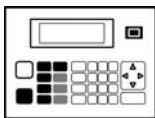


BE-1204B-BC BE-1206B-BC

INSTRUCTION MANUAL

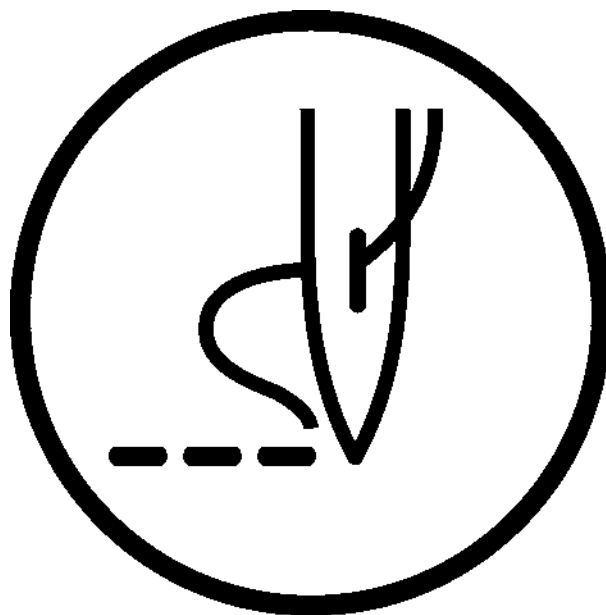


Stand-Alone type

Please read this manual before using the machine.

Please keep this manual within easy reach for quick reference.

TWELVE NEEDLE FOUR HEAD EMBROIDERY MACHINE
TWELVE NEEDLE SIX HEAD EMBROIDERY MACHINE



brother[®]

Thank you very much for buying a BROTHER sewing machine. Before using your new machine, please read the safety instructions below and the explanations given in the instruction manual.



With industrial sewing machines, it is normal to carry out work while positioned directly in front of moving parts such as the needle and thread take-up lever, and consequently there is always a danger of injury that can be caused by these parts. Follow the instructions from training personnel and instructors regarding safe and correct operation before operating the machine so that you will know how to use it correctly.

SAFETY INSTRUCTIONS

1 Safety indications and their meanings

This instruction manual and the indications and symbols that are used on the machine itself are provided in order to ensure safe operation of this machine and to prevent accidents and injury to yourself or other people. The meanings of these indications and symbols are given below.

Indications

 DANGER	The instructions which follow this term indicate situations where failure to follow the instructions will almost certainly result in death or severe injury.
 CAUTION	The instructions which follow this term indicate situations where failure to follow the instructions could cause injury when using the machine or physical damage to equipment and surroundings.

Symbols



----- **This symbol () indicates something that you should be careful of.**

The picture inside the triangle indicates the nature of the caution that must be taken. (For example, the symbol at left means "beware of injury".)



----- **This symbol () indicates something that you must not do.**



----- **This symbol () indicates something that you must do.**

The picture inside the circle indicates the nature of the thing that must be done. (For example, the symbol at left means "you must make the ground connection".)

2 Notes on safety

DANGER



Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the face plate of the control box. Touching areas where high voltages are present can result in severe injury.

CAUTION

Environmental requirements



Use the sewing machine in an area which is free from sources of strong electrical noise such as high-frequency welders. Sources of strong electrical noise may cause problems with correct operation.



Any fluctuations in the power supply voltage should be within $\pm 10\%$ of the rated voltage for the machine. Voltage fluctuations which are greater than this may cause problems with correct operation.



The power supply capacity should be greater than the requirements for the sewing machine's electrical consumption. Insufficient power supply capacity may cause problems with correct operation.



The air supply should have a capacity greater than the machine consumption. If air is not supplied sufficiently, a machine malfunction may occur.



The ambient temperature should be within the range of 5°C to 35°C during use. Temperatures which are lower or higher than this may cause problems with correct operation.



The relative humidity should be within the range of 45% to 85% during use, and no dew formation should occur in any devices. Excessively dry or humid environments and dew formation may cause problems with correct operation.



Avoid exposure to direct sunlight during use. Exposure to direct sunlight may cause problems with correct operation.



In the event of an electrical storm, turn off the power and disconnect the power cord from the wall outlet. Lightning may cause problems with correct operation.



Do not use this machine outdoors.

Installation



Machine installation should only be carried out by a qualified technician.



Never operate the sewing machine with any ventilation openings blocked.



Keep the ventilation openings of the sewing machine free from the accumulation of lint or dust.



Contact your Brother dealer or a qualified electrician for any electrical work that may need to be done.



The sewing machine weighs more than 700 Kg (600 Kg in four head models). The installation should be carried out by four or more people.



Do not connect the power cord until installation is complete, otherwise the machine may operate if the start switch is pressed by mistake, which could result in injury.



Be sure to connect the ground. If the ground connection is not secure, you run a high risk of receiving a serious electric shock, and problems with correct operation may also occur.



When securing the cords, do not bend the cords excessively or fasten them too hard with staples, otherwise there is the danger that fire or electric shocks could occur.



Be sure to wear protective goggles and gloves when handling the lubricating oil or grease, so that no oil or grease gets into your eyes or onto your skin, otherwise inflammation can result. Furthermore, do not drink the oil or grease under any circumstances, as they can cause vomiting and diarrhoea. Keep the oil out of the reach of children.



Secure the machine with the adjustment bolts on the sound floor so that it will not move.

Installation

- ⚠ Avoid setting up the sewing machine near sources of strong electrical noise such as high-frequency welding equipment. If this precaution is not taken, incorrect machine operation may result.

⚠ CAUTION

Sewing

- ⊘ This sewing machine should only be used by operators who have received the necessary training in safe use beforehand.
- ⊘ Keep children away from the sewing machine.
- ⊘ The sewing machine should not be used for any applications other than sewing.
- ⚠ Be sure to wear protective goggles when using the machine. If goggles are not worn, there is the danger that if a needle breaks, parts of the broken needle may enter your eyes and injury may result.
- ⚠ Always use the proper needle plate. Any wrong plate can cause needles to break.
- ⚠ Do not use a bent needle.
- ⚠ Turn off the power switch at the following times, otherwise the machine may operate if the start switch is pressed by mistake, which could result in injury.
 - When threading the needle
 - When replacing the bobbin and needle
 - When not using the machine and when leaving the machine unattended
 - When cleaning the machine.
- ⊘ Do not get on the table. Table may be damaged.
- ⚠ Do not operate this machine where aerosol (spray) products are being used or where oxygen is being administered.
- ⚠ Attach all safety devices before using the sewing machine. If the machine is used without these devices attached, injury may result.
- ⚠ Do not touch any moving parts, press any objects against the machine, or pull/push the cloth during sewing. Doing so may result in personal injury, machine damage, or needle breakage.
- ⚠ Do not touch the pulse motor and sewing machine bed section during operation or for 30 minutes after operation. Otherwise burns may result.
- ⚠ Never drop or insert foreign objects or a screwdriver into the ventilation openings or the machine inside. Touching any high-voltage area may result in an electric shock.
- ⚠ Never damage, alter, heat, or put a strain on the power cable as well as other cables. Doing so may result in a fire or an electric shock.
- ⚠ If the controller is exposed to water or a chemical agent or if its entry is found inside the controller, turn off the power switch immediately. Continuing to use the machine under such a condition may result in a fire or an electric shock.
- ⚠ If an error occurs in machine operation, or if abnormal noises or smells are noticed, immediately turn off the power switch. Then contact your nearest Brother dealer or a qualified technician.
- ⚠ If the machine develops a problem, contact your nearest Brother dealer or a qualified technician.

Cleaning

- ⚠ Turn off the power switch before starting any cleaning work, otherwise the machine may operate if the start switch is pressed by mistake, which could result in injury.
- ⊘ Be sure to wear protective goggles and gloves when handling the lubricating oil or grease, so that no oil or grease gets into your eyes or onto your skin, otherwise inflammation can result. Furthermore, do not drink the oil or grease under any circumstances, as they can cause vomiting and diarrhoea. Keep the oil out of the reach of children.

Maintenance and inspection



Maintenance and inspection of the sewing machine should only be carried out by a qualified technician.



Ask your Brother dealer or a qualified electrician to carry out any maintenance and inspection of the electrical system.



Turn off the power switch and disconnect the power cable (do not pull on the cable itself) from the wall outlet before attempting to perform the following operations. Otherwise, the machine is started if the start switch is pressed by mistake. Injury may occur in such a case.

- When carrying out inspection, adjustment, or maintenance
- When replacing consumable parts such as a rotary hook, a knife, or a fluorescent lamp



If the power switch needs to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.



Use only the proper replacement parts as specified by Brother. When replacing a fluorescent lamp, use the same-type lamp having a rating of 40 watts. Wait until the fluorescent lamp cools off before replacement. Failure to do so can result in burns.



If any safety devices have been removed, be absolutely sure to re-install them to their original positions and check that they operate correctly before using the machine.



Any problems in machine operation which result from unauthorized modifications to the machine will not be covered by the warranty.

3 Warning labels

* The following warning labels appear on the sewing machine. Please follow the instructions on the labels at all times when using the machine. If the labels have been removed or are difficult to read, please contact your nearest Brother dealer.

1 Electric shock danger display



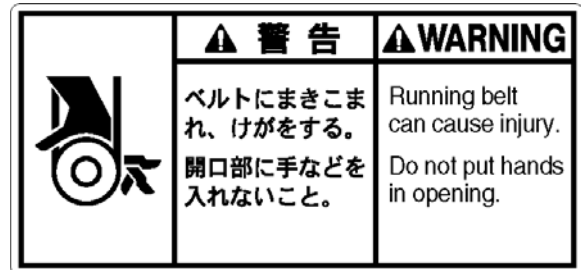
W1408Q

2 Electric shock danger display



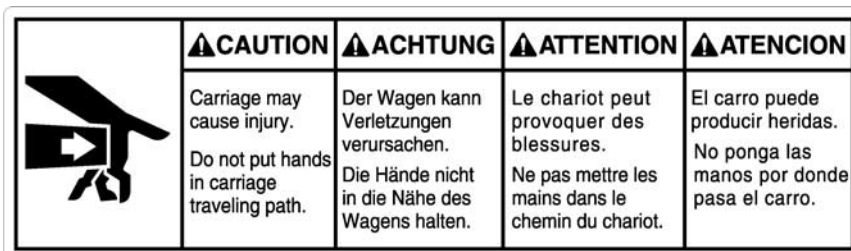
Hazardous voltage will cause injury.

3 Injury warning display



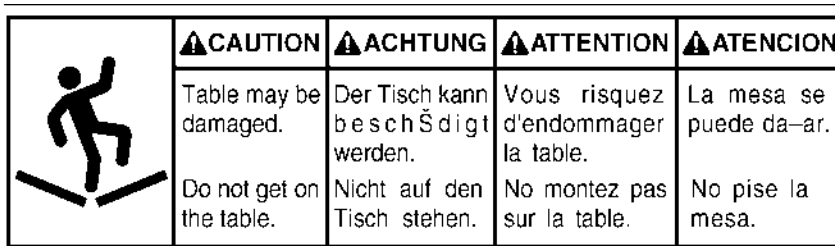
W1410Q

4 Injury caution display



W1200Q

5 Injury caution display



W1202Q

6 Injury caution display



Never touch or push the thread take up during operation as it may result in injuries machine.

7 Injury caution display



Never touch or push the needle bar during operation as it may result in injuries or damage to the sewing machine.

8 High temperature caution display



W1201Q

9 High temperature caution display



W1206Q

Do not touch this part during activation or for 30 minutes after shut-off. Otherwise burns may result.

10 Ground mark

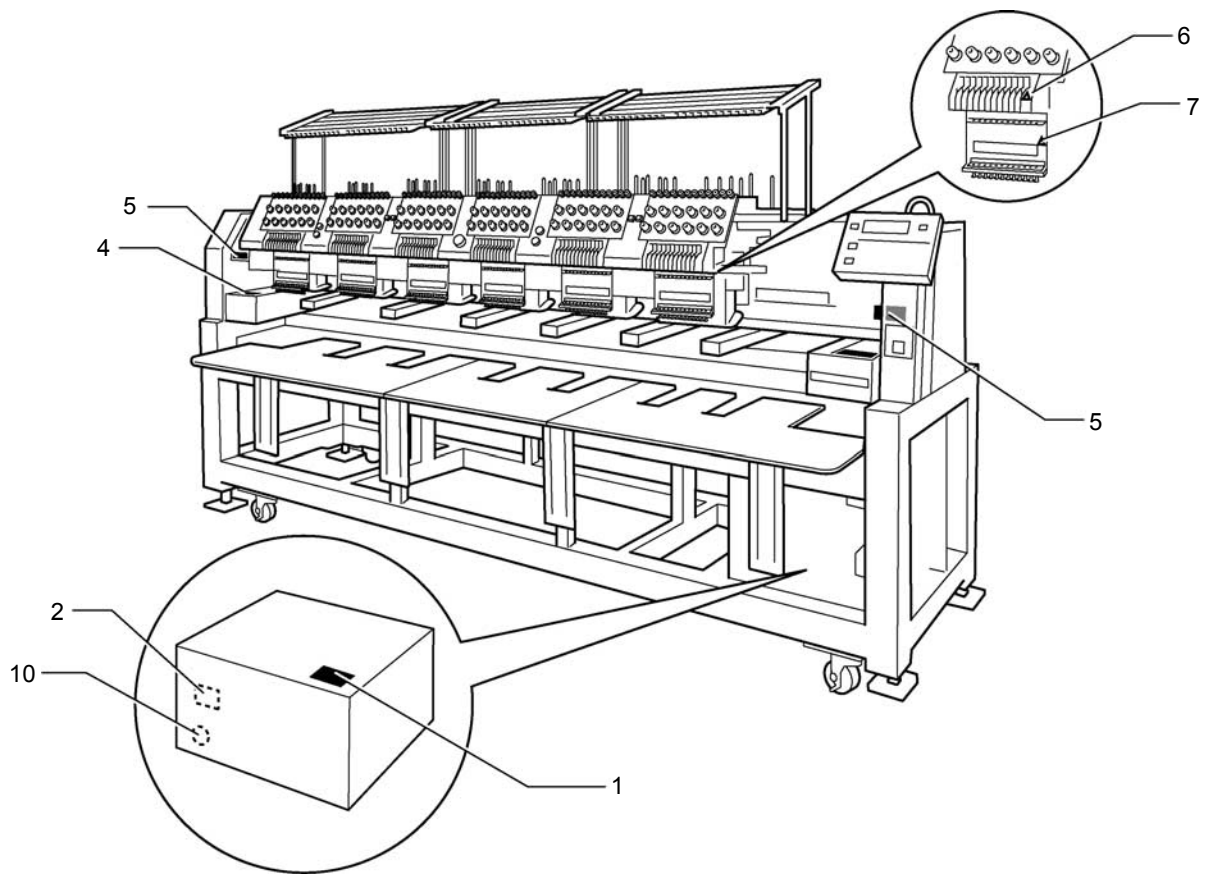


Be sure to connect the ground. If the ground connection is not secure, you run a high risk of receiving a serious electric shock, and problems with correct operation may also occur.

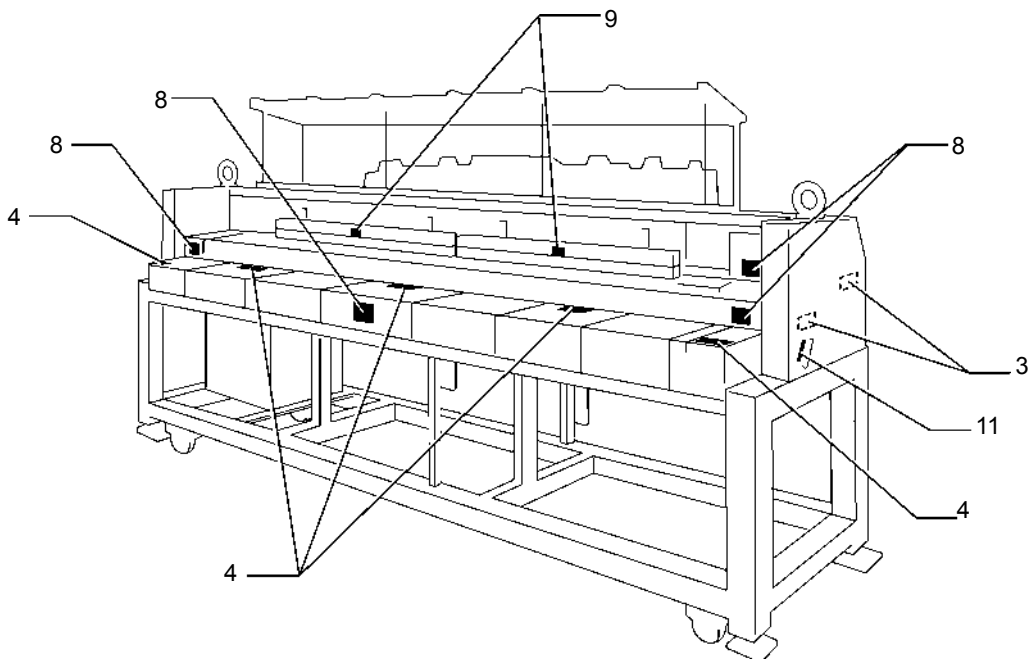
11 Direction of operation



W1205Q



W1207Q



W1208Q

Before Starting Operation

Do not force open the shutter for direct contact with the magnetic area.



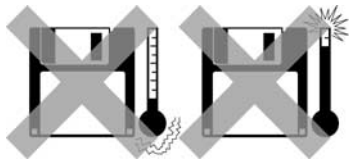
W1209Q

Do not bring disks near magnetic matters such as magnetic screwdriver or the back side of the programmer.



W1210Q

Do not store floppy disks in an extremely high or low ambient temperature.



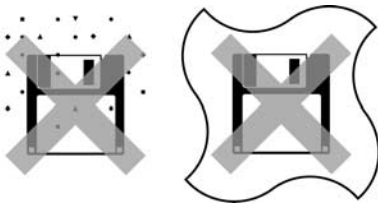
W1211Q

Do not use floppy disks under high humidity.



W1212Q

Do not use or store floppy disks in a dusty place. Do not place it on cloth.



W1213Q

Do not store floppy disks under direct sunlight.



W1214Q

Do not bend the disk. Do not put things on the disk.



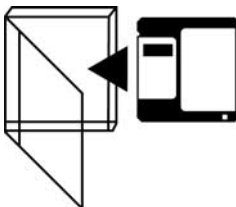
W1215Q

Avoid contact with solvent or drink.



W1216Q

Store it in the case immediately after using it to protect it from dust and damage.



W1217Q

Use a commercially available cleaning disk to clean the head of the floppy disk drive periodically.



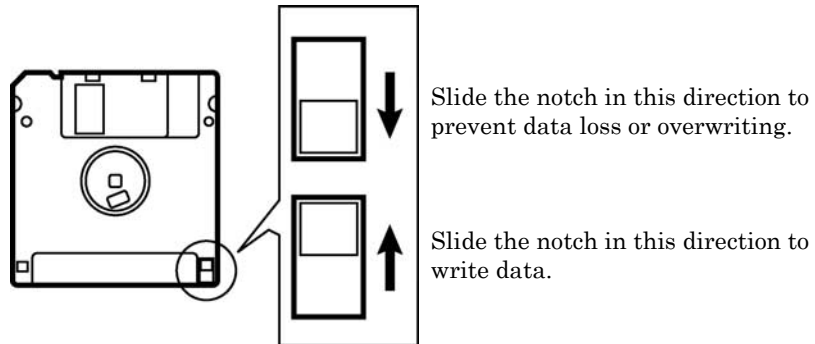
W1218Q

Do not remove the disk out of the drive during the access lamp is lit.

Protecting data in floppy disks

Write-protection is available for a floppy disk to prevent undesired data deletion. A write-protected disk is read-only. It is recommended to provide write-protection for disks which contain important data.

To do so, slide the write-protect notch to open the slot as shown below.



W1219Q

Procedure of Reading This Manual

Explanation of models

This manual explains two models:

- BE-1204B-BC
- BE-1206B-BC

Explanation for individual model is provided by identifying the model name. Check the model before using the machine. The display is BE-1206B-BC.

Configuration of this manual

This manual consists of the following chapters:

Chapter 1 Preparation of Embroidery Machine

This Chapter describes the specifications, installation and preparatory procedures of starting up the machine.

Chapter 2 Embroidering Procedures

Provides explanations on the operation panel and briefly reviews the flow of embroidering processes.

Chapter 3 Selection of Data and Embroidering

This Chapter describes procedures of reading sewing data and sewing.

Chapter 4 Editing of Embroidering Data

Explains how to edit the embroidery data.

Chapter 5 Setting

This Chapter describes procedures of setting the machine and working environment.

Chapter 6 Operation of Machine

Provides information on machine operation during embroidering.

Chapter 7 Maintenance

Describes appropriate maintenance of the machine.

Chapter 8 Adjustment

Explains how to adjust the needles.

Chapter 9 List of Error Messages

Provides information on error codes and action to be taken.

Chapter 10 Troubleshooting

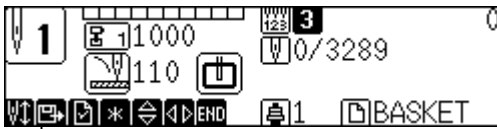
Provides troubleshooting for the machine.

Chapter 11 Connection and Installation of Optional Equipment

Describes connections between the machine/computer and optional equipment available.

Screen Composition

Initial Screen



W0406Q



Starting Sewing Operation (→ page 3-17)



Canceling of Sewing



Thread trimming



Hoop Retract



Area Check



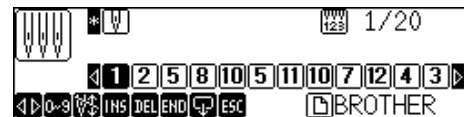
Selection of Embroidery data (→ page 3-3)



W0397Q



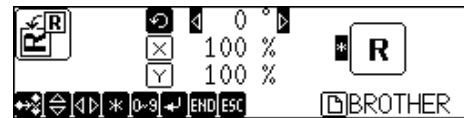
Setting of Needle Bars (→ page 5-4)



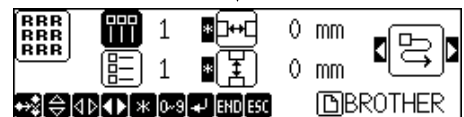
W0481Q



Editing of Embroidery data (→ page 4-1)



W0451Q



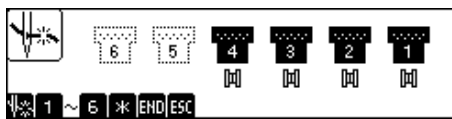
W0465Q



W0601Q



Setting of thread breakage sensor (→ page 5-6)



W0488Q



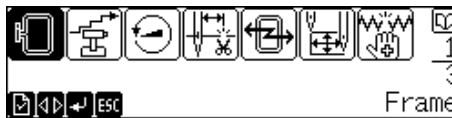
W0490Q



W0494Q



Setting of Machine (→ page 5-9)



W0609Q




W0620Q



W0621Q

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Chapter 1

Preparation of Embroidery Machine

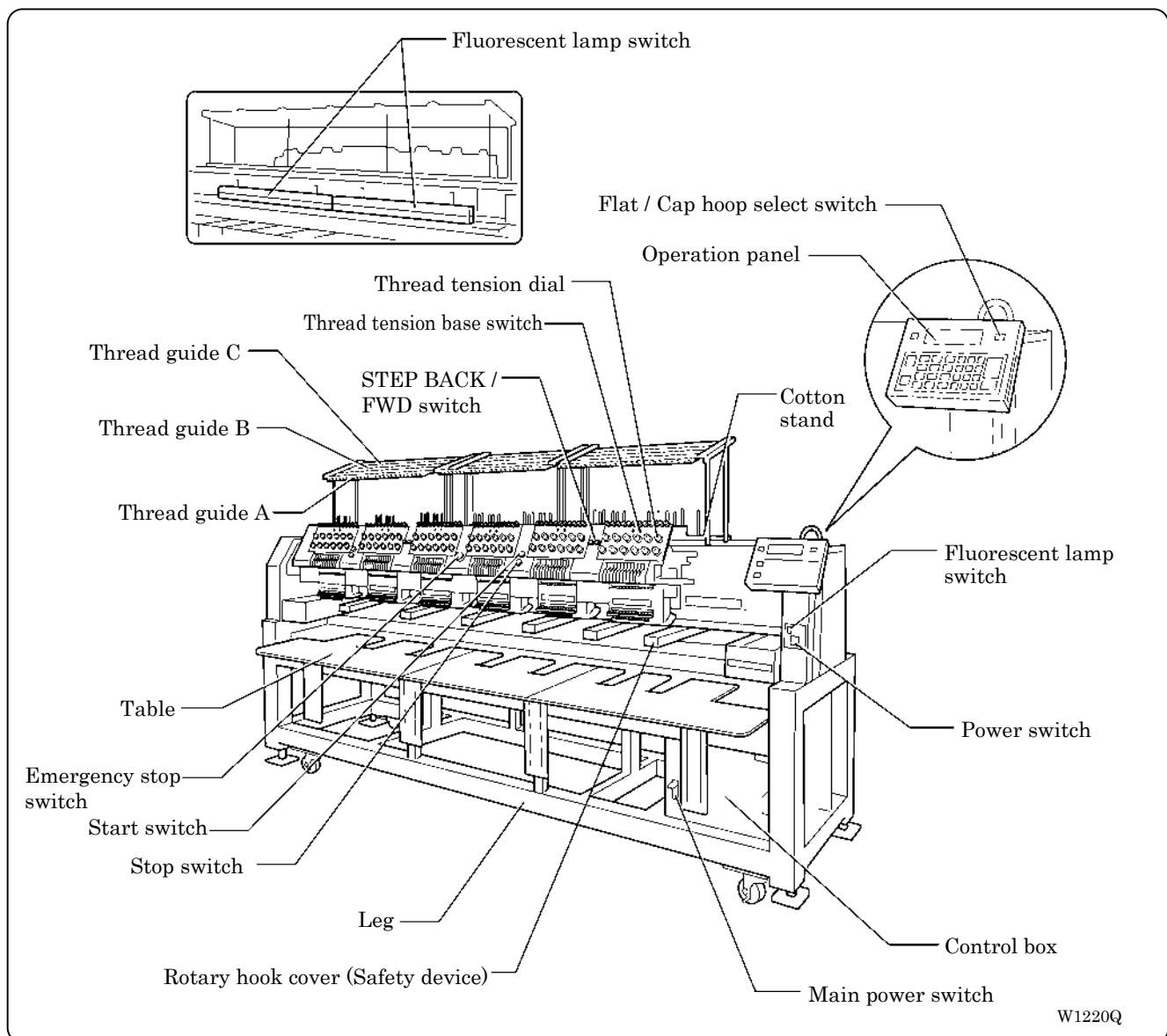
1. Specifications

Embroidery machine used	12 needle six-head embroidery machine	12 needle four-head embroidery machine
Application	Pattern embroidery	
Sewing speed	Maximum 1000 rpm	
Distance between heads	360 mm	
Maximum feed range	450 (V) × 360 (H) mm 95 (V) × 360 (H) mm (With cap frame)	
Sewing area	450 (V) × 360 (H) mm (With sash frame) 430 (V) × 300 (H) mm (With maximum-size tubular square hoop/flat hoop) 85 (V) × 360 (H) mm (With cap frame)	
Feed system	By timing belt and stepping motor drive	
Stitch length	0.1 ~ 12.7 mm (minimum pitch: 0.1 mm)	
Storage medium	3.5 2DD floppy disk (Tajima format) 3.5 2HD floppy disk (the equivalent to Tajima format) 3.5 2DD floppy disk (Barudan FDR/FMC format) 3.5 2DD floppy disk (ZSK format) 3.5 floppy disk (brother ECS format)	
Thread trimming	Automatic thread trimmer	
Thread breakage detect	Upper and lower thread breakage detector	
Power supply	Single phase 200 V, 220 V, 230 V, 240 V, 1.1 kVA Flourescent lamp: 92VA 49W (Maximum)	
Weight	700 kg	600kg
Dimensions	(Before assembly) 3040 (W) × 810 (L) × 1400 (H) mm (After setup) 3040 (W) × 1360 (L) × 1750 (H) mm	(Before assembly) 2320 (W) × 810 (L) × 1400 (H) mm (After setup) 2320 (W) × 1360 (L) × 1750 (H) mm
Options	Embroidery hoops in different sizes, Bobbin winder	

Accessories

	Standard Accessories	Optional Accessories
Embroidery hoop	<ul style="list-style-type: none"> • Tubular square hoop 26 × 43 (6 head: 6, 4 head: 4) • Tubular round arm set (6 head: 7, 4 head: 5) 	<ul style="list-style-type: none"> • Holder base 30 × 43 (6 head: 6, 4 head: 4) <p>Other embroidery hoops in different sizes</p> <ul style="list-style-type: none"> • Sash frame assembly * Other Tajima embroidery hoops that can be used with BE-1201A-AC etc. • Cap frame (6 head: 6, 4 head: 4) Cap frame drive assembly (6 head: 6, 4 head: 4) Base frame set (6 head: 12, 4 head: 8) Set frame base set (1)
Others	Table assembly	<ul style="list-style-type: none"> • Bobbin winder

2. Names of Machine Components



The machine heads are numbered 1 to 6 (1 to 4 in four head models) from the right front.

3. Installation

! DANGER

- ⊘** Embroidery machines should be installed only by trained engineers.

! Electric wiring should be laid by your distributor or electric experts.

! The sewing machine weights more than 700 Kg (600 Kg in four head models). The installation should be carried out by four or more people.

⊘ Do not connect the power source until installation is completed. Doing so may start the machine unintentionally through an accidental activation of the START switch, resulting in bodily injuries.
- !** Install a machine in a place away from a high-frequency welding machine or other machines that may generate a strong electric noise. Failure to do so may cause the embroidery machine to malfunction.

⚡ Be sure to connect the ground. If the ground connection is not secure, you run a high risk of receiving a serious electric shock, and problems with correct operation may also occur.

! Secure the machine with the adjustment bolts on the sound floor so that it will not move.

