

NOTE:
- To carry the sewing machine, hold the carrying handle with your hand, and support the sewing machine with the other hand.
- Sewing machine design and specifications are subject to change without prior notice.



(51) Free-arm
(52) Needle plate release hole
(53) Feed balancing dial

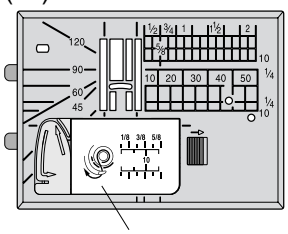


Standard Accessories

No.	Part Name	Part No.
1	Zigzag foot A (Set on the machine)	832523007
2	Zipper foot E	808852003
3	Satin stitch foot F	822804118
4	Automatic buttonhole foot R (in the accessory storage)	753801004
5	Overedge foot C	822801001
6	Overcasting foot M	822808008
7	Blind hemming foot G	825817009
8	1/4″ seam foot O	200008037
9	Embroidery foot P	819802105
10	Needle set	820827007
11	Spool holder (large) x 2* (1 is set on the machine)	822020503
12	Spool holder (small) x 2*	822019509
13	Extra spool pin	809041004
14	Bobbin x 4* (1 is set on the machine)	102261103
15	Screwdriver	820832005
16	Seam ripper (Buttonhole opener)	647808009
17	Lint brush	802424004
18	Touch screen stylus	860194002
19	Scissors	803813203
20	Bobbin holder cleaner	859858007
21	Special bobbin holder for embroidery	867513208

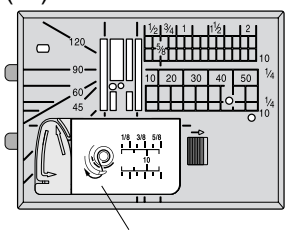
* This is the part number for a single item (not for a set).

(22)



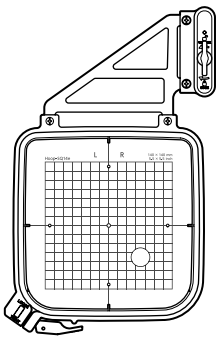
(23)

(24)



(23)

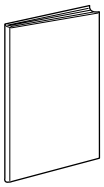
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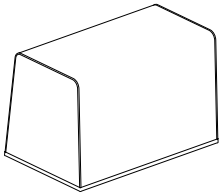
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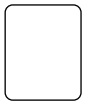
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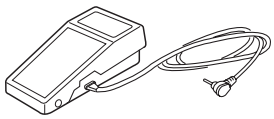
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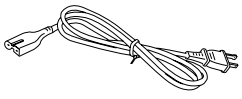
(29)



(30)



(31)



Standard Accessories

No.	Part Name		Part No.
22	Needle plate (set on the machine)		819625009
23	Hook cover plate		809136100
24	Straight stitch needle plate (in the accessory storage)		819803003
25	Embroidery hoop SQ14e (with template)		819801001
26	Stitch reference chart*		819806A03
27	Instruction book		819800033
28	Soft cover		819807100
29	Threading guide sticker		101506A09
30	Foot control		C-1036
31	Power supply cable**	U.S.A. and Canada	856519004
		U.K.	830377008
		Australia	830314018
		Continental Europe	830335004

* Built-in stitch patterns can also be referred on page 193.

** The power supply cable included may differ from the illustration.

Optional accessories

Optional accessories for this model are avaialble by accessing the following QR code.

https://global.elna.com/optional-accessories/

Instructional Video

A presentation video with quick-start information for this model is available online and can be accessed using the following QR code.

bit.ly/eXpressive_808

Template Sheets

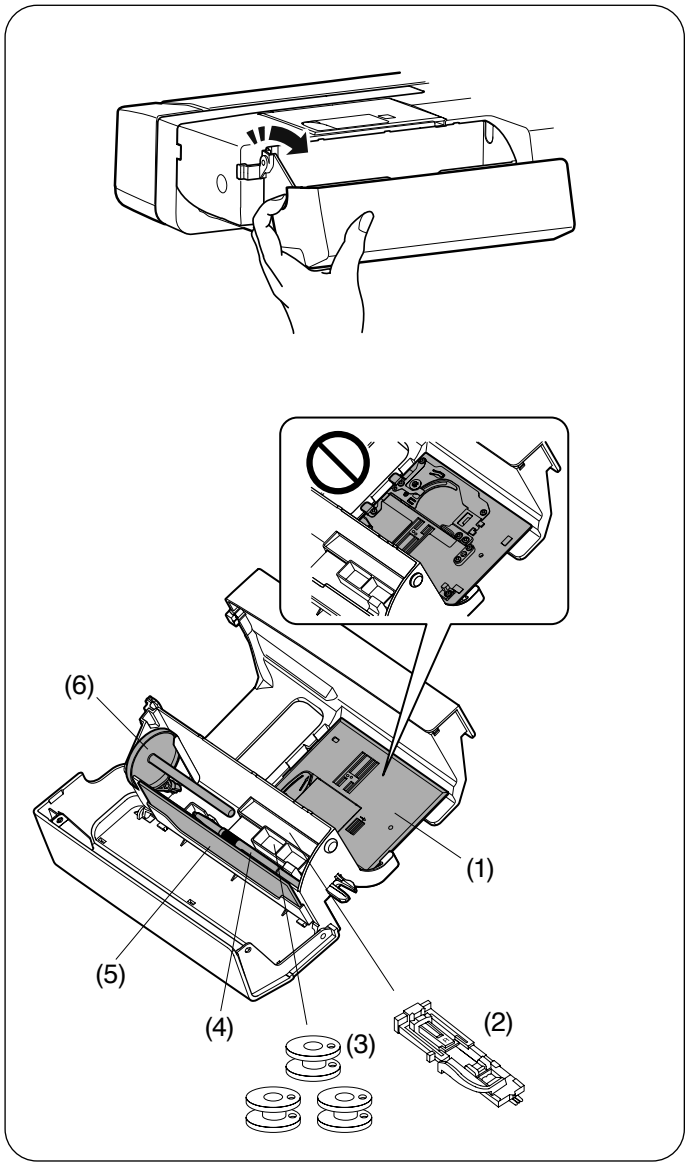
https://global.elna.com/resources-expressive-808/

EmbroideryEditor*

Download application for PC. You can use on your computer the same functions available on the machine to create and modify embroidery designs.

https://global.elna.com/embroidery-editor/

* This application is for PC only.

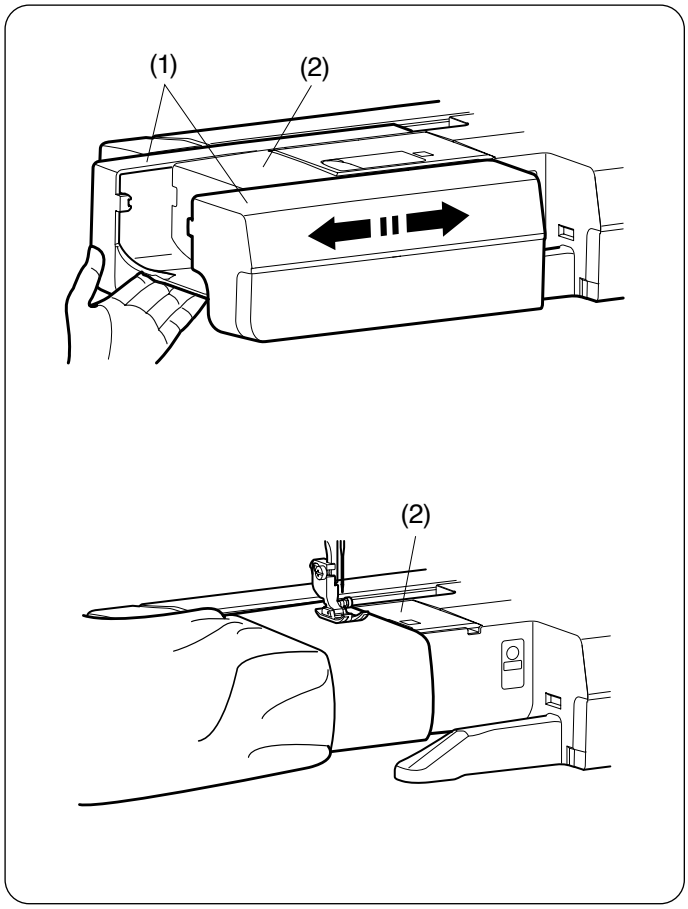


Accessory Storage

The accessories can be conveniently stored in the compartments of the extension table.
To store the accessories in the compartment of the extension table, hook your fingers in the hollow on the left side of the extension table. Push up the cover towards you to open the accessory storage.

(1) Needle plate
(2) Automatic buttonhole foot R
(3) Bobbin
(4) Touch screen stylus
(5) Stitch reference chart
(6) Extra spool pin

⚠ CAUTION:
Do not place the needle plate upside down otherwise the needle plate may break or cause malfunction.



Extension Table

The extension table provides an extended sewing area and can be removed for free-arm sewing.

(1) Extension table
(2) Free-arm

To detach:

Draw the table out to the left.

To attach:

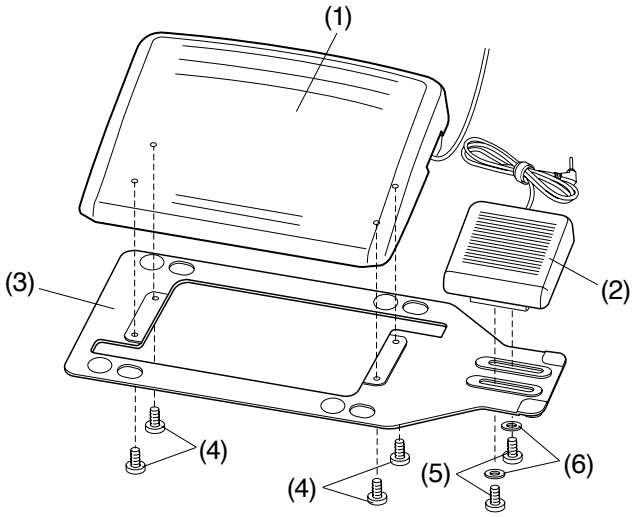
Slide the table on the base and push the table to the right.

Free-arm Sewing

Free-arm sewing is used for stitching sleeves, waistbands, pant legs or any other tubular garments.

It is also useful for darning socks or mending knees or elbows.

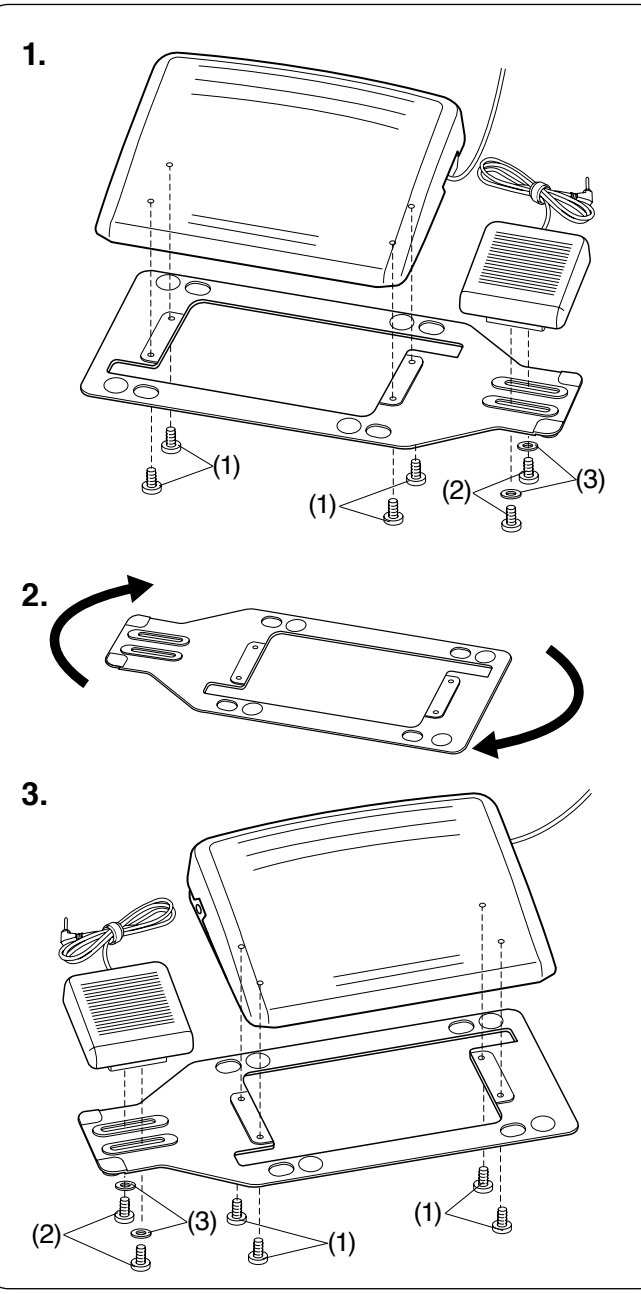
(2) Free-arm



Foot Control and Thread Cutter Switch (optional)

To attach the foot control and the thread cutter switch to the base plate, tighten setscrews A, and setscrews B with washers as shown.

(1) Foot control
(2) Thread cutter switch
(3) Base plate
(4) Setscrew A
(5) Setscrew B
(6) Washer



Adjusting the Thread Cutter Switch Position

Placing the thread cutter switch to the left

The thread cutter switch position can be adjusted for your convenience.

If you wish to attach the thread cutter switch to the left side of the foot control, follow the procedure below.

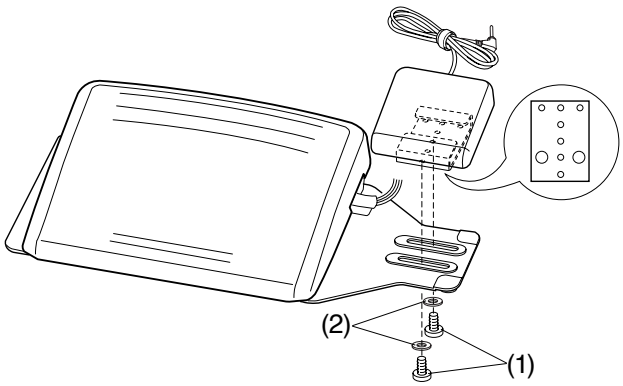
NOTE:
A Phillips head screwdriver is not included with this machine.

1. Remove the setscrews A, B and washers with a Phillips head screwdriver.
(1) Setscrew A
(2) Setscrew B
(3) Washer

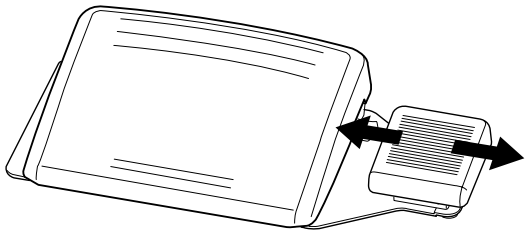
2. Turn the base plate 180 degrees.

3. Attach the foot control and thread cutter switch with the setscrews and the washers. Tighten the setscrews A and B. Be sure that the cable is not caught between the foot control and the base plate.
(1) Setscrew A
(2) Setscrew B
(3) Washer

1.

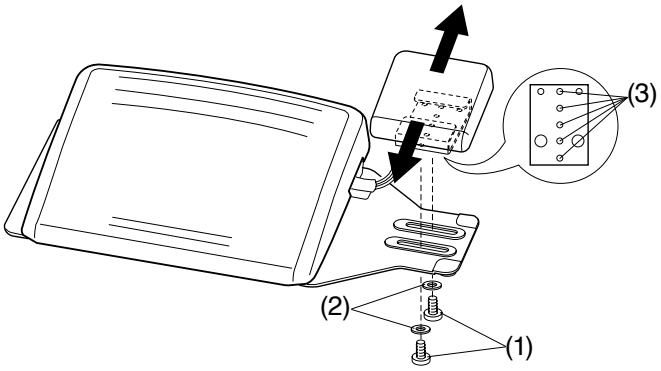


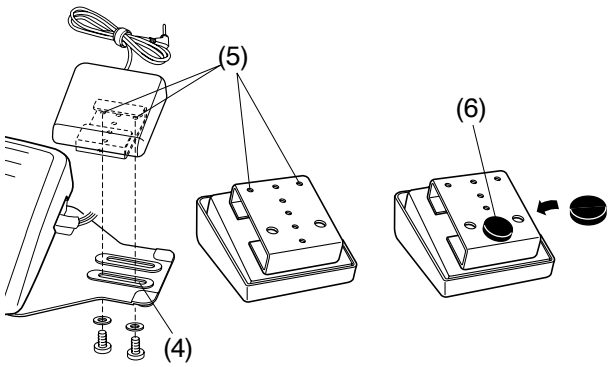
2.



---

1. 2.





Adjusting the horizontal position of the thread cutter switch

1. Loosen the setscrews B under the switch.

(1) Setscrew B
(2) Washer

2. Slide the switch to the left or right, and fix it at the desired position by tightening the setscrews with a screwdriver.

Adjusting the vertical position of the thread cutter switch

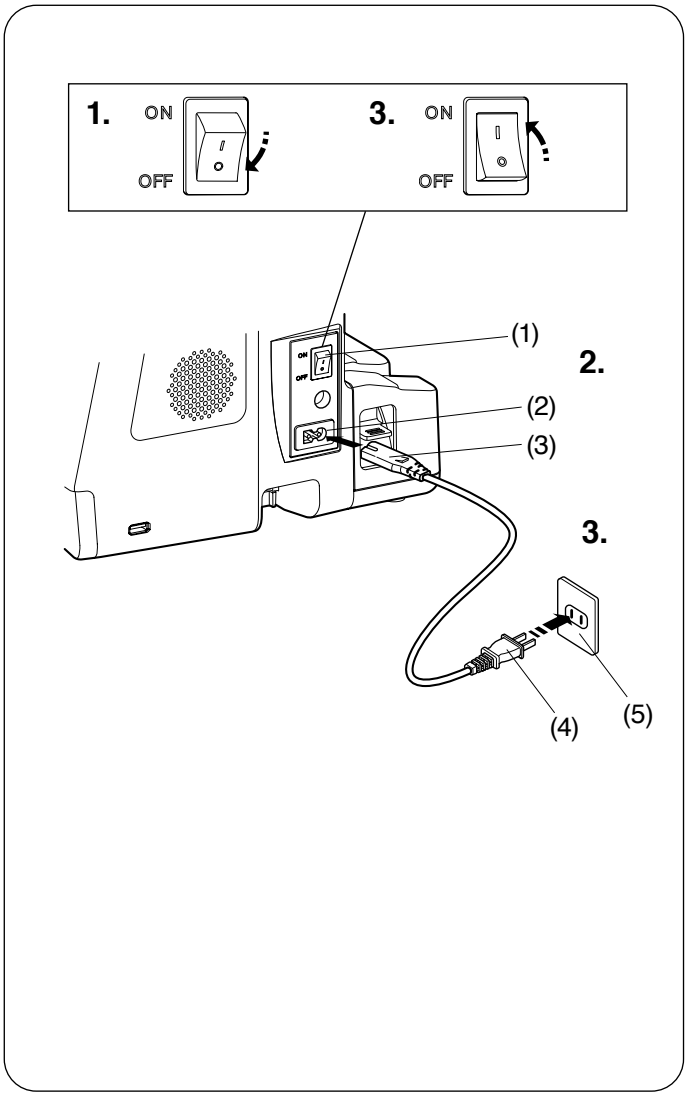
1. Remove the setscrews B and washers.

2. Move the switch forward or backward, attach the switch at the desired position and fix it with the setscrews and washers.

(1) Setscrew B
(2) Washer
(3) Desired position

NOTE:

- To fix the thread cutter switch at its lowest position, fix the setscrews B into the hole (4), and then holes (5).
- Tighten the setscrews B securely.
- Peel off the backing paper from the rubber sole (6) and attach it to the bottom of the thread cutter switch as shown.



GETTING READY TO SEW

Connecting the Power Supply

Using start/stop button

1. First make sure the power switch is OFF.
2. Insert the machine plug of the power supply cable into the machine socket.
3. Insert the power supply plug into the wall outlet, and turn the power switch ON.

   (1) Power switch
   (2) Machine socket
   (3) Machine plug
   (4) Power supply plug
   (5) Wall outlet

NOTE:
- Make sure to use the power supply cable that came with the machine.
- If you turn OFF the power switch, wait for 5 seconds before turning it on again.

⚠ WARNING:
- While in operation, always keep your eyes on the sewing area, and do not touch any moving parts such as the thread take-up lever, handwheel or needle.
- Always turn OFF the power switch and unplug the machine from the power supply:
  - when leaving the machine unattended.
  - when cleaning the machine.
- Do not place anything on the foot control.

Before using your sewing machine

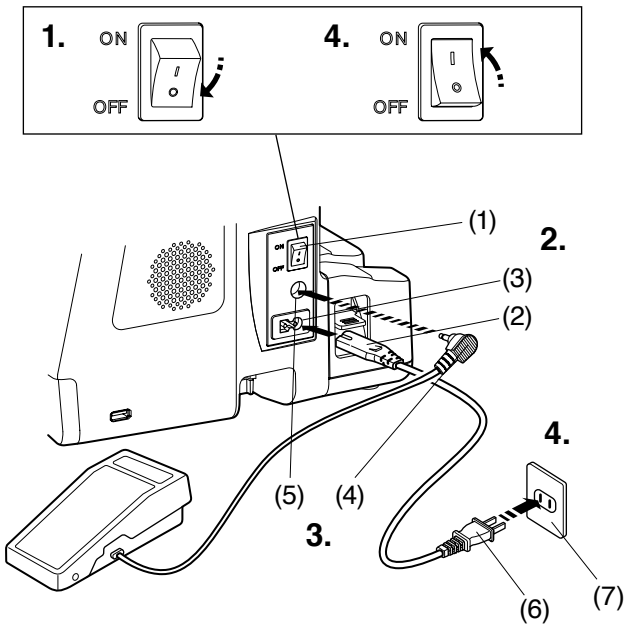
Before using your sewing machine for the first time, place a scrap of fabric under the presser foot and run the machine for a few minutes.
Wipe away any oil which may appear.

Operating instructions:

The symbol “O” on the switch indicates the “OFF” position of the switch.

For the U.S.A. and Canada only

Polarized plug (one blade wider than the other):
To reduce the risk of electric shock, this plug is intended to fit in a polarized outlet only one way. If it does not fit fully in the outlet, reverse the plug. If it still does not fit, contact a qualified electrician to install the proper outlet. Do not modify the plug in any way.



Using foot control

If you wish to use the foot control, insert the pin connector into the jack on the machine.

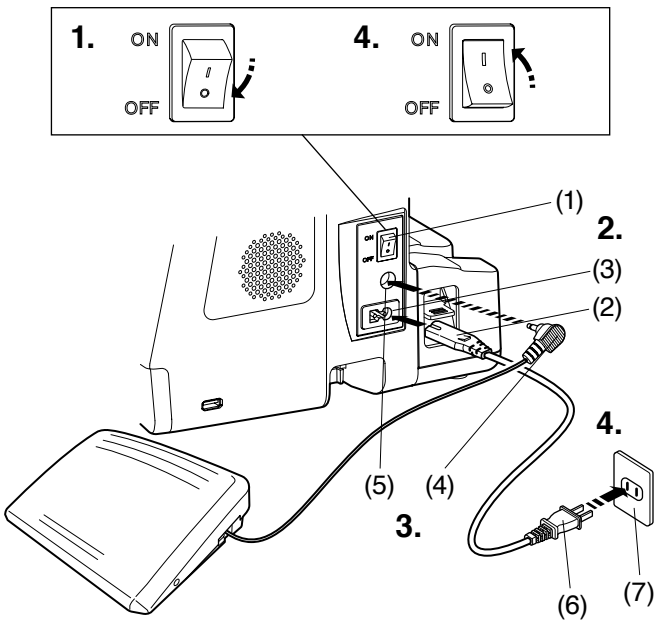
1. First make sure the power switch is OFF.
2. Insert the machine plug of the power supply cable into the machine socket.
3. Insert the pin connector into the foot control jack on the machine.
4. Insert the power supply plug into the wall outlet, and turn the power switch ON.

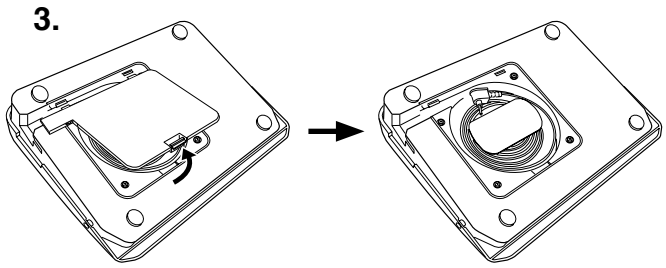
(1) Power switch
(2) Machine plug
(3) Machine socket
(4) Pin connector
(5) Foot control jack
(6) Power supply plug
(7) Wall outlet

NOTE:
- The start/stop button does not work when the foot control is connected except variable zigzag sewing.
- Connect the foot control when sewing the variable zigzag sewing (refer to page 63).

Operating Instructions:

Foot control model YC-485EC-1 (YDK) is for use with this sewing machine.





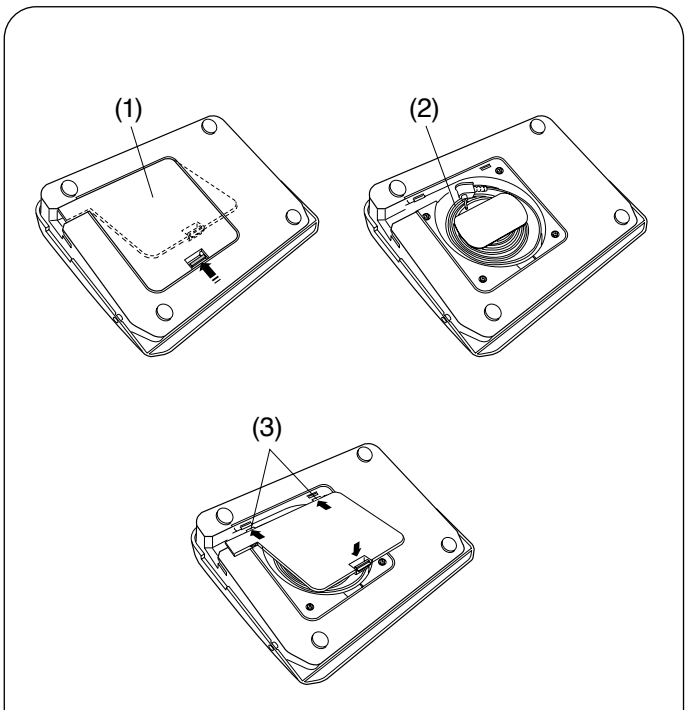
Using optional foot control

If you wish to use the optional foot control, pull out the cord from the foot control and insert the pin connector into the foot control jack on the machine.

1. First make sure the power switch is OFF.
2. Insert the machine plug of the power supply cable into the machine socket.
3. Pull out the cord from the foot control and insert the pin connector into the foot control jack on the machine.
4. Insert the power supply plug into the wall outlet, and turn the power switch ON.

(1) Power switch
(2) Machine plug
(3) Machine socket
(4) Pin connector
(5) Foot control jack
(6) Power supply plug
(7) Wall outlet

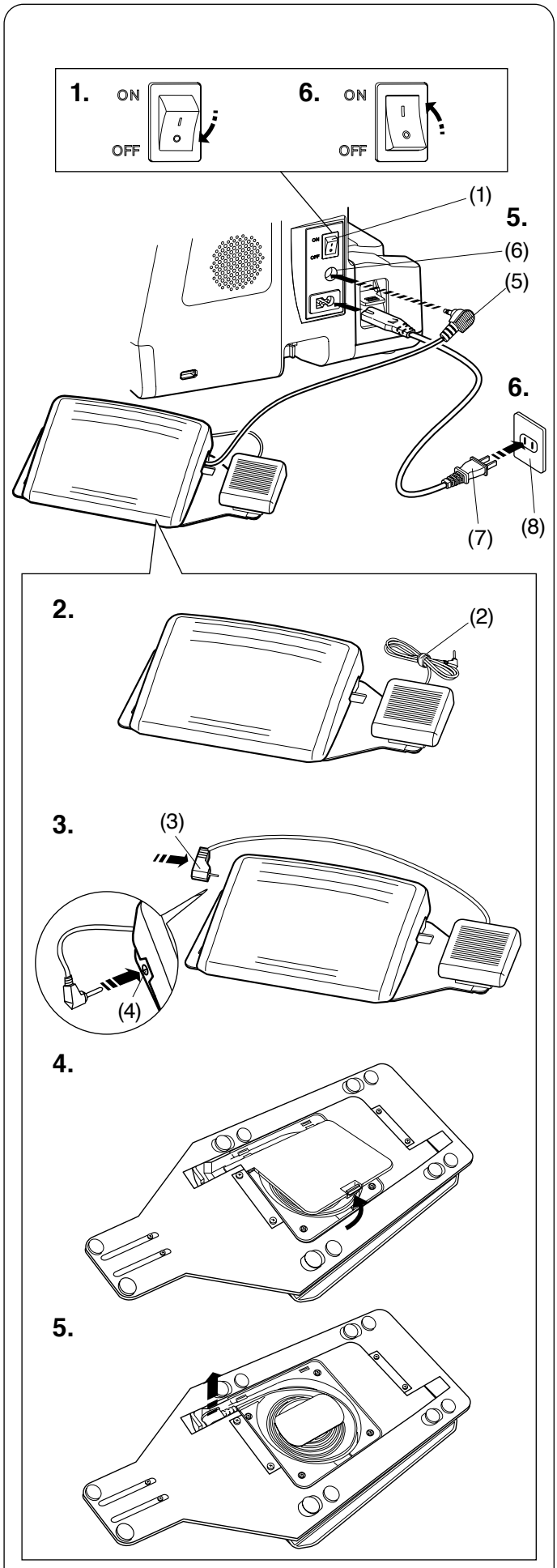
NOTE:
- The start/stop button does not work when the foot control is connected except variable zigzag sewing.
- Connect the foot control when sewing the variable zigzag sewing (refer to page 63).



Cord storage

The cord of the foot control can be conveniently stored in the cord storage under the base cover of the foot control.

(1) Base cover
(2) Cord
(3) Hooks

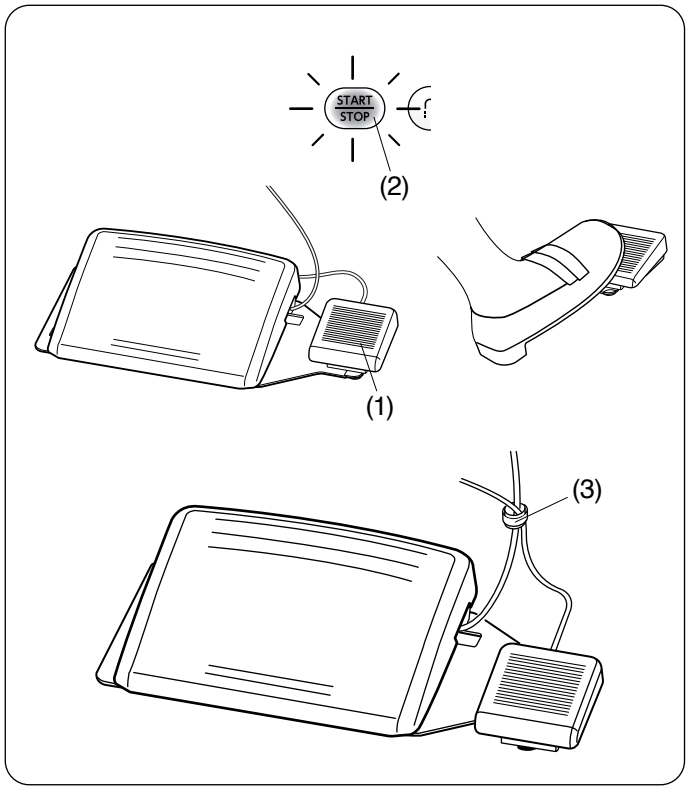


Using optional thread cutter switch

If you wish to use the optional thread cutter switch, insert the pin connector of the thread cutter switch into the jack on the foot control (optional), and insert the pin connector of the foot control into the foot control jack on the machine.

1. First make sure the power switch is OFF.
2. Remove the cable tie from the cable.
3. Insert the pin connector (thread cutter switch) into the jack on the foot control.
4. Flip the foot control upside down and open the cover.
5. Draw the cord from the foot control and insert the pin connector (foot control) into the foot control jack on the machine.
6. Insert the power supply plug into the wall outlet, and turn the power switch ON.

(1) Power switch
(2) Cable tie
(3) Pin connector (thread cutter switch)
(4) Jack on the foot control
(5) Pin connector (foot control)
(6) Foot control jack
(7) Machine plug
(8) Wall outlet

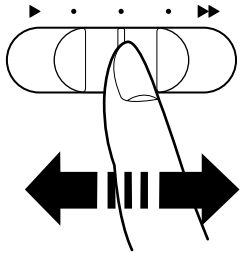


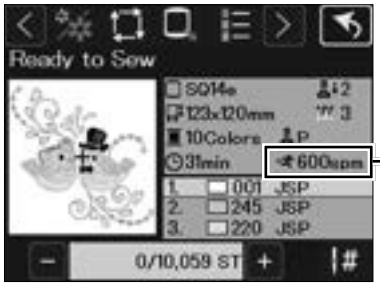
After sewing, depress the thread cutter switch on the right side of the foot control to trim both the needle and bobbin threads.
Do not depress the thread cutter switch until the start/stop button turns blue.

(1) Thread cutter switch
(2) Start/stop button

NOTE:
- Threads are trimmed when the thread cutter switch is depressed for more than 0.5 seconds.
- The thread cutter switch does not work without the foot control being depressed first.
- Bundle the cables with the cable tie as necessary.

(3) Cable tie





(1)

Controlling sewing speed

Speed control slider

You can limit the maximum sewing speed with the speed control slider according to your sewing needs.

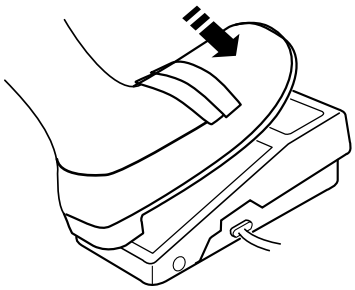
To increase the sewing speed, move the slider to the right.

To decrease the sewing speed, move the slider to the left.

The sewing speed can be changed while stitching.

Maximum sewing speed in the embroidery mode is displayed on the Ready to Sew window.

(1) Maximum sewing speed



Foot Control

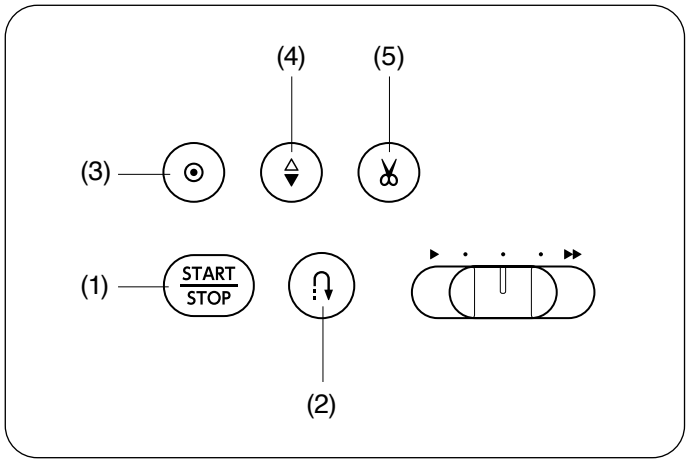
Pressing on the foot control can vary sewing speed.

The harder you press the foot control, the faster the machine runs.

For variable zigzag sewing, refer to page 63.

NOTE:

- The machine runs at the maximum speed set by the speed control slider when the foot control is fully depressed.
- You can select the desired start-up speed from 1 to 5 by pressing the corresponding key (refer to page 171).
- This machine is equipped with an automatic shutdown safety feature to prevent overheating whenever the machine is running overloaded. Follow the safety instructions that appear on the visual touch screen (refer to page 186).



Machine Operating Buttons

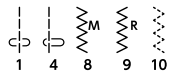
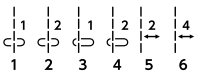
(1) Start/stop button

Press this button to start or stop the machine.
The machine starts running slowly for the first few stitches, then runs at the speed set by the speed control slider. The machine runs slowly as long as this button is pressed.
The button will turn red when the machine is running, and blue when it has been stopped.
Pressing and holding this button while sewing will slow down the sewing speed and the machine will stop when the button is released.

NOTE:
- The start/stop button cannot be used when the foot control is connected to the machine.
- You can select the desired start-up speed from 1 to 5 by pressing the corresponding key (refer to page 171).

(2) Reverse button

- **When the following stitch patterns are selected:**

Utility	Quilt	Bridge
		

The machine will sew in reverse as long as the reverse button is pressed. Release the button to sew forward. When the machine is stopped and foot control is disconnected, the machine will sew in reverse slowly as long as the reverse button is pressed. Release the button to stop the machine.

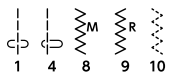
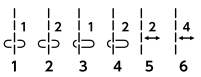
- **When any other stitches are selected:**

If you press the reverse button when sewing any other patterns, the machine will immediately sew locking stitches and automatically stop. When the reverse button is pressed while the machine is stopped, the machine will immediately sew locking stitches and automatically stop after the machine is started.

NOTE:
There will be particular functions of the reverse button when stitch pattern U2, U3, B13 or B14 is selected. Refer to pages 46-47, 76 and 78 for instructions.

(3) Auto-lock button

- **When the following stitch patterns are selected:**

Utility	Quilt	Bridge
		

Press the auto-lock button to sew a locking stitch immediately. The machine will automatically stop. When the auto-lock button is pressed while the machine is stopped, the machine will immediately sew locking stitches and automatically stop after the machine is started.

- **When any other stitches are selected:**

Press the auto-lock button to sew a locking stitch at the end of current pattern. The machine will automatically stop.
When the machine is stopped, press the auto-lock button to sew a locking stitch at the end of current pattern and the machine will automatically stop after the machine is started.
The machine will trim the threads automatically after locking the stitch when the auto thread cutting is turned on (refer to page 170).

(4) Needle up/down button

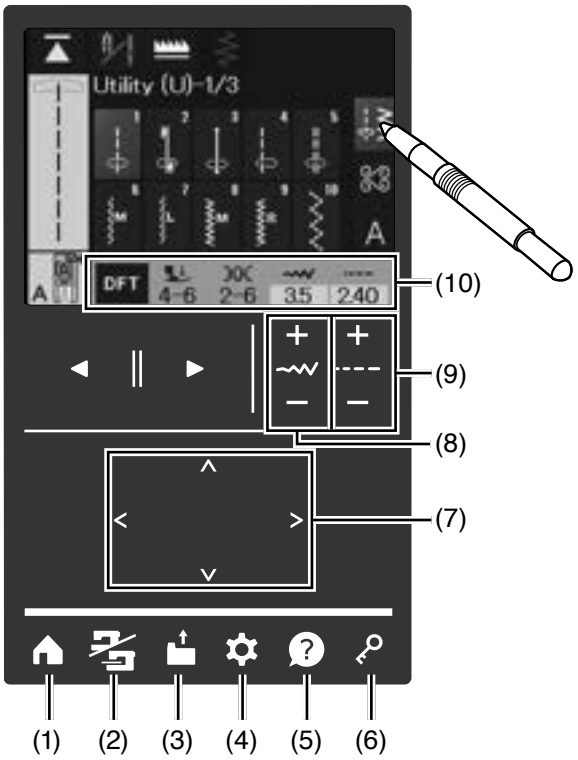
Press this button to bring the needle bar up or down. The machine will stop with the needle in down position. However, you can change the needle stop position in the machine setting mode (refer to page 170).

(5) Thread cutter button

After finishing sewing, press this button to trim the threads. The needle bar automatically rises after trimming the threads (refer to page 43).

After using auto thread cutting or threading the bobbin holder, you can start sewing without drawing up the bobbin thread.

NOTE:
- The thread cutter button does not function:
  - directly after turning ON the power.
  - when the presser foot is raised with the presser foot lifter.
  - after being pressed 3 times in a row.
- Use the thread cutter on the face cover if the thread is #30 or thicker (refer to page 43).





Touch Screen Keys

⚠ CAUTION:
Do not press the visual touch screen with hard or sharp objects like pencils or screwdrivers. Use touch screen stylus included in the standard accessories.

(1) Home key (refer to page 117)

Press this key to go to the top of the category selections for the ordinary sewing mode or the embroidery mode window.

(2) Mode switch key

Press this key to switch the ordinary sewing mode or embroidery mode.

(3) Open file key (refer to pages 162-165)

Press this key and the open file window will open.

You can open pattern combinations and monograms saved in the machine's internal memory or on a USB flash drive.

(4) Set mode key (refer to pages 166-178)

Press this key to enter the setting mode. You can customize the machine settings to your preference.

The settings for "Machine Settings", "Ordinary Sewing Settings", "Embroidery Settings", and "Language Setting" are available in this mode.

(5) Help key (refer to page 18)

Press this key and the help window will open.

(6) Lockout key

Press this key to lockout the machine when threading the machine, replacing the accessories, etc.

To reduce the risk of injury, all the buttons and keys except the lockout key are deactivated.

To unlock the machine, press this key again.

(7) Cursor keys

Press the cursor keys to move the cursor, the embroidery hoop or designs in editing window, etc.

(8) Stitch width adjustment keys (refer to pages 40, 55, 64, 70, 85, 99, etc.)

Press the "+" or "–" key to alter the stitch width or needle drop position of the selected pattern.

(9) Stitch length adjustment keys (refer to pages 41, 64, 70, 77, 79, 99, etc.)

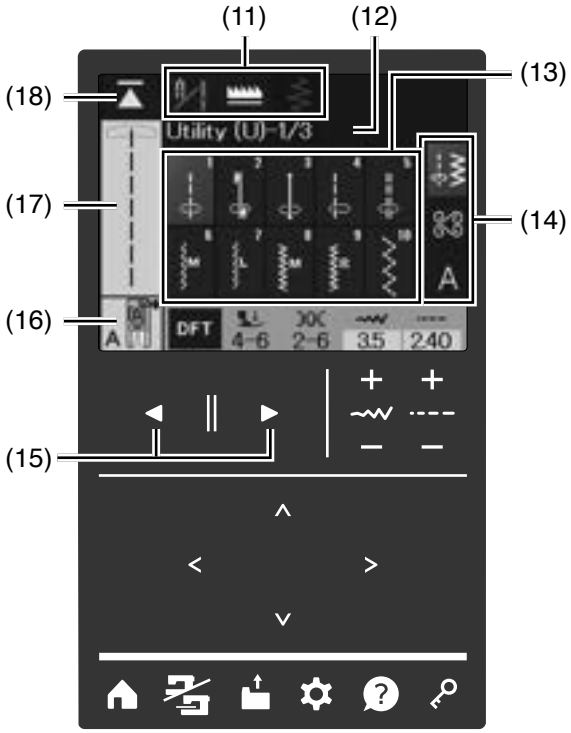
Press the "+" or "–" key to alter the stitch length of the selected stitch pattern.

(10) Manual stitch setting window (refer to pages 40-41)

Recommended presser foot pressure value and needle thread tension are displayed on the window.

The stitch width and stitch length or needle drop position of the selected pattern are also displayed. You can alter those settings with the stitch length/width adjustment key.

Press the default key to recover the original stitch setting.



(11) Function key (refer to pages 38-39)

You can change sewing settings for the selected pattern to suit your personal preference.

(12) Stitch category name and page

You can see the stitch category name and pages.

(13) Pattern selection keys

Press this key to sew the desired pattern directly.

(14) Category selection keys (refer to pages 36-37)

Press these keys to select the desired stitch category.

(15) Page keys (refer to pages 120, 143)

Press the page keys to display the next page or previous page. In embroidery mode, you can switch embroidery patterns or layers.

(16) Presser foot

The presser foot suitable for typical sewing of the selected pattern is displayed.

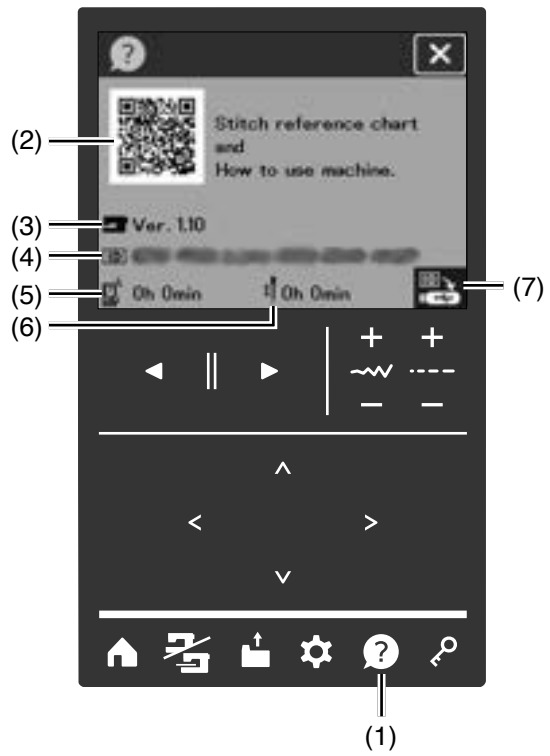
The presser foot varies depending on the purpose of sewing.

(17) Preview

The images of selected stitch patterns are shown in the edit box.

(18) Startover key (refer to page 100)

If you stop sewing in the middle of a stitch pattern and wish to sew the pattern again from the beginning, press this key before you start sewing.



Help Screen

Press the help key to show the help window. You can check the QR code, software version of the machine, machine ID, total power-on time of the machine, and total operating time of the machine.

(1) Help key
(2) QR code
(3) Software version
(4) Machine ID
(5) Total power-on time
(6) Total operating time

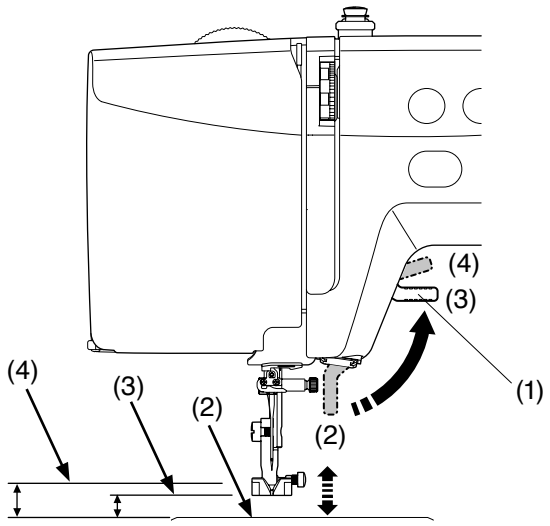
Read the QR code to see the instructional video, stitch chart (ordinary), design chart (embroidery) and quick reference chart.

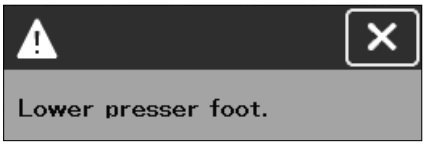
Press the machine ID copy key to save the machine ID (machineID.txt) to the USB flash drive inserted in the sewing machine.

(7) Machine ID copy key

NOTE:

- QR code reader (scanner) application can be downloaded from App store or market. Standard data charges from your internet provider may apply.
- QR Code is a registered trademark of Denso Wave Inc.





Raising and Lowering the Presser Foot

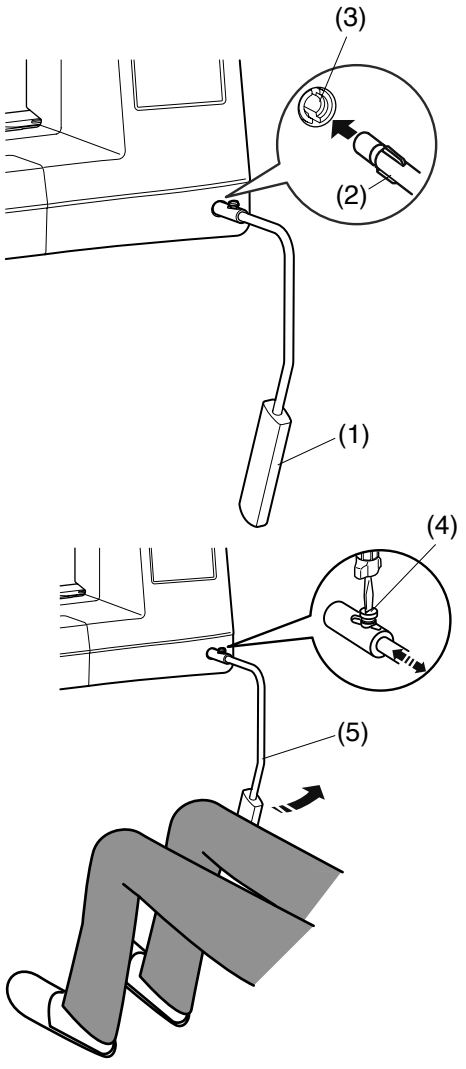
⚠ CAUTION:
Do not turn the handwheel or press the needle up/down button when the presser foot is in extra lifted position. This may cause damage to the presser foot.

The presser foot lifter raises and lowers the presser foot.

You can raise the presser foot about 6 mm (1/4″) higher than the normal up position by exerting more pressure when lifting the presser foot lifter. This helps you to place layers of thick fabric.

(1) Presser foot lifter
(2) Down position
(3) Up position
(4) Extra lifted position

NOTE:
If you press the start/stop button without lowering the presser foot, the warning message appears on the visual touch screen.
Lower the presser foot lifter and press the start/stop button.



Knee Lifter (optional)

The knee lifter is extremely helpful when sewing patchwork, quilting, etc. since it allows you to handle the fabric while your knee controls the presser foot.

Attaching the knee lifter

Match the ribs on the knee lifter with the notches in the knee lifter socket and insert the knee lifter.

(1) Knee lifter
(2) Rib
(3) Knee lifter socket

Adjusting the knee lifter

The angle of the knee lifter can be adjusted to fit the user.

Loosen the setscrew and slide the angle bar in or out to adjust the angle of the knee lifter.

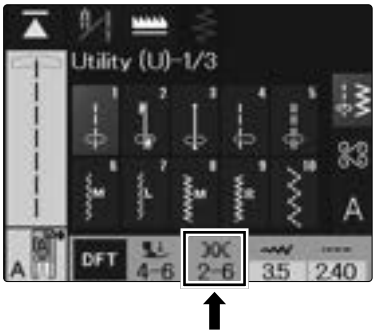
Tighten the setscrew to secure the angle bar.

(4) Setscrew
(5) Angle bar

Using the knee lifter

Push the knee lifter with your knee to easily move the presser foot up and down.

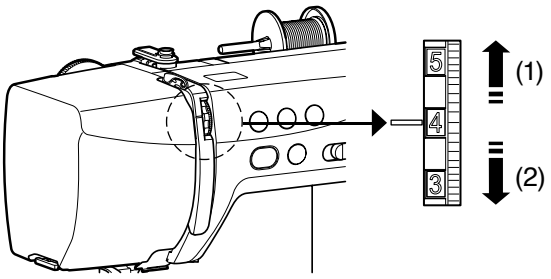
You can control how high the foot rises by the amount of knee pressure you exert.



Adjusting Thread Tension

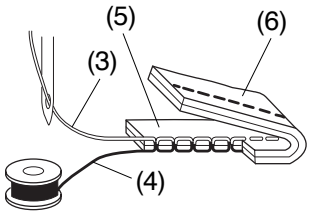
Select the stitch pattern to show the optimized thread tension.

NOTE:
- You may need to manually adjust the tension balance depending on the sewing conditions, or you can fine-tune the thread tension to suit your preference.
- Set the thread tension dial at “3” in the embroidery mode (refer to page 110).



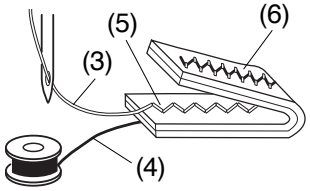
Adjust the thread tension dial to the number shown on screen.

(1) Turn the dial to smaller number, and the needle thread tension becomes weaker.
(2) Turn the dial to bigger number, and the needle thread tension becomes stronger.



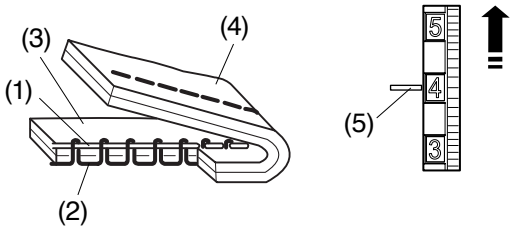
Balanced thread tension

Straight stitch: Both needle and bobbin threads interlock between the layers.



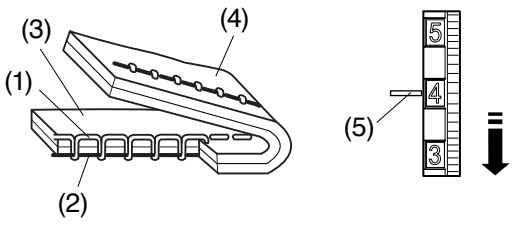
Zigzag stitch: The needle thread appears slightly on the wrong side of the fabric.

(3) Needle thread
(4) Bobbin thread
(5) Right side of the fabric
(6) Wrong side of the fabric



Needle thread tension is too tight:

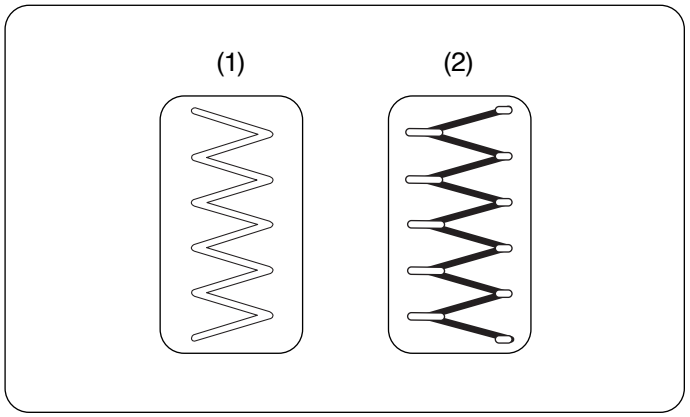
Turn the dial to smaller number.



Needle thread tension is too weak:

Turn the dial to bigger number.

(1) Needle thread
(2) Bobbin thread
(3) Right side of the fabric
(4) Wrong side of the fabric
(5) Setting mark

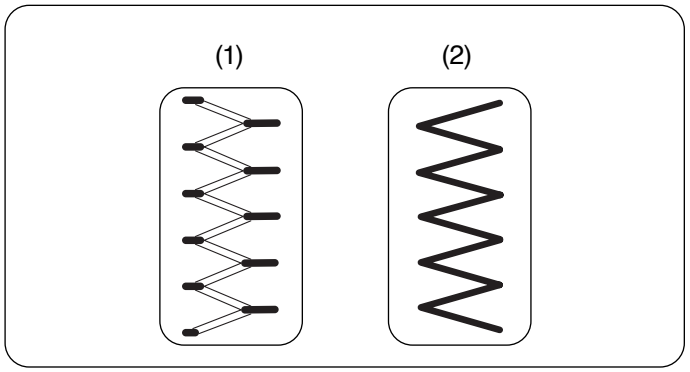


Correct tension

(1) Right side (top side) of fabric
(2) Wrong side (bottom side) of fabric

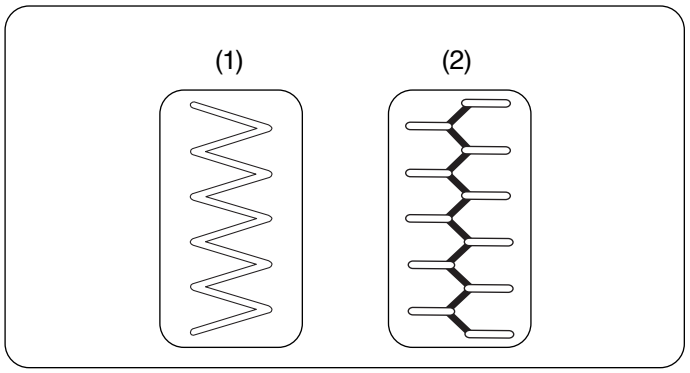
Minimize the amount of needle thread visible on the wrong side (bottom side) of the fabric without causing excessive puckering, or causing the bobbin thread to show on the right side (top side) of the fabric.

Results vary with fabric, thread and sewing conditions.



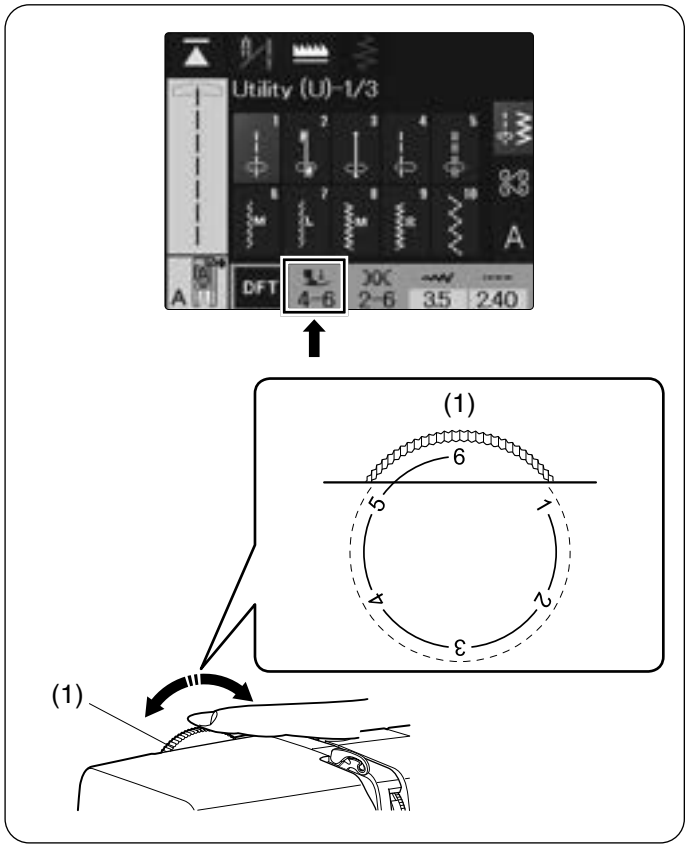
Tension is too tight

The corner of each zigzag point pulls together on the right side of the fabric.



Tension is too loose

The corner of each zigzag point pulls together on the wrong side of the fabric.



Adjusting Presser Foot Pressure

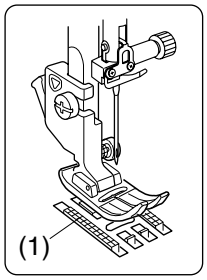
Select the stitch pattern to show the optimized presser foot pressure.

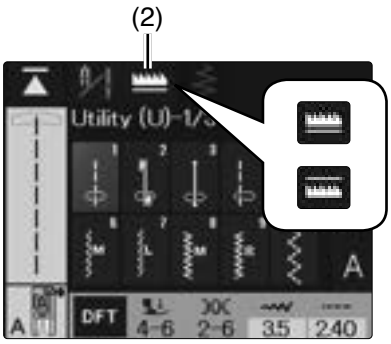
Adjust the presser foot pressure dial to the number shown on screen.

(1) Presser foot pressure dial

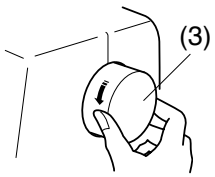
NOTE:

- Turn the dial to smaller number, and the presser foot pressure becomes weaker.
- Set the presser foot pressure dial at “2” for embroidery (refer to page 110).









Dropping the Feed Dogs

The feed dogs can be lowered for sewing on buttons, free motion quilting, etc.

Press the drop feed key to lower the feed dogs. The feed dogs position is displayed as the drop feed key.

(1) Feed dogs
(2) Drop feed key

NOTE:
- If you start the machine with the feed dogs lowered, a message will appear on the visual touch screen.
- Retract the carriage arm before raising/lowering the feed dogs.
- The setting by drop feed key takes precedence over feed dogs setting in ordinary sewing settings (refer to page 172).

Press the drop feed key again after sewing with lowering the feed dogs.

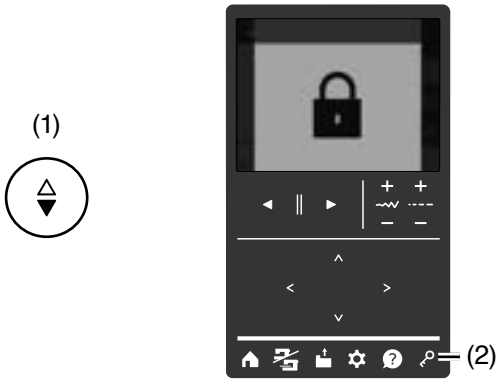
Turn the handwheel toward you to make sure the feed dogs are raised.

(3) Handwheel

Replacing the Presser Foot

⚠ CAUTION:
- Always make sure to press the lockout key to lockout the machine or turn the power switch OFF before replacing the presser foot.
- Use the proper foot for the selected pattern. The wrong foot can cause the needle to break.

1.



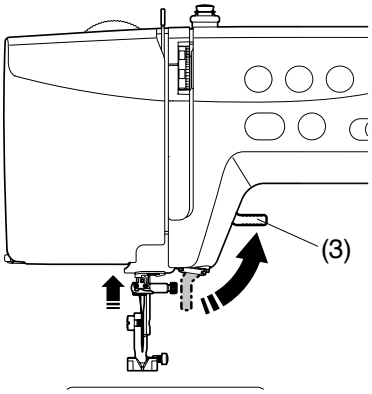
Removing the presser foot

1. Raise the needle by pressing the needle up/down button.

Press the lockout key to lockout the machine.

(1) Needle up/down button
(2) Lockout key

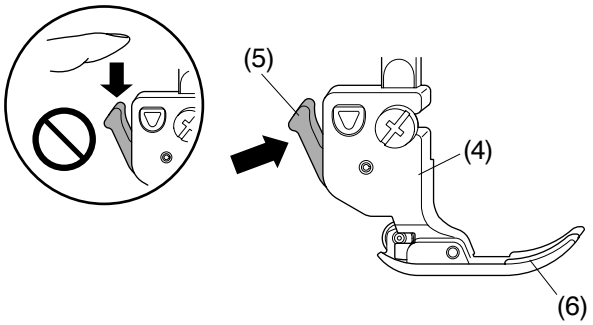
2.



2. Raise the presser foot lifter.

(3) Presser foot lifter

3.

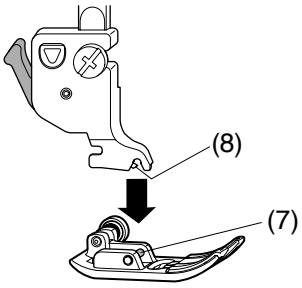


3. Press the black lever on the back of the foot holder.

The presser foot will drop off.

(4) Foot holder
(5) Lever
(6) Presser foot

⚠ CAUTION:
To avoid damaging the lever, do not push it down.



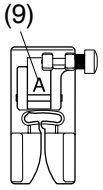
Attaching the presser foot

Place the presser foot so that the pin on the foot lies just under the groove of the foot holder.

Lower the presser foot lifter to lock the foot in place.

(7) Pin
(8) Groove

Press the lockout key to lockout the machine.



NOTE:
Each foot is marked with an identification letter.
(9) Identification letter

Removing and Attaching the Foot Holder

Remove the foot holder before using embroidery foot P.

> **⚠ CAUTION:**
> Always make sure to press the lockout key to lockout the machine or turn the power switch OFF before replacing the foot holder.

Removing the foot holder

1. Raise the needle by pressing the needle up/down button.

Press the lockout key to lockout the machine.

(1) Needle up/down button
(2) Lockout key

2. Raise the presser foot lifter.

(3) Presser foot lifter

3. Loosen the setscrew and remove the foot holder.

(4) Setscrew
(5) Foot holder

Attaching the foot holder

1. Attach the foot holder to the presser bar from behind.

Tighten the setscrew partially with the screwdriver.

(1) Foot holder
(2) Presser bar
(3) Setscrew

2. Lower the presser foot lifter.

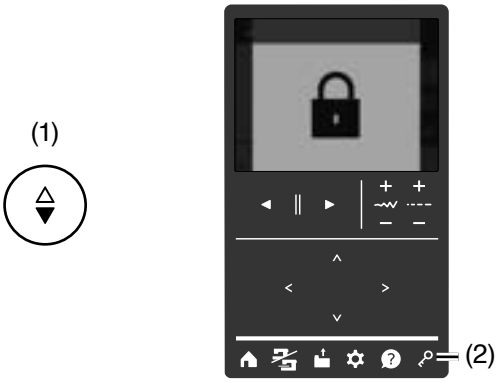
(4) Presser foot lifter

3. Tighten the setscrew securely with the screwdriver.

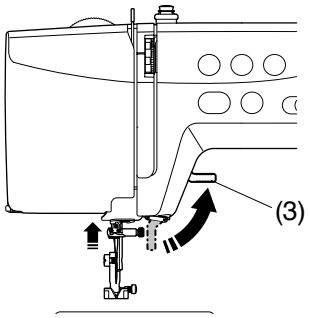
Press the lockout key to unlock the machine.

(3) Setscrew

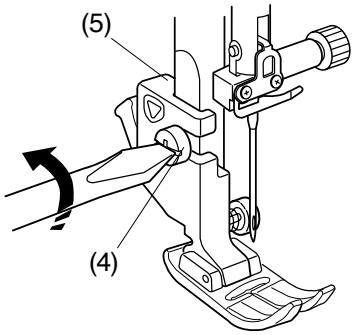
1.



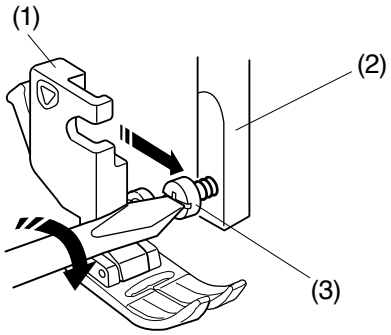
2.



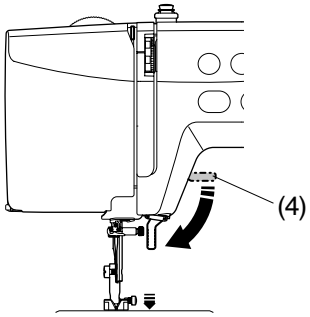
3.

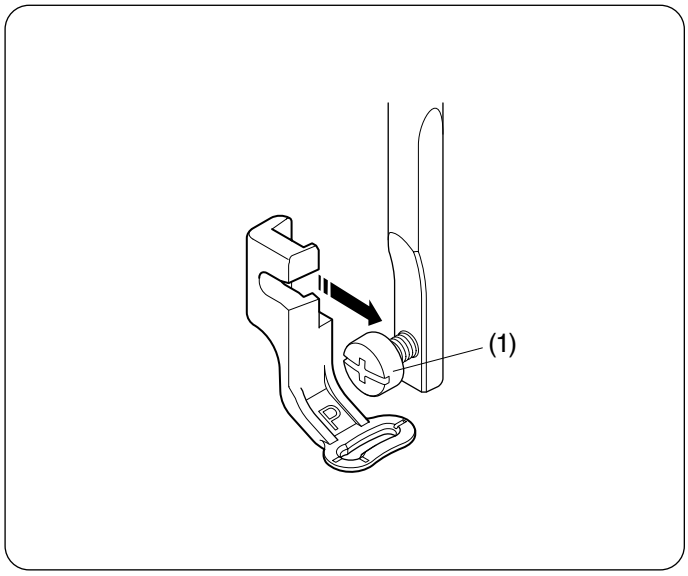


1. 3.



2.





Replacing the Embroidery foot P

⚠ CAUTION:
Always make sure to press the lockout key to lockout the machine or turn the power switch OFF before replacing the presser foot.

Use embroidery foot P for embroidery.

Attach embroidery foot P to the presser bar from behind (refer to page 110).

Tighten the setscrew securely with the screwdriver.

(1) Setscrew

Replacing the Needle Plate

Use the straight stitch needle plate when embroidering.

⚠ CAUTION:

- Always make sure to press the lockout key to lockout the machine before replacing the needle plate.
- Never remove the needle plate while running the machine.

NOTE:
When the straight stitch needle plate is attached to the machine, the patterns not suitable for the straight stitch needle plate is grayed out and cannot be selected.

1. Press the needle up/down button to raise the needle.

Press the lockout key to lockout the machine.

Raise the presser foot lifter.

(1) Needle up/down button
(2) Lockout key
(3) Presser foot lifter

2. Hook your fingers in the hollow on the left side of the extension table. Push up the cover toward you to open it.

(4) Extension table
(5) Hollow

3. Insert the screwdriver into the needle plate release hole under the needle plate.

Pull up the screwdriver as shown and remove the needle plate to the right.

(6) Needle plate
(7) Needle plate release hole
(8) Screwdriver

4. A warning message will appear that the needle plate is not secured.

Place the needle plate on the machine.

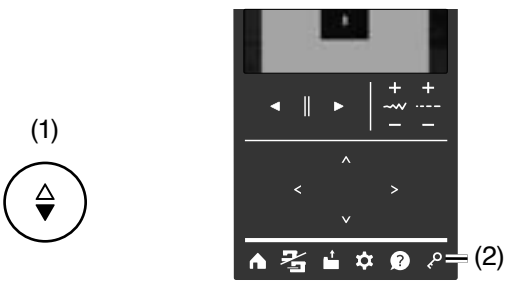
Set the left edge of the needle plate into the opening.

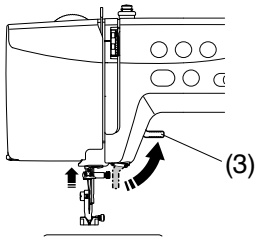
5. A message will appear when the needle plate is attached. Be sure the proper foot is attached to the machine.

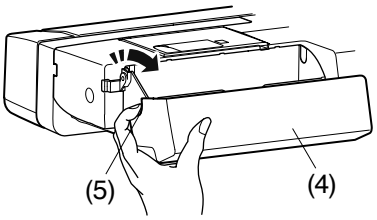
Turn the handwheel slowly and make sure that the needle does not hit the needle plate. Press the X key.

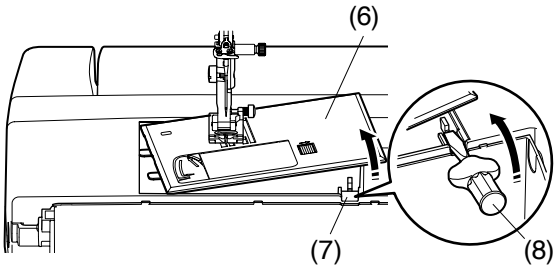
Press the lockout key to unlock the machine.

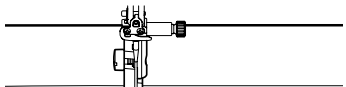
(9) Handwheel
(10) X key



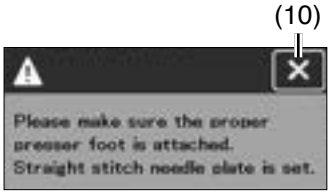


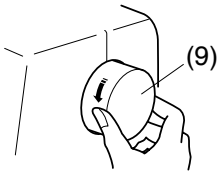












Replacing the Needle

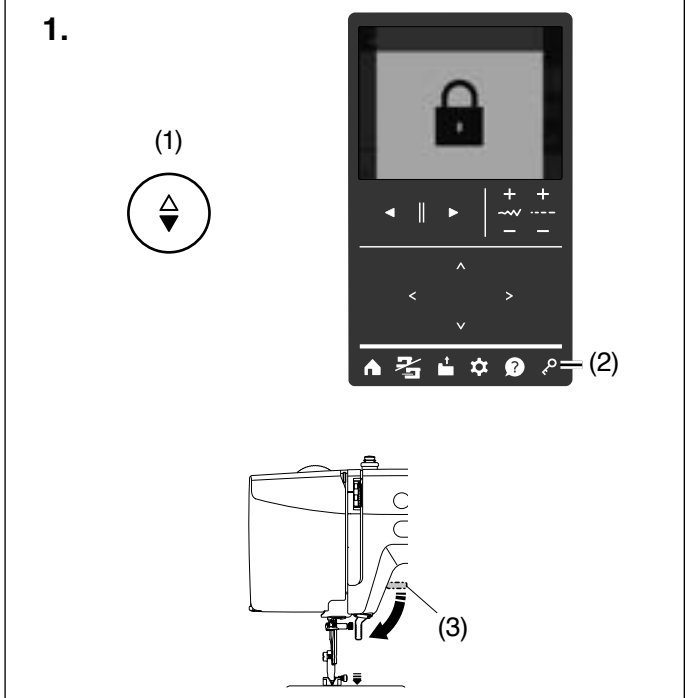
⚠ CAUTION:
Always make sure to press the lockout key to lockout the machine or turn the power switch OFF before replacing the needle.