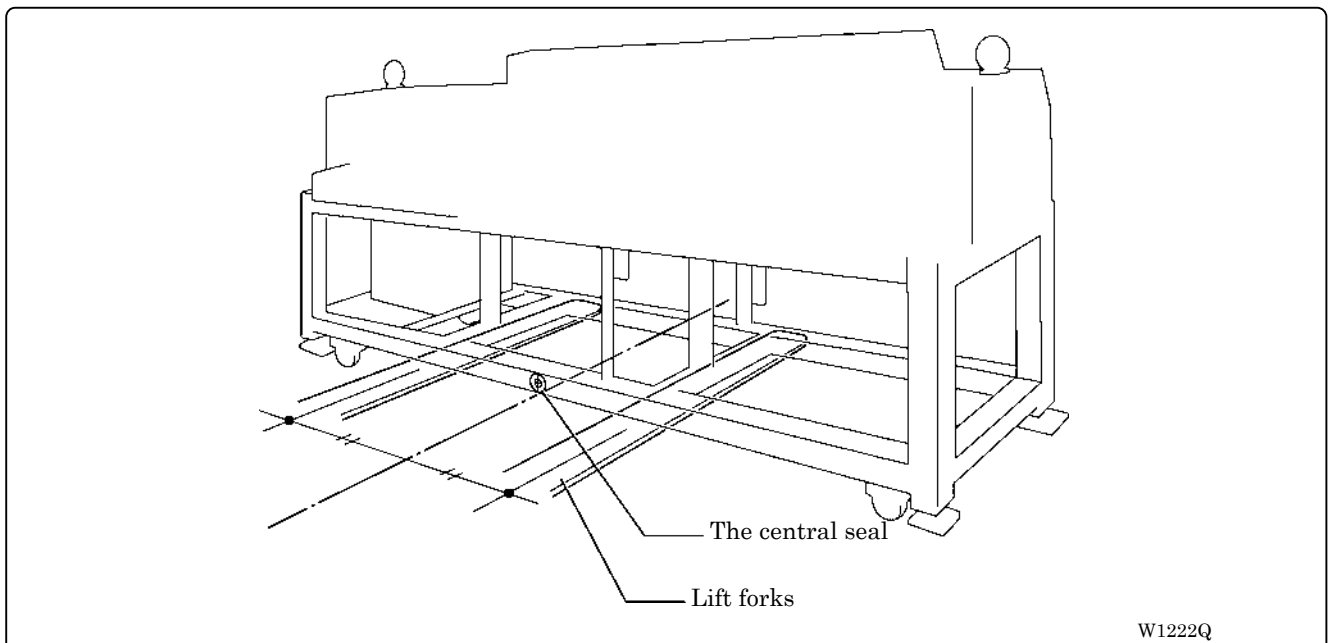
After installation is completed, get the power supply from a dedicated outlet.

When connecting multiple machines, exercise care not to exceed the capacity of the outlet.

3-1 Transportation of Machine

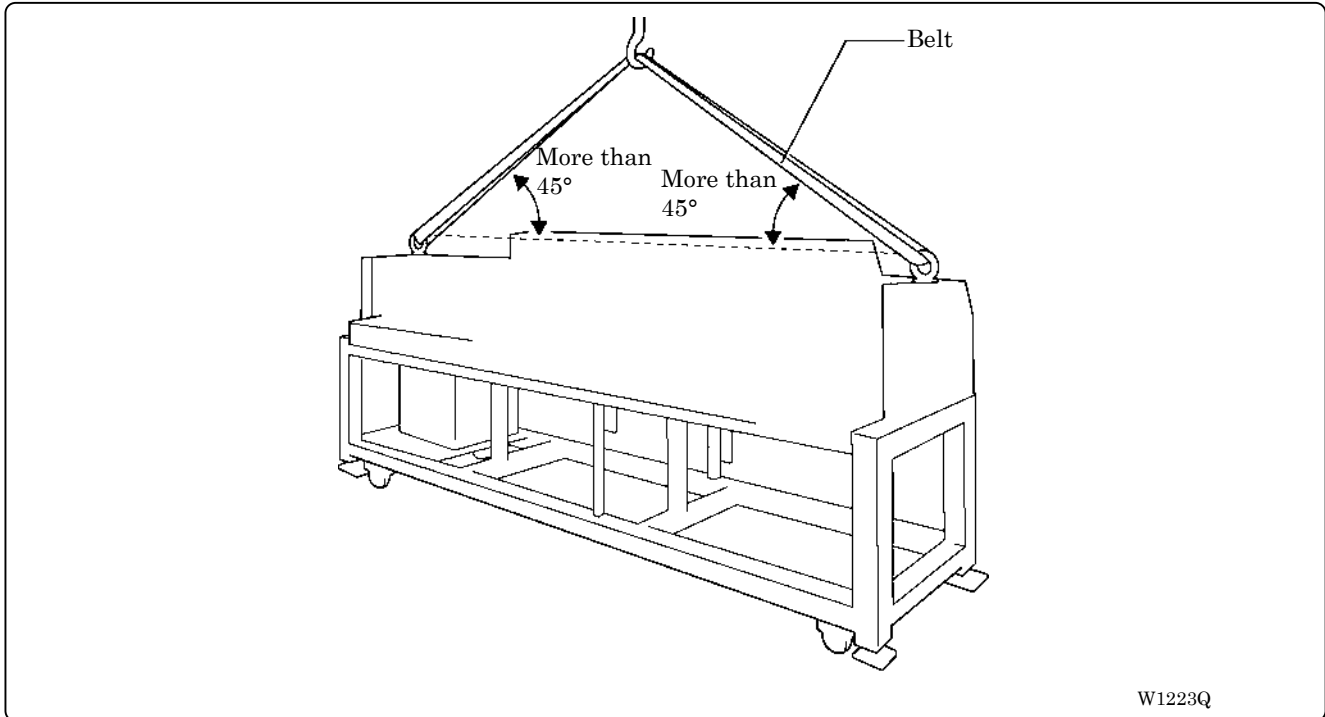
When relocating the machine, push the steel frame. Never push the cover or carriage.

■ When using a fork lift



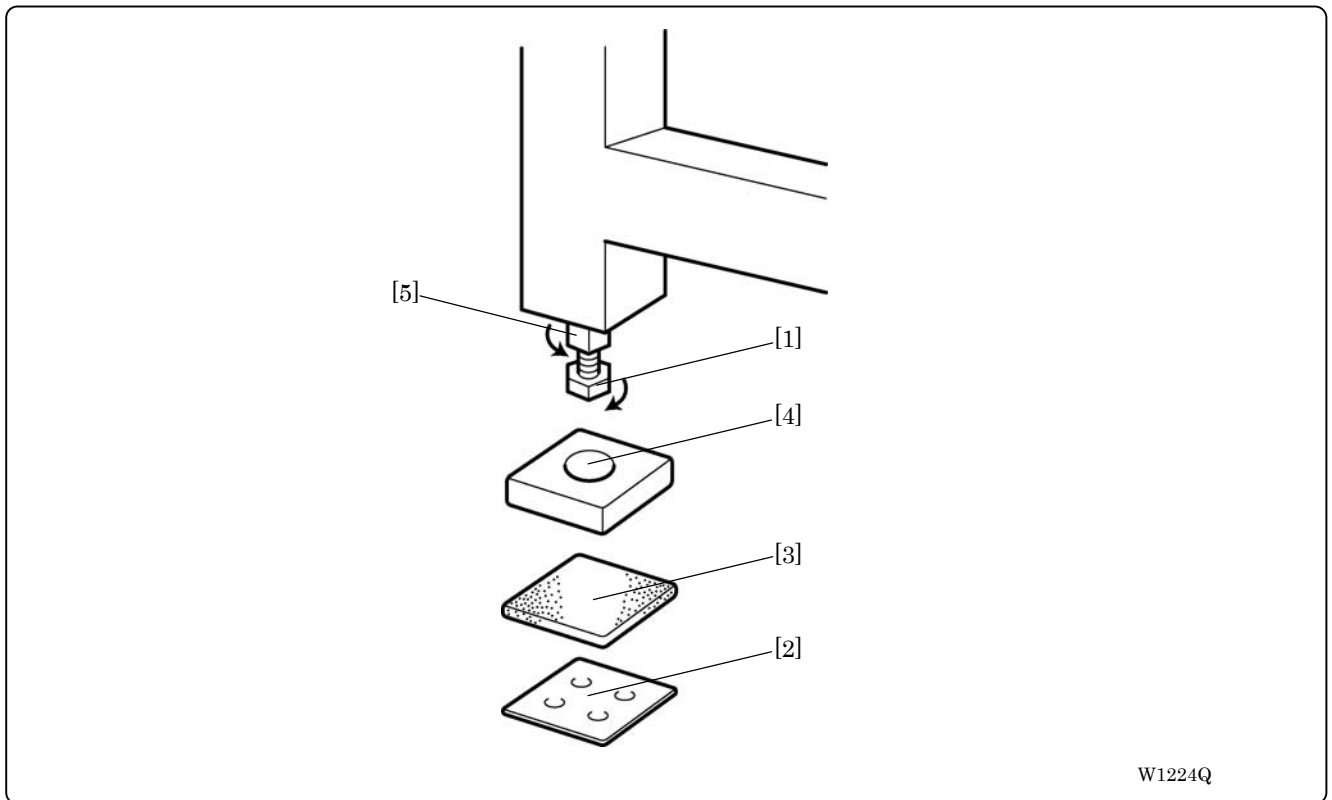
1. Viewing the machine from the back, position their center at the central seal, insert the forks under the legs and lift the machine.

■ When using a crane



2. Hook on the eyebolts with each belt to lift up the machine.
When lifting the machine, make sure that the belts do not contact the machine table or the tension plate.

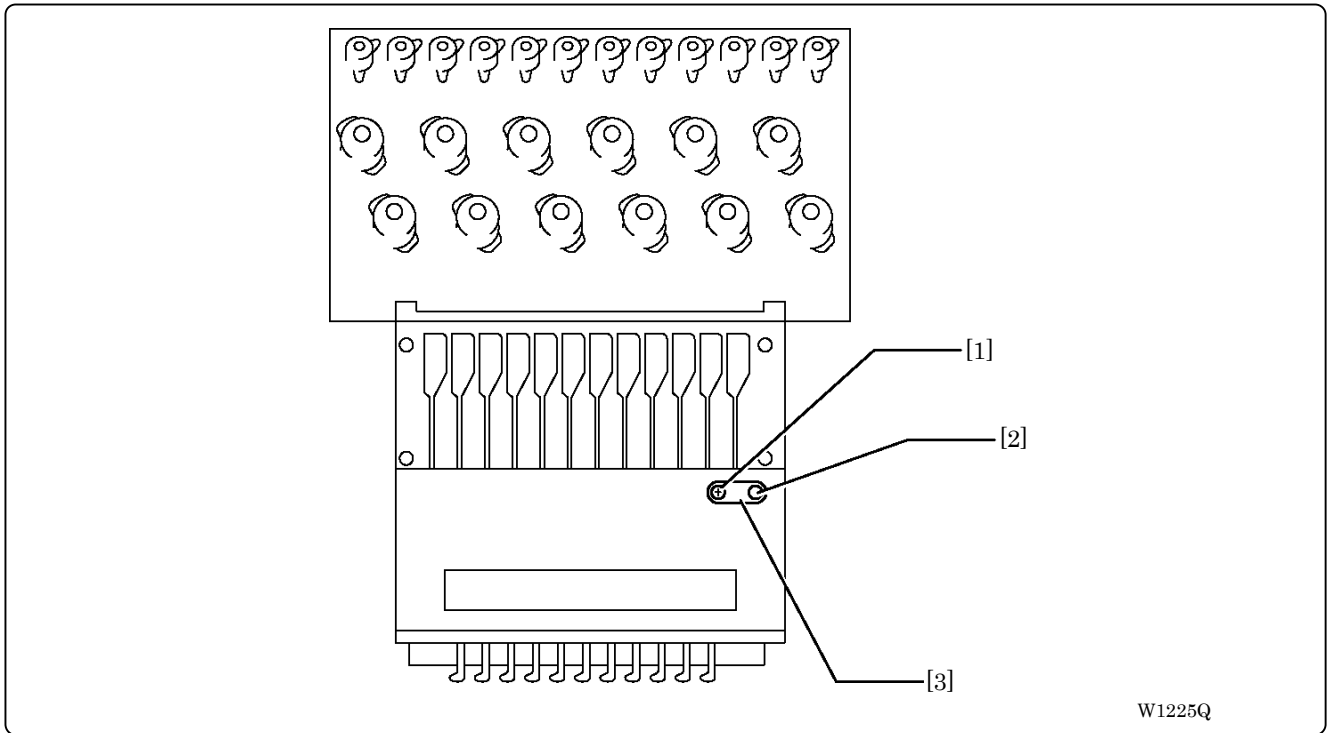
3-2 Installation of Machine



W1224Q

1. Place Footboard [4], a rubber cushion 10 [3] (provided with the machine), and PE sheet [2] under each of four adjustment bolts M20 [1]. The Footboard must be on the rubber cushion.
2. Fit four adjustment bolts M20 [1] into the hole of Footboard [4], and adjust the embroidery machine in height.
The adjustment must be made in such a manner that the four bolts are under an equal load when the machine is placed down. (To lower adjustment bolt M20 [1], turn it in the direction of the arrow.) Also, the casters should be raised.
3. After adjusting four adjustment bolts M20 [1], turn nuts M20 [5] in the direction of the arrow to fasten them.
If the floor is not strong enough, the embroidery machine may be rocked during operation. In such a case, it is recommended that a secure base of concrete be placed below the embroidery machine.

3-3 Preparation of Needle Bar Case

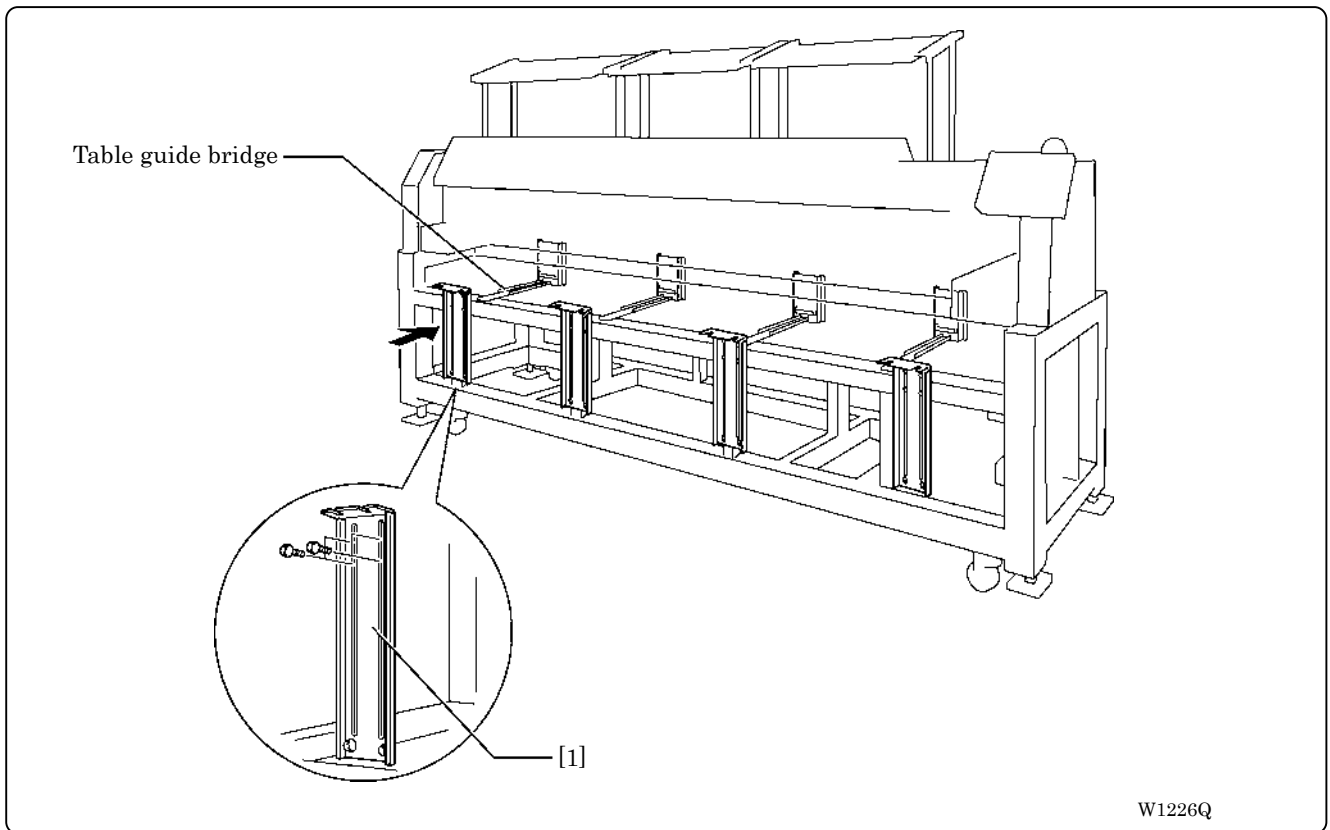


Repeat the procedures below for all the heads:

1. Unscrew the screw [1], then detach the bracket [3] and pin [2].

3-4 Mounting of Table

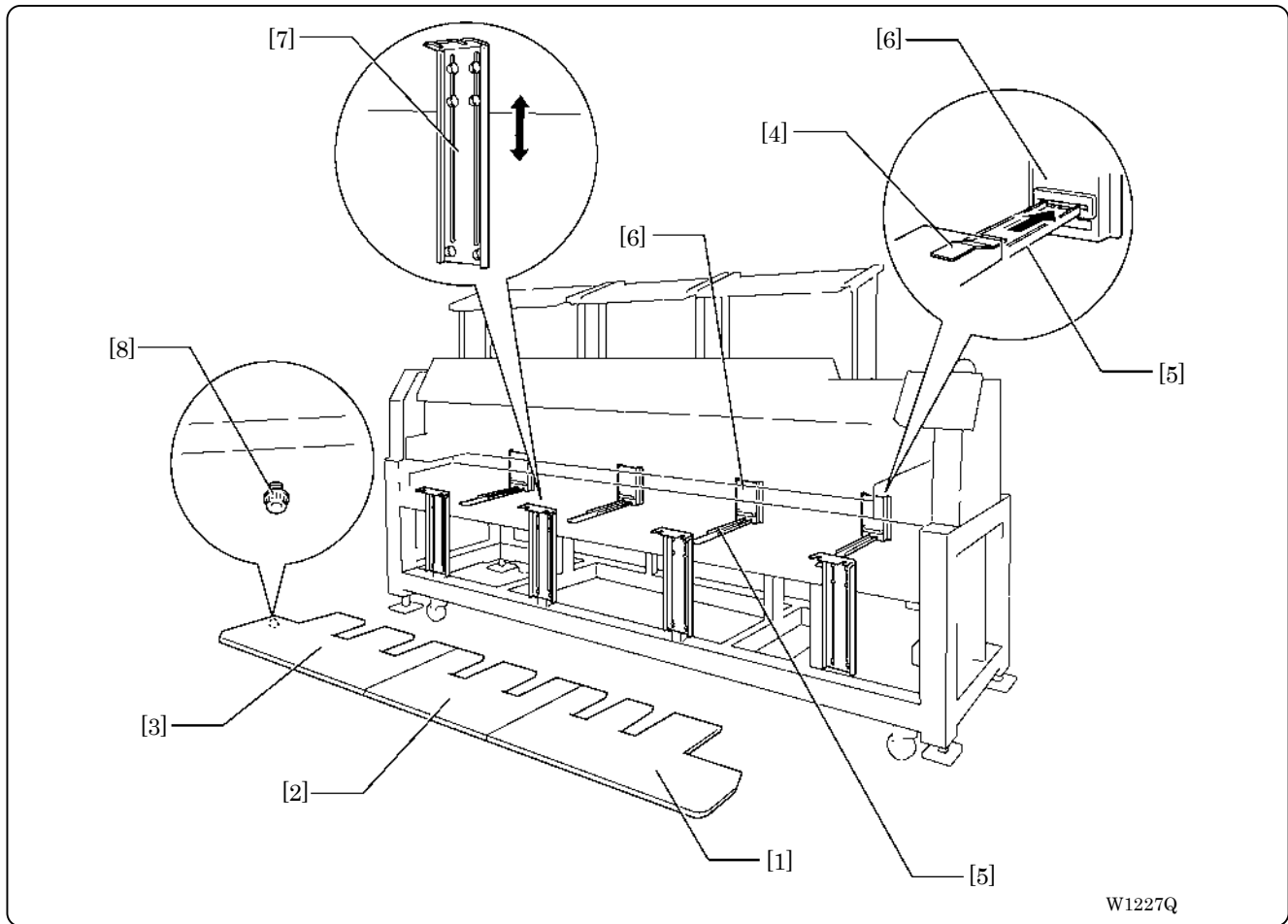
■ Preparation for mounting the table



W1226Q

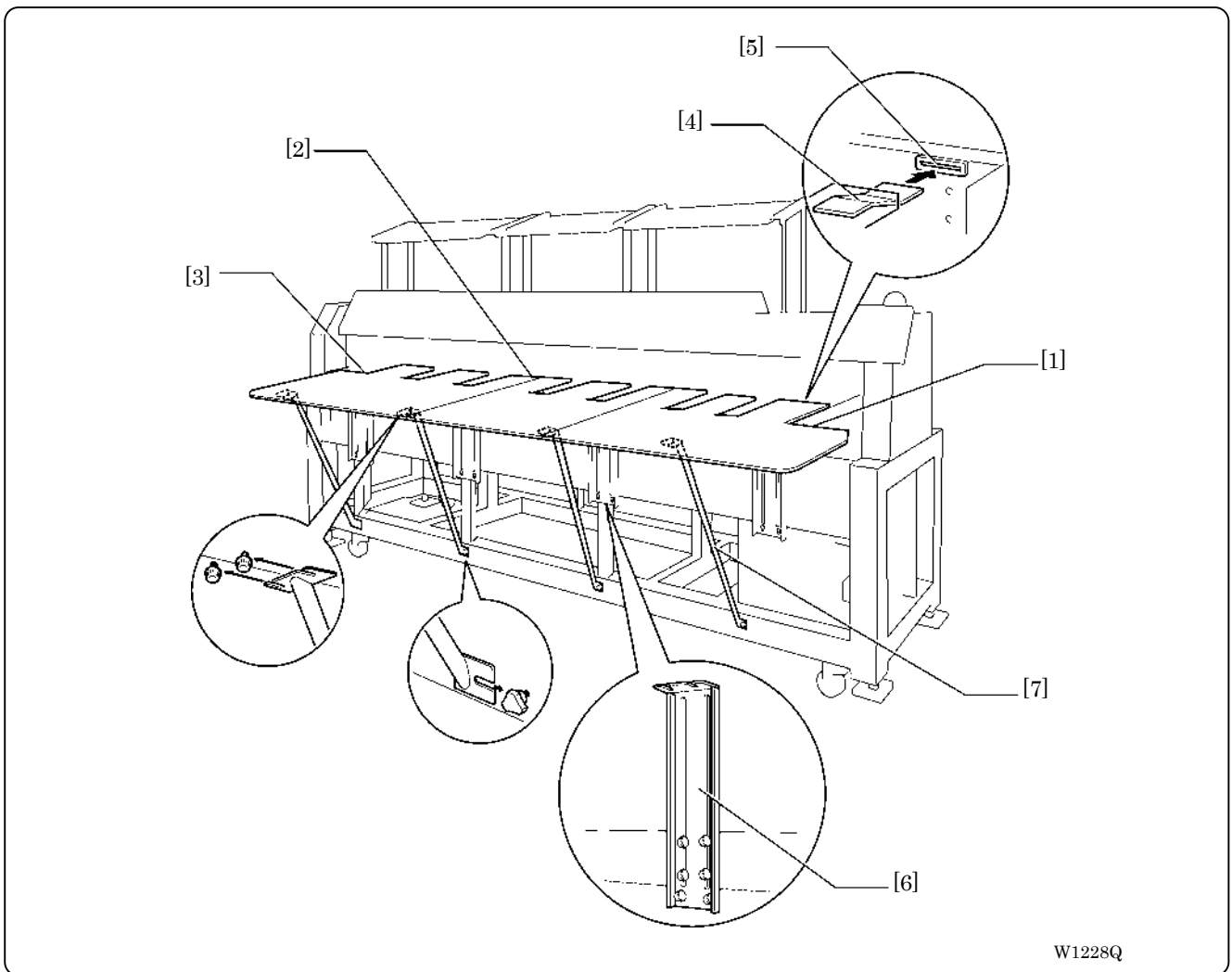
- This operation is required only when the table set is purchased separately from the machine.
 - The table is a standard attachment.
1. Tentatively mount 4 (3 in four-head models) table supports Front [1] on the leg front using 4 bolts each.

■ For embroidering with tubular square hoop or cap frame (lower position)



1. Attach four hexagon socket head cap screws to each of table parts R [1], M [2](six head models only), and L [3] from the back.
2. Put the table backing plate [4] of each table on to the table guide bridge [5], and slide to the other side. Insert the table backing plate [4] into the table backing rubber on the table support Rear [6].
3. Adjust table supports front [7] in height so as to make the table parallel with the floor.
4. Tighten all hexagon socket head cap screws [8] firmly.

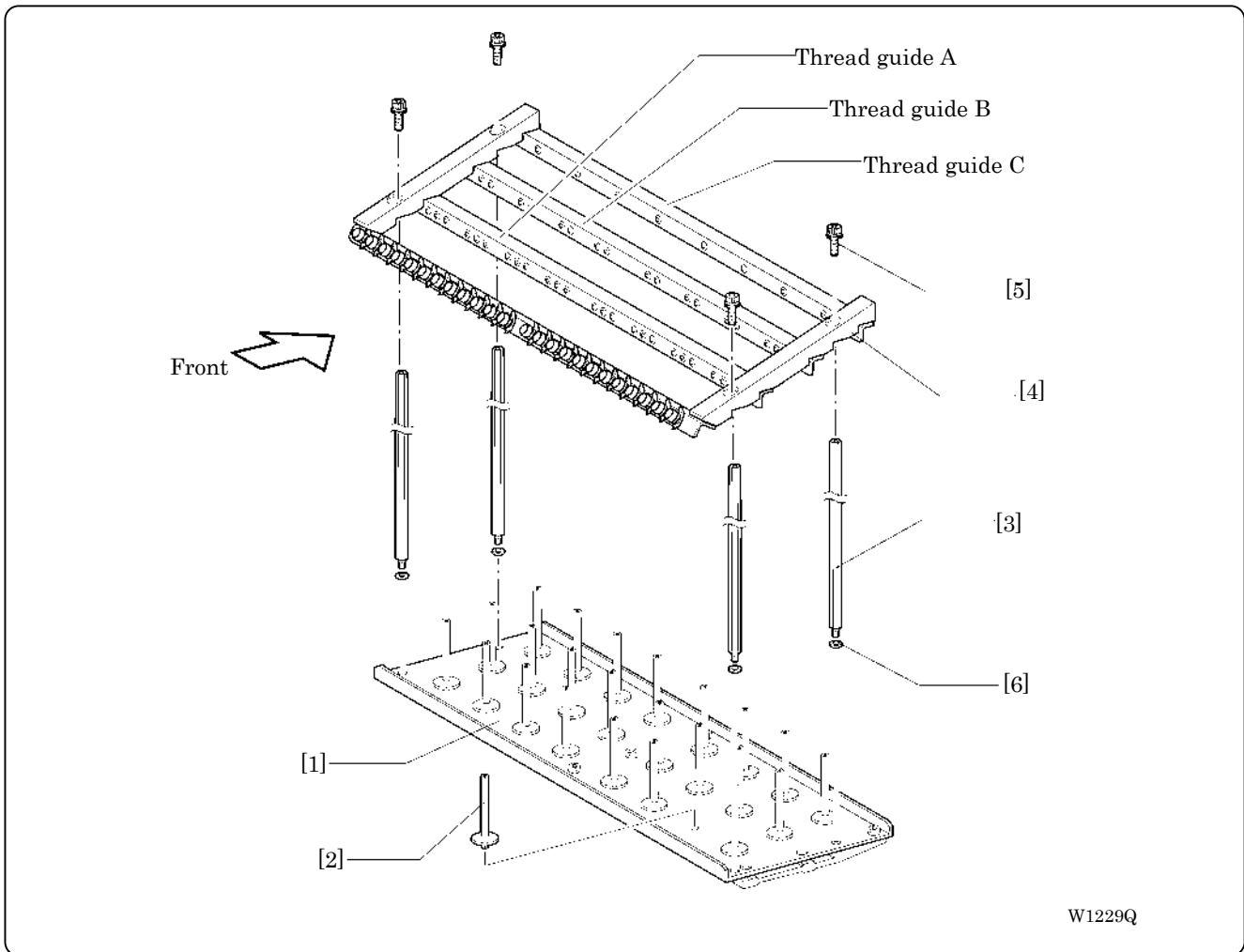
■ For embroidering with flat hoop/sash frame (upper position)



W1228Q

1. Attach four hexagon socket head cap screws to each of table parts R [1], M [2](six head models only), and L [3] from the back.
2. Insert the table backing plate [4] of each table into the table backing rubber on the table support Middle [5].
3. Adjust the height of the table support Front [6] to be even with the upper surface of the bed.
4. Tighten all hexagon socket head cap screws firmly.
5. Attach four(three in four head models) thumb bolts to the lower front steel pipe of the leg section. Fasten the table and the leg section using table stays (4 pcs(3pcs in four head models)) [7].

3-5 Mounting of Cotton Stand



1. Attach the cotton stand bars[2] to the cotton stand assembly[1].
2. Attach four thread guide support bars [3] to the cotton stand assembly [1], while fitting into the four holes.
3. Mount the thread guide assembly [4] on the thread guide support bars [3] using the four screws [5].
 - When mounting, use one flat washer [6] below the thread guide support bar [3].
 - Pay careful attention to the front and back directions of the thread guides (A, B, C).

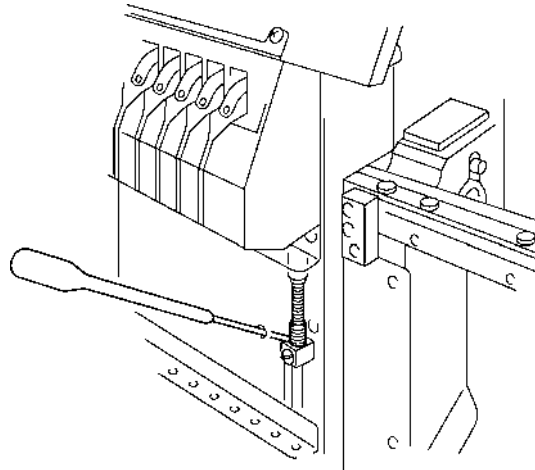
3-6 Lubrication to Needle Bar Case

Proper lubrication is necessary for keeping the machine head in good condition.

CAUTION



Turn off the power switch before starting any cleaning work, otherwise the machine may operate if the start switch is pressed by mistake, which could result in injury.



W1221Q

Before operating the machine for the first time after unpacking or after leaving the machine without operation for a long period of time, supply one or two drops of oil to each needle bar from the oil supply holes of the lower cover.

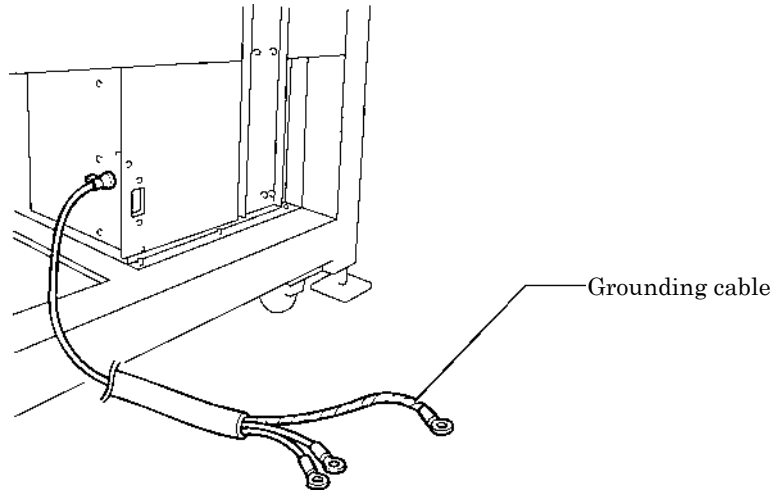
- Use the Brother's specified oil (Nippon Oil, Embroidery Lube 10N; VG10) for this.
- Supplying an excessive amount of oil will cause dripping onto the material.

3-7 Grounding

CAUTION



Perform a grounding cable connection. Failure to do so may result in electric shock or machine malfunction.



W1231Q

When connecting the power supply, make sure to connect it to the grounding cable (with green and yellow stripes). When plugging in the outlet, use a plug suited to the outlet.

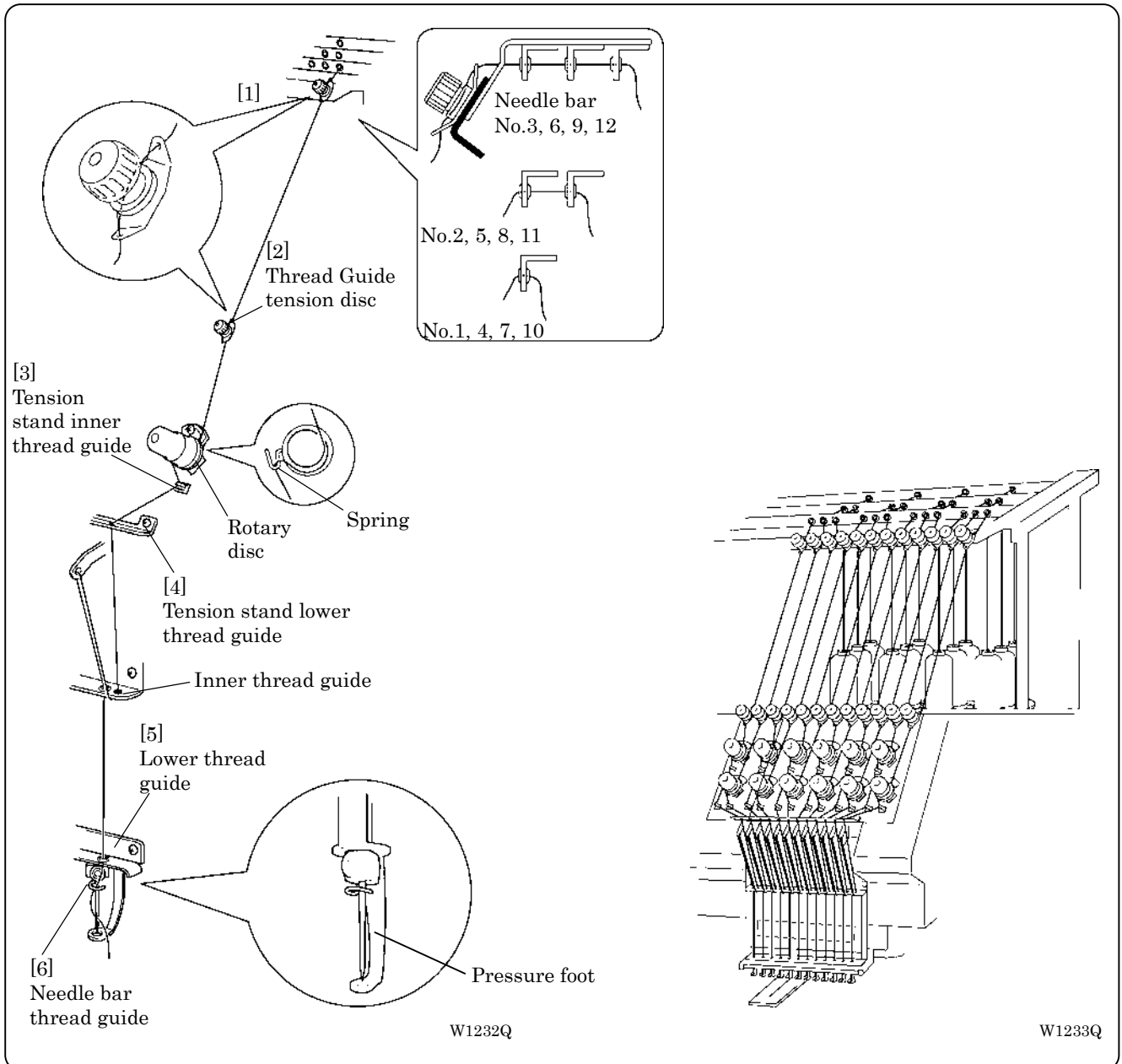
4. Preparation for Embroidering

! CAUTION

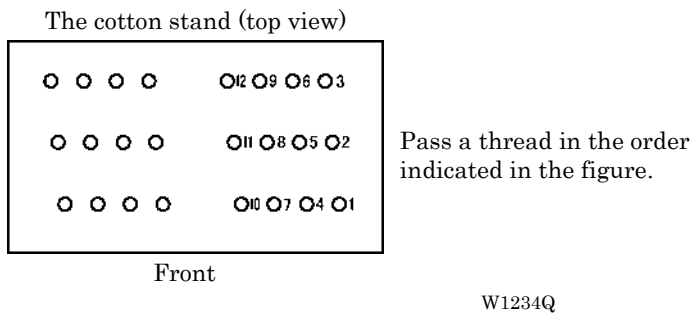


Turn off the power switch before starting preparation.
Failure to do so may start the machine unintentionally through an accidental activation of the START switch, resulting in bodily injuries.

4-1 Upper Threading



1. Pass an upper thread from the cotton stand through the hole of the thread guide right above each cotton stand bar. Pass the thread from the back to the front hole.

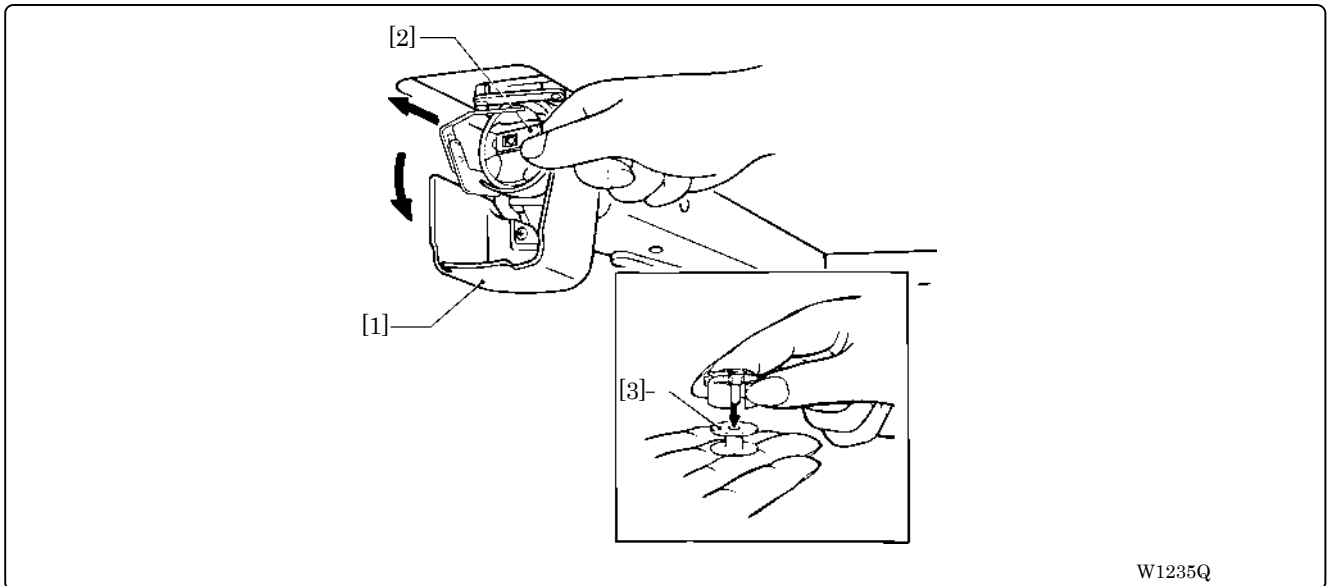


2. Pass the thread through the upper hole of the pretension[1]. Push up the thread guide tension disc with your finger, and pass it from the left to the lower hole.
3. Pass the thread through the upper hole of the 2nd pretension. Push up the thread guide tension disc[2] with your finger, and pass it from the left to the lower hole.
4. Wind the thread clockwise once around the rotary disc and place it on the spring.
5. Pass the thread through the hole of tension stand inner thread guide [3].
6. After passing the thread through the hole of tension stand lower thread guide [4], insert the thread into the right side of the inner thread guide and pass it through the hole of the thread take-up.
7. Bring the thread back to the inner thread guide. Insert the thread into the hole from the upper section.
8. Pass the thread through the hole of the wire of the needle bar thread guide [6] and pass it through the needle eye. Pass it through the presser foot. Pass it to presser spring at the front of lower thread guide [5].

4-2 Replacement of Bobbin

Remove dust, lint and oil from the bobbin case before replacement.

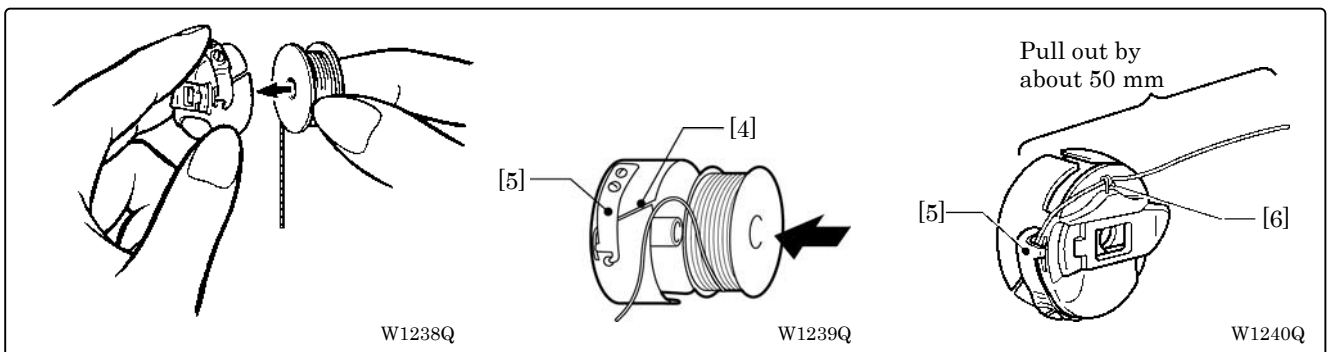
■ Removing bobbin case



W1235Q

1. Open the rotary hook cover [1].
2. Hold the knob [2] and take out the bobbin case.
3. Close the knob and take out the bobbin [3].

■ Replacing bobbin



W1238Q

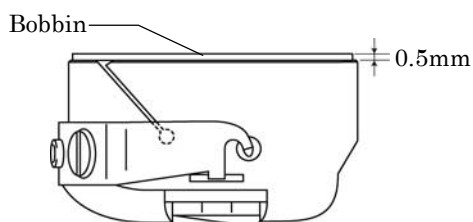
W1239Q

W1240Q

1. Put a new bobbin in the bobbin case.

Check the winding direction.

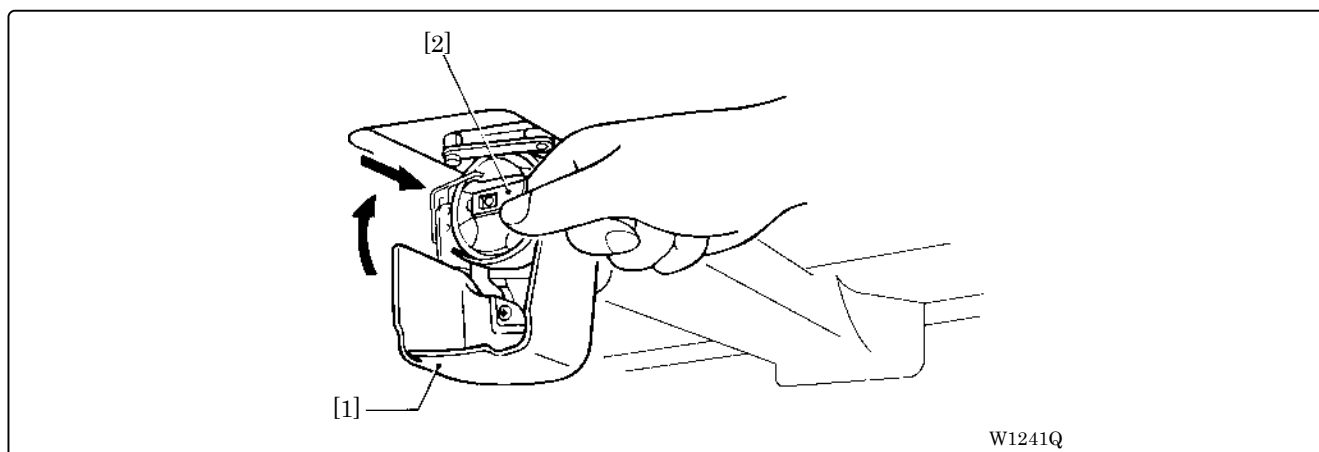
Check that the bobbin is pushed out of the bobbin case by about 0.5 mm. If not, the slip prevention spring of the bobbin case does not work. Adjust the height of the spring or replace it with a new one.



W1237Q

2. Slide the thread under the tension spring [5] through the notch [4].
3. Pull out the thread from the hole of the tension spring [5].
4. Pull out the thread by about 50 mm.
5. Pass the thread through the thread guide [6].

■ Attaching bobbin case



1. Hold the knob [2] and attach the bobbin case securely.
2. Close the rotary hook cover [1].

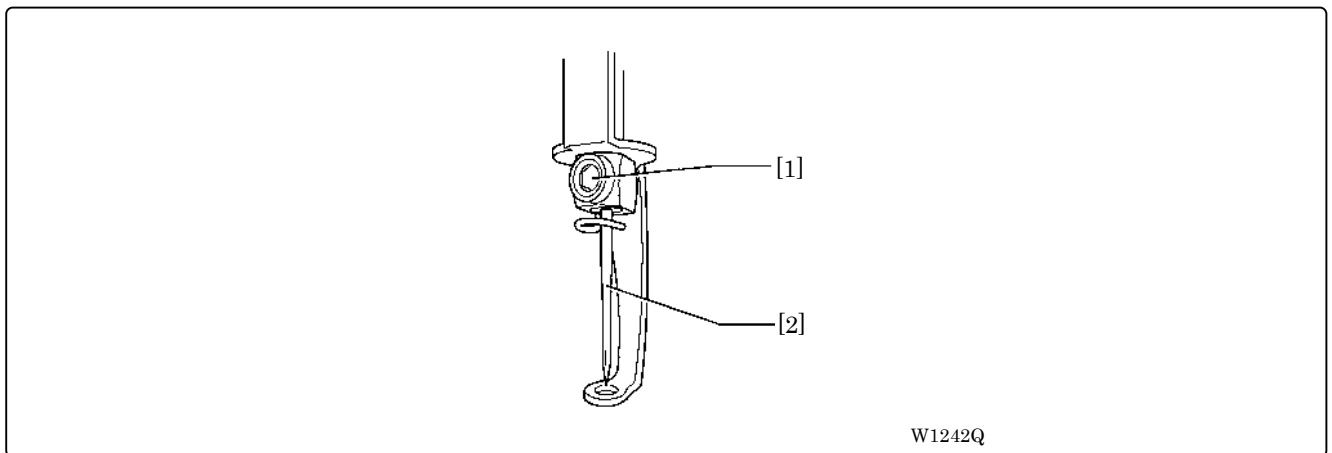
4-3 Replacing and Selecting Needle

* Relationship between materials and needles

Material	Needle	Needle thickness
Denim Leather	DB × K5	#14, #16, #18
Handkerchief		#9, #10
Shirt Towel		#11, #12, #13

■ Selecting needle

- When using special threads such as gold, silver, and rame yarn, use a heavy-duty needle (#11~#16). For better finish, paste the waxed paper on the back of the material.
- In general, use DB×K5 #11 ~ #18 according to the material thickness. For knitted materials, use DB×K23 #11 because its rounded point prevents the knit thread from breaking.



W1242Q

■ Removing needle

Loosen the set screw [1] and remove the needle [2].

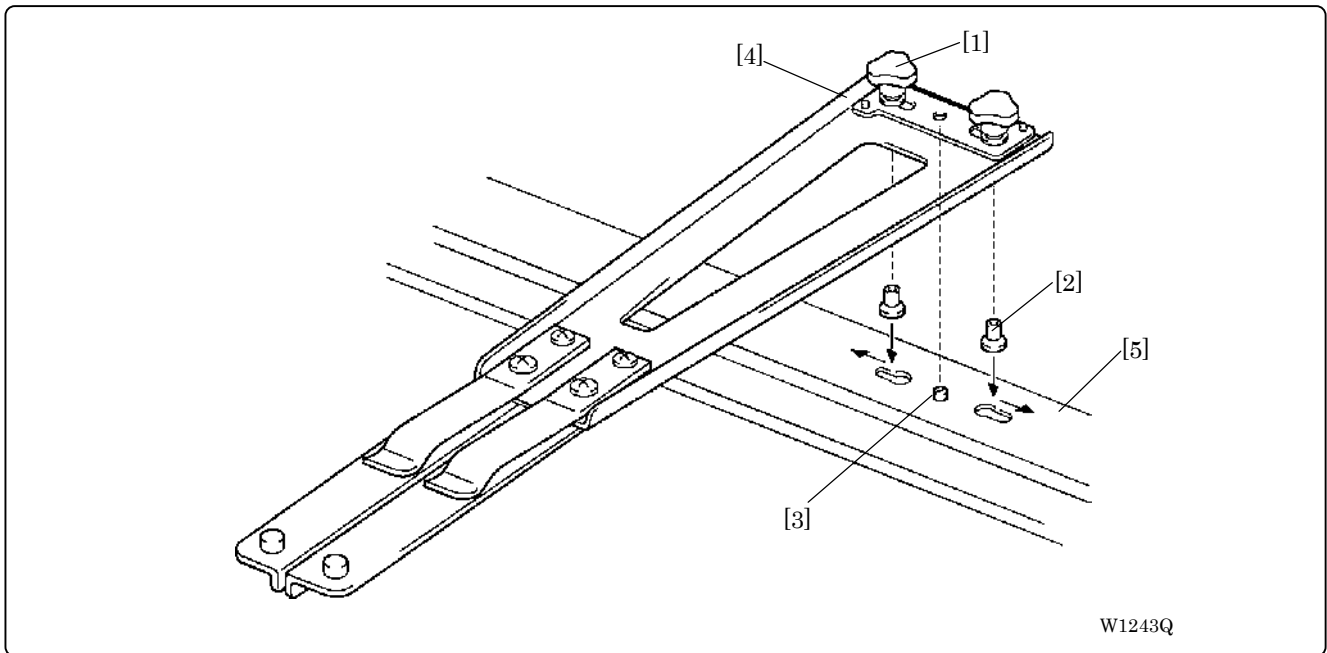
■ Attaching needle

With the flat side facing the front, insert the needle all the way until it meets the end of the needle bar. Tighten the set screw [1] firmly.

- Set the needle so that the notched part will come on the rotary hook side.
- The needle should not be angled to the left (when viewed from the front).

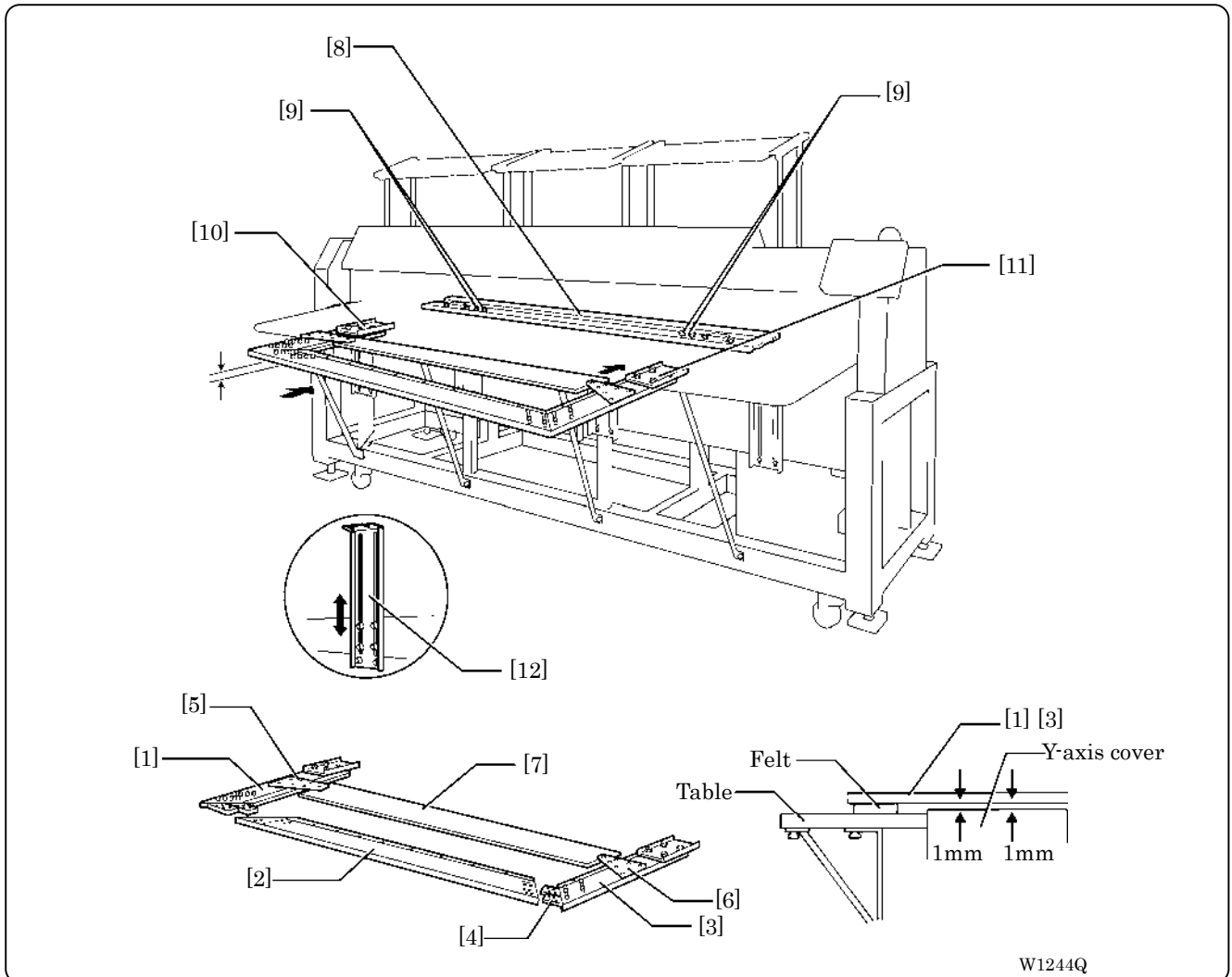
4-4 Attachment of Embroidery Hoop and Frame

■ Tubular square hoop



1. Loosen the thumb bolt M6 [1] to draw it to the center.
2. Align the positioning hole on the tubular round arm frame [4] with the positioning pin [3] (S58665) on the X-feed sash [5] (S58650), and fit the tubular round arm fixing nut [2] on the back side of the thumb bolt M6 [1] into the hole on the X-feed sash.
3. While keeping the nut in the hole, slide the thumb bolt M6 toward the edge and tighten it firmly at the outermost point.

■ Holder base (optional)

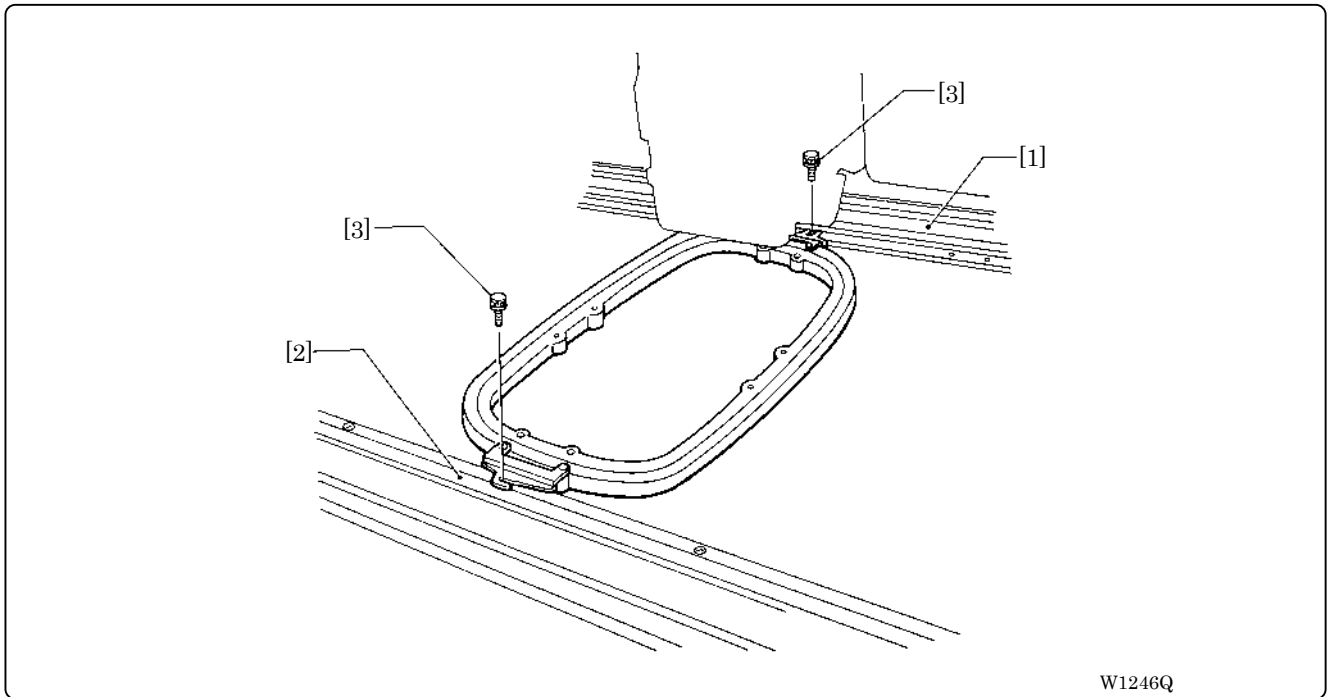


Attaching the holder base frame

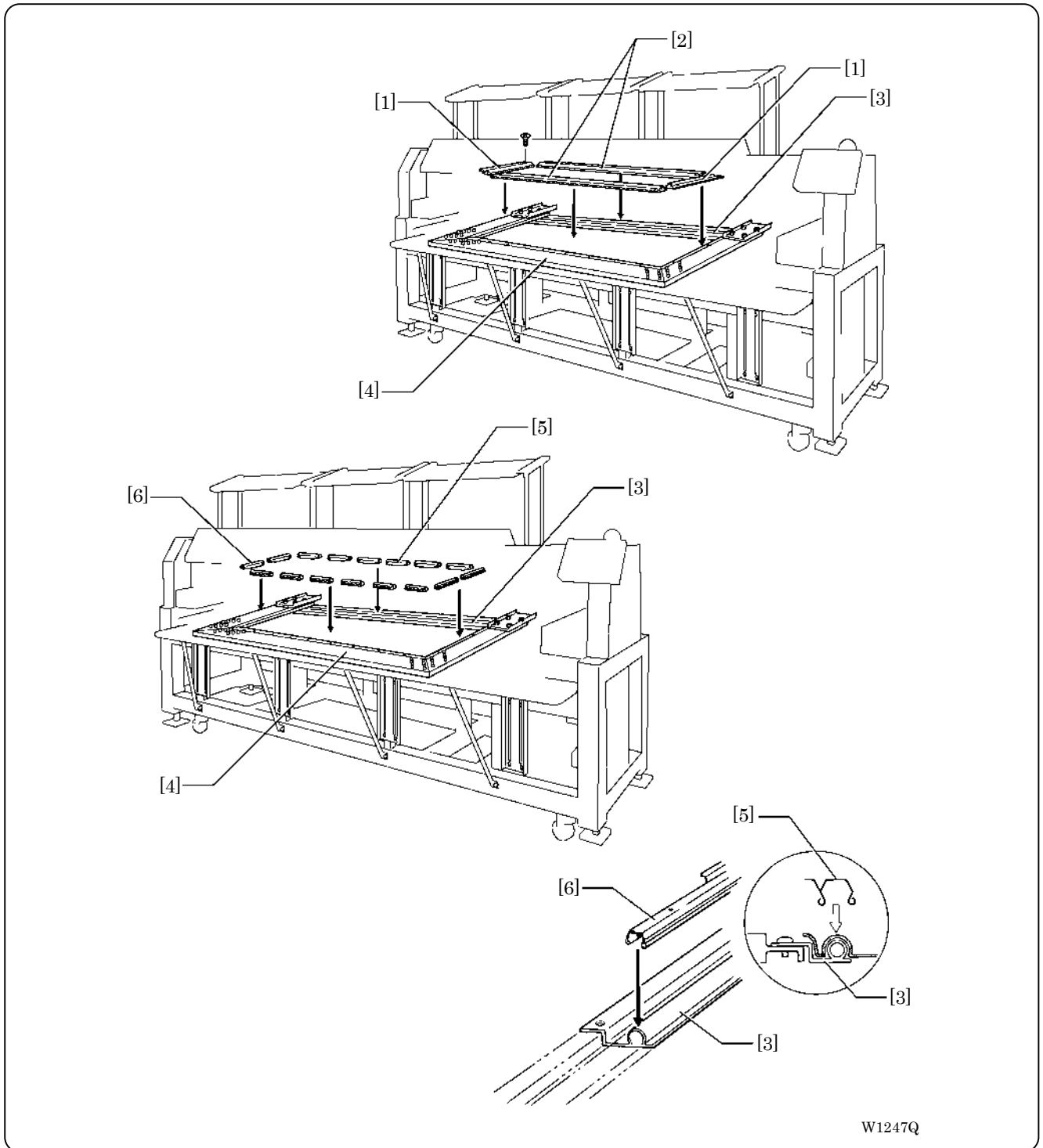
1. Set the table. (Refer to “Mounting of Table” on page 1-9.)
2. Insert the frame connecting plate F [4] into the holder base frame L [1], flat frame C6-360 [2] and holder base frame R [3], using bolts and washers.
 [When using the machine only with the holder base frame (small)]
 Attach the flat frame S connecting plates L [5] and R [6] to the flat frame S6-360 set [7].
 Attach the flat frame S connecting plates L [5] and R [6] to the holder base frames L [1] and R [3], using bolts of 4×12 and washers of middle 4.
3. Remove 4 bolts [9] from the front of X-feed sash [8].
4. Put the frame connecting plates L [10] and R [11] on the X-feed sash [8]. Fix them with bolts and washers.
5. Check that the clearance between the mounted flat frame C6-360 [2] and the table is even when viewed from the machine front.
 If adjustments are needed, loosen bolts of the F table support Front [12] and move it in the direction of the arrow.
6. Tighten each bolt securely after the adjustment is completed.