1. Raise the needle by pressing the needle up/down button.

Press the lockout key to lockout the machine.

Lower the presser foot lifter.

(1) Needle up/down button
(2) Lockout key
(3) Presser foot lifter



2. Loosen the needle clamp screw by turning it counterclockwise.

Remove the needle from the clamp.

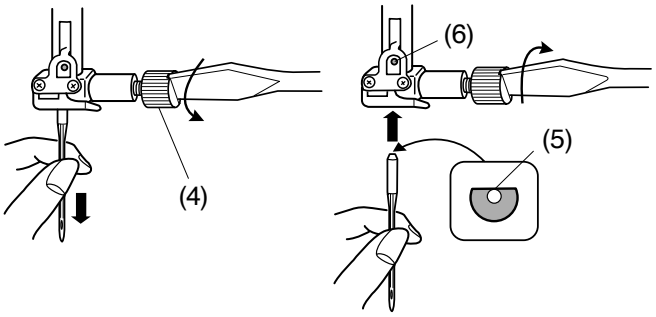
(4) Needle clamp screw

3. Insert a new needle into the needle clamp with the flat side of the needle to the rear.

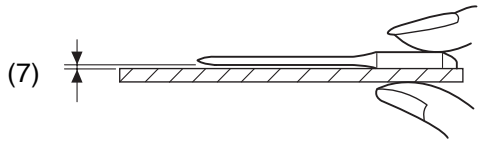
When inserting the needle into the needle clamp, push it up against the stopper pin and tighten the needle clamp screw firmly with a screwdriver.

Press the lockout key to unlock the machine.

(5) Flat side
(6) Stopper pin



⚠ CAUTION:
Be sure to tighten the needle clamp screw firmly with a screwdriver when attaching a needle to the machine, otherwise the needle may break or cause malfunction.



To check needle straightness, place the flat side of the needle onto something flat (a needle plate, glass, etc.). The gap between the needle and the flat surface should be consistent.

(7) Gap

Never use a blunt needle.

Fabric		Thread	Needle
Fine	Lawn Georgette Tricot Organza Crepe	Cotton #80-100 Synthetic #80-100	Blue tip needle Universal needle #9/65-11/75
Medium	Sheeting Jersey Broadcloth Fleece	Cotton #50-80 Synthetic #50-80	Blue tip needle Universal needle #11/75-14/90
Heavy weight	Denim Tweed Coating Quilting	Cotton #40-50 Synthetic #30-50	Universal needle #14/90-16/100

Fabric	Thread	Needle
Fine	Embroidery thread	Blue tip needle Universal needle #11/75
Medium		
Heavy weight		Universal needle #14/90

NOTE:
1 x twin needle, 1 x blue tip needle (#11/75), 2 x #11/75 needles and 1 x #14/90 needle are included in the needle case (Part No. 820827007).

Fabric and Needle Chart

For Ordinary sewing

- For general sewing, use needle size 11/75 or 14/90.
- A fine thread and needle should be used for sewing lightweight fabrics, so the fabric will not be marred.
- Heavy weight fabrics require a needle large enough to pierce the fabric without fraying the needle thread.
- Always test the needle size on a small scrap of the fabric that will be used for actual sewing.
- In general, use the same thread for the needle and bobbin.

For Embroidery

- When sewing stretch fabrics, very fine fabrics and synthetics, use a blue tip needle. The blue tip needle effectively prevents skipped stitches.
- For general embroidery, use a blue tip needle.
- Bobbin thread for embroidery is recommended for bobbin.

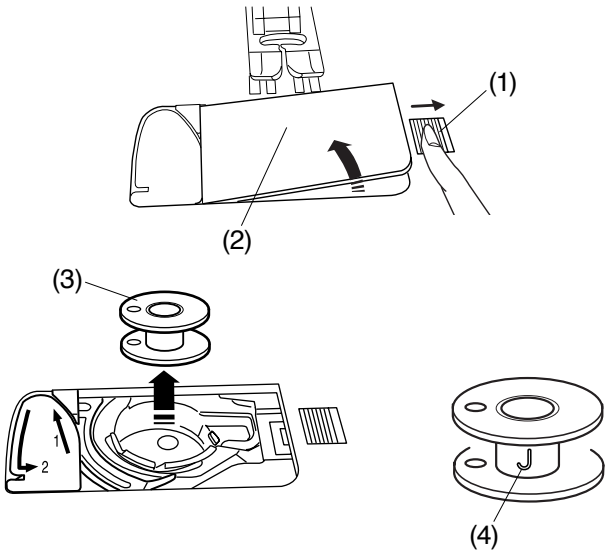
Winding the Bobbin

Removing the Bobbin

Raise the presser foot lifter.

Slide the hook cover release button to the right, and remove the hook cover plate.

Lift out the bobbin from the bobbin holder.



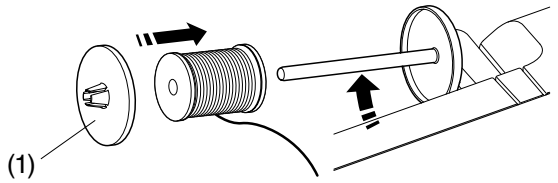
(1) Hook cover release button
(2) Hook cover plate
(3) Bobbin

NOTE:
- Use “J” plastic bobbins (4) for the horizontal hook. Using other bobbins, such as pre-wound paper bobbins, may cause stitching problems and/or damage to the bobbin holder.
- Do not use the easy bobbin or metal bobbins.

Setting the spool of thread

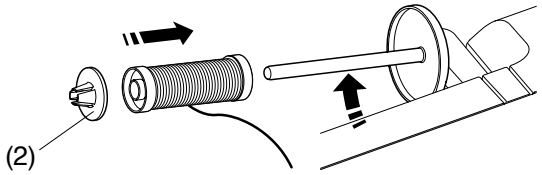
Lift up the spool pin. Place the spool of thread on the spool pin.

Attach the spool holder (large), and press it firmly against the spool of thread.

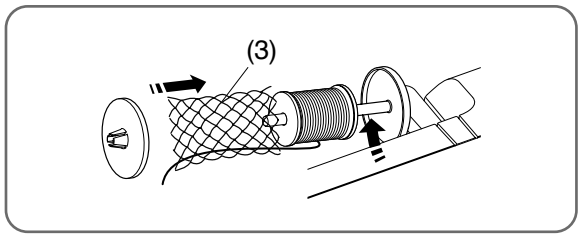


(1) Spool holder (large)

Use the spool holder (small) to hold narrow or small spools of thread.



(2) Spool holder (small)



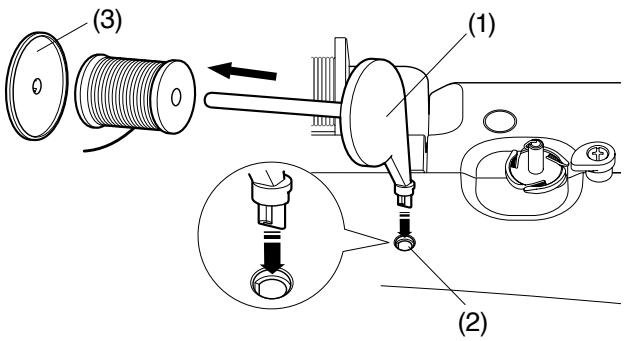
NOTE:
- If you use a slippery thread such as monofilament transparent thread, elastic thread or metallic thread, put a net on the spool of thread to prevent the thread from slipping off the spool and jamming around the spool pin.
  If the net is too long for the spool, fold the net and place it on the spool.
- A spool net is not included with this machine.
  (3) Spool net

Extra spool pin

Use the extra spool pin when you need to wind a bobbin without unthreading the machine while working on a sewing project (refer to page 30).

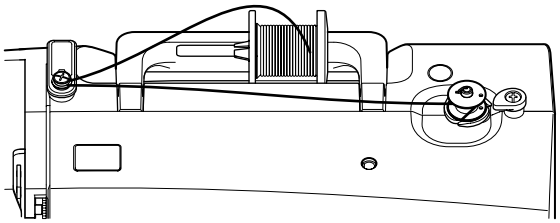
Insert the extra spool pin into the hole as shown.

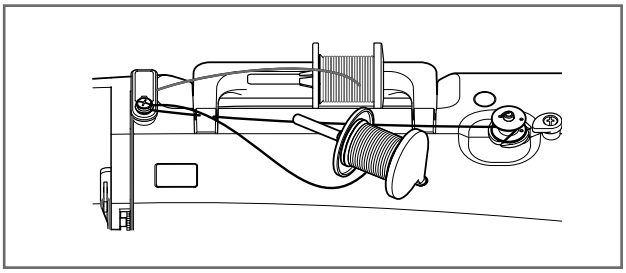
Place a spool of thread on the extra spool pin and fix the spool with the spool holder.



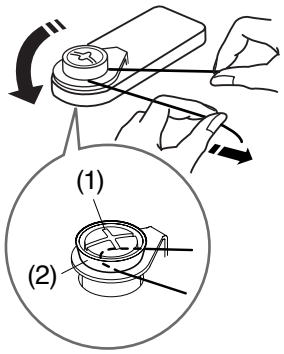
(1) Extra spool pin
(2) Hole for extra spool pin
(3) Spool holder (large)

NOTE:
- The extra spool pin is also used for twin needle sewing (refer to page 106).
- Remove the extra spool pin when covering the machine with the soft cover.

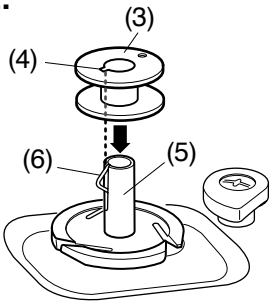




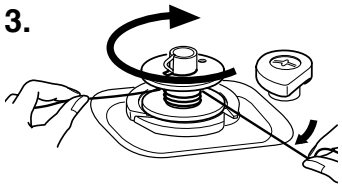
1.



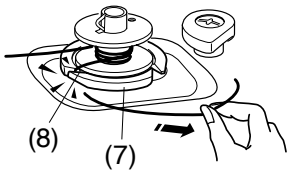
2.



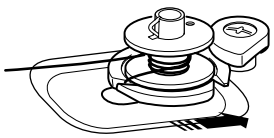
3.



4.

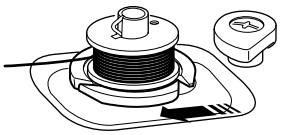


5.

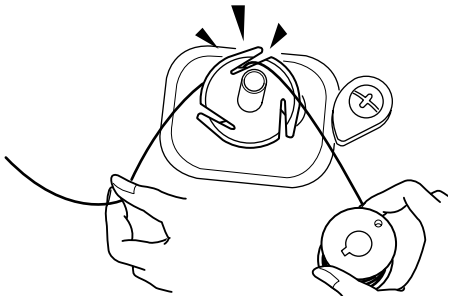




6.



7.



Winding the bobbin

NOTE:
Set the speed control slider at the fastest position (refer to page 15).

Bobbin winding when the extra spool pin is attached
If you want to wind the bobbin with the extra spool pin while sewing, draw the thread around the bobbin winding tension disk as shown.
(1) Bobbin winding tension disk

1. Pull the thread from the spool.

Hold the thread with both hands and pass the thread into the bobbin winding tension disk.

Draw the thread to the left and forward around the thread guide.

Firmly pull the thread to the right while holding it with both hands.

(1) Bobbin winding tension disk
(2) Disk

2. Put the bobbin on the bobbin winder spindle.

Be sure that the bobbin snaps into the place.

(3) Bobbin
(4) Slit
(5) Bobbin winder spindle
(6) Spring (Projection)

3. Pass the thread to the bobbin.

Hold the thread with both hands and wind it around the bobbin clockwise several times.

4. Insert the thread into one of the slits of the flange plate and pull the thread to cut.

(7) Flange plate
(8) Slit

5. Push the bobbin to the right. The visual touch screen will show the bobbin winding sign.

NOTE:
Do not move the bobbin winder spindle while the machine is running.

6. Start the machine.

Stop the machine when the bobbin is fully wound and stops spinning.

Return the bobbin winder spindle to its original position.

7. Remove the bobbin. Cut the thread with one of the slits of the flange plate.

NOTE:
For safety purposes, the machine will automatically stop 1.5 minutes after starting bobbin winding.

Inserting the Bobbin

⚠ CAUTION:
Always make sure to press the lockout key to lockout the machine or turn the power switch OFF before inserting the bobbin.

1. Press the lockout key to lockout the machine.

Place the bobbin in the bobbin holder with the thread running off counterclockwise as shown on the hook cover plate.

(1) Lockout key
(2) End of thread
(3) Bobbin holder
(4) Hook cover plate

2. Hold the bobbin with your fingertip so it does not rotate.

Guide the thread into the front notch of the bobbin holder.

Pull the thread to the left to pass it under the guide.

(5) Front notch
(6) Guide

3. Draw the thread to the left to pass it into the guide path marked “1”.

Make sure that the thread comes out from the side notch of the bobbin holder.

(7) Guide path 1
(8) Side notch

NOTE:
If the thread does not come out from the side notch, rethread from step **1**.

4. Continue to draw the thread along the guide path marked “2” and pull the thread to the right through the slit. The thread will be cut to a proper length and held in place.

(9) Guide path 2
(10) Slit (Thread cutter)

5. Set the left edge of the hook cover plate into the opening.

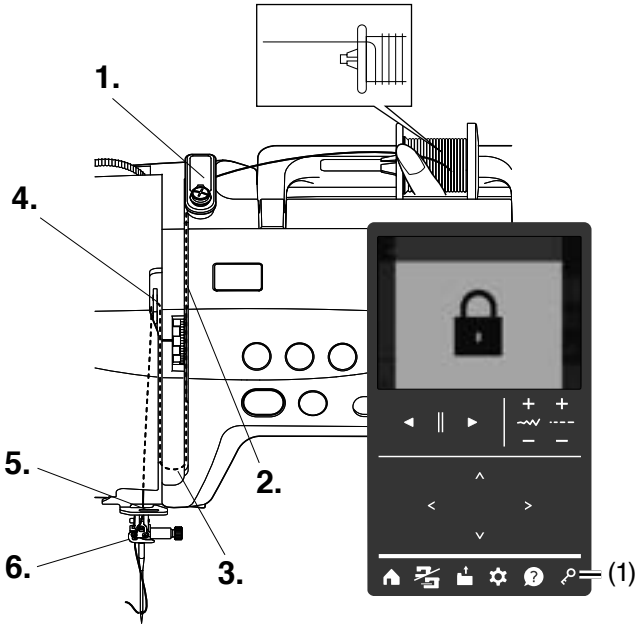
Push the hook cover plate down to fit in place.

(4) Hook cover plate

NOTE:
- Unless otherwise noted, you can start sewing without drawing up the bobbin thread.
- Refer to page 35 for how to draw up the bobbin thread.

Threading the Machine

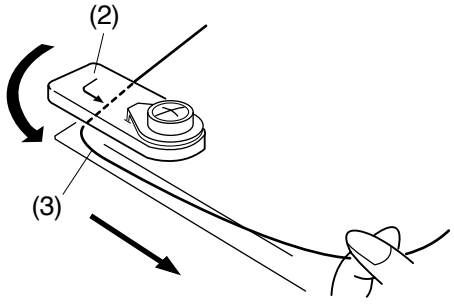
⚠ CAUTION:
Always make sure to press the lockout key to lockout the machine or turn the power switch OFF before threading the machine.



Raise the presser foot lifter.
Press the needle up/down button to raise the take-up lever to the highest position.
Press the lockout key to lockout the machine.

(1) Lockout key

1. 2.



Pass the thread in order from **1.** to **6.**

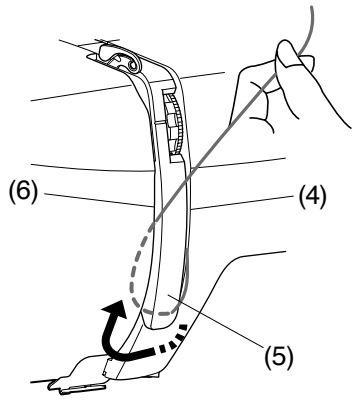
1. Hold the thread with both hands and pass the thread into the upper thread guide.

(2) Upper thread guide

2. Be sure that the thread is pulled down under the notch and into the space below the thread guide plate as shown.

(3) Notch

3.

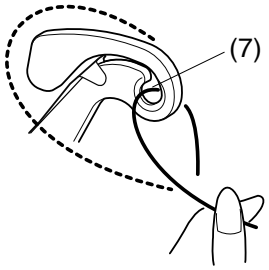


3. Firmly pull the thread toward you along the right channel until the thread snaps.

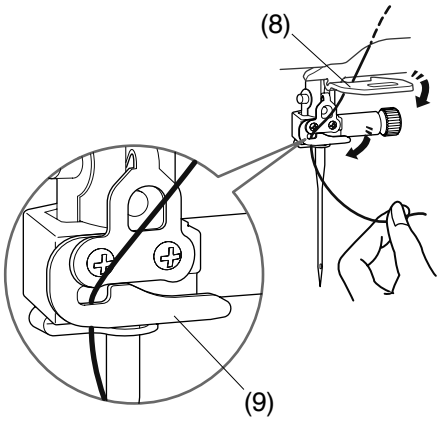
Draw the thread down along the right channel and around the bottom of the thread guide plate. Pull the thread up along the left channel.

(4) Right channel
(5) Thread guide plate
(6) Left channel

4.



5. 6.



4. While holding the thread at the spool, firmly draw the thread up and to the back of the take-up lever. Draw the thread forward to slip it into the eye of the take-up lever.

(7) Eye of the take-up lever

5. Then pull the thread down along the left channel and through the lower thread guide.

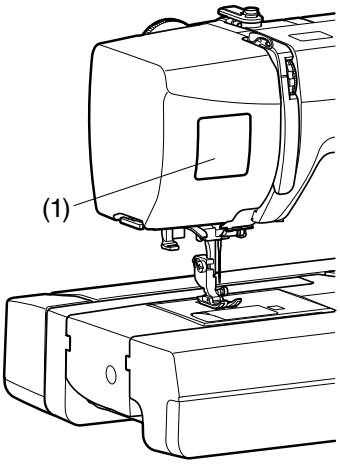
(8) Lower thread guide

6. Slide the thread from the right of the needle bar thread guide to the left.

(9) Needle bar thread guide

Thread the needle with the needle threader (refer to page 34).

Example



Guide sticker for threading

There is a threading guide sticker in the standard accessories. If you wish, you can attach the sticker on the machine to check the threading procedure.

(1) Threading guide sticker

Built-in Needle Threader

⚠ CAUTION:
Always make sure to press the lockout key to lockout the machine or turn the power switch OFF before threading the machine.

NOTE:
- The needle threader can be used with a #11 to #16 needle.
- Thread size 50 to 90 is recommended.
- Do not use thread size 30 or thicker.
- The needle threader cannot be used with the twin needle.

1. Press the needle up/down button to raise the needle.
Press the lockout key to lockout the machine.
(1) Needle up/down button
(2) Lockout key

2. Pull the thread up to the left, over the needle threader guide while holding the thread near the spool with your hand.
(3) Needle threader guide

NOTE:
Be sure that the thread pass the slit of the needle threader as shown.
(4) Slit

3. Pull the thread up and slip it between the thread cutter and face cover from behind.
Pull the thread toward you to cut.
(5) Thread cutter

4. Lower the presser foot lifter.
Pull down the needle threader lever as far as it will go.
(6) Presser foot lifter
(7) Needle threader lever

5. Slowly release the needle threader lever to its original position to pass the thread through the needle eye.
Press the lockout key to unlock the machine.

NOTE:
If the thread loop is formed after releasing the needle threader lever, pull out the thread loop through the needle eye.

Drawing Up the Bobbin Thread

After using auto thread cutting or threading the bobbin holder, you can start sewing without drawing up the bobbin thread.

However, you need to draw up the bobbin thread when sewing gathering stitches, etc.

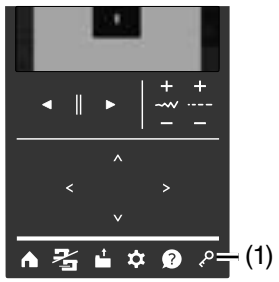
1. Press the lockout key to lockout the machine.

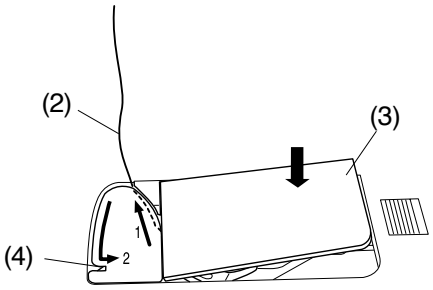
Turn the handwheel toward you to raise the needle.

Raise the presser foot lifter.

Remove the bobbin. Insert the bobbin into the bobbin holder again and rethread the bobbin holder according to the instructions on page 31, but leave a 10 cm (4″) tail of bobbin thread as shown.

(1) Lockout key
(2) Bobbin thread
(3) Hook cover plate

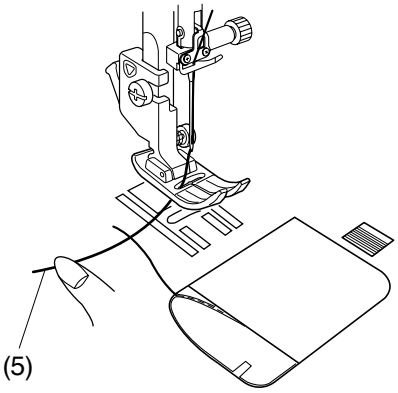




NOTE:
Do not cut the bobbin thread with the thread cutter.
(4) Thread cutter

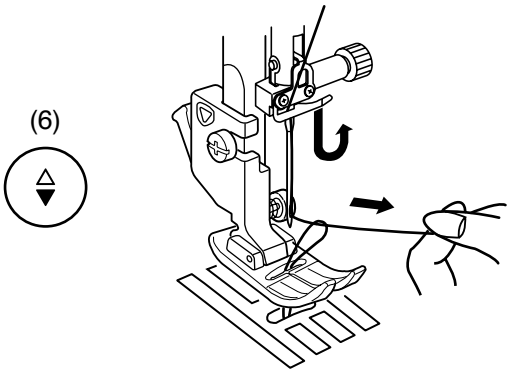
2. Hold the needle thread lightly with your left hand.

(5) Needle thread

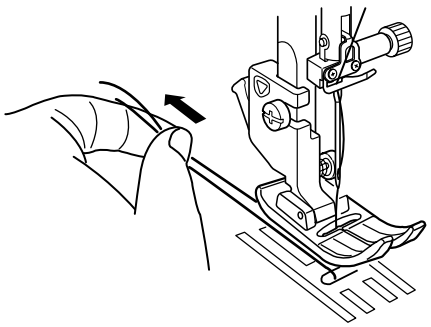


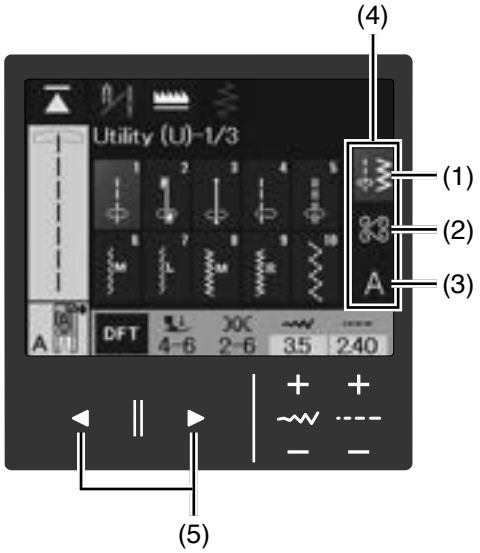
3. Press the needle up/down button twice to lower and raise the needle and pick up the bobbin thread.

(6) Needle up/down button



4. Pull both threads 10 cm (4″) under and behind the presser foot.





ORDINARY SEWING MODE

Ordinary Stitch Patterns

In the ordinary sewing mode, there are 3 categories available.

(1) Utility stitches, buttonholes and specialty stitches
(2) Decorative and quilting stitches
(3) Monogramming

Press one of the category selection keys to select the category.

Each category is composed of multiple pages.

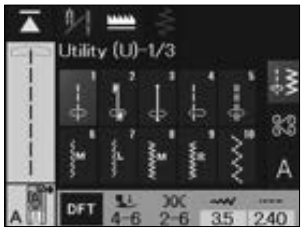
Press page keys to switch the pattern selection keys.

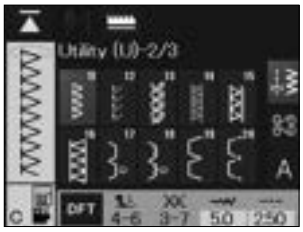
(4) Category selection keys
(5) Page keys

NOTE:
In this manual, the pattern number refers to the initial letter for each group or category. For example, pattern #15 in the buttonholes and specialty stitches is referred to as pattern B15.

(1)





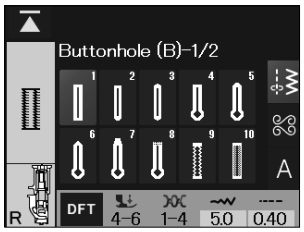


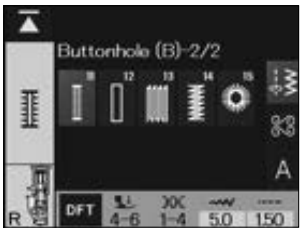


(1) Utility stitches, buttonholes and specialty stitches

Utility (U)

You can select utility stitches for seaming, overcasting, blind hemming and shell tucking.



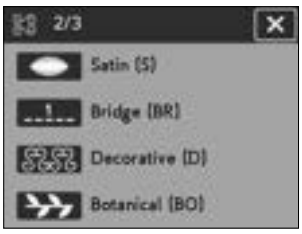


Buttonholes and specialty stitches (B)

There are various styles of buttonholes, darning, tacking and eyelet available in this category (refer to pages 65-79).

(2)







(2) Decorative and quilting stitches

This category consists of the following 11 groups (refer to pages 80-92).

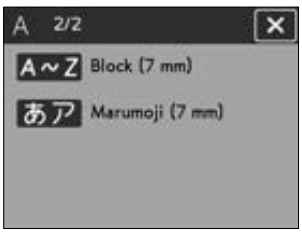
1/3 Page
- Applique (A)
- Cross-Stitch (C)
- Heirloom (H)
- Quilt (Q)

2/3 Page
- Satin (S)
- Bridge (BR)
- Decorative (D)
- Botanical (BO)

3/3 Page
- Long (L)
- Life Style (LS)
- Kids (K)

(3)



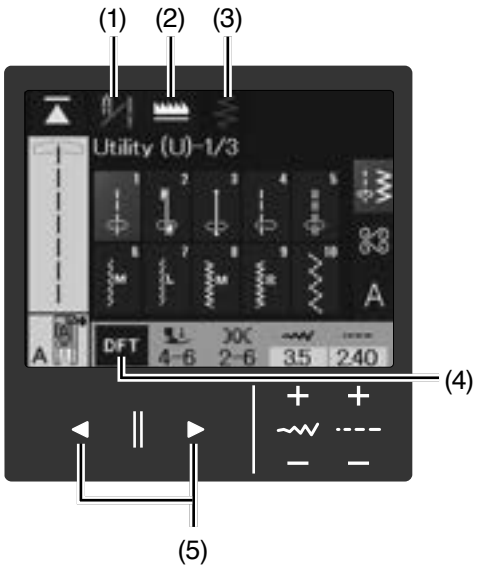


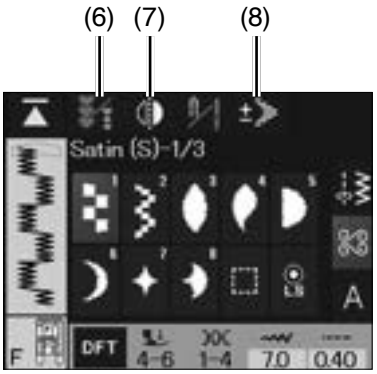
(3) Monogramming

You can program lettering as well as a combination of characters and symbol patterns (refer to pages 102-105).

1/2 Page
- Block
- Script
- Broadway
- Cyrillic

2/2 Page
- Block (7 mm)
- Marumoji (7 mm)





Utility Stitches

Function keys

Adjust the settings for the selected stitch pattern to your preference. Some function keys may be grayed out and cannot be selected depending on the selected stitch pattern.

(1) Twin needle key

Press this key to set the stitch width for twin needle sewing (refer to pages 106-107).

(2) Drop feed key

Press this key to drop or raise the feed dogs (refer to page 22).

(3) Variable zigzag key

Press this key for variable zigzag sewing (refer to page 63).

(4) Default key

Press this key to reset the settings (factory settings).

(5) Page keys

Press these keys to switch the pattern selection keys.

(6) Program key

Press this key to program a pattern combination. When this key is pressed, the mirror image key, preview key, delete key, letter size key, elongation key and the save file key will appear (refer to pages 93-101).

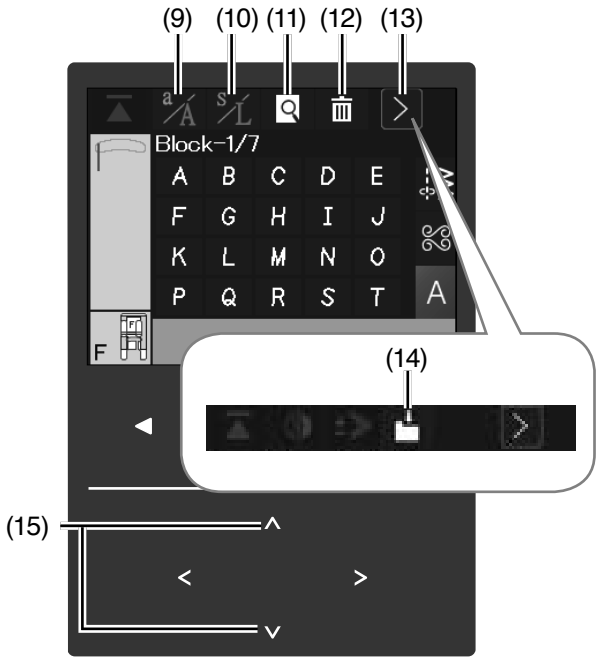
(7) Vertical mirror image key

Press this key to sew a vertical mirror image of the selected pattern (refer to pages 95-96).

(8) Elongation key

Press this key to elongate up to 5 times their original length while the stitch density remains the same (refer to page 91).

NOTE:
The elongation key (8) appears when a pattern from the Satin group is selected.





(9) Letter case key

Press this key to select upper case or lower case for monograms (refer to page 103).

(10) Letter size key

Press this key to select full size (L) or small size (S) (refer to page 105).

(11) Preview key

Press this key to view the stitch image of the entire pattern combination (refer to page 101).

(12) Delete key

Press this key to delete a pattern from the pattern combination (refer to page 98).

(13) Function switch key

Press this key to switch the function keys.

(14) Save file key

Press this key to save the pattern combination as a file (refer to pages 157-161).

(15) Cursor keys

Press one of these keys to move the cursor up or down (refer to page 98).

(16) Hiragana/Katakana key*

Press this key to switch Hiragana or Katakana for monograms (refer to page 103).

(17) Horizontal/Vertical orientation key*

Press this key to switch the horizontal or vertical orientation (refer to page 103).

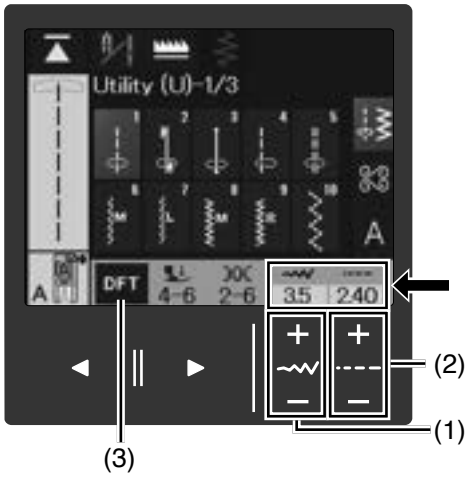
NOTE:
Hiragana/Katakana keys (16) and Horizontal/ Vertical orientation keys (17) are displayed only when Marumoji (7 mm) is selected.

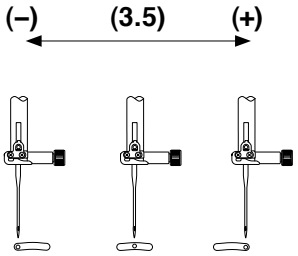
Manual Stitch Settings

You can alter the stitch width, needle drop position of the straight stitches and stitch length.

Press the “+” or “–” key to change the setting. Press the default key to recover the original stitch setting.

(1) Stitch width adjustment keys
(2) Stitch length adjustment keys
(3) Default key





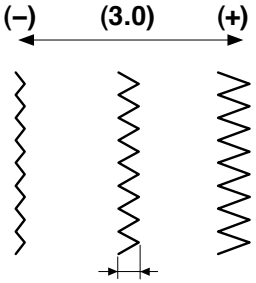
Altering needle drop position (straight stitches)

Press the stitch width adjustment keys to move the needle drop position.

Press the “+” key to move the needle drop position to the right.

Press the “–” key to move the needle drop position to the left.

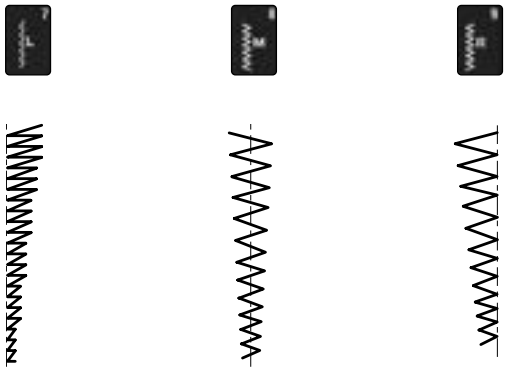
NOTE:
The adjustable range for patterns U1-U5 is 0.0 to 7.0.



Altering stitch width (zigzag stitches)

Press stitch width adjustment keys to change the stitch width.
Press the “+” key to increase the stitch width.
Press the “–” key to decrease the stitch width.

NOTE:
The adjustable range for patterns U6-U9 is 0.0 to 7.0.

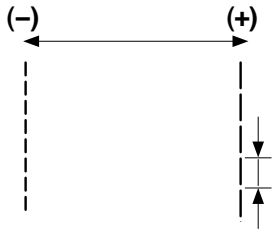


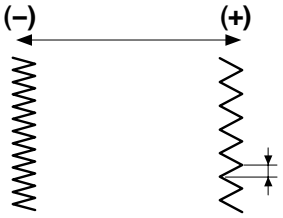
The letter beside the stitch image denotes the baseline of the needle drop position.

L: Left
When you change the stitch width, the right needle drop position will change.

M: Middle (center)
The stitch width changes symmetrically

R: Right
When you change the stitch width, the left needle drop position will change.





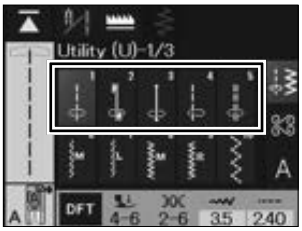
Altering stitch length

Press the stitch length adjustment keys to change the stitch length.

Press the “+” key to increase the stitch length.

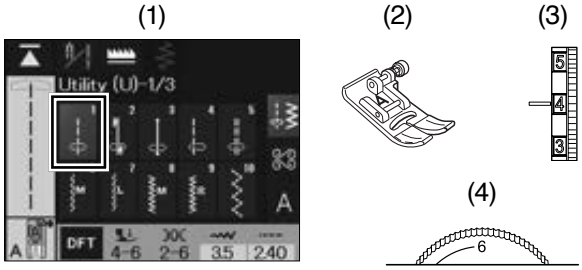
Press the “–” key to decrease the stitch length.

NOTE:
- The adjustable range for patterns U1 and U4 is 0.00 to 5.00.
- The adjustable range for patterns U2 and U3 is 1.00 to 5.00.
- The adjustable range for patterns U5-U7 is 1.00 to 4.00.
- The adjustable range for patterns U8-U10 is 0.20 to 5.00.



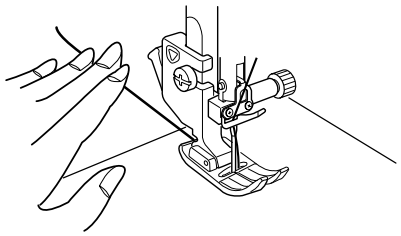
Straight Stitches

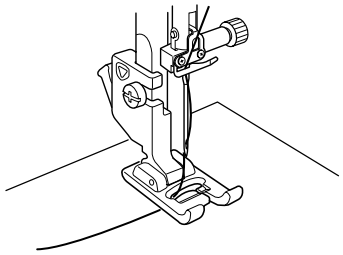
Patterns U1 to U5 are straight stitches for seaming.
Press the pattern selection key for the desired stitch.



Machine settings

(1) Stitch pattern: U1
(2) Presser foot: Zigzag foot A
(3) Thread tension: 2-6
(4) Foot pressure: 4-6



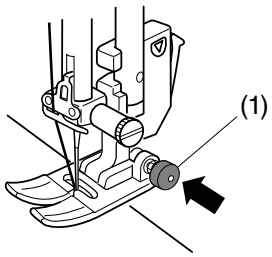


Starting to sew

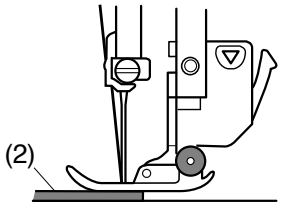
Place the fabric next to the seam guide line on the needle plate. Lower the needle to the point where you want to start.
Pull the needle thread towards the rear and lower the foot.

NOTE:
Pull the needle thread to the left when using satin stitch foot F or automatic buttonhole foot R.

1.



2.



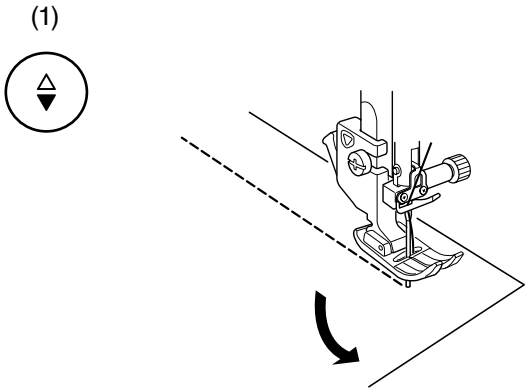
Sewing from the Edge of Thick Fabric

The black button on the zigzag foot locks the foot in the horizontal position.
This is helpful when you start sewing from extreme edge of thick fabrics or sewing across a hem.

1. Lower the needle into the fabric at the point where you wish to start sewing.

2. Lower the foot while pushing the black button in. The foot is locked in the horizontal position to avoid slipping.
(1) Black button
(2) Thick fabrics

1. 2. 3.

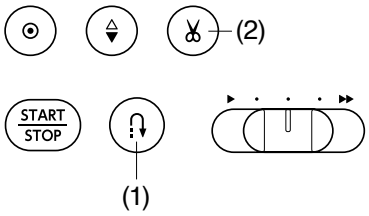


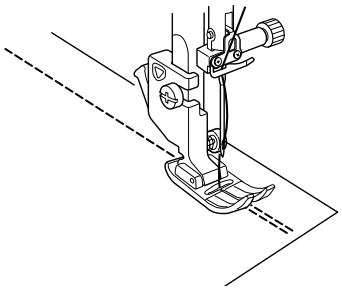
Changing Sewing Direction

1. Stop the machine and raise the presser foot lifter.
2. Pivot the fabric around the needle to change the sewing direction as desired.
3. Lower the presser foot lifter and start sewing in a new direction.

NOTE:
Lower the needle by pressing needle up/down button if the needle stop position is set at the up position.
(1) Needle up/down button

1. 2.



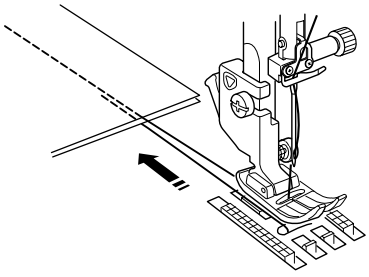


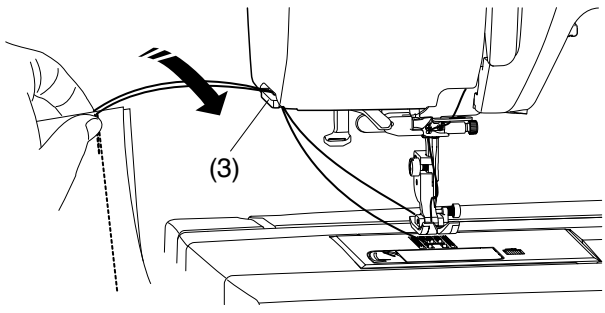
Securing Seams

1. For fastening the ends of seams, press the reverse button and sew several reverse stitches.
   The machine sews in reverse as long as you press and hold the reverse button.
   (1) Reverse button
2. To cut the threads after finishing sewing, press the thread cutter button.
   (2) Thread cutter button

NOTE:
After cutting the thread, you can start sewing without drawing up the bobbin thread.

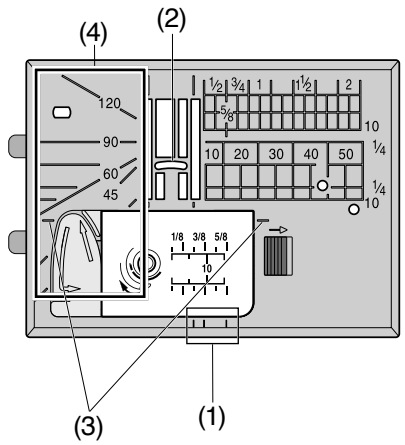
3.





3. To use the thread cutter on the face cover, remove the fabric and draw it to the back.
   Pull the threads up and slip them between the thread cutter and face cover from behind.
   Pull the threads toward you to cut.
   (3) Thread cutter

NOTE:
Use the thread cutter on the face cover to cut specialized, #30 or thicker threads if the auto thread cutter does not work well.



Needle Plate Guides

The seam guides are marked on the needle plate and hook cover plate.

The seam guides for 1/4″, 3/8″ and 5/8″ are also marked on the front of the needle plate.

(1) Seam guides on the front of the needle plate

The numbers on the needle plate indicate the distance from the center needle position in millimeters and inches.

(2) Center needle position

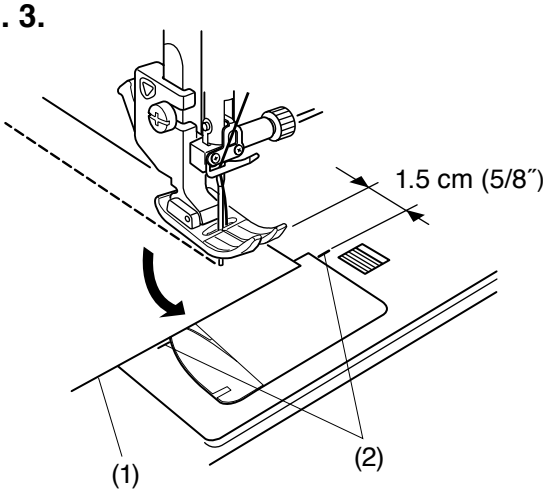
The cornering guides are very useful when turning a square corner.

(3) Cornering guide

The angle scales on the needle plate are useful for patchwork piecing (refer to page 89).

(4) Angle scales

1. 2. 3.



Turning a Square Corner

To maintain a 5/8″ seam allowance after turning a square corner, use the cornering guide on the needle plate.

1. Stop sewing when the front edge of fabric reaches the cornering guide lines.
   (1) Front edge of fabric
   (2) Cornering guide
2. Raise the presser foot lifter and turn the fabric 90 degrees.
3. Lower the presser foot lifter, and begin stitching in the new direction.

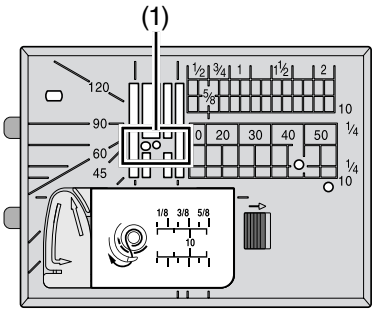
NOTE:
Lower the needle by pressing needle up/down button if the needle stop position is set at up position.

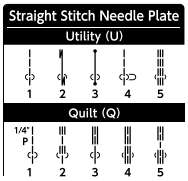
Straight Stitch Needle Plate

The straight stitch needle plate has two holes where the needle enters. The straight stitch needle plate is helpful to hold and support the fabric when the needle pierces the fabric. Use the straight stitch needle plate for better results.

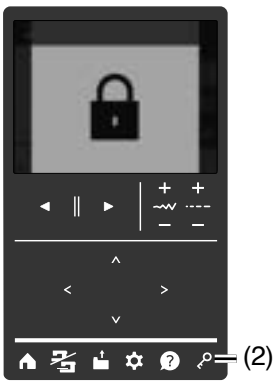
(1) Two holes

It is recommended to use straight stitch needle plate when sewing straight stitches (U1-U5).





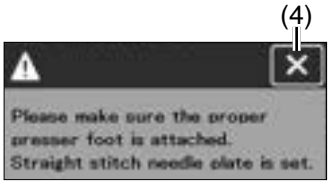
1.

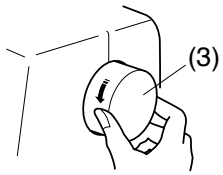


1. Press the lockout key to lockout the machine.
Replace the needle plate with the straight stitch needle plate (refer to page 26).

(2) Lockout key

2.

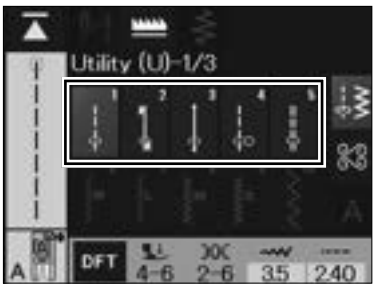


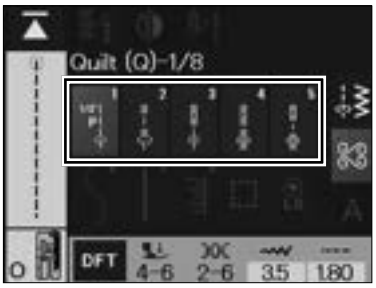


2. A warning message will appear.
Be sure the proper foot is attached to the machine.
Turn the handwheel slowly and be sure that the needle does not hit the needle plate.
Press the X key.

(3) Handwheel
(4) X key

3.



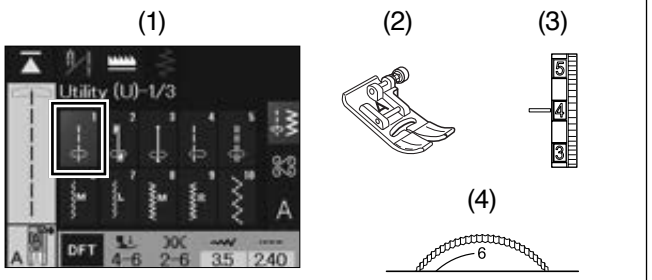


3. Press the lockout key to unlock the machine.
Start sewing.

NOTE:
- The patterns not suitable for the straight stitch needle plate are grayed out and cannot be selected.
- Needle position cannot be changed with the stitch width adjustment keys when the straight stitch needle plate is attached.

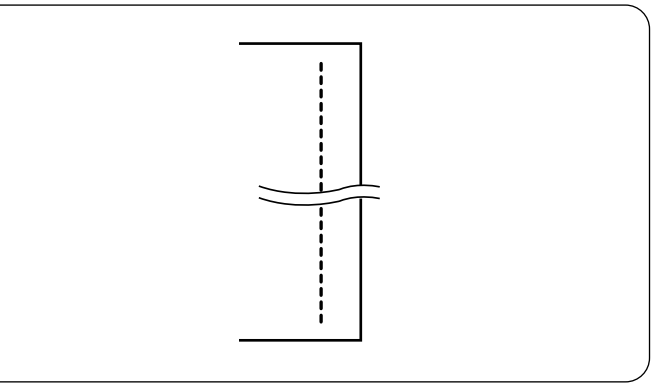
Variety of Straight Stitches

U1 Straight stitch in center needle position



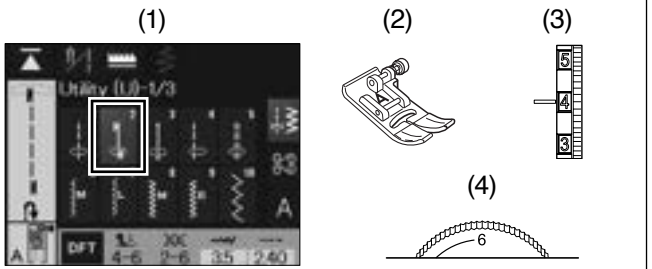
Machine settings

(1) Stitch pattern: U1
(2) Presser foot: Zigzag foot A
(3) Thread tension: 2-6
(4) Foot pressure: 4-6



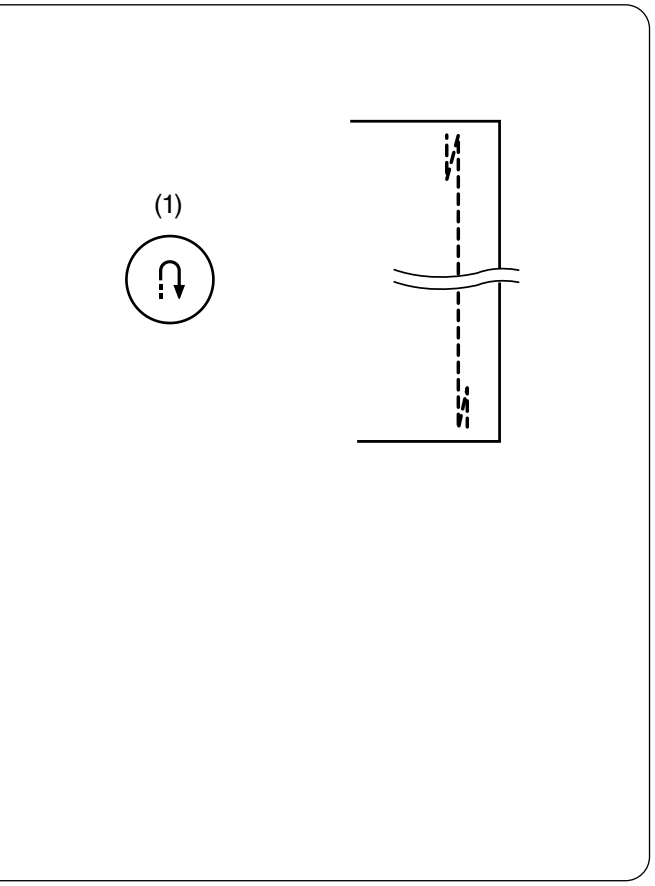
Use this stitch for seaming.

U2 Lock-a-Matic stitch



Machine settings

(1) Stitch pattern: U2
(2) Presser foot: Zigzag foot A
(3) Thread tension: 2-6
(4) Foot pressure: 4-6

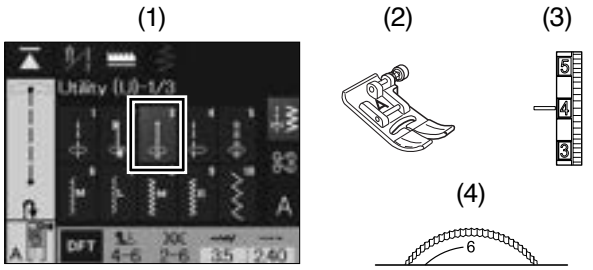


Use this stitch to secure the beginning and the end of a seam with backstitching.

When you reach the end of the seam, press the reverse button once.

The machine will sew four reverse stitches, four forward stitches, and then stop sewing automatically.

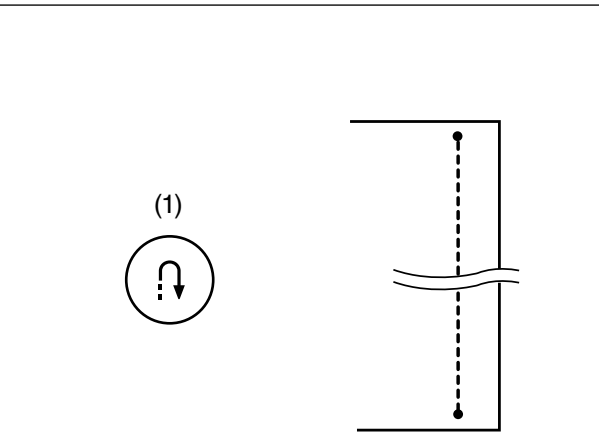
(1) Reverse button



U3 Locking stitch

Machine settings

(1) Stitch pattern: U3
(2) Presser foot: Zigzag foot A
(3) Thread tension: 2-6
(4) Foot pressure: 4-6

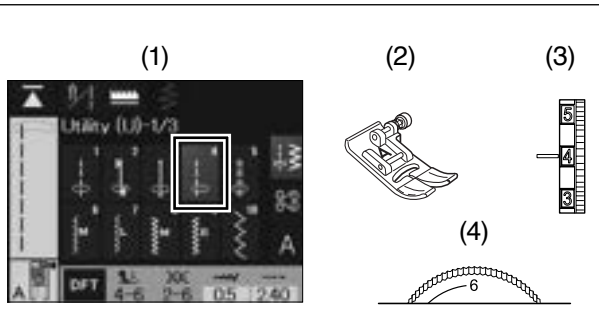


This unique stitch is used where an invisible locking stitch is needed.

The machine will sew several locking stitches at the beginning and continue sewing forward.

When you press the reverse button at the end of the seam, the machine will sew several locking stitches in place, then stop sewing automatically.

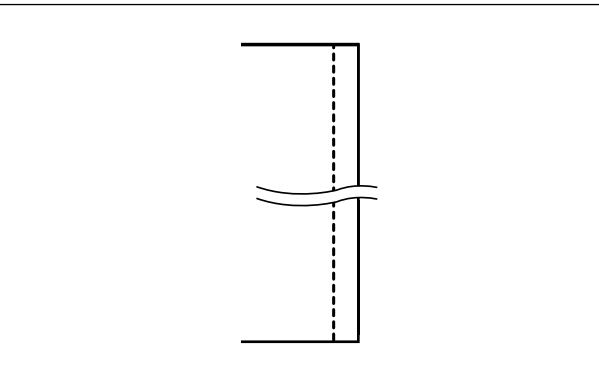
(1) Reverse button



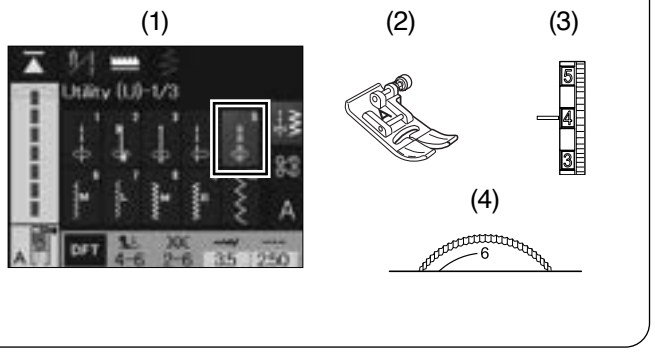
U4 Straight stitch in left needle position

Machine settings

(1) Stitch pattern: U4
(2) Presser foot: Zigzag foot A
(3) Thread tension: 2-6
(4) Foot pressure: 4-6



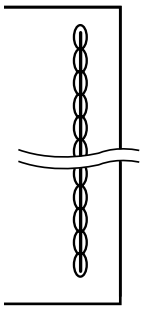
Use this stitch to seam fabrics close to the edge.



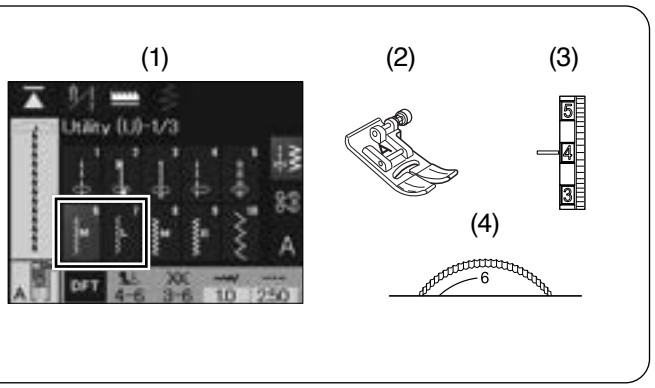
U5 Triple stretch stitch

Machine settings

(1) Stitch pattern: U5
(2) Presser foot: Zigzag foot A
(3) Thread tension: 2-6
(4) Foot pressure: 4-6



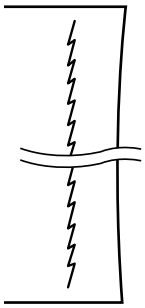
This strong, durable stitch is recommended for areas where both elasticity and strength are needed to ensure comfort and durability.
Use it to reinforce areas such as crotch and armhole seams.
Also use it when constructing items such as backpacks for extra strength.



U6, U7 Stretch stitches

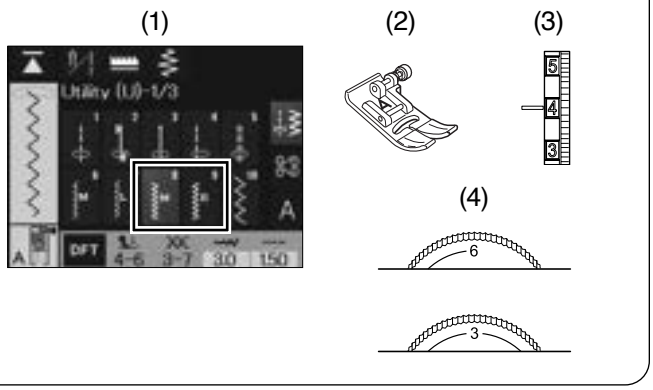
Machine settings

(1) Stitch pattern: U6, U7
(2) Presser foot: Zigzag foot A
(3) Thread tension: 3-6
(4) Foot pressure: 4-6



These are narrow stretch stitches designed to eliminate puckering on knit fabrics and bias seams, while permitting the seam to be pressed completely open flat.
Use U7 for seaming fine fabrics or stretch fabrics.

NOTE:
The letter beside the stitch image denotes the baseline of the needle drop position (refer to page 40).



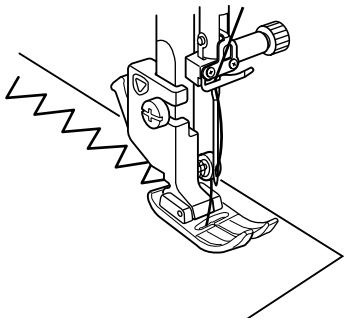
Zigzag Stitches

U8, U9 Zigzag stitches

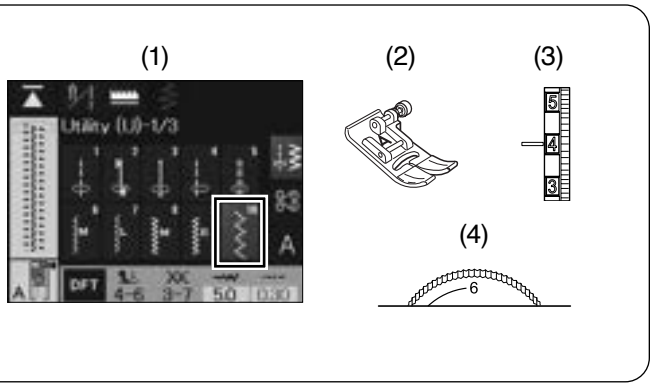
Machine settings

(1) Stitch pattern: U8, U9
(2) Presser foot: Zigzag foot A
(3) Thread tension: 3-7
(4) Foot pressure: U8: 4-6, U9: 3-4

NOTE:
U8 is used for variable zigzag sewing (refer to page 63).



Zigzag stitches are used for various sewing needs including overcasting. These stitches can be used on most woven fabrics.
A dense zigzag stitch can also be used for applique.

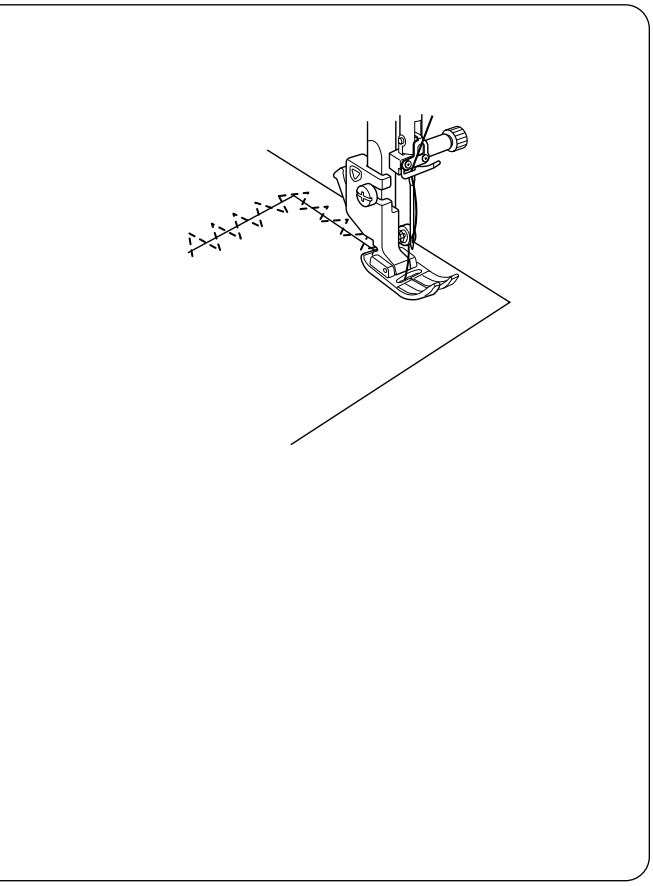


U10 Multiple zigzag stitch

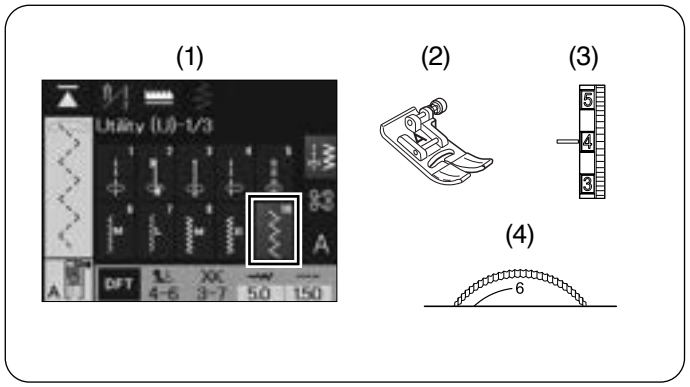
Machine settings

(1) Stitch pattern: U10
(2) Presser foot: Zigzag foot A
(3) Thread tension: 3-7
(4) Foot pressure: 4-6

NOTE:
Adjust the stitch length to 0.30-0.50 with the stitch length adjustment keys.



This stitch is used for mending tears.

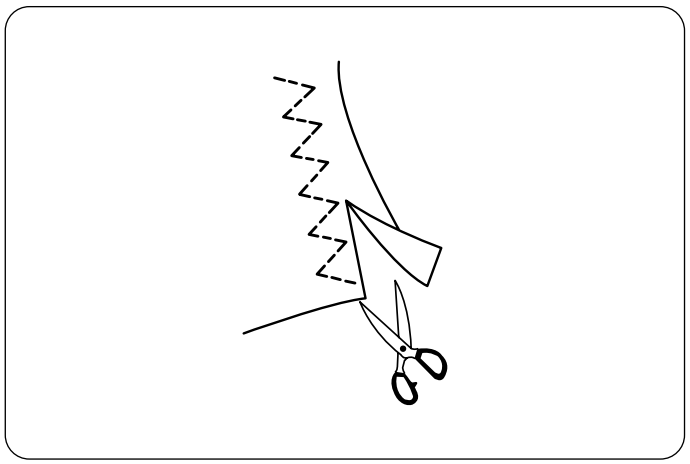


Overedge Stitches

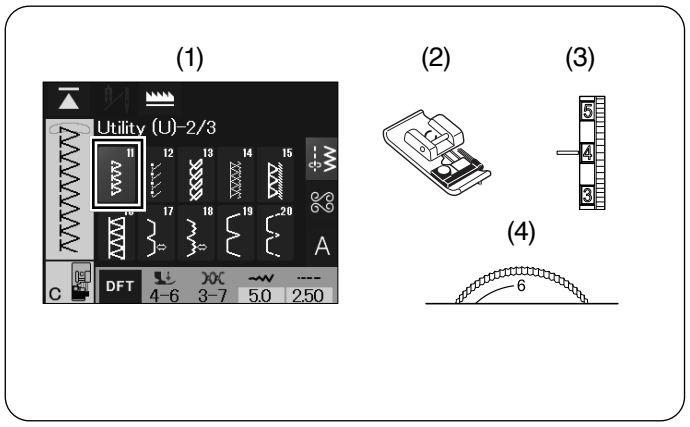
U10 Multiple zigzag stitch

Machine settings

(1) Stitch pattern: U10
(2) Presser foot: Zigzag foot A
(3) Thread tension: 3-7
(4) Foot pressure: 4-6



This stitch is used to finish a raw edge of synthetics and other stretch fabrics that tend to pucker.
Sew along the fabric edge leaving an adequate seam allowance.
After sewing, trim the seam allowance close to the stitches.

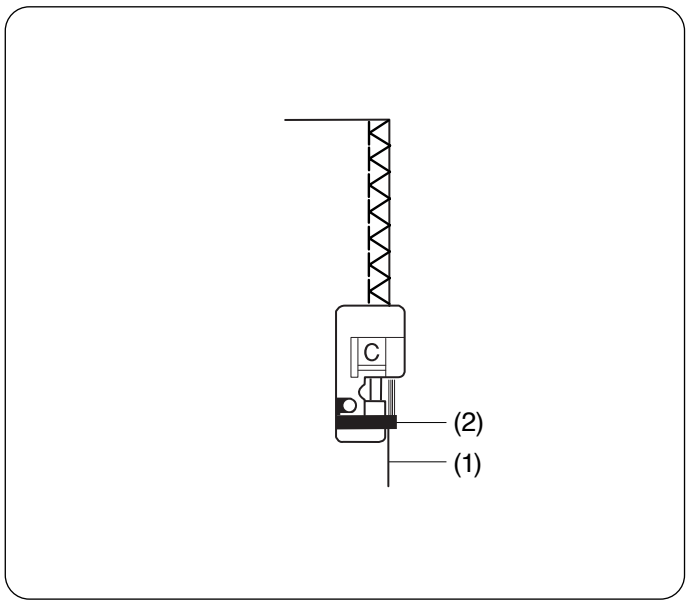


U11 Overedge stitch

Machine settings

(1) Stitch pattern: U11
(2) Presser foot: Overedge foot C
(3) Thread tension: 3-7
(4) Foot pressure: 4-6

⚠ CAUTION:
When using an overedge foot, make sure to set the stitch width at 5.0 - 7.0, otherwise the needle may hit the wires on the foot.

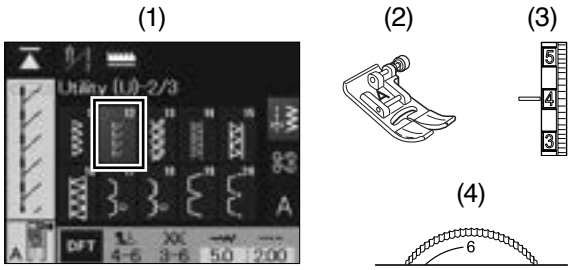


This stitch can be used to simultaneously seam and overcast edges of fabrics.

Use this stitch when you do not need to open seams flat.

Place the fabric edge next to the guide of the foot and then sew.

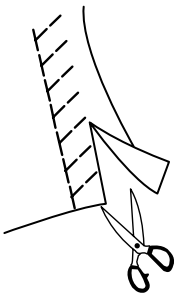
(1) Edge of fabric
(2) Guide



U12 Knit stitches

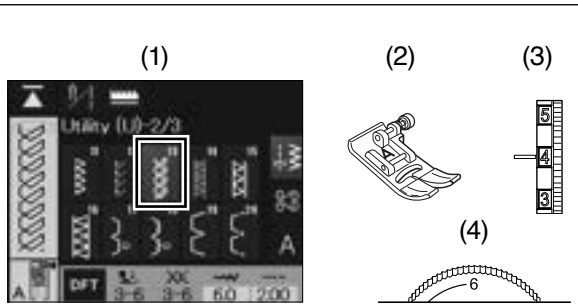
Machine settings

(1) Stitch pattern: U12
(2) Presser foot: Zigzag foot A
(3) Thread tension: 3-6
(4) Foot pressure: 4-6



This stitch is recommended for sewing such fabrics as synthetic knits and stretch velour as it provides the greatest amount of elasticity and strength.

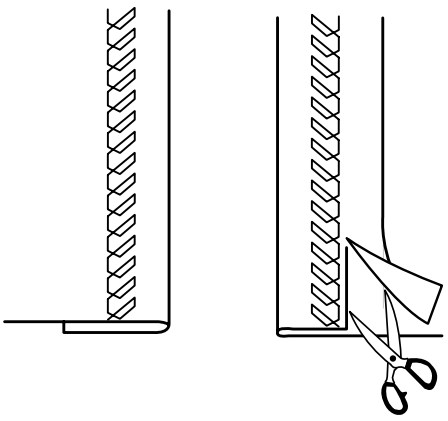
Place your fabric to allow a 1.5 cm (5/8″) seam. Trim excess close to the stitching. Be careful not to cut the stitches.



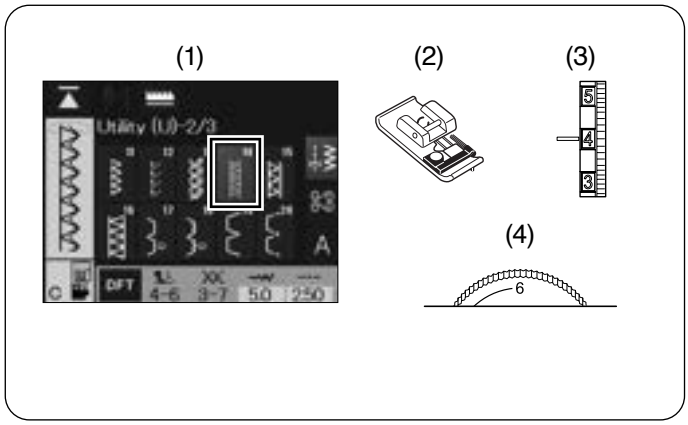
U13 Visible hemming

Machine settings

(1) Stitch pattern: U13
(2) Presser foot: Zigzag foot A
(3) Thread tension: 3-6
(4) Foot pressure: 3-6



Fold and press a single hem. Place the fabric with the right side up.
Sew along the fold at the desired depth.
Trim the excess on the wrong side.

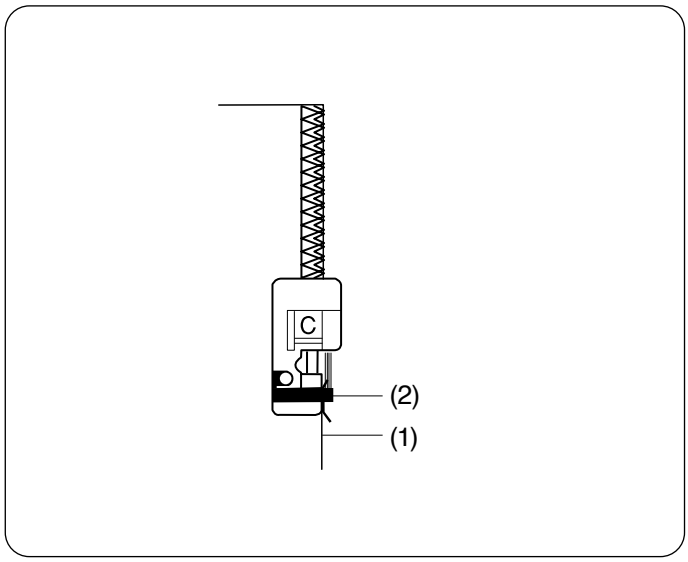


U14 Double overedge stitch

Machine settings

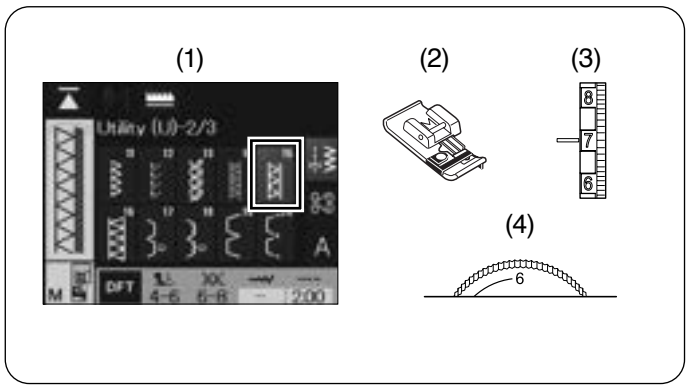
(1) Stitch pattern: U14
(2) Presser foot: Overedge foot C
(3) Thread tension: 3-7
(4) Foot pressure: 4-6

⚠ CAUTION:
When using an overedge foot, make sure to set the stitch width at 5.0 - 7.0, otherwise the needle may hit the wires on the foot.