Attaching the holder base

1. Mount the holder base vertically to the X-axis feed sash [1] and flat frame C6-360 [2] using the thumb bolts [3].



■ Sash frame (optional)

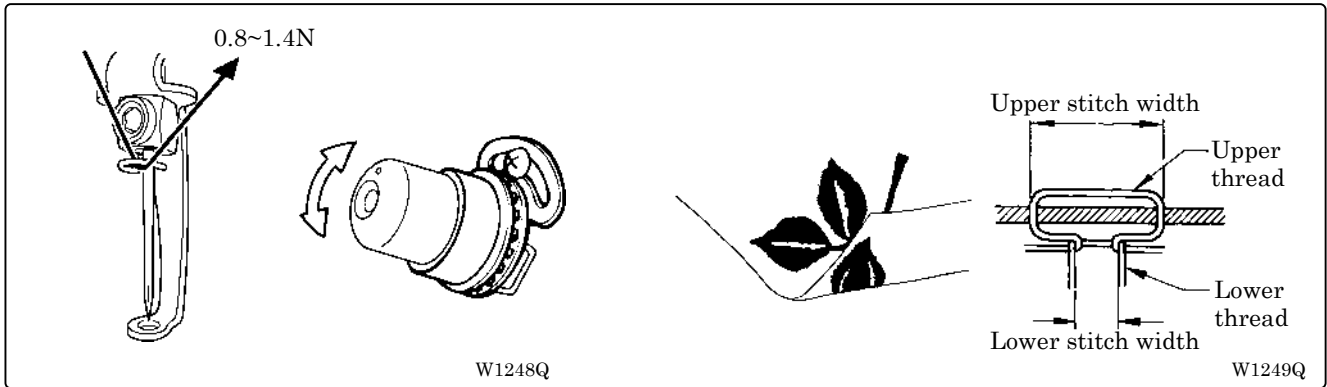


Attaching the sash frame

1. Set the table. (Refer to "3-4 Mounting of Table" (Page 1-9) for details.)
2. Mount two vertical sash frames [1] on the holder base frames L and R, and two horizontal sash frames [2] on the X-axis feed sash [3] and the holder base frame C6-360 [4], using the screws.
3. Set the material. Then set sash clips 290 [5] horizontally and set sash clips 220 [6] vertically.
 Six head models: Sash clips 290 12 units, sash clips 220 10 units
 Four head models: Sash clips 290 10 units, sash clips 220 6 units

4-5 Adjustment of Thread Tension

■ Adjustment of upper thread

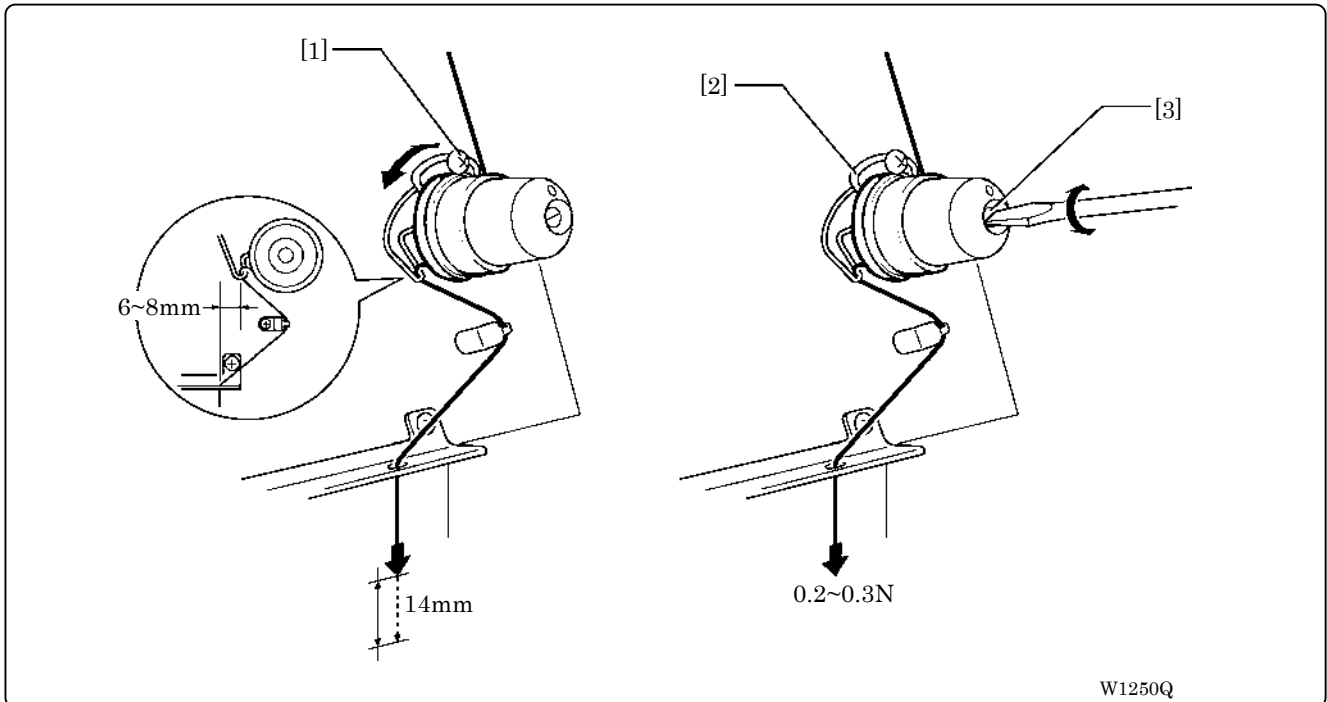


Adjust upper thread tension to 0.8~1.4N when the thread is pulled at the needle bar thread guide.

* Correct adjustment

Turn the upper thread tension dial so that the needle thread can be pulled to the back of the material and that the lower stitch width will be about 1/3 of the upper stitch width.

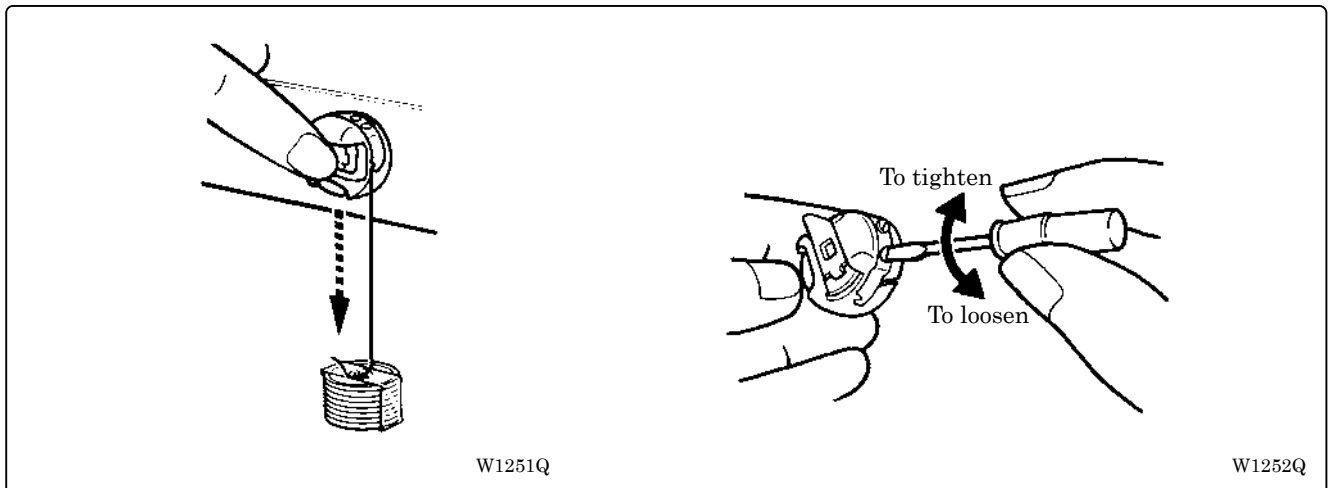
■ Adjustment of tension spring



1. The standard height of the tension spring is the point from where the upper thread comes down by about 14 mm when it is pulled with certain tension which does not pull out the thread.
2. The standard force of the tension spring is 0.2 to 0.3 N at the start of the motion when it is pulled in the direction illustrated.
Adjust it so that the tension spring does not move when the upper thread is pulled out slowly from the presser foot.

3. For adjusting the height, loosen the screw [1] and turn the tension spring bracket [2].
4. For adjusting the tension spring force, insert a driver tip in the groove of the thread tension bar [3] and turn it.

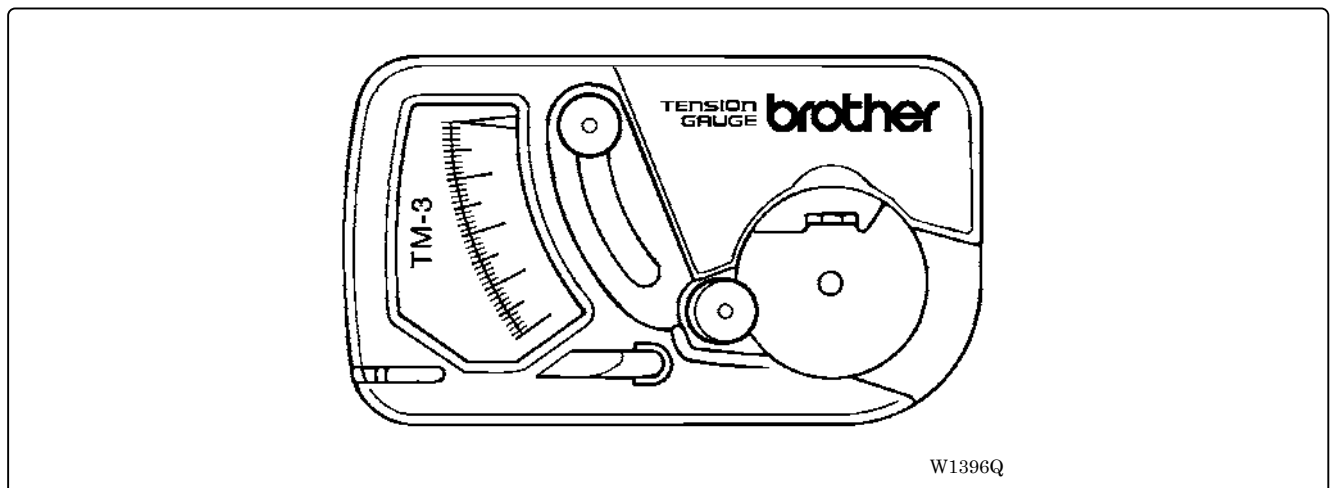
■ Lower thread tension



The standard tension of the lower thread is 0.15 ~ 0.3N.

This tension may vary depending on the used thread. In general, press the bobbin case to a smooth vertical surface and hang the designated number of coins. Turn the thread tension screw so that the lower thread will come out smoothly.

Check that the bobbin is pushed out of the bobbin case by about 0.5 mm. If not, the slip prevention spring of the bobbin case does not work. Adjust the spring in height or replace it with a new one. (Refer to "Replacing Bobbin" on page 1-17.)



We recommend the use of the optional gauge set TM-3 (S59956-001).

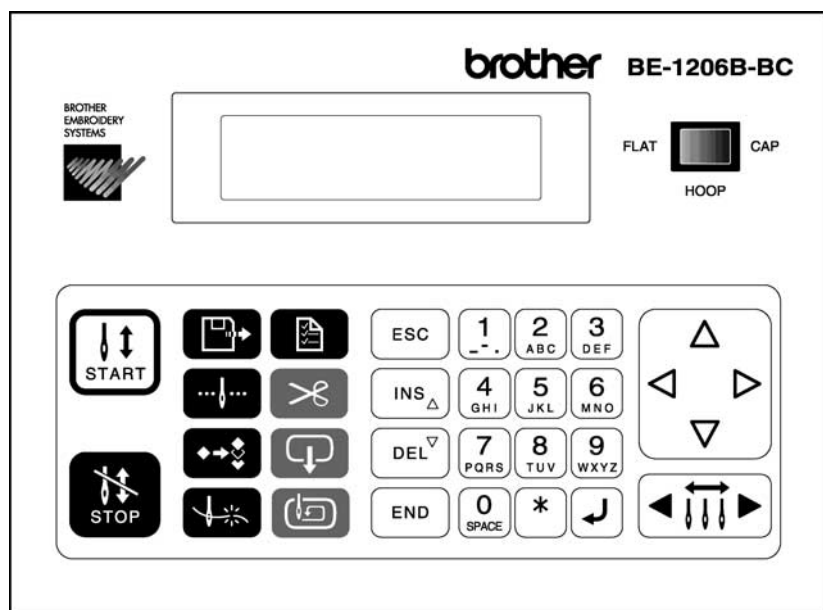
Chapter 2

Embroidering Procedures

After installation of machine start embroidering. This chapter explains about the operation panel on the machine as well as precautions for the actual embroidering process.

Functions of Operation Panel

Operation Panel



W1253Q



Starts embroidering.

Restarts after moving the carriage to embroidering start position by using the jog switch.

Restarts embroidering after a suspension.



Cancels errors during embroidering.

Suspends embroidering.

Sewing without home position detection (i.e. the frame does not move) is available when turning on the power with this key pressed.



Selects sewing data. (→ "Chapter 3 Selection of Data and Embroidering" page 3-1)



Specifies a sequence of colors (sequence of needle changes) in sewing data.

(→ "Setting of Needle Bars" page 5-4)



Edits sewing data. (→ "Chapter 4 Editing of Embroidering Data" page 4-1)



Sets the upper thread breakage sensor. (→ "Thread Breakage Sensor" page 5-6)



Machine motions can be set. (→ "Chapter 5 Setting" page 5-1)



Trims thread during suspension.



Moves the hoop to a preset hoop retract position. When this switch is pressed again, the hoop returns to the previous position.




Checks the embroidering area.

Moves the hoop automatically into the embroidering area when the embroidery position is out of the area.



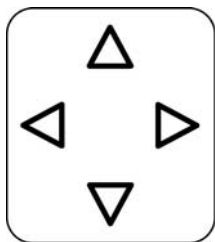
W1254Q

Used for selecting data and setting functions.

Turning on the power with  key pressed will display the memory clear selection screen.



Selects the flat or cap hoop. This selection should be done before turning the power ON to the machine. The setting will not be changed if the selection is done after turning the power OFF.



Moves the hoop.

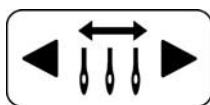
Step-back or forward is available during suspension. (Use ◀ ▶ switches only.)

Changes the speed range during embroidering (Use ▲ ▼ switches only).

Carries out inching of the hoop when the switch is pressed in the inching mode.

Move the cursor for selecting sewing data and an icon.

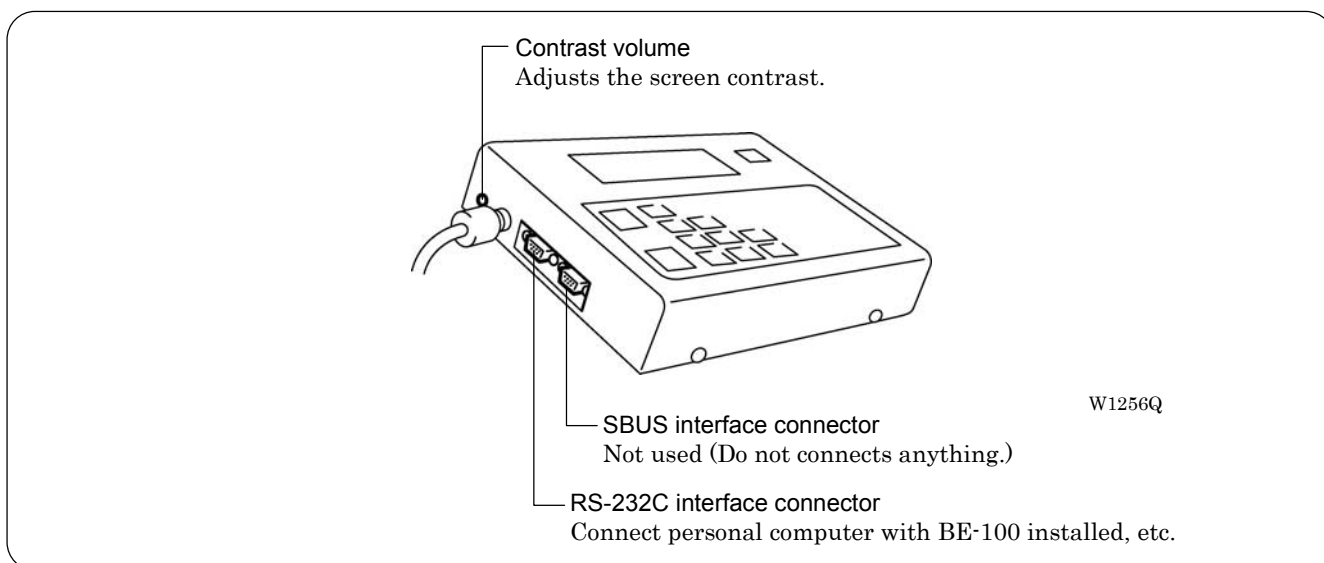
Turning on the power with ▲ key pressed will display the test mode screen.



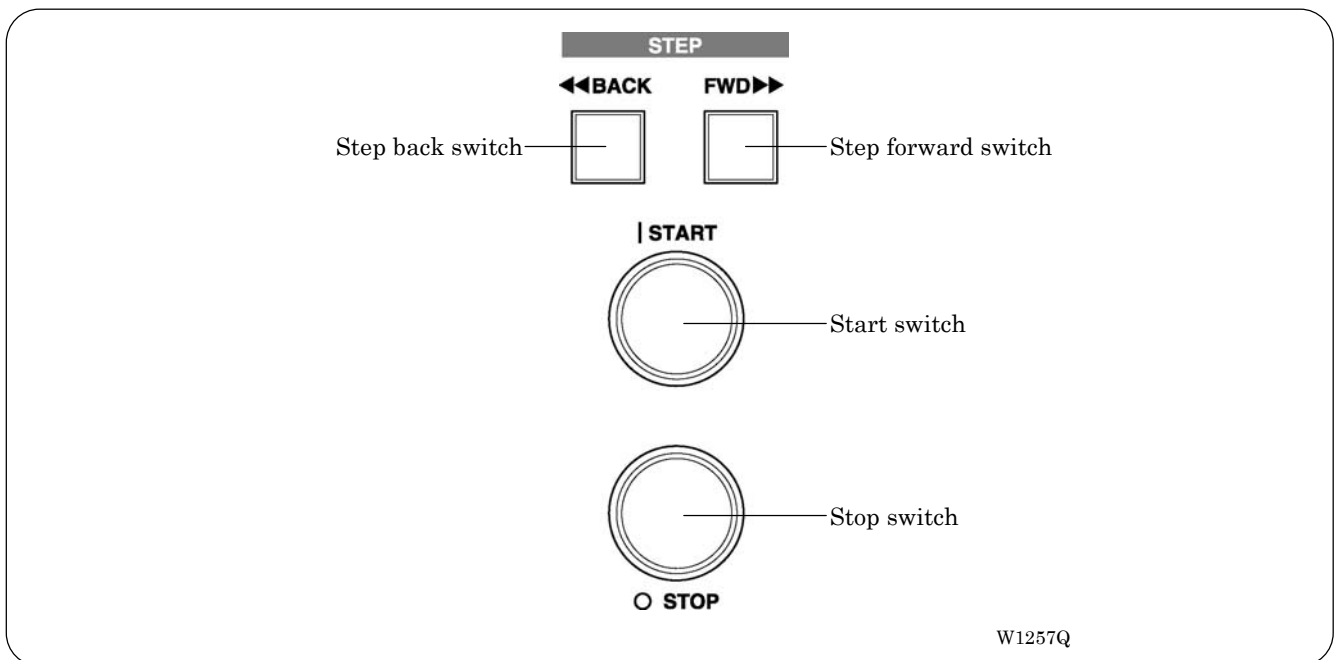
Moves the needle bar. The needle moves by the diameter every time this switch is pressed.

Change to the screen for selecting sewing data.

Operation panel



Switches at Machine Heads



■ Stop switch

Stops embroidering operation. "Release stop SW to operate!" is displayed on the screen as soon as the machine stops.

Refer to "Stopping the machine" (page 6-3) to stop flashing.

In BE-1206B-BC models, this switch is located between the head 2 and 3, and also between the head 5 and 6.

In BE-1204B-BC models, this switch is located between the head 1 and 2, and also between the head 3 and 4.

■ Start switch

Starts embroidering. Holding down this switch executes embroidering at a low speed.

When resuming embroidering after a stop, release stop before pressing this switch. Refer to "Stopping the machine" (page 6-3) for details.

In BE-1206B-BC models, this switch is located between the head 2 and 3, and also between the head 5 and 6.

In BE-1204B-BC models, this switch is located between the head 1 and 2, and also between the head 3 and 4.

■ STEP BACK/FWD switch

When BACK switch is pressed, the machine steps back. When FWD switch is pressed, the machine steps forward. If you keep the switch pressed for a while, the machine will continue stepping even after you let the switch alone.

If any error occurs, it can be reset.

When the sewing is suspended during the area checking, pushing this switch can move the head to the previous or the next vertex of the outlined rectangle pattern.

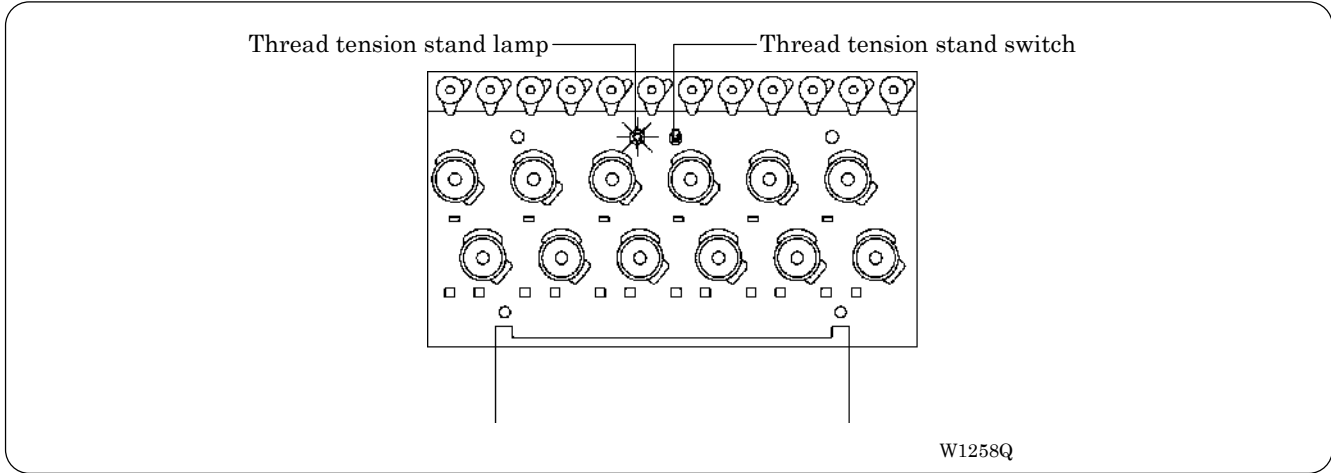
In BE-1206B-BC models, switches are located between the head 1 and 2, and also between the head 5 and 6.

In BE-1204B-BC models, switches are located between the head 1 and 2, and also between the head 3 and 4.

Lamps and switches on the thread tension stand

The thread tension stand has lamps and switches mounted on it.

Switches can set movements of the heads such as to drive, to suspend or mending, and those statuses can be checked by lamps.



■ Thread tension stand lamp

Shows statuses of each head of the machine.

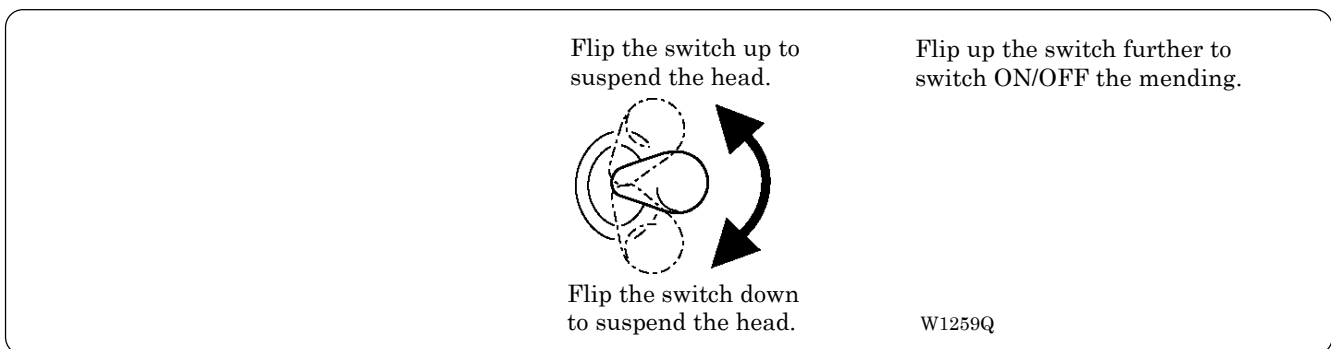
Lamp illumination	Machine head status
Off	The head is suspended
	The head is not suspended but its mending is set to OFF.
	Some other head has an error.
Illuminates green	The head is ready to drive.
Blinks green	The head has an error. Blinking will change into illuminating when the error is cleared.
Blinks red	The head has a thread breakage error. Blinking will change into illuminating when the error is cleared.

■ Thread tension stand switch

Sets drive/suspend of each head and ON/OFF of the mending.

Mending is a function to drive or suspend the head for the specified time period when the machine steps back during embroidering.

- Switching of drive/suspend should be done when the machine is stopped.
- Switching of the mending should be done when the machine is suspended during embroidering.



Flowchart of Preparation for Embroidering

Turn on the machine power. (→ page 2-8).




Retrieve the embroidery data (→ page 2-9).

"Chapter 3 Selection of Data and Embroidering" (→ page 3-1)




Edit the retrieved embroidery data.

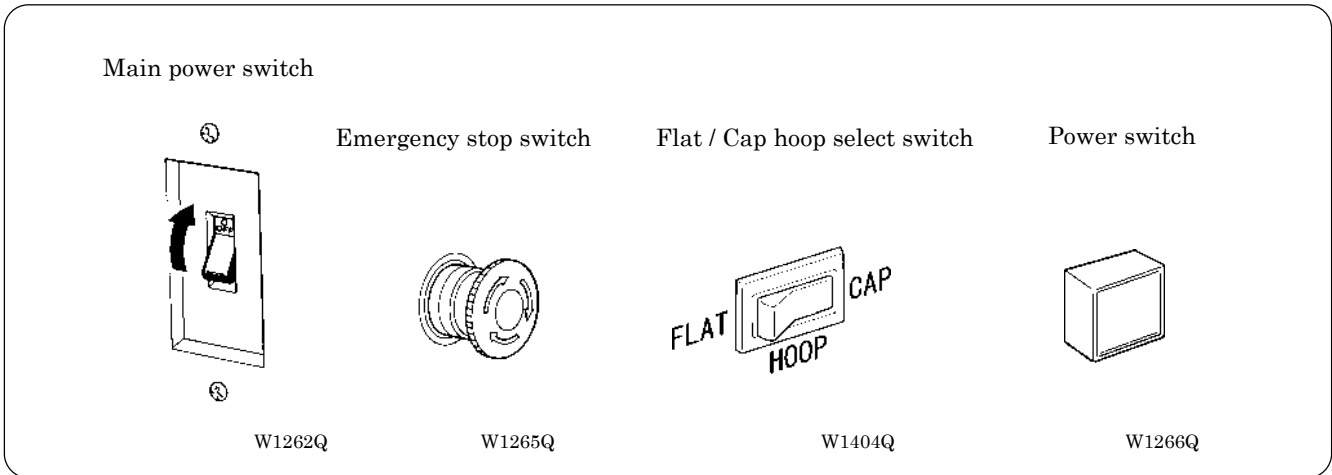
"Chapter 4 Editing of Embroidering Data" (→ page 4-1)

Press  on the operation panel.



Press  on the operation panel.

Turn on the Machine Power



1. Turn on the main power switch.
2. Reset the emergency stop switch.
3. Change the Flat / Cap hoop select switch on the operation panel according to the hoop to be used.
4. Press the power switch.
5. A message is displayed on the LCD as soon as the power is turned ON.

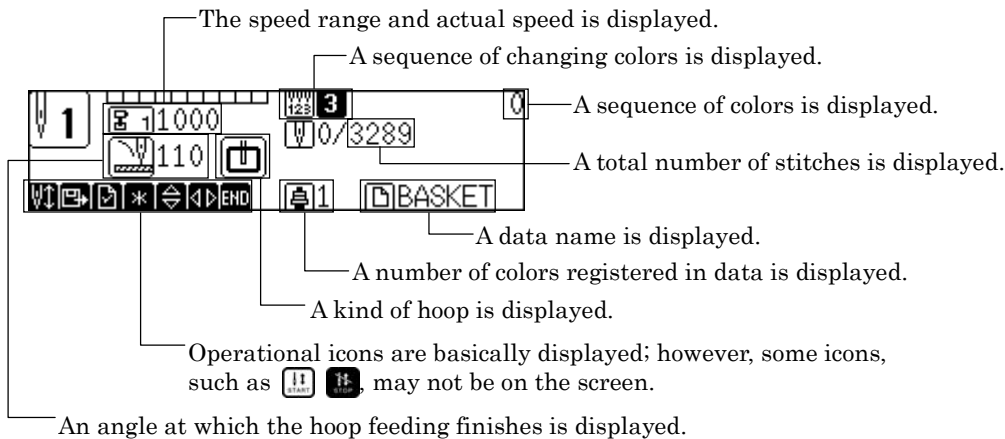


BE-1204B-BC
W1263Q



BE-1206B-BC
W1264Q

6. The alarm sounds three times. The hoop moves back to the zero point and the sewing screen is displayed.



W0406Q







Retrieve the Embroidery Data

The description in this section is based on the method of reading data which is registered in the memory unit of the machine.

Refer to "Selection of Data" (→ Page 3-3) for details.

1. Press  switch.

Data saved in the machine is displayed.

2. Select a screen by pressing   keys, and select required data by pressing ten keys or  
 .

When using ten keys for data selection, input a numerical figure (1 ~ 9) which indicates each data name. Required embroidery data is selected and read.



W0397Q

3. Press  key.

Required embroidery data is selected and read.



W0405Q


Selected embroidery data is read.



W0406Q

Start Embroidering

1. Press  to check the embroidering area.

2. Press  to start embroidering.



W0406Q

Sewing is started and the next screen is displayed.



W0439Q

Chapter 3

Selection of Data and Embroidering


This Chapter describes how to select embroidery data in order to start embroidering.

What Can the Machine Do?


Selection of Embroidery Data

 Registration of data from the floppy disk (→ Page 3-3)

 Reading of data from the memory (→ Page 3-7)

 Registration of data created by BE-100 (→ Page 3-8)

(These icons are displayed in the lower right of the screen.)

 Modification of data name (→ Page 3-13)

Deletion of embroidery data (→ Page 3-9)

Embroidering Operation

Embroidering start (→ Page 3-17)

Embroidering feedhold (→ Page 3-18)

Embroidering cancel (→ Page 3-18)

Step forward/step back (→ Page 3-19)



Step forward (back) stitch by stitch



Step forward (back) by every 10 stitches



Step forward (back) by every 100 stitches



Step forward (back) until a next color change



Step forward (back) to the embroidering start point of a next pattern

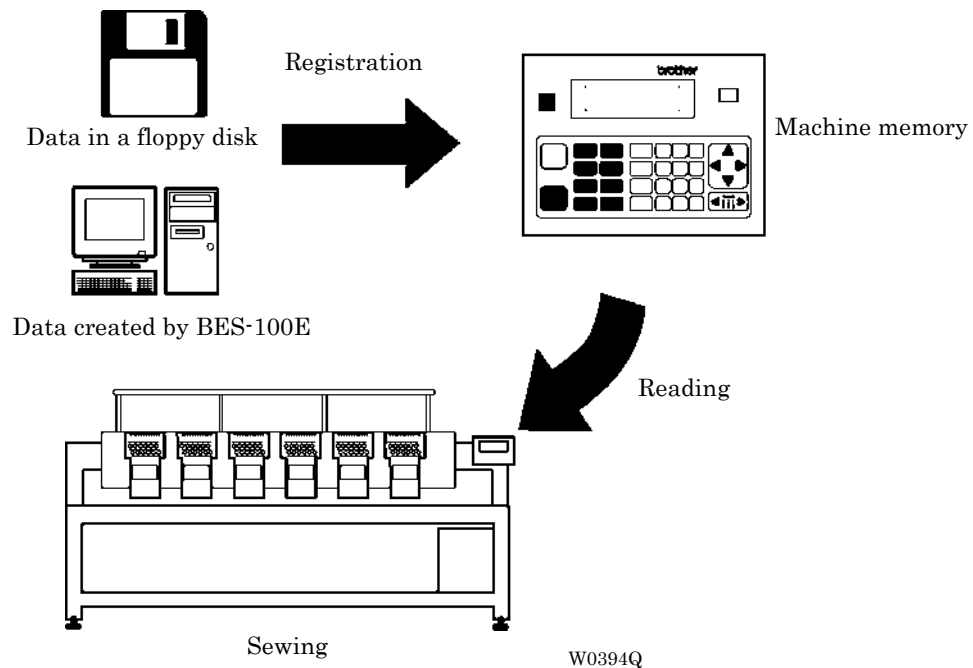
B↔F Designate stitch nos
(/ *****)

Step forward (back) by a specified number of stitches
(→ Page 3-19)

Selection of Data

Select data in order to start sewing.

- Data to use for actual embroidering is selected from data registered in the machine memory. A maximum of 45 kinds or 480,000 stitches of embroidery data can be registered in the machine memory; however, depending on the combination of embroidery data, the number of pieces or total stitches available may become less.
- When using data in a floppy disk or in BES-100E, register it in the machine memory once before selection. If there is no space in the machine memory, delete unnecessary data to make a space.



Registration of Embroidery Data from Floppy Disk

Register embroidery data from a floppy disk into the machine memory.

- Types of data to be registered are as shown below.

- DOS-formatted data

Data format	Extension	Icon
ECS	Data with a name of [xxxx.ECS]	
Tajima	Data with a name of [xxxx.DST]	
Barudan	Data with a name of [xxxx.DSB]	
Zanks (ZSK)	Data with a name of [xxxx.DSZ]	
Data received from BE-100	Data with a name of [xxxx.STH]	

(These icons are displayed in the lower right of the screen.)

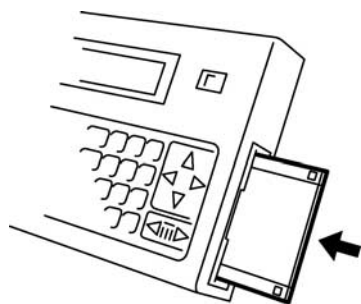
- Other data

Data format	Icon
Barudan FDR	
Barudan FMC	
Zanks ZSK	

(These icons are displayed in the lower right of the screen.)

Loading and Loading of Floppy Disk

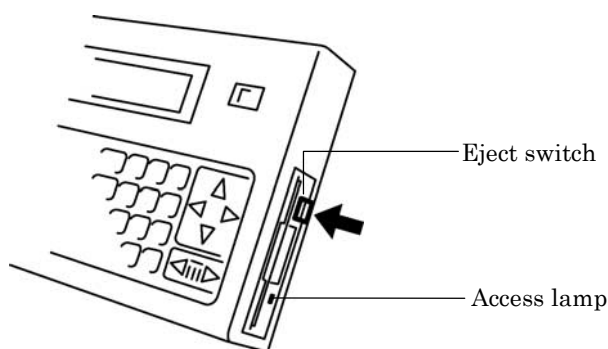
1. When loading a floppy disk, set it straight with the labeled surface facing this side.



W0395Q

2. When unloading a floppy disk, press the eject switch.
3. When it comes out, pull it straight.

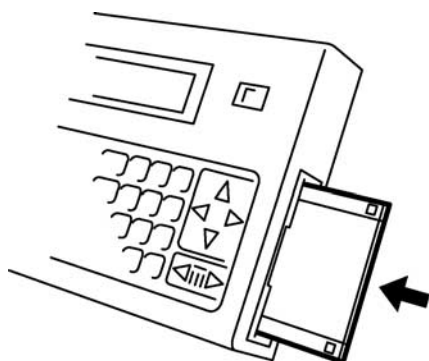
When the access lamp is ON, never press the eject switch. Otherwise, embroidery data in the floppy disk may be destroyed.




W0396Q


Registration of Sewing Data into Machine Memory


1. Load a floppy disk with sewing data.




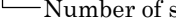
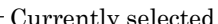


W0395Q

2. Press .

3. Select a screen for data registration by pressing  .








 Currently displayed screen
 No. of screens to be selected
 Data in machine memory
 Number of stitches in selected embroidery data
 Currently selected embroidery data

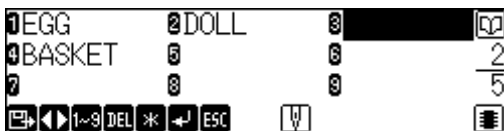
W0397Q



When there is no data


W0398Q

4. Select an area for registration, using ten keys or    , then press .








W0399Q

A space available is automatically selected.

Pressing  automatically locates the first space in the memory.

5. Data in the floppy disk is displayed. Press   to select a screen.



 Currently displayed screen
 No. of screens to be selected
 Data in floppy disk
 Icon indicating a kind of selected data


W0400Q

Pressing  displays a pattern name.



Name of a selected embroidery pattern
(It may be the same as a file name.)


W0401Q

6. Select data to register by pressing ten keys or ◀▶△▽ then press .

Data is newly registered in the machine memory.

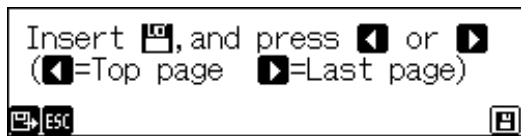


W0402Q

Select embroidery data and press . The selected data is automatically registered in the memory and the machine enters a standby status.

If registration is done without loading a floppy disk, the following screen is displayed after the step 4 is finished.

Load a floppy disk for data registration.



W0588Q



Reading from Memory

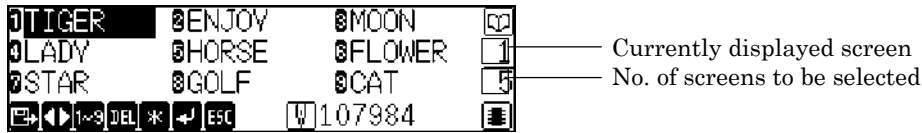
Data to use for sewing can be selected from the machine memory.

- A maximum 45 kinds or 480,000 stitches of embroidery data can be registered in the memory.





1. Press .

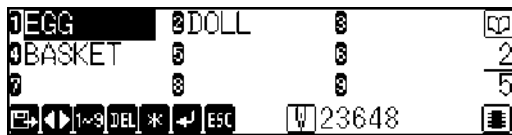
Embroidery data registered in the memory is displayed.

2. Select a screen by pressing  .



W0397Q

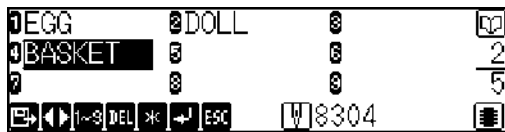
3. Select embroidery data to read by pressing ten keys or    .



W0404Q

4. Press .

Embroidery data is selected and read.

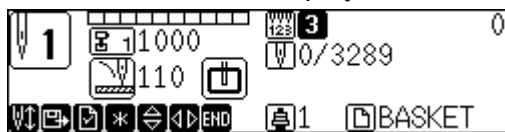


W0405Q

When a free space is specified in the memory, a screen for reading data from the floppy disk is displayed.

Refer to "Registration of Sewing Data into Machine Memory" (steps 5 and afterward on Page 3-5).

5. The initial screen is displayed.

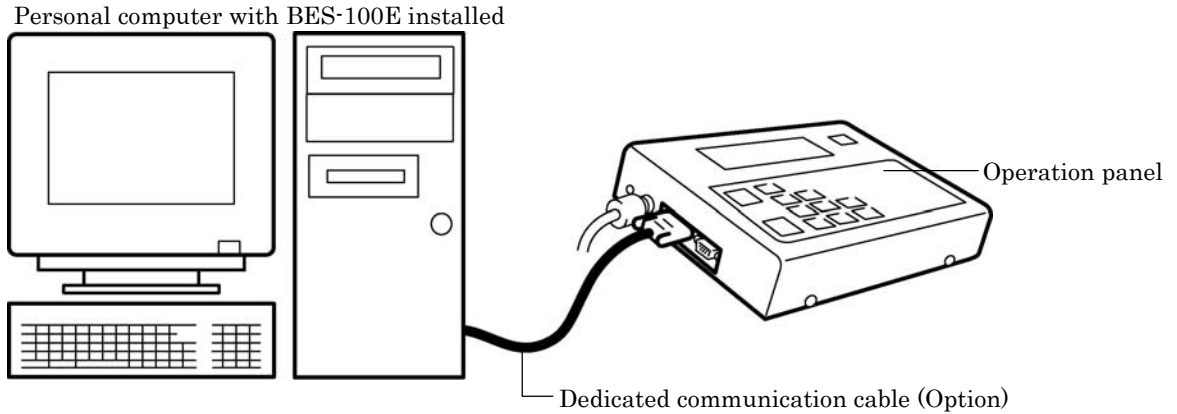


W0406Q



Registration of Embroidery Data from BES-100E

Connect the operation panel and the personal computer with BES-100E installed in order to register the embroidery data into the machine memory.

1. Connect the personal computer with BES-100E installed and the operation panel by means of the RS-232C cable.





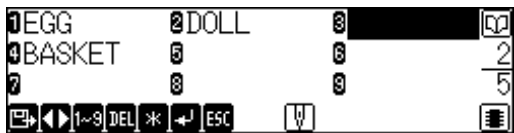
W0407Q

2. Press the .
3. Select the data registration screen by pressing the .




W0397Q

4. Select an area for data registration by pressing ten keys or , and then press the  key.



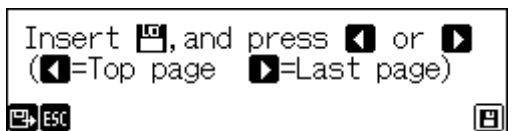
W0399Q

5. Press the .



When a floppy disk is set

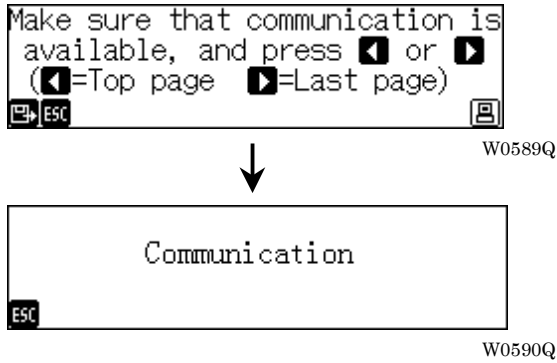
W0400Q



When no floppy disk is set

W0588Q

6. Prepare the BES-100E, and then press the ◀ ▶.



7. The BES-100E embroidery data is displayed. Press the ◀ ▶ and select a required screen.



8. Select embroidery data to register by pressing ten keys or ◀ ▶△▽, and then press the ⏏ key. The data is registered in the machine memory.

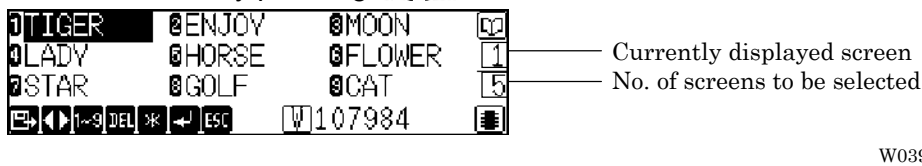


Deletion of Embroidery Data from Machine Memory

Embroidery data can be deleted from the machine memory.


1. Press .
- A list of registered data is displayed.

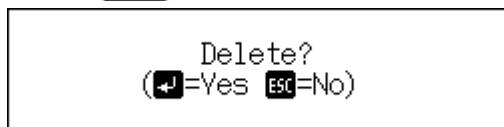
2. Select a screen by pressing ◀ ▶.




3. Select embroidery data to delete by pressing ten keys or ◀ ▶△▽.

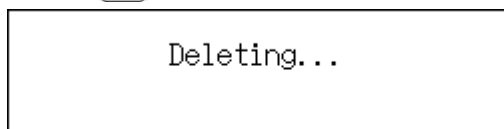


4. When  is pressed, the confirmation message is displayed.

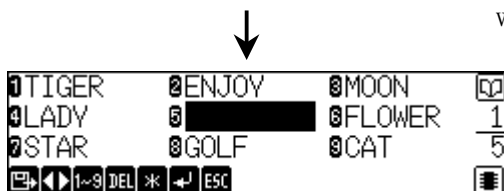


W0591Q

5. When  key is pressed, selected embroidery data is deleted from the memory.




W0592



W0413

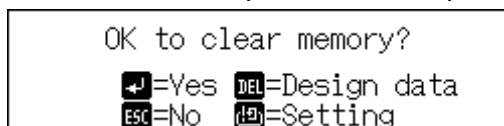
When deleting embroidery data in the machine memory entirely:

All embroidery data can be deleted from the machine memory.




1. Turn ON the power to the machine while pressing .

The confirmation message is displayed.

2. Confirm the description to delete, press switch.



W0770Q

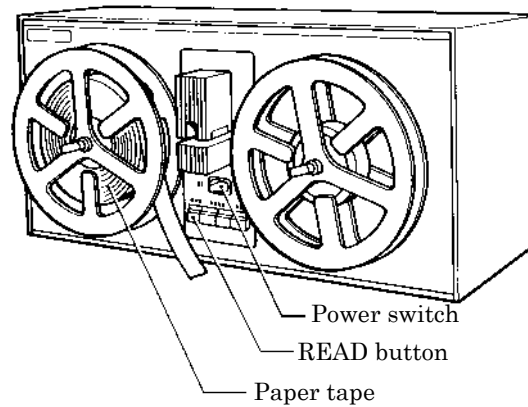
	Delete all embroidery data.
	Reset settings.
	Delete all embroidery data and reset settings.

Tape Reader Input Setting



The followings describe how to input data from the tape reader.

- Tape reader is required in the registration of tape data.
- Confirm that the tape reader is connected properly to the operation panel before the operation.
- Compatible data formats for the reading are the followings:
 - TAJIMA
 - BARUDAN
 - ZSK
- The data transfer rates of the tape reader and the embroidery machine have to be synchronized each other before sewing.
- The stored data in the memory is titled as “Tape Date”.

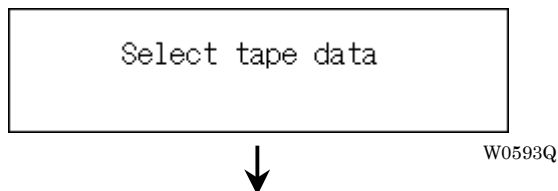
1. Turn on the power switch of the tape reader.
2. Set the tape to read after the READ button is illuminated.



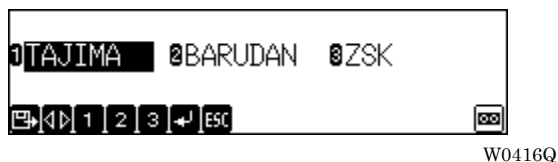
W0414Q

3. Set device to read from to  memory.
Refer to “Automatic input setting” (→ page 5-34) for the setting procedure.
4. Press  four times.

The tape data selection screen is shown.



W0593Q



W0416Q

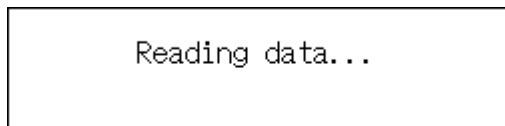
5. Choose the type of the tape data with ◀ ▶ keys.



W0417Q

6. Press .

The data will be read now.



W0594Q



Modification of Embroidery Data Name

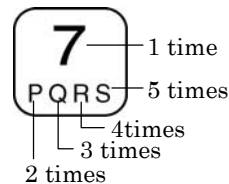
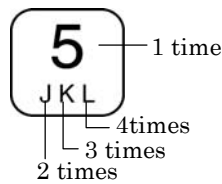
Name of embroidery data registered in the machine memory can be modified.

This example shows how to modify the data name "FLOWER" to "TEST003".

- A maximum number of characters to use for an embroidery data name is 8.
- The following kinds of characters can be used.
- It is impossible to input a ". " or space.

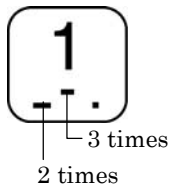
Alphabetical characters (A~Z) Numerical characters (0~9)


Use  through . An input character changes depending on the number of times each is pressed as shown below.



_ (underbar), - (hyphen)

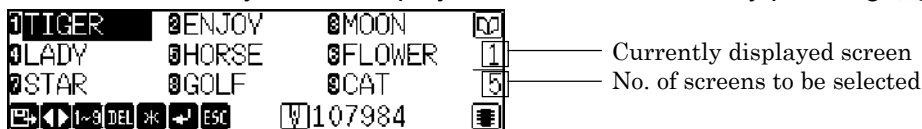
Use .







1. Press .

Embroidery data saved in the memory is displayed.

2. A list of embroidery data is displayed. Select a screen by pressing  .



W0397Q

3. Select embroidery data to modify the name by pressing ten keys or    .

4. Press *****.



W0422Q

When selected data has a pattern name, the name is displayed. Press the ***** key once again.



W0401Q

5. Input a new data name by pressing ten keys.

When modifying embroidery data names entirely

6. Pressing **DEL** deletes currently reversed characters.



W0423Q

7. Press **8** twice.

"T" is input.



W0424Q

8. Press **3** three times.

"E" is input.



W0425Q

9. Press **7** five times.

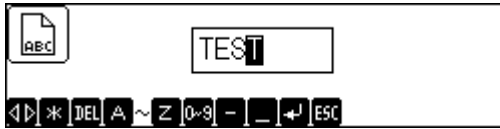
"S" is input.



W0426Q

10. Press **8** TUV twice.

"T" is input.



W0427Q

11. Press **0** SPACE once.

"0" is input.



W0428Q

12. Press **▷**.

When inputting the same character continuously, press the **▷** to move the cursor to the right.



W0429Q

13. Press **0** SPACE once.

"0" is input.



W0430Q

14. Press **3** DEF once.

"3" is input.



W0431Q

15. After inputting a data name, press **↵**.

A data name is modified by the above procedures.



W0432Q

When modifying only one character:

[FLNWER] can be modified to [FLOWER] in the following procedures.

6. Press ◀.



W0433Q

7. Press ▶ twice and display "N" reversely.



W0434Q

8. Press DEL.

"N" is deleted.



W0435Q

9. Press 6 four times.

"O" is input.



W0436Q

10. Press ↵.

A data name is modified by the above procedures.



W0437Q

Sewing Operation

Before Starting Sewing

Select a hoop to set on the machine.




- The following operation should be done before turning the power ON to the machine. Otherwise, it will damage the hoop.
1. Select either the flat hoop or cap hoop, using FLAT or CAP switch on the operation panel.
When a flat or tabular hoop, or a sash frame is set on the machine, select [FLAT].
When a cap hoop is set, select [CAP].

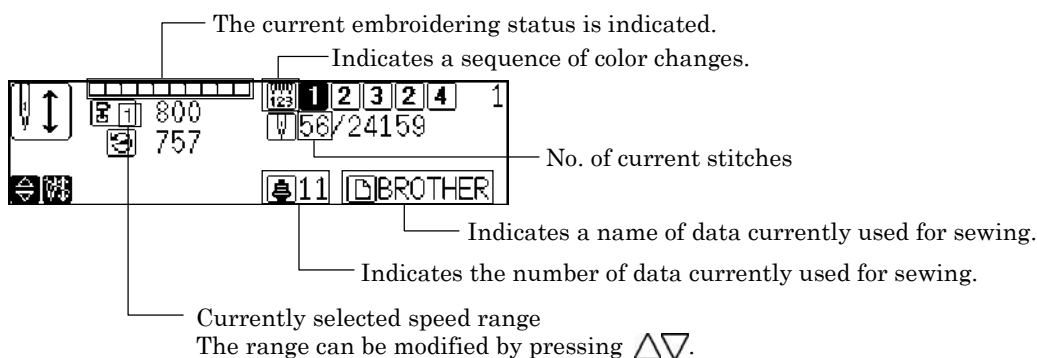


W0438Q

2. Specify an embroidery hoop set on the machine, referring to "Embroidery Hoop" (→ Page 5-9).

Starting Sewing Operation

- For details of specifying a sewing start position, refer to "Registration of Sewing Start Position" (→ Page 5-18).
 - When  is pressed while the message "Area over" is indicated on the screen, a dialog box is displayed for confirming whether or not to start sewing forcibly. Pressing  starts sewing; however, depending on the start position, an interference with the frame may occur. Exercise added care when doing so.
1. Check that sewing data has been selected, then press .
Sewing is started.



W0439Q

Feedhold and Cancellation of Sewing

Feedhold


1. Press .


Sewing is interrupted.



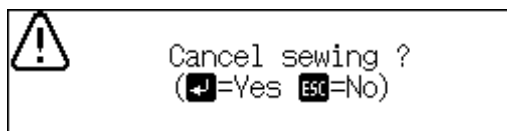
W0440Q

Cancellation

1. Press  while sewing is interrupted.

When repetition of patterns is set, a pattern which is currently being sewn is canceled. When canceling all patterns, press  once again.

2. A message for confirmation is displayed. When canceling sewing, press .





W0595Q

Step Forward and Step-Back






Stitches can be advanced (step forward) or retracted (step-back) without sewing.

Step Forward/Step-Back Mode

1. Press  when selecting either mode before starting sewing and press  when selecting a mode during sewing.


Setting Amount or Timing of Step Forward/Step-Back

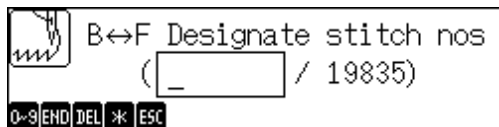
A step forward/step-back amount or timing can be selected as described below.

	For stepping forward (back) stitch by stitch
	For stepping forward (back) by 10 stitches
	For stepping forward (back) by 100 stitches
	For stepping forward (back) up to the next (previous) color change
	For stepping forward up to the sewing start point of a next pattern if repetition of patterns is set.
B↔F Designate stitch nos (<input type="text"/> / ****)	Specify the number of stitches for stepping forward (back).


1. Select a required item as described above by pressing .

When the number of stitches is specified, the needle steps forward (back) to an input position:

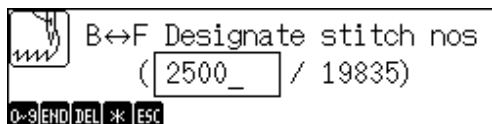
1. Press the  five times.
2. Input the number of stitches to move by pressing ten keys.



W0596Q

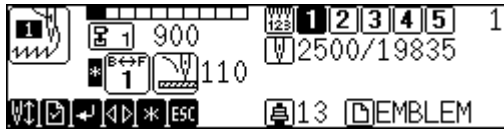
3. Press the .

The needle steps forward (back) as specified.





W0597Q

- The embroidery head advances (retracts) by a specified number of stitches.




W0598Q

For Step Forward (Back)

- Press  .
- Stitches steps forward (back) by a specified amount.

Resuming Sewing

- Press .
- Sewing is started.

Writing the embroidering data

The embroidering data stored in the memory of the machine is written to the floppy disk.

- The format of the data to be written is brother ESC or TAJIMA TFD.





1. Press the  button.

The embroidering data stored in the memory is displayed.

2. The list of the embroidering data is displayed. Select the screen by pressing  .





W0476Q

3. Select the embroidering data to be written with numeric keys or    .



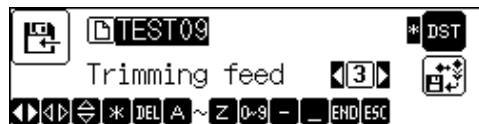
W0480Q

4. Press the  button.

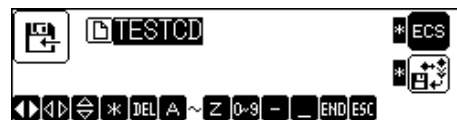
5. Designate the thread trimming feed number with  .

It cannot be designated when the ECS data format is selected.

Use numeric keys,  , or the  button to change the file name.









In any data format other than the ECS format
W0599Q



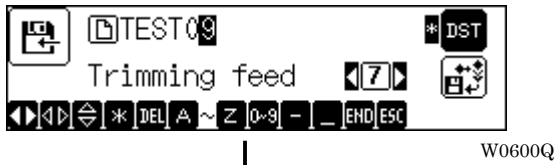
In the ECS data format

W0448Q

6. Highlight the icon of the data format with   and designate the format of the data to be written with .
7. Highlight the edit value validating or invalidating icon with   and designate validating or invalidating of the edit value with .
8. Set the formatted floppy disk.


9. Press the **END** button.

The selected embroidering data is stored on the floppy disk.



Chapter 4
























Editing of Embroidering Data

Pressing  on the operation panel after reading embroidering data displays the embroidering data editing screen. Simple operation by using embroidering data is available on this screen.

What Can the Machine Do?

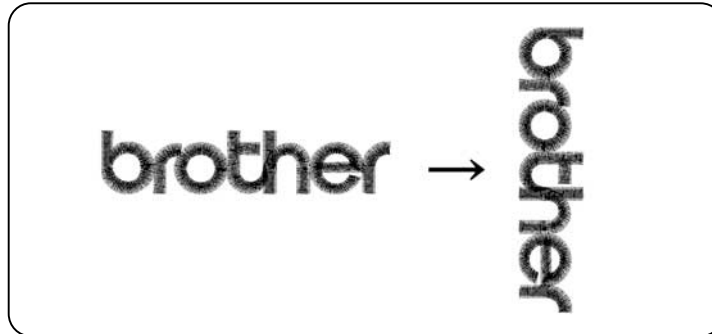
Editing

- Enlargement/reduction is executed ahead of rotation. When an embroidery pattern is so set to be rotated by 90° and then enlarged by 2 times in the X-axis direction, the X-axis enlargement is executed first and rotation by 90° is executed afterwards. Therefore, a pattern is enlarged by 2 times at the sewing point.