This is an excellent stitch for fabrics that tend to fray extensively such as linens and gabardines.
Two rows of zigzag stitches are simultaneously sewn over the edge to insure that fabric will not ravel.
Place the fabric edge next to the guide of the foot and then sew.

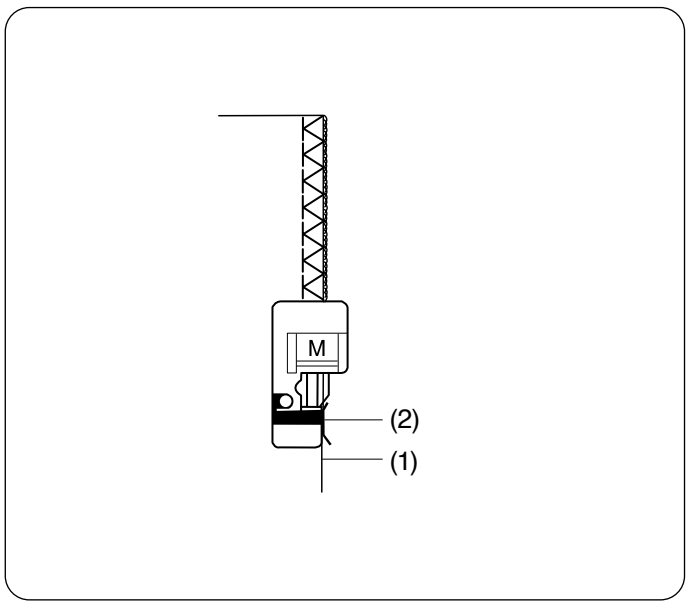
(1) Edge of fabric
(2) Guide



U15 Overcasting stitch

Machine settings

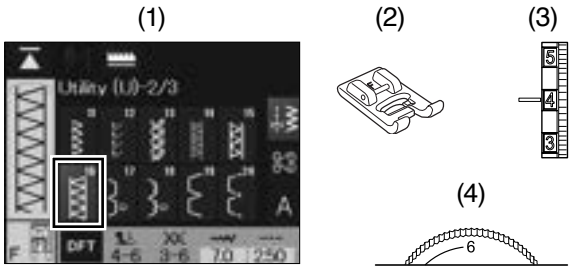
(1) Stitch pattern: U15
(2) Presser foot: Overcasting foot M
(3) Thread tension: 6-8
(4) Foot pressure: 4-6



This stitch finishes the edges of fabric in a way similar to a commercial overlocking machine for a professional look.

Place the fabric edge next to the guide of the foot and sew.

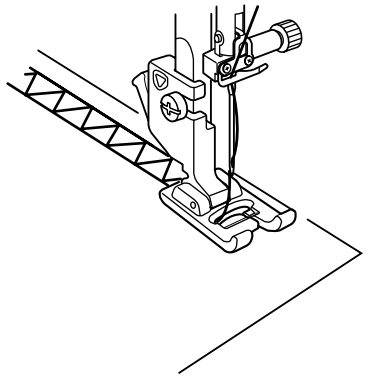
(1) Edge of fabric
(2) Guide



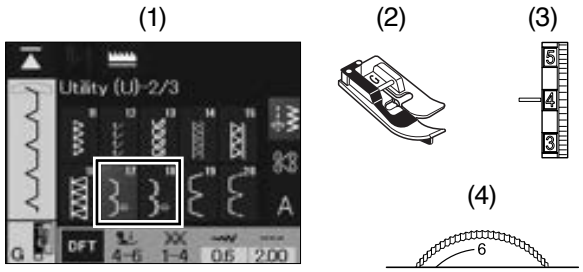
U16 Hemstitch

Machine settings

(1) Stitch pattern: U16
(2) Presser foot: Satin stitch foot F
(3) Thread tension: 3-6
(4) Foot pressure: 4-6



Use this stitch for decorative stitch.

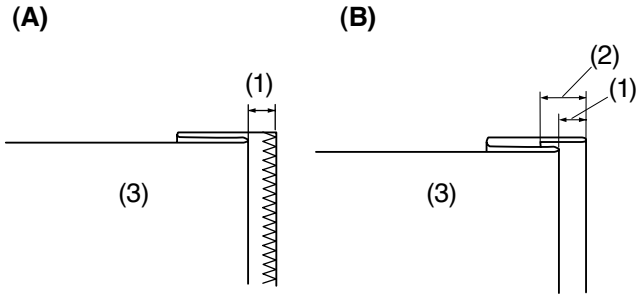


U17, U18 Blind hemming

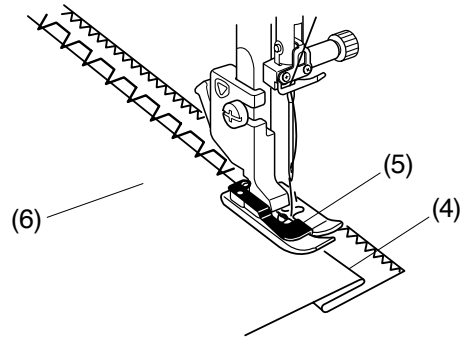
Machine settings

(1) Stitch pattern: U17, U18
(2) Presser foot: Blind hemming foot G
(3) Thread tension: U17: 1-4, U18: 3-6
(4) Foot pressure: 4-6

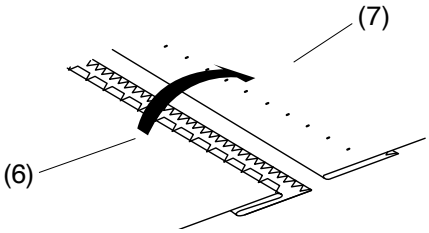
1.



2.



3.



To sew:

1. Attach blind hemming foot G.

Fold the fabric to form a hem leaving a 0.5 cm (1/4″) allowance as shown.

(1) 0.5 cm (1/4″)

(A) Medium to heavy weight fabrics: The raw edge should be overcasted.

(B) Fine fabrics: Fold the raw edge 1 cm (3/8″).

(2) 1 cm (3/8″)
(3) Wrong side of the fabric

2. Position the fabric so that the fold comes to the left side of the guide on the foot. Lower the presser foot lifter. The needle should just pierce the folded edge when it comes over to the left side.

Adjust the position of the needle drop if necessary. (refer to page 55).

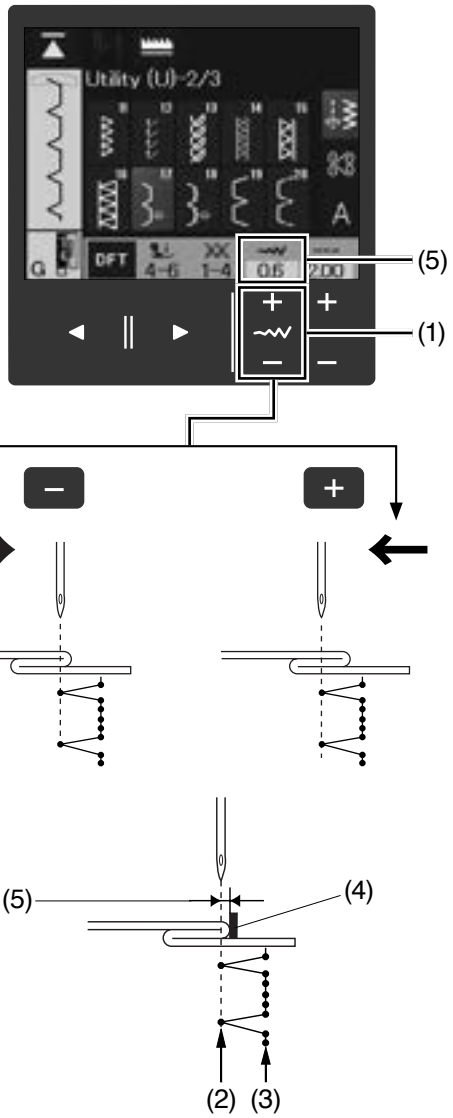
Sew guiding the fold along the guide.

(4) Fold
(5) Guide
(6) Wrong side of the fabric

3. Open the fabric with the right side up.

The stitches on the right side of the fabric will be almost invisible.

(6) Wrong side of the fabric
(7) Right side of fabric



Adjusting the Needle Drop Position

Press the stitch width adjustment keys to adjust the needle drop position.

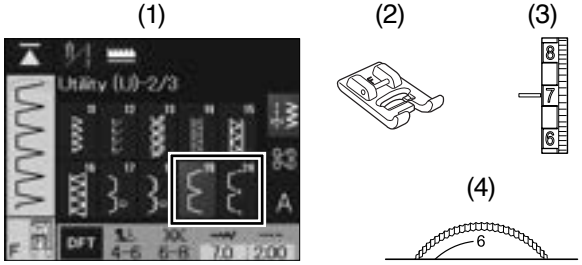
Press the “+” key to move the needle drop positions to the left.

Press the “–” key to move the needle drop positions to the right.

The needle drop position will change, while the stitch width remains consistent.

The distance between the left needle drop position and guide of the foot is indicated in millimeters.

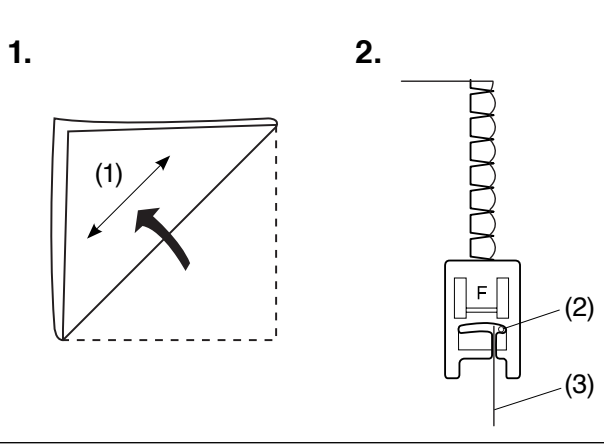
(1) Stitch width adjustment keys
(2) Left needle drop position
(3) Right needle drop position
(4) Guide on foot
(5) Distance between the left needle position and the guide



U19, U20 Shell tuck

Machine settings

(1)	Stitch pattern:	U19, U20
(2)	Presser foot:	Satin stitch foot F
(3)	Thread tension:	6-8
(4)	Foot pressure:	U19: 4-6, U20: 3-4

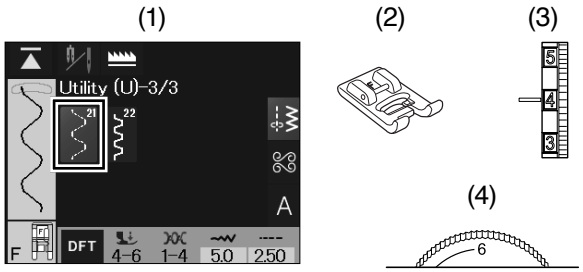


Use a light weight fabric (tricot, for example).

1. Fold the fabric as shown and stitch on the fold.
(1) Bias direction

2. Allow the needle to barely clear the folded edge to create a shelled edge. You may need to increase the needle thread tension.
(2) Right needle drop position
(3) Folded edge

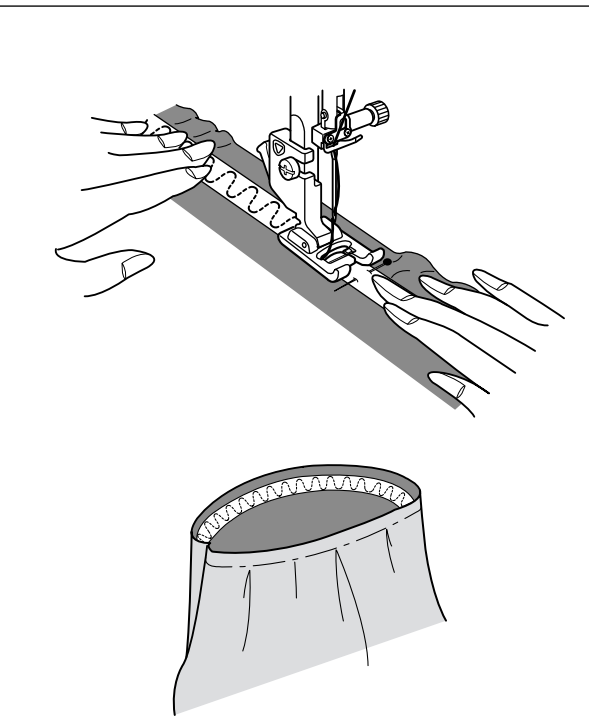
If you sew rows of shell tucks, space the rows at least 1.5 cm (5/8″) apart. You can also sew shell tucks on knits or soft silky woven fabrics in any direction.



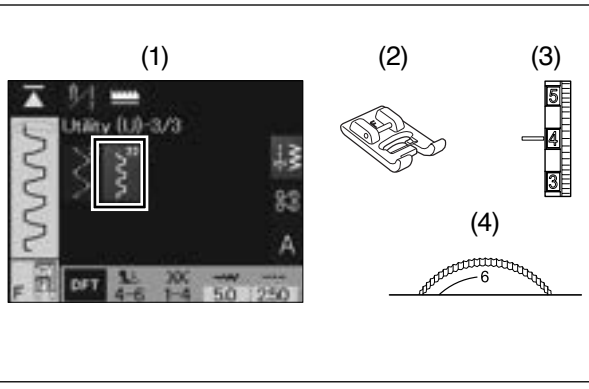
U21 Attaching elastic

Machine settings

(1) Stitch pattern: U21
(2) Presser foot: Satin stitch foot F
(3) Thread tension: 1-4
(4) Foot pressure: 4-6



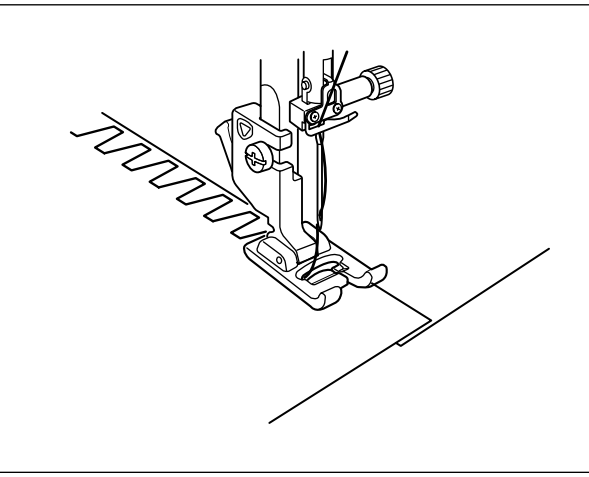
Mark the elastic into quarters. Match those to the center front, center back and side seams, and pin the elastic to the fabric.
Place the elastic under the foot and stitch into place while stretching the elastic evenly.



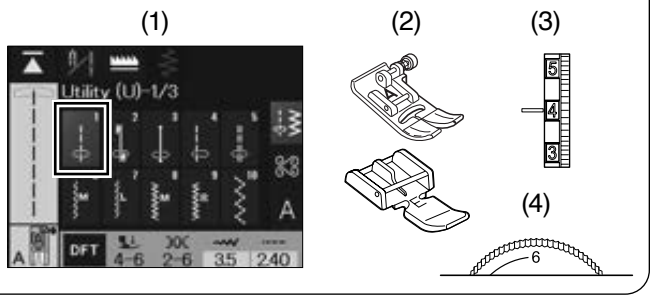
U22 Box stitching

Machine settings

(1) Stitch pattern: U22
(2) Presser foot: Satin stitch foot F
(3) Thread tension: 1-4
(4) Foot pressure: 4-6



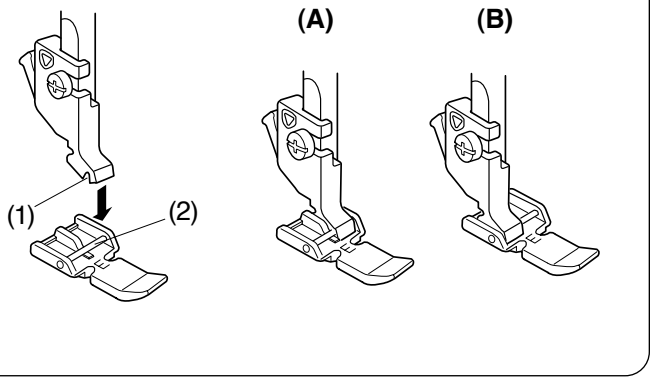
Use this stitch to join heavy weight fabrics.
Overlap two raw edges together and use this stitch to join them.



Zipper Sewing

Machine settings

(1) Stitch pattern: U1
(2) Presser foot: Zipper foot E
Zigzag foot A
(3) Thread tension: 2-6
(4) Foot pressure: 4-6



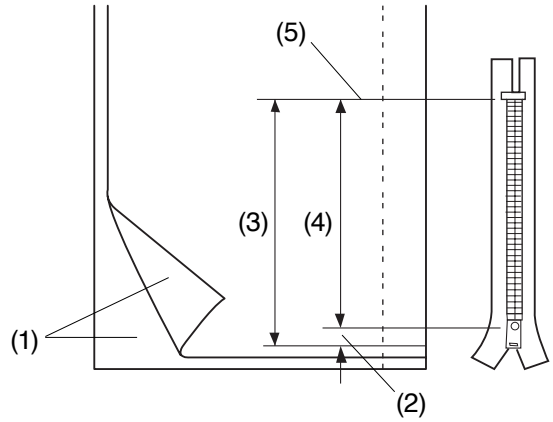
Attaching zipper foot E

Fit the pin on zipper foot E to the groove on the foot holder.

(1) Groove
(2) Pin

(A): To sew the left side of the zipper, attach the zipper foot with the pin on the right-hand side.
(B): To sew the right side of the zipper, attach the zipper foot with the pin on the left-hand side.

1.

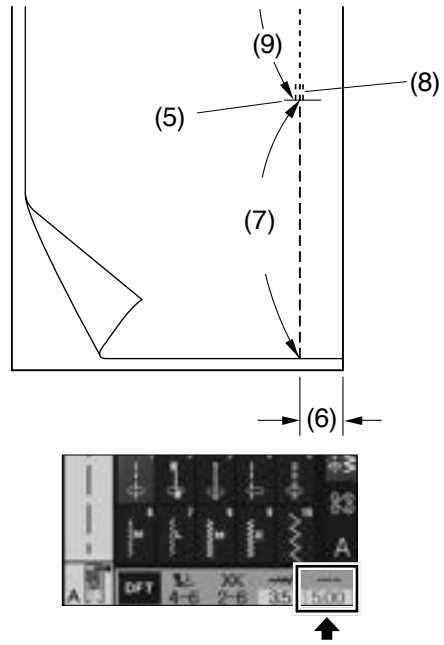


Fabric preparation

1. Add 1 cm (3/8″) to the zipper size. This is the overall opening size.

(1) Right sides of the fabric
(2) 1 cm (3/8″)
(3) Opening size
(4) Zipper size
(5) End of the zipper opening

2.



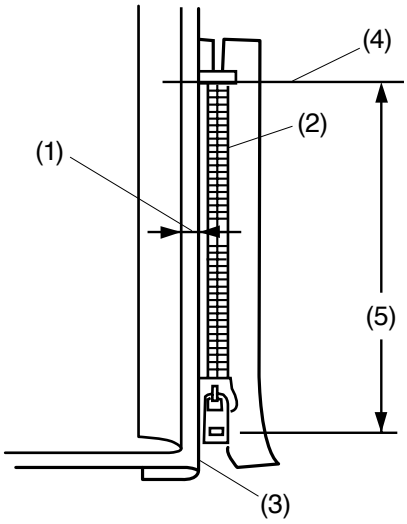
2. Place the right sides of the fabric together.

Attach the zigzag foot and seam up to the end of the zipper opening, with a 2 cm (3/4″) seam allowance. Reverse the stitch to fasten the seam.

Manually increase the stitch length to 5.0 and baste the zipper opening with the thread tension loosened to 1.

(5) End of the zipper opening
(6) 2 cm (3/4″) seam allowance
(7) Basting
(8) Reverse stitches
(9) Seam stitches

1.



To sew:

1. Attach zipper foot E.

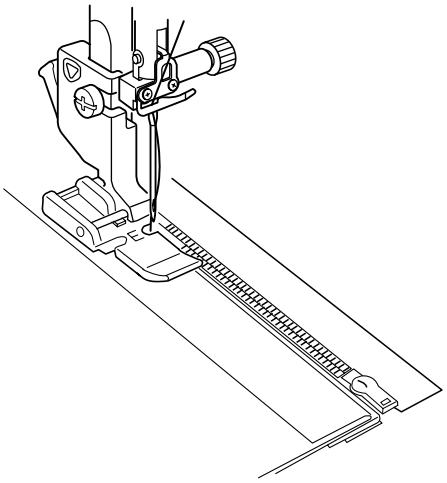
Fold back the left seam allowance. Turn the right seam allowance under to form a 0.2 cm to 0.3 cm (1/8″) fold.

Place the zipper teeth next to the fold and pin in place.

Set the stitch length and thread tension back to the original setting.

(1) 0.2 cm to 0.3 cm (1/8″)
(2) Zipper teeth
(3) Fold
(4) End of the zipper opening
(5) Opening size

2.

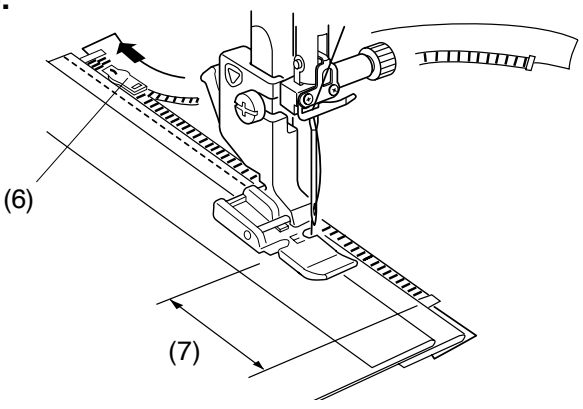


2. Lower the foot onto the topside at the end of the zipper opening so that the needle pierces the fabric next to the fold and the zipper tape.

Sew along the zipper guiding the zipper teeth along the bottom edge of the foot.

⚠ CAUTION:
Be sure that the needle does not strike the presser foot or zipper teeth when sewing.

3.



3. Sew through all layers next to the fold.

Stop the machine 5 cm (2″) before the foot reaches the slider on the zipper tape.

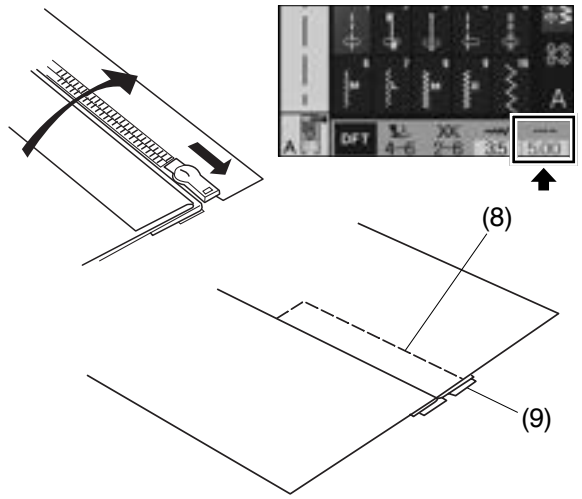
Lower the needle slightly into the fabric.

Raise the foot and open the zipper to clear the slider.

Lower the foot and stitch the remainder of the seam.

(6) Slider
(7) 5 cm (2″)

4.



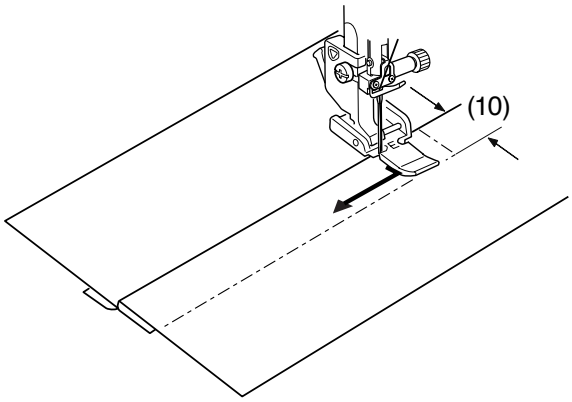
4. Close the zipper and spread the fabric open flat with the right side of the fabric facing up. Attach the Zigzag foot A.

Adjust the stitch length to 5.0, stitch width to 3.5 (default value) and the thread tension dial at “1”.

Baste the opened fabric and zipper tape together.

(8) Basting
(9) Zipper tape

5.



5. Attach the zipper foot E with the left pin.

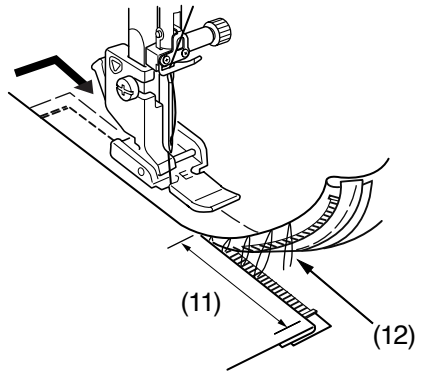
Adjust the stitch length and the stitch width to default value, and thread tension dial at “4”.

Backstitch across the end of the opening 0.7 cm - 1 cm (3/8″) and turn the fabric 90 degrees.

(10) 0.7 cm - 1 cm (3/8″)

⚠ CAUTION:
Be sure that the needle does not strike the presser foot or zipper teeth when sewing.

6.

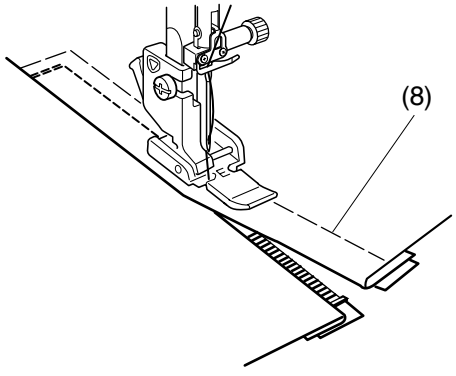


6. Stitch through the garment and zipper tape, guiding the zipper teeth along the side edge of the foot.

Stop the machine 5 cm (2″) before the foot reaches the slider on the zipper tape. Lower the needle into the fabric, and raise the foot. Remove the basting stitches.

(11) 5 cm (2″)
(12) Basting stitches

7.



7. Open the zipper, then lower the foot and stitch the remainder of the seam.

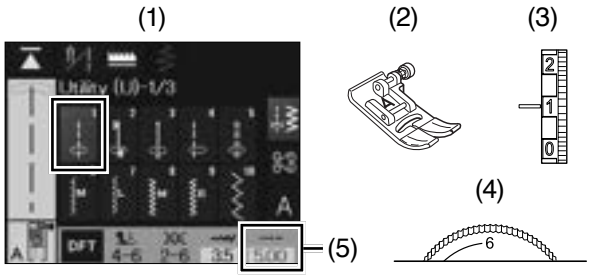
After sewing is finished, remove the basting stitches on the upper fabric.

(8) Basting

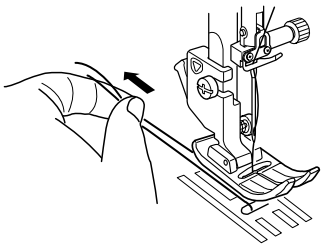
Gathering

Machine settings

(1) Stitch pattern: U1
(2) Presser foot: Zigzag foot A
(3) Thread tension: 1
(4) Foot pressure: 4-6
(5) Stitch length: 4.00-5.00



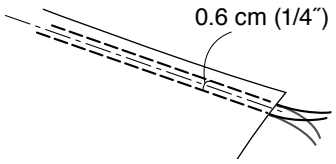
1. Pull both threads 10 cm (4″) under and behind the presser foot (refer to page 35).



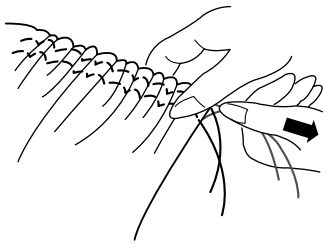
2. Set the thread tension dial at “1” and increase the stitch length to “5.00”.

Sew two rows of straight stitches 0.6 cm (1/4″) apart.

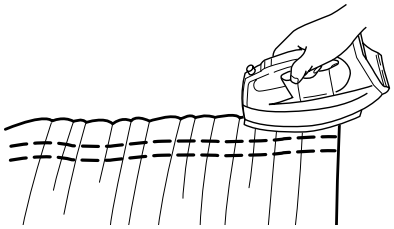
Knot the threads at the beginning.



3. Pull the bobbin threads at the end to gather the fabric.



4. Knot the threads at the end and distribute the gathers evenly.

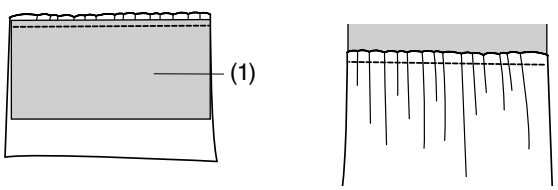


5. Prepare the fabric to attach the gathering.

Set the thread tension dial at “4” and the stitch length to “2.40” (default settings).

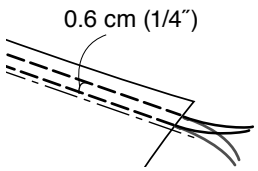
Place the wrong side of the fabric under the gathering.

(1) Wrong side of the fabric

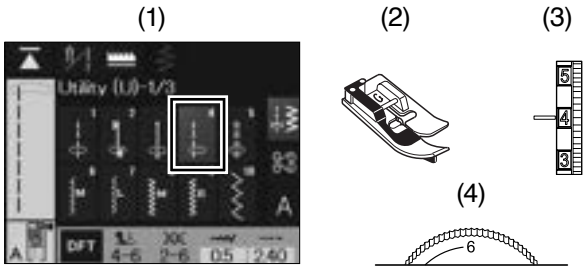


Sew the straight stitch between the two gathering rows.

Remove the two rows of straight stitches.



NOTE:
You may sew the straight stitch under the two gathering rows to cover the remains of gathering rows.



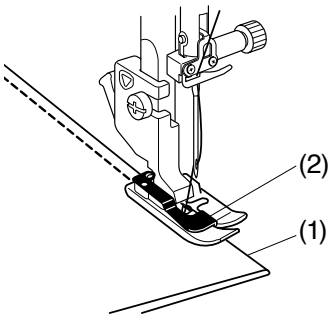
Pintucking

Machine settings

(1) Stitch pattern: U4
(2) Presser foot: Blind hemming foot G
(3) Thread tension: 2-6
(4) Foot pressure: 4-6

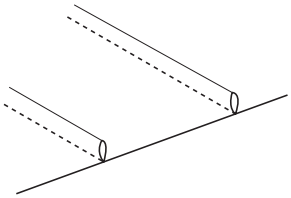
NOTE:
The “A” foot is displayed on the visual touch screen when straight stitch pattern 4 (Utility) is selected. However, use blind hemming foot G when sewing pintuck.

1.

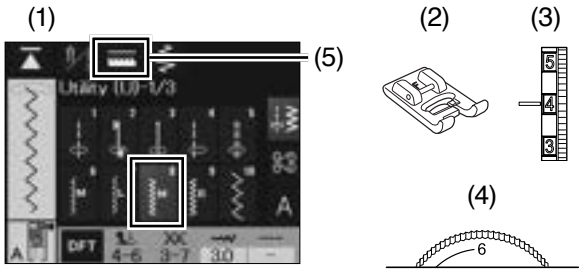


1. Fold the fabric with the wrong sides together.
Place the folded fabric under the blind hemming foot.
Align the edge of the fold with the guide on the foot, and lower the foot.
(1) Fold
(2) Guide on the foot

2.



2. Open the fabric and press the tuck to one side.



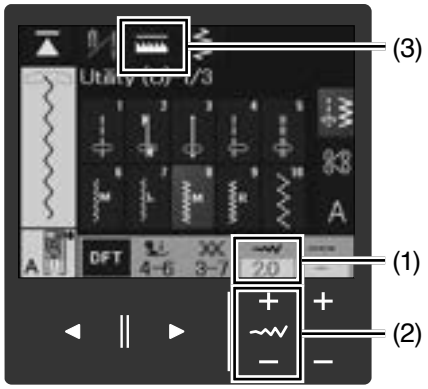
Button Sewing

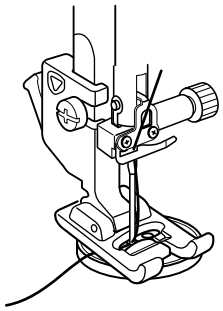
Machine settings

(1) Stitch pattern: U8
(2) Presser foot: Satin stitch foot F
(3) Thread tension: 3-7
(4) Foot pressure: 4-6
(5) Feed dogs: Down position
(refer to page 22)

NOTE:
The “A” foot is displayed on the visual touch screen when straight stitch pattern 8 (Utility) is selected. However, use satin stitch foot F when sewing button.

1. 2. 3.





1. Lower the feed dogs (refer to page 22).

Set the speed control slider at a slower speed. Match the holes of button to the horizontal slot on the presser foot.

Lower the foot to hold the button in place.

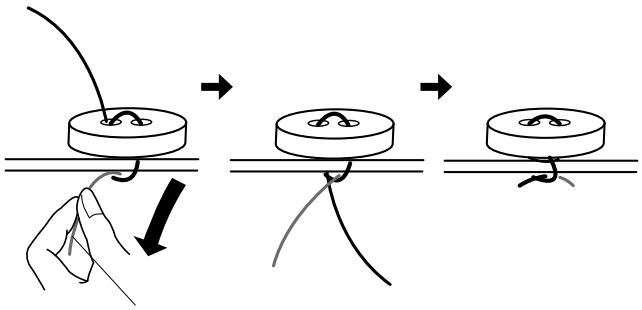
2. Adjust the stitch width so the needle will enter the left hole of the button.

(1) Stitch width
(2) Stitch width adjustment keys
(3) Drop feed key

3. Turn the handwheel so that the needle will enter the right hole of the button. Readjust the stitch width if necessary.

Stitch several times.

4.



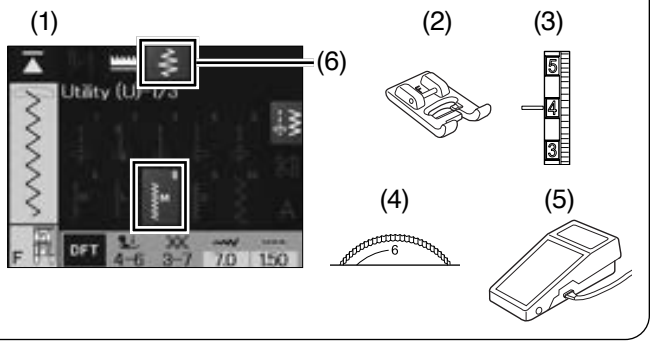
4. After you finish sewing, cut the threads but leave 7.5 cm - 10 cm (3″ - 4″) of threads at the end.

Pull the bobbin threads to bring the needle threads down to the wrong side of the fabric.

Tie the threads together.

After the button sewing is completed, raise the feed dogs for normal sewing (refer to page 22).

NOTE:
Do not use the thread cutter button to cut the threads. Otherwise, you cannot tie the threads.



Variable Zigzag

Machine settings

(1) Stitch pattern: U8
(2) Presser foot: Satin stitch foot F
(3) Thread tension: 3-7
(4) Foot pressure: 4-6
(5) Connect the foot control
(6) Turn the variable zigzag key on

Pressing on the foot control can vary stitch width.

The harder you press the foot control, the wider the stitch width becomes.

You can adjust the amount of needle swing with the foot control for variable zigzag (refer to page 171).

NOTE:
For variable zigzag sewing, be sure to connect the foot control to the machine. Otherwise you cannot sew variable zigzag stitches.

1. Connect the foot control to the machine (refer to page 11).

Select the pattern U8 and press the variable zigzag key.

(1) Variable zigzag key

2. A message will appear on the visual touch screen.

Press the OK key.

(2) OK key

NOTE:
In variable zigzag mode, the sewing machine will not start even if you press the foot control.

3. Press the Start/stop button to start the machine.

(3) Start/stop button

4. Sew at slow to medium speed while guiding the fabric with your hands and controlling the stitch width with the foot control.

NOTE:
Attach a stabilizer to the wrong side of the fabric if necessary.

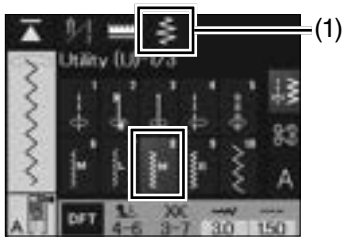
5. Press the variable zigzag key again.

A message will appear as shown.

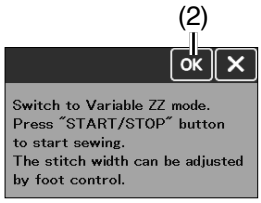
Press the OK key to return to the ordinary sewing.

(4) OK key

1.



2.

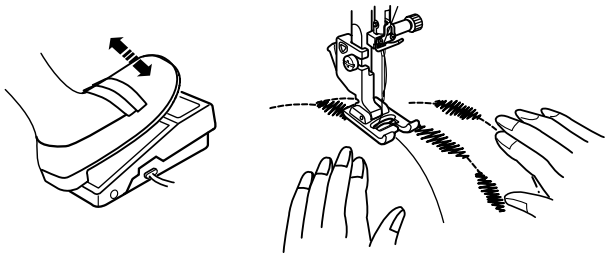




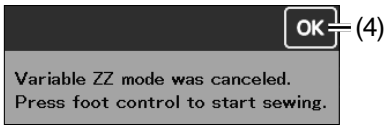
3.



4.



5.





Maximum zigzag width adjustment

The maximum zigzag width can be limited to suit your sewing needs.

Press the “+” or “–” key to limit the maximum zigzag width to your preference.

(1) Stitch width adjustment keys

Variable zigzag length adjustment

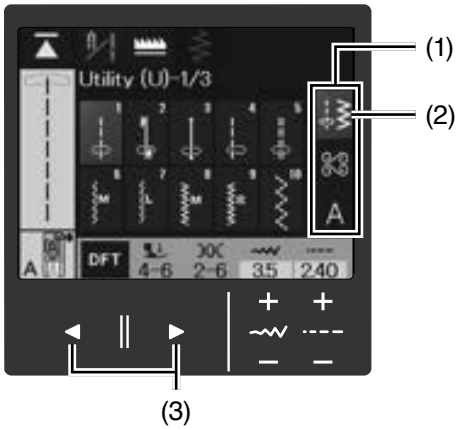
The maximum zigzag length can be changed to suit your sewing needs.

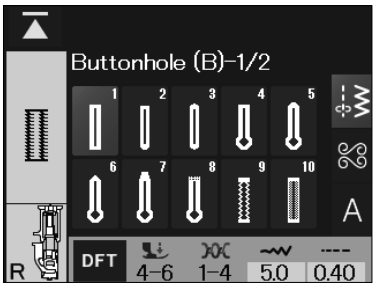
Press the “+” or “–” key to change the maximum zigzag length to your preference.

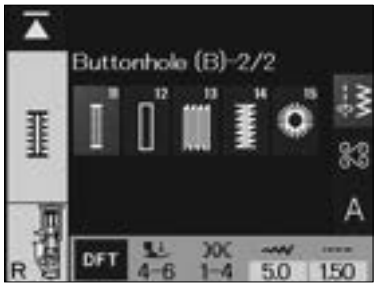
(2) Stitch length adjustment keys

Press the default key to recover the original stitch setting.

(3) Default key







BUTTONHOLES AND SPECIALTY STITCHES

Buttonholes and Specialty stitches

Press one of the category selection keys to select the category.

Each category is composed of multiple pages.

To select buttonholes and specialty stitches, press the utility stitch key.

Press page keys to switch the pattern selection keys.

(1) Category selection keys
(2) Utility stitch key
(3) Page keys














Variety of Buttonholes

B1 Sensor (square) buttonhole
This square buttonhole is widely used on medium to heavy weight fabrics. The buttonhole size is automatically determined by placing a button in the foot.

B2 Round end buttonhole
This buttonhole is used on fine to medium weight fabrics especially for blouses and children's clothes.

B3 Fine fabric buttonhole
This buttonhole is rounded at both ends and is used on fine, delicate fabrics such as fine silk.

B4 Keyhole buttonhole
The keyhole buttonhole is widely used on medium to heavy weight fabrics. It is also suitable for larger and thicker buttons.

B5 Rounded keyhole buttonhole
This buttonhole is used for thicker buttons on medium weight fabrics.

B6 Tailored buttonhole
This durable buttonhole is used with thick buttons and heavy weight fabrics.

B7 Keyhole buttonhole (tapered reinforced end)
This buttonhole is used for tailored clothing, woven cloth, etc.

B8 Keyhole buttonhole (heavy reinforced end)
This buttonhole is used for tailored clothing, jackets, particularly men’s wear, woven cloth, etc.

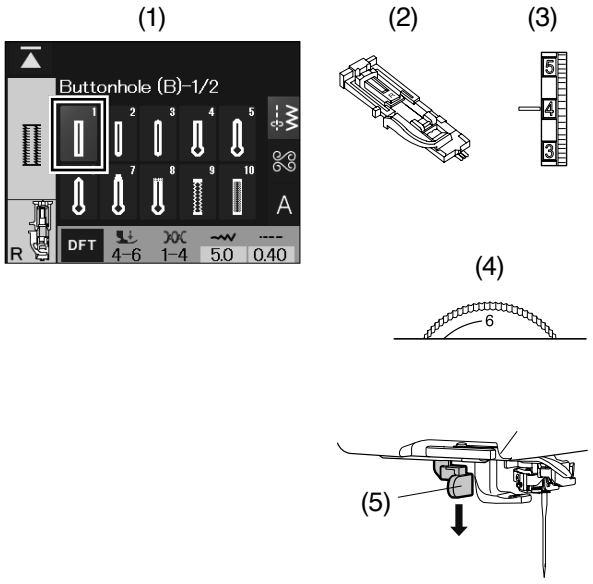
B9 Stretch buttonhole
This buttonhole is suitable for stretch fabrics. It can also be used as a decorative buttonhole.

B10 Knit buttonhole
This buttonhole is suitable for knit fabrics. It can also be used as a decorative buttonhole.

B11 Antique buttonhole
This buttonhole looks like the heirloom stitch. It has an attractive handmade appearance and makes a nice decorative buttonhole.

B12 Welted buttonhole
This is a template pattern for the hand sewn welted (bound) buttonhole.

NOTE:
B2-B12 are sensor buttonholes and the sewing procedure is the same as for B1.



B1 Sensor (Square) Buttonhole

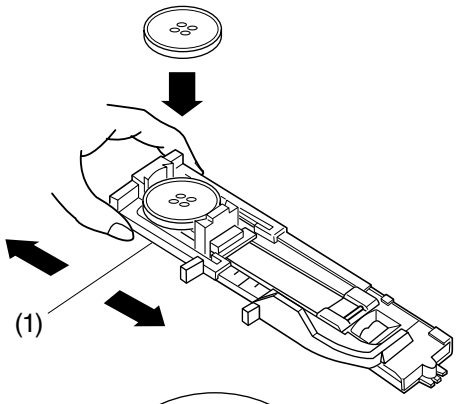
Machine settings

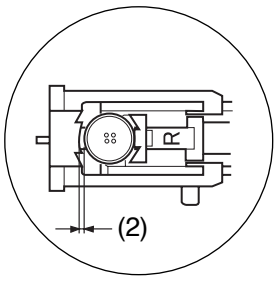
(1) Stitch pattern: B1
(2) Presser foot: Automatic buttonhole foot R
(3) Thread tension: 1-4
(4) Foot pressure: 4-6
(5) Lower the buttonhole lever

The size of a buttonhole is automatically set by placing a button in the rear of automatic buttonhole foot R.
The button holder of the foot takes a button size of 1 cm (3/8″) to 2.5 cm (1″) in diameter.

NOTE:
- It is sometimes necessary to change buttonhole size to match certain heavy or specific fabrics and threads.
- Make a test buttonhole on an extra piece of the fabric to check your settings.
- The preset width of the buttonhole is suited for ordinary buttons.
- Apply an interfacing to stretch or fine fabrics.

1.



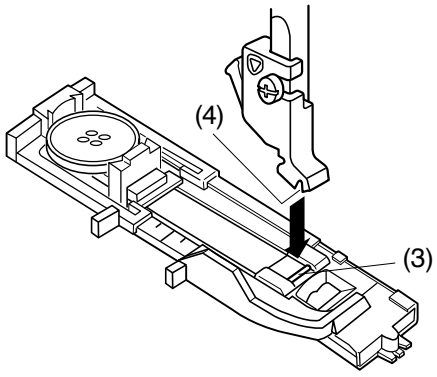


To sew:

1. Pull the button holder to the back, and place the button in it. Push it together tightly on the button.
(1) Button holder

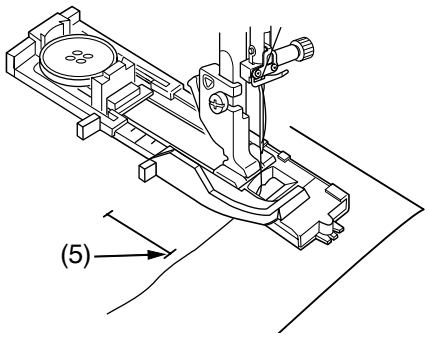
NOTE:
If the button is extremely thick, make a test buttonhole on an extra piece of the fabric.
If it is difficult to fit the button through the test buttonhole, you can lengthen the buttonhole by pulling the button holder back a little. The length of the buttonhole will be increased.
(2) Extra gap

2.



2. Press the needle up/down button to raise the needle.
Press the lockout key to lockout the machine.
Raise the presser foot and attach the automatic buttonhole foot R snapping the pin into the groove of the foot holder.
You may lift the presser foot lifter to the extra lifted position when placing the automatic buttonhole foot R under the foot holder (refer to page 19).
(3) Pin
(4) Groove

3.



3. Raise the presser foot lifter.

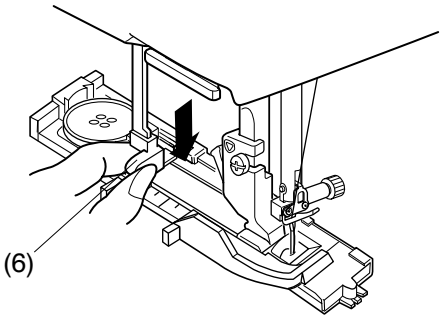
Draw the needle thread to the left through the hole of foot.

Press the lockout key to unlock the machine.

Mark the buttonhole position on the fabric and place it under the buttonhole foot. Lower the needle at the starting point by turning the handwheel.

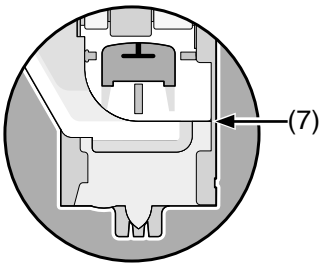
(5) Starting point

4.



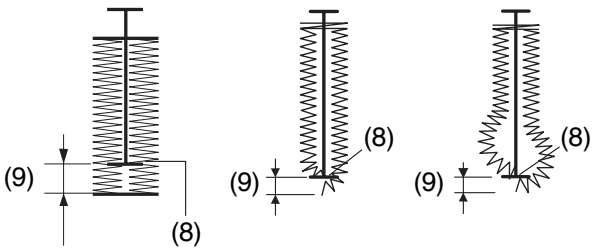
4. Lower the presser foot lifter and pull the buttonhole lever down as far as it will go.

(6) Buttonhole lever

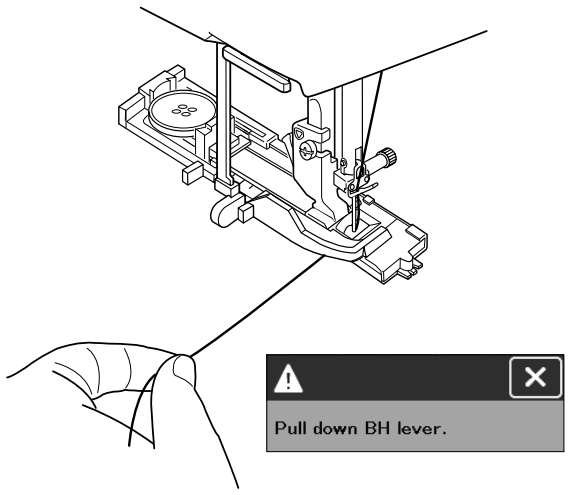


NOTE:
Make sure there is no gap between the slider and front stopper, otherwise the buttonhole will be out of position or there will be a sewing gap.

(7) No gap
(8) Starting point
(9) Sewing gap



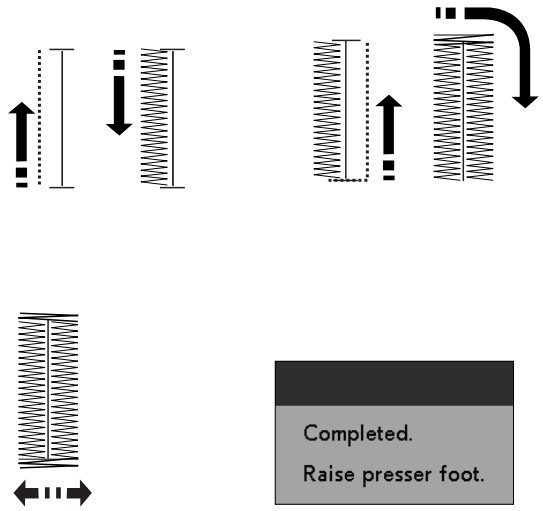
5.



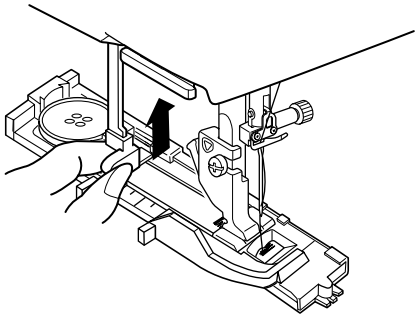
5. Start sewing while pulling the needle thread lightly to the left. After sewing a few stitches, free the thread and continue sewing.

NOTE:
If you start sewing without pulling down the buttonhole lever, the visual touch screen will show a warning and the machine will stop after a few stitches.
Pull the buttonhole lever down and start sewing.

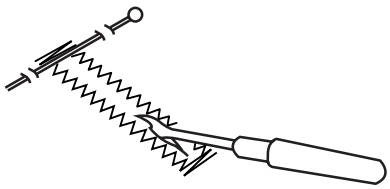
6.



7.



8.



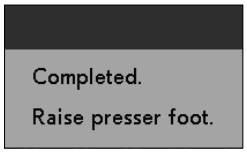
6. The buttonhole is sewn automatically in the sequence shown. When the buttonhole is finished, the machine will stop automatically with the needle in the up position.

Press the thread cutter button and remove the fabric.

7. After you finish buttonhole sewing, push the buttonhole lever up as far as it will go.

8. Place a pin just below the bartack at each end to prevent accidentally cutting the threads.

Cut the opening with the seam ripper.



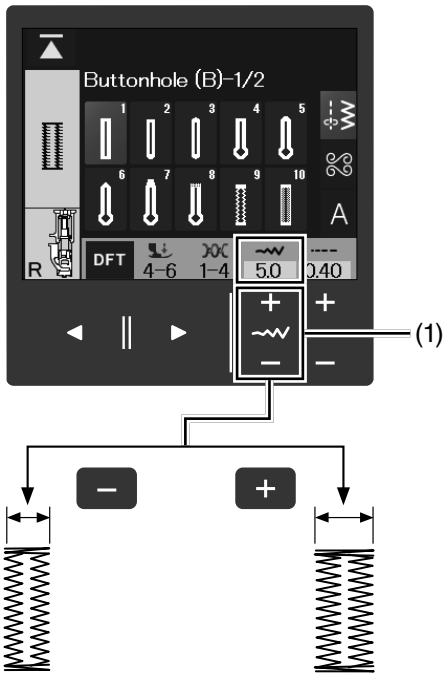
Double Layer Buttonhole

To make a solid and sturdy buttonhole, sew another layer of buttonhole over the previous one.

After the buttonhole is finished, simply press the start/stop button again. Do not raise the foot or reselect the pattern.

The machine will sew another buttonhole over the previous one.

NOTE:
Turn off “Thread Cut after Auto-Lock” option when you make a double layer buttonhole (refer to page 170).

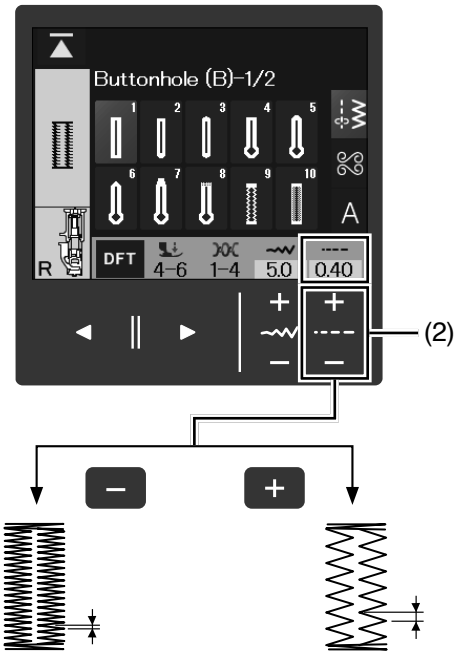


Altering buttonhole width

You can alter the buttonhole width by pressing the adjustment keys.

(1) Stitch width adjustment keys

Press the “+” key to increase the buttonhole width.
Press the “–” key to decrease the buttonhole width.



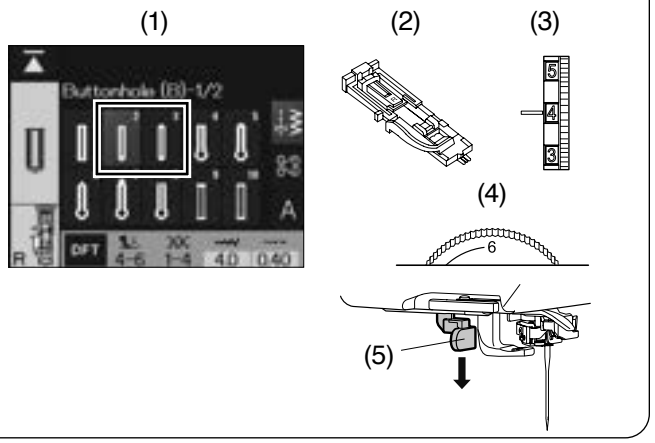
Altering buttonhole stitch density

Press the “+” key to make the buttonhole stitches less dense.

Press the “–” key to make the buttonhole stitches denser.

(2) Stitch length adjustment keys

NOTE:
- The buttonhole width is adjustable from 2.5 to 7.0.
- The stitch density is adjustable from 0.20 to 0.80.

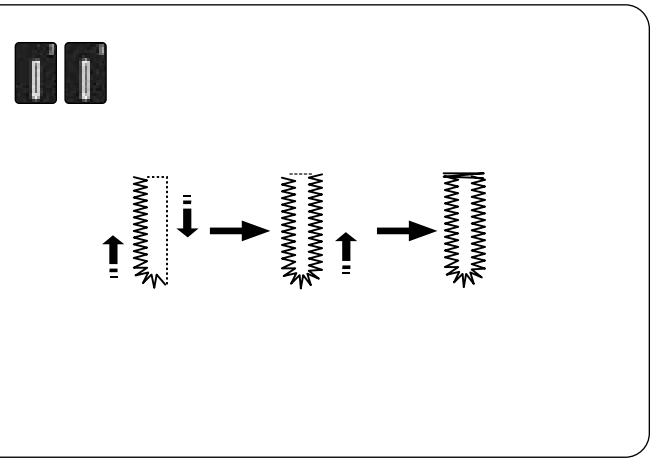


Other Buttonholes

B2, B3 Round end and fine fabric buttonholes

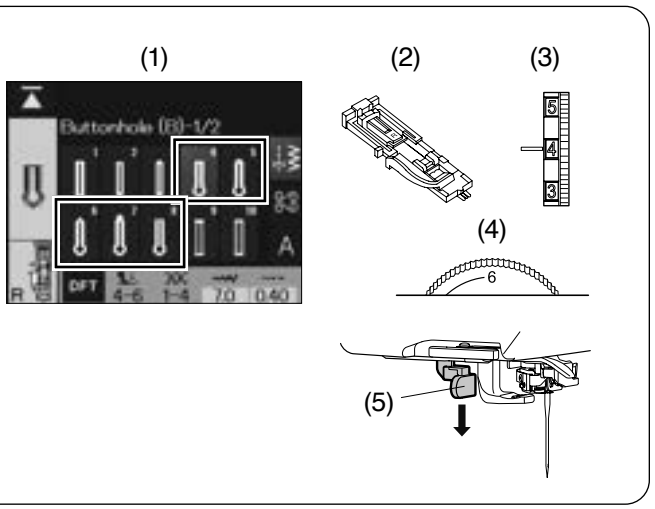
Machine settings

(1) Stitch pattern: B2, B3
(2) Presser foot: Automatic buttonhole foot R
(3) Thread tension: 1-4
(4) Foot pressure: 4-6
(5) Lower the buttonhole lever



The sewing procedure is the same as that of B1 sensor (square) buttonhole (refer to pages 67-70).

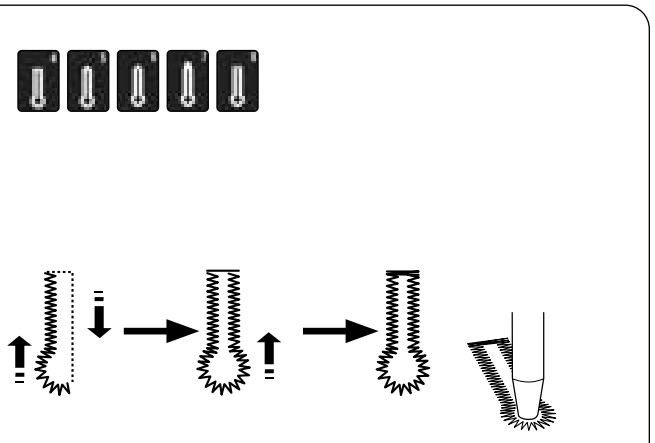
NOTE:
- The buttonhole width is adjustable from 2.5 to 5.5.
- The stitch density is adjustable from 0.20 to 0.80.



B4-B8 Keyhole buttonholes

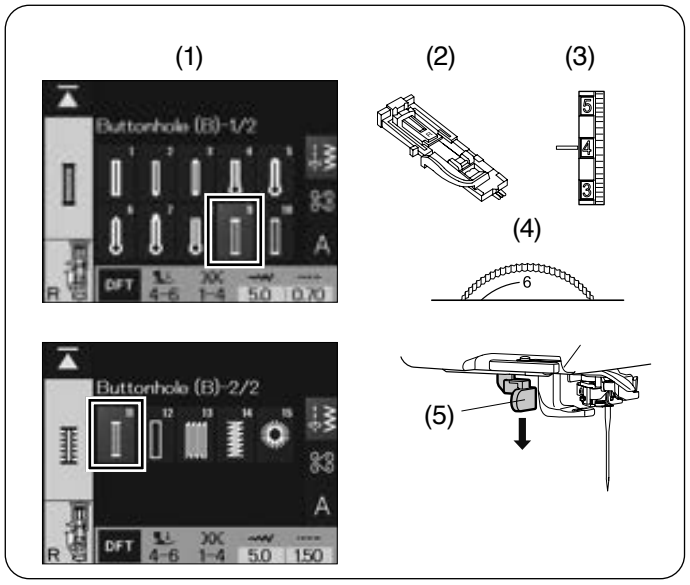
Machine settings

(1) Stitch pattern: B4-B8
(2) Presser foot: Automatic buttonhole foot R
(3) Thread tension: 1-4
(4) Foot pressure: 4-6
(5) Lower the buttonhole lever



The sewing procedure is the same as B1 sensor (square) buttonhole (refer to pages 67-70).
Use a punch to open the keyhole buttonhole.

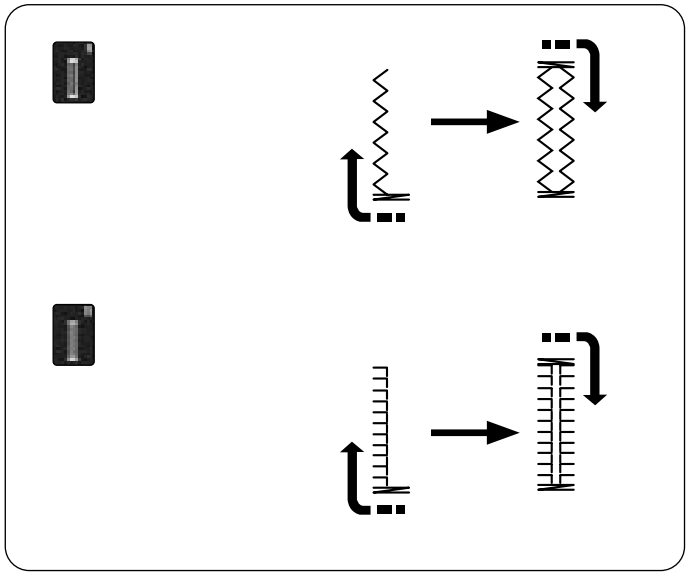
NOTE:
- A punch is not included with this machine.
- The buttonhole width is adjustable from 5.5 to 7.0.
- The stitch density is adjustable from 0.30 to 0.80.



B9, B11 Stretch and antique buttonholes

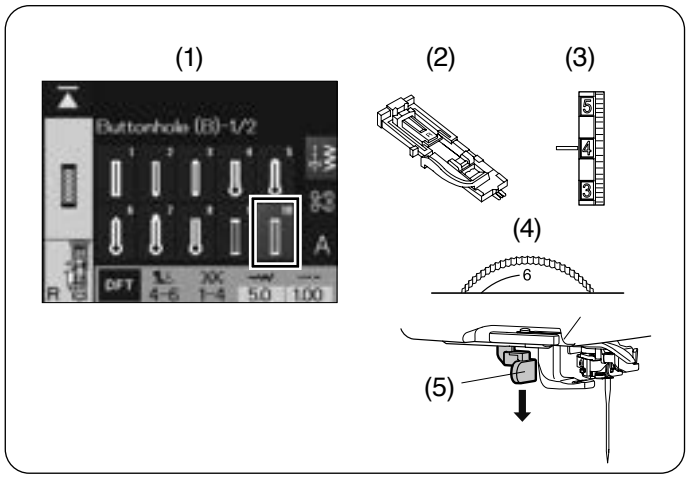
Machine settings

(1) Stitch pattern: B9, B11
(2) Presser foot: Automatic buttonhole foot R
(3) Thread tension: 1-4
(4) Foot pressure: 4-6
(5) Lower the buttonhole lever



The sewing procedure is the same as B1 sensor (square) buttonhole (refer to pages 67-70).

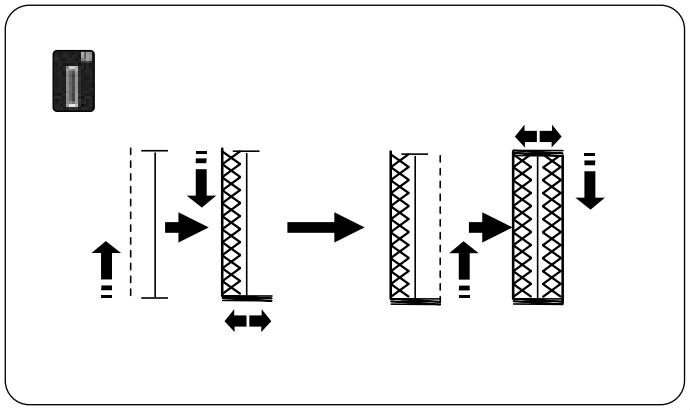
NOTE:
- The buttonhole width is adjustable from 2.5 to 7.0.
- The stitch density is adjustable from 0.50 to 1.00 (B9), and from 0.50 to 2.50 (B11).



B10 Knit buttonhole

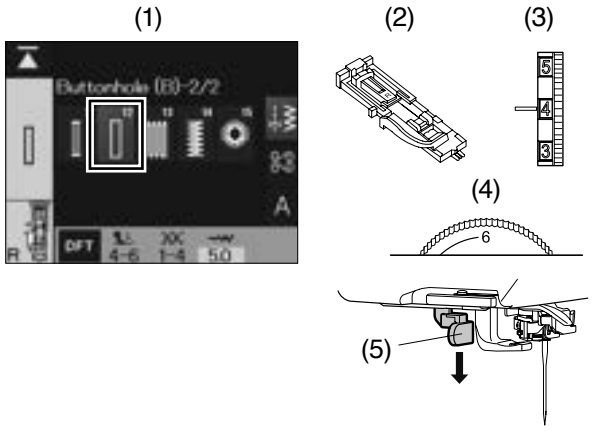
Machine settings

(1) Stitch pattern: B10
(2) Presser foot: Automatic buttonhole foot R
(3) Thread tension: 1-4
(4) Foot pressure: 4-6
(5) Lower the buttonhole lever



The sewing procedure is the same as B1 sensor (square) buttonhole (refer to pages 67-70).

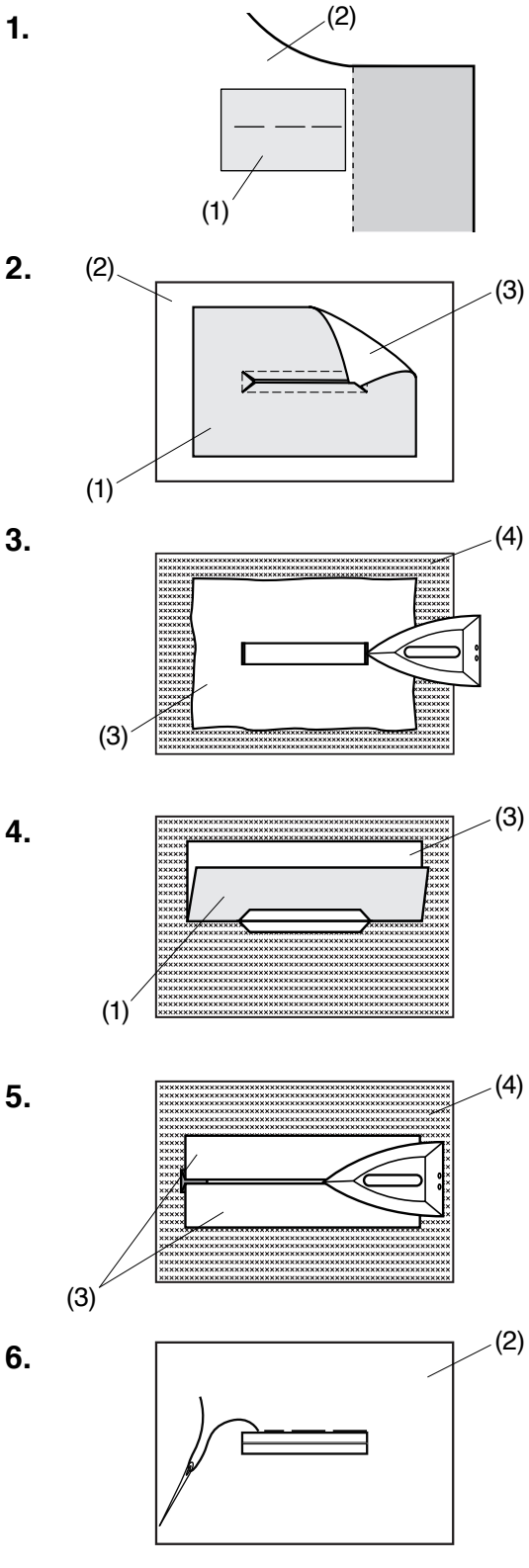
NOTE:
- The buttonhole width is adjustable from 2.5 to 7.0.
- The stitch density is adjustable from 0.70 to 1.20.



B12 Welted buttonhole (Bound buttonhole)

Machine settings

(1) Stitch pattern: B12
(2) Presser foot: Automatic buttonhole foot R
(3) Thread tension: 1-4
(4) Foot pressure: 4-6
(5) Lower the buttonhole lever



A welted buttonhole is made by stitching a strip or patch of fabric to the buttonhole.

Welted buttonholes are particularly suitable for tailored garments, but are not recommended for sheer or delicate fabrics where the patch might show through or add bulk.

1. Baste a patch to the garment fabric with the right sides together.
(1) Wrong side of patch
(2) Right side of garment fabric

2. Select pattern B12.
Sew the welted buttonhole on both fabrics together.
Cut the buttonhole opening as illustrated then pull the patch out through the slit to the other side.
(1) Wrong side of patch
(2) Right side of garment fabric
(3) Right side of patch

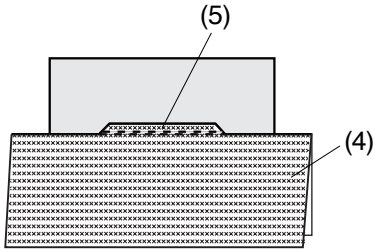
3. Pull out the patch until the right side of the patch is showing. Use an iron to press both corner ends until they are squared off.
(3) Right side of patch
(4) Wrong side of garment fabric

4. Fold back each side of the patch to form buttonhole lips.
(1) Wrong side of patch
(3) Right side of patch

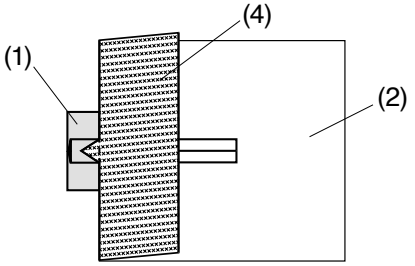
5. Press both folds with an iron.
(3) Right side of patch
(4) Wrong side of garment fabric

6. Baste both edges of the seam with a needle and thread by hand.
(2) Right side of garment fabric

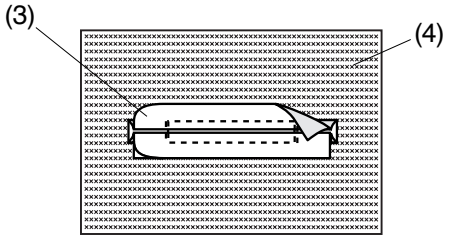
7.



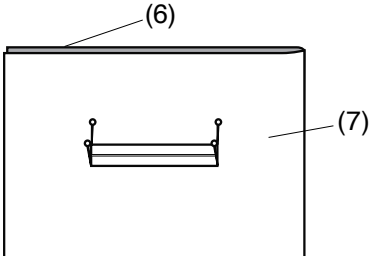
8.



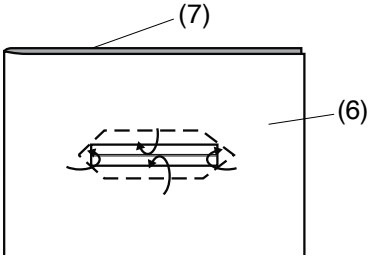
9.



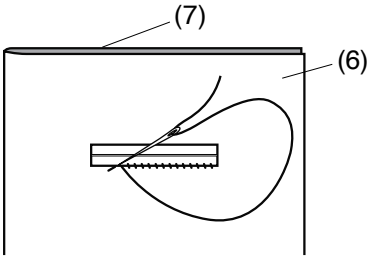
10.



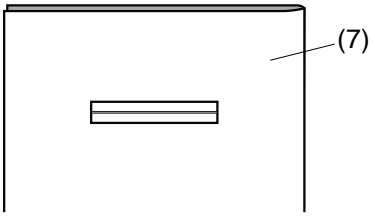
11.



12.



13.



7. Fold over the length of the garment fabric, sew back and forth beside the original seam to secure flaps of the patch.

(4) Wrong side of garment fabric
(5) Sew back and forth

8. Fold over the end of fabric and sew back and forth three times over the triangular end.

(1) Wrong side of patch
(2) Right side of garment fabric
(4) Wrong side of garment fabric

9. The patch should be cut 1 cm to 1.5 cm (3/8″ - 5/8″) away from the hole. The corners should be cut rounded off as shown.

(3) Right side of patch
(4) Wrong side of garment fabric

10. Place the facing on the wrong side of the garment fabric. Mark the 4 corners with pins as shown.

(6) Facing
(7) Garment fabric

11. Turn all the layers over and cut the buttonhole opening on the facing in the same way as step **2.**

Four marker pins show you the corner points on the facing. Fold back each flap between the facing and patch.

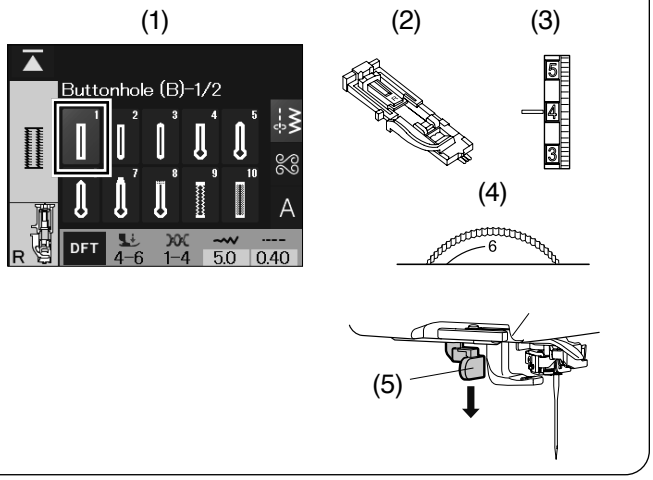
(6) Facing
(7) Garment fabric

12. Stitch around the opening with a needle and thread as shown.

(6) Facing
(7) Garment fabric

13. The welted buttonhole is complete.

(7) Garment fabric

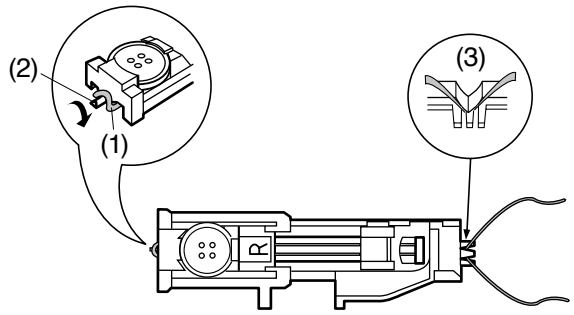


Corded Buttonhole

Machine settings

(1) Stitch pattern: B1
(2) Presser foot: Automatic buttonhole foot R
(3) Thread tension: 1-4
(4) Foot pressure: 4-6
(5) Lower the buttonhole lever

1. 2.



The sewing procedure is the same as B1 sensor (square) buttonhole (refer to pages 67-70).

Select pattern B1.

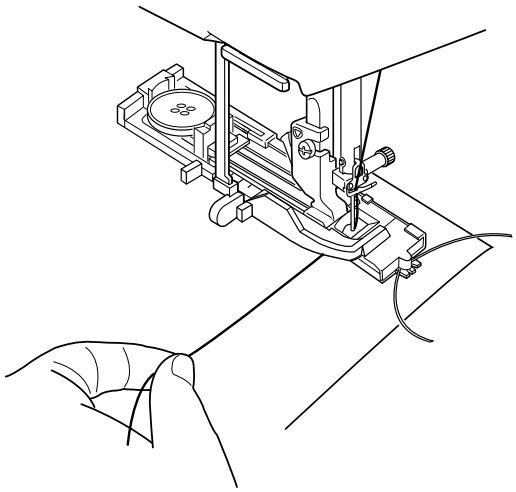
1. Set the stitch width to match the thickness of the cord used. With the buttonhole foot raised, hook the filler cord on the spur at the back of the buttonhole foot.

(1) Cord
(2) Spur
(3) Forks

2. Bring the ends toward you under the buttonhole foot, clearing the front end. Hook the filler cord into the forks on the front of the automatic buttonhole foot R to hold them tight.

Lower the needle into the garment where the buttonhole will start, and lower the foot.

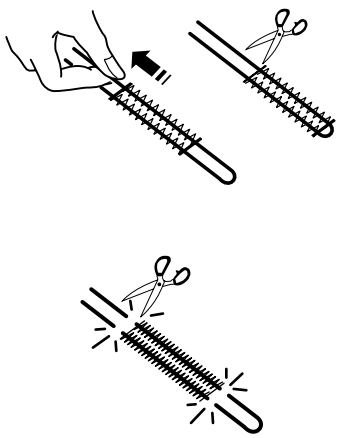
3.



3. Lower the buttonhole lever. Pull the needle thread lightly to the left. Start the machine and sew the buttonhole. Each side of the buttonhole and the bartacks will be sewn over the cord.

Remove the fabric from the machine, and cut the sewing threads only.

4.



4. Pull the loose ends of the filler cord to tighten it. Trim the excess filler.

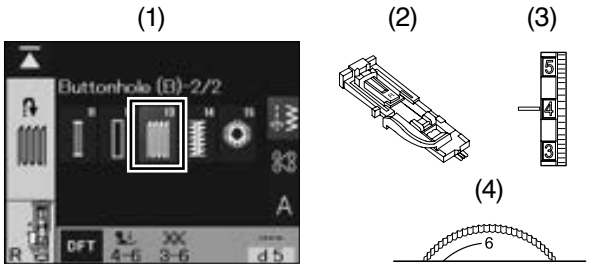
NOTE:
Cut the filler cord at both ends, if the filler cord is stitched on the fabric and cannot be pulled.

Specialty Stitches

B13 Darning

Machine settings

(1) Stitch pattern: B13
(2) Presser foot: Automatic buttonhole foot R
(3) Thread tension: 3-6
(4) Foot pressure: 4-6

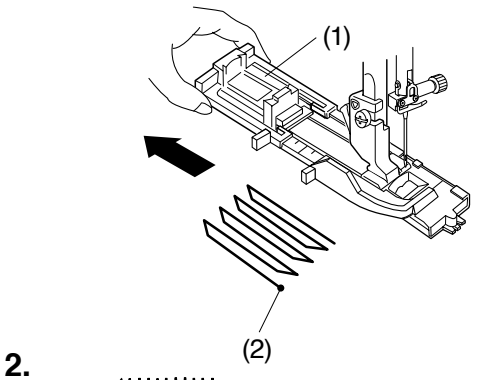


Select pattern B13.

1. Attach automatic buttonhole foot R and pull the button holder all the way out.

Place the fabric under the foot, and lower the needle at the starting point. Then lower the foot.

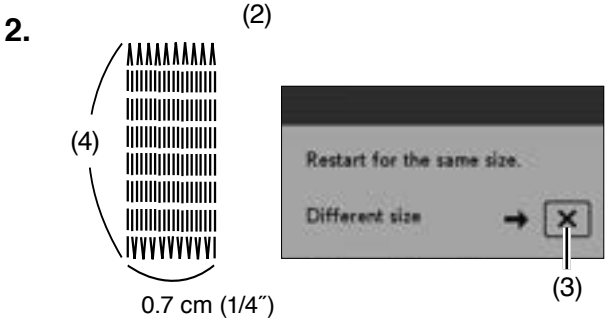
(1) Button holder
(2) Starting point



2. Start the machine and continue sewing until the machine stops automatically. When finished sewing, a confirmation message will appear.

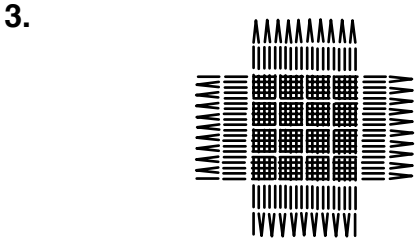
Press the X key if you sew in a different size.

(3) X key



NOTE:
The machine will sew the darning at maximum 2 cm (3/4″) length and fixed 0.7 cm (1/4″) width when sewing until it stops automatically.
(4) 2 cm (3/4″)

3. Sew another layer of darning over the first layer, at a right angle to it.



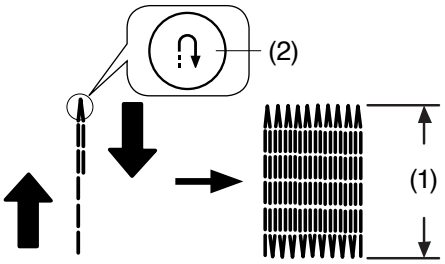
To sew shorter darning

Sew the first line to the desired length and stop the machine.

Press the reverse button and start the machine again.

The machine will sew the rest of the darning and stop automatically.

(1) Required length
(2) Reverse button



To sew the same size darning

When finished sewing, a confirmation message will appear.

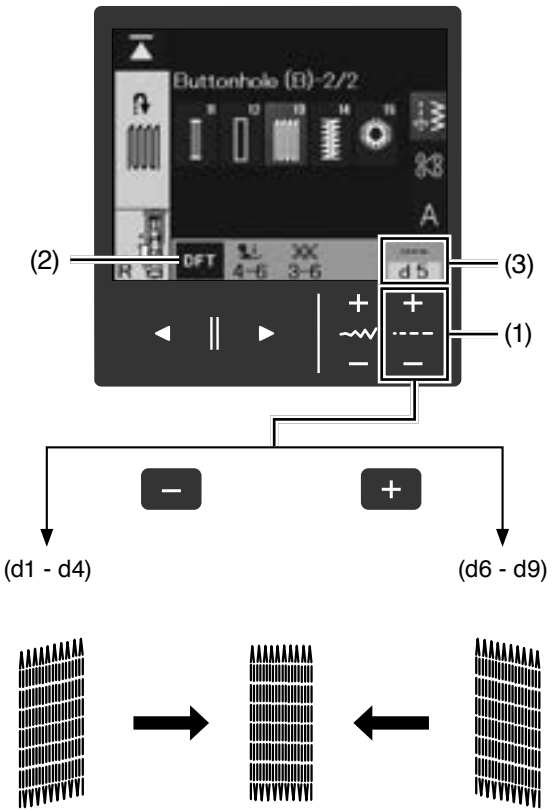
Simply start the machine to sew another layer of darning stitches in the same size.

To sew the next layer of darning stitches in a different size, press the X key.

(3) X key



NOTE:
The memorized length will be cancelled if the presser foot is raised or the startover key (refer to page 100) is pressed before darning is completed.



To adjust the evenness of darning stitches

You can correct unevenness of darning stitches by pressing the stitch length adjustment keys.

If the left corner is lower than the right side, press the “–” key to correct it.

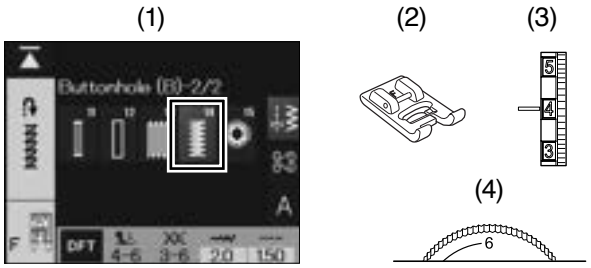
If the right corner is lower than the left side, press the “+” key to correct it.

(1) Stitch length adjustment keys

NOTE:
The evenness (3) can be adjusted within d1 to d9 (default setting is d5).

Press the default key to recover the original stitch setting.

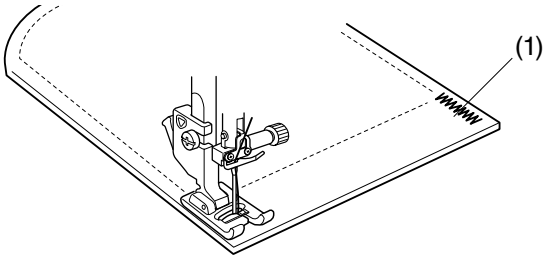
(2) Default key



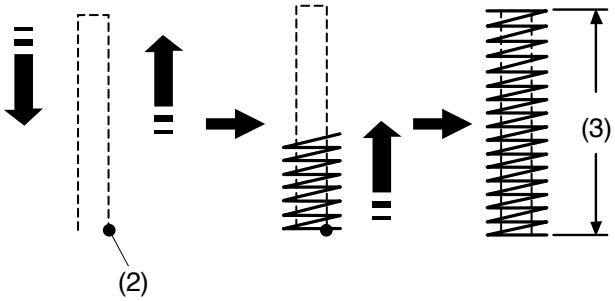
B14 Tacking

Machine settings

(1) Stitch pattern: B14
(2) Presser foot: Satin stitch foot F
(3) Thread tension: 3-6
(4) Foot pressure: 4-6



1. 2.



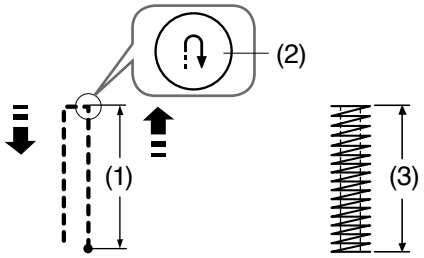


Tacking is used to reinforce pockets, crotch seams and belt carriers where extra strength is needed.

To sew:

1. Lower the needle at the starting point.
   Lower the foot and sew until the machine stops automatically.
2. The machine will sew a tacking 1.5 cm (5/8″) long automatically.
   Press the X key if you sew in a different size.

(1) Tacking
(2) Starting point
(3) 1.5 cm (5/8″)
(4) X key





Sewing a shorter tack

To sew a tack shorter than 1.5 cm (5/8″), first stop the machine after sewing the required length, and then press the reverse button.

The required length has been determined.

Start the machine and continue sewing until the machine stops automatically.

(1) Required length
(2) Reverse button
(3) Tack length

Sewing the same size tack

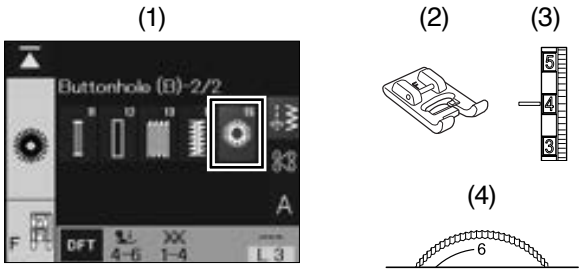
To sew another tack at the same size, simply start the machine and it will stop automatically when finishing sewing.

Sewing the tack at a different size

To sew the next tack at a different size, press the X key to memorize a new size and start sewing from the beginning.

(4) X key

NOTE:
The memorized length will be cancelled if the presser foot is raised or the startover key (refer to page 100) is pressed before tacking is completed.



B15 Eyelet

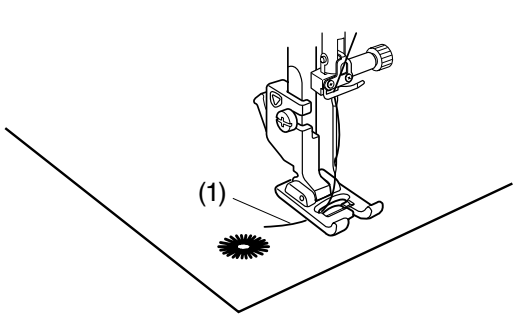
Machine settings

(1) Stitch pattern: B15
(2) Presser foot: Satin stitch foot F
(3) Thread tension: 1-4
(4) Foot pressure: 4-6

The eyelet is used for belt holes, etc.

To sew:

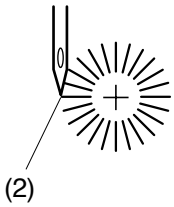
1. Draw the needle thread to the left.



(1) Needle thread

2. Place the garment under the foot and lower the needle to the starting point.

Sew until the machine stops automatically.



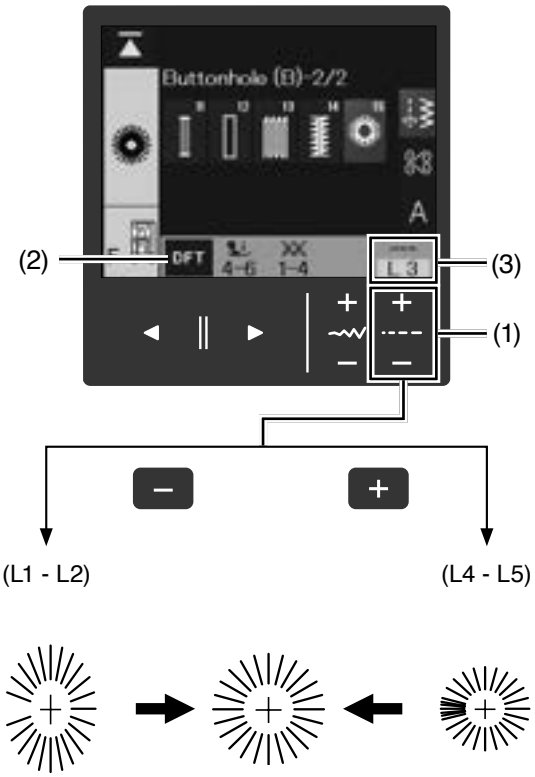
(2) Starting point

Adjusting the shape of an eyelet

Correct the shape of the eyelet as follows:

If the eyelet gap opens, press "–" on the stitch length adjustment keys.

If the eyelet overlaps, press "+" on the stitch length adjustment keys.

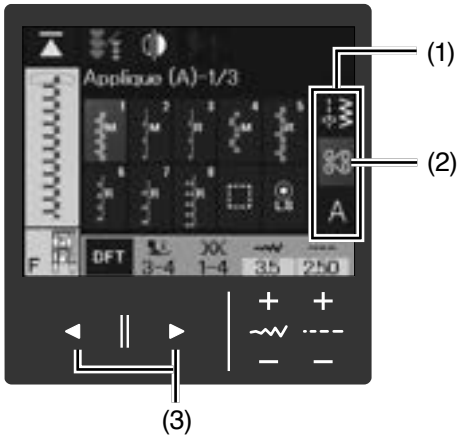


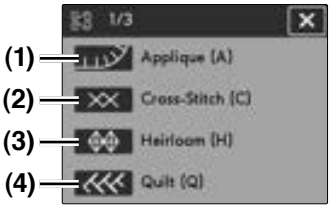
(1) Stitch length adjustment keys

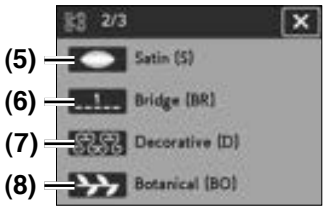
Press the default key to recover the original stitch setting.

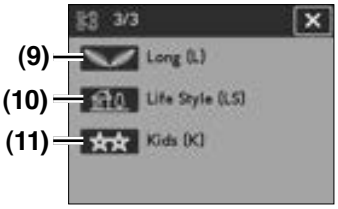
(2) Default key

NOTE:
The shape (3) can be adjusted within L1 to L5 (default setting is L3).

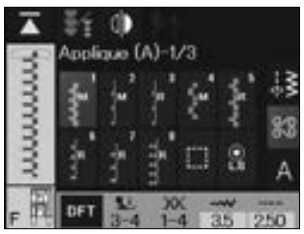




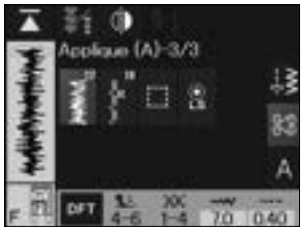




(1)







DECORATIVE STITCHES

Decorative Stitches

The patterns in this section are classified into 11 groups.

These patterns are programmable and you can make a pattern combination.

Press one of the category selection keys to select the category.

Each category is composed of multiple pages.

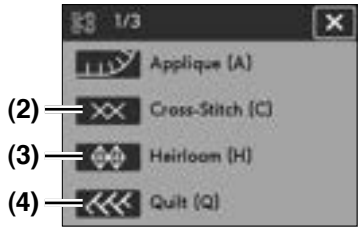
To select the decorative stitches, press the decorative and quilting stitches key.

Press page keys to switch the pattern selection keys.

(1) Category selection keys
(2) Decorative and quilting stitches key
(3) Page keys

(1) Applique (A): 3 pages

Stitches in this group are for applique (refer to pages 85-86).



(2)

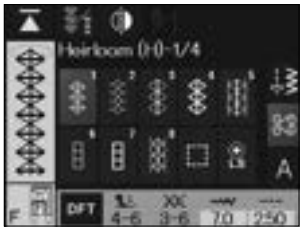




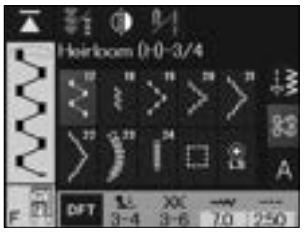
(2) Cross-Stitch (C): 2 pages

This group provides cross-stitches for craft sewing and home décor (refer to page 87).

(3)







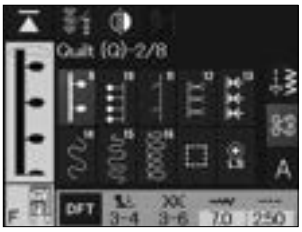


(3) Heirloom (H): 4 pages

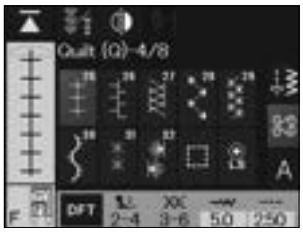
This group provides heirloom stitches for craft sewing and home décor (refer to pages 87-88).

(4)





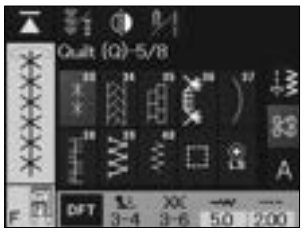




(4) Quilt (Q): 8 pages

Stitches in this group are for patchwork and quilting (refer to pages 89-90).

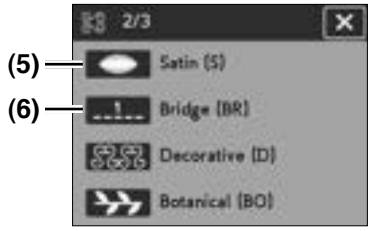
(4)



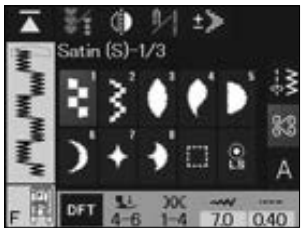


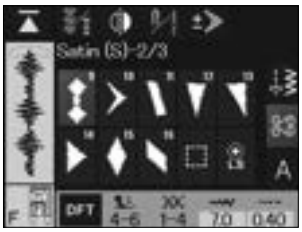






(5)







(6)



(4) Quilt (Q) (continued from previous page)

(5) Satin (S): 3 pages

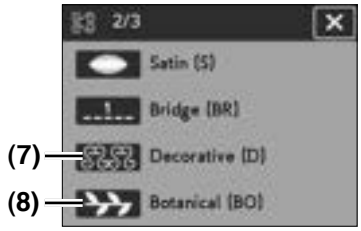
The stitches in this group can be elongated up to 5 times their original length while the stitch density remains the same (refer to page 91).

(6) Bridge (BR): 1 page

Bridge stitches are used for inserting straight stitches after a stitch pattern.

The number beside the stitch image on the straight stitch key indicates the stitch count of a programmable unit.

Patterns BR5, BR6 and BR8 will inherit the needle drop position and stitch length of the previous pattern in the programmed pattern combination (refer to page 97).

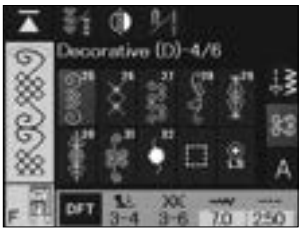


(7)













(8)







(7) Decorative (D): 6 pages

42 attractive patterns are available in this group. Patterns in this group are ideal for decorating (refer to page 92).

(8) Botanical (BO): 3 pages

There are patterns of trees, grass and flowers in this group.



(9)







(9) Long (L): 3 pages

Patterns in this group are ideal for decorating garments and for adding border trims.

(10)





(10) Life Style (LS): 2 pages

There are patterns related to lifestyle in this group.

(11)

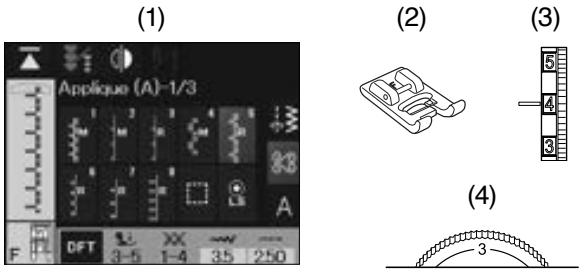






(11) Kids (K): 3 pages

There are patterns for kids in this group.

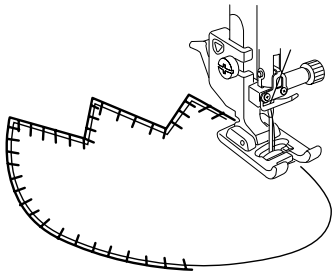


Applique

Machine settings

(1) Stitch pattern: A1-A18
(2) Presser foot: Satin stitch foot F
(3) Thread tension: 1-4
(4) Foot pressure: 3-4

NOTE:
Adjust the foot pressure to 4 or lower with the presser foot pressure dial.



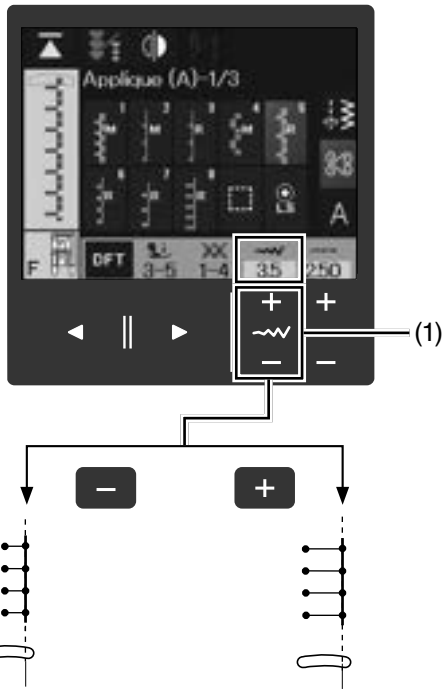
To sew:

Place an applique on the fabric and baste it in place or use a fusible web to secure the applique in place.

Guide the applique fabric, so that the needle falls off the edge of the applique when the needle swings to the right.

When turning a sharp corner, stop the machine with the needle at the outer edge of the applique.

Raise the foot and pivot the fabric around the needle to change the sewing direction.



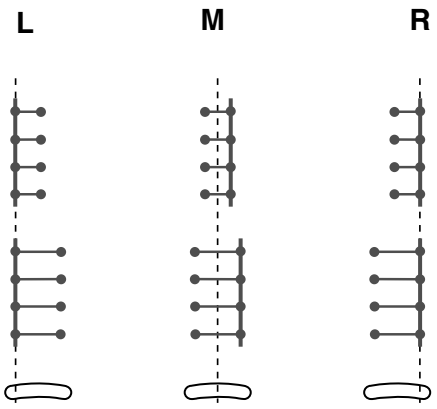
The stitch width can be altered by pressing the stitch width adjustment keys.

(1) Stitch width adjustment keys

Press the “+” key to increase the stitch width.

Press the “–” key to decrease the stitch width.

The letter beside the stitch image denotes the baseline of the needle drop position.



L: Left

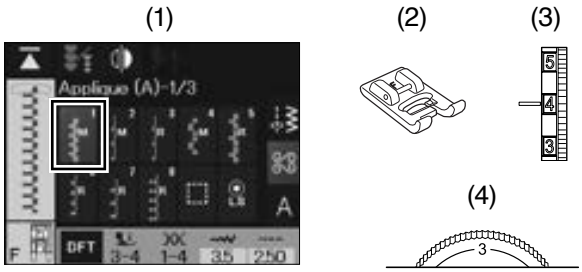
When you change the stitch width, the right needle drop position will change.

M: Middle (center)

The stitch width changes symmetrically.

R: Right

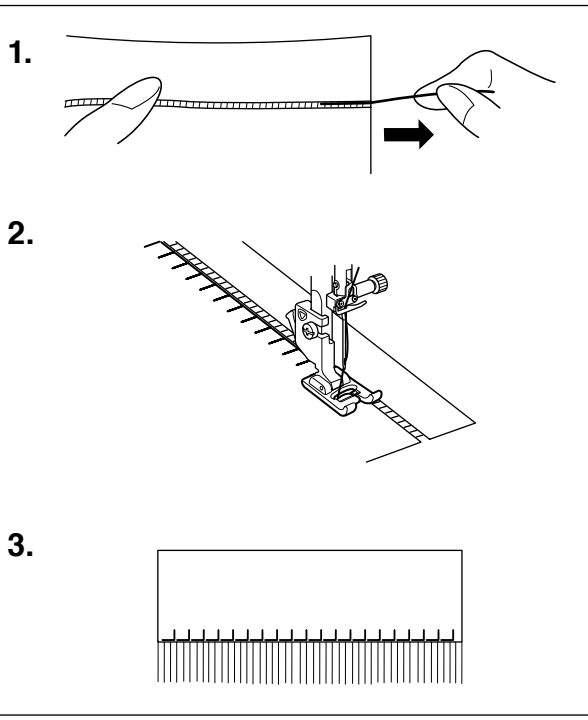
When you change the stitch width, the left needle drop position will change.



Fringing

Machine settings

(1) Stitch pattern: A1
(2) Presser foot: Satin stitch foot F
(3) Thread tension: 1-4
(4) Foot pressure: 3-4

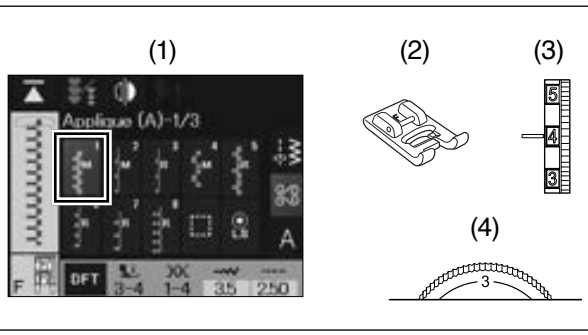


Fringing adds a special touch on table linens and shawls. Choose a firm, woven fabric like linen where threads can be removed easily.

1. Carefully cut the fabric on the grain. Remove a single strand of yarn or thread where the fringing is to begin.

2. Sew down the left side so the right hand stitches fall in the open space.

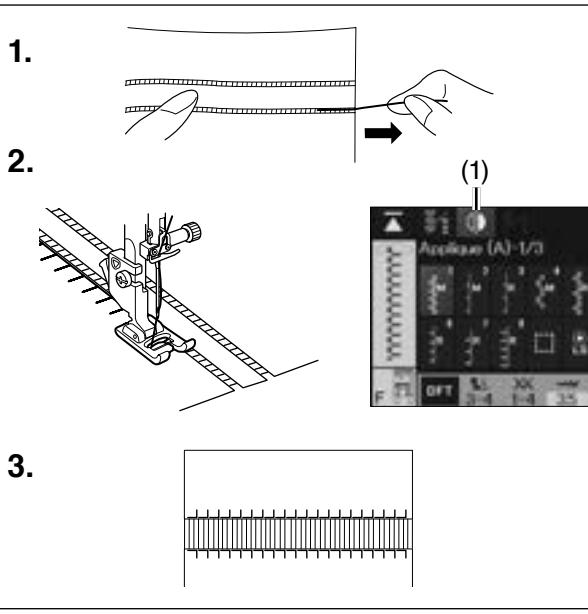
3. Remove all excess yarn located to the right of the stitching and create a fringe.



Drawn Work

Machine settings

(1) Stitch pattern: A1
(2) Presser foot: Satin stitch foot F
(3) Thread tension: 1-4
(4) Foot pressure: 3-4



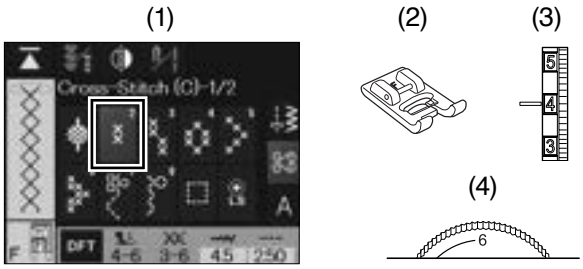
Drawn work uses the same method as fringing. Choose a firm, woven fabric like linen where threads can be removed easily.

1. Carefully cut the fabric on the grain. Determine the width of the drawn work and remove one strand of yarn or fabric thread at each end.

2. Sew down the left side, guiding the fabric so the right hand stitches fall in open space. After finishing the left side, press the vertical mirror image key. Sew down the other side (refer to pages 95-96).

(1) Vertical mirror image key

3. Remove the yarn or fabric threads between the stitching.

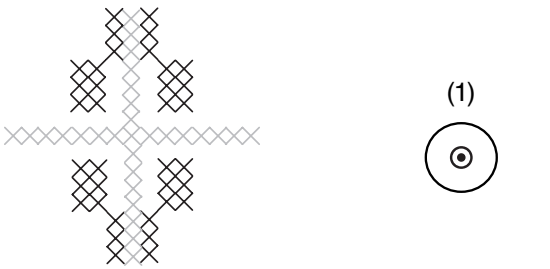


Cross-Stitch

Select the desired pattern in Cross-Stitch category (refer to page 80).

Machine settings

(1) Stitch pattern: C1-C13
(2) Presser foot: Satin stitch foot F
(3) Thread tension: 3-6
(4) Foot pressure: 4-6

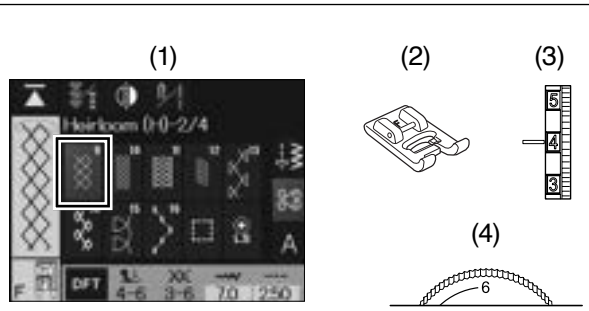


You can make cross stitch designs with these patterns in half the time it would take if embroidered by hand.

Sew from the center of the design outward.

If you press the auto-lock button before sewing, the machine will sew one unit of the cross stitch and stop automatically.

(1) Auto-lock button



Heirloom

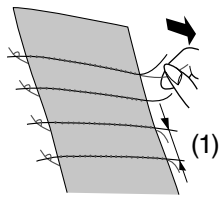
Smocking

Select the desired pattern in Heirloom category (refer to page 80).

Machine settings

(1) Stitch pattern: H8-H12
(2) Presser foot: Satin stitch foot F
(3) Thread tension: 3-6
(4) Foot pressure: 4-6

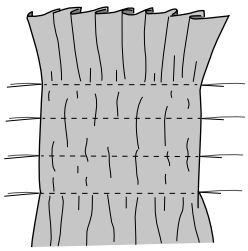
1.



1. Choose a soft, lightweight fabric such as batiste, gingham or challis. Cut the fabric three times wider than the projected width.

> **NOTE:**
> Pull up the bobbin thread and draw a 10 cm (4″) thread tail to the back before starting to sew.
> Use the thread cutter on the face cover.

2.



Sew rows of straight stitches, 1 cm (3/8″) apart with the stitch length between “3.00” to “5.00” and thread tension dial at “1” to across the area to be smocked (refer to page 20, 41).

(1) 1 cm (3/8″)

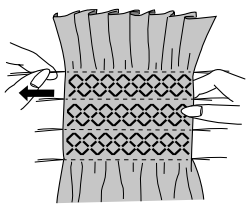
2. Tie the threads along one edge.

Pull the bobbin threads at the end to gather the fabric.

Knot the threads at the end and distribute the gathers evenly.

Use an iron to press the gathered fabric.

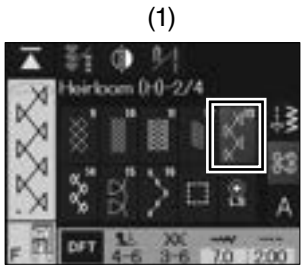
3.

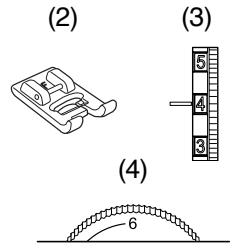


3. Select a smocking stitch and return the thread tension dial to “3” to “6”.

Sew the smocking stitches between the gathered rows.

Remove the straight stitches between the gathered rows.

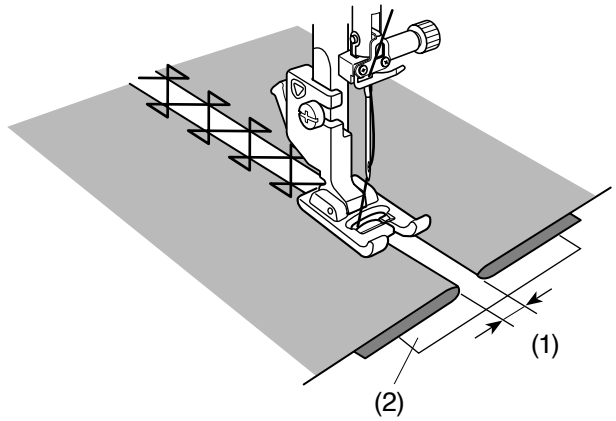




Fagoting

Machine settings

(1) Stitch pattern: H13, H25
(2) Presser foot: Satin stitch foot F
(3) Thread tension: 3-6
(4) Foot pressure: 4-6



Use this stitch to join two pieces of fabric to create an open work appearance and add design interest.

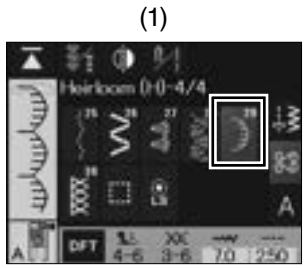
Fold under each fabric edge 1.5 cm (5/8″) and press.

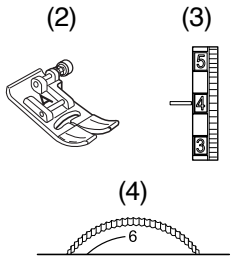
Pin the two edges to paper or tear away backing 0.3 cm (1/8″) apart.

(1) 0.3 cm (1/8″)
(2) Paper

Sew slowly, guiding the fabric so the needle catches the folded edge on each side.

After finishing sewing, tear away the paper.

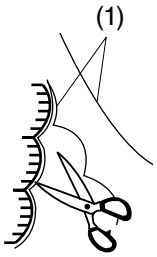




Scallop

Machine settings

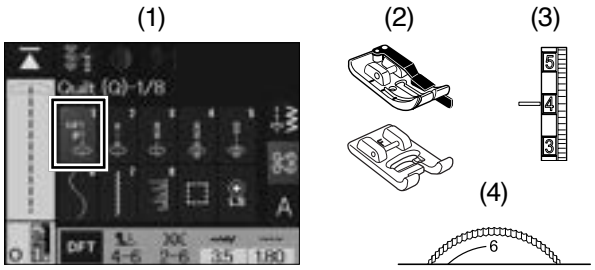
(1) Stitch pattern: H29, S6, S22
(2) Presser foot: Zigzag foot A
(3) Thread tension: 3-6
(4) Foot pressure: 4-6



Sew scallops 1 cm (3/8″) from the fabric edge.
Trim the allowance close to the stitches.

Make sure not to cut the stitches.

(1) 1 cm (3/8″)

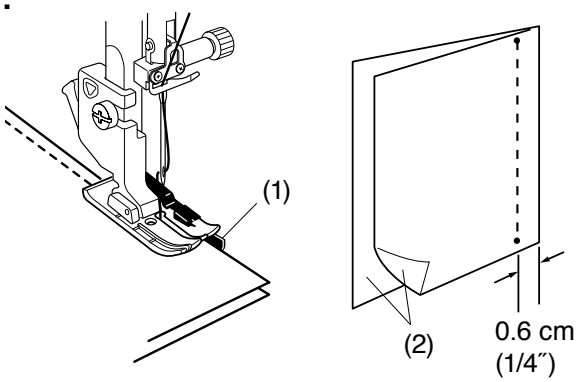


Patchwork Piecing

Machine settings

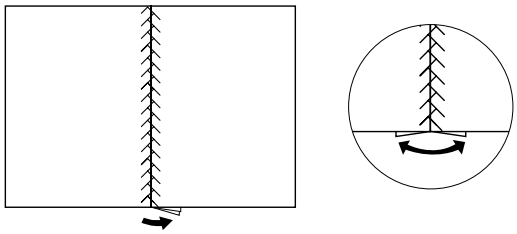
(1) Stitch pattern: Q1
(2) Presser foot: 1/4″ seam foot O
Satin stitch foot F
(3) Thread tension: 2-6
(4) Foot pressure: 4-6

1.



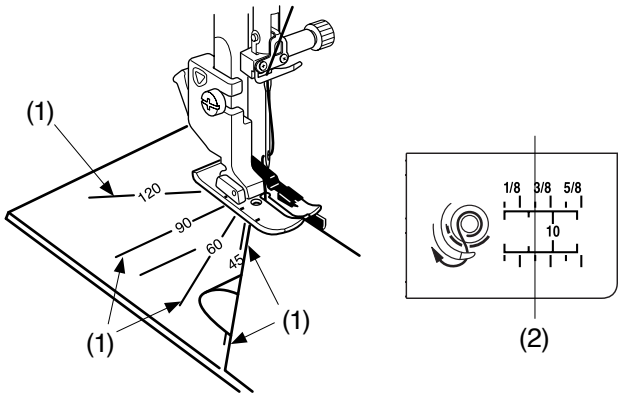
1. Place the patchwork pieces right sides together.
Sew while guiding the edge of the fabric along the guide.
(1) Guide
(2) Right sides of the fabric

2. 3.



2. Replace the presser foot with satin stitch foot F.
Press the seam allowance to one side or open.

3. Sew the stitch pattern on the right side of the garment centering over the seam line.



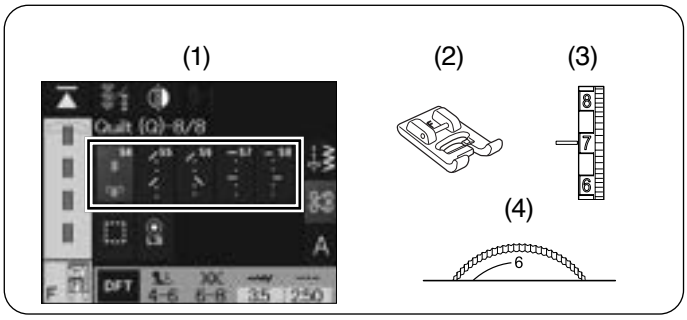
Angle scales on the needle plate

You can easily seam patchwork pieces at the desired angle without marking, by using the angle scales on the needle plate.

The angle scales are marked at 45, 60, 90 and 120 degrees.

Align the edge of the fabric to the 1/4″ seam guide line.

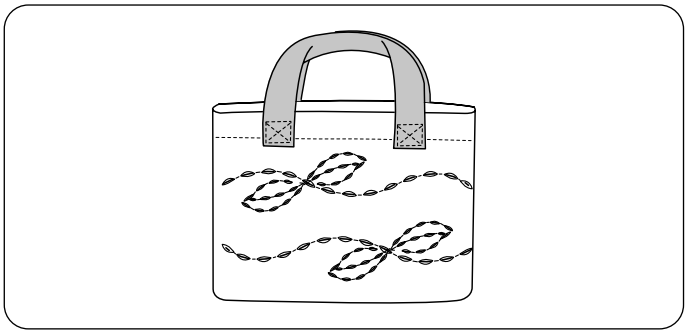
(1) Angle scales
(2) 1/4″ seam guide line



Q54-Q58 Hand-look quilt stitches

Machine settings

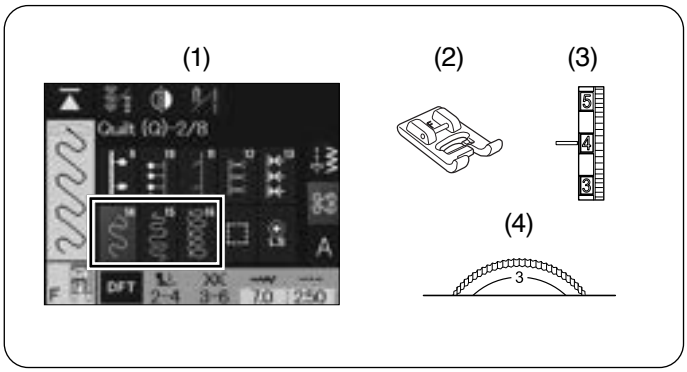
(1) Stitch pattern: Q54-Q58
(2) Presser foot: Satin stitch foot F
(3) Thread tension: 6-8
(4) Foot pressure: 4-6



Patterns Q54 to Q58 are special stitches for quilting which look like hand sewn stitches.

Use a transparent nylon thread for the needle and ordinary sewing thread for the bobbin.

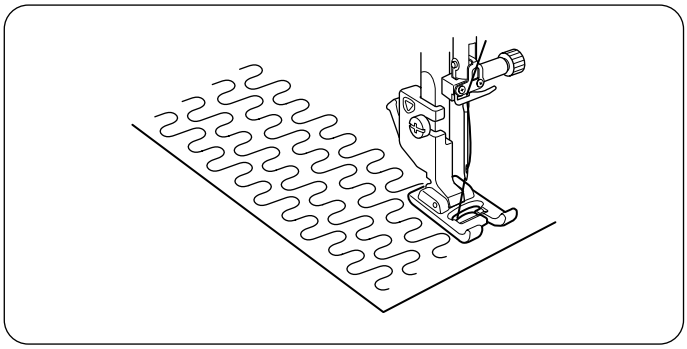
The recommended needle size is #14/90 - #16/100. The bobbin thread is pulled up on the right side of the fabric and the stitches look as if they were sewn by hand.



Stippling

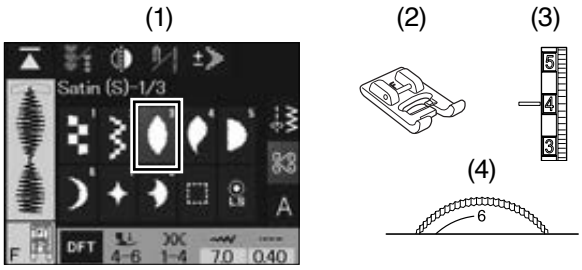
Machine settings

(1) Stitch pattern: Q14-Q18
(2) Presser foot: Satin stitch foot F
(3) Thread tension: 3-6
(4) Foot pressure: 2-4



A pre-programmed stippling stitch is a fast and easy method to quilt small areas.

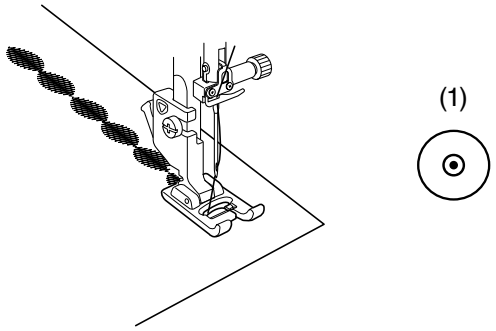
Place a quilt layer and sew.



Satin Stitches

Machine settings

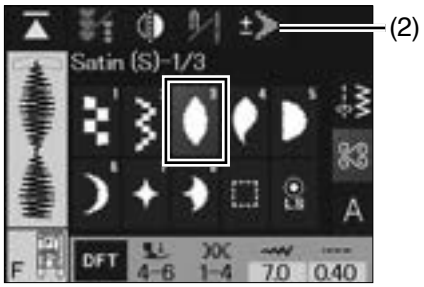
(1) Stitch pattern: S1-S24
(2) Presser foot: Satin stitch foot F
(3) Thread tension: 1-4
(4) Foot pressure: 4-6



For better sewing results, interfacing should be used on the wrong side of the fabric when you use stretch or elastic fabrics.

Press the auto-lock button to finish the end of the pattern.

(1) Auto-lock button



Elongation ratio

Patterns S1 to S24 are decorative satin stitches for which the pattern length can be elongated without changing the stitch density.

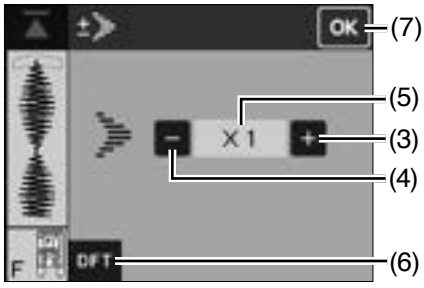
Press the elongation key to select the desired elongation ratio.

(2) Elongation key

Press the “+” key to elongate the stitch pattern.

Press the “–” key to reduce the elongation ratio.

(3) “+” key
(4) “–” key



The pattern can be elongated up to 5 times the original length.

The elongation ratio is indicated in the box.

(5) Elongation ratio

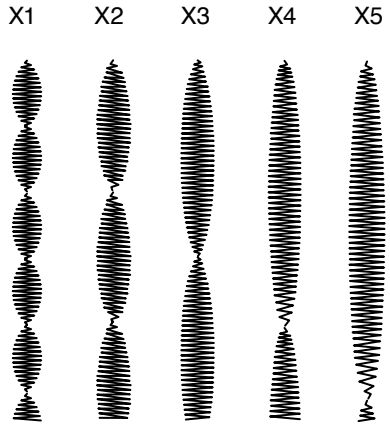
Press the default key to recover the original stitch setting.

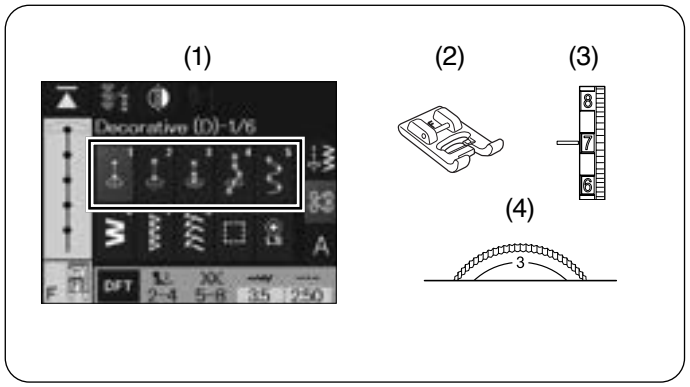
(6) Default key

Press the OK key to start sewing.

(7) OK key

The stitch length and width can also be changed.





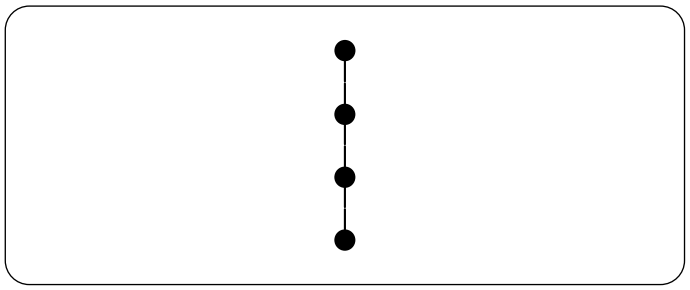
Bridge Stitches

Select the desired pattern in Quilt category (refer to page 80).

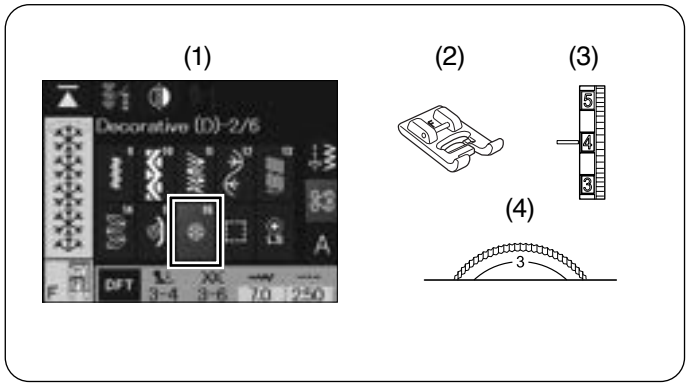
French knots and Candlewick knots

Machine settings

(1) Stitch pattern: D1
(2) Presser foot: Satin stitch foot F
(3) Thread tension: 5-8
(4) Foot pressure: 2-4



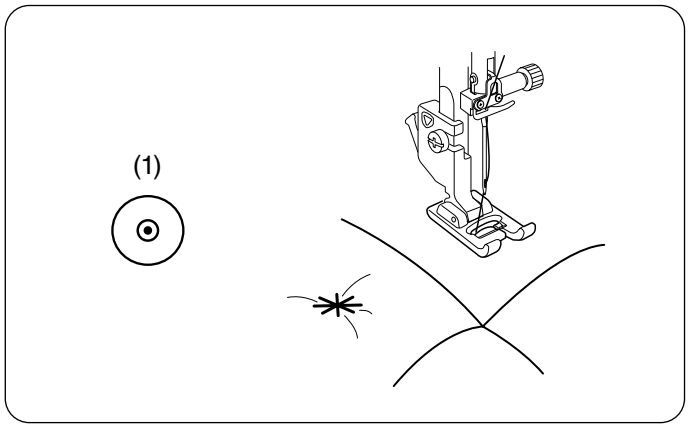
Tighten the thread tension to “5” to “8” when sewing.



Clasp Stitch

Machine settings

(1) Stitch pattern: D16
(2) Presser foot: Satin stitch foot F
(3) Thread tension: 3-6
(4) Foot pressure: 3-4



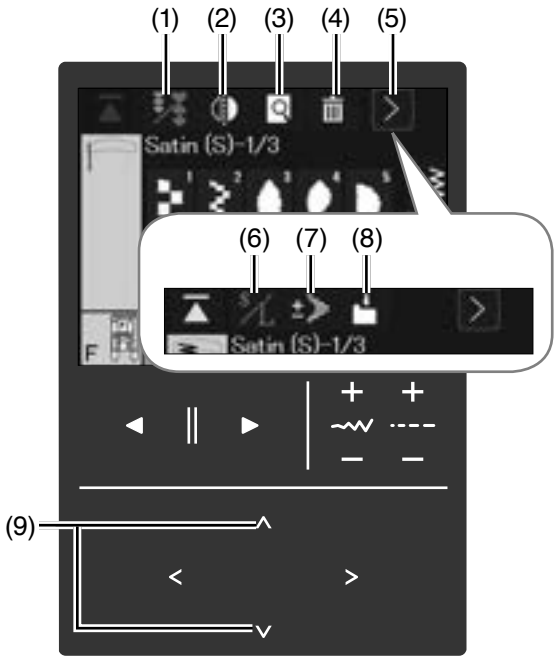
You can close quilt layers and batting using the clasp stitch.

Press the auto-lock button.

(1) Auto-lock button

The machine sews one unit of the pattern and automatically stops when completed.





PROGRAMMING A PATTERN COMBINATION

The patterns in the decorative stitch category and monograms can be programmed to make a pattern combination.

You can program up to 100 patterns in each combination by pressing the program key.

The images of programmed patterns are shown in the edit box.

To sew a pattern combination, press the program key.

(1) Program key

When this key is pressed, preview key (3), delete key (4), letter size key (6), elongation key (7) and the save file key (8) will be added to the function keys.

Press the function switch key (5) to show rest of keys.

(1) Program key

Press this key to program a pattern combination.

(2) Vertical mirror image key

Press this key to sew a vertical mirror image of the selected pattern (refer to pages 95-96).

(3) Preview key

Press this key to view the stitch image of the entire pattern combination (refer to page 101).

(4) Delete key

Press this key to delete the character above the cursor or the character in front of the cursor (refer to page 98).

(5) Function switch key

Press this key to switch the function keys.

(6) Letter size key

Press this key to select full size (L) or small size (S) (refer to page 105).

(7) Elongation key

Press this key to elongate up to 5 times their original length while the stitch density remains the same (refer to page 91)

(8) Save file key

Press this key to save the pattern combination as a file (refer to pages 157-161).

(9) Cursor keys

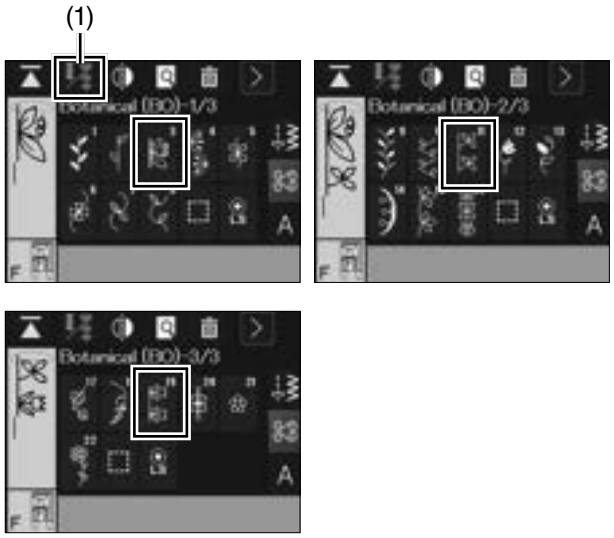
Press one of these keys to move the cursor up or down (refer to page 98).

Pattern Combination

Example: Patterns 3 and 11 and 19 (Botanical)

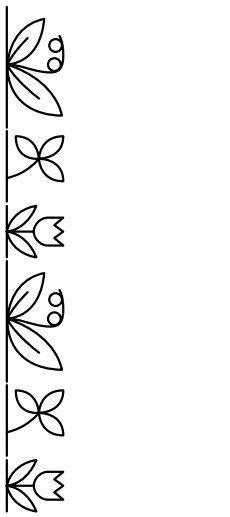
1. Press the program key.
Select patterns 3, 11 and 19 (Botanical).
(1) Program key

1.

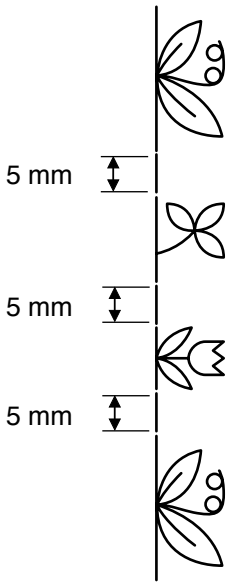


2. Start sewing. Combination of patterns 3, 11 and 19 will be sewn continuously.

2.



NOTE:
If you press the auto-lock button in the middle of sewing, the machine will sew to the end of the current pattern, sew locking stitches and stop automatically.



Using space key **and lock stitch key**

- Use space key to insert a blank space (approx. 5 mm) between stitch patterns.
  Spacing can be adjusted with stitch length adjustment keys.
- Use lock stitch key to sew locking stitches and the machine stops automatically.
  When one or some patterns are combined with a locking stitch at the end, the machine will sew locking stitches at the end after sewing and stop automatically.

Pattern Combination with a Mirror Image

NOTE:
The vertical mirror image key will gray out when the selected pattern is not suitable for the mirror image.

Vertical mirror image (pattern combination)

Example: Pattern S6

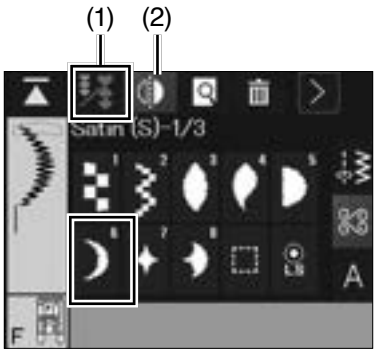
1. Press the program key to program a pattern combination.

Select pattern S6.

Press the vertical mirror image key to sew a vertical mirror image of the selected pattern.

Press the vertical mirror image key again to cancel the mirror image function.

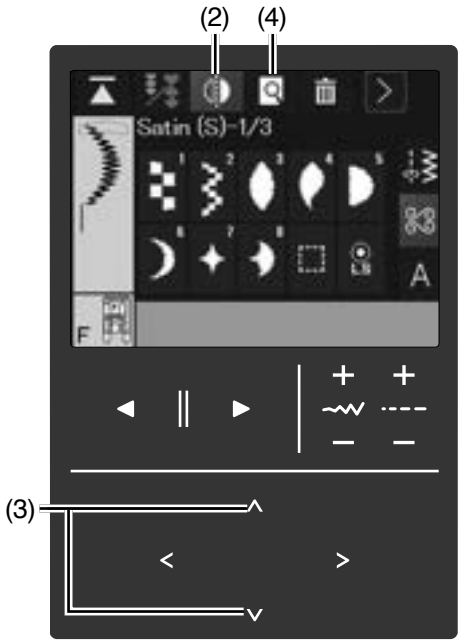
(1) Program key
(2) Vertical mirror image key



2. Vertical mirror image key turns blue.

Press pattern S6.

(2) Vertical mirror image key



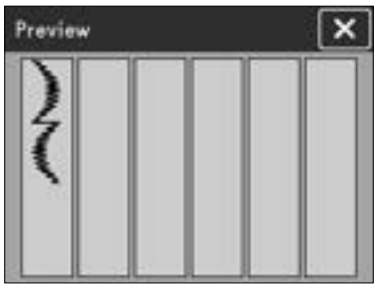
3. Start sewing.

The machine will sew the pattern combination repeatedly.

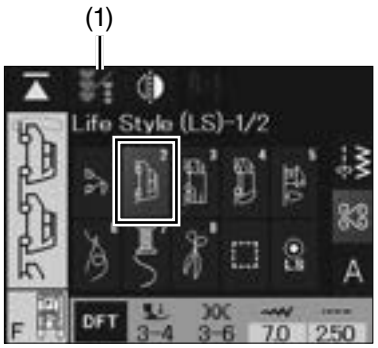
To view the entire pattern combination, press the cursor keys to scroll over the pattern combination or press the preview key to show the entire pattern combination at a glance (refer to page 101).

(3) Cursor keys
(4) Preview key

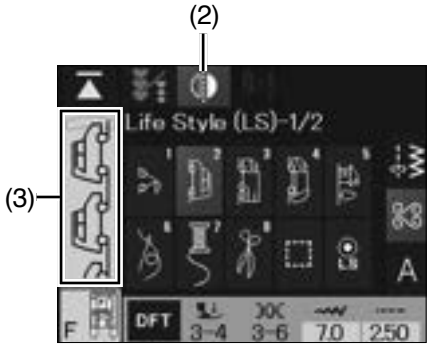




1.



2.





Vertical mirror image (ordinary sewing)

Example: Pattern LS2

1. Select pattern LS2.

2. Press the vertical mirror image key to sew a vertical mirror image of the selected pattern.

Vertical mirror image key turns blue.

Press the vertical mirror image key again to cancel the mirror image function.

(1) Program key
(2) Vertical mirror image key
(3) Preview

NOTE:
Pattern will be sewn continuously flipped when the vertical mirror image key is turned blue.
Press the vertical mirror image key again to cancel the function.

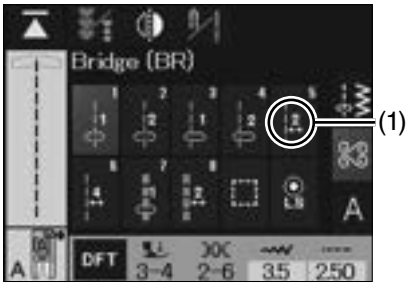
(4) Preview

Bridge Stitches

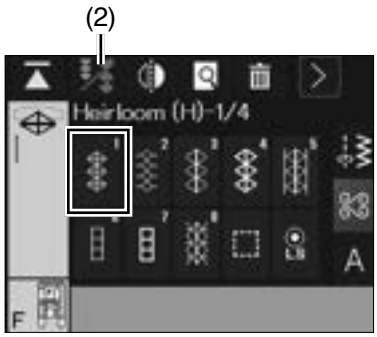
Bridge stitches are used to insert straight stitches after stitch pattern.

The number beside the stitch image on the straight stitch key indicates the stitch count of a programmable unit.

(1) Number



1.



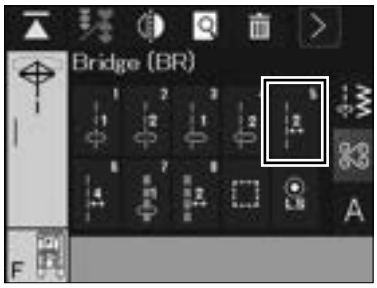
Example: Insert pattern BR5 between patterns H1

1. Press the program key.

(2) Program key

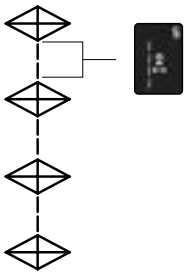
Press the pattern H1.

2.



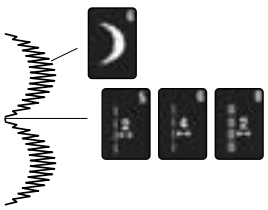
2. Select pattern BR5.

3.



3. Start sewing. Two counts of straight stitches are added to pattern H1.

(A)



(B)

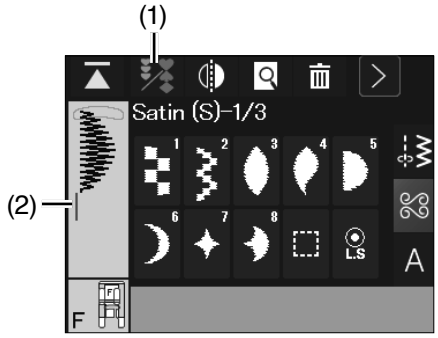


NOTE:

The number beside the stitch image indicates stitch counts to be inserted.

(A) Patterns BR5, BR6 and BR8 will inherit the stitch length and needle drop position of a previous pattern in the programmed pattern combination.

(B) Use patterns BR1 - 4 and BR7 with satin stitches.

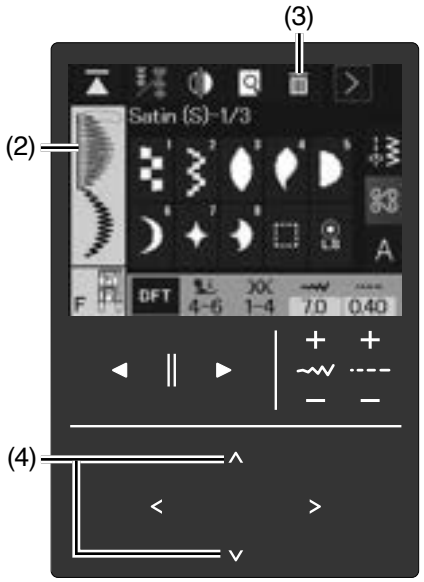


Editing a Pattern Combination

The programmed pattern (pattern combination) can be edited in the programming mode.

You can insert, delete or flip the stitch pattern by selecting the stitch with the cursor. You can also adjust the stitch width and stitch length.

(1) Program key
(2) Cursor



Deleting a Pattern

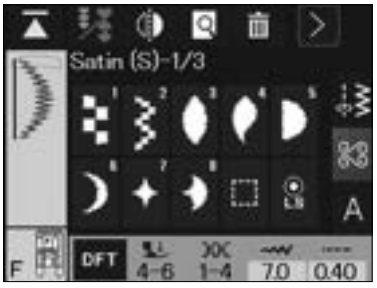
The pattern before the cursor or shown in blue is deleted by pressing the delete key.

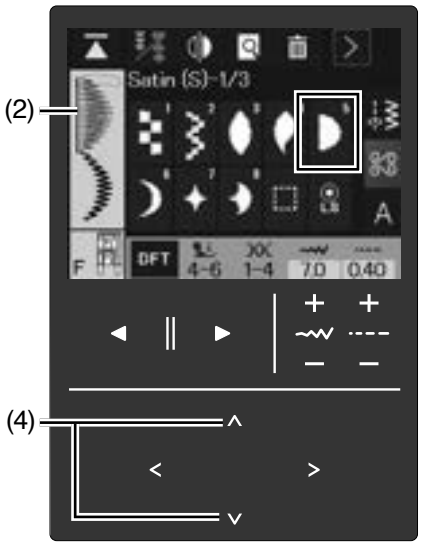
To delete a pattern in the middle of a combination, press the cursor keys to select the pattern you wish to delete.

The stitch image of the selected pattern turns blue.

Press the delete key to delete the selected pattern.

(2) Cursor
(3) Delete key
(4) Cursor keys





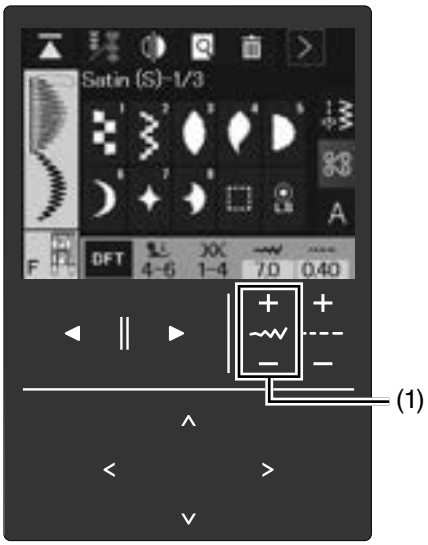
Inserting a Pattern

Press the cursor keys to select the pattern next to where you wish to insert a pattern.

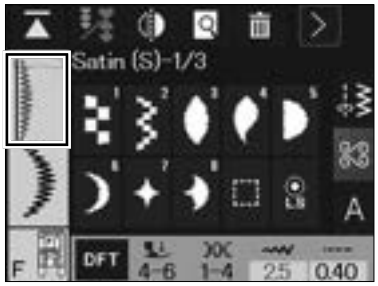
Enter the desired pattern to insert it before the selected pattern.

(2) Cursor
(4) Cursor keys

1.



2.



Individual stitch adjustment

The stitch width and length can be individually adjusted for each pattern in a programmed combination.

Example: Change the stitch width of the one pattern in the combination

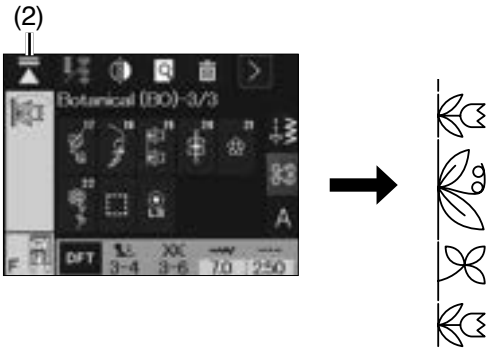
1. Change the stitch width from “7.0” to “2.5” by pressing the “–” key.

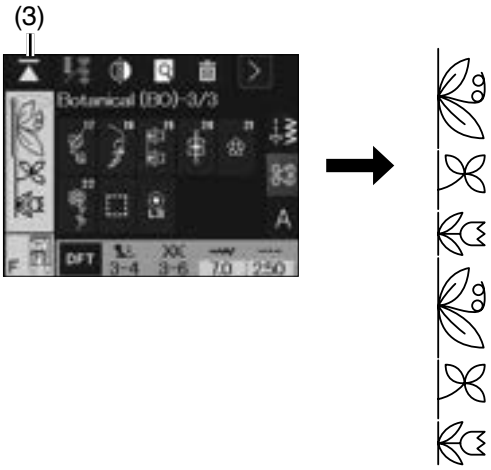
(1) Stitch width adjustment keys

2. The stitch width of the selected pattern is changed and the stitch pattern image shown in the edit box is also changed.

NOTE:
The pattern shown in blue with cursor can be changed or deleted.







Startover Key

This is a 2-way function key to start sewing a pattern combination over from the beginning.
When you stop sewing a pattern combination, the startover key is activated.

Example: BO3, BO11, BO19 (pattern combination)

Current pattern startover

If you wish to start sewing from the beginning of the current pattern, press the startover key once and start the machine. The key will change and show a triangle and double bar that means the machine will start over from the current pattern of the combination.

(1) Startover key
(2) Startover key (current pattern of the combination)

NOTE:
When you stop sewing a pattern combination during the first pattern and press the startover key, the number of the bar above the triangle will not change because the pattern will be sewn from the first pattern.

First pattern startover

The key shows a triangle and single bar that means the machine will start over from the first pattern.
If you wish to start sewing from the beginning of the first pattern of the combination, press the startover key twice and start the machine.

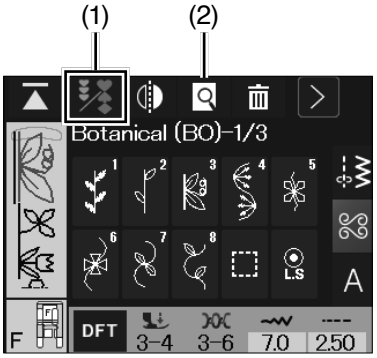
(3) Startover key (first pattern of the combination)

NOTE:
If auto thread cutting is done, the machine will startover from the first pattern.