		Rotation of embroidery pattern (→ Page 4-3)
		Enlargement/reduction of embroidery pattern in the X-axis direction (→ Page 4-4)
		Enlargement/reduction of embroidery pattern in the Y-axis direction (→ Page 4-4)
		Mirror pattern (→ Page 4-6)
		Right/left mirror pattern
		Up/down mirror pattern
		Zero point symmetric mirror pattern
		No. of repetitions in the horizontal direction (lines) (→ Page 4-8)
		No. of repetitions in the vertical direction (rows) (→ Page 4-8)
		Distance in the horizontal direction between two outer hoop centers (→ Page 4-8)
		Distance in the vertical direction between two outer hoop centers (→ Page 4-8)
		Direction of repetitions (→ Page 4-8)
		Horizontal direction from upper left to lower right
		Vertical direction from upper right to lower left
		Horizontal direction from lower right to upper left
		Vertical direction from lower left to upper right
		Horizontal direction from upper right to lower left
		Vertical direction from upper left to lower right
		Horizontal direction from lower left to upper right
		Vertical direction from lower right to upper left
		0 stitch deletion (→ Page 4-10) Thread trimming feed number (→ Page 4-10) Swing width correction (→ Page 4-11)

Rotation


A pattern can be rotated.

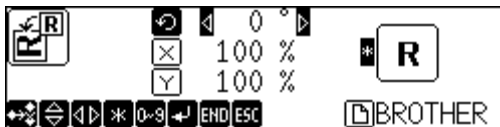


W0558Q


- A maximum range of rotation is 1 ~ 359 degrees.
- The rotating direction is counterclockwise.
- Rotating angle can be set in either of the following.

By using ◀ ▶	Angle can be specified in increments of 90°. Setting of 90°, 180° or 270° is available.
By using ten keys	Angle can be specified in increments of one degree.

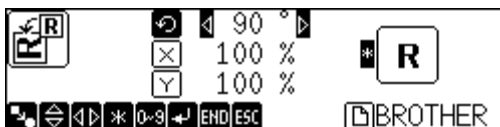
1. Read sewing data.
2. Press .
3. Press ◀ ▶ to select an angle or use ten keys to specify an angle.



W0451Q

4. Press .

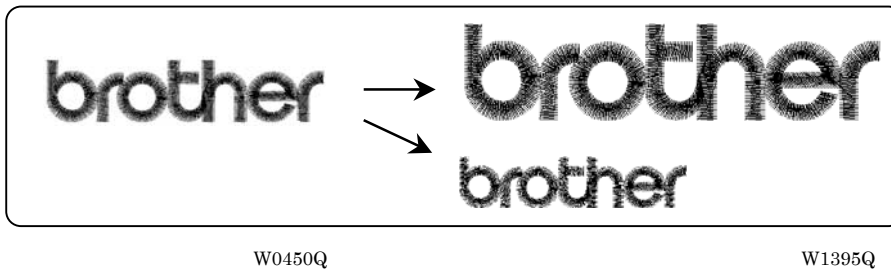
The initial screen is displayed again.



W0452Q

Enlargement and Reduction

A pattern can be enlarged or reduced.



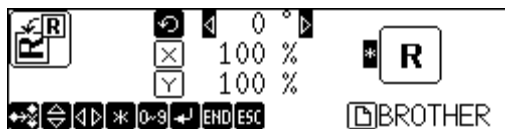
- The enlargement and reduction ratio is 50 ~ 200%.
- The number of stitches does not change even by enlargement or reduction of a pattern. However, stitches may become too rough or close if enlargement or reduction is excessive.
- There are the following two types of enlargement/reduction.
 - Enlargement/reduction at the same ratio in both the X and Y directions
 - Enlargement/reduction at different ratios in the X and Y directions

1. Read sewing data.
2. Press

Enlargement/reduction at the same ratio in the X/Y directions

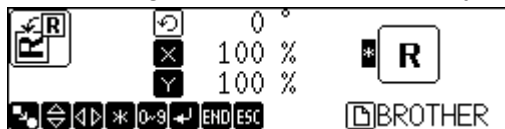
3. Press .

are reversed in black.



W0451Q

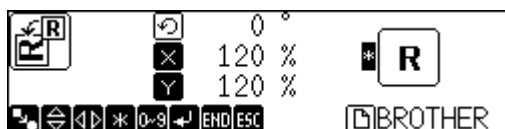
4. Input enlargement/reduction ratio by pressing ten keys.



W0453Q

5. Press .

The initial screen is displayed again.

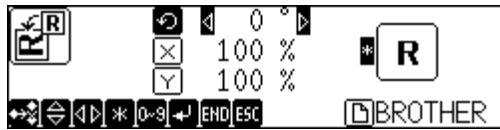


W0454Q

Enlargement/reduction at different ratios in the X/Y directions

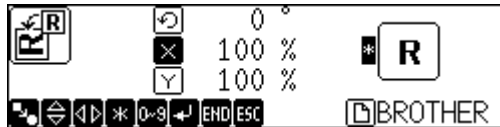
3. Press ∇ twice.

\boxtimes is reversed in black.



W0451Q

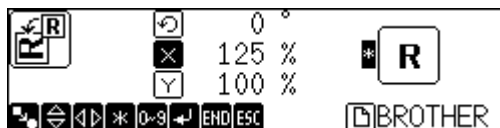
4. Input enlargement/reduction ratio in the X direction by pressing ten keys.



W0455Q

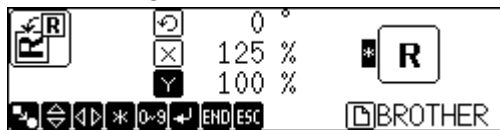
5. Press ∇ .

\boxtimes is reversed in black.



W0456Q

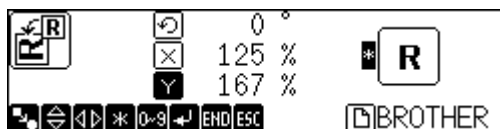
6. Input enlargement/reduction ratio in the Y direction by pressing ten keys.



W0457Q

7. Press $\boxed{\text{END}}$.

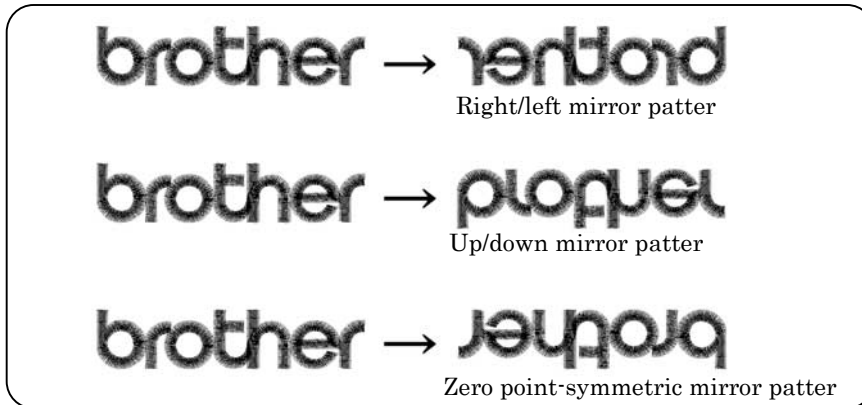
The initial screen is displayed again.



W0458Q

Mirror

A pattern can be reversed as if it is reflected in the mirror.



W0560Q

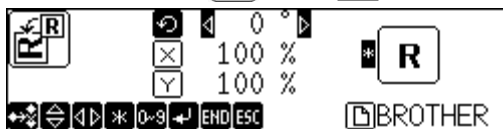
- Up/down mirror pattern → Right/left mirror pattern → Zero point-symmetric mirror pattern.

	Right/left mirror pattern	The pattern is reversed in the right/left direction on the basis of the embroidering start point.
	Up/down mirror pattern	The pattern is reversed in the up/down direction on the basis of the embroidering start point.
	Zero point-symmetric mirror pattern	The pattern is reversed on the basis of the embroidering start point.

1. Sewing data is read.
2. Press

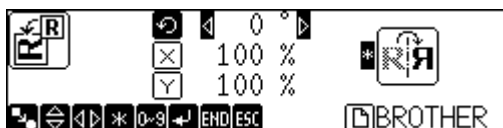
Right/Left Mirror Pattern

3. Keep pressing until is displayed.



W0451Q

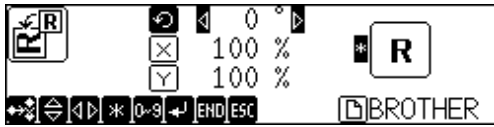
4. Press .
The initial screen is displayed again.



W0461Q

Up/Down Mirror Pattern

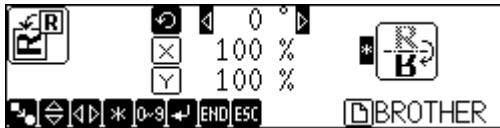
3. Keep pressing ***** until  is displayed.



W0451Q

4. Press **END**.

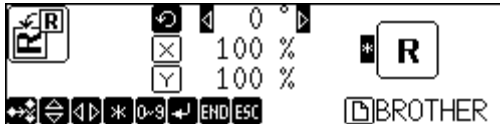
The initial screen is displayed again.



W0462Q

Zero Point-Symmetric Mirror Pattern

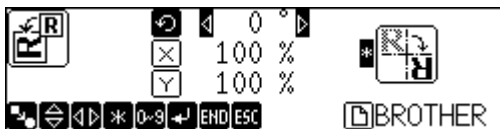
3. Keep pressing ***** until  is displayed.



W0451Q

4. Press **END**.

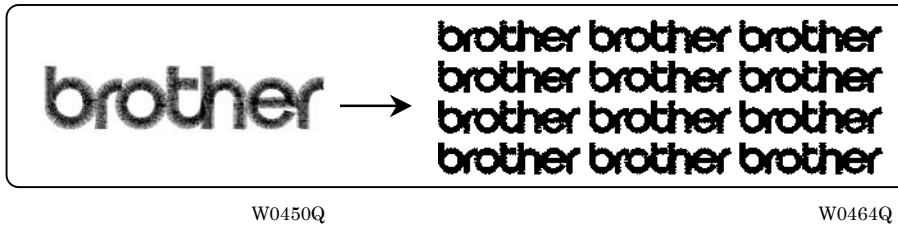
The initial screen is displayed again.



W0463Q

Repetition

A pattern is repeatedly copied as many times as specified.



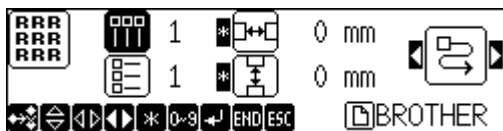
- The number of repetitions is 1 ~ 99 in both the vertical (row) and horizontal (line) directions.
- There are the following eight directions of repetitions.

	Horizontal direction from upper left to lower right
	Vertical direction from upper right to lower left
	Horizontal direction from lower right to upper left
	Vertical direction from lower left to upper right
	Horizontal direction from upper right to lower left
	Vertical direction from upper left to lower right
	Horizontal direction from lower left to upper right
	Vertical direction from lower right to upper left

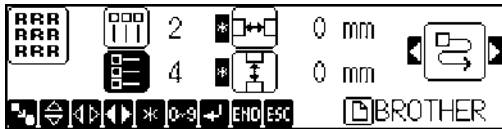
- There are the following two types of intervals between repetitions.

	By setting a distance between the outer hoops of each pattern
	By setting a distance between the centers of each pattern

1. Read sewing data.
2. Press twice.
3. Input the number of repetitions in the vertical and horizontal directions, by pressing ten keys.
The vertical and horizontal directions are changed over by pressing $\Delta \nabla$.





W0465Q

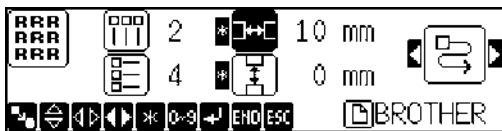
4. Press .

W0466Q

5. Input intervals between repetitions by pressing ten keys.

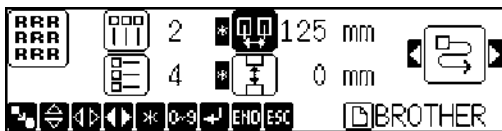
The vertical and horizontal directions are changed over by pressing .

Press  for setting a distance between the centers of each pattern.



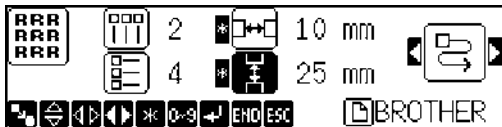
For setting a distance between the outer hoops of each pattern

W0467Q




For setting a distance between the centers of each pattern

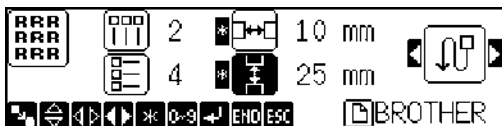
W0468Q

6. Select the direction of repetitions by pressing  .

W0469Q

7. Press .

The initial screen is displayed again.




W0470Q

Other Editing

Setting of other functions related to editing is available.

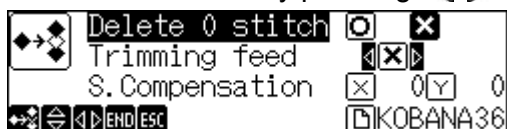
The following types of setting is available.

0 stitch deletion	For deleting stitches at the same point without stepping forward or back. This function is previously set to <input type="checkbox"/> (for deleting 0stitch) upon shipment. <input type="checkbox"/> For deleting 0 stitch <input checked="" type="checkbox"/> For not deleting 0 stitch
Thread trimming feed number	For setting the number of feeds for thread trimming This function is previously set to <input checked="" type="checkbox"/> (ECS data) or <input type="checkbox"/> (Except ECS data) upon shipment. <input type="1"/> ~ <input type="8"/> For thread trimming at the number of feeds indicated on the icon <input checked="" type="checkbox"/> For not thread trimming by feeding
Swing width correction	For setting the needle swing width correction amount The correction amount can be set in increments of 0.1mm. The setting range is -0.5 ~ 2.0mm in both the X and Y directions. (The setting range is displayed as "-5 ~ 20" on the screen.) This function is previously set to 0(no swing width correction) upon shipment.

1. Read sewing data.
2. Press  three times.



0 Stitch Deletion

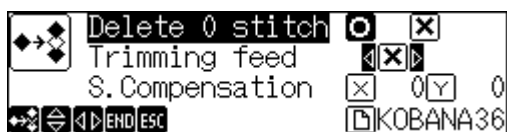
3. Select this function by pressing  .



W0601Q

4. Press  after setting is finished.

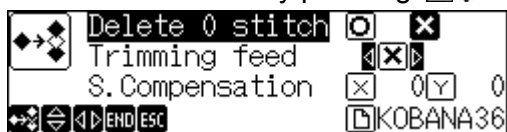
Press   when setting continuously.



W0602Q

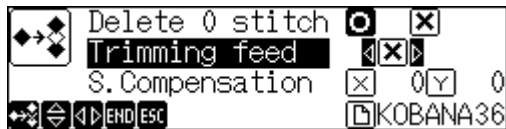
Thread Trimming Feed Number

3. Select this function by pressing  .



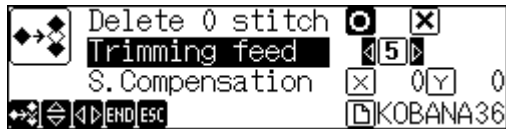
W0601Q

4. Select the number of feeds by pressing ◀ ▶.



W0603Q

5. Press **END** after setting is finished.

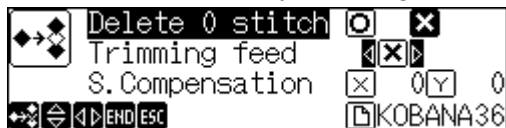


W0604Q

Swing Width Correction

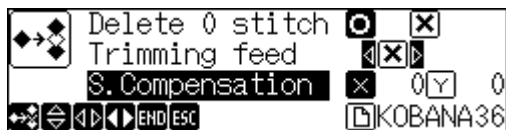
Correction values within -5 ~ 20 can be input. However, excessively large values may result in distortion of a pattern.

3. Select this function by pressing ▲ ▼.



W0601Q

4. Select a correction amount in the X direction by pressing ◀ ▶.



W0605Q

5. Reverse **Y** by pressing ▶



W0606Q

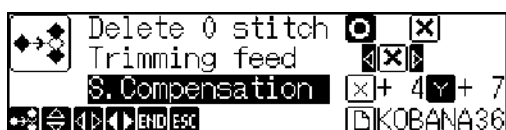
6. Input a correction amount in the Y direction by pressing ◀ ▶.



W0607Q

7. Press **END** after setting is finished.

Press ▲ ▼ when setting continuously.



W0607Q

Chapter 5 Setting

This Chapter describes how to set a sewing speed, correct trouble including thread breakage and others related to machine motions.

What Can the Machine Do?

Setting of Needle Bars



Needle bars allocated in the sequence of embroidering (→ Page 5-4)

Setting of Thread Breakage Sensor



Thread breakage sensor ON/OFF (→ Page 5-6)



Thread breakage sensitivity (→ Page 5-6)



Number of stitches in automatic step back (→ Page 5-7)



Display of total stitch number in automatic step back (→ Page 5-7)



Lower thread counter counts (→ Page 5-8)



Stitch counter indication (→ Page 5-8)

Setting of Machine



Selection of embroidery hoop (→ Page 5-9)



Speed range (→ Page 5-10)



Speed in speed range (→ Page 5-11)



Thread trimming length (→ Page 5-14)



Thread removal feed length (→ Page 5-15)



Inching ON/OFF (→ Page 5-16)



Sewing area (→ Page 5-17)



Resetting of thread breakage error (→ Page 5-12)



Needle bar stop at mending stop point (→ Page 5-12)



Method of thread trimming before thread breakage error (→ Page 5-12)



Method of thread trimming before stop (→ Page 5-12)

Setting of Environment



Return to start point after embroidering end (→ Page 5-20)



Method of reflecting modified machine speed (→ Page 5-21)



Method of checking the embroidery area (→ Page 5-21)



Slow sewing needle number at start-up (→ Page 5-22)



Data transfer speed (→ Page 5-23)

Display language (→ Page 5-24)

Alarm sound (→ Page 5-25)

Motive speed (→ Page 5-26)

Small-pitch deletion (→ Page 5-27)

Auto pause ins. (→ Page 5-28)



Setting of Lock Stitch



Lock stitch ON/OFF (sewing start position) (→ Page 5-29)



Lock stitch ON/OFF (sewing end position) (→ Page 5-30)



Lock stitch ON/OFF (sewing start position after thread trimming) (→ Page 5-31)



Setting of speed limit in a small pitch

Speed limit in a short pitch (→ Page 5-32)



Display of Information



Display of pattern information (→ Page 5-37)



Features of machine (→ Page 5-38)



Version information (→ Page 5-39)



Feed timing (→ Page 5-33)



Automatic input setting (→ Page 5-34)



Hoop Retract Point



Hoop retract point (→ Page 5-18)



Automatic hoop retract ON/OFF (→ Page 5-19)

Hoop Movement




Registration of embroidering start point (→ Page 5-18)

Movement to registered sewing start point (→ Page 5-19)

Setting of Needle Bars

Needle bars allocated in the sequence of sewing can be modified.


- This setting is explained on the basis of the BE-1206B-BC screen.
- Either feedhold or hoop retract can be inserted.

1. Press .
2. Select a sewing sequence to modify by pressing  .

The current embroidering sequence is selected while embroidering is interrupted.




W0481Q

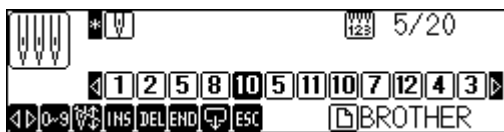
Press  for modifying all sequences at one time.



W0482Q



3. Input the number of a needle bar by pressing ten keys.

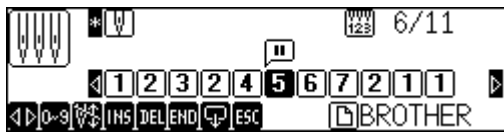
When inputting a numerical figure exceeding 10, press the  first.



W0483Q

Insertion of Feedhold

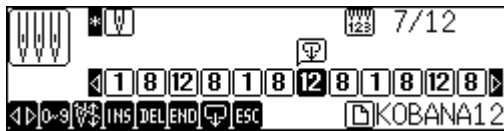
Press  to highlight the position right next to the position to insert the feedhold, then press .



W0484Q

Insertion of Hoop Retract

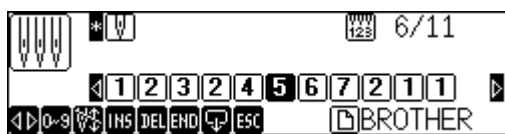
Press  to highlight the position right next to the position to insert the hoop retract, then press .



W0486Q

4. Press **END**.

Modified setting is saved and the previous screen is displayed again.







W0485Q


Thread Breakage Sensor

Validity or invalidity and sensitivity of the thread breakage sensor can be set.

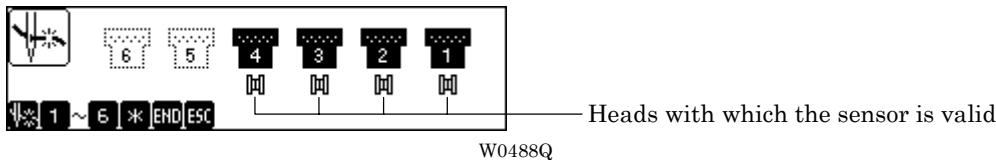
Setting of sensor validity/invalidity


- This function is previously set to valid for all heads upon shipment.
- Each pressing on the ten keys or  key will switch the combination of the thread breakage sensors in the following order:

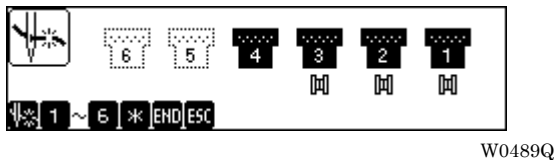
	Upper thread sensor and lower thread sensor both valid
	Upper thread sensor valid, lower thread sensor invalid
	Invalid


1. Press .
2. Specify the number of a machine head by pressing ten keys and validate or invalidate the thread breakage sensor.

Each pressing on ten keys will switch the setting to valid or invalid.



Pressing on  key will switch the setting of the thread breakage sensor in each head to valid or invalid.






3. Press .
- Modified setting is saved and the initial screen or halt screen is displayed again.

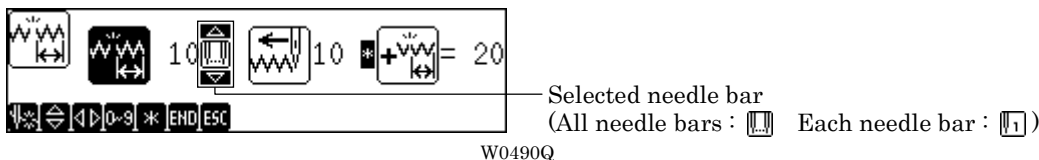
Thread Breakage Sensitivity

Sensitivity of the thread breakage sensor can be set.

- The sensitivity can be set within the range of 1 ~ 100. Sensitivity increases as the figure decreases.
- This function is previously set to 10 upon shipments.

1. Press  twice.
2. Select the needle bar for which the sensitivity is modified by pressing  .

The number of needle bars changes in the sequence of :
 ALL (all needle bars) → 1 → 2 → ... 9 or 12 (max.) → ALL → ...



3. Select  by pressing \triangleleft \triangleright .

4. Input sensitivity of the thread breakage sensor.



W0491Q

5. Press .


Modified setting is saved and the previous screen is displayed again.

Automatic Step-Back

The number of stitches to step back automatically in case of a thread breakage can be set.

- Setting can be done within the range of 0 ~ 10 stitches.
- This function is previously set to 0 stitches upon shipments.


1. Press  twice.

2. Select  by pressing \triangleleft \triangleright .



W0473Q

3. Input the number of stitches to step back automatically by pressing ten keys.

Pressing  sets whether to execute an extra step-back by a sensitivity amount of the thread breakage sensor in the automatic step-back mode.



Total number of stitches to step back in the automatic step-back mode

When stepping back by a sensitivity amount of the thread breakage sensor

W0492Q





When stepping back by preset number of stitches


W0493Q

4. Press .

Modified setting is saved and the previous screen is displayed again.


Setting of Lower Thread Counter/Stitch Counter

- The lower thread counter reduces the indication each time one pattern is finished. After the reduction is finished, an error message can be displayed.
- The stitch counter increases the indication stitch by stitch.
- The lower thread counter can be validated or invalidated by pressing .
- The stitch counter can be cleared to zero by pressing .

1. Press  three times.
2. Input the number of counts of the lower thread counter by pressing ten keys.



W0494Q

3. Press .
- Modified setting is saved and the initial screen or halt screen is displayed again.







Setting of Machine


Machine motions can be set.




Embroidery Hoop

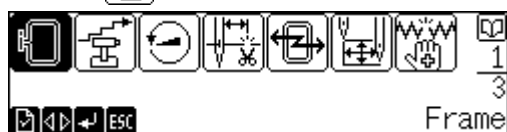
Specify a type of an embroidery hoop set on the machine.

- A type of a hoop to be selected varies depending on a type of a hoop (flat or cap) selected by a switch on the operation panel.

When a flat hoop (FLAT) is selected		Tabular square hoop
		Flat hoop
		Sash frame
		Small flat hoop
When a cap hoop (CAP) is selected		Semi-wide cap frame
		Wide cap frame



1. Press .

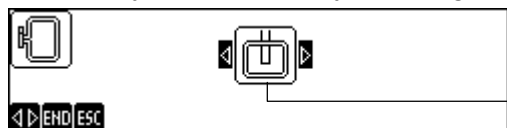
2. Select  by pressing  .



W0609Q

3. Press .

4. Select a type of a hoop by pressing  .



Currently selected hoop

W0496Q

5. Press .

Modified setting is saved and the previous screen is displayed again.




W0497Q

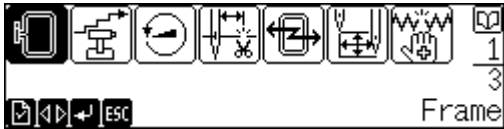
Speed Range

A range of speed for each needle bar can be set.

- This setting is explained on the basis of the BE-1206B-BC screen.
- The speed range can be set within the range of 1 ~ 6.

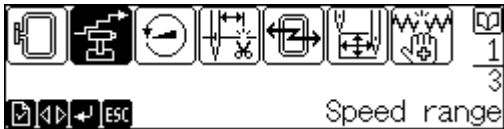
1. Press .

2. Select  by pressing  .






W0609Q

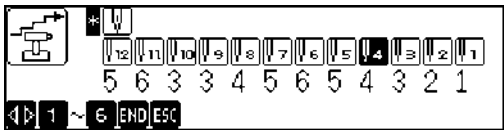
3. Press .



W0610Q

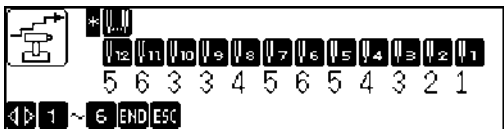
4. Select a needle bar by pressing  .

When setting the same speed range for all needle bars, press .



When modifying the speed range for one needle bar

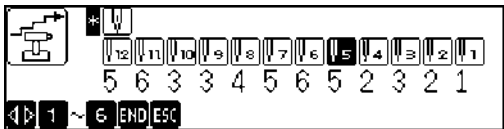
W0499Q




When modifying the speed range for all needle bars

W0500Q

5. Input a required speed range by pressing ten keys.



W0501Q

6. After modification is finished, press .




Modified setting is saved and the previous screen is displayed again.

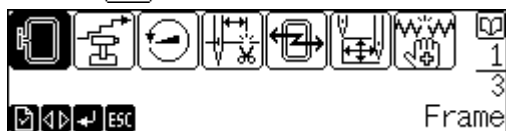
Speed of Each Speed Range

Maximum speed of each range can be set.

- Speed can be input in increments of 10rpm.
- The upper limit of a speed to be set varies depending on a selected hoop.

1. Press .

2. Select  by pressing  .





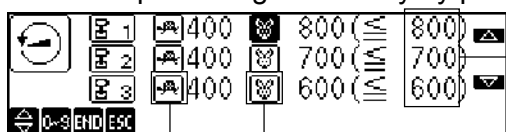
W0609Q

3. Press .



W0611Q

4. Select a speed range to modify by pressing  .



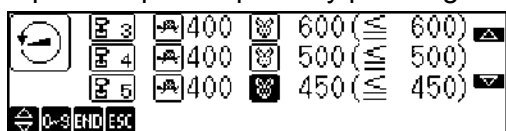
Upper limit of speed to be set in each range

Maximum speed


Lowest speed

W0503Q

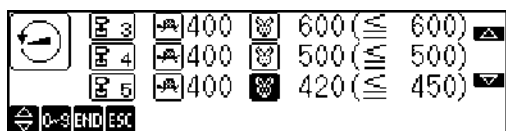
5. Input a required speed by pressing ten keys.



W0504Q

6. After modification is finished, press .

Modified setting is saved and the previous screen is displayed again.


















W0505Q


Setting of Mending




Details of mending can be set in case of a thread breakage.

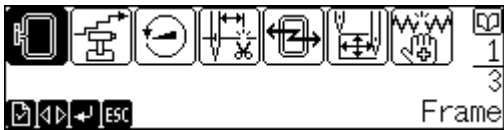
- Contents of each setting item are as described below.

Item	Contents
	For setting a mending end point (number of stitches before a thread breakage) within the range of 1 ~ 10. This function is previously set to 1 stitches upon shipments.
	For setting whether to reset a thread breakage error automatically. This function is previously set to  (Manual) upon shipments.
	For resetting an error automatically
	For resetting an error manually
	For setting whether to stop embroidering temporarily at the mending end point
	For stopping embroidering at the mending end point
	For stopping embroidering temporarily at the mending end point and then starting all heads automatically
	For not stopping embroidering at the mending end point and continuing embroidering Manually trim the lower thread immediately after resetting a thread breakage error if feeding by stitch back is long (i.e., 40 to 50 mm or more) in this mode. Set the thread trimming method to 
	For setting a thread trimming method using the  immediately after resetting a thread breakage error. (This setting is effective only once after resetting the error.)
	For trimming both upper and lower threads
	For trimming the lower thread only
	For not trimming any thread

- Refer to "Mending" (→ Page 6-5).

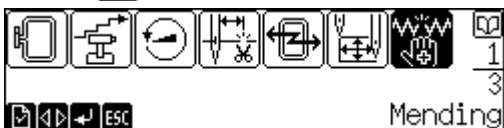
1. Press .