Preview

To view the entire pattern combination, press the preview key to show the entire pattern combination at a glance.

(1) Program key (pattern combination)
(2) Preview key

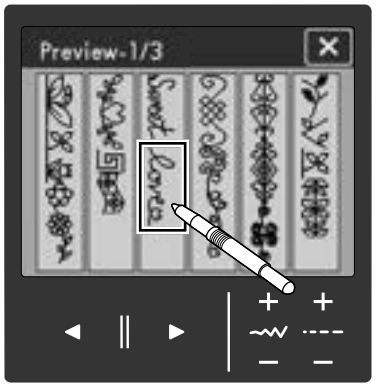




If the entire pattern combination exceeds the preview window, press the next page key to show the rest of the entire pattern combination.

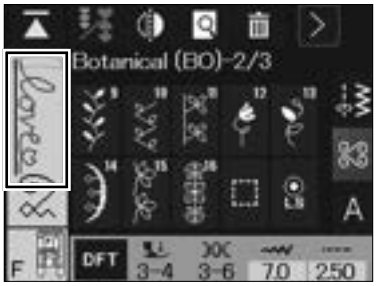
Press the X key to close the preview window.

(3) Next page key
(4) X key



Selecting patterns from preview window

If you press one of the stitch images in the preview window, the selected stitch image will be displayed at the edit box.



MONOGRAMMING

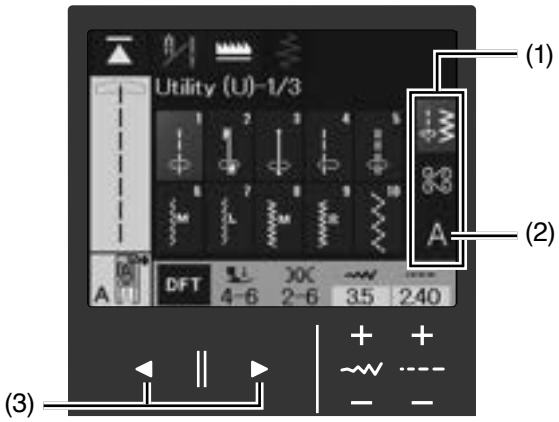
You can program letters and symbol designs for monogramming.

Press one of the category selection keys to select the category.

Each category is composed of multiple pages.

To select the monogram, press the monogram key.

Press page keys to switch the pattern selection window.



(1) Category selection keys
(2) Monogram key
(3) Page keys

You can select one of 6 fonts.
Press the page keys to switch the font selection window.

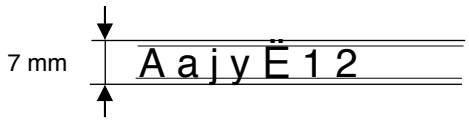
Select the desired font by pressing the font keys.

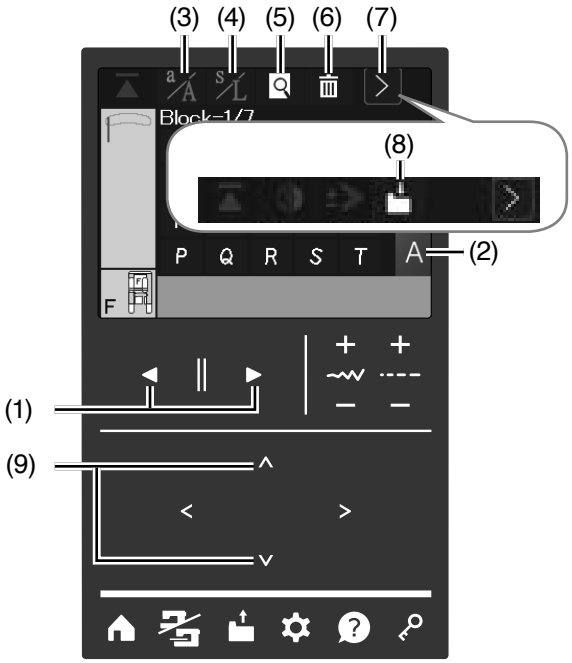


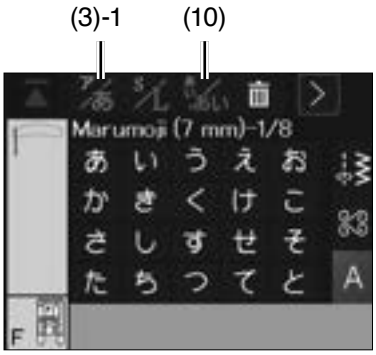
(1) Block key
(2) Script key
(3) Broadway key
(4) Cyrillic key
(5) Block (7 mm) key
(6) Marumoji (7 mm) key



NOTE:
The heights of Block (7 mm) and Marumoji (7 mm) are approximately 7 mm.







Pattern Selection Window

Select the font and pattern selection window will open.

Press the page keys to switch the font selection window.

(1) Page keys

The pattern selection window is composed of multiple pages.

(2) Monogram key

Press this key to open the font selection window.

(3) Letter case key

Press this key to select upper case or lower case.

> **NOTE:**
> Press the letter case key (3)-1 to switch Hiragana or Katakana for monograms when selecting Japanese Marumoji (7 mm).

(4) Letter size key

Press this key to select the full size (L) or small size (S) (refer to page 105).

(5) Preview key

Press this key to show the entire pattern combination.

(6) Delete key

Press this key to delete selected characters.

(7) Function switch key

Press this key to switch the function keys.

(8) Save file key

Press this key to save the monogram as a data file (refer to pages 157-161).

(9) Cursor keys

Press these keys to move the cursor up or down.

(10) Horizontal/Vertical orientation key

Press this key to switch the horizontal or vertical orientation.

This key is displayed only when Marumoji (7 mm) is selected.

Programming a Monogram

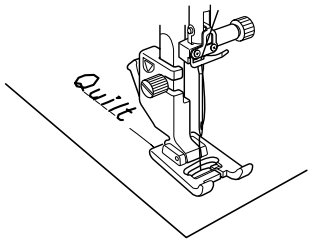
Simply enter the characters by pressing the corresponding keys to program a monogram.

NOTE:
- Use a blue tip needle for sewing a monogram.
- Apply a sheet of stabilizer to fine fabrics or stretch fabrics.
- Test sew to check the sewing results.



(2)





Example 1: “Quilt” in Block font

Press the monogram key and select Block font.
Enter “Q”.
(1) Monogram key

Press the letter case key to select lower case.
(2) Letter case key

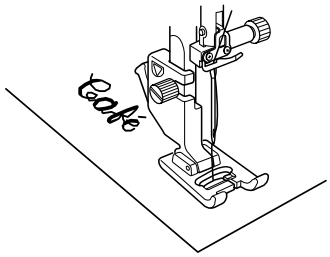
Enter “u”, “i”, “l” and “t”.

Start sewing. Sew until the machine stops.



(2)





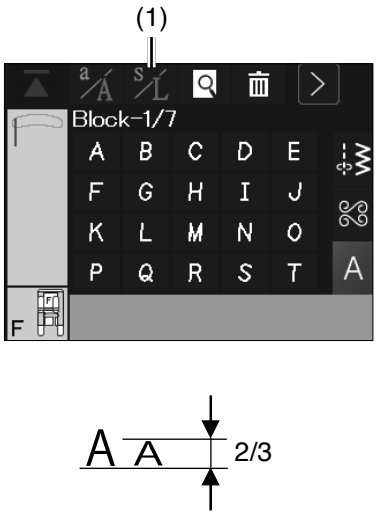
Example 2: “Café” in Script font

Press the monogram key and select Script font.
Enter “C”.
(1) Monogram key

Press the letter case key and select lower case letters.
Enter “a” and “f”.
(2) Letter case key

Press the next page key 4 times to go to page 5/7.
Enter “é”.
(3) Next page key

Start sewing. Sew until the machine stops.

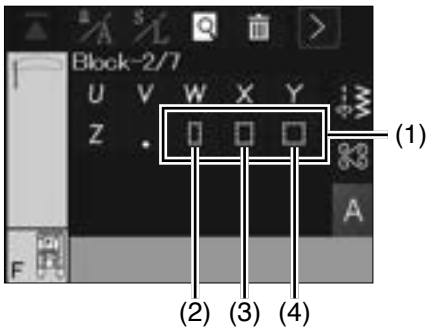


Reducing the Size of Letters

To reduce the height of a character to approximately 2/3 of its original size, select the character and press the letter size key.

(1) Letter size key

NOTE:
The height of Kanji characters cannot be reduced.



Spacing

To enter a space in monogramming, press one of the three space keys on the lower right corner of the monogram selection.

(1) Space keys
(2) Small-size space
(3) Medium-size space
(4) Large-size space

NOTE:
Size of spacing may vary depending on the settings adjusted with stitch length adjustment keys (refer to page 41).

Twin Needle Sewing

Some of the utility stitches and decorative stitches can be sewn with a twin needle.

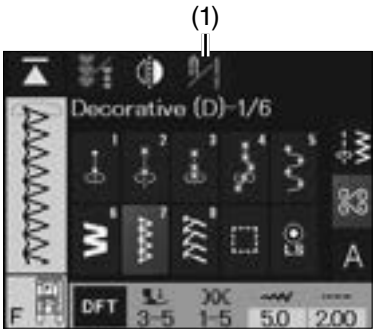
Replace the needle with the twin needle supplied with the standard accessories (refer to page 27).

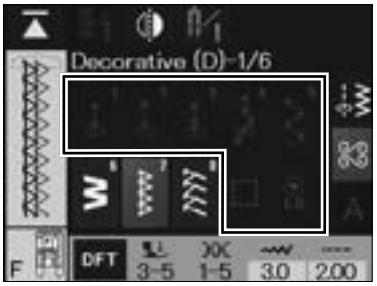
Preparation

Press the twin needle key and select the desired pattern.

Patterns not suitable for twin needle sewing cannot be selected (pattern selection keys are grayed out).

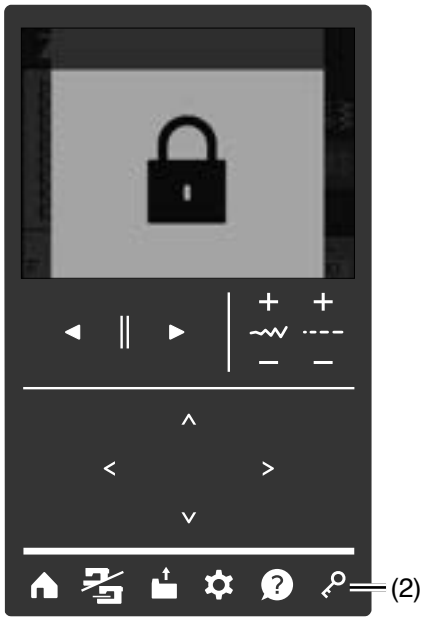
(1) Twin needle key





NOTE:

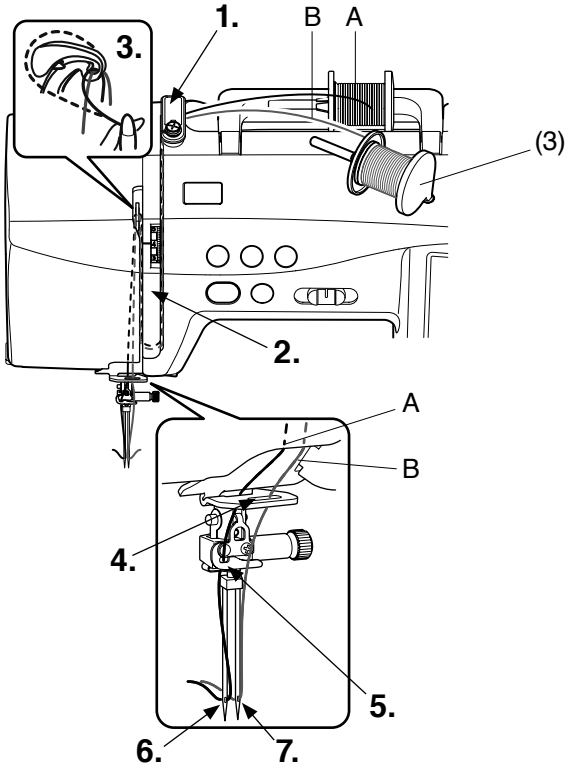
- When you sew patterns with the twin needle, test the stitches first before you sew on the garment.
- Use zigzag foot A or satin stitch foot F for twin needle sewing.
- Use the threads #60 or finer.
- When changing the sewing direction, raise the needle and presser foot then turn the fabric.
- Use the thread cutter on the face cover when cutting threads.



⚠ CAUTION:

- Always make sure to press the lockout key to lockout the machine before changing the needle.
- Do not use twin needles other than the ones included in the standard accessories, otherwise the needle may hit the needle plate, foot or hook and break.

(2) Lockout key



Insert the extra spool pin into the hole for extra spool pin.

Place a spool of thread on the extra spool pin (refer to page 29).

(3) Extra spool pin

Draw both threads from the spools and pass them through the threading points from **1.** to **3.**

Slip the thread A through the lower thread guide **4.**, then pass through point **5.**, and the needle hole **6.** as illustrated.

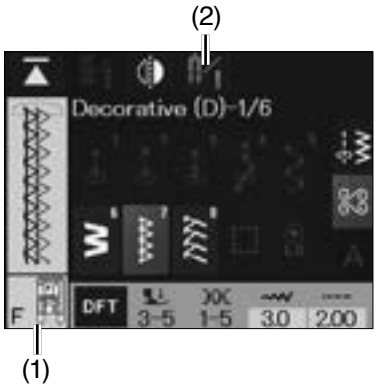
Thread the thread B through the front hole of lower thread guide **4.**, then to the needle hole **7.** as illustrated.

Make sure that the two strands of thread from the spools do not get tangled.

A: Thread from spool pin
B: Thread from extra spool pin

NOTE:
- Threading from points **1.** to **3.** is the same as for a single needle (refer to pages 32-33).
- The needle threader cannot be used with the twin needle.

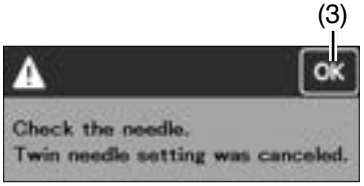
1.



2.



3.



To sew:

1. Replace the presser foot suitable for the selected pattern in twin needle sewing.

(1) Presser foot

2. Draw the needle thread to the rear when using zigzag foot A.

Draw the needle thread to the left when using satin stitch foot F.

Lower the presser foot lifter and start sewing.

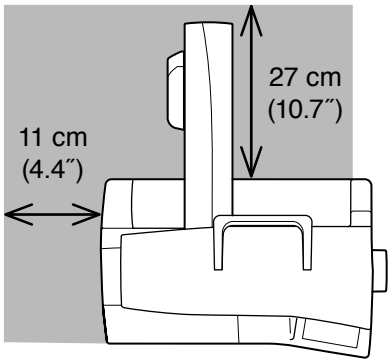
3. After twin needle sewing is finished, press the twin needle key and the warning message will appear.

Replace the twin needle with a single needle and press the OK key.

(2) Twin needle key
(3) OK key

EMBROIDERY MODE

Embroidery Unit



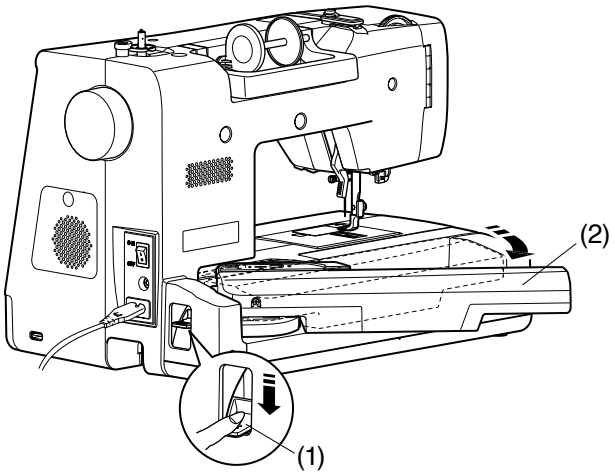
NOTE:
Be sure to provide sufficient space around the machine to allow the hoop to move freely.
Do not place anything inside the area shown on the left.

Extending the carriage arm

1. Press down the carriage arm release lever to extend the carriage arm.

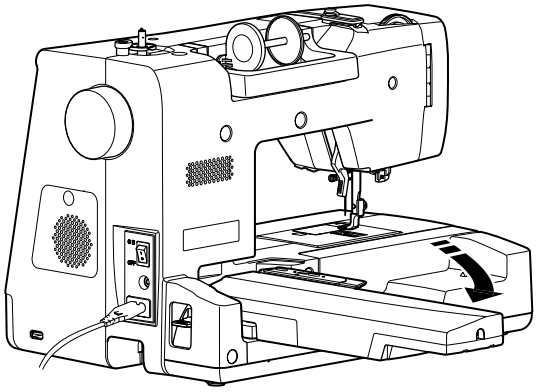
(1) Carriage arm release lever
(2) Carriage arm

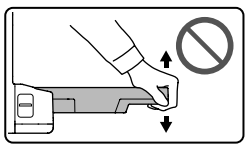
1.

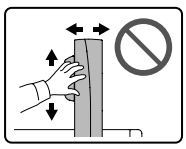


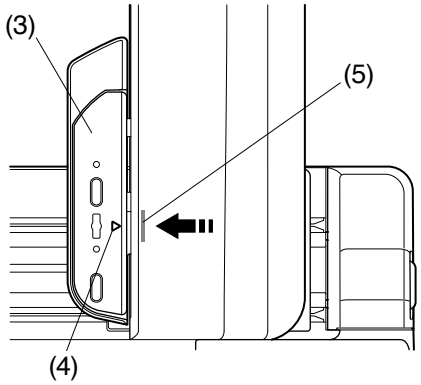
2. Swing out the carriage arm until it locks in the fully extended position.

2.









⚠ CAUTION:

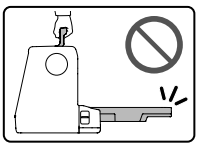
- Do not push on the carriage arm when it is extended.
- Do not force to move the carriage or carriage arm by hand.
- Do not hold the carriage or carriage arm while it is moving.
- Never move the carriage by hand regardless of whether the power is ON or OFF, otherwise the machine may be damaged when opening the carriage arm.
- Be sure that the carriage is at the home position when extending the carriage arm (a triangle mark on the carriage matches with a bar sign on the carriage arm).

(3) Carriage
(4) Triangle mark
(5) Bar sign

Retracting the carriage arm

⚠ CAUTION:
Be sure to retract the carriage arm when carrying or storing the machine.

1.



1. Remove the hoop from the carriage.

Press the mode switch key and the message will appear.

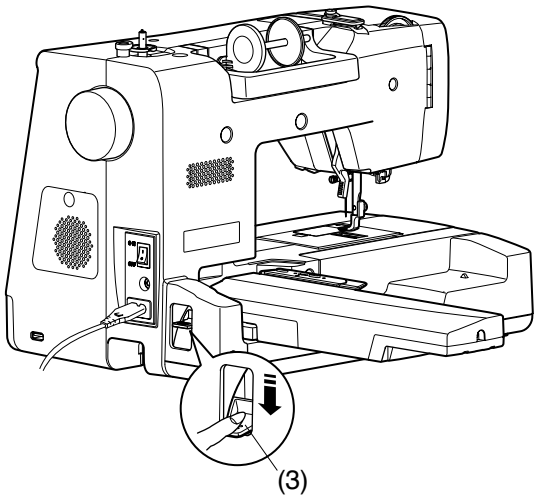
Press the OK key to return the carriage to the home position.

(1) Mode switch key
(2) OK key



NOTE:
- If the needle and the presser foot is in down position, make sure to raise the needle with pressing the needle up/down button and the presser foot with the presser foot lifter.
- You can also return the carriage to home position with pressing the home position key on the embroidery mode window (refer to page 118).

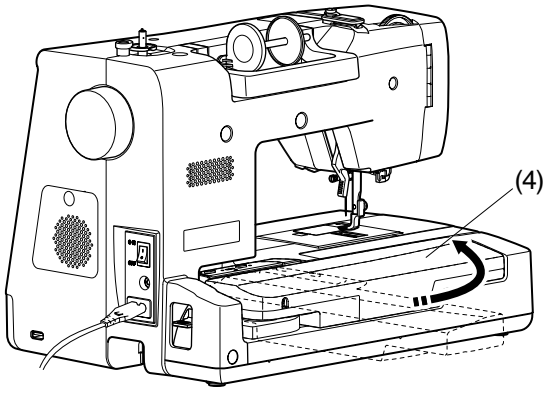
2.



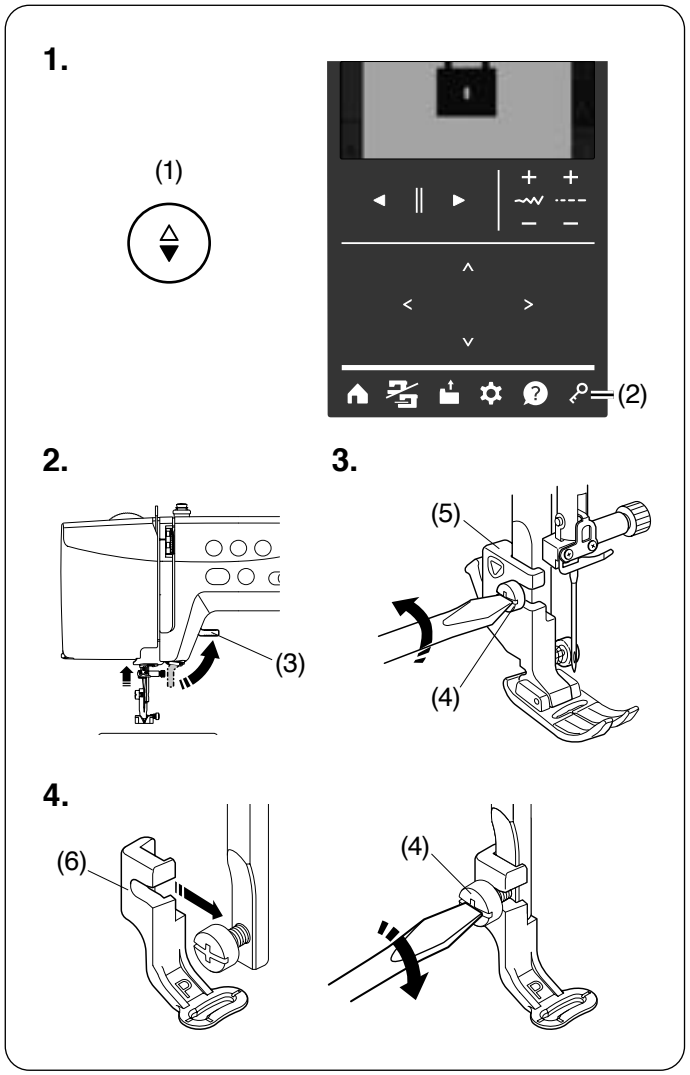
2. Push down the carriage arm release lever to retract the carriage arm.

(3) Carriage arm release lever
(4) Carriage arm

NOTE:
When the carriage arm is retracted, the carriage and carriage arm moves slightly and the feed dogs are lowered.
Be careful not to get anything caught in the gap between the carriage or carriage arm and the sewing machine.



⚠ CAUTION:
- Never move the carriage by hand regardless of whether the power is ON or OFF, otherwise the machine may be damaged when retracting the carriage arm.
- Be sure that the carriage is at the home position when retracting the carriage arm.

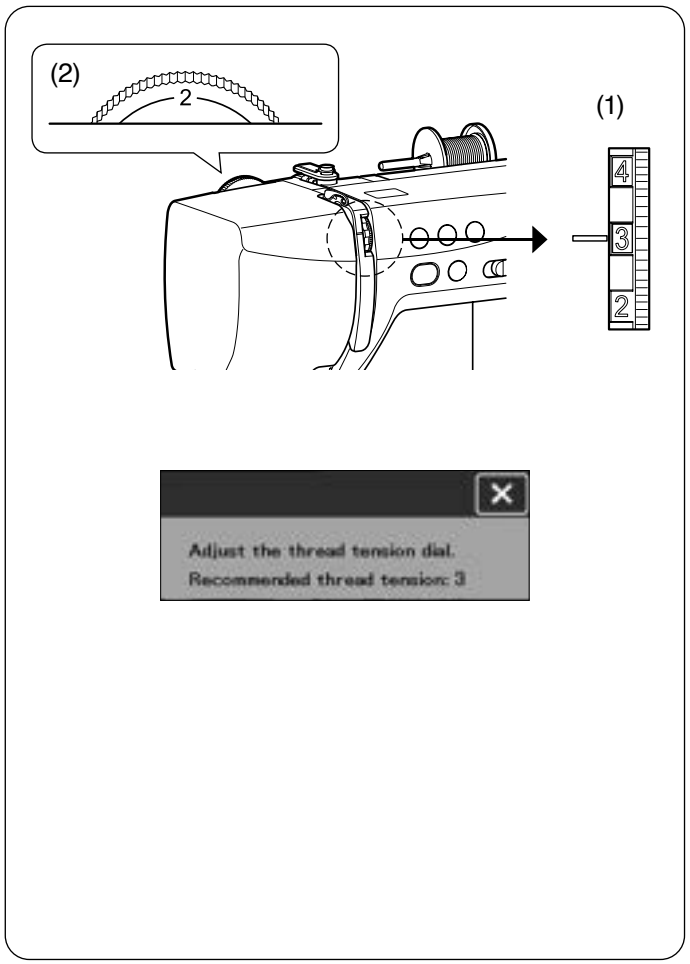


Attaching the embroidery foot P

Use the embroidery foot P for embroidery.

⚠ CAUTION:
Always make sure to press the lockout key to lockout the machine or turn the power switch OFF before replacing the presser foot.

1. Turn the power switch ON.
   Raise the needle by pressing the needle up/down button.
   Press the lockout key to lockout the machine.
   (1) Needle up/down button
   (2) Lockout key
2. Raise the presser foot lifter.
   (3) Presser foot lifter
3. Loosen the setscrew with the screwdriver and remove the foot holder.
   (4) Setscrew
   (5) Foot holder
4. Attach embroidery foot P to the presser bar from behind. Tighten the setscrew with the screwdriver.
   (4) Setscrew
   (6) Embroidery foot P



Thread tension and presser foot pressure

Set the thread tension dial at “3” for embroidery.

Set the presser foot pressure dial at “2” for embroidery.

(1) Thread tension dial
(2) Presser foot pressure dial

NOTE:
If the message appears on the visual touch screen, adjust the thread tension dial as indicated.
If “Confirm to Check Thread Tension Dial” is set to “OFF” in the manual settings, the message will not appear (refer to page 178).

Replacing needles

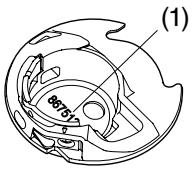
Replace a needle to blue tip needle for embroidery (refer to pages 27-28).

Replacing the needle plate

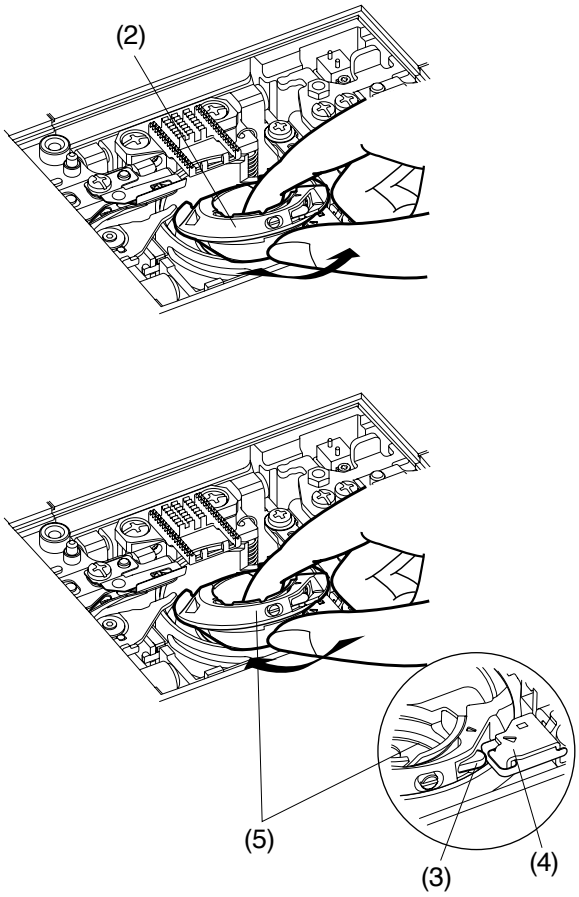
Use the straight stitch needle plate for embroidery (refer to page 26).

NOTE:
The procedure for winding the bobbin (refer to pages 29-31) and threading the machine (refer to pages 32-34) is the same as for ordinary sewing.

1.



2.



Bobbin holder for embroidery (high tension)

⚠ CAUTION:
Always make sure to press the lockout key to lockout the machine or turn the power switch OFF before replacing the bobbin holder.

Replace the standard bobbin holder (part number 867513002) with the special bobbin holder (high tension, part number 867513208) when using bobbin threads other than bobbin thread for embroidery.

Either part number (867513002 or 867513208) is indicated inside the bobbin holder.

(1) Part number indicated here

1. Remove the needle, foot holder and needle plate (refer to pages 27, 24, 26).

Take out the standard bobbin holder.

(2) Standard bobbin holder

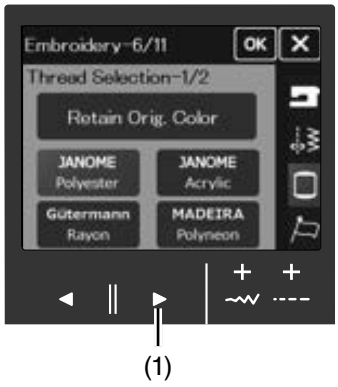
2. Insert the special bobbin holder into the hook race.

Make sure to match the knob of the bobbin holder with the stopper on the machine.

Attach the needle plate, foot holder and needle.

(3) Knob
(4) Stopper
(5) Special bobbin holder for embroidery (high tension)

NOTE:
Use the standard bobbin holder when sewing designs that use the same thread for the bobbin as the needle thread.



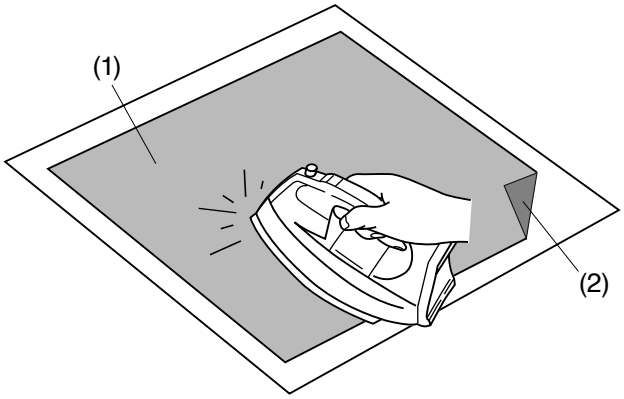
Selecting embroidery thread

Select the thread from the “Thread Selection” before threading the machine (refer to page 176).

Press the next page key to show the next page.

(1) Next page key

NOTE:
Use synthetic #90 for bobbin thread when embroidering.



Stabilizers

To create the best quality embroidery, it is important to use stabilizers.

In case the embroidery design pattern you are going to sew is dense, attach layers of stabilizers or a thick stabilizer on the back of the fabric for better sewing results.

How to use:

Attach the stabilizer to the wrong side of the fabric.

You may need to use more than one layer.

For firm fabrics, you may place a thin sheet of paper under the fabric.

The non-adhesive type should be used when embroidering fabric which cannot be ironed or for sections which are difficult to iron.

Cut the stabilizer larger than the embroidery hoop and set it on the hoop so that the entire piece is fastened to the hoop to prevent any looseness in the fabric.

Attaching the stabilizer

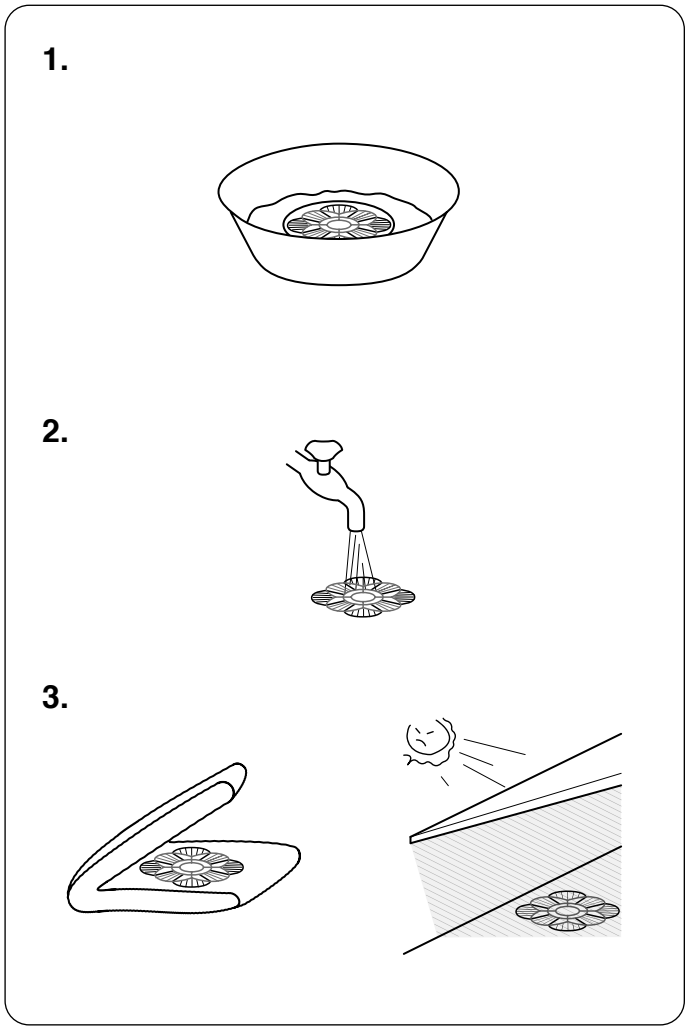
Place the wrong side of fabric and the glossy side of the stabilizer together. Fold up a corner of the stabilizer and fuse it with an iron.

(1) Stabilizer
(2) Corner

NOTE:

- Fold up a corner of the stabilizer, to make it easier to peel off the excess stabilizer after stitching.
- Ironing temperatures vary depending on the kind of adhesive stabilizer you are using.
- Sticky type stabilizers can be used only for securing a small piece of fabric or work that cannot be secured in the hoop, or for securing velvet and other napped fabric that would be permanently marked by the hoop.
- Clean the bobbin holder after stitching as glue can get stuck on it (refer to page 180).

Type	Usage	Property
Tear-away	Stable woven fabrics	Made from a fiber that will tear easily.
Iron-on	Knits and all kinds of unstable fabrics	Adhesive type fusible with an iron.
Cut-away	Knits and all kinds of unstable fabrics	Non-woven fabric that does not tear.
Water soluble	Cutwork or lace embroidery. Right side of looped fabrics such as towels to avoid loops coming through the embroidery	A thin film that will dissolve in water.
Heat-away	Cutwork or lace embroidery	A thin film that will melt away with heat.



Using water soluble stabilizers (non-woven)

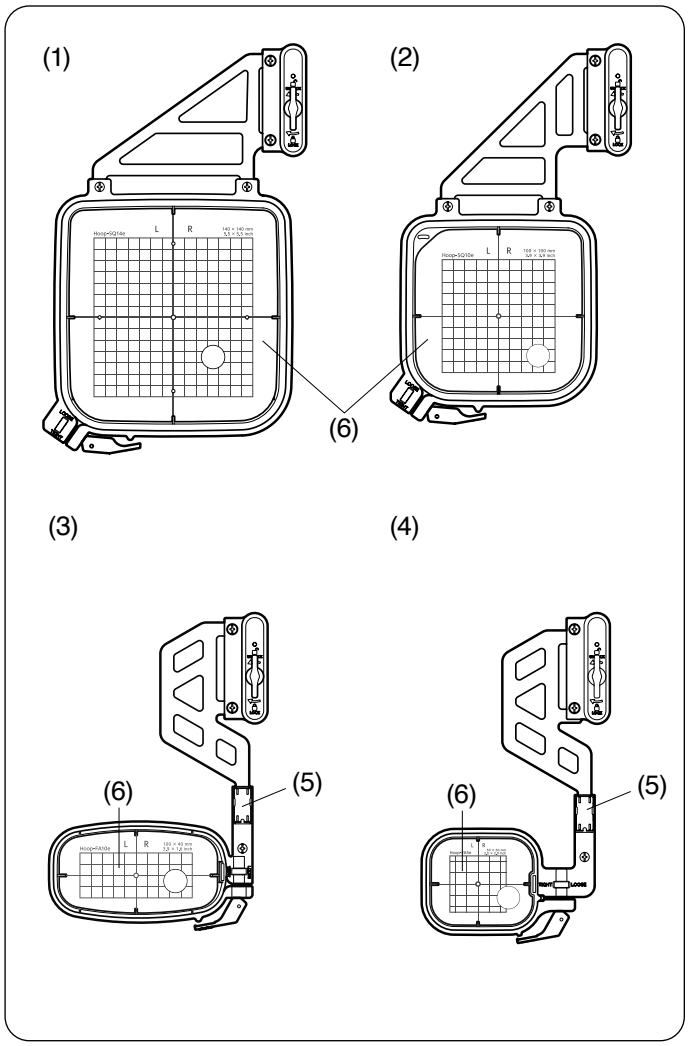
Unlike other stabilizers, you can remove the water soluble stabilizer by soaking the designs in a bowl of warm water. Apply layers of water soluble stabilizers to fine fabrics such as tulle and organdie or brushed fabrics such as towel, velour, and corduroy for better sewing results. You can embroider on the water soluble stabilizer directly to create designs without fabric, or three-dimensional embroidery designs by soaking lace designs.

NOTE:
- Do not use non-washable materials.
- Apply a layer of water soluble stabilizer to the brushed side of the fabric when sewing on towel, velour and corduroys.

1. After sewing, trim away the water soluble stabilizer cutting approximately 1 cm (3/8″) with scissors around the design pattern.

   Remove the water soluble stabilizer by soaking the design in a bowl of warm water.

   Change the warm water and soak the pattern for 10 more minutes to fully remove the stabilizer.
2. Rinse off the pattern several times to make the water soluble stabilizer softer.
3. After melting away the stabilizer, wipe off the water from the lace piece completely using a towel and dry it out in the shade.



Embroidery hoops

There is 1 embroidery hoop included in the standard accessories.

(1) Embroidery hoop SQ14e (with template)

A square embroidery hoop with a 14 cm (5.5″) square embroidery area.

(2) Embroidery hoop SQ10e (with template, optional)

A square embroidery hoop with a 10 cm (3.9″) square embroidery area.

(3) Embroidery hoop FA10e (with template, optional)

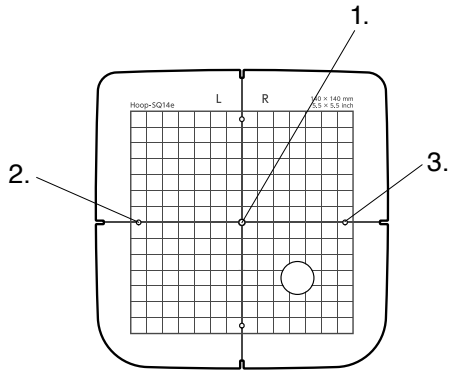
A free-arm embroidery hoop with a 10 cm by 4 cm (3.9″ by 1.6″) embroidery area.

(4) Embroidery hoop FA5e (with template, optional)

A free-arm embroidery hoop with a 5 cm (2″) square embroidery area.

NOTE:
Insert the blocking plate into the inner hoop to prevent the cuff from overlapping the embroidery area when using free-arm embroidery hoops (refer to page 156).
(5) Blocking plate

(6)



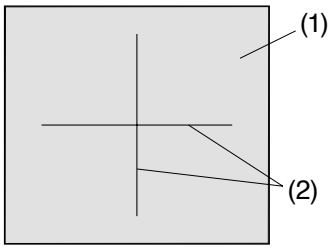
(6) Template

You can select one of 3 monogram placements: left justify, center justify and right justify.

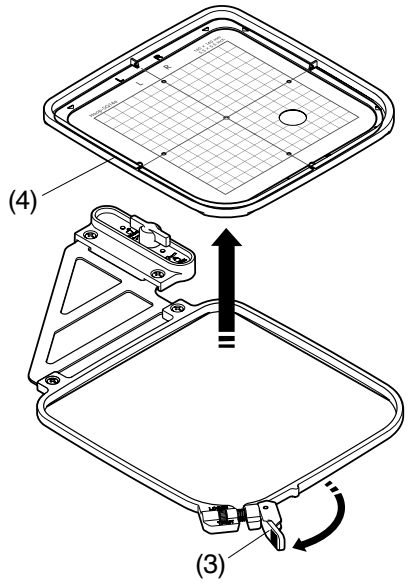
1. Center Justify:
   Sew in the center of the hoop.
2. Left Justify:
   Sew from the left end reference line on the template.
3. Right Justify:
   Sew from the right end reference line on the template.

* Refer to page 139 for monogram placements.

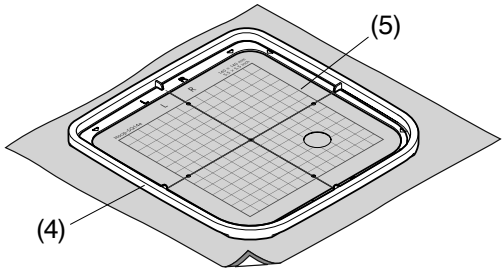
1.



2.



3.



Setting the fabric in an embroidery hoop

1. Prepare a fabric and attach a stabilizer to the wrong side of the fabric.

The fabric and stabilizer should be larger than the hoop size.

Draw centerlines on the fabric with tailor's chalk.

(1) Fabric
(2) Centerlines

NOTE:
Use the template sheet when drawing the centerlines on the fabric. The template sheet can also be downloaded via QR code (refer to page 6).

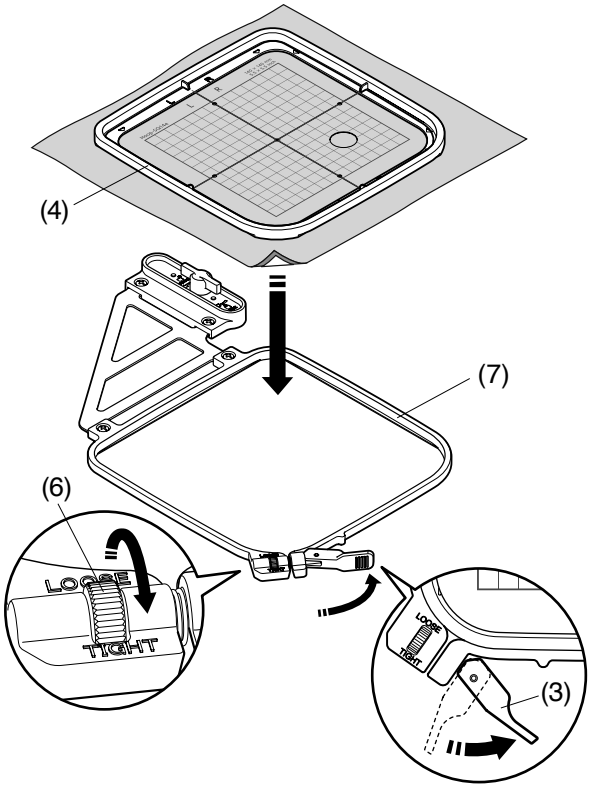
2. Turn the outer hoop lever in the direction of the arrow and remove the inner hoop.

(3) Outer hoop lever
(4) Inner hoop

3. Lay the inner hoop and template on the fabric, matching the centerlines of the fabric with the template.

(4) Inner hoop
(5) Template

4.

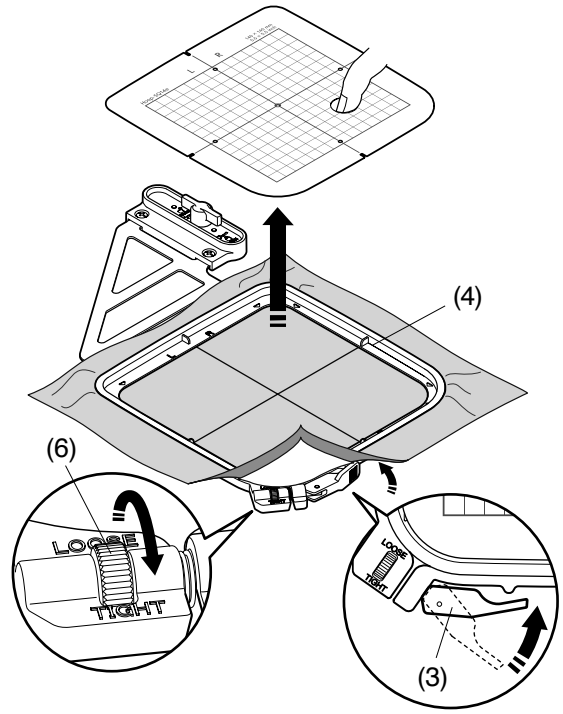


4. Push the inner hoop and fabric into the outer hoop.

Turn the outer hoop lever halfway (in the direction of the arrow) and tighten the hoop tightening screw partially with your fingers.

(3) Outer hoop lever
(4) Inner hoop
(6) Hoop tightening screw
(7) Outer hoop

5. 6.



5. Pull the four sides of the fabric to stretch it tight.

Make sure that the fabric is stretched tightly in the hoop.

6. Turn the outer hoop lever in the direction of the arrow.

Tighten the hoop tightening screw with your finger until it stops.

Remove the template.

(3) Outer hoop lever
(4) Inner hoop
(6) Hoop tightening screw

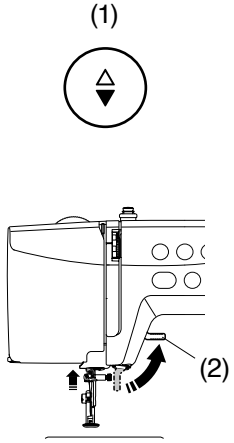
⚠ CAUTION:

If the outer hoop lever is difficult to turn in the direction of the arrow, turn the hoop tightening screw in the direction of “LOOSE” slightly, and turn the outer hoop lever. Be careful not to use force when turning the lever as this may cause it to break.

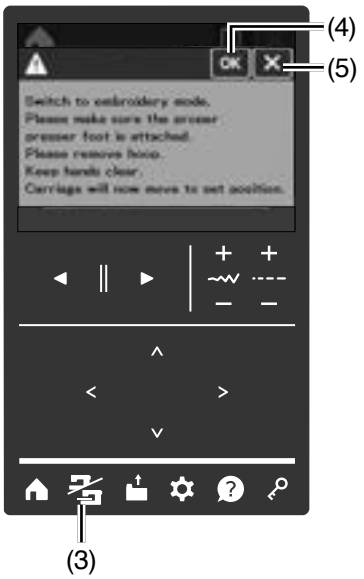
NOTE:

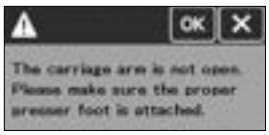
Thick layers of fabric and stabilizer may cause skipped stitches, or broken threads and needles. Avoid sewing on layers thicker than 3 mm (1/8″).

1.



2.

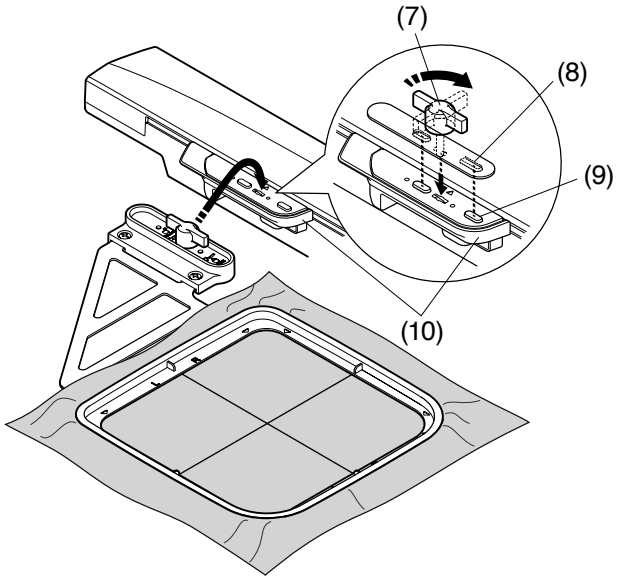


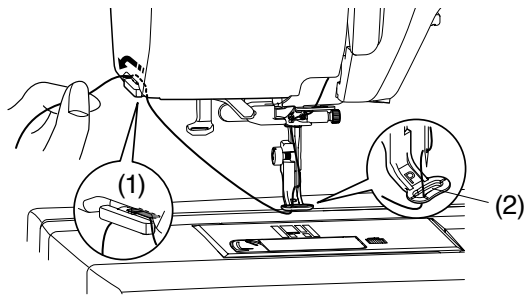


3.



4.





Attaching the embroidery hoop to the machine

NOTE:
Always make sure to attach embroidery presser foot P for embroidery (refer to page 110).

1. Extend the carriage arm and turn the power switch ON (refer to page 108).

Press the needle up/down button to raise the needle. Raise the presser foot lifter.

(1) Needle up/down button
(2) Presser foot lifter

2. Press the mode switch key to switch to the embroidery mode.

A warning message will appear.

Press the OK key and the carriage moves to starting position and the feed dogs drop automatically.

Press the X key to return to the previous window.

(3) Mode switch key
(4) OK key
(5) X key

NOTE:
If you press the mode switch key with the carriage arm retracted, a confirmation message will appear. Extend the carriage arm and press the OK key (refer to page 108).

3. Select the desired pattern (refer to page 117).

Press the lockout key to lockout the machine.

(6) Lockout key

⚠ CAUTION:
Always make sure to press the lockout key to lockout the machine before replacing the embroidery hoop.

4. Place the hoop on the machine and attach the hoop to the carriage by inserting the lock pin of the hoop into the hole in the carriage arm.

Turn the knob clockwise to secure the hoop.

(7) Knob
(8) Hole
(9) Lock pin
(10) Carriage

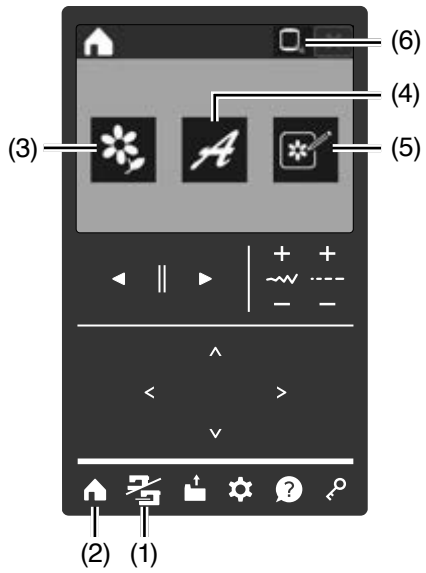
Thread holder

To avoid sewing over a tail of the needle thread, place the thread end on the thread holder.

Pass the needle thread through the hole in the embroidery foot and draw it up to the thread holder.

Hang the thread on the thread holder from front to back.

(1) Thread holder
(2) Hole in the embroidery foot



Embroidery Mode Window

(1) Mode switch key

Press the mode switch key to switch to the embroidery mode.

(2) Home key

Press this key to show the embroidery mode window.

(3) Design category key

Press this key to show the design category selection keys for built-in embroidery designs (refer to page 117).

(4) Monogram key

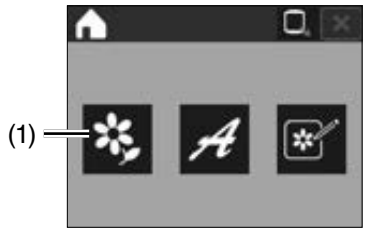
Press this key to show the font selection keys for monogramming (refer to page 119).

(5) Editing key

Press this key to show the editing window (refer to page 143).

(6) Home position key

Press this key to move the carriage to home position (refer to page 118).









Selecting Built-in Embroidery Designs

Design category key

Press the design category key on the embroidery mode window to show the first page of the selected design category.

(1) Design category key

Press the design category key to show the design category selection keys in 6 pages to select other designs.

Press the page keys to browse the design category.

(2) Page keys

Design category

1/6 Page

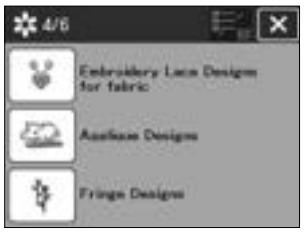
- GANAHA Collections
- Floral and Garden Designs
- Food and Drink Designs

2/6 Page

- Everyday and Holiday Designs
- Baby and Child Designs
- Name Tag Designs

3/6 Page

- In-The-Hoop Designs <Rattles>
- Cross-Stitch Designs
- Embroidery Lace Designs for water soluble stabilizer







4/6 Page

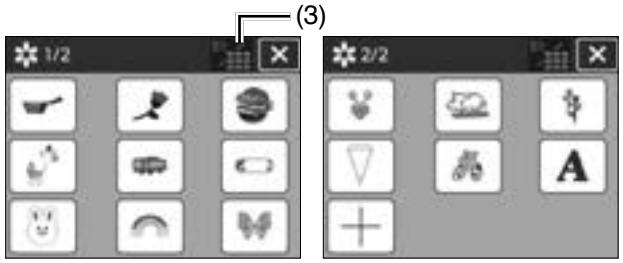
- Embroidery Lace Designs for fabric
- Applique Designs
- Fringe Designs

5/6 Page

- Flag Designs
- Alphabet Designs <Floral>
- Alphabet Designs <Cross-Stitch>

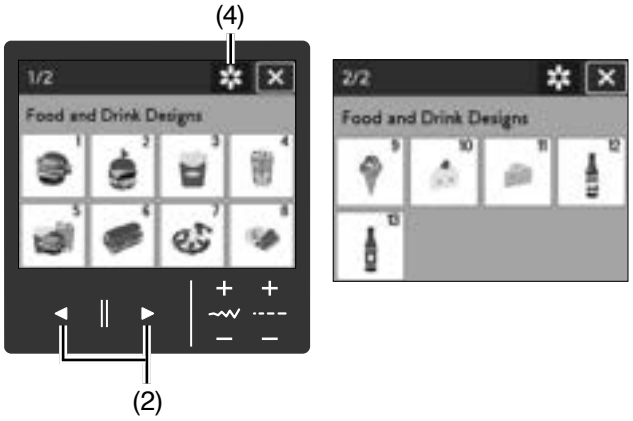
6/6 Page

- Calibration Pattern



Press the category name on/off key to display a window without the category names.

(3) Category name on/off key

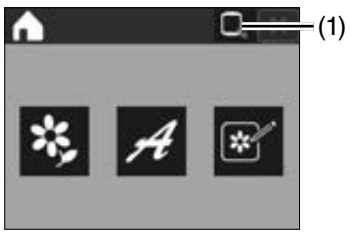


Press the design category selection key to show the first page of the selected design category.

Browse the pattern list with the page keys, and select the desired pattern by pressing the pattern key.

Press the design category selection key to return to the category selections.

(2) Page keys
(4) Design category selection key



Home position key

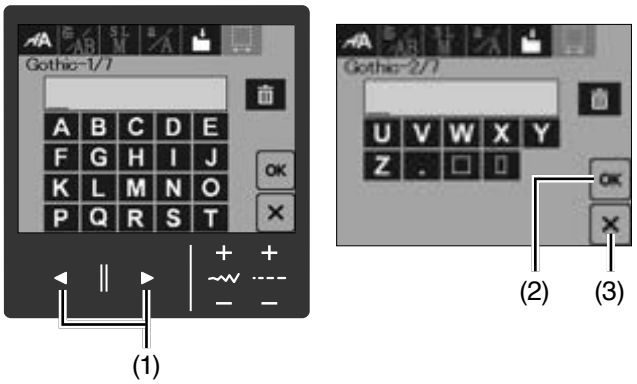
When you stop embroidering, remove the embroidery hoop and press the home position key. Carriage will go back to the home position.

NOTE:
If the carriage arm is retracted or the carriage is in the home position, the home position key is not displayed and cannot be used.

(1) Home position key







Selecting Built-in Monograms

Press the monogram key on the embroidery mode window to show the first page of the font selections.

(1) Monogram key

Press the font selection key to show the font keys in 6 pages to select other fonts.

Press the page keys to browse the font category.

(2) Font selection key
(3) Page keys

Font category

1/6 Page

- Gothic
- Script
- Cheltenham
- Bauhaus

2/6 Page

- Galant
- Typist
- Brush
- First Grade

3/6 Page

- Hollowblock
- Jupiter
- Micro Gothic
- Cyrillic 1

4/6 Page

- Cyrillic 2
- Cyrillic 3
- Kaisho
- Marumoji

5/6 Page

- Kaku Gothic
- Border
- Normal Sew
- 2-Letters

6/6 Page

- 3-Letters

NOTE:
The height of micro gothic font is approximately 5 mm.

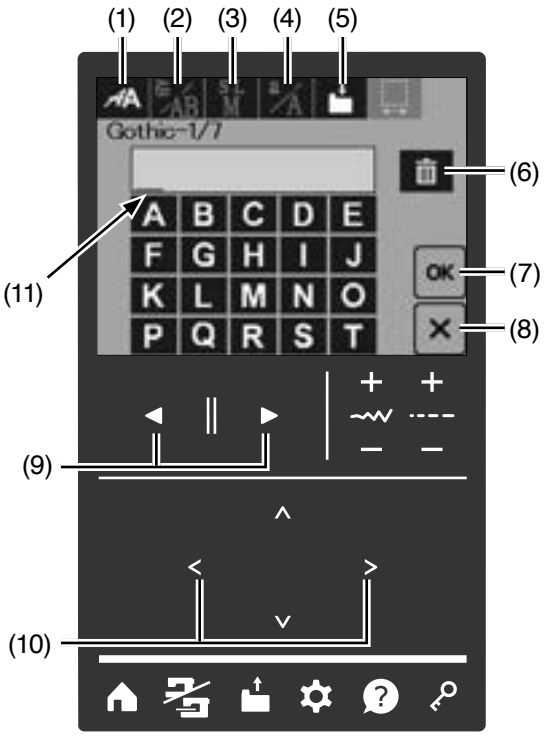
Press the font selection keys to show the first page of the selected font category.

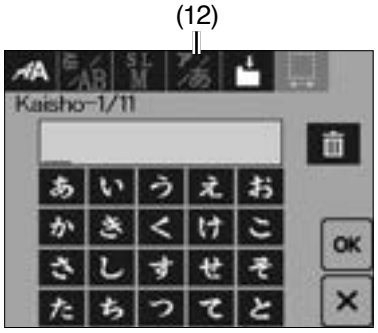
Browse the pattern list with the page keys, and select the desired pattern by pressing the pattern key.

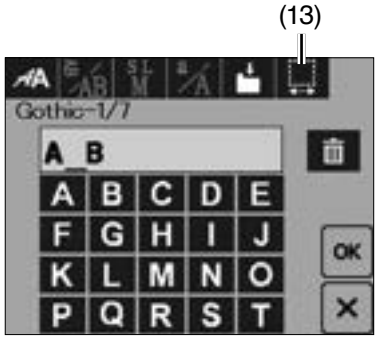
You can enter alphabet letters, numbers, symbols, European, Japanese and Cyrillic letters. Enter patterns and press OK key to show Ready to Sew window.

Press the X key to return to the previous window.

(1) Page keys
(2) OK key
(3) X key









Function Keys for Monograms

(1) Font selection key

Press this key to open the font selection window.

(2) Lettering orientation key

Press this key to select the horizontal or vertical orientation.

(3) Letter size key

You can select the following 3 letter sizes by pressing this key. The approximate letter sizes of upper case are as follows:

L (Large)	30 mm (1.2″)
M (Medium)	20 mm (0.8″)
S (Small)	10 mm (0.4″)

(4) Letter case key

Press this key to select upper case or lower case. The character display will change.

(5) Save file key

Press this key to save the monogram as a data file (refer to pages 157-161).

(6) Delete key

Press this key to delete the character above the cursor or the character in front of the cursor.

(7) OK key

Press this key to confirm your entry and open the Ready to Sew window.

(8) X key

Press this key to close the font selection window.

(9) Page keys

Press these keys to display the next page or previous page.

(10) Cursor keys

Move the cursor with pressing the cursor key to select the character you want to change.

(11) Cursor

(12) Hiragana/Katakana key (for Kaisho, Marumoji, and Kaku Gothic)

Press this key to switch Hiragana or Katakana for monograms.

(13) Space adjust key

This key is activated only when a cursor is moved below the space entered.

If the spaces between characters look uneven, insert a blank space between characters and adjust the space width to justify.

Press this key to open the space adjustment window.

To increase the space width, press the “+” key.

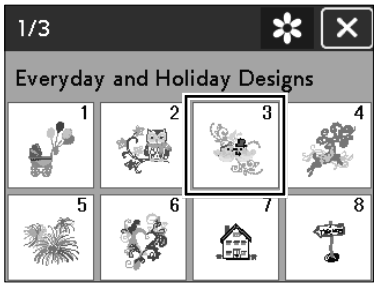
To decrease the space width, press the “–” key.

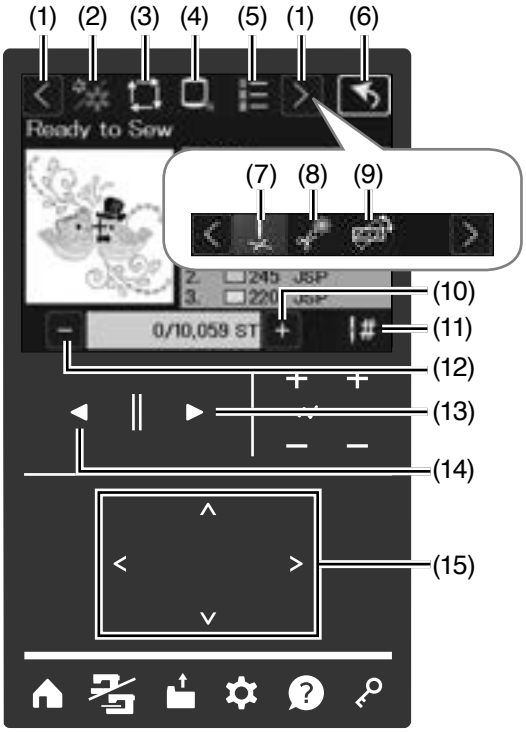
Press the OK key to confirm the setting.

Press the X key to cancel the setting.

Press the default key to recover the original stitch setting.

(14) OK key
(15) X key
(16) Default key





Ready to Sew Window

The Ready to Sew window shows embroidery function keys and information on the selected pattern.

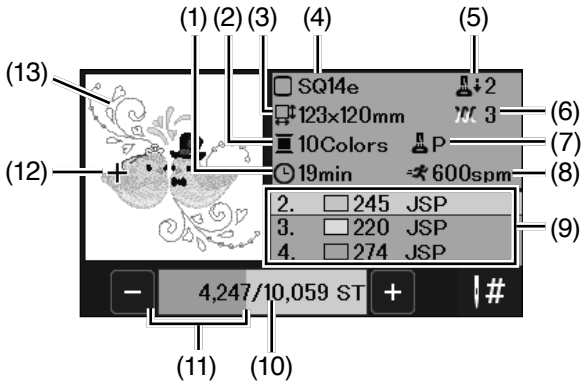
Example: Everyday and Holiday Designs #3

Select the pattern #3 in the pattern selection window for Everyday and Holiday Designs.

Ready to Sew window will open.

Function keys

(1) Function switch key
(2) Color section key (refer to page 122)
(3) Trace key (refer to page 123)
(4) Hoop back key (refer to page 124)
(5) Color list key (refer to page 125)
(6) Previous window key
Press this key to return to previous window.
(7) Cross key (refer to page 126)
(8) Jump thread cutting length key (refer to page 126)
(9) Fine position/angle adjustment key (refer to page 127)
(10) Stitch forward key (refer to page 122)
(11) Jump key (refer to page 122)
(12) Stitch backward key (refer to page 122)
(13) Next layer key (refer to page 122)
(14) Previous layer key (refer to page 122)
(15) Jog keys (refer to page 126)



Pattern information

The Ready to Sew window displays the following details:

(1) Required sewing time
(2) Number of thread colors (layers)
(3) Dimension of the design (width X height)
(4) Hoop type
(5) Presser foot pressure
(6) Tension setting
(7) Presser foot
(8) Maximum sewing speed
(9) Thread color
(10) Stitch count
(11) Progress bar
(12) Cross mark (current sewing point)
(13) Preview window

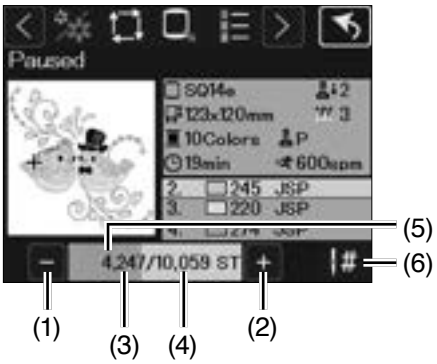
Function Keys for Embroidery

Stitch back/forward keys

Press the "–" key to move the hoop back to a previous sewing point. Press the "+" key to move the hoop ahead.

The hoop will move one stitch each time the key is pressed. Hold down the key to travel faster and jump 10, 100 or 500 stitches at a time. The stitch count and the total number of stitches are displayed in the stitch count window.

You can use these keys to move the embroidery hoop to where the thread has broken or run out.



(1) Stitch backward key
(2) Stitch forward key
(3) Stitch count
(4) Total number of stitches

The progress bar appears when the stitch count increases, and indicates the progress of the embroidery sewing project. When the project is completed, the progress bar returns to 0.

(5) Progress bar

Jump key

If you want to jump to the desired sewing point directly, press the jump key and the numeric keypad window will open. Enter the desired stitch count number and press the OK key. Press the clear key to delete the stitch count number and reset to 0.

The hoop moves to the sewing point you entered.



(6) Jump key
(7) Numeric keypad window
(8) Clear key
(9) OK key
(10) X key

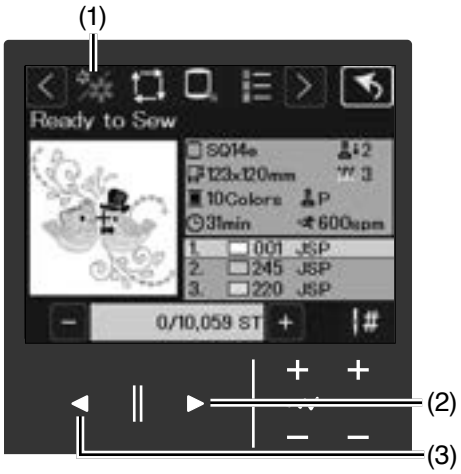
Color section key

Press this key to show the complete image of the selected design or partial image of each color section only.

To view the next color section, press the next layer key.

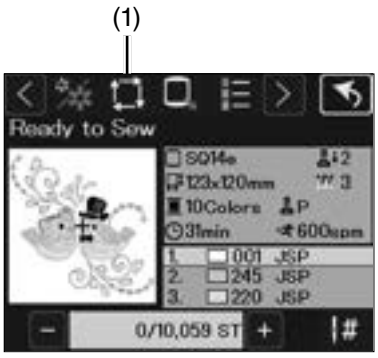
To view the previous color section, press the previous layer key.

You can sew only the specific color section by pressing the next layer key until the desired section is displayed.



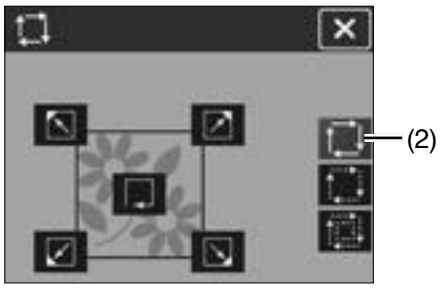
(1) Color section key
(2) Next layer key
(3) Previous layer key



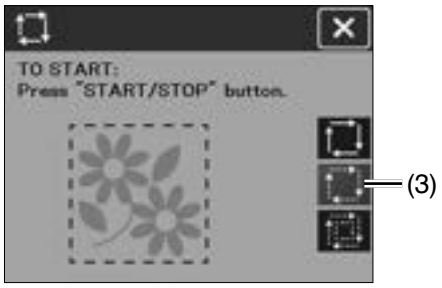




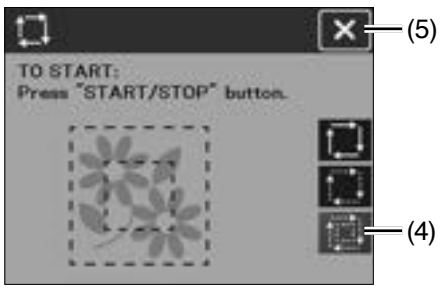
1.



2.



3.



Trace key

You can check the size of the embroidery area by tracing the pattern outline without stitching or with basting stitches.
Raise the needle with pressing the needle up/down button. Press the trace key and the trace window will open.

(1) Trace key

NOTE:
- The machine will baste around the embroidery area with a 5 mm allowance. However, there will be no allowance if the pattern spreads over the maximum limit of embroidery area.
- Message appears if the key is pressed with the presser foot in down position. Raise the presser foot lifter and press the trace key again.
- It is recommended to bring up the bobbin thread before pressing the start/stop button (refer to page 35).

The following 3 options are available:

1. Trace without stitching

Make sure the trace key is activated.

(2) Trace key

Press the key to start tracing or press one of the keys to move the hoop to a corner.

2. Trace and baste (single)

Press the trace and baste (single) key to open the trace and baste (single) window. Press the start/stop button to start tracing with basting stitches.

(3) Trace and baste (single) key

3. Trace and baste (double)

Press the trace and baste (double) key to open the trace and baste (double) window. Press the start/stop button to start tracing with basting stitches. First, the machine bastes inside the pattern then traces the pattern outline with basting stitches.

(4) Trace and baste (double) key

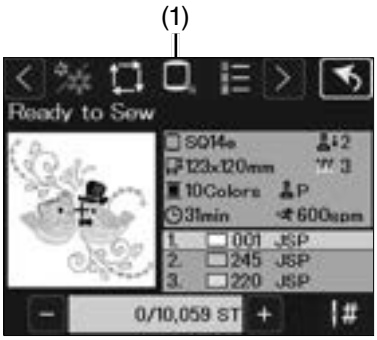
To close the trace window, press the X key.

(5) X key

Hoop back key

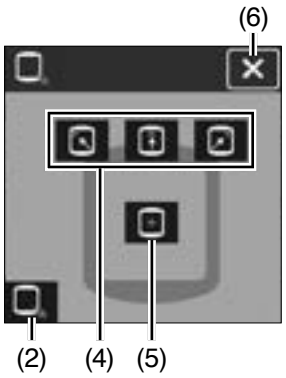
Raise the needle with pressing the needle up/down button. Press the hoop back key and the hoop back option window will open.

(1) Hoop back key

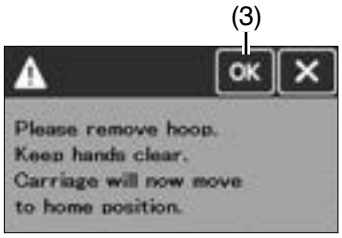




NOTE:
If this key is pressed while the presser foot is lowered, a message will appear. Raise the presser foot lifter and press the hoop back key again.



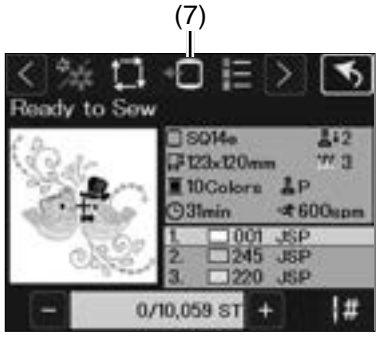
Message appears when the home position key is pressed. Press the OK key to move the carriage to the home position. Ready to Sew window will open.



NOTE:
Before using the home position key, remove the embroidery hoop.
(2) Home position key
(3) OK key

Press one of the keys (4) to move the hoop so that the needle falls at the position indicated by the arrow on the frame. Ready to Sew window will open.

Press the key (5) to move the hoop to the center. Ready to Sew window will open.



Press the X key and the hoop back option window will close.

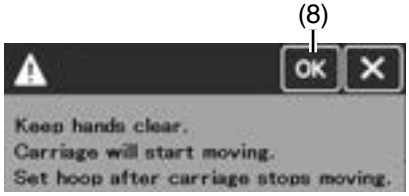
(6) X key

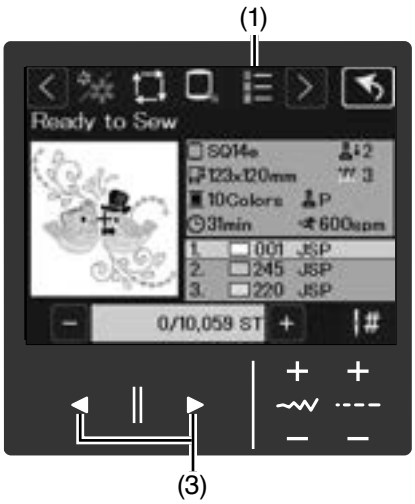
Press the key (7) or start/stop button and the message will be displayed.

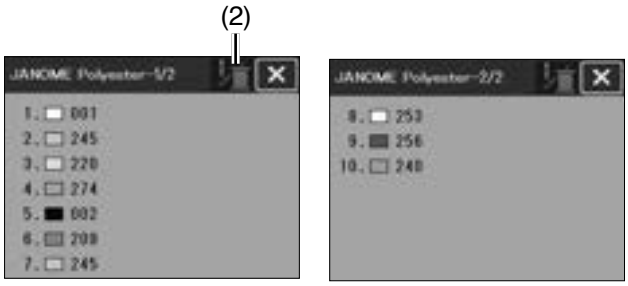
Press the OK key to return the hoop to the original position.

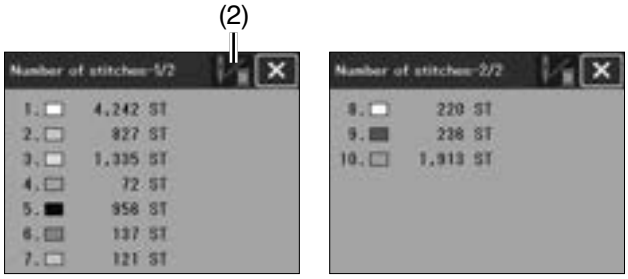
If the hoop is removed, attach the hoop after the carriage moves to the original position.

(8) OK key









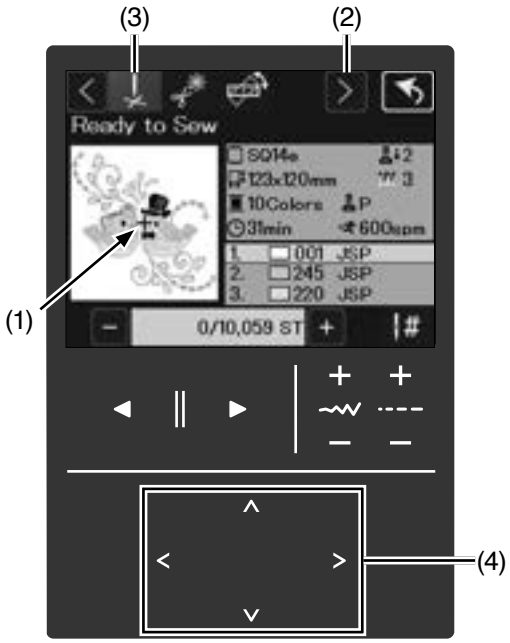
Color list key

Press the color list key to show the color list of the selected design. The list shows the color of threads to be used, the sewing order of the threads, and the stitch count for the threads to be sewn.

(1) Color list key
(2) Thread colors/Number of stitches switch key

To view the next/previous colors, press the page keys.

(3) Page keys



Cross key

The cross mark indicates the current sewing point.

Press the function switch key to show cross key.

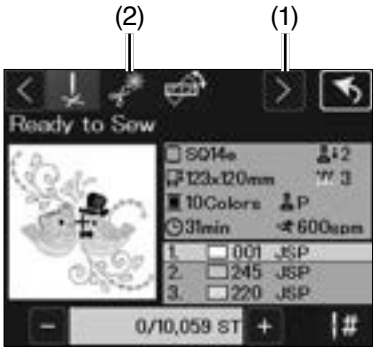
Press the cross key again to hide the cross mark.

(1) Cross mark (Current sewing point)
(2) Function switch key
(3) Cross key

Jog keys

Adjust the hoop position with the jog keys so that the needle position comes right above the center of the reference lines on the fabric.

(4) Jog keys



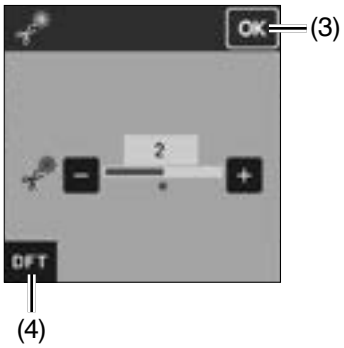
Cutting the tails of jump threads

Press the function switch key to show the jump thread cutting length key.

Press the jump thread cutting length key to open the adjusting window.

(1) Function switch key
(2) Jump thread cutting length key

NOTE:
This option can be used when the “Thread Cutting” is activated in the embroidery settings (refer to page 175).

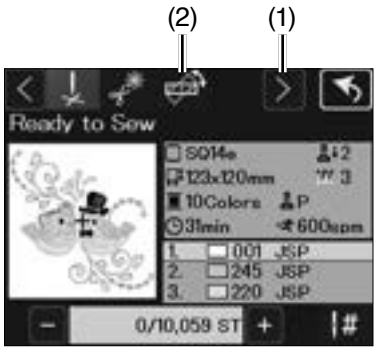


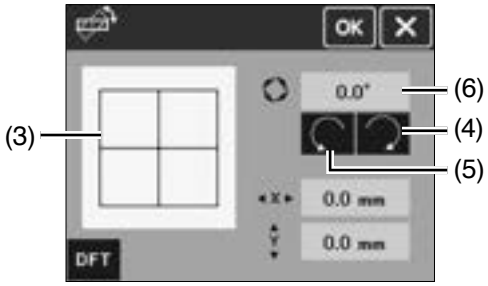
Press the “+” or “–” key to adjust the tail length of jump thread.

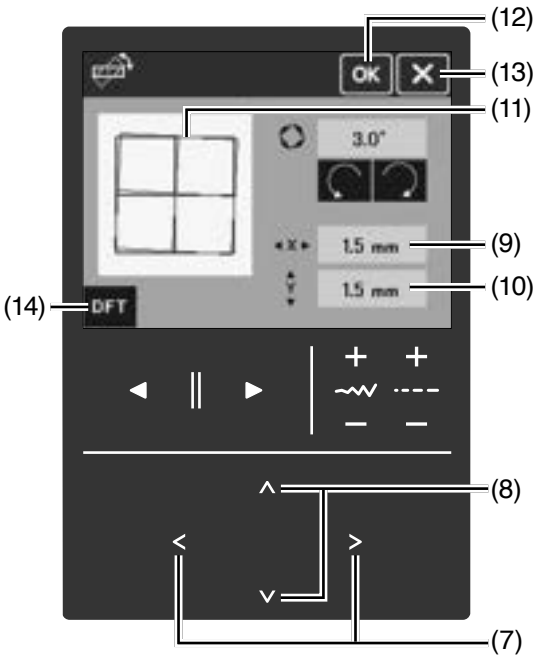
Press the OK key to confirm.

Press the default key to recover the original setting.

(3) OK key
(4) Default key







Fine position/angle adjustment key

You can make fine adjustments to the position or angle of the embroidery design without removing the embroidery hoop from the machine.

Press the function switch key to show the fine position/ angle adjustment key.

Press the fine position/angle adjustment key.

The original embroidery design position is previewed as a black rectangle.

(1) Function switch key
(2) Fine position/angle adjustment key
(3) Black rectangle

Rotating a design

You can make fine adjustments to the angle of the embroidery design.

Press the key (4) to rotate the design 0.5 degrees clockwise.

Press the key (5) to rotate the design 0.5 degrees counterclockwise.

The angle value is displayed in the window (6).

NOTE:
- The angle of an embroidery design can be adjusted from -5.0 to 5.0 degrees.
- The angle of the embroidery design cannot be adjusted to exceed the sewing area.

Moving a design

You can make fine adjustments to the position of the embroidery design.

Press the one of the jog keys (7) to move the design 0.5 mm right or left (X window).

Press the one of the jog keys (8) to move the design 0.5 mm forward or backward (Y window).

The moving distance from the original position is shown as coordinates in the X and Y window.

(9) X window
(10) Y window

NOTE:
- The position of an embroidery design can be finely adjusted from -5.0 mm to 5.0 mm.
- The position of the embroidery design cannot be adjusted to exceed the sewing area.
- The moving distance from the original position is shown only in millimeters.

The red rectangle appears when you make fine adjustments to the embroidery design, and it shows the difference between the original position and the adjusted position.

Press the OK key to apply the fine adjustment.

Press the X key to cancel the settings.

Press the default key to recover the original setting.

(11) Red rectangle
(12) OK key
(13) X key
(14) Default key

Starting to Sew Embroidery

1. Select the desired pattern. A message will appear to confirm the size of the embroidery hoop.

   Press the OK key.

   (1) OK key

2. A message will appear to confirm the thread tension.

   Adjust the thread tension as recommended in the message. Press the X key. The Ready to Sew window will open.

   (2) Thread tension dial
   (3) X key

3. Set the presser foot pressure dial at “2”.

   (4) Presser foot pressure dial

4. Adjust the hoop position with the jog keys so that the needle position comes right above the center of the centerlines on the fabric.

   (5) Jog keys
   (6) Centerlines on the fabric

5. Hook the needle thread to the thread cutter/holder, then press the start/stop button (refer to page 116).

   Sew 5 to 6 stitches and press the start/stop button to stop the machine.

   Cut the loose thread close to the beginning of the starting point.

   (7) Thread cutter/holder
   (8) Start/stop button
   (9) Loose thread hook to the thread holder

6. Press the start/stop button to start sewing again.

   The machine will stop (and trim the threads if auto thread cutting is activated) automatically when the first color section is finished (refer to page 175).

   Change the thread to the next color and sew the next section.

Sewing results

The embroidery pattern is sewn against the centerlines on the fabric as shown.

(6) Centerlines on the fabric

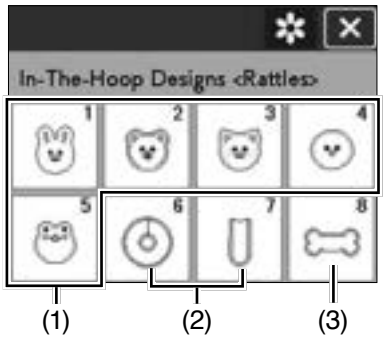
Retracting the carriage arm

Remove the hoop from the carriage after the project is completed.

Press the mode switch key to return the carriage to the home position. Retract the carriage arm (refer to page 109).

(10) Mode switch key





In-The-Hoop Designs <Rattles>

You can make your own stuffed doll with the In-The-Hoop Designs.

3 parts of rattles are available in this category.

(1) Stuffed doll
(2) Handle for rattle
(3) Rattle

Prepare fabric of your desired design and material.

- Fabric 1 (front side of the doll)
- Fabric 2 (rear side of the doll)
- Fabric 3 (front side of the handle)
- Fabric 4 (rear side of the handle)
- Stabilizer (non-water-soluble)
- Wad cotton
- Plastic bell (2 cm or less)
- Ribbon (Width: 0.5 cm, Length: 4 cm)

NOTE:

- The embroidery data for the stuffed doll includes basting the ribbon before the end of the sewing so that you can pass a ball chain through it.
- If you use fabrics such as pile or boa, the shape will come out nicely when you stuff cotton, resulting in an adorable finish.
- Pile fabrics and boa may fray when the stabilizer is removed. It is recommended to use a soft stabilizer of a light to medium weight fabric that is glued on one side and does not need to be removed.

Example: In-The-Hoop Designs <Rattles> #5 + #6

Creating the doll

The stuffed doll can be combined with two types of handles (pattern 6: circle type, pattern 7: stick type) to make a rattle. Add bells as you like.

1. Select #5. Press the OK key.

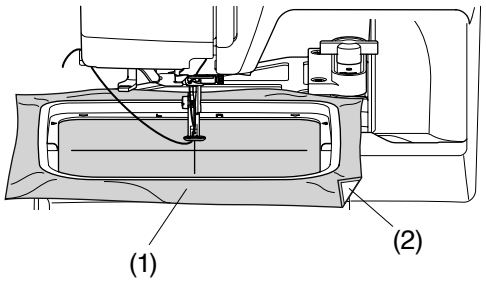
Confirm the hoop size in the Ready to Sew window.



2. Attach a stabilizer on the wrong side of the fabric 1.

Set the fabric in embroidery hoop (refer to pages 114-115). Attach the embroidery hoop on the carriage (refer to page 116).

(1) Fabric 1
(2) Stabilizer

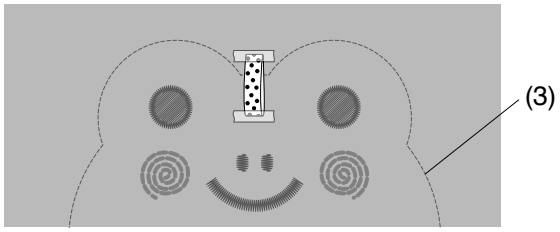


NOTE:
Do not remove the fabric from the embroidery hoop until the sewing project is completed.

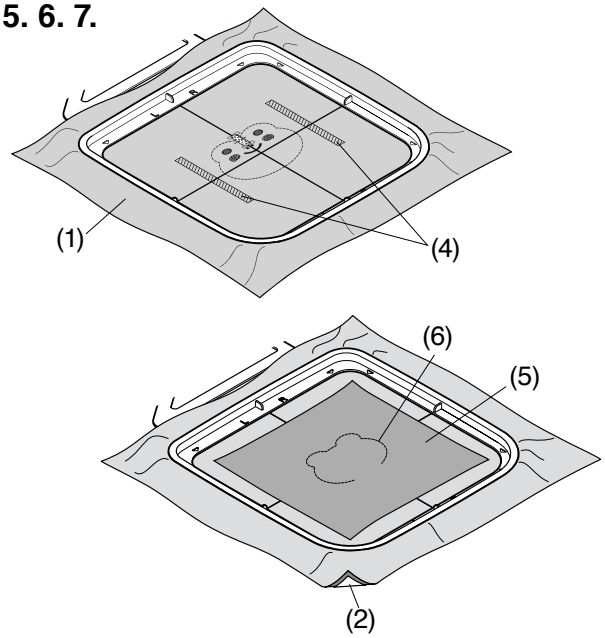
3. Embroider the following parts: eyes, mouth, nose, cheeks and cut-off line.

(3) Cut-off line

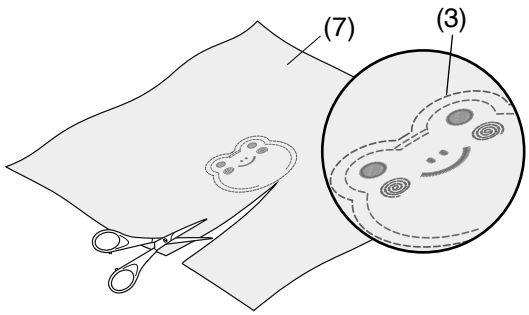
4. If you want to attach the ribbon, baste it at this step (refer to page 132).



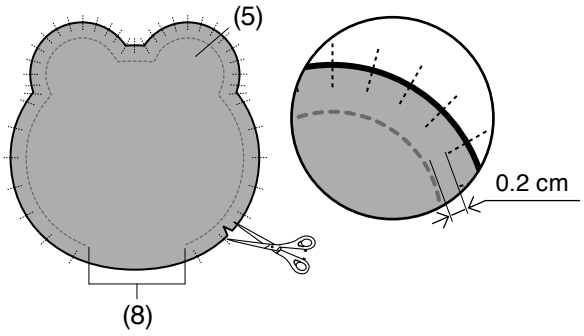
5. 6. 7.



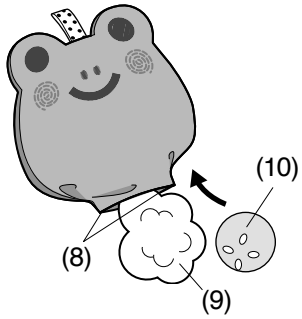
8.



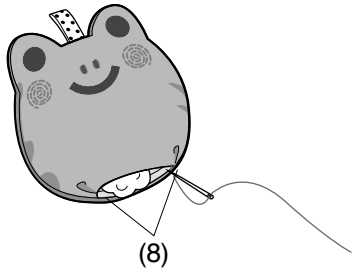
9. 10.



11.



12.



5. After sewing is finished, apply glue on both sides of the embroidery design as shown.

Place fabric 2 with the right side down on the fabric 1 and stick them together with glue.

(1) Fabric 1 (right side)
(4) Glue

NOTE:
Apply the glue lightly where it will not overlap with the stitches. If the glue sticks to the needle or the hook race, it may cause breakage or malfunction.

6. Embroider the rest of the design. After sewing is finished, remove the fabrics from the embroidery hoop.

(5) Fabric 2 (wrong side)
(6) Seam line

NOTE:
Use the same (or similar) colors for the fabrics and the upper threads, so that the threads will not stand out (or pop up) when turning the fabric inside out.

7. Remove the stabilizer from fabric 1.

(2) Stabilizer

NOTE:
- If the stabilizer is soft and one-sided, there is no need to remove it.
- Warm up the stabilizer with an iron for easier removal. Cover the stabilizer with a cloth when ironing to prevent sticking on the iron.

8. Cut the fabrics along the cut-off line (outmost seams) with scissors.

(7) Fabric 1 (wrong side)
(3) Cut-off line

9. Cut slits from the edge of the fabric to 0.2 cm in front of the seam in the curved area.

Be careful not to cut the seam.

10. Turn the doll inside out from the opening.

(5) Fabric 2 (wrong side)
(8) Opening

NOTE:
- Non-stretch fabrics may be difficult to turn the right side out. In that case, use an awl to turn the right side.
- If an awl seems to make a hole in the fabric, use a thin stick with a rounded end to turn the fabric right side out.

11. Adjust the shape of the doll and stuff the doll with wad cotton and a plastic bell from the opening.

(8) Opening
(9) Wad cotton
(10) Plastic bell

12. Stitch the opening by hand to close it.

If you want to attach a stick-type handle (#7), insert the opening of the handle into the opening of the stuffed doll and hand-sew the area around the opening to close it.

(8) Opening

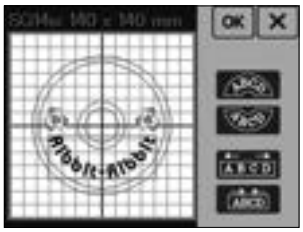
Example: In-The-Hoop Designs <Rattles> #5 + #6

Creating the handle with monograms

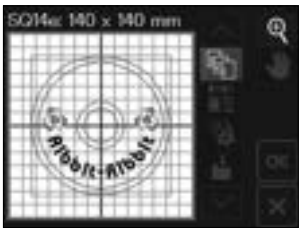
1. Select #6 in the editing mode. Edit monograms as you like (refer to page 147).

2. Change the sewing order so that pattern 6 be sewn at the end (refer to page 152).

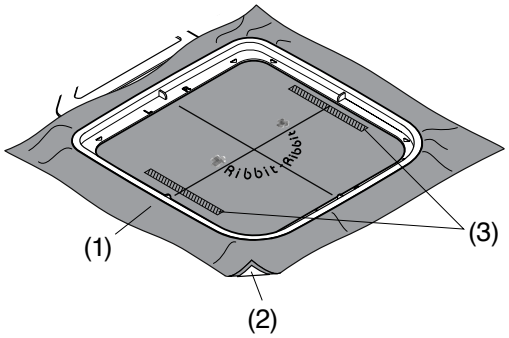
1.



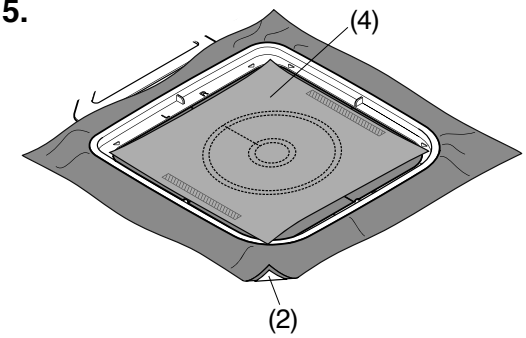
2.



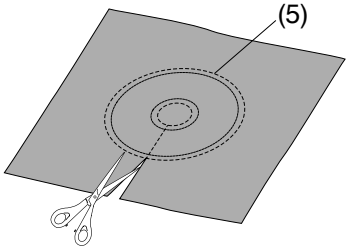
3.



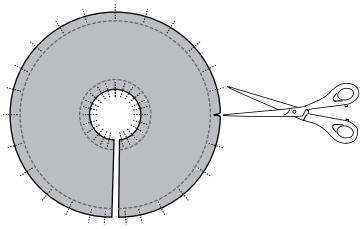
4. 5.



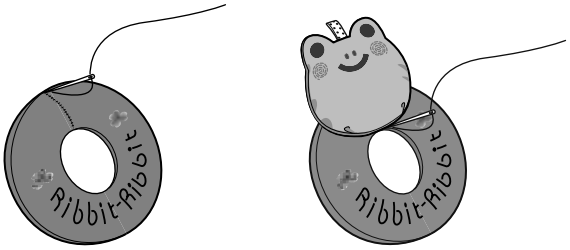
6.



7.



8.



3. Attach a stabilizer on the wrong side of the fabric 3 and set the fabric in embroidery hoop (refer to pages 114-115). Attach the embroidery hoop on the carriage (refer to page 116).

Embroider monograms and patterns. Apply glue on the inside edge of the embroidery hoop as shown.

(1) Fabric 3 (right side)
(2) Stabilizer
(3) Glue

NOTE:
Apply a thin layer of glue to baste the fabric in place where it will not overlap with the stitches. If glue gets on the needle or bobbin holder, it can cause poor quality of sewing, damage or malfunction of the machine.

4. Place fabric 4 with the right side down on the fabric 3. Embroider the rest of the design. After sewing is finished, remove the fabrics from the embroidery hoop.

(4) Fabric 4 (wrong side)

5. Remove stabilizer from fabric 3 if necessary.

(2) Stabilizer

6. Cut the fabrics along the cut-off line (outmost seams) with scissors.

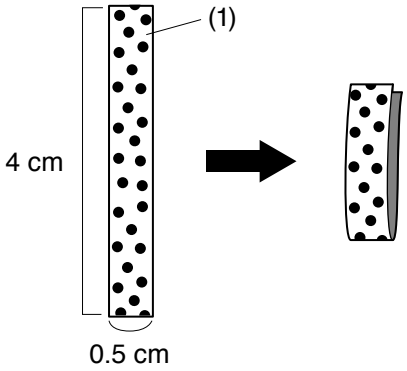
(5) Cut-off line

7. As in steps **9.** to **11.** of “Creating the doll”, make a slit along the curve, turn it over through the opening, and stuff it with cotton.

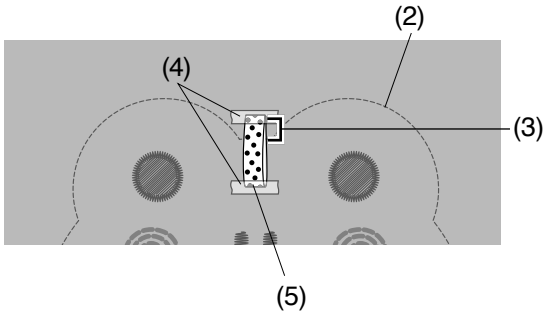
8. Stitch the opening by hand to close it.

Attach the stuffed doll and the rattle together to hide the seam.

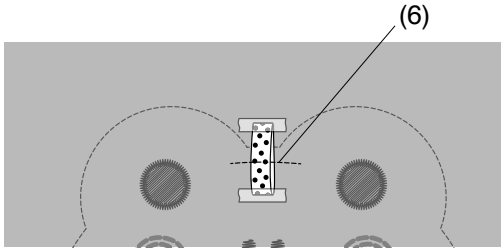
1.



2.



3.



Attaching the ribbon

The embroidery data for the stuffed doll includes sewing for basting the ribbon for passing a ball chain.

If you add the ribbon in step **4.** of “Creating the doll”, follow the step below.

1. Cut a piece of ribbon approximately 0.5 cm wide and 4 cm long and fold it in half.

(1) Ribbon

2. Place the ribbon so that the end of the ribbon exceeds approximately 0.5 cm outside the cut-off line, and secure both ends of the ribbon fix them with sticky tapes as shown. Make sure that the fold of the ribbon is on the inside of the cut-off line.

(2) Cut-off line
(3) 0.5 cm
(4) Sticky tape
(5) Ribbon fold

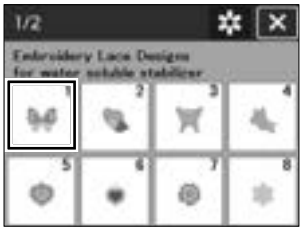
3. Baste the ribbon. After the sewing is finished, remove the sticky tapes.

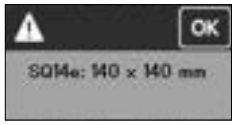
(6) Basting

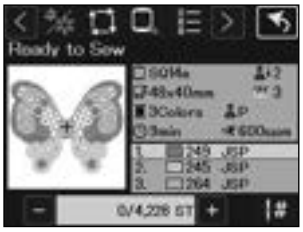
For the rest of the steps, refer to “Creating the doll” step **5.** onward (refer to page 130).

1.







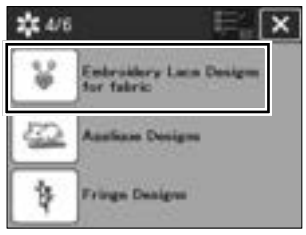


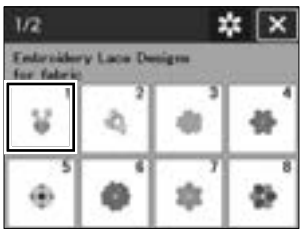
2.

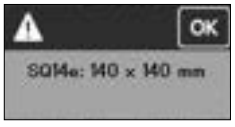
(1)

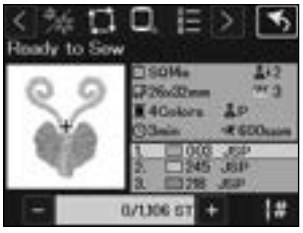


3.









Embroidery Lace Designs

You can attach the lace pieces in the “Embroidery Lace Designs for water soluble stabilizer” category to a background fabric with the lace designs in the “Embroidery Lace Designs for fabric” category to achieve a three-dimensional appearance.

Lace designs in the “Embroidery Lace Designs for water soluble stabilizer” require water soluble stabilizer for embroidering.

NOTE:
Use the standard bobbin holder when sewing designs that use the same thread for the bobbin as the needle thread.

Butterfly design

Example: Embroidery Lace Designs for water soluble stabilizer #1

Attach the water soluble stabilizer to the hoop. Be sure that the stabilizer is stretched tightly in the hoop (refer to pages 114-115).

1. Select “Embroidery Lace Designs for water soluble stabilizer” #1. Press the OK key to confirm the hoop size.

Start sewing.

2. Remove the water soluble stabilizer from the hoop. Trim away the water soluble stabilizer surrounding the design pattern with scissors.

Remove the water soluble stabilizer by soaking the butterfly wing design in a bowl of warm water.

Be sure that the lace piece to be attached is completely dried out after removing from water.

The butterfly wings part is completed.

(1) Butterfly wing design

NOTE:
- Do not rub or scratch the embroidery lace designs for water soluble stabilizer.
- Refer to page 113 for how to use a water soluble stabilizer.

3. Attach the background fabric to the hoop.

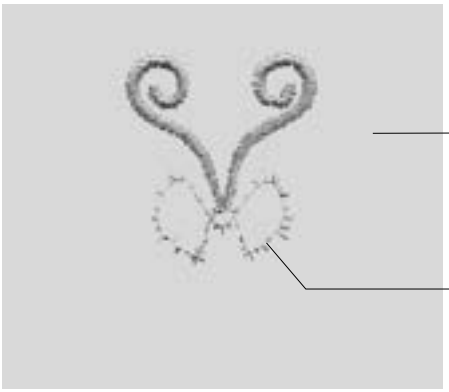
Select “Embroidery Lace Designs for fabric” #1.

Confirm the embroidery hoop size and press the OK key.

Start sewing.

Sew the first and second sections (color).

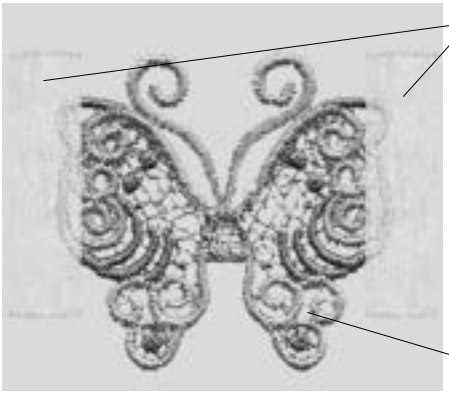
4.



4. The second section is the placement guide for placing butterfly wings.

(2) Background fabric
(3) Placement guide (second section)

5.



5. Place the butterfly wings piece which was created in step **2**. above so that the butterfly wings are aligned with the placement guide.

Use tape to hold the design for your convenience.

(1) Butterfly wing
(4) Tape

NOTE:

Press the key in the Ready to Sew window. Press one of the keys to move the carriage to a standby position (refer to page 124).

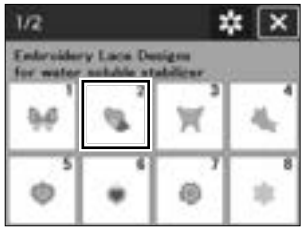
6.

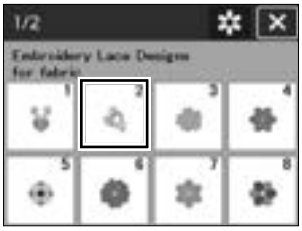


6. Sew the third section (color) over the design.

The butterfly wings are attached to the background fabric.

Sew the rest of the section (color) and remove the tape to complete the design.

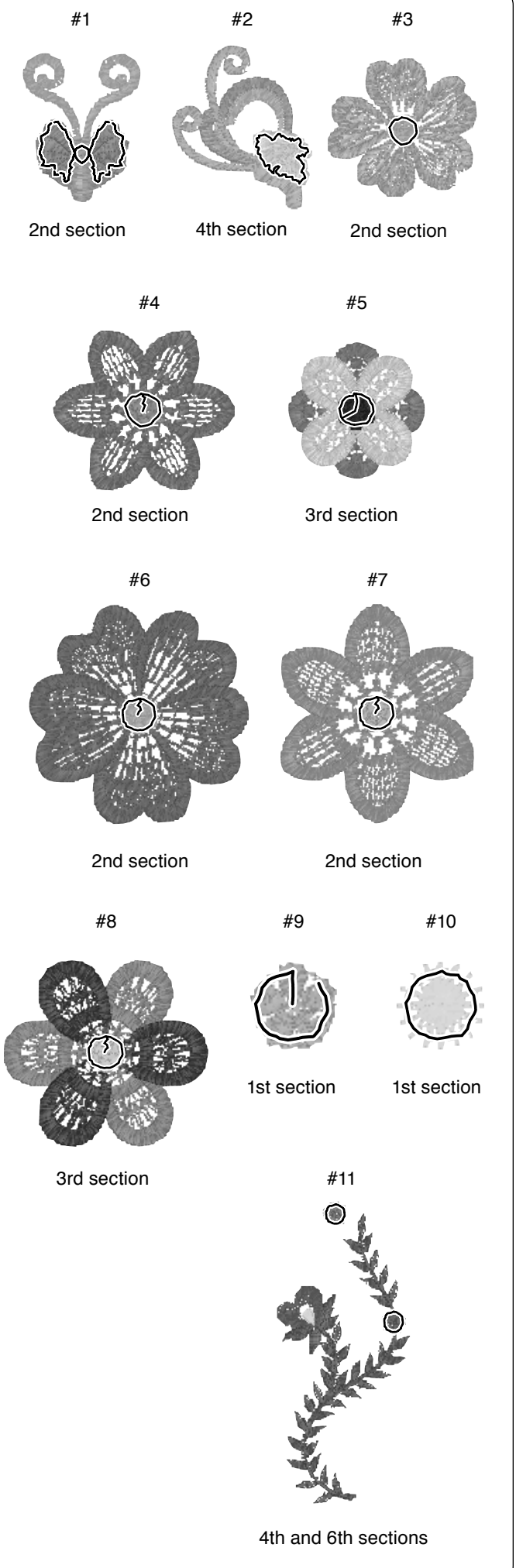




NOTE:

The other butterfly design also requires a combination of "Embroidery Lace Designs for water soluble stabilizer" #2 and "Embroidery Lace Designs for fabric" #2. Place the butterfly wing piece on the placement guide and continue sewing.





Placement guides for "Embroidery Lace Designs for fabric"

Each embroidery design in the "Embroidery Lace Designs for fabric". category contains a placement guide section for placing "Embroidery Lace Designs for water soluble stabilizer".

After the placement guide is sewn, the machine will sew over the lace piece with the next section (color) to hold the piece.

The placement guides and their sewing orders are shown on the left. Place the desired lace piece on the placement guide and hold it with tape. Sew over the lace piece with the next section to hold the piece.

Applique Designs

Prepare background fabric and applique fabric.

Example: Applique Designs pattern #1

1. Select the Applique Designs pattern #1.

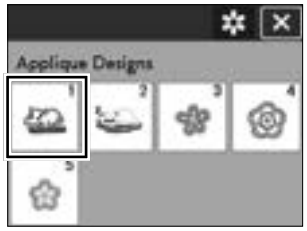
A message will appear to confirm the size of the embroidery hoop.

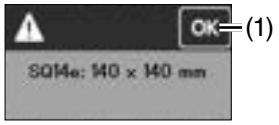
Press the OK key to show the Ready to Sew window.

(1) OK key

1.





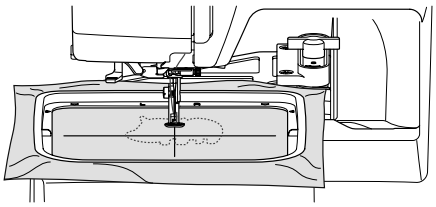




2. Set the applique fabric to the embroidery hoop.

Attach the hoop to the machine and sew the first color section.

2.

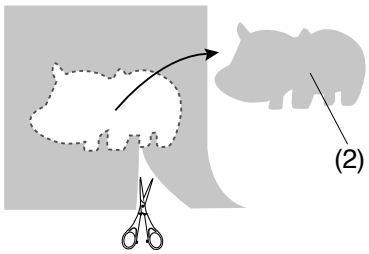


3. After finishing sewing the first color section, remove the hoop from the machine.

Unhoop the applique fabric and cut the applique fabric along the stitching line to make an applique piece.

(2) Applique fabric

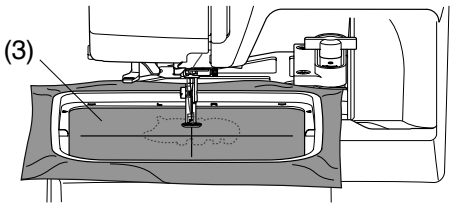
3.



4. Set the background fabric to the hoop, attach the hoop to the machine, then sew the second color section to the background fabric.

(3) Background fabric

4.

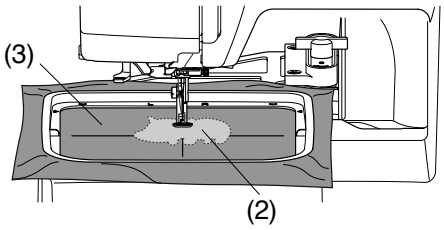


5. Attach the applique fabric on the second color section.

Apply a thin layer of glue on the wrong side of the applique fabric and attach to the background fabric.

(2) Applique fabric
(3) Background fabric

5.



⚠ CAUTION:

Do not apply glue on the seams.
If the glue sticks to the needle or the hook race, it may cause breakage or malfunction.

6. Start the machine to sew the third color section.



Fringe Designs

Fringe designs are special patterns for creating fringed flowers.
The embroidery design easily turns into an attractive fringed flower.

Example: Fringe Designs pattern #4

1. Select the Fringe Designs pattern #4.

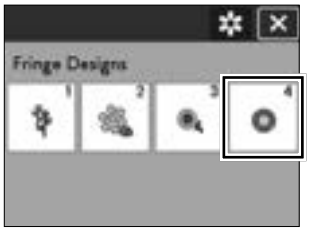
A message will appear to confirm the size of the embroidery hoop.

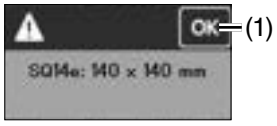
Press the OK key.

(1) OK key

1.

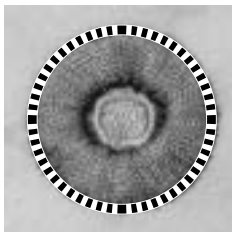


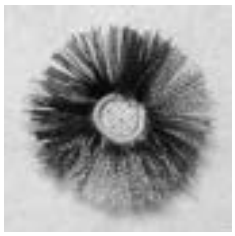






2. 3. 4. 5.





2. Sew the pattern as you would sew a normal embroidery design.

3. Remove the fabric from the hoop.

4. Cut the needle threads along the broken line at the outer edge of the pattern as show.

5. Ruffle the threads to make the fringe.

Alternative method for fringe designs

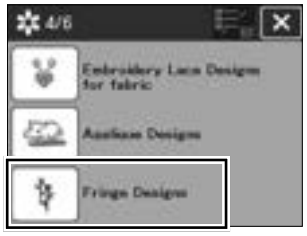
1. Select the Fringe Designs pattern #4.

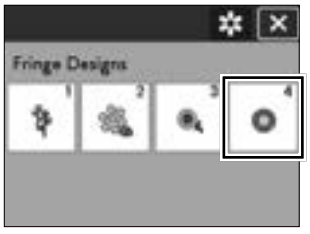
A message will appear to confirm the size of the embroidery hoop.

Press the OK key to show the Ready to Sew window.

(1) OK key

1.

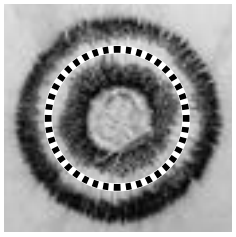






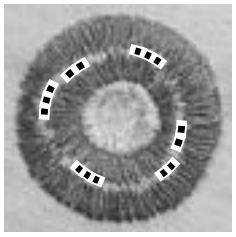


2. 3. 4. 5.





When the bobbin threads are too narrow



2. Sew the pattern as you would sew a normal embroidery design.

3. Remove the fabric from the hoop.

4. Cut the bobbin threads along the broken line at the outer edge of the pattern as shown.

> **NOTE:**
> When the bobbin threads are too narrow to see and cut, choose the bobbin threads you can cut and remove them (shown as dots).

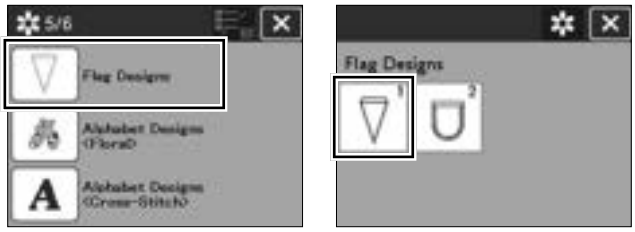
5. Pull the needle threads up and bring the loop ends to the right side of the fabric to make the fringe.

Flag Garlands

You can make your own flag garlands by embroidering patterns on the flags.

Example: Flag Designs pattern #1

1. Select Flag Designs pattern #1.



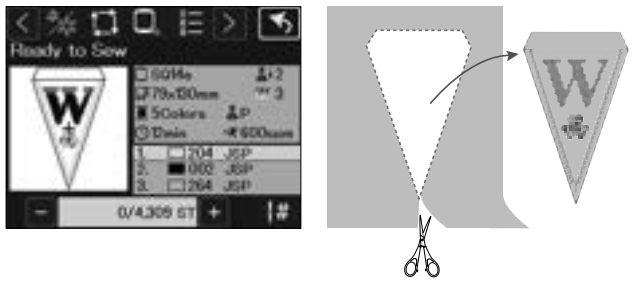
2. Edit your pennant design in the editing mode.
Press the OK key.
(1) OK key

3. A message will appear to confirm the size of the embroidery hoop.
Press the OK key to show the Ready to Sew window.
(2) OK key

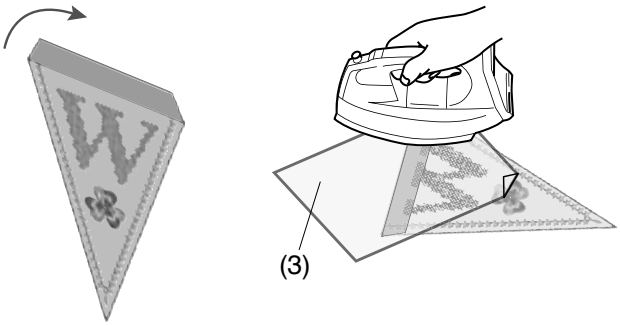


4. The Ready to Sew window will open.
Set the fabric in the hoop and attach the hoop to the carriage.
Press the start/stop button to sew.

5. Remove the hoop from the carriage when sewing is finished. Remove the fabric from the hoop.
Cut out the pennant design along the outer seam.



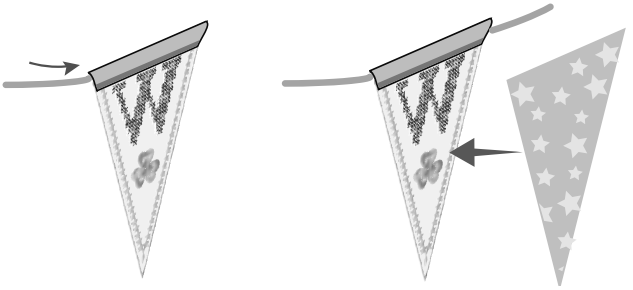
6. Fold back the top of the pennant to the wrong side of the fabric as shown.
Use press cloth and iron the folded edge.
(3) Press cloth



7. Sew the folded edge or paste the wrong side of the folded edge with double-sided tape or glue.
Be sure to leave space to pass the cord through.

8. Pass the cord through the hole as shown.

9. Cut the fabric to the same size as the pennant design.
Sew the fabric to cover the back of the pennant.



10. Repeat the procedure above and make your own flag garland.



Monogramming for Embroidery

Programming a monogram

Example: Programming **"R&B"** in Gothic style font

1. Press the font selection key to show the font selection window (refer to page 119).

(1) Font selection key

Select Gothic font.

Enter "R", the cursor shifts to the right and **"R"** is automatically memorized.

Press the letter size key and select small size.

(2) Letter size key
(3) Cursor

2. Enter "&", the cursor shifts to the right and **"&"** is automatically memorized.

Press the letter size key and select medium size. Enter "B", the cursor shifts to the right and **"B"** is automatically memorized.

Press the OK key.

(4) OK key

3. A warning message will appear.

Press the OK key and the carriage moves to starting position.

(5) OK key

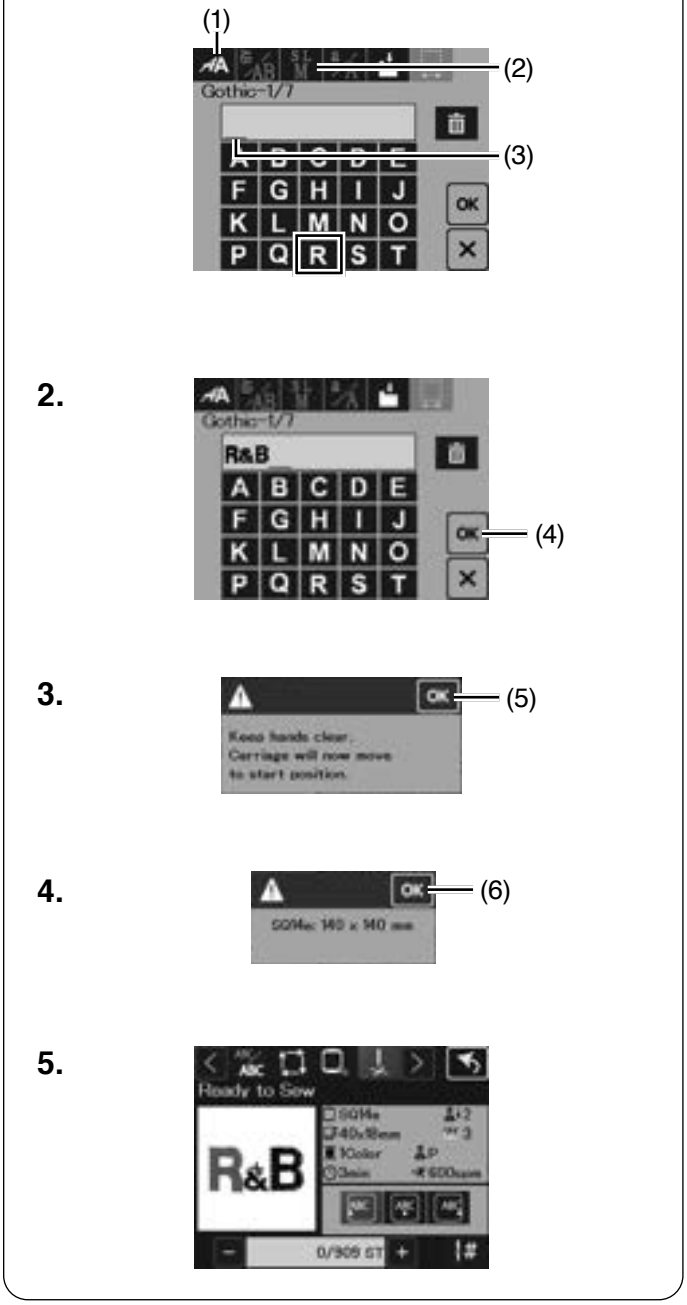
4. A message will appear to confirm the hoop size.

Press the OK key.

(6) OK key

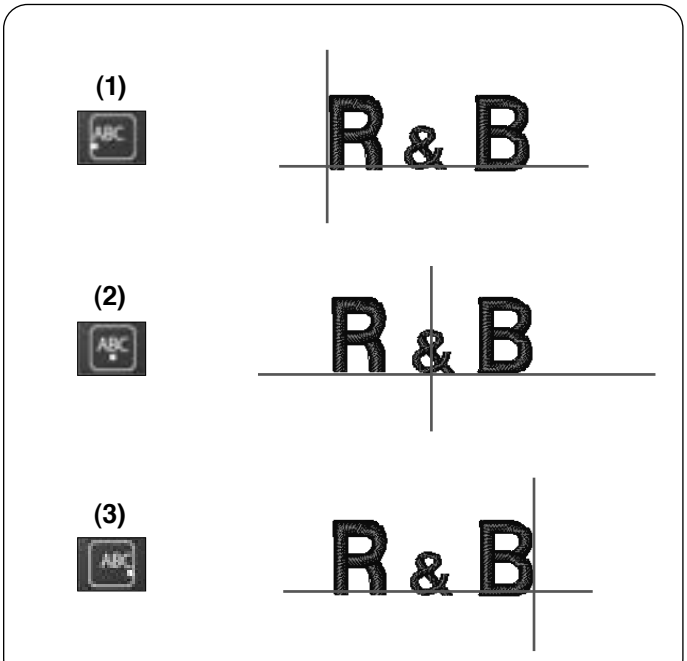
5. The screen changes to the Ready to Sew window.

Press the start/stop button to start sewing.



Monogram placement

You can select one of 3 monogram placements: left justify, center justify and right justify.



(1) Left Justify

Press the key to start sewing from the left end reference line on the template.

(2) Center Justify

Press the key to sew in the center of the hoop.

(3) Right Justify

Press the key sew from the right end reference line on the template.

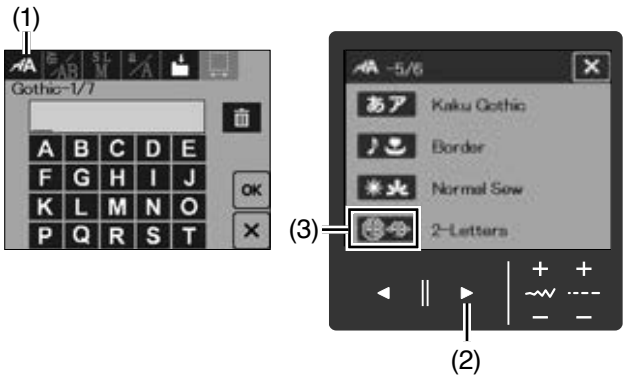
2-Letters monogram

Example: 2-Letters in an octagon

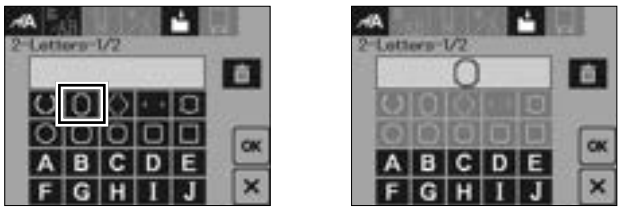
1. Press the font selection key to open the font selection window.

Press the page key and select “2-Letters”.

(1) Font selection key
(2) Page key
(3) 2-Letters



2. Select the octagon.

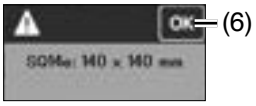


3. Enter **“A”** and **“B”**.

Press the OK key.

(4) OK key





NOTE:
If you want to change the text, press the delete key and start over by selecting the frame pattern and text again.

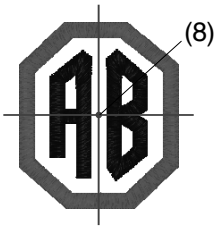
(5) Delete key

4. A message will appear to confirm the hoop size. Press the OK key.

(6) OK key

5. The screen changes to the Ready to Sew window. Press the start/stop button to start sewing.





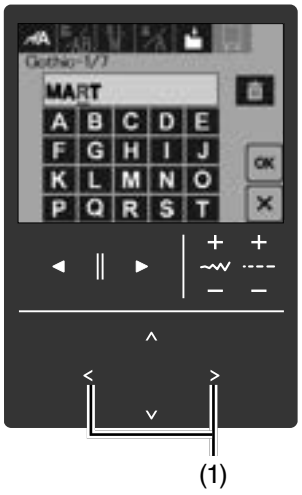
NOTE:
If you press the color change key before sewing, the machine will stop after each letter is sewn. You can then change the thread to change the color of the letters.

(7) Color change key

NOTE:
The 3-Letters monogram is sewn in the same way as the 2-Letters monogram.
The starting position for the 2-Letters and 3-Letters monogram is at the center of the hoop.

(8) Starting point

1.



2.



3.



4.



Editing a monogram

Deleting a character: Deleting **"R"** from **"MART"**

1. Press the cursor keys to move the cursor under **"R"**. The color of the selected character with the cursor turns blue.
(1) Cursor keys

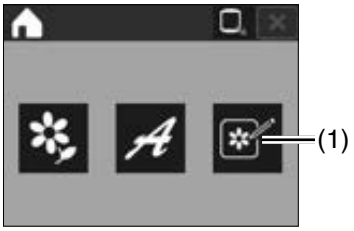
2. Press the delete key and the letter **"R"** is deleted.
(2) Delete key

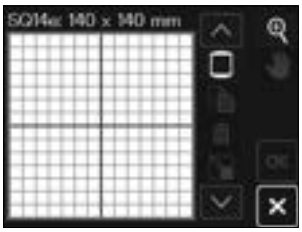
NOTE:
If the cursor is to the right of the last character, the last character is deleted.

Inserting a character: Inserting **"E"** into **"MAT"**

3. Press the cursor keys to move the cursor under **"A"**.
(1) Cursor keys

4. Enter **"E"**.
The letter **"E"** is inserted before **"A"**.





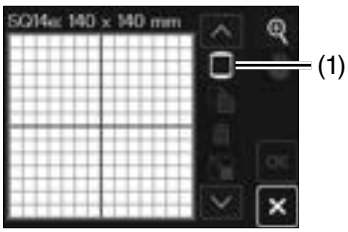
Editing Mode

In the editing mode, you can edit and combine patterns to create original embroidery designs.

Press the editing key on the embroidery mode window to show the editing window for hoop SQ14e.

(1) Editing key

1.



Selecting a hoop size

You can select other hoop sizes.

1. Press the hoop selection key and the hoop selection window will open.

(1) Hoop selection key

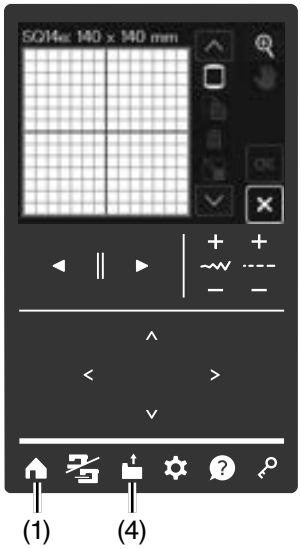
2.

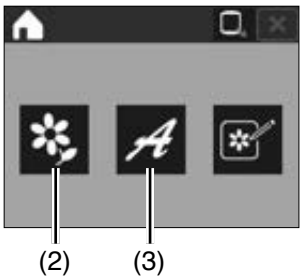


2. Select the desired hoop.

The screen will return to the editing window.

NOTE:
In the editing mode, you cannot select patterns larger than the size of the selected hoop.





Opening the embroidery designs

In the editing window, you can open the built-in designs, monogram, and designs in the internal or USB flash drive.

To open built-in design patterns, press the home key.

Press the design category key to select the desired pattern from the design list (refer to pages 198-201).

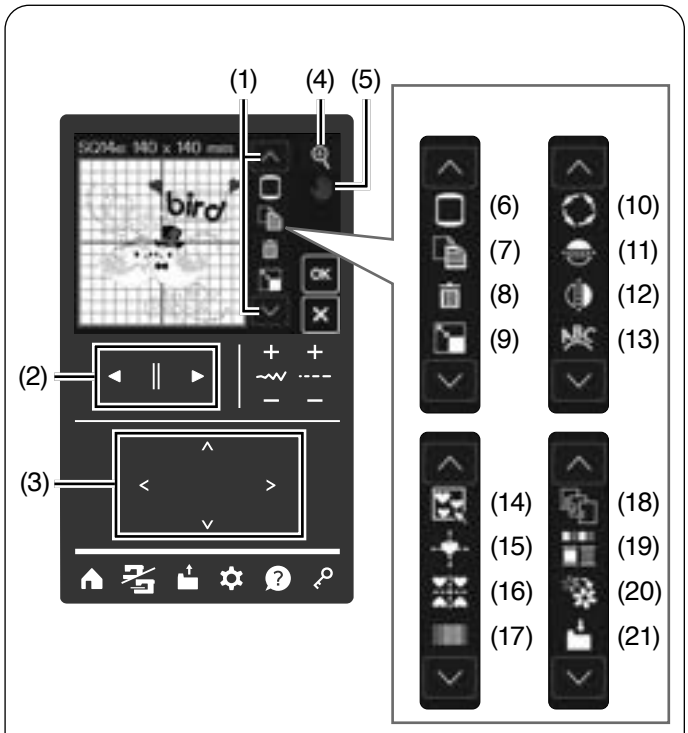
The screen will return to the editing window with the selected pattern displayed.

To add more design patterns or monogram in the editing window, press the home key again and select the desired pattern or monogram from the design list (refer to pages 198-204).

(1) Home key
(2) Design category key
(3) Monogram key

To open designs in a USB flash drive, press the open file key (refer to pages 164-165).

(4) Open file key

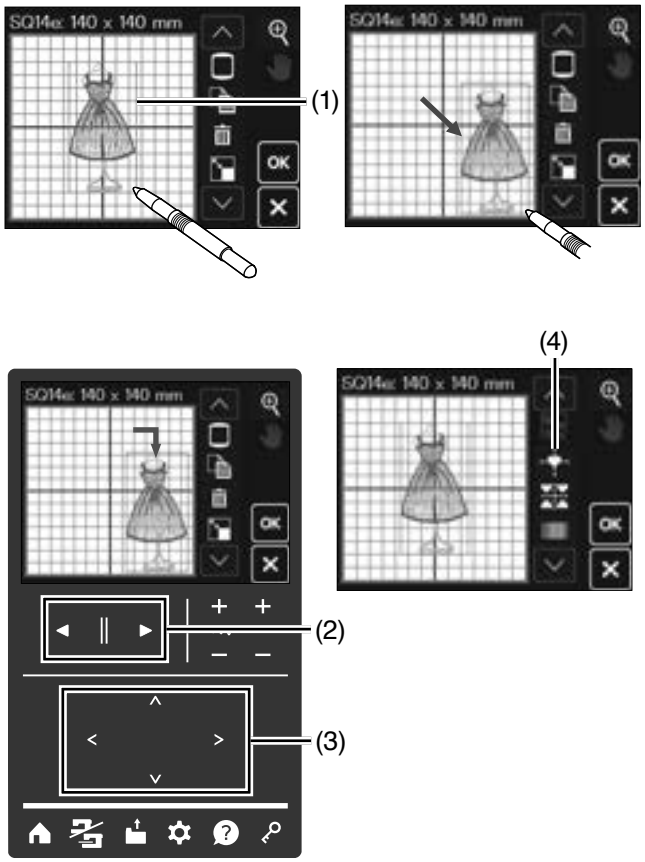


Editing Window Information

The editing window contains the following keys. Press the next/previous set key to switch the editing tools.

NOTE:
Some keys may not be available depending on the selected pattern or settings.

(1) Next/Previous set key
(2) Page keys (refer to page 143)
(3) Jog keys (refer to page 143)
(4) Zoom key (refer to page 145)
(5) Scroll key (refer to page 145)
(6) Hoop selection key (refer to page 142)
(7) Duplicate key (refer to page 144)
(8) Delete key (refer to page 144)
(9) Resize key (refer to page 145)
(10) Rotate key (refer to page 146)
(11) Horizontal mirror image key (refer to page 146)
(12) Vertical mirror image key (refer to page 146)
(13) Arc key (refer to page 147)
(14) Group key (refer to page 148)
(15) Center position key (refer to page 143)
(16) Corner layout key (refer to page 149)
(17) Custom color key (refer to page 150)
(18) Sewing order key (refer to page 152)
(19) Color group key (refer to page 153)
(20) Single color sewing key (refer to page 154)
(21) Save file key (refer to page 154)



Selecting a pattern

To select the pattern to edit, press on the pattern image in the editing window.
A green frame appears around the selected pattern.

(1) Green frame

NOTE:
If multiple patterns are placed close to each other and it is difficult to select the desired pattern. Use the page keys to select the pattern you want to edit.

(2) Page keys

Moving a pattern

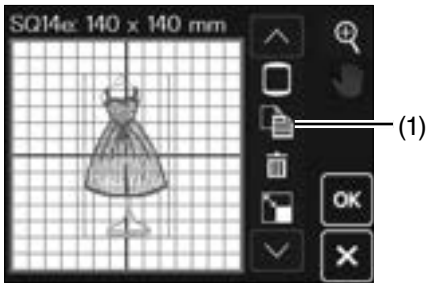
To move the embroidery pattern in the editing window, press and drag the pattern to a desired location with the touch screen stylus.
You can also move the selected pattern by pressing the jog keys.
Press the jog keys to move the pattern to the desired position in the editing window.
Press the center position key to move the pattern to the center of the editing window.

(3) Jog keys
(4) Center position key

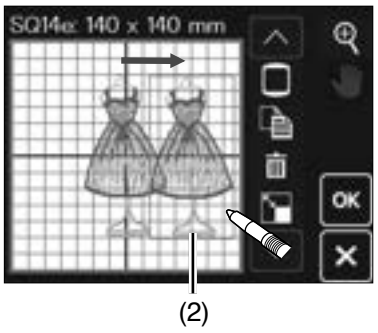
NOTE:
- Do not drag the pattern on the screen with a sharp pointed object.
- The carriage will not move when you press the jog keys since the pattern position will move relative to the hoop, not to the machine.



1.



2.



Duplicating a pattern

1. To make a copy of the selected pattern, press the duplicate key.

A green frame appears around the selected pattern.

Press the duplicate key to duplicate the selected pattern.

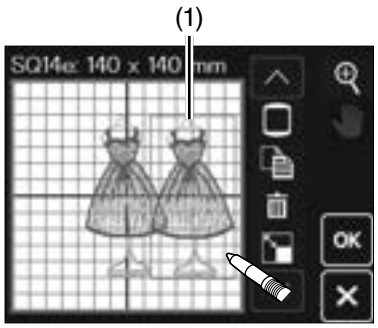
(1) Duplicate key

2. The duplicated pattern will be copied over the original pattern. Move the duplicate to show the original pattern.

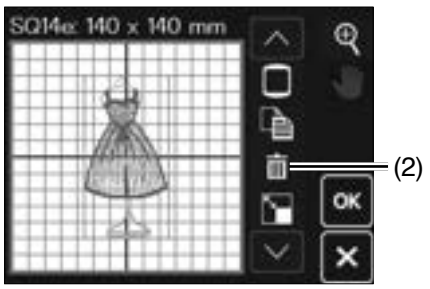
(2) Duplicated pattern



1.



2.



Deleting a pattern

1. Press on the pattern to delete.

A green frame appears around the selected pattern.

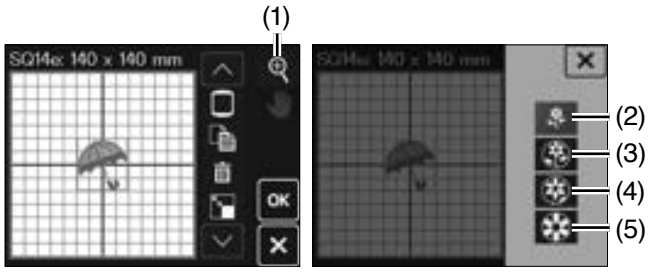
(1) Deleting pattern

2. Press the delete key to delete the selected pattern.

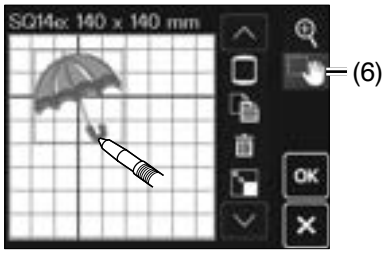
(2) Delete key



1.



2.





Zooming in the editing window

1. Press the zoom key to open the zoom in/out window. Select the view size from normal, middle, large or largest by pressing one of the view size keys.

(1) Zoom key
(2) Normal view size key
(3) Middle view size key
(4) Large view size key
(5) Largest view size key

2. The scroll function is activated automatically when zoomed in (the scroll key turns blue).

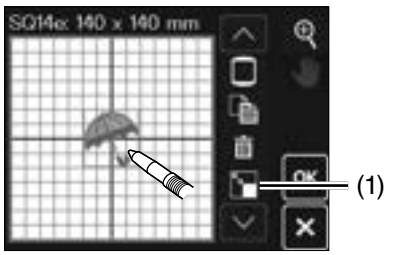
To scroll the magnified window, drag the window in the desired direction.

Press the scroll key to cancel the scroll command.

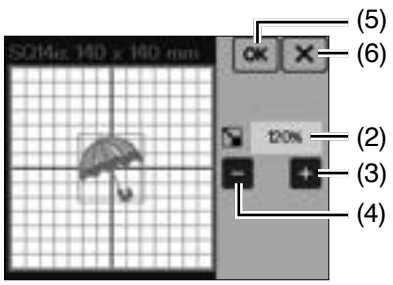
(6) Scroll key (activated)
(7) Scroll key (deactivate)



1.



2.



Resizing a pattern

1. Press the resize key to open the resize option window. A green frame appears around the selected pattern. Press the resize key to resize the selected pattern.

(1) Resize key

2. You can change the embroidery pattern size from 80% to 120% of the original size.

Press the “+” key to enlarge the pattern size.
Press the “–” key to reduce the pattern size.
The size will change 1% each time you press the “+” or “–” key. To change the size quickly, press and hold the “+” or “–” key.

The scale of a resized pattern is displayed as a percentage.

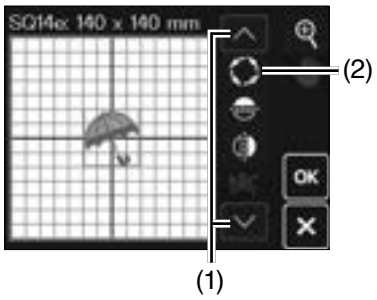
Press the OK key to confirm the new size.

Press the X key to return to the previous page.

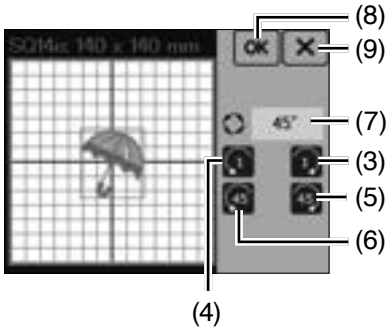
(2) Pattern size
(3) + key
(4) – key
(5) OK key
(6) X key



1.



2.



Rotating a pattern

1. Press on the pattern to rotate.

A green frame appears around the selected pattern.

Press the next/previous set key to show the rotate key.

Press the rotate key to rotate the selected pattern.

(1) Next/Previous set key
(2) Rotate key

2. Press the key (3) to rotate the selected pattern 1 degree clockwise.

Press the key (4) to rotate the selected pattern 1 degree counterclockwise.

Press the key (5) to rotate the selected pattern 45 degree clockwise.

Press the key (6) to rotate the selected pattern 45 degree counterclockwise.

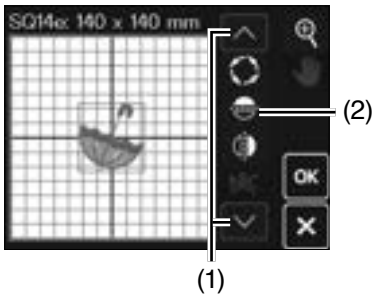
The angle of a rotated pattern is displayed in the window.
Press the OK key to confirm.

Press the X key to return to the previous page.

(7) Angle of a rotated pattern
(8) OK key
(9) X key



1.



2.



Flipping a pattern

1. Press on the pattern to flip.

A green frame appears around the selected pattern.

Press the next/previous set key to show the horizontal mirror image key.

Press the horizontal mirror image key to create the horizontal mirror image of a selected pattern.

(1) Next/Previous set key
(2) Horizontal mirror image key

2. Press the vertical mirror image key to create the vertical mirror image of a selected pattern.

(3) Vertical mirror image key

Monogramming in an arc

In the editing mode, you can make a monogram in an upper or lower arc.

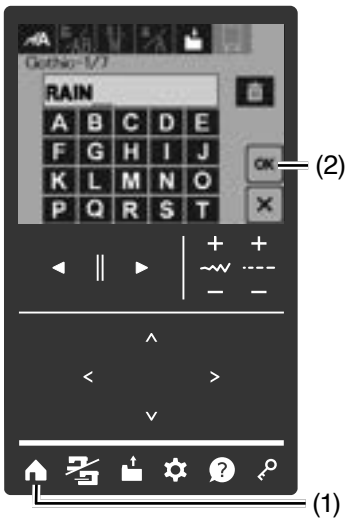
Example: RAIN/Gothic/Middle size/Upper case

1. Press the home key and press the monogram key in the embroidery mode window (refer to page 119).

Enter the monogram and press the OK key.

(1) Home key
(2) OK key

1.



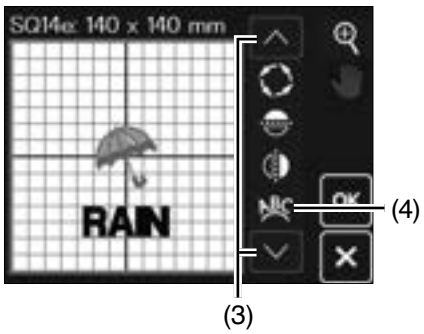
2. The entered characters are displayed in the editing window.

Press the next/previous set key to show the arc key.

Press the arc key and the arc layout window will open.

(3) Next/Previous set key
(4) Arc key

2.



3. Press the upper arc key to make an upper arc.

Press the lower arc key to make a lower arc.

Press the enlarge key to make the arc longer.

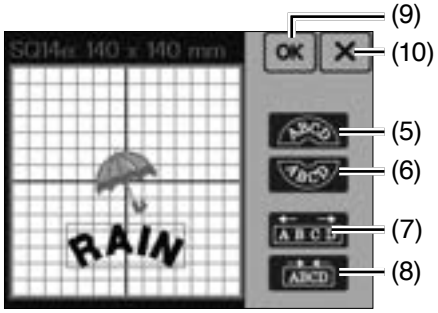
Press the shorten key to make the arc shorter.

Press the OK key.

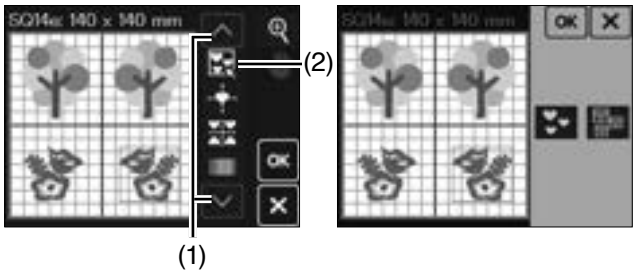
Press the X key to return to the previous page.

(5) Upper arc key
(6) Lower arc key
(7) Enlarge key
(8) Shorten key
(9) OK key
(10) X key

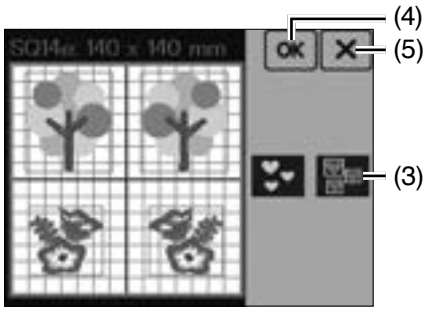
3.



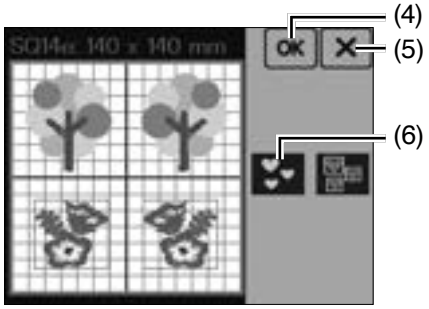
1.



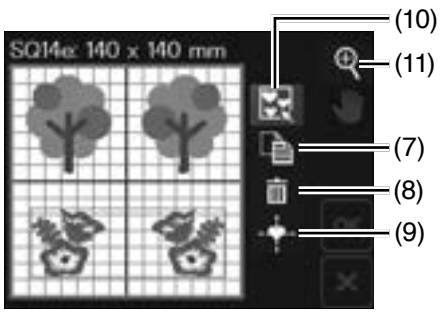
2.



3.



4.



Grouping patterns

1. You can group patterns together.

Press the next/previous set key to show the group key. Press the group key and the grouping option window will open.

(1) Next/Previous set key
(2) Group key

2. Press the group all key and press the OK key to group all the patterns in the editing window.

Press the X key to return to the previous page.

(3) Group all key
(4) OK key
(5) X key

3. If you wish to group the selected patterns only, press the group select key.

Select the desired patterns by pressing on the pattern images. A green frame appears around the selected pattern.

Press the selected pattern again to unselect the pattern.

Press the OK key to group the selected patterns.

Press the X key to return to the previous page.

(4) OK key
(5) X key
(6) Group select key

4. The grouped patterns can be moved, duplicated, deleted and moved to the center position as a unit.

After editing, press the group key.

When grouping the selected patterns only, the rest of the patterns are grayed out and cannot be selected.

To ungroup the patterns, press the group key again.

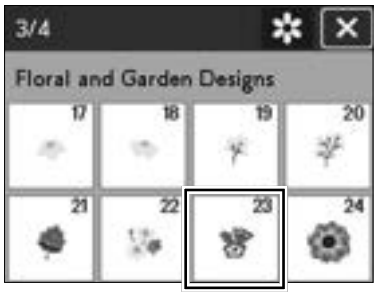
To change the magnification, press the zoom key (refer to page 145).

(7) Duplicate key
(8) Delete key
(9) Center position key
(10) Group key
(11) Zoom key

Corner layout

1. Select a pattern.

1.