2. Select  by pressing  .





W0609Q

3. Press .



W0612Q



Setting of thread breakage error resetting method

- Select  by pressing ◀ ▶.
- Press  for modifying a resetting method.



W0507Q

For setting whether to stop embroidering temporarily at the mending stop point

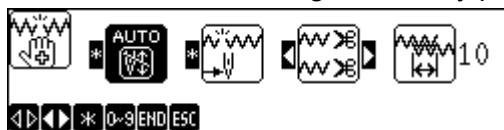
- Select  by pressing ◀ ▶.
- Press  and select whether to stop embroidering temporarily.



W0508Q

Setting of thread trimming method after stopping

- Select a thread trimming method by pressing ◀ ▶.



W0507Q

Setting of mending stop position

- Select a stop point (number of stitches before mending) by pressing ten keys.
The machine does not stop if the automatic step-back setting is lower than the input value.



W0509Q


After setting all items, press .




Modified setting is saved and the initial screen is displayed again.

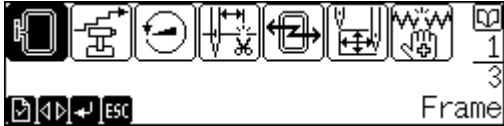
Thread Trimming Length

Length of thread to leave on the needle bar after thread trimming can be set for each needle bar.

■ This function is previously set to 5 upon shipments.

1. Press .

2. Select  by pressing  .





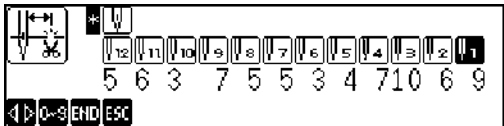
W0609Q

3. Press .




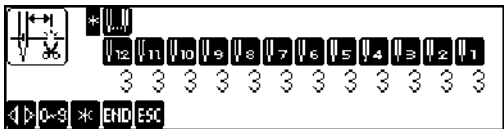
W0613Q

4. Select a needle bar to modify by pressing  .



W0511Q


Press  for setting the same speed range for all needle bars.

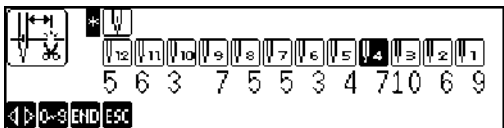


W0512Q

5. Input thread length by pressing ten keys.

Thread length can be input within the range of 1 ~ 10. Length decreases as the figure decreases.

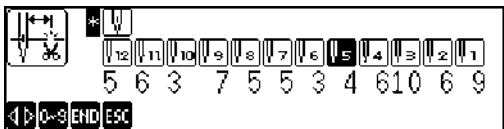
When inputting "10", press the  first.



W0513Q

6. After setting is finished with all needle bars, press .

Modified setting is saved and the previous screen is displayed again.



W0514Q

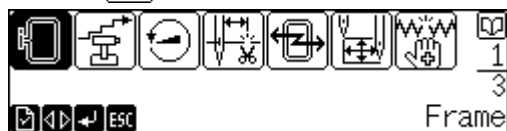
Thread Withdrawal Feed Length

Thread withdrawal length can be set before thread trimming.

- The input range is 0 ~ 100mm.
- This function is previously set to 15mm upon shipments.

1. Press .

2. Select  by pressing  .



W0609Q

3. Press .




W0619Q

4. Input thread withdrawal length by pressing ten keys.



W0516Q


5. Press .

Modified setting is saved and the previous screen is displayed again.

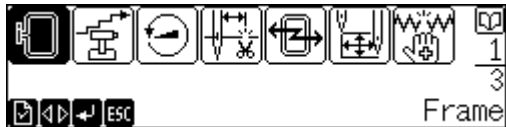
Inching

Whether to select the inching mode for thread trimming can be set.

- This function is previously set to selected upon shipments.


1. Press .

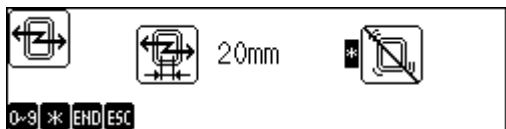
2. Select  by pressing  .




W0609Q

3. Press .

4. Set whether to select the inching mode by pressing .




W0518Q

5. Press .

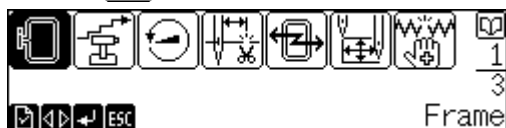
Modified setting is saved and the previous screen is displayed again.

Sewing Area

An allowable area for sewing can be set.

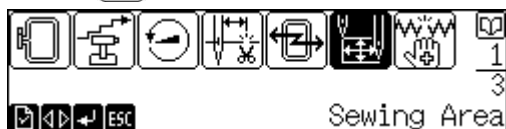
1. Press .

2. Select  by pressing $\triangleleft \triangleright$.



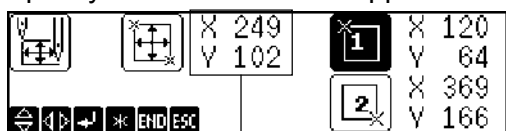
W0609Q

3. Press .



W0615Q


4. Specify coordinates of the upper left of the sewing area. Move the hoop by pressing $\triangle \nabla \triangleleft \triangleright$.



Indicates a currently set embroidery area

W0521Q

5. Press .

Pressing  set a maximum area designated for a currently set hoop.

6. Specify coordinates of the lower right of the sewing area. Move the hoop by pressing $\triangle \nabla \triangleleft \triangleright$.


7. Press .

Modified setting is saved and the previous screen is displayed again.

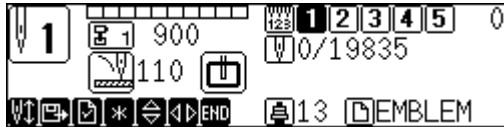
Registration of Sewing Start Position

Register a position to start sewing.

- When returning to a registered sewing start position, hold down  and press .

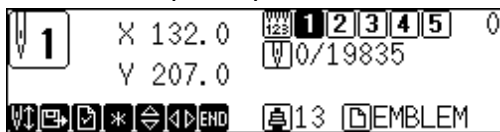
- Press the  key.

The hoop coordinates are displayed.





W0522Q

- Shift the hoop to a position to start sewing by pressing the    .



W0523Q

- Press .


- Press the  key.






W0616Q

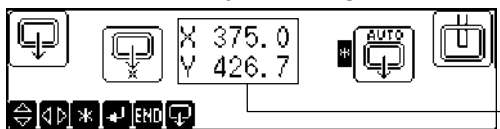
Hoop Retract Point

The hoop basic point (retract point) can be set when sewing is interrupted.

- When restarting sewing after the hoop is retracted during an interrupt, press .


- Press .

- Move the hoop by pressing    .



Current hoop coordinates

W0525Q

- Press .

Modified setting is saved and the initial screen or halt screen is displayed again.
The hoop returns to the initial point.

Cancellation of Setting


- Press  once again.


Modified setting is canceled and the initial screen or halt screen is displayed again. The hoop returns to the initial point.

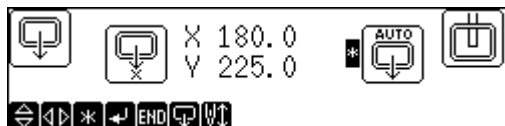
Hoop Automatic Retract

Set whether to move the hoop automatically to the retract point at the end of sewing.

- This function is previously set to no hoop automatic retract upon shipments.

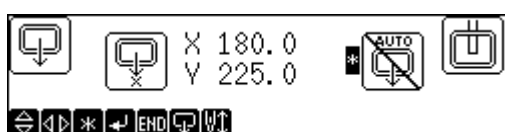
1. Press .

2. Select whether to retract the hoop automatically by pressing .




For automatically retracting the hoop

W0526Q



For not retracting the hoop automatically

W0527Q

3. Press .

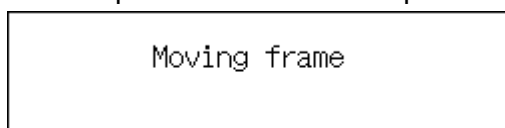
Modified setting is saved and the initial screen or halt screen is displayed again.

Movement to Registered Sewing Start Point

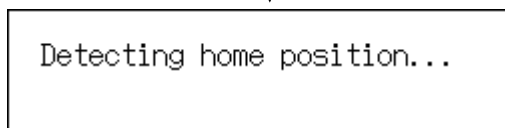
This operation should be done before starting sewing.

1. Hold down  and press .

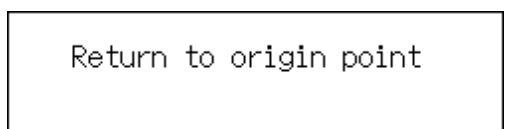
2. The hoop moves and the zero point is detected. Then the hoop moves to a registered start point.



W0617Q



W0618Q



W0619Q




3. The initial screen is displayed again.

Setting of Environment

Return to Start Point

Whether to return to the start point after sewing is finished can be set.




1. Press  twice.

2. Select  by pressing  .




W0620Q

3. Press .

4. Select  by pressing  .



W0532Q

5. Select whether to validate a return to the start point by pressing .




When the start point return is valid

W0532Q



When the start point return is invalid

W0533Q




6. Press .

Modified setting is saved and the previous screen is displayed again.

Speed Range

For setting whether to reflect modified machine speed to all needle bars.

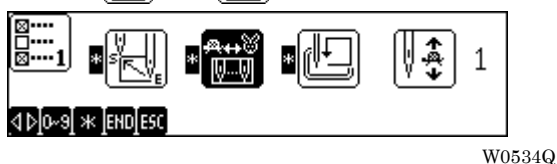
1. Press  twice.


2. Select  by pressing  .



3. Press .

4. Select  (or ) by pressing  .



5. Modify setting by pressing .

Press  for invalidating the modification.





6. Press .

Modified setting is saved and the previous screen is displayed again.

Checking the Embroidery Area

The embroidery area can be checked according to the following procedure.

- The following two checking methods (rectangle and octagon) can be selected.

Item	Contents
	Checking by rectangle tracing
	Checking by octagon tracing
	Checking by rectangle tracing with the needle bar No. 1 used.
	Checking by octagon tracing with the needle bar No. 1 used.

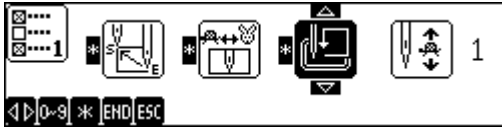
1. Press  twice.

2. Select  with  .




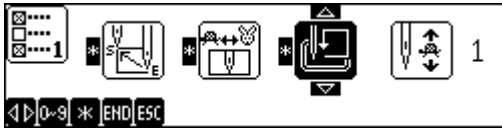
3. Press .

4. Press   to select .



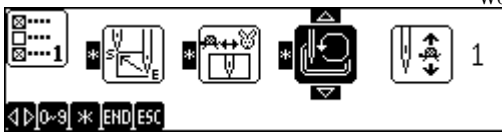
W0535Q

5. Press  to change the settings.





Checking with the rectangle

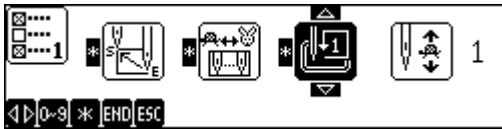
W0535Q



Checking with the octagon

W0536Q

6. Press  or  for the selection when using the needle bar No. 1.




Checking with the rectangle (needle bar No. 1)

W0537Q



Checking with the octagon (needle bar No. 1)

W0538Q

7. Press .

The changed settings are stored and the previous screen is displayed.

Slow sewing needle number at start-up

Indicates the initial needle number to sew at the lowest speed in the beginning or restarting.

- The setting range is 1 to 10 needles.

1. Press  two times.

2. Press  or  to select .




W0620Q

3. Press .

4. Input the needle number using ten keys.



W0540Q

5. Press .




The revised setting is now registered and the screen will return to the previous one.

Setting of RS-232C Communication Speed

Speed for transferring embroidery data between the operation panel and a personal computer with BE-100 installed.

- The transmission speed can be selected within the range of 9600, 19200, 38400. (unit : bps) (115200 is used for embroidery network system BES-300N.)

1. Press  twice.

2. Select  by pressing  .



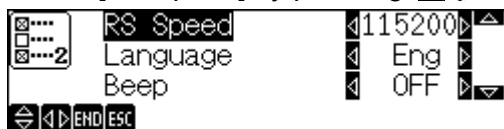
W0620Q

3. Press .






W0621Q

4. Select [RS Speed] by pressing  .

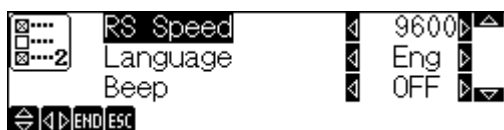


W0622Q

5. Select communication speed by pressing  .

6. Press .

Modified setting is saved and the previous screen is displayed again.



W0623Q




Display Language

A language to display on the screen can be set.

- The following languages can be selected.

Display	Contents
JPN	Japanese
Eng	English
Españl	Spanish
fr.	French
中文	Traditional Chinese
IT.	Italian
Portug	Portuguese

- Press  twice.

- Select  by pressing  .



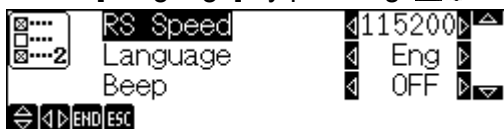
W0620Q

- Press .





W0621Q

- Select [Language] by pressing  .




W0622Q

- Select a language to display by pressing  .



W0624Q

- Press .

The previous screen is displayed again with a display in a selected language.

Alarm Sound

Whether to generate a sound in case of an error can be set.

- The following sounds can be set.

ON	A sound is generated until the error is reset.
OFF	A sound is generated twice.
5	A sound is generated five times.

1. Press  twice.

2. Select  by pressing  .





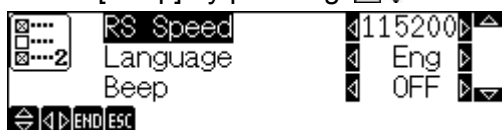
W0620Q

3. Press .





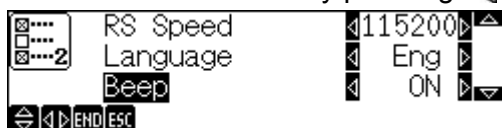
W0621Q

4. Select [Beep] by pressing  .



W0622Q

5. Select a kind of sound by pressing  .



W0625Q

6. Press .

Modified setting is saved and the previous screen is displayed again.

Motive Speed

The startup speed of the main shaft can be set.

- The following startup speed can be set.

NOMAL	Starts up the main shaft at the normal speed.
UP	Speeds up the startup speed of the main shaft.
CAP	Speeds up the startup speed of the main shaft when using the cap frame.
FLAT	Speeds up the startup speed of the main shaft when using a frame other than the cap frame.

1. Press  twice.

2. Select  with $\triangleleft \triangleright$.



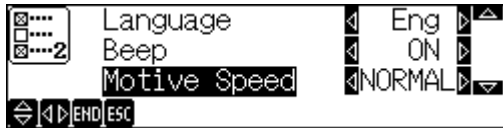
W0620Q

3. Press .



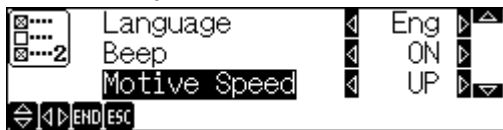
W0621Q

4. Select "Motive Speed" with $\triangle \nabla$.



W0626Q

5. Select the type of the startup speed of the main shaft with $\triangleleft \triangleright$.



W0627Q

6. Press the  button.

The changed settings are stored and the previous screen is displayed.

Small-Pitch Deletion

Stitches less than preset can be deleted.

- Settings in the range of OFF to 1.0 mm (in units of 0.1 mm) are valid. When OFF is chosen, stitch deletion is not carried out.
- "0.3" is set before shipment.

1. Press  twice.

2. Select  with  .



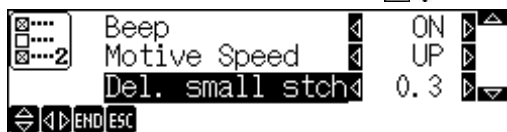
W0620Q

3. Press .



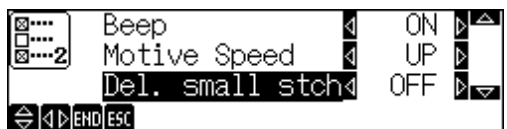
W0621Q

4. Select "Del. small stch" with  .



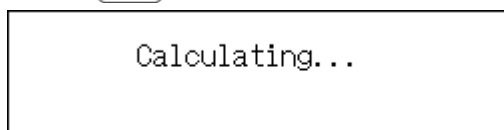
W0628Q

5. Select the maximum stitch to be deleted with  .



W0629Q

6. Press .



W0630Q

The new setting is saved and calculation is performed. The previous screen appears.

Automatic pause insertion




A pause signal will be inserted automatically between the same two needle numbers when reading the DST data which had been set to the needle on the setting screen of needle bar number.

- The following settings are available.

ON	Inserts a pause signal automatically between the same two needle numbers.
OFF	Does not insert pauses.

- Those settings will be retained after turning off the machine.

1. Press  twice.

2. Select  by pressing  .





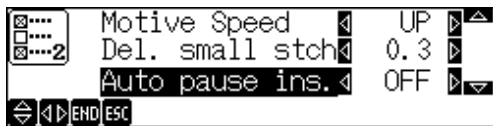
W0620Q

3. Press .





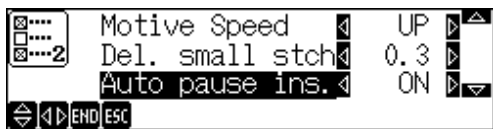
W0621Q

4. Select [Auto pause ins.] by pressing  .




W0633Q


5. Select whether or not to insert a pause automatically by pressing  .



W0634Q

6. Press .

The renewed setting is stored and the screen changes into the previous one.




Pressing  will cancel the modification of the setting.

Lock Stitch

Lock stitch can be set at the sewing start and end positions and sewing start position after trimming thread.

Setting lock stitch at the sewing start position

1. Press  twice.

2. Select  with  .





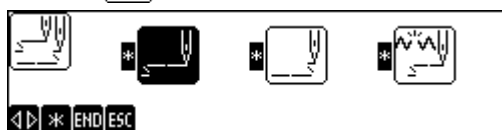
W0620Q

3. Press .




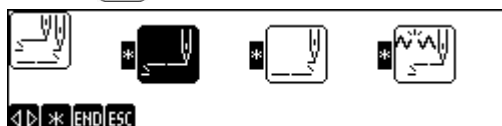
W0636Q

4. Select  with  .



W0562Q

5. Press  to validate or invalidate the lock stitch.



Validating the lock stitch

W0562Q



Invalidating the lock stitch

W0563Q

6. Press the  button.

The changed settings are stored and the previous screen is displayed.

Setting the lock stitch on the sewing send position

1. Press  twice.

2. Select  with \triangleleft \triangleright .



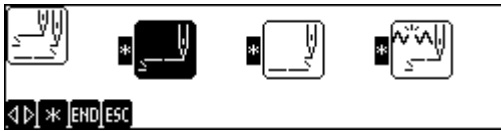
W0620Q

3. Press .




W0636Q

4. Select  with \triangleleft \triangleright .



W0562Q

5. Press  to validate or invalidate the lock stitch.



Validating the lock stitch

W0564Q



Invalidating the lock stitch


W0565Q

6. Press the  button.

The changed settings are stored and the previous screen is displayed.

Setting the lock stitch at the sewing start position after thread trimming

1. Press  twice.

2. Select  with \triangleleft \triangleright .



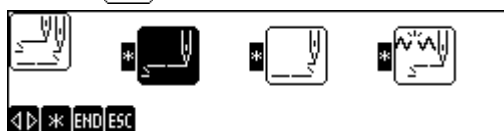
W0620Q

3. Press .




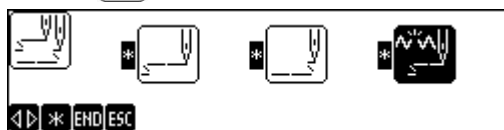
W0636Q

4. Select  with \triangleleft \triangleright .



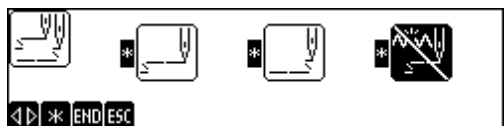
W0562Q

5. Press  to validate or invalidate the lock stitch.



Validating the lock stitch

W0566Q



Invalidating the lock stitch

W0567Q

6. Press the  button.


The changed settings are stored and the previous screen is displayed.

Speed Limit in a Short Pitch

Speed can be limited when stitching in a designated pitch.

- The pitch can be designated between 0.0 and 2.0 mm in units of 0.1 mm.
- The speed can be set from 400 rpm to the maximum speed available for the current frame in units of 10 rpm.

1. Press  twice.

2. Select  with \triangleleft \triangleright .



W0620Q

3. Press .



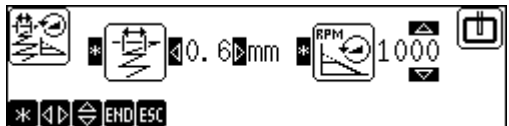
W0637Q

4. Designate the stitch length to be limited with \triangleleft \triangleright .



W0569Q

5. Designate the speed to be limited with \triangleleft \triangleright .



W0570Q


6. Press the  button.

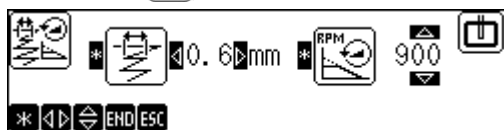
The changed settings are stored and the previous screen is displayed.



W0571Q

Invalidating speed limit in a short pitch

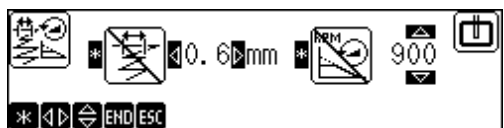
1. Press the  button after the setting screen is displayed.



W0571Q

2. Press the  button.

The changed settings are stored and the previous screen is displayed.



W0572Q

Feed Timing

The timing of needle drop and hoop movement can be adjusted according to the cloth thickness.

- The value can be designated between 95 and 125 degrees (85 to 115 degrees for cap hoop) in 1-degree units. The smaller values are suitable for thick material and the larger ones are suitable for thin material. The standard value is 110 degrees (100 degrees for cap hoop).

1. Press  twice.

2. Select  with  .



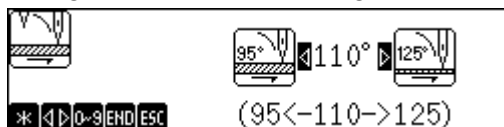
W0638Q

3. Press .



W0639Q

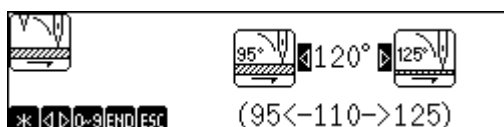
4. Designate the feed end angle with  .



W0575Q

5. Press the  button.

The changed settings are stored and the previous screen is displayed.




















W0576Q

Automatic Input Setting

The sewing data can be read from floppy disks or personal computers by manual, automatic or full automatic operation.

- The following items are available for the settings.

Item	Contents
	Choose the device to read from. <ul style="list-style-type: none">  Reads from a memory. Only MANU (manual) mode is available in this case.  Reads from a floppy disk.  Reads from a personal computer.  Reads from a network.
	Choose the mode for the reading. <ul style="list-style-type: none">  MANU (Manual): The data selection for the reading can be changed manually on the file selection screen shown each time with data reading.  AUTO (Automatic): After the completion of the sewing, pressing  will execute the next data reading automatically. The file selection screen is shown at the first reading only. Data for the reading cannot be changed manually.  F-AT (Full-Automatic): The next data reading will be executed automatically after the completion of the sewing. The file selection screen is shown at the first reading only. Data for the reading cannot be changed manually. This mode is not available when the device to read from is set to network.
	Choose whether or not to continue automatic reading from the start on completion of the sewing. <ul style="list-style-type: none">  Discontinues data reading on completion of sewing.  Continues data reading from the start automatically on completion of sewing.
	Choose whether or not to reflect the initial edit data in following sewing operations. <ul style="list-style-type: none">  The initial edit data is reflected.  The initial edit data is not reflected.

- To choose  network as the device and to read the data via the network will require another software and so on. Please consult our sales office or service station nearby in this case.

1. Press  three times.

2. Select  with \leftarrow \rightarrow keys.



W0638Q

3. Press .







W0640Q


4. Choose the device to read from with \leftarrow \rightarrow keys.



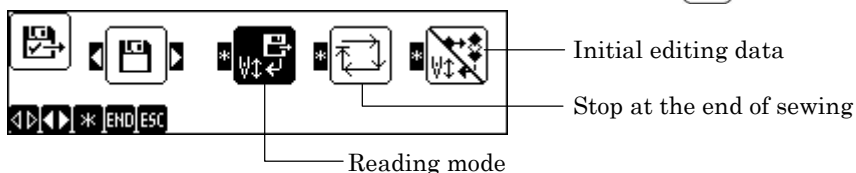
W0578Q

The factory setting is  memory.

Go to step 5 if the chosen device is  floppy disk,  personal computer or  network.

Go to step 6 if  memory is chosen.

5. Choose the item to modify with \leftarrow \rightarrow keys and press  to edit the setting.

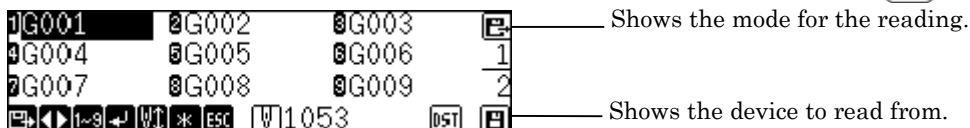


W0579Q


6. To read the data from a floppy disk, insert the floppy disk into the operation panel.
To read the data from a computer, establish connection with it.
To read the data via network, arrange the network for the communication.


7. Press .

8. Choose the first data for the sewing with Δ ∇ \leftarrow \rightarrow keys and press .



W0580Q


Press  to change the order of the data. Each pressing on the key will switch to the registered date order or the alphabetical order.

9. Press  to start the sewing.




One of MANU (manual), AUTO (automatic) or F-AT (full automatic) will be displayed for the reading mode.

W0581Q



10. Press  when the sewing is completed.

If AUTO (automatic) is selected, the next data will be read here, then the machine gets into a standby status.

If MANU (manual) is selected, the next data to be read will be shown here. Choose the required data with \triangle ∇ \triangleleft \triangleright keys and press .



W0582Q

11. To discontinue the automatic sewing, follow the steps 1 to 4 then set the device to read from to  memory, and press .







Display of Information

Information about the machine and patterns can be displayed on the screen.


Pattern Information

Detailed information about a selected pattern can be checked.

- Contents of information to be displayed are as shown below.

	Size of sewing data (mm)
	Coordinates of embroidering start point
	Coordinates of embroidering end point
	Number of stitches
	Number of colors
	Name of data

1. Press  three times.

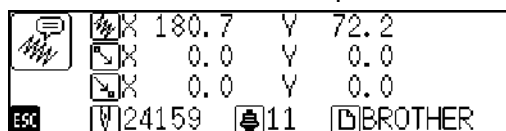
2. Select  by pressing ◀ ▶.



W0638Q

3. Press .

4. Check information about patterns.



W0583Q





5. Press .

The previous screen is displayed again.

Features of Machine

Detailed information of the machine can be checked.

- Contents of information to be displayed are as shown below.

	Maximum moving range of flat hoop (for all heads)
	Maximum moving range of cap hoop
	Number of heads
	Number of needle bars per head

1. Press  three times.

2. Select  by pressing  .



W0638Q

3. Press .




W0641Q

4. Check information about the machine.



W0585Q






5. Press .

The previous screen is displayed again.

Information about Versions

Information about CPU ROM version, etc. can be checked.

- Contents of information to be displayed are as shown below.

	Panel CPU ROM version
	Main CPU ROM version
	Main axis CPU ROM version
	Interface CPU ROM version
	Feed wave form table version

1. Press  three times.

2. Select  by pressing  .

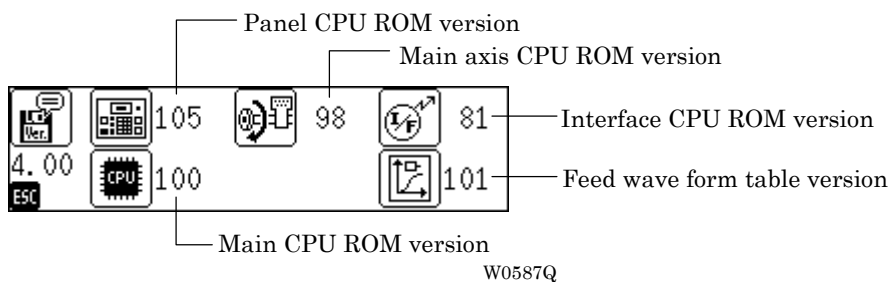



3. Press .



4. Check information about versions.

The version is displayed by numerical figures (1 ~ 255).



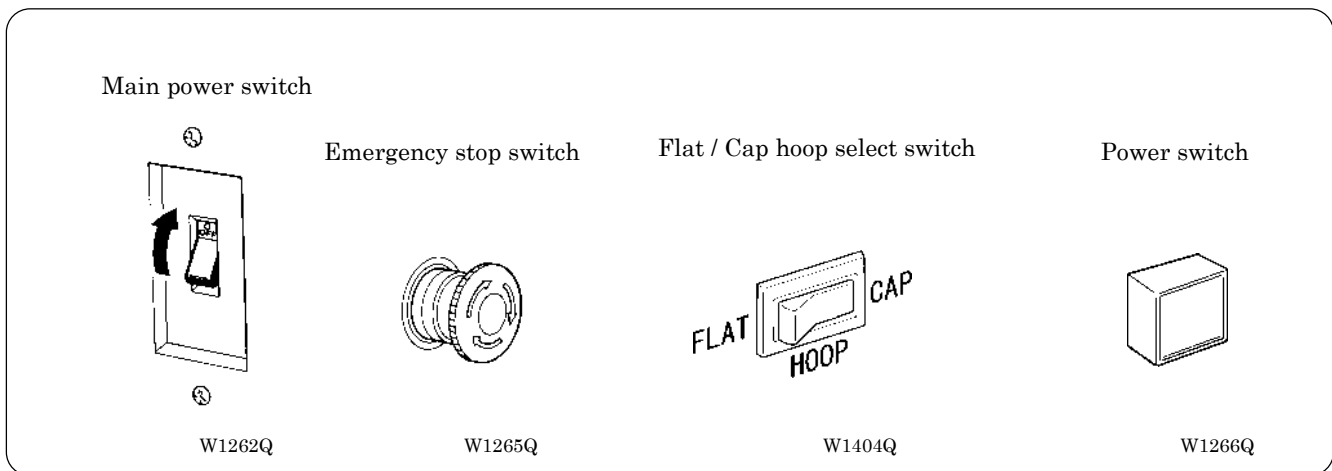
5. Press .