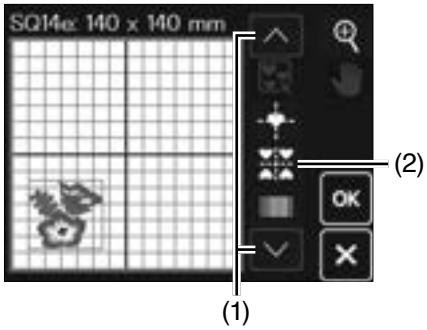
2.

2. Move the design down and to the left.

Press the next/previous set key to show the corner layout key.

Press the corner layout key.

(1) Next/Previous set key
(2) Corner layout key

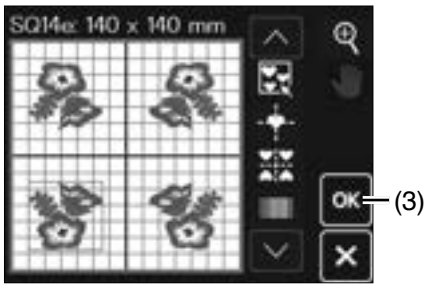


3.

3. The pattern will automatically be copied and placed symmetrically into 4 corners.

Press the OK key.

(3) OK key



4.

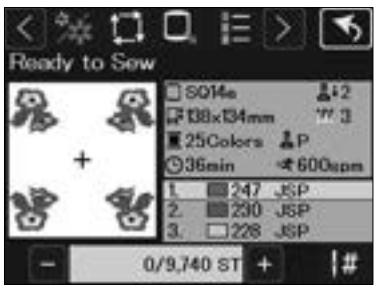
4. The Ready to Sew window will open.

A message will appear to confirm the size of the embroidery hoop.

Press the OK key.

(4) OK key





Customizing the display colors

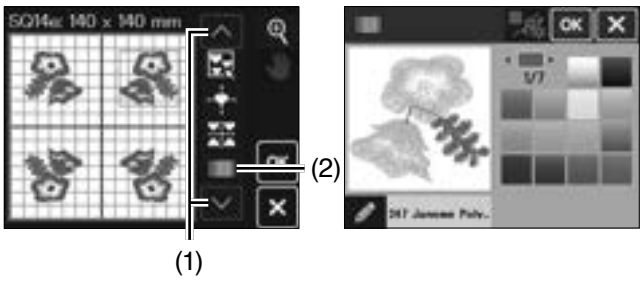
You can simulate the colors of the actual fabric and threads on the screen by customizing the colors of the design image and editing window.

Colors of the design pattern

1. Press the next/previous set key to show the custom color key.

   Press the custom color key and the custom color window will open.

   (1) Next/Previous set key
   (2) Custom color key



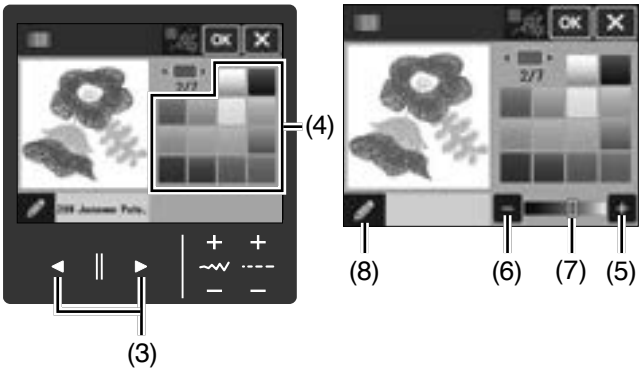
2. Press the page keys until the desired section is displayed in the preview window.

   To select the hue, press one of the 14 color tiles.

   (3) Page keys
   (4) Color tiles

3. To change the shade of the selected color, press the "+" or "–" key, or drag the slider to the left or right.

   (5) + key
   (6) – key
   (7) Slider



4. You can assign a name to the customized color for the color section by pressing the name key (refer to page 160).

   Enter a new name in the new name window and press the OK key.

   Up to 30 characters can be entered.

   Press the delete key to delete the character before the curor.

   (8) Name key
   (9) OK key
   (10) Delete key

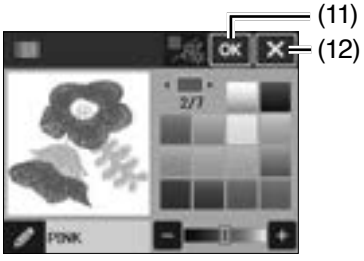


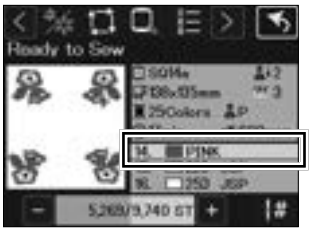
5. Press the OK key in the custom color window.

   The assigned name will be displayed instead of the name and code of the thread color in the embroidery window.

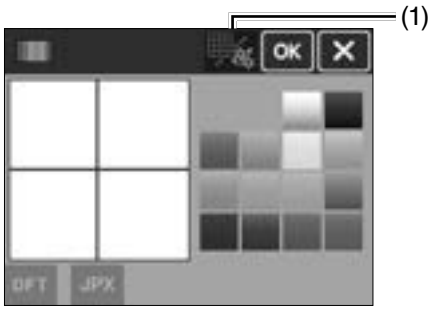
   Press the X key to return to the previous page.

   (11) OK key
   (12) X key

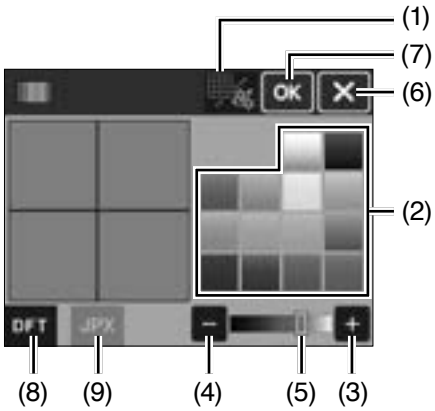


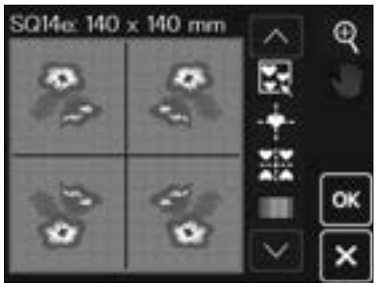


1.



2. 3.





Colors of the background

1. To change the background color, press the design color/background color key and select the desired color.

The custom color window will open.

(1) Design color/background color key

2. To select the hue, press one of the 14 color tiles.

To change the shade of the selected color, press the "+" or "–" key, or drag the slider to the left or right.

Press the X key to return to the previous window.

Press the design color/background color key to return to the custom color window.

(1) Design color/background color key
(2) Color tiles
(3) + key
(4) – key
(5) Slider
(6) X key

3. Press the OK key.

Background color of the editing window will be changed.

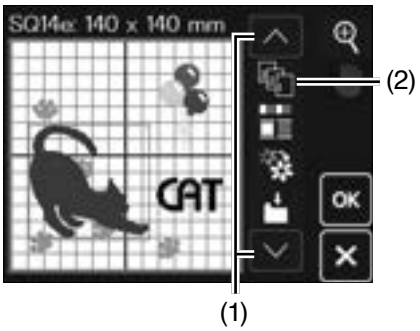
(7) OK key

NOTE:

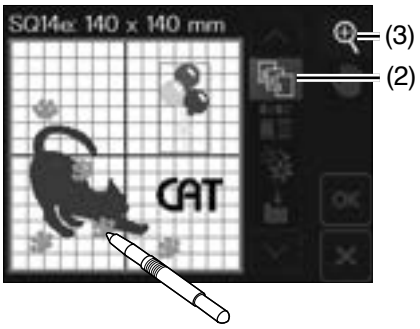
- To return the background color to its original color, press the default key and OK key.
  (8) Default key
- Press the background image key to display the image on the background of the editing window if you are opening a JPX format file that contains a background image. By doing so, you can visually confirm the layout of a embroidery pattern and the background images.
  .JPX file format can be saved with a background image.
  (9) Background image key



1.



2.



Sewing order

You can change the sewing order of a pattern combination.

1. Press the next/previous set key to show the sewing order key. Press the sewing order key.

(1) Next/Previous set key
(2) Sewing order key

2. Press on the images of the patterns one by one.

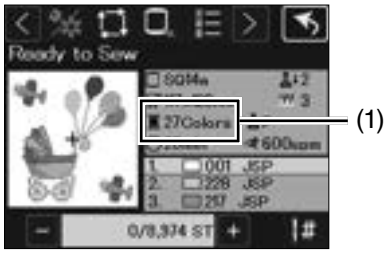
The patterns will be sewn in the order you press on the images. Press the sewing order key again to return to the previous screen.

(2) Sewing order key

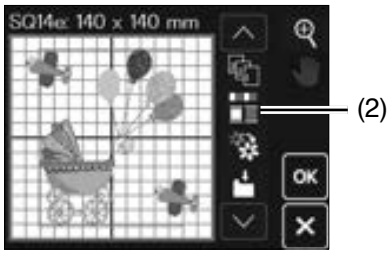
NOTE:
To change the magnification, press the zoom key (refer to page 145).

(3) Zoom key

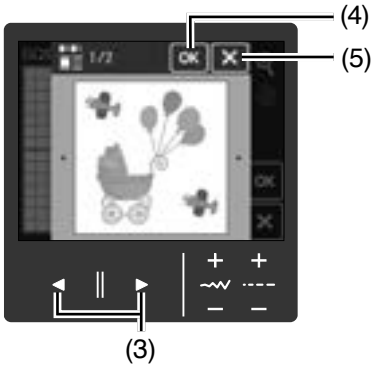
1.



2.



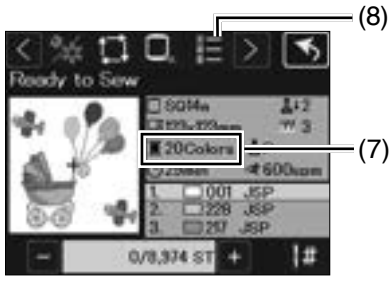
3. 4.



5.



6.





Color grouping

When combining patterns, you can reduce the number of color sections with color grouping.

Set the sewing order so that the same airplane patterns are sewn (refer to page 152). If the sewing order is set to include different patterns between the same patterns, the same thread colors in the same patterns cannot be grouped together.

1. For example, the combined design pattern created on the left has 27 color sections.
(1) 27 color sections

2. Press the color group key in the editing window.
(2) Color group key

3. Color group window will be open.
Press the page keys to confirm which patterns are grouped together.
(3) Page keys

4. Press the OK key to unite all color sections of the same color and the Ready to Sew window opens.
Press the X key to return to the previous window.
(4) OK key
(5) X key

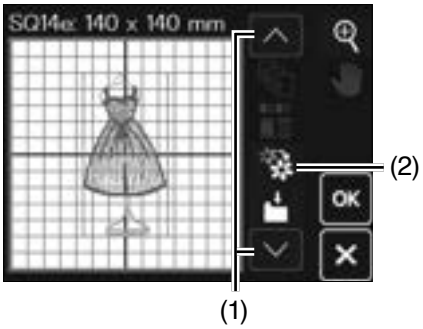
5. Check the hoop size and press the OK key.
(6) OK key

6. The number of color sections is reduced to 20.
(7) 20 color sections
(8) Color list key

NOTE:
- Color grouping can be checked with the color list key.
- Color grouping will be cancelled when returning to the editing window.



1.



2. 3.





4.



Single color sewing

If you want to sew a pattern or a pattern combination in one color only, press the single color sewing key. The machine will not stop until the entire design is sewn.

1. Press the next/previous set key to show the single color sewing key.

Press the single color sewing key.

(1) Next/Previous set key
(2) Single color sewing key

2. A message appears. Press the OK key.

Press the X key to return to the previous window.

(3) OK key
(4) X key

3. Check the hoop size and press the OK key.

(5) OK key

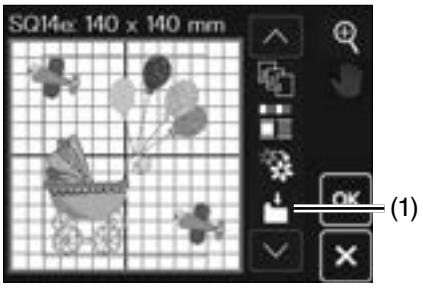
4. The design will be displayed in gray.

Press the start/stop button to start single color sewing.

The design will be sewn without stopping for any color change.

NOTE:
Single color sewing will be cancelled when returning to the editing window.





Saving a file

You can save original embroidery designs as files in the internal memory or USB flash drive with pressing the save file key (refer to pages 157-161).

(1) Save file key

Free-Arm Embroidery (optional)

The free-arm embroidery hoop FA10e/FA5e is specially designed for embroidering tubular garments such as sleeves, pant legs etc.

Check the opening size of the tubular portion of the garment. The opening width must be 200 mm (8″) or wider.
The embroidery area should be within 200 mm (8″) from the opening.

Opening width:

If the opening width is 200 mm - 250 mm, the embroidery area should be limited in order to prevent fabric from restraining hoop movement.

Example: Baby and Child Design #5 with FA10e free-arm embroidery hoop

1. Draw centerlines on the fabric with tailor's chalk.
(1) Centerlines

2. Open the editing window and select the FA10e free-arm embroidery hoop. (FA10e: 100 mm x 40 mm).
Press the home key to open the embroidery window.
(2) Hoop selection key
(3) Home key
(4) FA10e: 100 mm x 40 mm

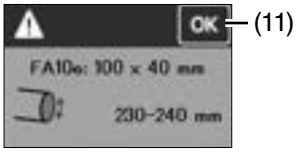
3. Press the design category key to select the Baby and Child Design #5.
(5) Design category key

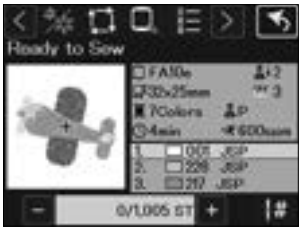
4. Press the opening width key in the editing window to show the embroidery area window.
Press the "+" or "–" key to adjust the opening width.
Press the OK key in the embroidery area window.
Press the X key to return to the previous page.
(6) Opening width key
(7) "+", "–" key
(8) OK key
(9) X key

Press the OK key after editing and a message will appear to confirm the hoop size.
(10) OK key

NOTE:
- If the opening width is set to less than 250 mm, automatic thread trimming for jump threads will be disabled, even if "Thread Cutting" in the embroidery settings is set to anything other than "OFF" (refer to page 175).
- Settings for the embroidery area is not available when using the FA5e free-arm embroidery hoop. The automatic thread cutting for jump threads is always disabled.

5.

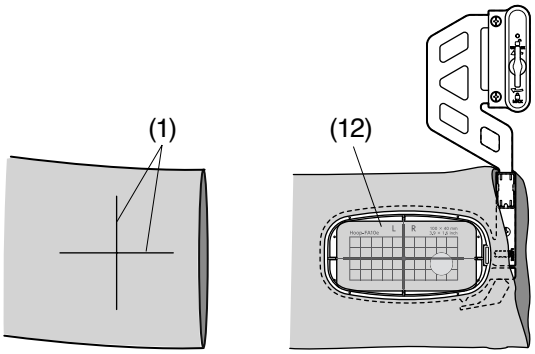




5. Press the OK key and the Ready to Sew window will open.

(11) OK key

6.

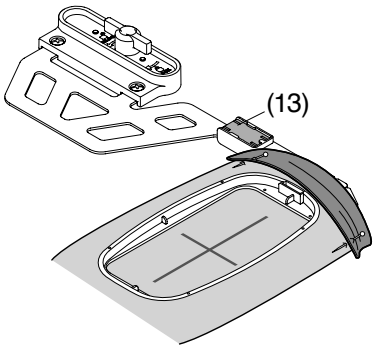


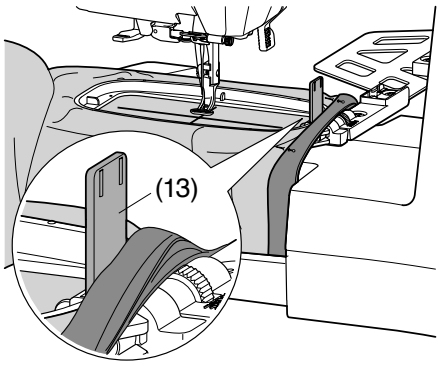
6. Set the garment in the FA10e hoop as shown.

Position the garment so that the centerlines match those on the template in the hoop.

(1) Centerlines
(12) Template

7.





7. Remove the extension table (refer to page 7).

Place the garment over the free-arm of the machine and attach the FA10e hoop to the carriage (refer to page 116).

Roll up the cuff so that it will not jam at the neck of the free-arm.

Insert the blocking plate into the inner hoop to prevent the cuff from overlapping the embroidery area.

(13) Blocking plate

8. Remove the hoop from the carriage when sewing is finished. Remove the garment from the free-arm.

SAVING AND OPENING A FILE

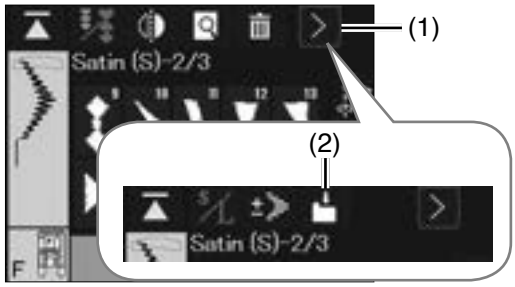
Saving a File

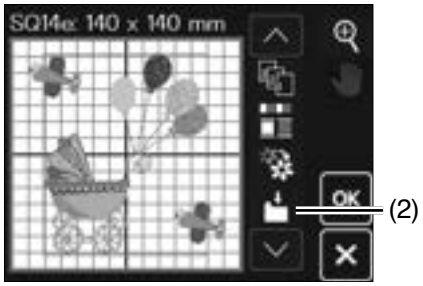
You can save programmed pattern combinations in ordinary sewing mode or original embroidery designs created in embroidery mode as files in the internal memory or USB flash drive.

⚠ CAUTION:
Do not turn OFF the power or disconnect the USB flash drive while saving or opening files, otherwise it may damage the memory bank.

NOTE:
- This model supports FAT16 and FAT32 formats only. If the USB flash drive is not read, check its format (refer to pages 191-192).
- Do not use a USB card reader and USB hub.

1.







Saving a file in an internal memory (Ordinary sewing)

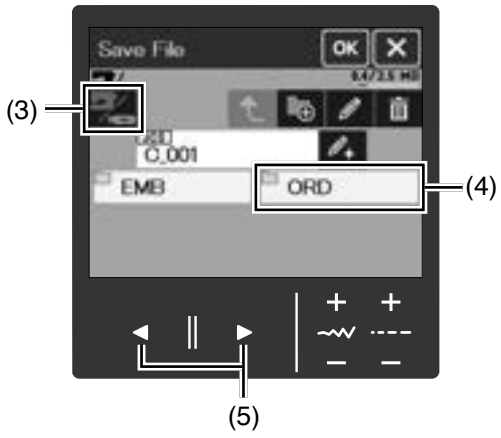
The steps for saving ordinary sewing and embroidery pattern data is the same.

1. Press the function switch key in the pattern combination window.

Press the save file key and the save file window will open.

(1) Function switch key
(2) Save file key

2. 3.



2. Press the internal memory/USB flash drive switch key to select the internal memory.

(3) Internal memory/USB flash drive switch key

3. The EMB and ORD folders are displayed on the screen.

Press the ORD folder icon to select the folder in the ordinary sewing mode.

(4) ORD folder

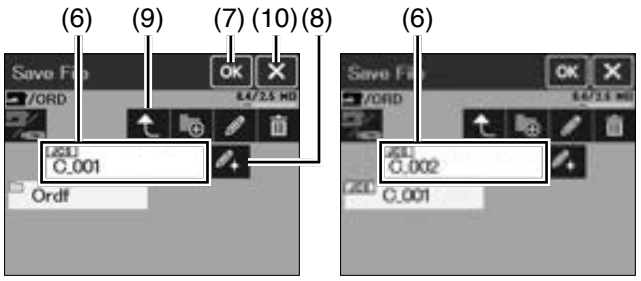
To create a new folder to save it in, refer to page 159 “Creating a new folder (Ordinary sewing)”.

If the saved files exceed the limits to be displayed on one window in steps **2.** or **3.**, press the page keys to view other pages.

Files and folders are displayed on separate pages. Use the page keys to switch between pages.

(5) Page keys

4.



4. The ORD folder is shown and the file name is assigned automatically starting from C_001... in order. Press the OK key and the file is saved in the selected folder.

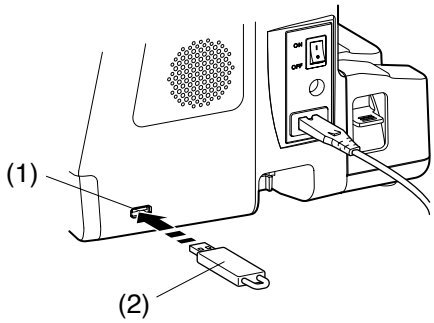
(6) File name
(7) OK key

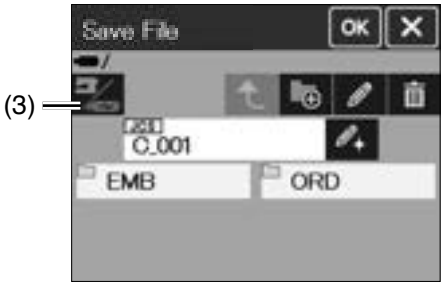
If data has already been saved under the name C_001, the number will automatically be incremented and C_002 will be displayed.

To save the file name with a new name key, refer to page 161.

Press the upper folder key to go to the save file window at the upper level, or press the X key to return to the pattern selection window without saving the data.

(8) New name key
(9) Upper folder key
(10) X key





Saving a file on a USB flash drive

1. To save a file on a USB flash drive, insert a USB flash drive to USB port.

(1) USB port
(2) USB flash drive

2. Press the internal memory/USB flash drive switch key to select the USB memory on the save file window (refer to page 157).

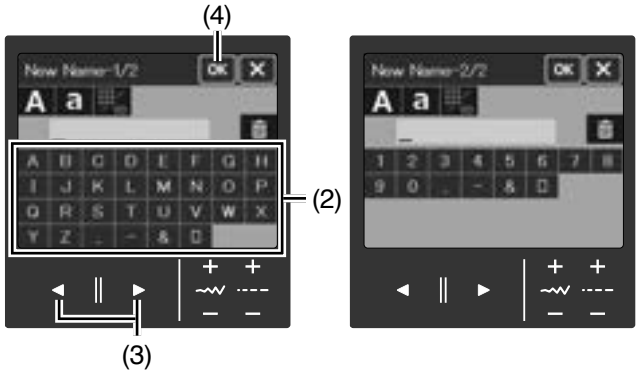
(3) Internal memory/USB flash drive switch key

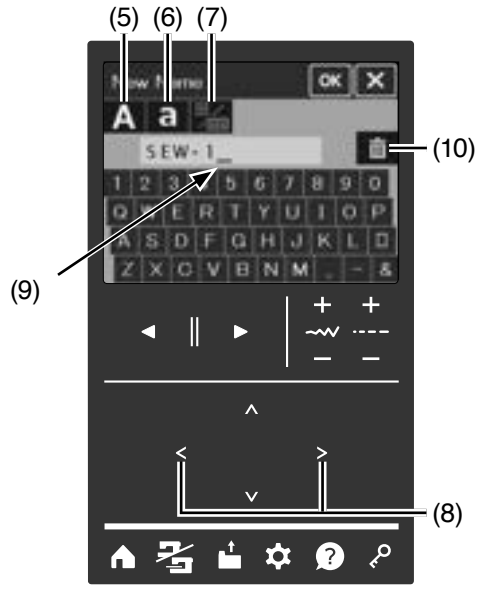
Icon	Description
 Rename key	To change the name of the file or folder (refer to page 160).
 New name key	To assign a new name to the file (refer to page 161).
 Delete key	To delete the file or folder (refer to page 160).
 New folder key	To create the new folder (refer to page 159).
 Upper folder key	To move to the upper folder.
	To save data to internal memory of the machine.
	To save data to USB flash drive.
	To save data for ordinary sewing in the internal memory of the machine.
	To save data for embroidery designs in the internal memory of the machine.

1.

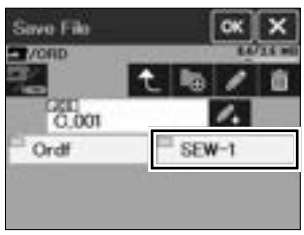


2.

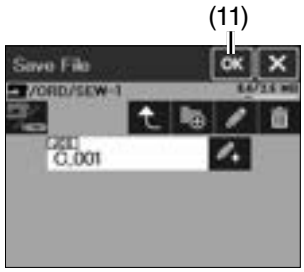




3.



4.



Creating a new folder (Ordinary sewing)

You can create your own folders to save data instead of using the folders provided by the sewing machine.

1. Press the new folder key in the save file window in step **3.** on page 157 and the new name window will open.

(1) New folder key

2. Enter a name of 10 characters or less.

To enter numbers, press the page keys.

Press the OK key to show the save file window again.

(2) Characters
(3) Page keys
(4) OK key

Press the upper case key or lower case key to select the letter case.

If you wish to use the QWERTY layout keyboard, press the keyboard key.

To delete while entering characters, press the cursor keys to move the cursor under the character to delete, then press the delete key.

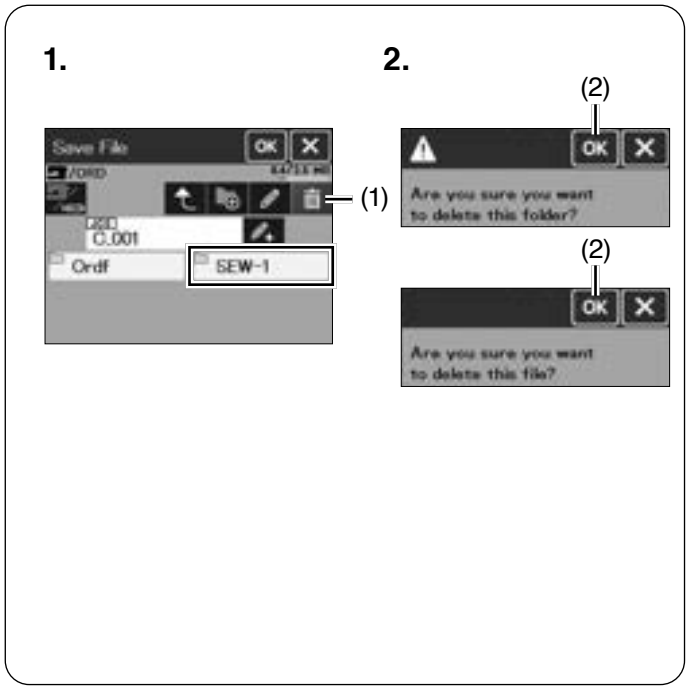
A message will appear if the same name already exists.
Press the X key and enter a new name.

(5) Upper case key
(6) Lower case key
(7) Keyboard key
(8) Cursor keys
(9) Cursor
(10) Delete key

3. The newly created folder will be displayed in the save file (ORD) window. Press the folder to open the newly created folder.

4. When you press the OK key in the newly created folder, the pattern with the file name “C_001” will be saved to the newly created folder and you will return to the pattern selection window.

(11) OK key



Deleting a file or folder

Press the delete key and select the file or folder to delete.

1. On the save file (ORD) window, press the delete key to turn it blue.

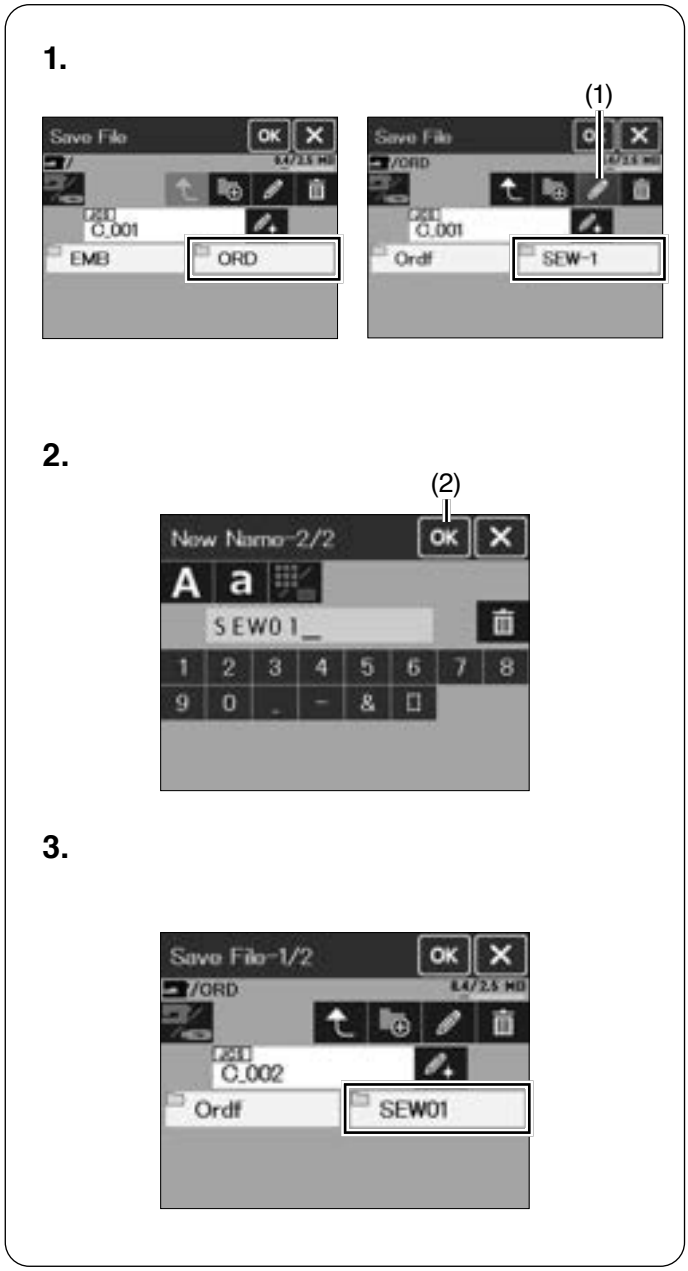
   The delete key is activated.

   (1) Delete key

   Select the folder or file to delete.
2. A confirmation message will appear.

   Press the OK key to delete the file or folder.

   (2) OK key



Rename key and new name key

You can change a name of a file or folder already created.

Changing folder name with rename key

1. Press the save file key on the pattern selection window to open the save file window.

   Select the location of the file or folder to rename.

   Press the rename key to turn it to blue. You can change the name of the folder or file with the key selected.

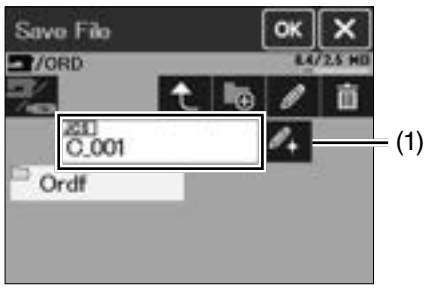
   Select the folder to rename.

   (1) Rename key
2. New name window will be displayed.

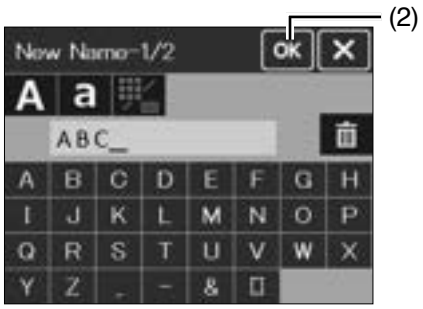
   Enter a new name and press the OK key.

   (2) OK key
3. The save file (ORD) window opens with a new folder name (refer to page 159).

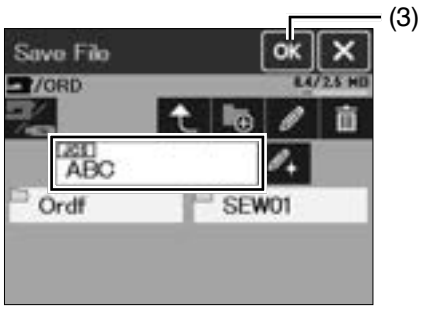
1.



2.



3.



Changing file name with new name key

1. To change the machine' s default file name "C_001" on the save file (ORD) window, press the new name key to show the new name window (refer to page 158 step **4.**).

(1) New name key

2. Enter a name of 10 characters or less.

Press the OK key (refer to page 159).

(2) OK key

3. Save file window opens with a new file name. Press the OK key.

File is saved with a new name.

(3) OK key

Opening a File

You can open saved files in the machine's internal memory or USB flash drive.

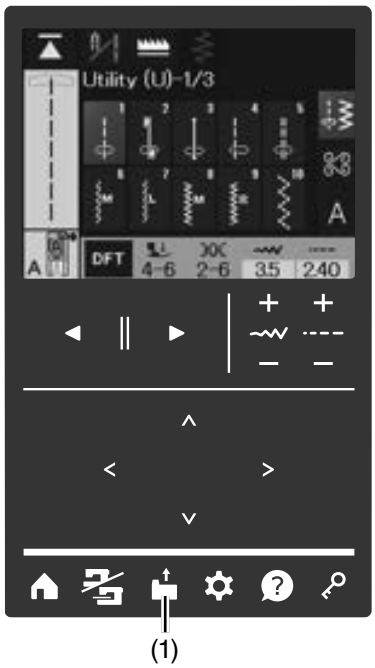
⚠ CAUTION:
Do not turn OFF the power or disconnect the USB flash drive while saving or opening files, otherwise it may damage the memory bank.

NOTE:
- This model supports FAT16 and FAT32 formats only. If the USB flash drive is not read, check its format (refer to pages 191-192).
- Do not use a USB card reader and USB hub.

Ordinary sewing

Opening a file in the internal memory of the machine

1. Press the open file key in the ordinary sewing mode to open the open file window.



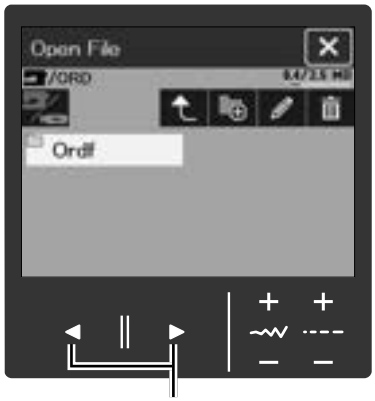
(1) Open file key

2. Make sure to press the internal memory/USB flash drive switch key to select the internal memory.

3. Select the desired folder in the open file window.

Press the page keys to show the pages and check the files stored in the ORD folder.





(2) Internal memory/USB flash drive switch key
(3) ORD folder
(4) Page keys

4.

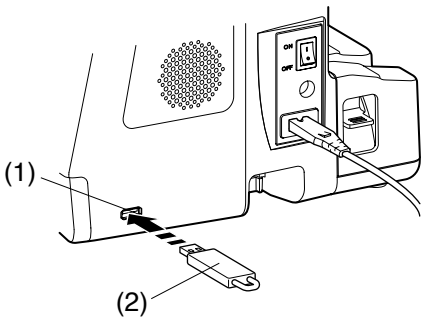


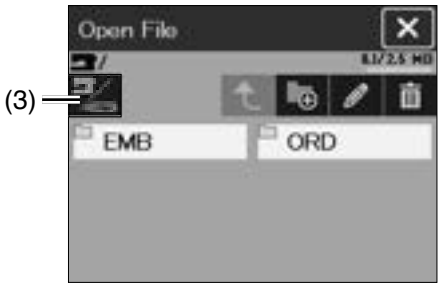


4. Select the desired file and the saved data will be displayed on the pattern selection window.

If the saved files exceed the limits to be displayed on one window, press the page keys to view other pages.

(4) Page keys





Opening a file on a USB flash drive

1. To open a file on a USB flash drive, insert a USB flash drive to USB port.

(1) USB port
(2) USB flash drive

2. Make sure to press the internal memory/USB flash drive switch key to select the USB flash drive (refer to page 162).

(3) Internal memory/USB flash drive switch key

Opening a file in the internal memory of the machine

1. Press the open file key in the embroidery mode to open the open file window.

(1) Open file key

1.



2. Make sure to press the internal memory/USB flash drive switch key to select the USB flash drive.

(2) Internal memory/USB flash drive switch key

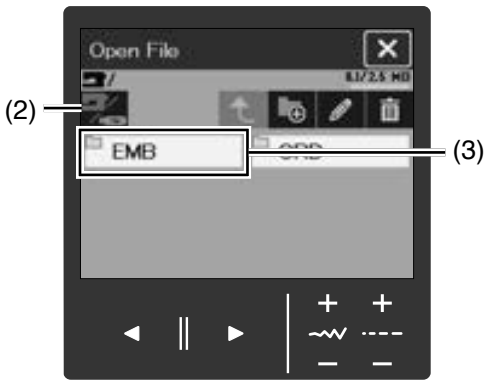
3. Select the desired folder in the open file window.

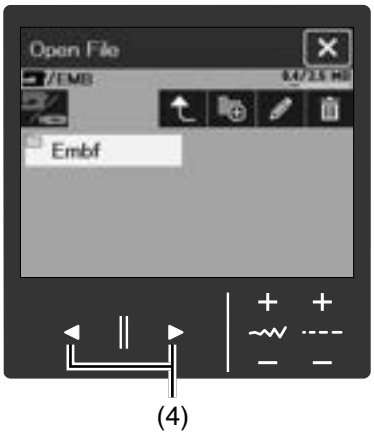
Press the page keys to display the next page and check the files stored in the EMB folder.

(3) EMB folder
(4) Page keys

To create a new folder, delete a file or folder, and change a file or folder name, refer to pages 159-160.

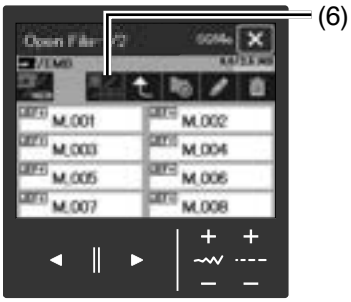
2. 3.



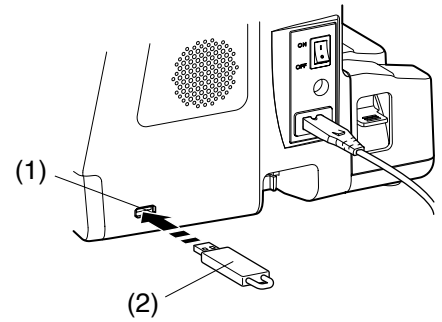


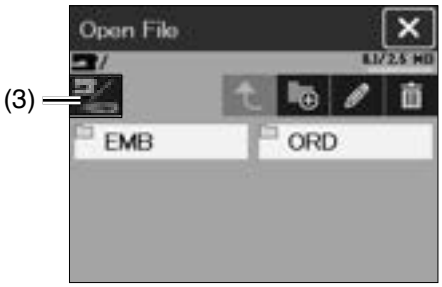
4.











4. Select the desired file.

The saved data will be displayed on the Ready to Sew window.

When you press the file open key on the editing window, the selected pattern will be displayed on the editing window.

The file list is set to display icons with pattern name, pattern preview and file format by default (6 files can be displayed per page)

If the saved files exceed the limits to be displayed on one window, press the page keys to view other pages. The file will also appear on a separate page for each hoop.

(4) Page keys
(5) Embroidery hoop

Press the icon/list key to switch the display of the list with or without pattern preview (8 files can be displayed per page).

(6) Icon/list key

File format

File format icons are as follows:

File format icon	Description
JEF	*.JEF (non-editable JEF embroidery format)
JEF+ / JPX	*.JEF+ (editable JEF embroidery format)
JPX	*.JPX (*.JEF+ with a background bitmap image)
JPX	*.JPX (Acufil embroidery format)
JPX	*.JPX (Cutwork embroidery format)
	*.JPX (Free-arm embroidery format)
DST	*.DST (Tajima embroidery format)
JCPR	*.JCPR (protected embroidery format)

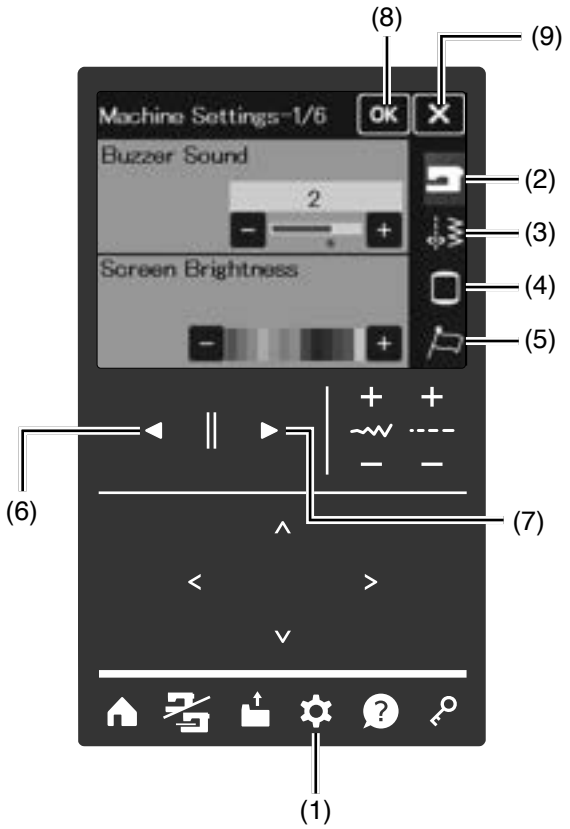
Opening a file on a USB flash drive

1. To open a file on a USB flash drive, insert a USB flash drive to USB port.

(1) USB port
(2) USB flash drive

2. Make sure to press the internal memory/USB flash drive switch key to select the USB flash drive (refer to page 162).

(3) Internal memory/USB flash drive switch key



CUSTOMIZING MACHINE SETTINGS

Machine Settings Mode

Press the set mode key to enter the machine settings mode.
You can select various options and customize the machine settings to suit your personal preference.
Press one of the 4 keys to select the mode to customize.

(1) Set mode key

(2) Machine settings mode key

Press this key to enter the machine settings.

(3) Ordinary sewing settings mode key

Press this key to enter the ordinary sewing settings mode (refer to pages 170-172).

(4) Embroidery settings mode key

Press this key to enter the embroidery settings mode (refer to pages 173-178).

(5) Language setting mode key

Press this key to enter the language setting mode (refer to page 178).

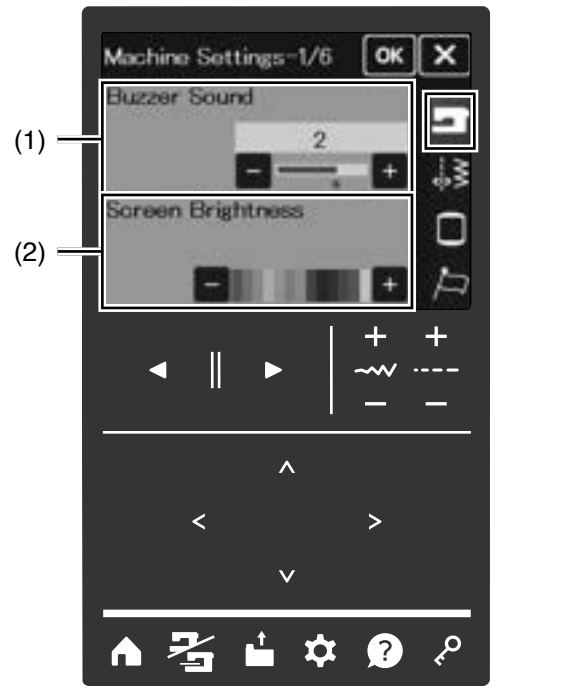
To browse pages in each mode, press the previous page key or next page key.

(6) Previous page key
(7) Next page key

Registering the custom settings

After customizing the settings, press the OK key to enable the new settings.
To cancel the changes to the settings, press the X key and the setting mode window will close.

(8) OK key
(9) X key



Machine Settings

Press the machine settings mode key to enter the machine settings mode.

(1) Buzzer Sound

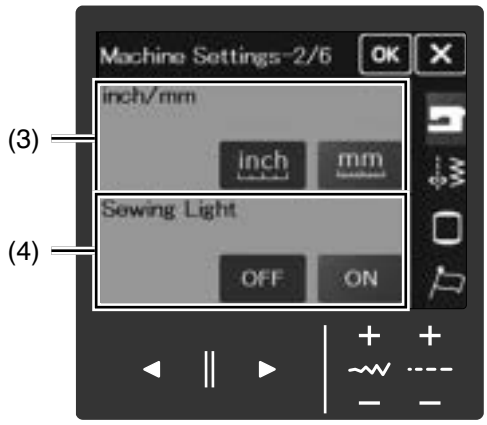
The signal sound can be adjusted by pressing the “+” or “–” key.

Set the value to “OFF” by pressing the “–” key several times to mute the signal sounds.

(2) Screen Brightness

You can adjust the brightness of the visual touch screen by pressing the “+” or “–” key.

Press the next page key to show the next menu.



(3) inch/mm

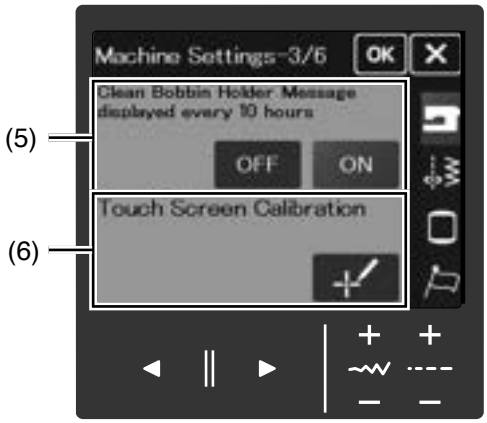
You can set your machine's dimensional unit to either inches or millimeters by pressing the "inch" or "mm" key.

The default unit is millimeters.

(4) Sewing Light

The sewing lights can be turned on or off.

Press the next page key to show the next menu.



(5) Clean Bobbin Holder Message displayed every 10 hours

The caution message for cleaning the bobbin holder and the hook race will be displayed when a certain time (10 hours) passes if this function is turned on. The caution message will not be displayed when this option is turned off.

(6) Touch Screen Calibration

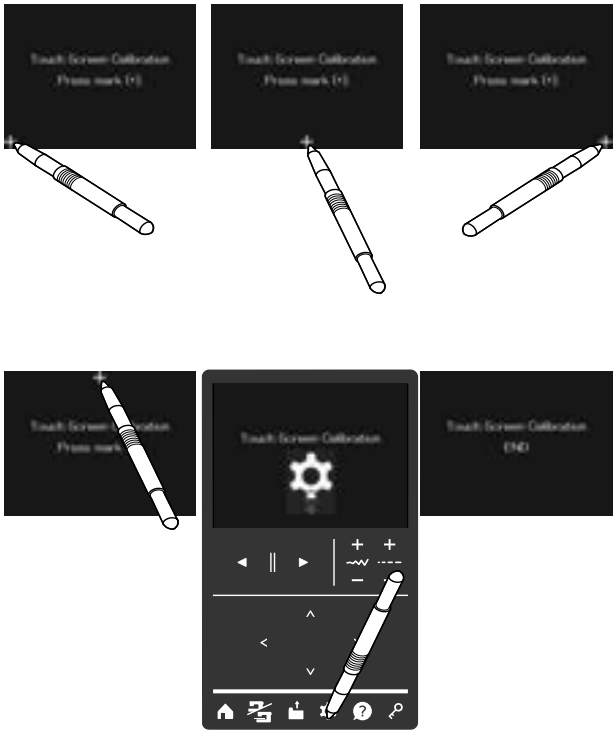
You can calibrate the key positions of the visual touch screen if you feel the visual touch screen key is not responding properly.

Press the  key to open the calibration window.

Press the "+" sign with the touch screen stylus as the sign appears.

When you press the last sign, the screen shows "END" and the calibration window will close.

Press the next page key to show the next menu.





(7) Standby Timer

The sewing lights will be turned off and the machine will enter standby mode if you do not use the machine within the time period set by this timer. Doing any operation will turn the lights and screen on again.

The standby timer can be set from 1 to 30 minutes.

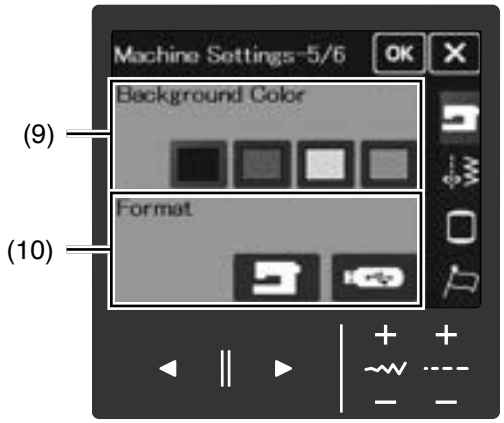
If you wish to turn off the timer, press and hold the “+” key until “OFF” shows in the timer window.

(8) Auto-off (Timer Setting)

The machine will be automatically turned off if you do not use it within the time period set by this timer.
The “Auto-off (Time Setting)” can be set from 1 to 12 hours.
If you wish to turn off the timer, press and hold the “+” key until “OFF” shows in the timer window.
To turn on the machine again, turn the power switch ON.

Press the next page key to show the next menu.

NOTE:
The auto-off timer is available in EU countries and some regions which use 200 - 240 voltage standards.



(9) Background Color

You can select from the colorful wallpapers for the background of the visual touch screen by pressing the relevant icon.

(10) Format

If the internal memory of the machine or USB flash drive does not function due to damage to the memory bank, you need to re-enable it by formatting the memory.

To format the machine’s internal memory, press the machine icon key and a confirmation message will appear.

Press the OK key to format.

To format a USB flash drive, press the USB icon and the confirmation window will open.

Press the OK key to format.

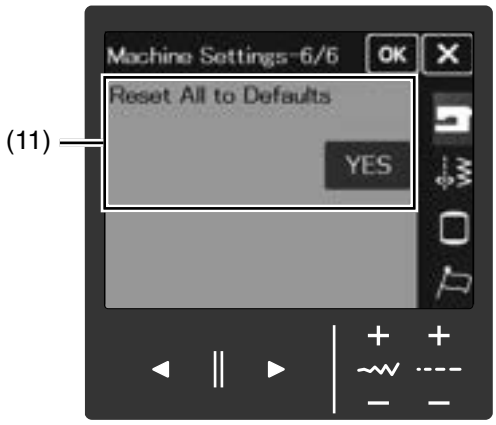
Press the next page key to show the next menu.



⚠ CAUTION:
Do not turn OFF the power or disconnect the USB flash drive while a warning message is displayed otherwise it may damage the memory bank.



NOTE:
- This model supports FAT16 and FAT32 formats only. If the USB flash drive is not read, check its format (refer to pages 191-192).
- Do not use a USB card reader and USB hub.

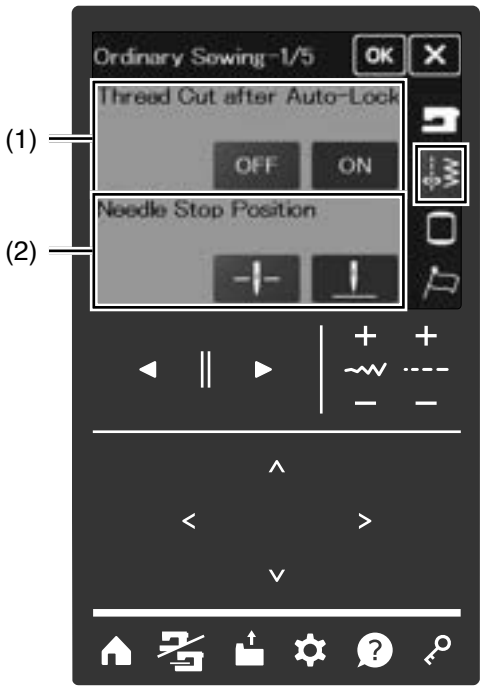


(11) Reset All to Defaults

Press the Yes key to reset all the parameters except the language setting to the original values (factory settings).



After customizing the settings, press the OK key to enable the new settings.



Ordinary Sewing Settings

Press the ordinary sewing settings mode key to enter the sewing settings mode.

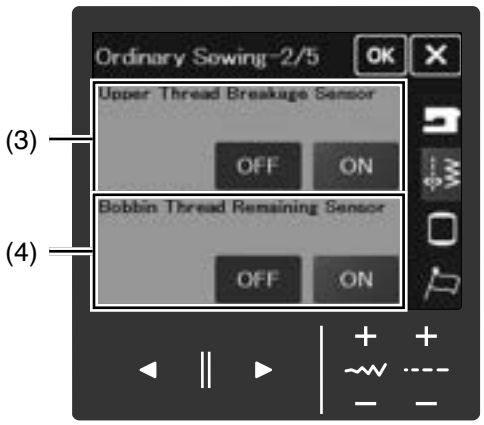
(1) Thread Cut after Auto-Lock

The machine automatically trims the threads after sewing locking stitches when this option is turned on.

(2) Needle Stop Position

The machine always stops with the needle in the down position except when sewing buttonholes, specialty stitches, monograms, etc. However you can change the needle stop position to up by pressing the needle up key.

Press the next page key to show the next menu.



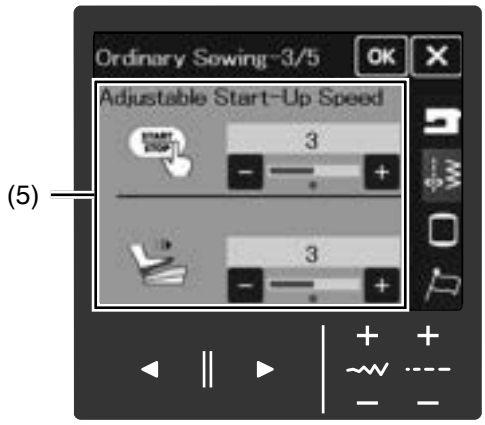
(3) Upper Thread Breakage Sensor

If you want to turn off the auto-stop function when the upper thread (needle thread) breaks, turn off the upper thread breakage sensor.

(4) Bobbin Thread Remaining Sensor

If you want to turn off the auto-stop function right before the bobbin thread runs out, turn off the bobbin thread remaining sensor.

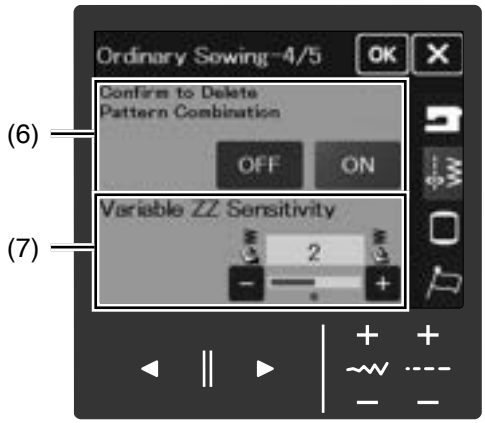
Press the next page key to show the next menu.



(5) Adjustable Start-Up Speed

The machine will start running slowly and the sewing speed will gradually increase to maximum. You can select the desired start-up speed from 1 to 5 by pressing the corresponding key, and set the speed for the start/stop button or foot control individually.

Press the next page key to show the next menu.



(6) Confirm to Delete Pattern Combination

When the pattern combination is cancelled, a message will appear before deleting patterns.

When “OFF” is selected, the confirmation message will not be displayed.

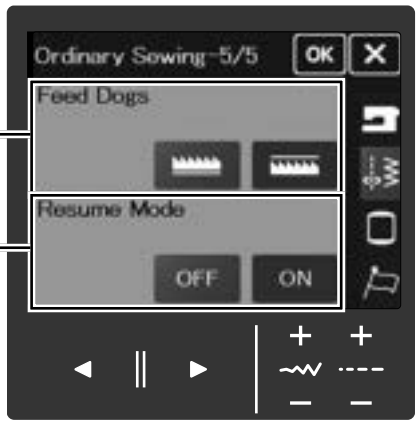
(7) Variable ZZ Sensitivity

You can adjust the amount of needle swing with the foot control for variable zigzag.

Select “1” to increase the sensitivity, so the needle swings when depressing the foot control a small amount.

Select “3” to decrease the sensitivity, so the needle swings when depressing the foot control a large amount.

Press the next page key to show the next menu.



(8) Feed Dogs

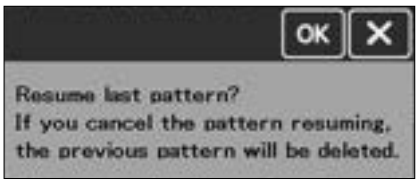
The feed dog can be lowered for sewing on buttons, etc. Raise the presser foot lifter and press the drop feed key.

NOTE:
Retract the carriage arm when raising or lowering the feed dogs.

(9) Resume Mode

Turn this option on when you wish to resume the last pattern sewn before turning the power switch OFF.

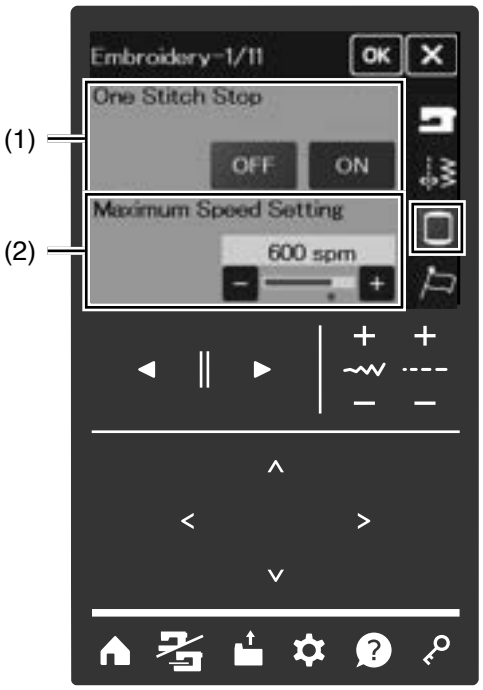
When the power is turned ON again, the confirmation message will appear. Press the OK key to resume the last pattern.



NOTE:
Resume data will be cleared when the internal memory is formatted.



After customizing the settings, press the OK key to enable the new settings.



Embroidery Settings

Press the embroidery settings mode key to enter the embroidery settings mode.

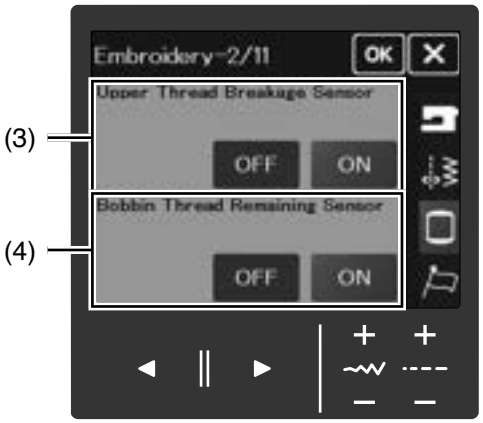
(1) One Stitch Stop

When this option is turned on, the machine sews one stitch and stops automatically with the “One Stitch Stop” message displayed on the screen, so that you can bring the bobbin thread up before sewing.

(2) Maximum Speed Setting

The maximum sewing speed can be set from 400 spm to 600 spm in 100 spm intervals from 600 spm to 660 spm in 60 spm intervals depending on the embroidery patterns by pressing the “+” or “–” key.

Press the next page key to show the next menu.



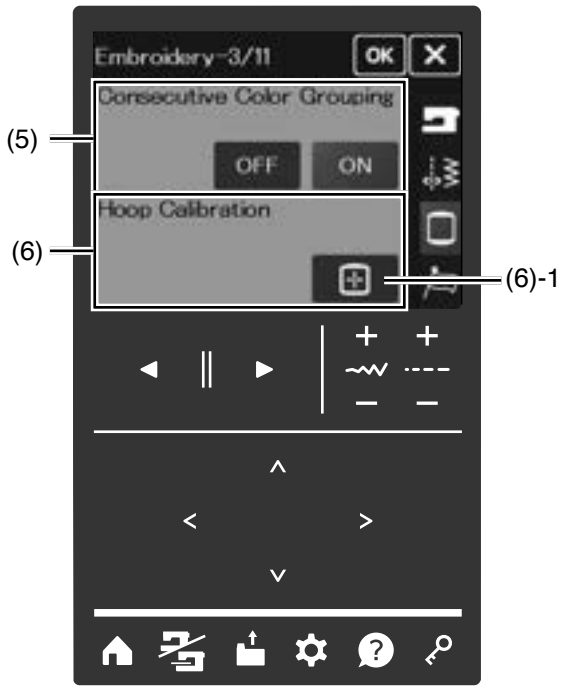
(3) Upper Thread Breakage Sensor

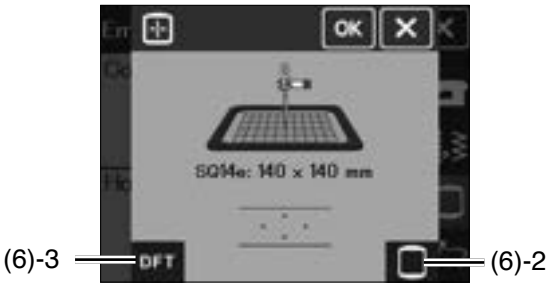
If you want to turn off the auto-stop function when the upper thread (needle thread) breaks, turn off the upper thread breakage sensor.

(4) Bobbin Thread Remaining Sensor

If you want to turn off the auto-stop function right before the bobbin thread runs out, turn off the bobbin thread remaining sensor.

Press the next page key to show the next menu.







(5) Consecutive Color Grouping

If an imported stitch data file or design files of a pattern combination contain consecutive sections in the same color, these sections are automatically grouped together as one section when opening the file or saving the pattern combination as a file or going to the Ready to Sew window. This option is invalid when combining the built-in designs and externally sourced designs.

Turn this option off if you do not wish to group the sections together.

Press the next page key to show the next menu.

(6) Hoop Calibration

You can calibrate the center position of the hoops.

You need to enter embroidery mode before opening the embroidery settings window.

Press the key (6)-1 to open the hoop position adjustment window. The carriage moves to the center position.

Press the key (6)-2 to show the hoop selection window. Select the hoop and attach it to the carriage. Set the template in the hoop.

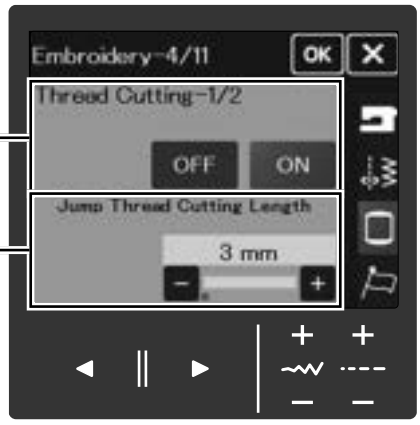
Adjust the hoop position by pressing the jog keys so that the needle is right above the hole in the template.

After customizing the settings, press the OK key to enable the new settings.

To return to the default settings, press the default key (6)-3 on the hoop position adjustment window, then press the OK key.

Press the OK key on the Embroidery settings window.

Press the next page key to show the next menu.



(7) Thread Cutting

When this option is turned on, the following thread cutting options (8), (9) and (10) will be enabled. The machine trims the thread and stops automatically.

(8) Jump Thread Cutting Length

When this option is turned on, the machine trims the jump threads if the jump thread length is the same or more than the set value. Jump thread cutting length can be set from 3 mm to 30 mm or “OFF”.

Press the next page key to show the next menu.



(9) Cut at Color Change/End

When this option is turned on, the machine trims the thread when it stops to change the thread to the next color.

(10) Cutting Command

When this option is turned on, the machine trims the threads at the trim code if the imported stitch data file contains a trim command (cutting command).

Press the next page key to show the next menu.







(11) Thread Selection

There are 10 types of embroidery thread to choose from.

Press the key of the thread you wish to use. The color code and the selected brand are shown on the Ready to Sew window. The color code and the selected brand are also shown by pressing the color list key.

If you use imported embroidery stitch data containing proper thread information, press the “Retain Orig.Color” key (11)-1 to retain this information.

(11)-1 Retain original color key

Press the next page key to show the next page of the thread selection.

(12) Locking Stitch after Each Color Change

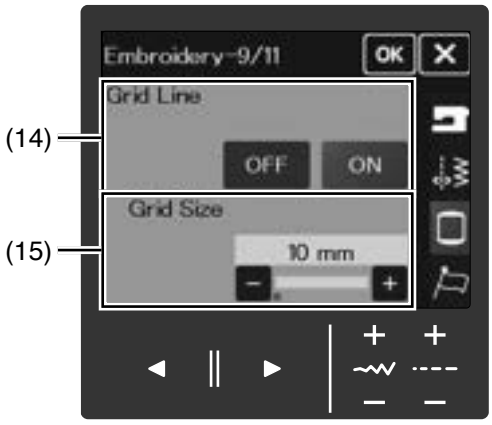
The threads may ravel if the stitch data does not contain locking stitches at the beginning of each color section.

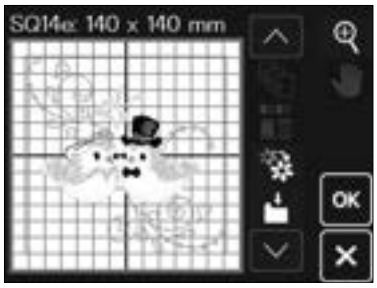
To avoid raveling, insert locking stitches at the beginning when this option is turned on.

(13) Locking Stitch after Thread Trimming

If you turn the thread cutting on (refer to the previous page “Thread Cutting”), the machine will insert locking stitches after the jump to avoid threads from raveling.

Press the next page key to show the next menu.





(14) Grid Line

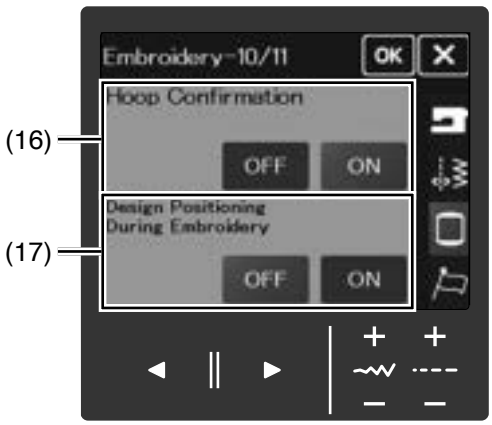
Turn this option on to show grid in the editing window.

(15) Grid Size

The grid size can be altered from 10 mm to 30 mm with the “+” or “–” key when the grid line option is on.

Turn the grid line option off to hide the grid.

Press the next page key to show the next menu.



(16) Hoop Confirmation

The hoop confirmation message will appear every time before opening the Ready to Sew window. However you can turn this option off by selecting “OFF”.

(17) Design Positioning During Embroidery

If you turn on the “Design Positioning During Embroidery”, you can re-position the embroidery design with the jog keys during embroidery.

Press the next page key to show the next menu.

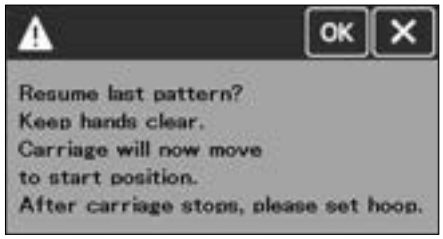


(18) Confirm to Check Thread Tension Dial

Turn this option on to show the message to confirm the thread tension every time the thread tension is changed.

(19) Resume Mode

> **NOTE:**
> You cannot turn off the resume mode setting if the "Auto-off (Time Setting)" is not set to "OFF" (refer to page 168).

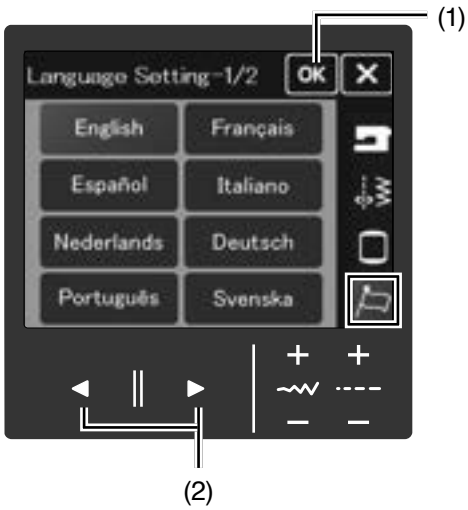


When resume mode is turned on, the last stitch sewn before turning the power switch OFF will resume when you turn the power ON again.

Press the OK key to resume the last stitch of the sewn pattern.



After customizing the settings, press the OK key to enable the new settings.



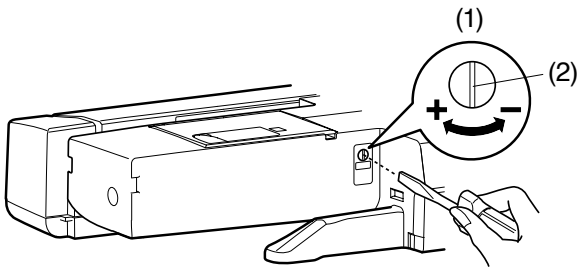
Language Setting

Select the desired language in two pages and press the OK key.
The visual touch screen shows messages in the selected language.

Press the page keys to show the next page of the language selection.

(1) OK key
(2) Page keys





Correcting Distorted Stitch Patterns

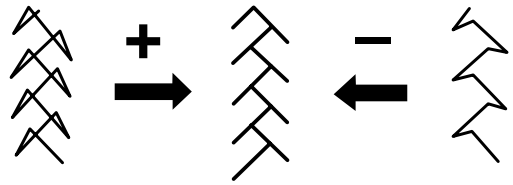
Sewing results of the stitch patterns may vary depending upon sewing conditions, such as sewing speed, type of the fabric, number of layers, etc.

Always test sew on an extra piece of the fabric that you wish to use.

If decorative stitch patterns, monogram or the stretch buttonhole are distorted, correct them with the feed balancing dial.

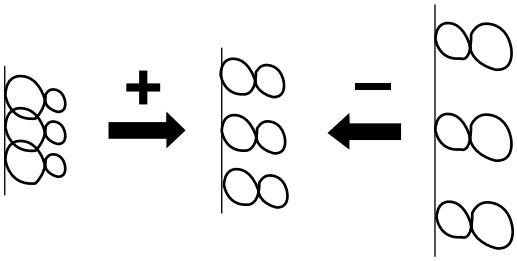
(1) Feed balancing dial
(2) Neutral position

NOTE:
Return the feed balancing dial to its neutral position when sewing is finished.



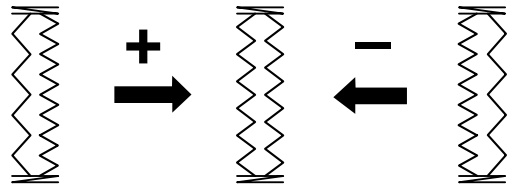
Stretch stitch pattern (Q21)

If the pattern is compressed, turn the feed balancing dial in the direction of “+”.
If the pattern is drawn out, turn the feed balancing dial in the direction of “–”.



Letters and numbers

If the pattern is compressed, turn the feed balancing dial in the direction of “+”.
If the pattern is drawn out, turn the feed balancing dial in the direction of “–”.



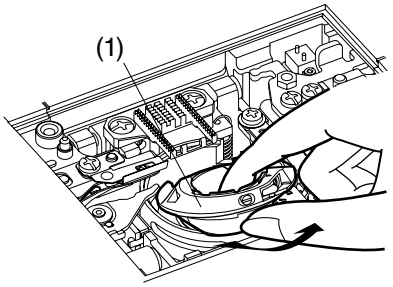
Stitch balance of the stretch buttonholes (B9, B11)

If the right row is denser, turn the dial in the direction of “+”.
If the left row is denser, turn the dial in the direction of “–”.

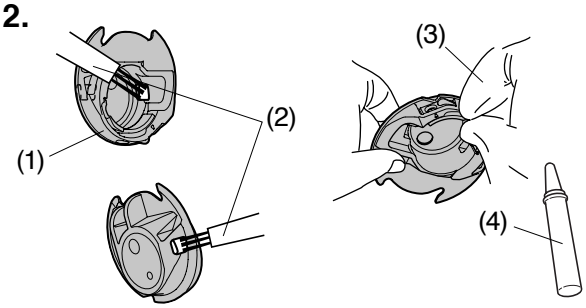




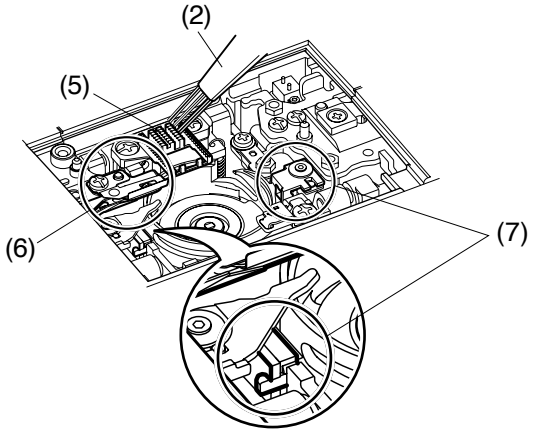
1.



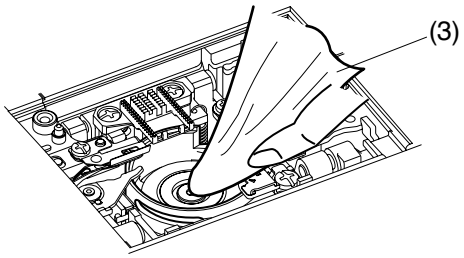
2.



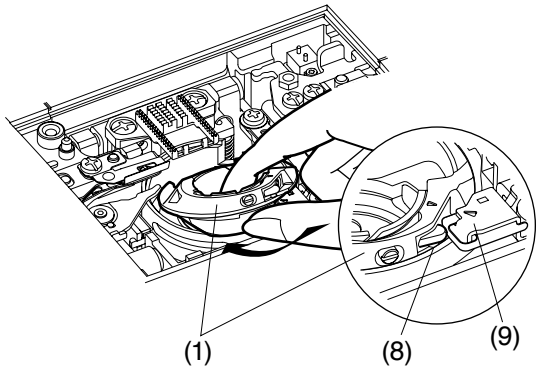
3.



4.



5.



CARE AND MAINTENANCE

Cleaning the Hook Area

⚠ WARNING:

- Turn the power switch OFF and unplug the machine before cleaning.
- Do not dismantle the machine in any way other than as explained in this section.

⚠ CAUTION:

- Do not store the machine in a high-humidity area, near a heat radiator, or in direct sunlight. Store the machine in cool dry place.
- Clean the outside of the machine with a soft cloth.
- Do not use chemical solvents.

Clean the hook area at least once a month.

The caution message for cleaning the bobbin case and the hook race will be displayed when a certain time (10 hours) passes if “Clean Bobbin Holder Message displayed every 10 hours” option is turned on (refer to page 167).

1. Turn the power switch OFF and unplug the machine.

Remove the needle and foot holder (refer to pages 24, 27).

Remove the needle plate (refer to page 26).

Take out the bobbin and bobbin holder.

(1) Bobbin holder

2. Clean the bobbin holder with a lint brush.

Apply a few drops of the bobbin holder cleaner (included in the standard accessories) to a soft cloth and wipe the bobbin holder thoroughly both inside and outside.

(2) Lint brush
(3) Soft cloth
(4) Bobbin holder cleaner

3. Clean the feed dogs, auto thread cutter device and around the bobbin thread remaining sensor with the lint brush.

(5) Feed dogs
(6) Auto thread cutter device
(7) Bobbin thread remaining sensor

4. Clean the hook race with a soft cloth.

(3) Soft cloth

5. Insert the bobbin holder so that the knob fits next to the stopper in the hook race.

(8) Knob
(9) Stopper

Attach the needle plate, presser foot and needle. Insert the bobbin.

Cleaning the Thread Path

Clean lint and wax in the tension area with a piece of paper.

1. Press the mode switch key to select the ordinary sewing mode for cleaning the thread path.

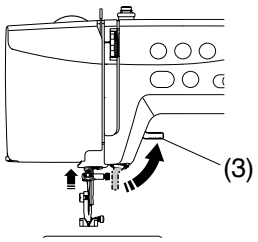
Turn the power switch OFF.

(1) Mode switch key
(2) Power switch



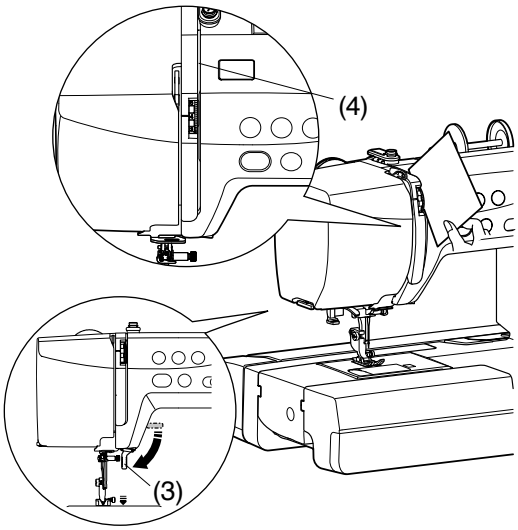
2. Raise the presser foot lifter.

(3) Presser foot lifter

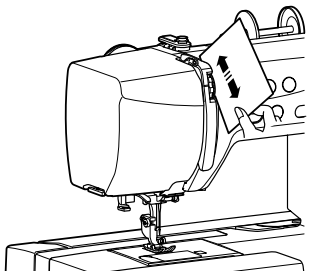


3. Insert a piece of paper along the right channel and lower the presser foot lifter.

(3) Presser foot lifter
(4) Right channel



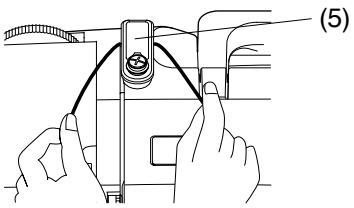
4. Scrape out the lint with the paper.



5. Hold the thread with both hands and pass the thread into the thread guide plate.

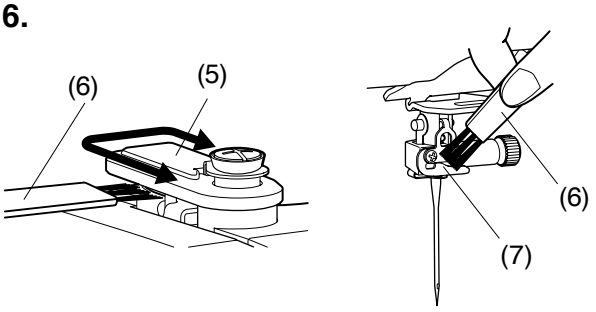
Scrape out the lint with the thread.

(5) Thread guide plate



6. Clean the needle bar thread guide with the lint brush.

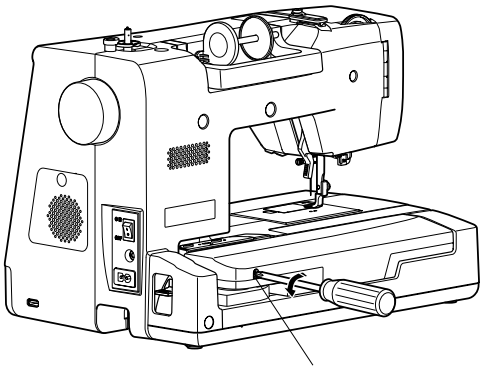
(5) Thread guide plate
(6) Lint brush
(7) Needle bar thread guide



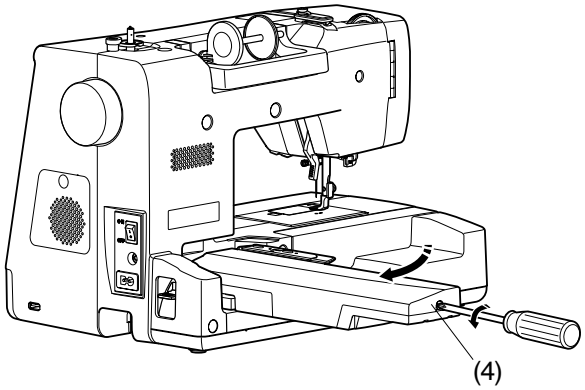
1.



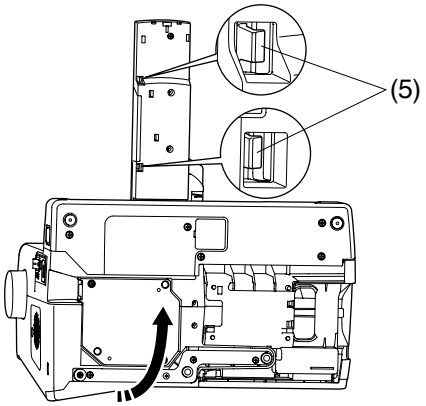
2.



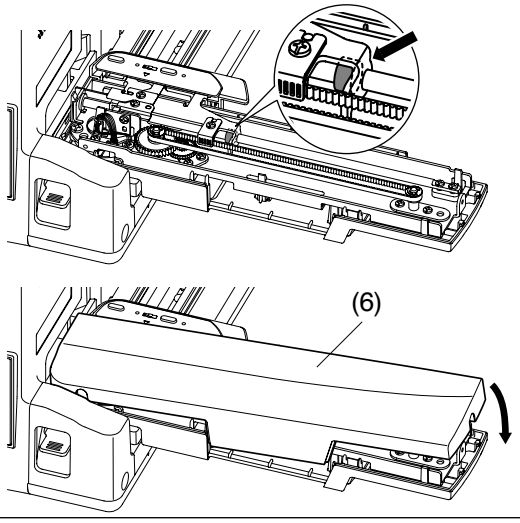
3.



4. 5.



6.



Oiling the Machine

⚠ WARNING:

- Move the carriage to the home position, turn the power switch OFF, and unplug the machine before oiling the machine.
- Wait until the motor cools down before oiling.
- Do not dismantle the machine in any way other than as explained in this section.
- Do not oil any parts other than as explained in this section.

NOTE:

- Oil the points as shown at least once a month if you are using the machine every day.
- Use good quality sewing machine oil.
- One or two drops of oil is sufficient.
- Remove excess oil, otherwise it may stain fabric.
- In case machine is not used for an extended time, oil it before sewing.
- A Phillips head screwdriver is not included with this machine.
- Be sure to oil each part as instructed.

Oil the Y-carriage

NOTE:
Be careful not to damage any parts when raising the machine.

1. Press the mode switch key to switch to the ordinary sewing mode.

Turn the power switch OFF.

(1) Mode switch key
(2) Power switch

2. Retract the carriage arm and remove the setscrew A.

(3) Setscrew A

3. Extend the carriage arm and remove the setscrew B.

(4) Setscrew B

4. Tilt the sewing machine in the direction of the arrow so that the front comes to the underside of the machine.

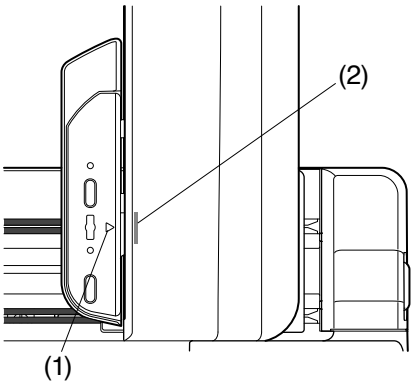
5. While lifting up the Y carriage cover, release the two hooks and remove the Y carriage cover.

(5) Hooks
(6) Y carriage cover

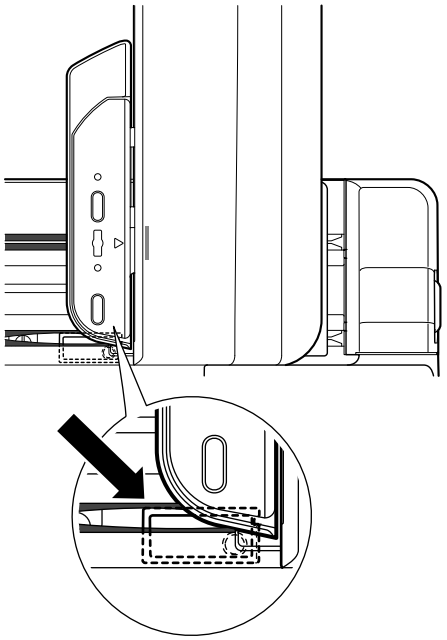
6. Oil the arrow point (felt) as indicated in the illustration.

To attach the carriage cover, follow the procedures in reverse.

1.



2.



Oil the X-carriage

1. Make sure the carriage is in the home position with the carriage arm extended.

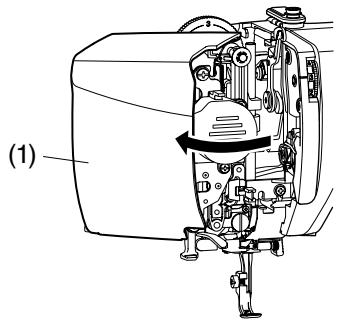
(1) Triangle mark on the carriage
(2) Bar sign on the carriage arm

NOTE:
The home position is where the triangle mark on the carriage and the bar sign on the carriage arm are aligned.

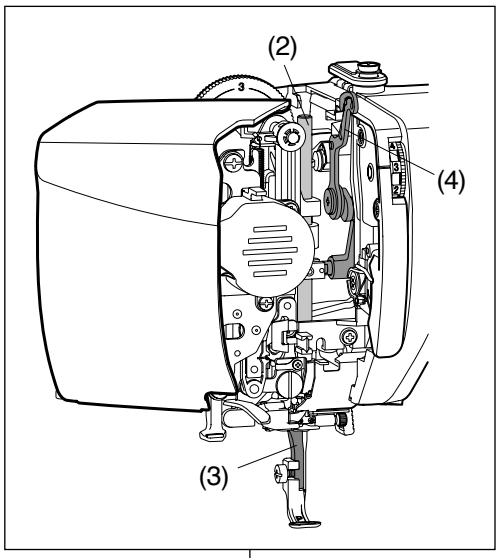
2. Flip over the black sheet on the left side of the carriage arm and apply oil in the carriage arm where the arrow is pointing.

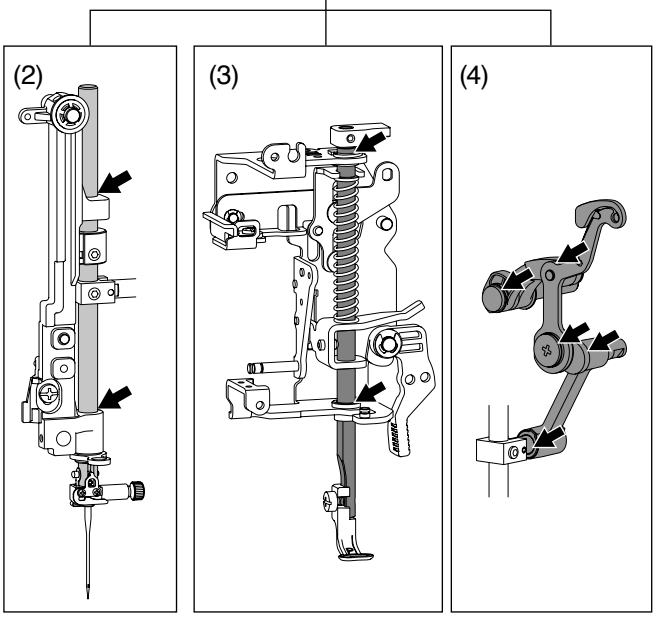
NOTE:
Do not tilt the machine for about 30 minutes after oiling.

1.



2.





Oil the needle bar, presser bar and thread take-up lever

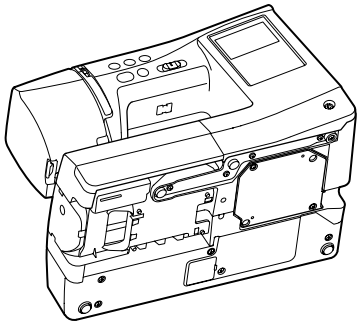
1. Open the face cover.

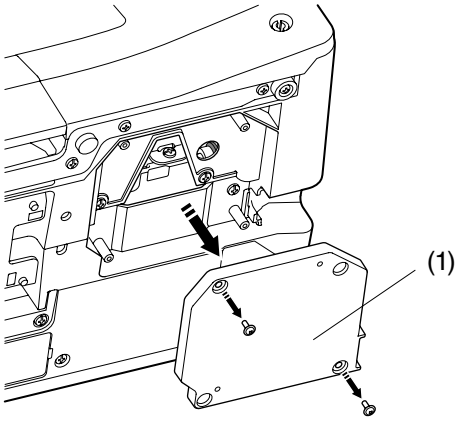
(1) Face cover

2. Oil the arrow points as indicated in the illustration. Close the face cover.

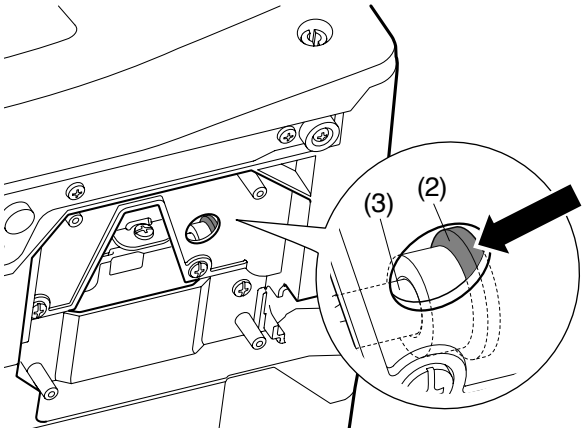
(2) Needle bar
(3) Presser bar
(4) Thread take-up lever

1.





2.



Oil the lower shaft supporter (bottom)

1. Lay the machine as shown.

Remove the maintenance cover on the bottom side of the machine with a screwdriver.

(1) Maintenance cover

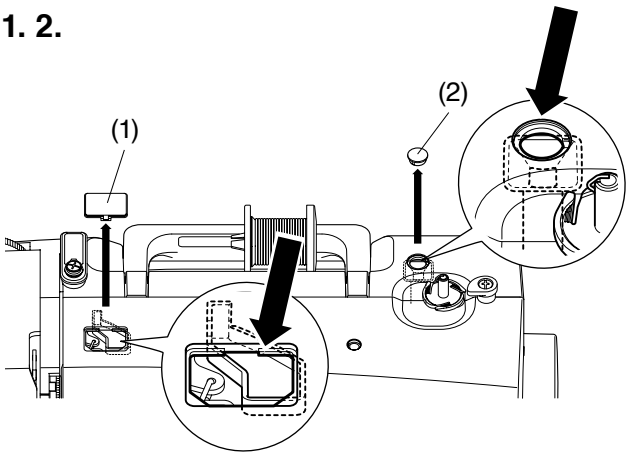
2. Oil the arrow point (felt) as indicated in the illustration.

(2) Felt
(3) Shaft

After oiling, attach the maintenance cover, follow the procedure **1.** to **2.** in reverse.

NOTE:
If the oil does not reach the arrow point, soak a cotton swab in oil and apply it to the machine.

1. 2.



Oil the upper shaft supporter (top side)

1. Remove the cover and the cap on the top side of the machine.

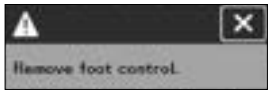
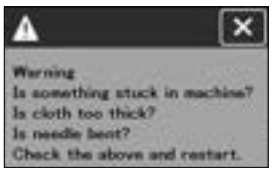
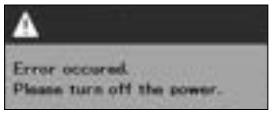
(1) Cover
(2) Cap

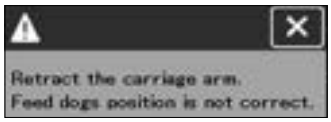
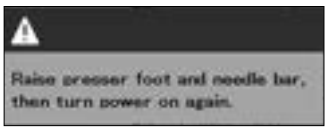
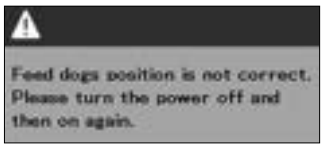
2. Oil the arrow points (felt) as indicated in the illustration.

NOTE:
Do not tilt the machine for about 30 minutes after oiling.

Problems and Warning Signals

If a buzzer sounds and the visual touch screen shows a warning sign, follow the guidance below.

Warning Sign	Cause	Try this
	The start/stop button is pressed with the foot control connected.	Disconnect the foot control.
	The foot control is broken.	Contact the service center or the store from whom the machine was purchased.
	The bobbin winder spindle is shifted to the right.	Shift the bobbin winder spindle to the left for stitching (refer to page 30).
	The machine will stop if the buttonhole is sewn without lowering the buttonhole lever.	Lower the buttonhole lever and start the machine again (refer to page 68).
	The twin needle key is pressed when the twin needle sign is indicated on the visual touch screen.	Replace the twin needle with a single needle and press the OK key (refer to page 27).
	The machine is started with the feed dogs lowered.	Raise the feed dogs unless you want to sew with the feed dogs lowered (refer to page 22).
	The needle plate is removed.	Attach the needle plate (refer to page 26). Check if the needle plate is attached properly.
	The machine stops due to overload.	Wait for at least 15 seconds to restart. Remove tangled threads around take-up lever, hook race and auto thread cutter device.
	The machine is malfunctioning.	Contact the service center or the store from whom the machine was purchased.

Warning Sign	Cause	Try this
	This message appears when the carriage arm is not retracted and the feed dogs cannot be raised or lowered.	Retract the carriage arm (refer to page 109).
	This message appears if an error occurs during motor initialization when the power is turned ON, if the feed dogs are not in the correct position, or if the needle plate comes off while embroidering.	Turn the power OFF and remove tangled threads around the hook race and auto thread cutter device, then turn the power ON. If this message does not disappear, contact the service center or the store from whom the machine was purchased.
	This message appears when an error occurs while the feed dogs are raised or lowered.	Turn the power OFF, extend the carriage arm and check there is nothing caught around the carriage, then turn the power ON. If this message does not disappear, contact the service center or the store from whom the machine was purchased.

Troubleshooting

Condition	Cause	Reference
The machine is noisy.	1. Thread is caught in the hook race. 2. Lint is built up in the hook race or bobbin holder. 3. The feed dog is packed with lint.	Page 180 Page 180 Page 180
The needle thread breaks.	1. The needle thread is not threaded properly. 2. The needle thread tension is too tight. 3. The needle is bent or blunt. 4. The needle is incorrectly inserted. 5. Thread is too thick or too fine for the needle. 6. Thread is jammed in the hook area. 7. The thread is tangled around the spool. 8. The needle thread was not set under the presser foot when ordinary sewing started. 9. The needle thread was not set in the thread holder when embroidery sewing started.	Pages 32-33 Pages 20-21 Replace the needle. Page 27 Page 28 Page 180 Use the spool holder. Page 42 Page 116
The bobbin thread breaks.	1. The bobbin thread is not threaded properly in the bobbin holder. 2. Lint has collected in the bobbin holder. 3. The bobbin is damaged and does not turn smoothly.	Page 31 Page 180 Change the bobbin.
The needle breaks.	1. The needle is incorrectly inserted. 2. The needle is bent or blunt. 3. The needle clamp screw is loose. 4. The needle thread tension is too tight. 5. The needle is too fine for the fabric being used. 6. An inappropriate presser foot is used.	Page 27 Page 27 Page 27 Pages 20-21 Page 28 Use the correct foot.
Skipped stitches	1. The needle is incorrectly inserted, bent or blunt. 2. The needle and/or threads are not suitable for the work being sewn. 3. A blue tip needle is not being used for sewing stretch, very fine fabrics and synthetic fabrics. 4. The needle thread is not threaded properly. 5. The presser foot pressure is weak. 6. A stabilizer is not used when sewing stretch fabrics. 7. A poor quality needle is used. 8. The embroidery hoop is not set properly. 9. The fabric is not stretched tightly enough on the embroidery hoop.	Page 27 Page 28 Page 28 Pages 32-33 Page 21 Apply a stabilizer. Replace the needle. Page 116 Pages 114-115
Seam puckering.	1. The needle thread tension is too tight. 2. The needle thread or the bobbin thread is not threaded properly. 3. The needle is too heavy for the fabric being sewn. 4. The stitch length is too long for the fabric. 5. The stitch width is too wide for the fabric. 6. The presser foot pressure is not adjusted properly. 7. A stabilizer is not used when sewing very fine fabrics.	Pages 20-21 Pages 31-33 Page 28 Make stitch shorter. Reduce the stitch width. Page 21 Apply a stabilizer.
The fabric is not feeding smoothly.	1. The feed dogs are packed with lint. 2. The stitches are too fine. 3. The presser foot pressure is weak. 4. Heavy weight fabric is not feeding smoothly at the beginning of sewing. 5. The feed dogs are not raised after “drop feed” sewing.	Page 180 Make stitch longer. Page 21 Page 42 Page 22

Condition	Cause	Reference
The machine does not run.	1. The machine is not plugged in. 2. Thread is caught in the hook race. 3. The presser foot lifter is not lowered. 4. The start/stop button is used with the foot control plugged in.	Page 10 Page 180 Page 19 Page 11
The machine does not run when pressing the foot control.	1. The foot control is broken. 2 The foot control is pressed in the variable zigzag mode. 3. The foot control is plugged in for sewing embroidery.	Unplug the foot control. Page 63 Unplug the foot control and use start/stop button.
Buttonhole sewing is not sewn properly.	1. The stitch density is not suitable for the fabric being sewn. 2. The stabilizer has not been used for the stretch or synthetic fabric. 3. The buttonhole lever is not lowered.	Page 70 Apply a stabilizer. Page 68
The embroidery patterns are distorted.	1. The needle thread tension is too strong. 2. Stabilizer is not used for sewing stretch and very fine fabrics. 3. The hoop tightening screw is too loose. 4. Something is caught between the carriage and the carriage arm. 5. The carriage arm is hitting something around the machine. 6. The fabric is caught or trapped when sewing embroidery. 7. The embroidery hoop is hitting something around the machine. 8. The embroidery foot is caught by a jump thread.	Pages 20-21 Apply a stabilizer. Page 115 Page 108 Page 108 Stop the machine and free the fabric. Pages 114-115 Trim the jump thread.
Auto thread cutting failed.	1. Thread is too thick for the auto thread cutting. 2. Threads are caught in the auto thread cutter device.	Page 43 Page 180
Pattern selection keys cannot be selected/grayed out.	1. The straight stitch needle plate is attached to the machine. 2. Twin needle key is on.	Page 26 Page 106
Keys on the visual touch screen and touch panel keys do not work.	1. The key position is out of alignment.	Page 167
Visual touch screen is not clear.	1. The screen brightness is not adjusted properly.	Page 166
Visual touch screen swells.	1. The machine has been exposed to a high-humidity and high-temperature area.	Use and store the machine in cool dry place.
The bobbin thread remaining sensor does not work; There is no signal sound when the bobbin thread has run out and the machine does not stop sewing.	1. The bobbin thread remaining sensor is turned off. 2. Lint has been collected around the bobbin thread detecting sensor. 3. A bobbin other than the “J” plastic bobbin is used.	Page 170 Page 180 Page 29

Condition	Cause	Reference
The message “Bobbin thread is not sufficient.” appears and the machine stops, although there is enough thread wound on the bobbin.	1. A strong light such as a white light bulb or LED light illuminates the area around the hook cover on the needle plate.	Do not shine the area around the hook cover on the needle plate with strong light.
The USB flash drive is not read.	1. Format setting of the USB flash drive is not correct. 2. The USB flash drive is malfunctioning.	Pages 191-192 Replace the USB flash drive.

It is not abnormal for a faint humming sound to be heard from the internal motors.
The visual touch screen and function key area may become warm after several hours of continuous use.

Formatting USB Flash Drives

NOTE:
Formatting of USB flash drive must be carried out on a personal computer using Microsoft Windows.*

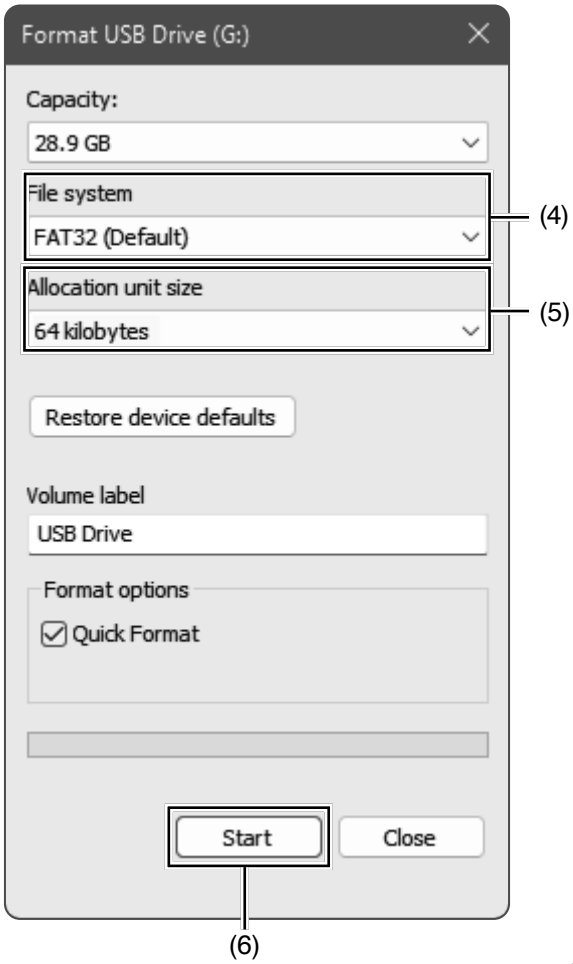
For Windows 11 and 10 users, screen shot samples using Windows 11 are shown.

1. Using File Explorer, right click on the USB flash drive. Click format.
   (1) Explorer
   (2) USB flash drive
   (3) Format

1.



2. 3. 4.



2. Format window will be displayed. Select FAT16 or FAT32 from file system.
   (4) File system

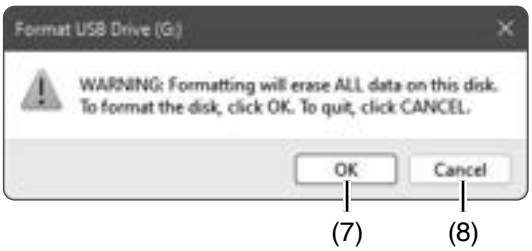
NOTE:
If FAT16 or FAT32 cannot be selected, use other PC. Or use other USB flash drive which can be read.

3. From allocation unit size, select a size of 64 kilobytes or less.
   (5) Allocation unit size

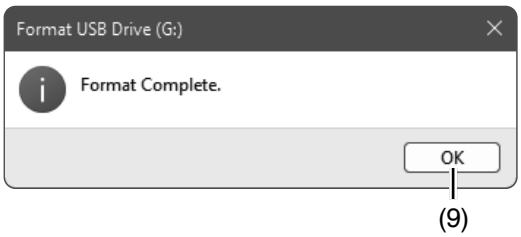
4. Click the start key.
   (6) Start key

* Windows is a registered trademark of Microsoft Corporation.

5.



6.



5. After the start key is clicked, the confirmation message will be displayed. Click the OK key to begin formatting.

(7) OK key

NOTE:
If there is any important data remaining on the USB flash drive, click the cancel key.
After saving the data elsewhere, begin the process again from **1.**

(8) Cancel key

6. A message will be displayed when the formatting is complete.

Click the OK key.

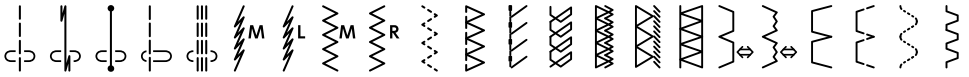
(9) OK key

STITCH CHART

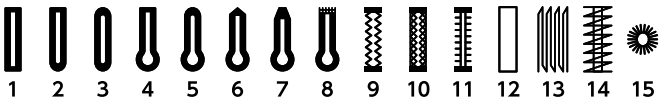
Ordinary Sewing

You can download these contents via QR code.

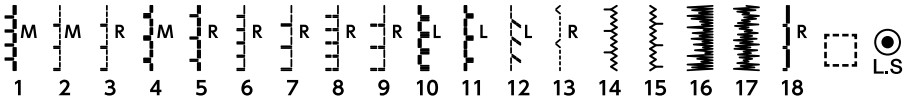
Utility (U)



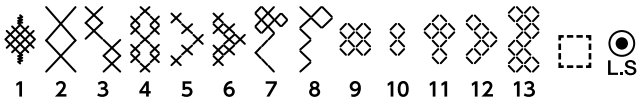
Buttonhole (B)



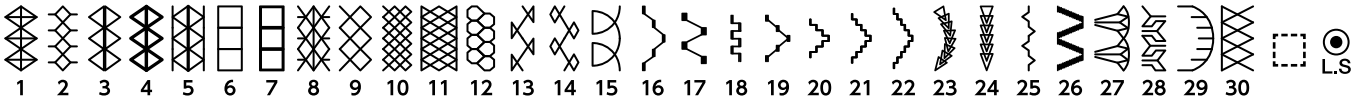
Applique (A)



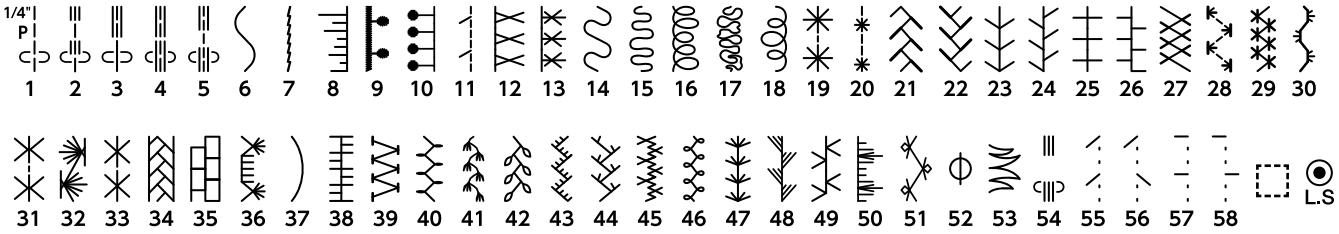
Cross-Stitch (C)



Heirloom (H)



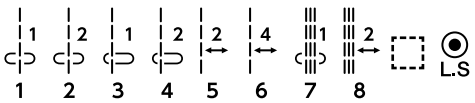
Quilt (Q)



Satin (S)

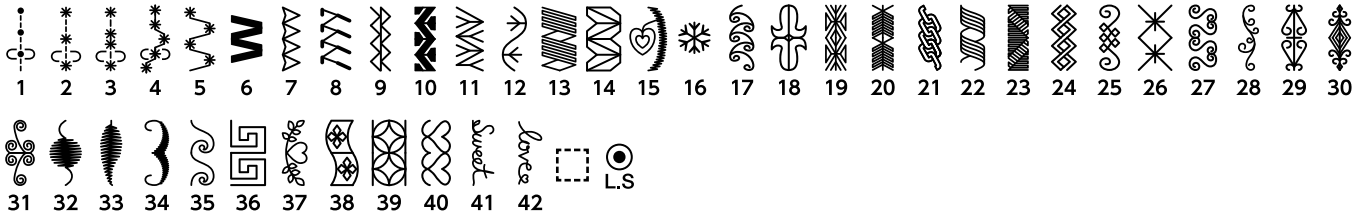


Bridge (BR)



STITCH CHART
Ordinary Sewing

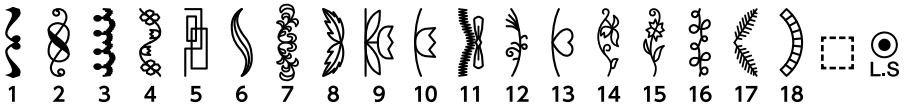
Decorative (D)



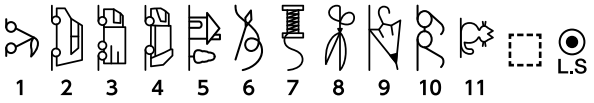
Botanical (BO)



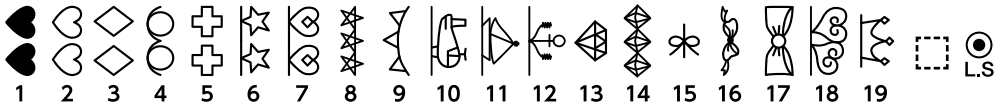
Long (L)



Life Style (LS)

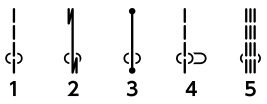


Kids (K)

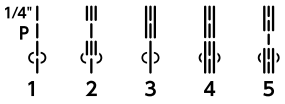


Stitches for the straight stitch needle plate

Utility (U)



Quilt (Q)



STITCH CHART
Monogram

Block

A B C D E F G H I J K L M N
O P Q R S T U V W X Y Z . □ □ □

a b c d e f g h i j k l m n
o p q r s t u v w x y z . □ □ □

1 2 3 4 5 6 7 8 9 0 & _ $ @ . • ,
? ¿ ! ¡ ‘ ’ < > ( ) – + = / // % ~ :
♪ ☆ ♡

À Á Â Ã Ä Å Æ Ç È É Ê Ë Ì Í Î Ï Ñ
Ò Ó Ô Õ Ö Ø Ù Ú Û Ü ß Ą Ć Č Ę Ğ İ IJ
Ł Ń Ň Œ Ś Ş Š Ý Ź Ż Ž

à á â ã ä å æ ç è é ê ë ì í î ï ñ
ò ó ô õ ö ø ù ú û ü ß ą ć č ę ğ ı ij
ł ń ň œ ś ş š ý ź ż ž

Script

𝒜 ℬ 𝒞 𝒟 ℰ ℱ 𝒢 ℋ ℐ 𝒥 𝒦 ℒ ℳ 𝒩
𝒪 𝒫 𝒬 ℛ 𝒮 𝒯 𝒰 𝒱 𝒲 𝒳 𝒴 𝒵 . □ □ □

𝒶 𝒷 𝒸 𝒹 ℯ 𝒻 ℊ 𝒽 𝒾 𝒿 𝓀 𝓁 𝓂 𝓃
ℴ 𝓅 𝓆 𝓇 𝓈 𝓉 𝓊 𝓋 𝓌 𝓍 𝓎 𝓏 . □ □ □

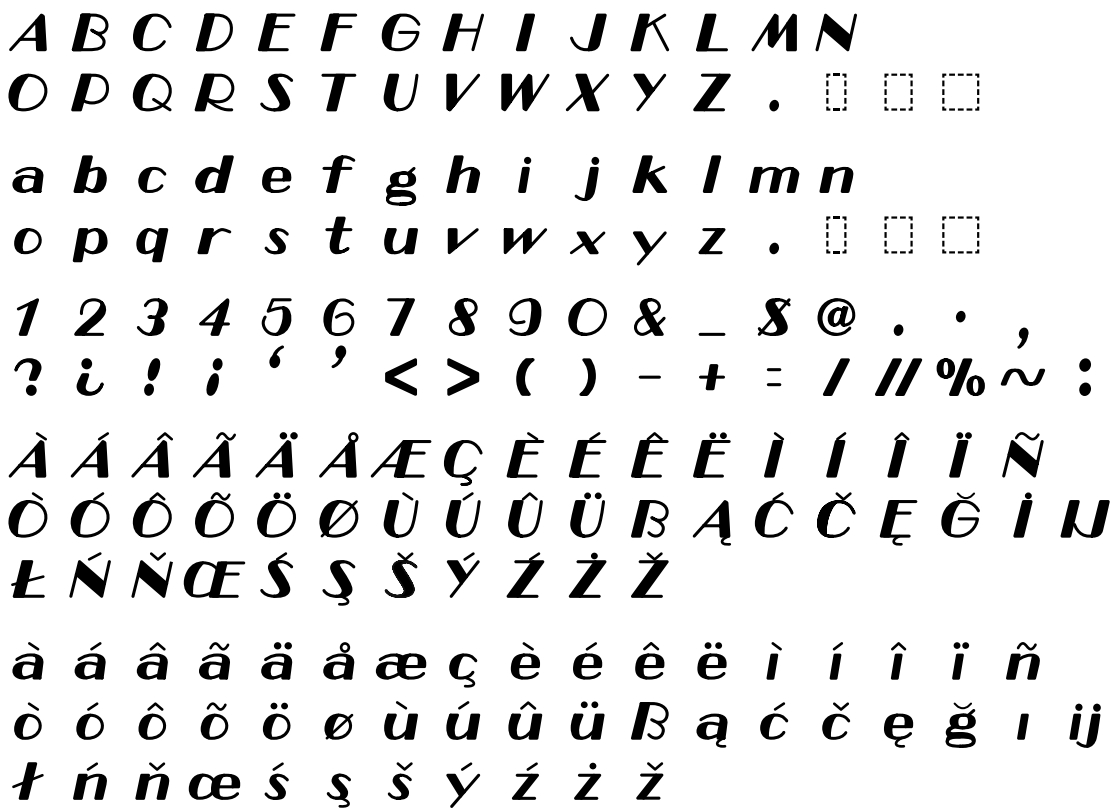
1 2 3 4 5 6 7 8 9 0 & _ $ @ . • ,
? ¿ ! ¡ ‘ ’ < > ( ) – + = / // % ~ :

𝒜́ ℬ́ 𝒞́ 𝒟́ ℰ́ ℱ́ 𝒢́ ℋ́ ℐ́ 𝒥́ 𝒦́ ℒ́ ℳ́ 𝒩́
𝒪́ 𝒫́ 𝒬́ ℛ́ 𝒮́ 𝒯́ 𝒰́ 𝒱́ 𝒲́ 𝒳́ 𝒴́ 𝒵́ ℬ̨ 𝒜̨ 𝒞̨ 𝒟̌ 𝒢̆ 𝒢̇ 𝒢̃
ℒ́ 𝒩́ 𝒩̌ 𝒪̃ 𝒮̃ 𝒮̨ 𝒮̌ 𝒴́ 𝒵́ 𝒵̇ 𝒵̌

𝒶́ 𝒷́ 𝒸́ 𝒹́ ℯ́ 𝒻́ ℊ́ 𝒽́ 𝒾́ 𝒿́ 𝓀́ 𝓁́ 𝓂́ 𝓃́
ℴ́ 𝓅́ 𝓆́ 𝓇́ 𝓈́ 𝓉́ 𝓊́ 𝓋́ 𝓌́ 𝓍́ 𝓎́ 𝓏́ 𝒷̨ 𝒶̨ 𝒸́ 𝒹̌ 𝒢̆ 𝒢̇ 𝒢̃
𝓁́ 𝓃́ 𝓃̌ 𝓅̃ 𝓈́ 𝓈̨ 𝓈̌ 𝓎́ 𝓏́ 𝓏̇ 𝓏̌

STITCH CHART
Monogram

Broadway



Cyrillic



STITCH CHART
Monogram

Block (7 mm)

A B C D E F G H I J K L M N
O P Q R S T U V W X Y Z . □ □ □

a b c d e f g h i j k l m n
o p q r s t u v w x y z . □ □ □

1 2 3 4 5 6 7 8 9 0 & _ $ @ . ・ ,
? ¿ ! ¡ ‘ ’ < > ( ) − + = / // % ~ :
♪ ☆ ♡

Marumoji (7 mm)

あ い う え お か き く け こ さ し す せ そ
た ち つ て と な に ぬ ね の は ひ ふ へ ほ
ま み む め も や ゆ よ □ □ ら り る れ ろ
わ を ん 、 。 ぁ ぃ ぅ ぇ ぉ っ ゃ ゅ ょ ー
が ぎ ぐ げ ご ざ じ ず ぜ ぞ だ ぢ づ で ど
ば び ぶ べ ぼ ぱ ぴ ぷ ぺ ぽ ゔ

ア イ ウ エ オ カ キ ク ケ コ サ シ ス セ ソ
タ チ ツ テ ト ナ ニ ヌ ネ ノ ハ ヒ フ ヘ ホ
マ ミ ム メ モ ヤ ユ ヨ □ □ ラ リ ル レ ロ
ワ ヲ ン 、 。 ァ ィ ゥ ェ ォ ッ ャ ュ ョ ー
ガ ギ グ ゲ ゴ ザ ジ ズ ゼ ゾ ダ ヂ ヅ デ ド
バ ビ ブ ベ ボ パ ピ プ ペ ポ ヴ

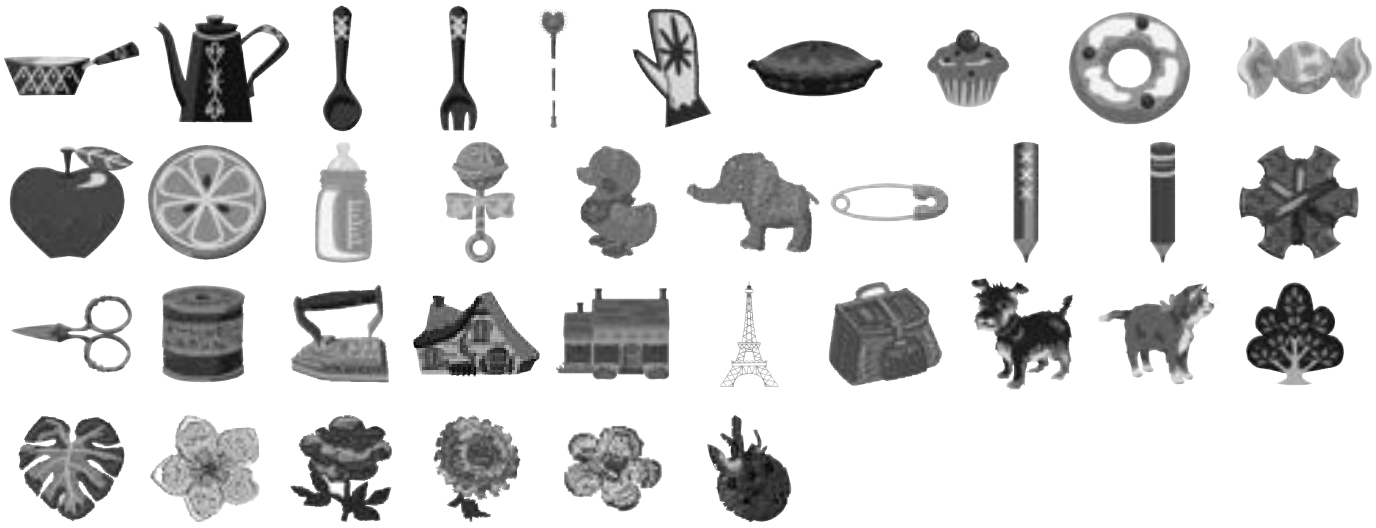
〇 一 二 三 四 五 六 七 八 九 十 月 火 水 木
金 土 日 小 中 学 校 幼 稚 保 育 園 会 年 組
係 班 子 供 生 才 部 国 算 理 社 外 音 図 家
体 道 特 総

DESIGN CHART

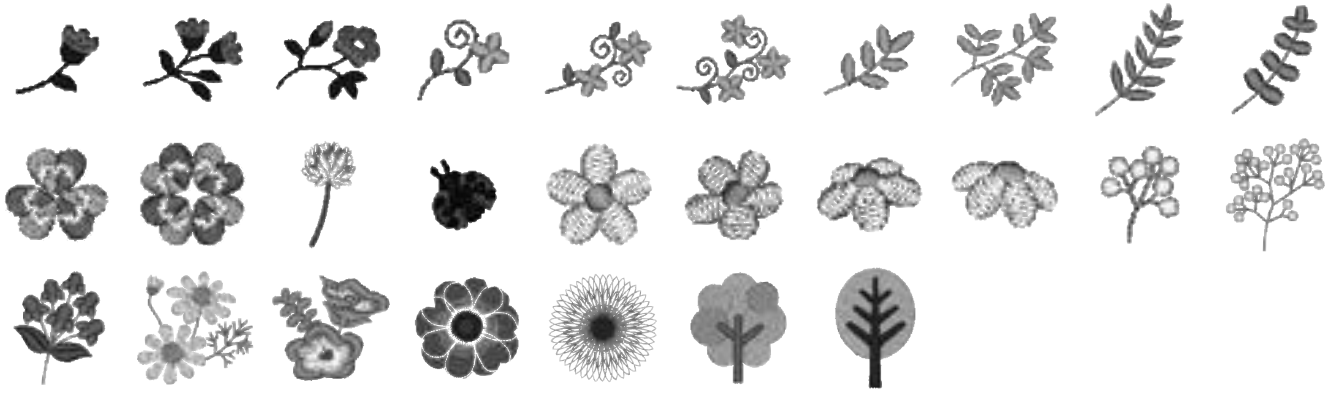
Embroidery

Pattern images are not to scale.
You can download the colored version
of these contents via QR code.

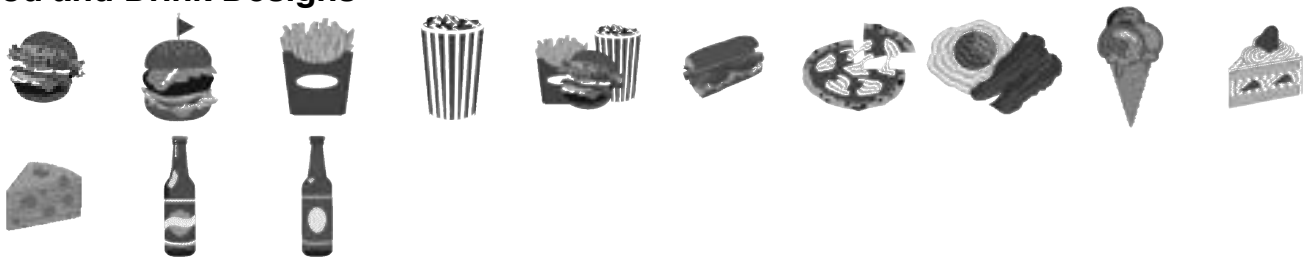
GANAHA Collections © Y. GANAHA



Floral and Garden Designs



Food and Drink Designs



DESIGN CHART
Embroidery

Pattern images are not to scale.

Everyday and Holiday Designs



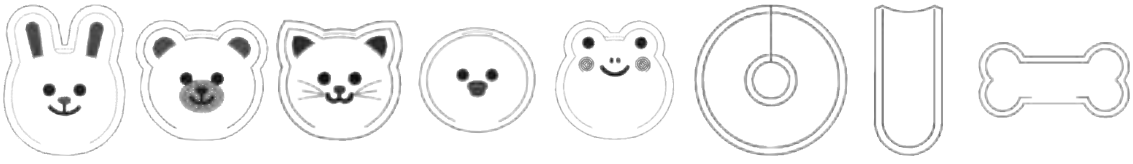
Baby and Child Designs



Name Tag Designs



In-The-Hoop Designs <Rattles>



DESIGN CHART
Embroidery

Pattern images are not to scale.

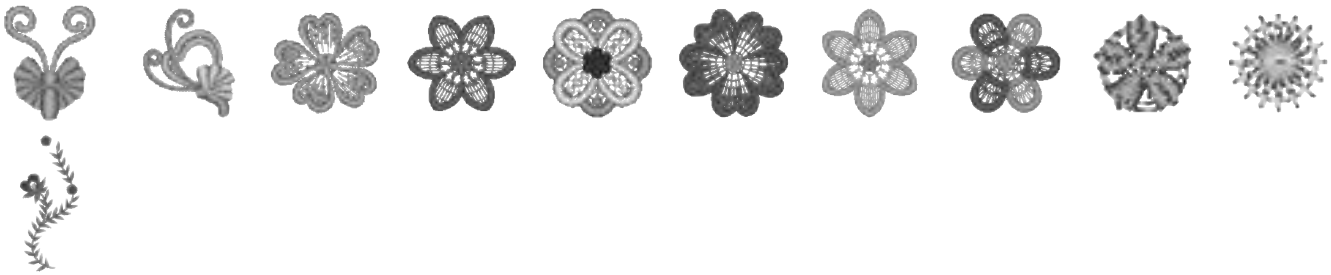
Cross-Stitch Designs



Embroidery Lace Designs for water soluble stabilizer



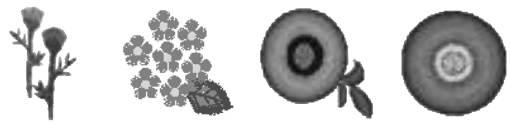
Embroidery Lace Designs for fabric



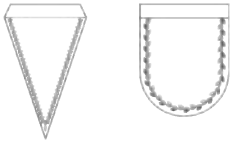
Applique Designs



Fringe Designs



Flag Designs



DESIGN CHART
Embroidery

Pattern images are not to scale.

Alphabet Designs <Floral>



Alphabet Designs <Cross-Stitch>



Calibration Pattern

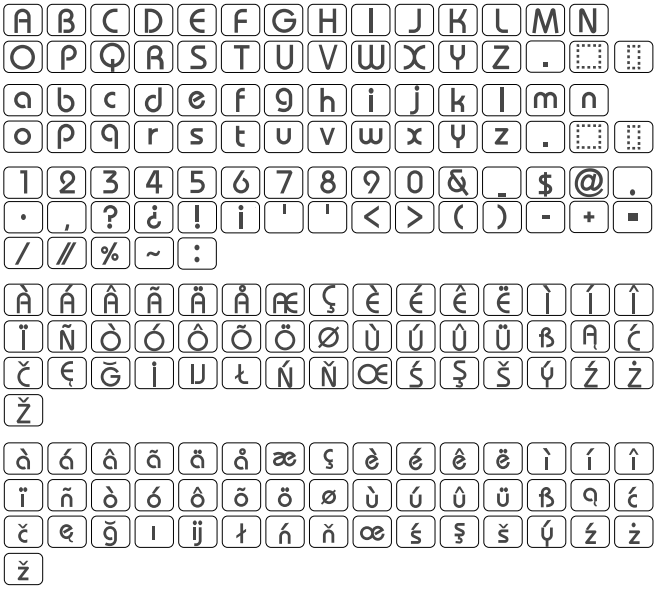


DESIGN CHART
Embroidery Monogram

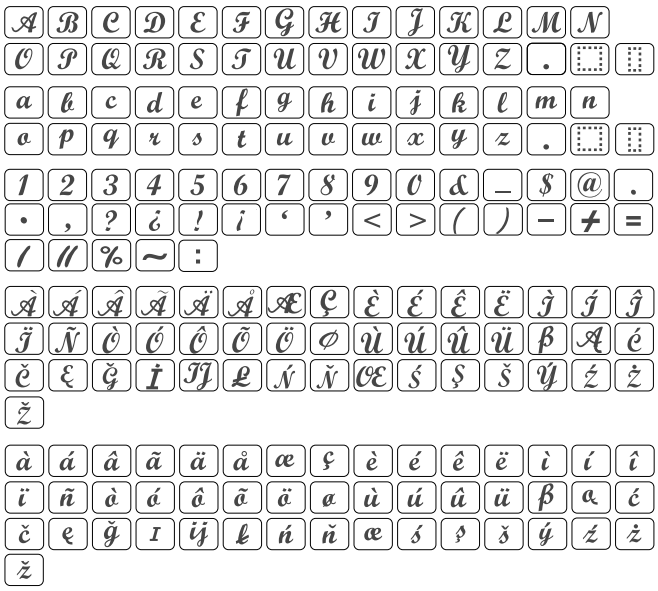
Gothic



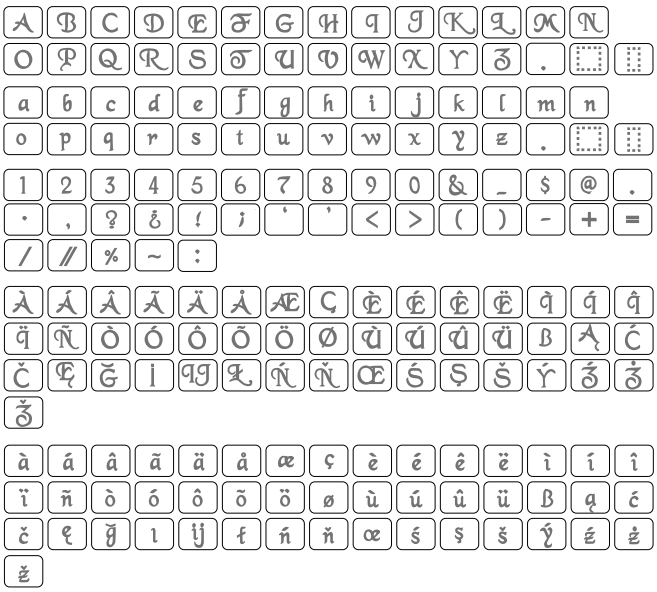
Bauhaus



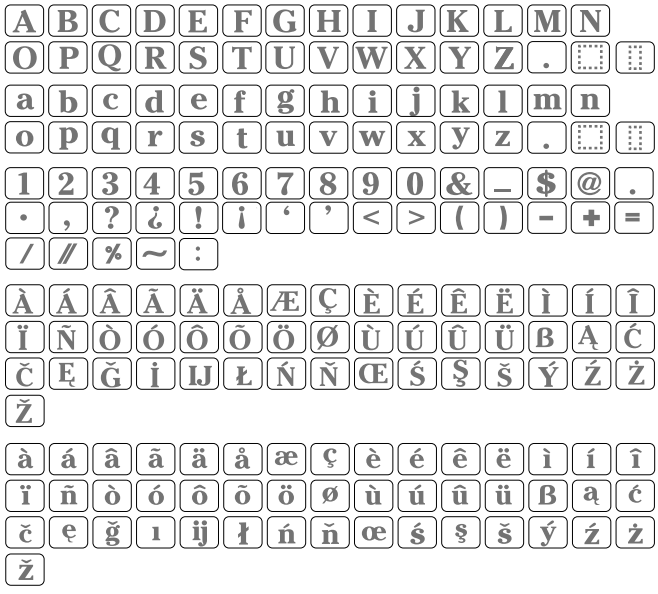
Script



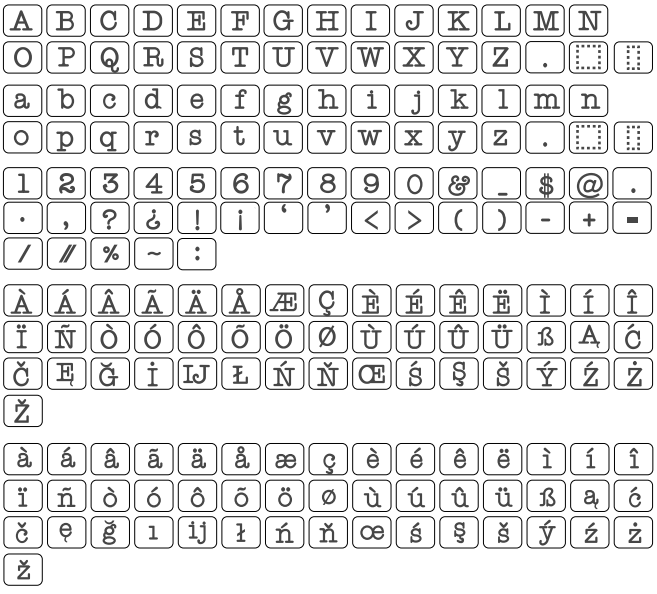
Galant



Cheltenham

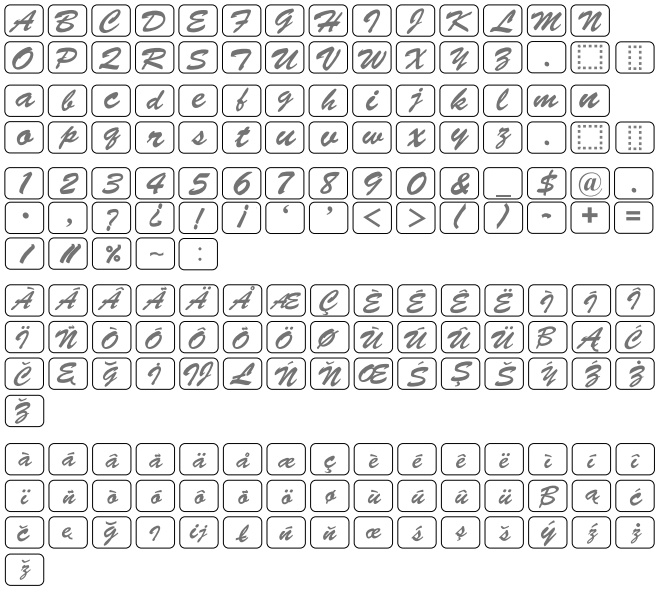


Typist

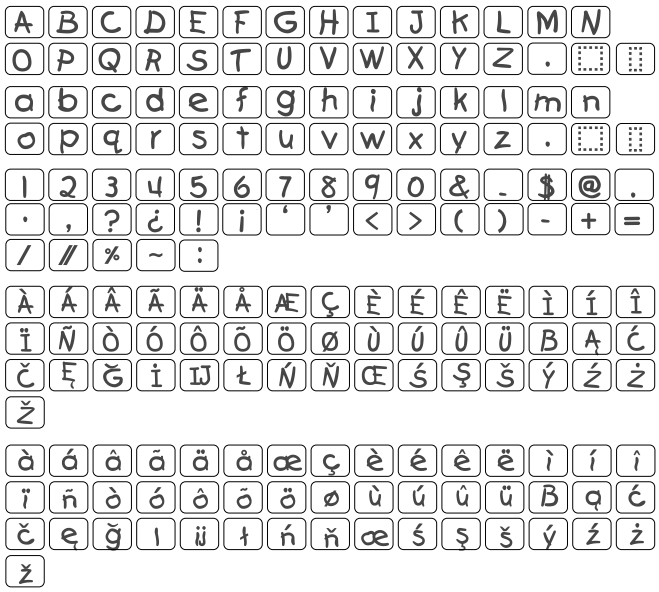


DESIGN CHART
Embroidery Monogram

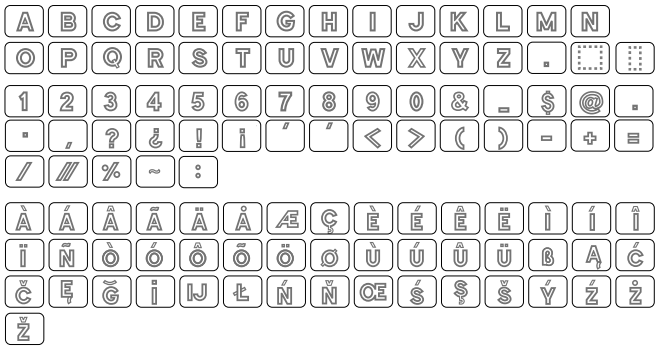
Brush



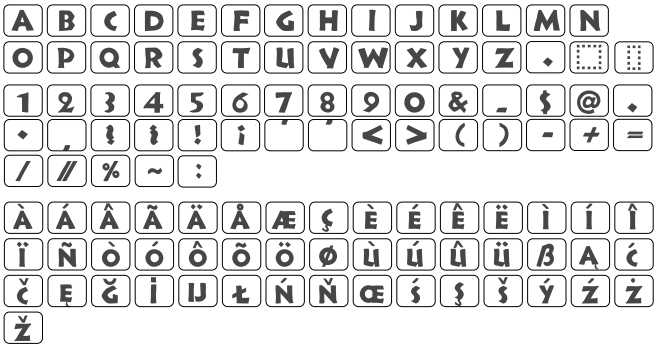
First Grade



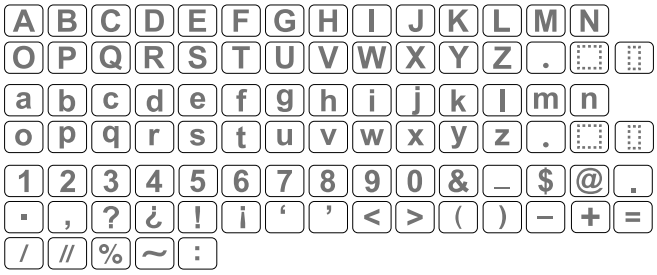
Hollowblock



Jupiter



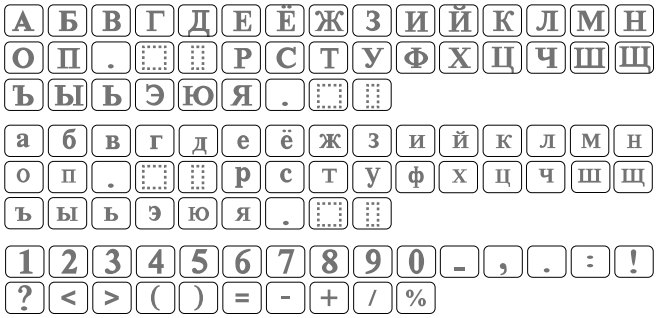
Micro Gothic



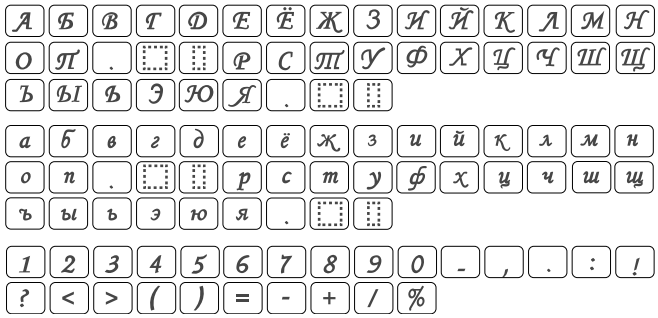
Cyrillic 1



Cyrillic 2



Cyrillic 3



DESIGN CHART
Embroidery Monogram

Kaisho

あ い う え お か き く け こ さ し す せ そ
た ち つ て と な に ぬ ね の は ひ ふ へ ほ
ま み む め も や ゆ よ ら り る れ ろ
わ を ん 、 。 ぁ ぃ ぅ ぇ ぉ っ ゃ ゅ ょ ー
が ぎ ぐ げ ご ざ じ ず ぜ ぞ だ ぢ づ で ど
ば び ぶ べ ぼ ぱ ぴ ぷ ぺ ぽ ゔ

ア イ ウ エ オ カ キ ク ケ コ サ シ ス セ ソ
タ チ ツ テ ト ナ ニ ヌ ネ ノ ハ ヒ フ ヘ ホ
マ ミ ム メ モ ヤ ユ ヨ ラ リ ル レ ロ
ワ ヲ ン 、 。 ァ ィ ゥ ェ ォ ッ ャ ュ ョ ー
ガ ギ グ ゲ ゴ ザ ジ ズ ゼ ゾ ダ ヂ ヅ デ ド
バ ビ ブ ベ ボ パ ピ プ ペ ポ ヴ

小 中 学 校 幼 稚 保 育 園 年 組 部 係 班 子
供 父 母 入 卒 式 会 社 祭 男 女 名 前 住 所
春 夏 秋 冬 元 気 晴 雨 曇 雪 結 婚 御 見 舞
待 引 越 礼 知 慶 新 誕 様 交 通 安 全 祝 休
株 生 才 時 分 曜 日 月 火 水 木 金 土 東 西
南 北 平 成 令 和 第 上 下 左 右 花 山 川 百
千 万

〇 一 二 三 四 五 六 七 八 九 十

Marumoji

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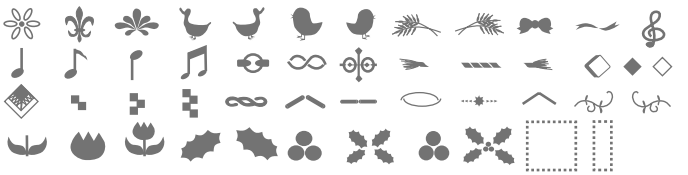
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Kaku Gothic

あ い う え お か き く け こ さ し す せ そ
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バ ビ ブ ベ ボ パ ピ プ ペ ポ ヴ

Border



Normal Sew



2-Letters



3-Letters



QUICK REFERENCE CHART

Ordinary sewing/Common

You can download the colored version of these contents via QR code.

Common Keys

	Change pages, windows, layers
	Move cursors, patterns, carriage
	Adjust stitch width, needle drop position (ordinary sewing)
	Adjust stitch length (ordinary sewing)
	Ordinary: Ordinary sewing mode window Embroidery: Embroidery mode window
	Ordinary sewing mode/ Embroidery mode
	Open file
	Machine settings
	On-screen help
	Lockout/Unlock machine

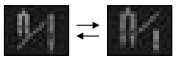
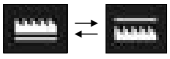
Machine Settings

	Common settings
	Ordinary sewing settings
	Embroidery settings
	Language settings

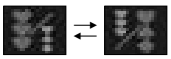
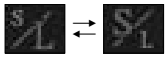
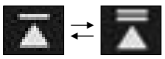
Category Selection (Ordinary sewing)

	Utility stitches, Buttonholes, Specialty stitches
	Decorative, Quilting stitches
	Monogramming

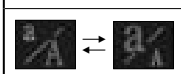
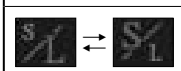
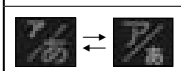
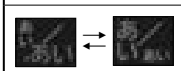
Utility

	Switch single/twin needle sewing
	Raise/Lower feed dogs
	Sew variable zigzag
	Start over from first pattern
	Return (stitch width and length) to default settings

Decorative/Pattern Combination

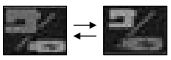
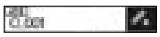
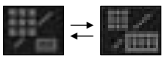
	Decorative/Pattern combination (mode)
	Flip pattern vertically
	Preview window
	Delete pattern
	Full/Small size
	Elongate pattern length without changing stitch density
	Save pattern combination
	First/current pattern startover

Monogramming

	Monogramming
	Upper/Lower case
	Full/Small size
	Hiragana/Katakana
	Horizontal/Vertical orientation
	Open preview window
	Delete selected character
	Save monograms

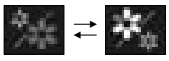
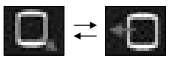
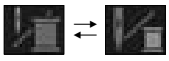
QUICK REFERENCE CHART

Ordinary sewing/Common

File/Folder	
	Move to parent folder
	Create new folder
	Change file/folder name
	Delete file/folder
	Internal memory/USB flash drive
	Enter new file name
	Folder for ordinary sewing provided with this machine
	Folder for embroidery provided with this machine
	Upper case
	Lower case
	Hiragana
	Katakana
	Switch keyboard layout

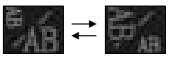
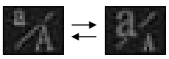
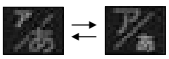
QUICK REFERENCE CHART
Embroidery

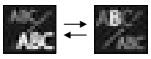
Embroidery mode window	
	Embroidery design mode
	Monogram mode
	Editing mode
	Move carriage to home position

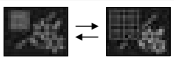
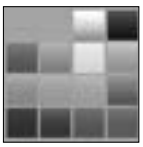
Ready to Sew Window	
	Change layer, move page
	Adjust pattern position
	Switch functions
	Show color section of design
	Check/Baste embroidery size by tracing
	Move carriage/Move hoop back to original position
	Open color list of thread/stitch count
	Switch sewing order of thread/stitch count
	Show/Hide current sewing point as cross mark
	Adjust jump thread cutting length
	Adjust fine position/angle
	Jump to desired sewing point
	Jump stitch count forward/backward
	Return to previous window

Editing Window	
	Change pattern selections, pages
	Move patterns
	Switch editing tools
	Change embroidery hoop
	Copy pattern
	Delete pattern
	Resize pattern
	Rotate pattern
	Flip pattern horizontally
	Flip pattern vertically
	Make monogram in upper/lower/enlarge/ shorten arc
	Group all patterns () / Group selected patters ()
	Move pattern to center position
	Copy and place pattern symmetrically into 4 corners
	Customize design color and background color
	Change sewing orders
	Reduce number of color sections by grouping
	Sew single color
	Save embroidery designs
	Zoom view size in editing window (Normal, Middle, Large, Largest)
	Scroll the magnified window, drag the selected pattern
	Adjust embroidery area for free-arm embroidery

QUICK REFERENCE CHART
Embroidery

Monogramming	
	Select font
	Horizontal/Vertical orientation
	Medium/Small/Large size
	Upper/Lower case
	Hiragana/Katakana
	Save monogram design
	Adjust spacing size

Monogramming Ready to Sew Window	
	Stop sewing at each letter for color change
	Sew from the left end reference line
	Sew in the center of the hoop
	Sew from the right end reference line

Background and Pattern Color	
	Preview customized colors for pattern
	Change pattern/background color
	Select pattern/background color
	Change shade of selected color
	Assign name to customized color
	Change display to background image with .JPX file format
	Return to original background color

EC DECLARATION OF CONFORMITY

This machine complies with the following regulations:

EN 60335-1: 2012 ; A11 ; A13 ; A1 ; A14 ; A2 ; A15 ; A16
EN 60335-2-28: 2003 ; A1 ; A11
EN 62233: 2008
EN IEC 55014-1: 2021
EN IEC 55014-2: 2021
EN IEC 61000-3-2: 2019 ; A1
EN 61000-3-3: 2013 ; A1 ; A2

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Address: Rue de Veyrot 14 - 1217 Meyrin - Switzerland