The previous screen is displayed again.

Chapter 6 Operation of Machine

1. Operating Procedures

1-1 Power Source



1. Turn on the main power switch.
2. Reset the emergency stop switch.
3. Change the Flat / Cap hoop select switch on the operation panel according to the hoop to be used.
4. Press the power switch.
5. A message is displayed on the LCD.




W1264Q

6. The alarm sounds three times and the needle bar move upward. Then the hoop moves to the home position and the sewing data screen is displayed.

When turning the power off and back it on again, wait for at least 10 seconds.


1-2 Preparation for Embroidering

1. Select embroidering data.
2. Pressing ◀▶△▽, determine a position to start embroidering.
An error message is displayed on the LCD if a pattern comes out of the hoop.
3. Pressing  starts embroidering.
4. After embroidering is finished, the machine is placed in the stand-by state.

2. Machine Stop

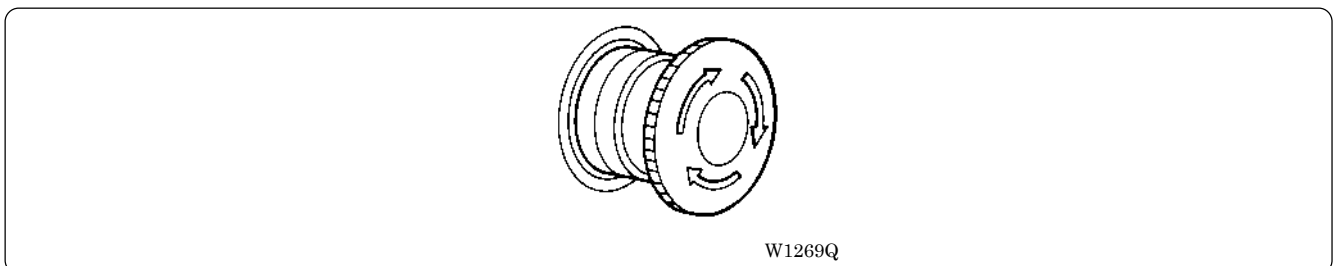
2-1 Stopping the Machine



Press the stop switch or  to stop the operation of the machine.

When the stop switch is pressed, the message, "Release stop SW to operate!", is displayed on the operation panel.

2-2 Emergency Stop of the Machine



When the emergency stop switch is pressed, all power except that for the fluorescent lamp is turned off.

2-3 Resetting Emergency Stop

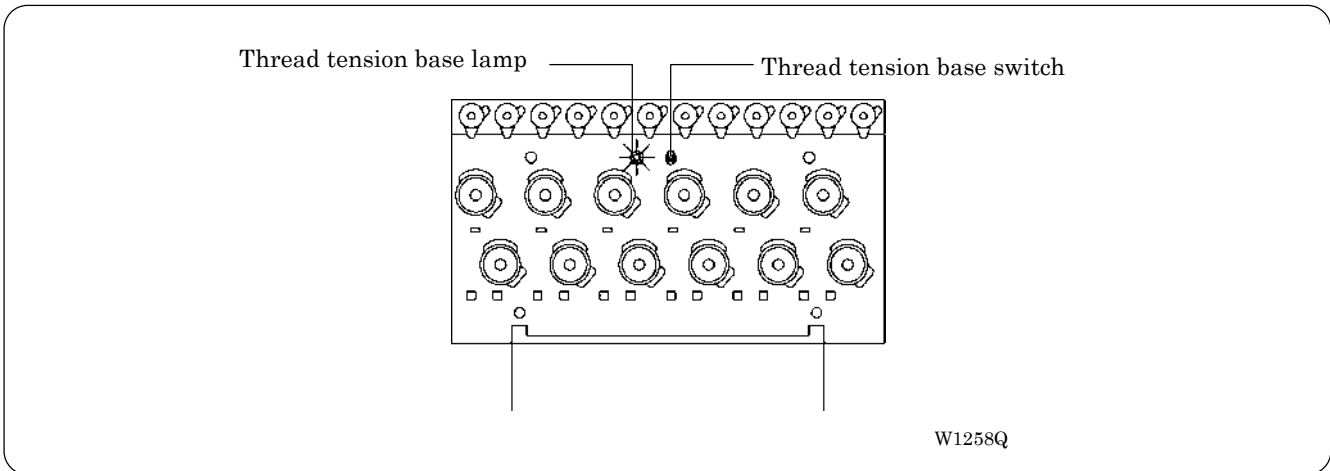



When turning the emergency stop switch in the direction of the arrow illustrated on the switch, the knob of the switch pops up and emergency stop is reset.

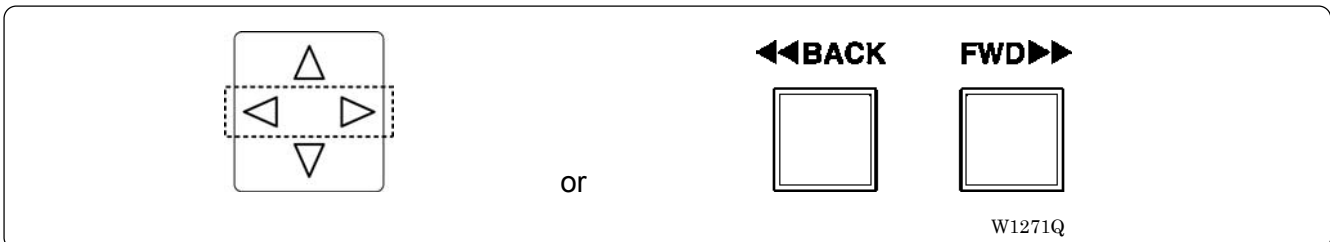
Press the power switch to turn on the power again.

3. Measures against Thread Breakage


3-1 Remedies

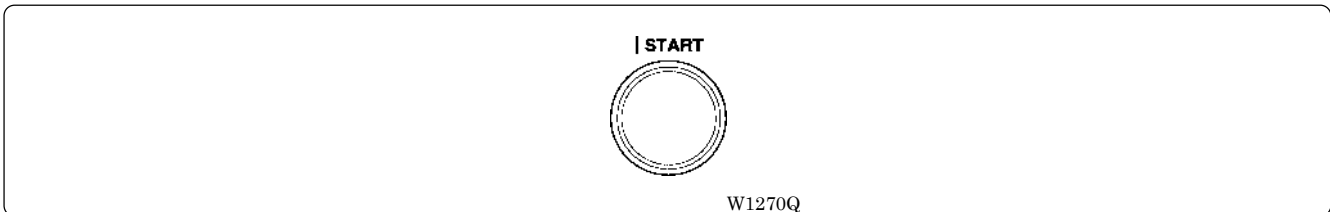


1. If embroidering is suspended due to thread breakage, the Thread tension base lamp of the machine head blinks in red.
2. Correct the broken thread and pass it through again.
Refer to "Chapter 1, 4-1 Upper Threading" (→ Page 1-15) for details.
3. Press the  switch or press the STEP BACK/FWD switch at machine head in order to reset the alarm.
4. Return the hoop to a position where thread breakage occurred by pressing the STEP BACK switch.



When the switch is pressed for 5 stitches or more, the machine continues operation without holding the switch. To stop the machine, press the switch to the opposite side.

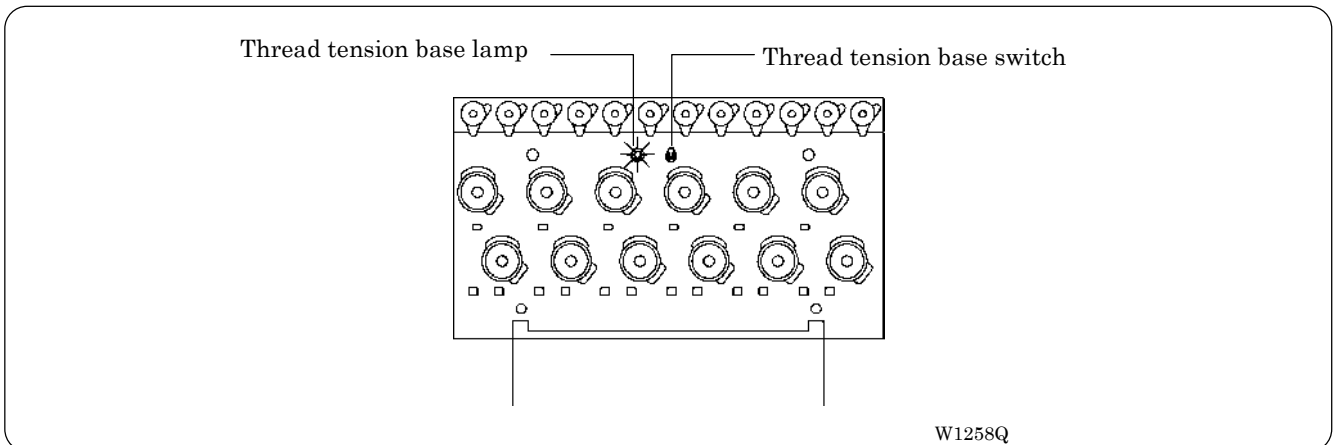
5. Press the  switch on the operation panel or the start switch located between the machine heads to resume operation.



3-2 Mending

In case that a head stops for some reasons such as thread breakage, only the stopped head will retry sewing by specified number of stitches when the head is recovered, and after that, all the heads will restart normal sewing.

- Refer to “Setting of Mending” on page 5-12 to set this function to mend the missing stitches caused by thread breakages.



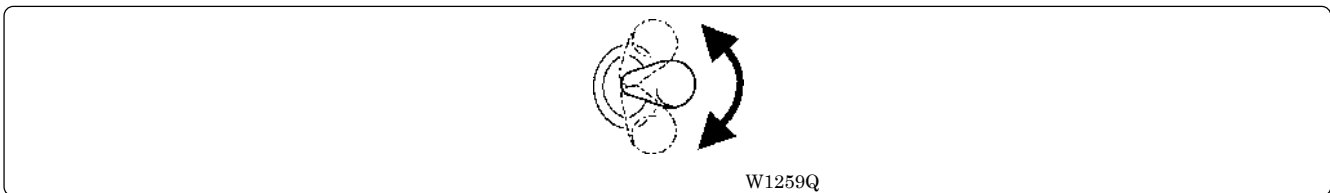
This function works in the following procedure:

1. In case of an error such as thread breakage, the thread tension stand lamp blinks red and the sewing will be stopped. The other thread tension stand lamps with other heads illuminate green.
2. The head with the error will restart sewing from specified position. Heads with no thread breakage are suspended during that period.
3. When the stitches reach the position of the thread breakage, all the heads will restart the sewing. However, heads already set to suspension are excluded.

Manual operation of the mending

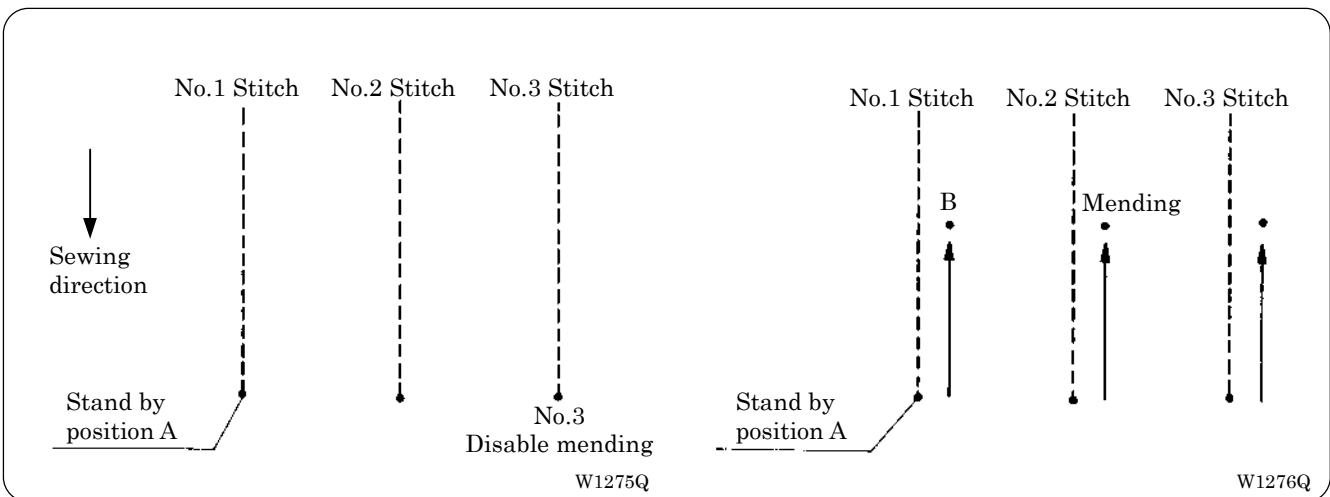
Setting or cancellation of the mending can be specified during the suspension of embroidering with individual heads regardless of thread breakage.

- End positions of the mending can not be individualized according to head.
If there are more than one heads with the mending function ON, the head position which was set first will be the end position for all heads.
 - To cancel the end position, turn ON the mending function (the lamp illuminates green) to all the heads sewing at that time.
1. While the embroidering is suspended with the head to set the mending, flip up its thread tension stand switch further.
The thread tension stand lamp will illuminate green and the mending will be set ON.
To turn OFF the mending, flip up the thread tension stand switch again to turn off the lamp.



2. Bring back the needle position by pressing ◀▶ or . The section between the brought back position and the suspended position will be the subject to the mending.

Case of Mending usage



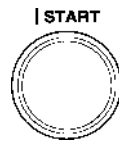
1. Disable MENDING function of No. 3 at the standby position A.
(This position should be the mending end position.)

2. Pressing ◀ or to move it backward.
Disable MENDING function of No. 2 at the position B.
(The position B does not become the end position; the position A remains the end position.)

When enabled MENDING function of the machine head whose MENDING function is disabled:

- The thread tension stand lamp will illuminate green, and mending is executed for the machine head.

4. Jog Embroidering




W1270Q

- Jog embroidering can be used for preventing the thread from slipping from the needle at the start of embroidering.
- Jog embroidering can be executed as long as the start switch at the machine head is held down. Never apply a tape on the switch to keep jog operation for a long time. Doing so may cause damage to the machine.

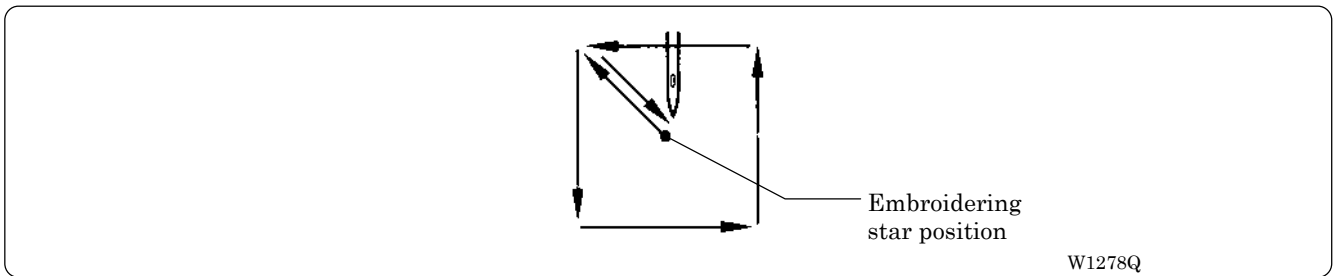
5. Hoop Feed Position


- In order to ease mounting and dismounting of the embroidery hoop, another needle position can be set as a hoop feed position in the movable area additionally to the current needle position.
- In order to ease material attachment while operation is suspended, the hoop can be moved to the feed position at any time by the hoop feed switch.
- The hoop can also be moved to the feed position automatically after embroidering is finished. Refer to "Hoop Automatic Retract" on Page 5-19 for details.

1. Press .

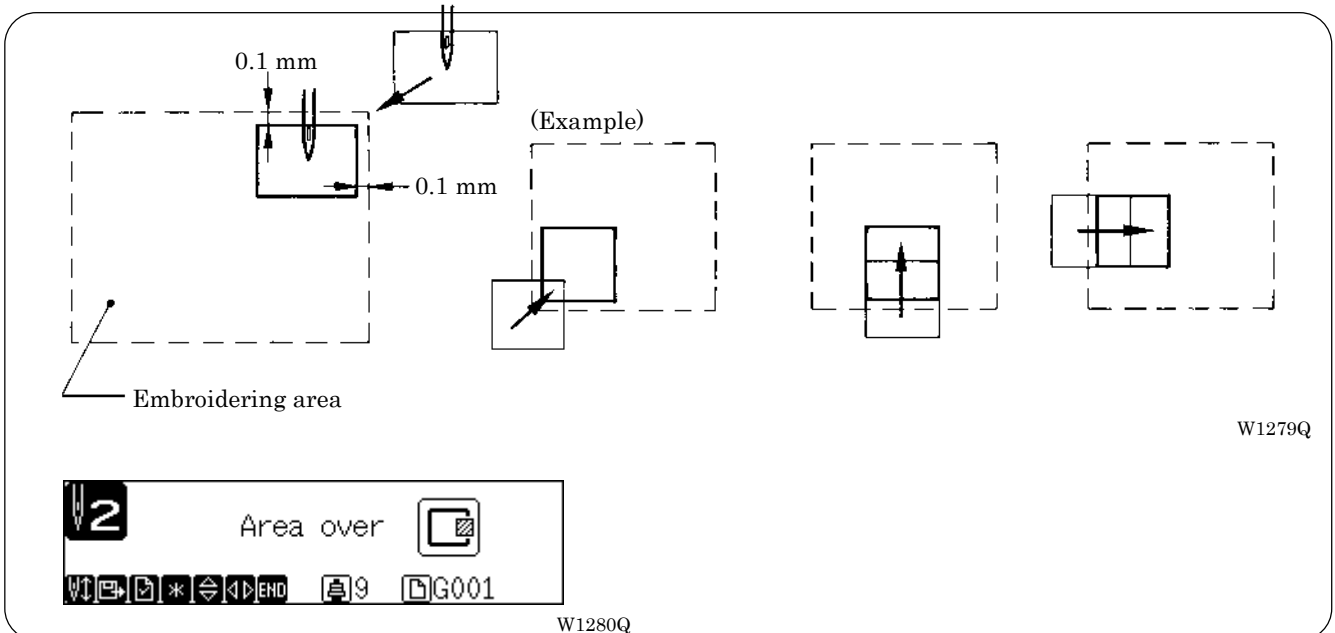
6. Area Check


6-1 External Tracing

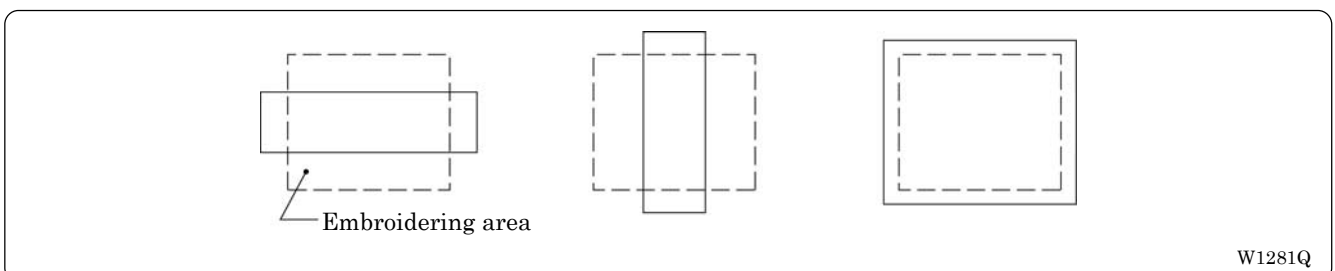


If  is pressed in other cases than "area over", the rectangular outline of the pattern is traced. The outline of pattern can be checked in rectangle or octagon by setting "Checking embroidery area" in "Environment 1".

6-2 Automatic Hoop Movement in Area

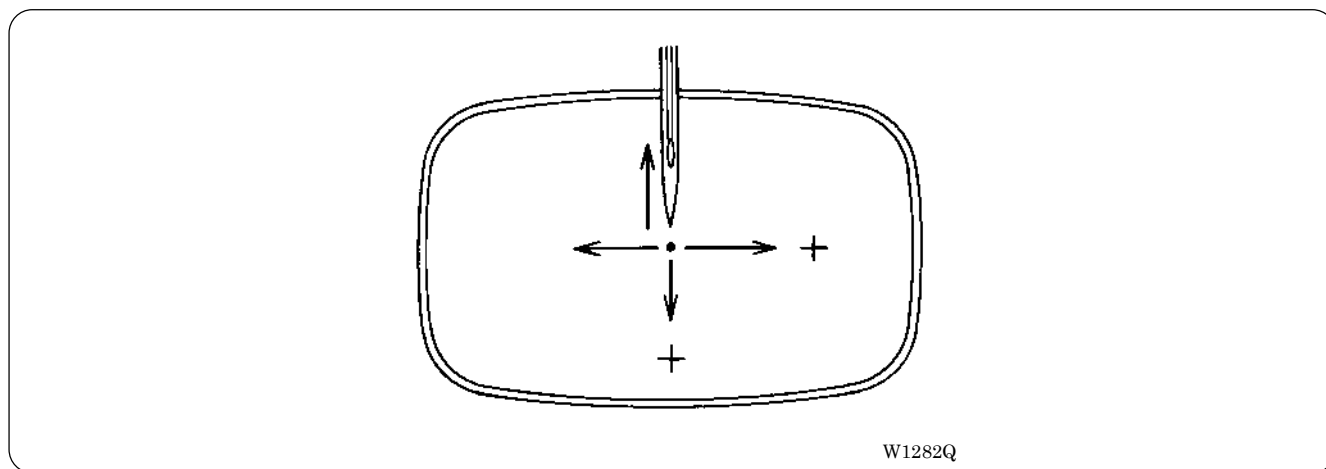


- If "area over" is displayed, press . The hoop automatically moves inside the embroidering area, where the pattern is set, at the nearest position.
- After finishing the movement inside the area by this function, execute external tracing. Then, check that the needle and the presser foot do not interfere with the hoop before starting embroidering.
- If the pattern is not held in the embroidering area as shown below, the hoop cannot move into the area. Enlarge the embroidering area on the operation panel.



7. Jog Switches

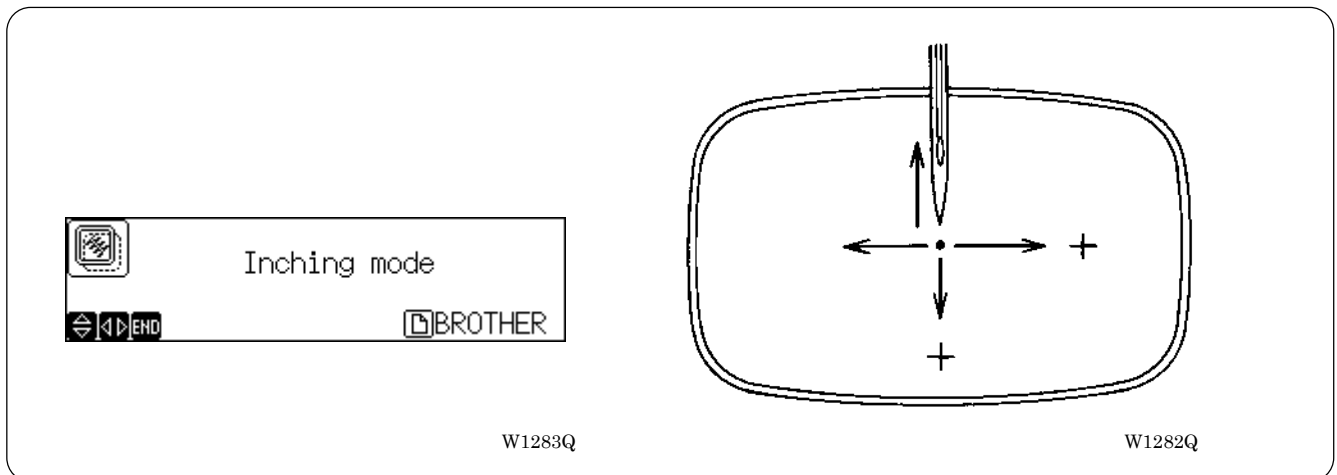
7-1 Hoop Movement to Start Position











The hoop can be moved by pressing ◀▶△▽ before starting embroidering and the start position can be set arbitrarily.

7-2 Inching Mode during Embroidering (Forcible Hoop Movement)

- Moving the frame greatly in the inching mode may cause an interference with the machine. Pay utmost care in the inching mode.
- Although the distance of the frame moved in the inching mode is stored even after turning OFF the power, if the power is turned ON again and sewing is started, the pattern may be embroidered in a different position. Be sure to use the inching mode appropriately.

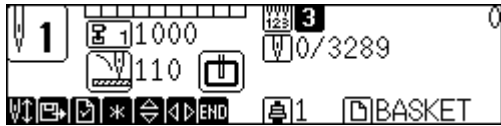


1. Press  while pressing  switch in order to select the inching mode.
2. Press     and the hoop moves to the direction of the pressed switch.
 - Note that the forcible hoop movement will produce deviation of embroidering by the amount.
 - If the hoop and material are deviated from each other during embroidering, correct it by using the jog switches.
3. Pressing  resets the inching mode.
4. Press  restarts embroidering.

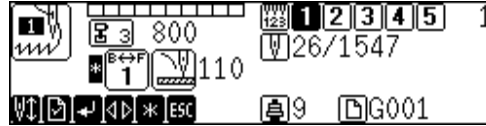
8. Detection of Home position

After the home position is detected, the hoop returns to the initial position.

1. Press  while pressing  with the machine stopped.

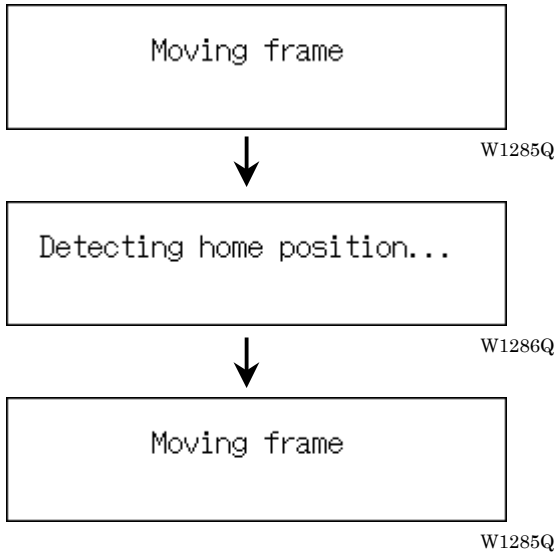


Initial screen
W0406Q



Temporary stop screen
W0440Q

2. The hoop moves and the home position is detected.



3. The initial screen is displayed again.

Chapter 7 Maintenance

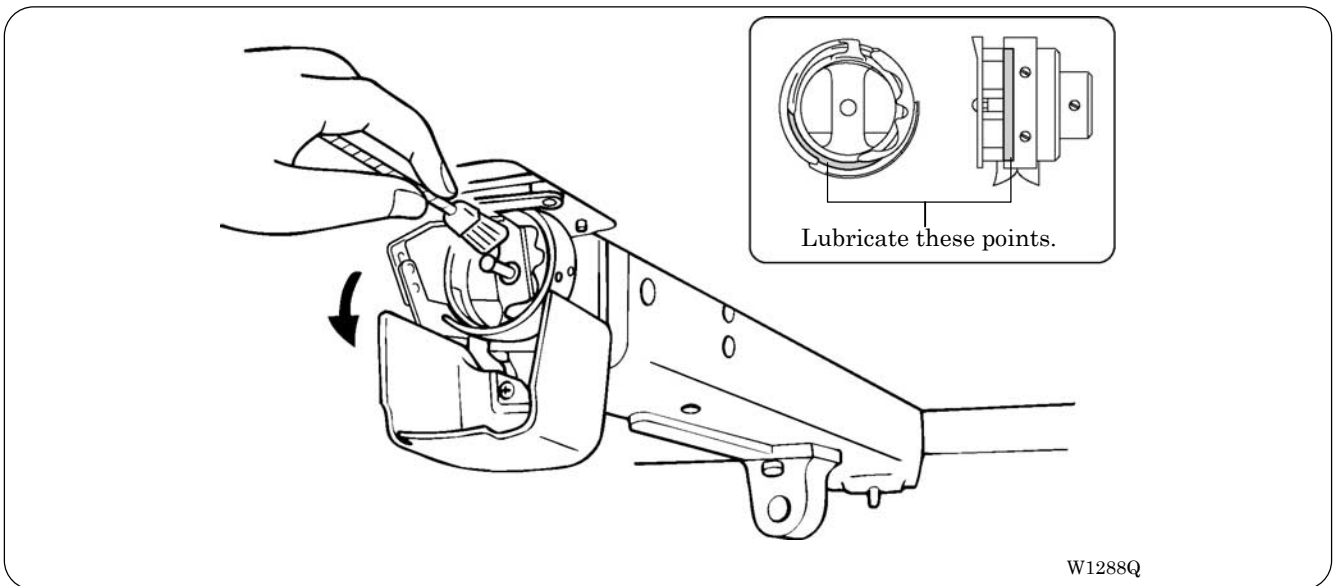
⚠ CAUTION

- ⚠
 Turn off the power switch before starting maintenance. Failure to do so may start the machine unintentionally through an accidental activation of the START switch, resulting in bodily injuries.
- ⊘
 Be sure to wear protective goggles and gloves when handling the lubricating oil or grease, so that no oil or grease gets into your eyes or onto your skin, otherwise inflammation can result. Furthermore, do not drink the oil or grease under any circumstances, as they can cause vomiting and diarrhoea. Keep the oil out of the reach of children.

- Keep the machine clean at all times to prevent machine trouble.
- Remove dirt with a soft, dry cloth. If necessary, clean with the detergent-soaked cloth, then wipe off the detergent with a cloth dampened with (hot) water.
- Never use benzene or thinner for cleaning the machine.

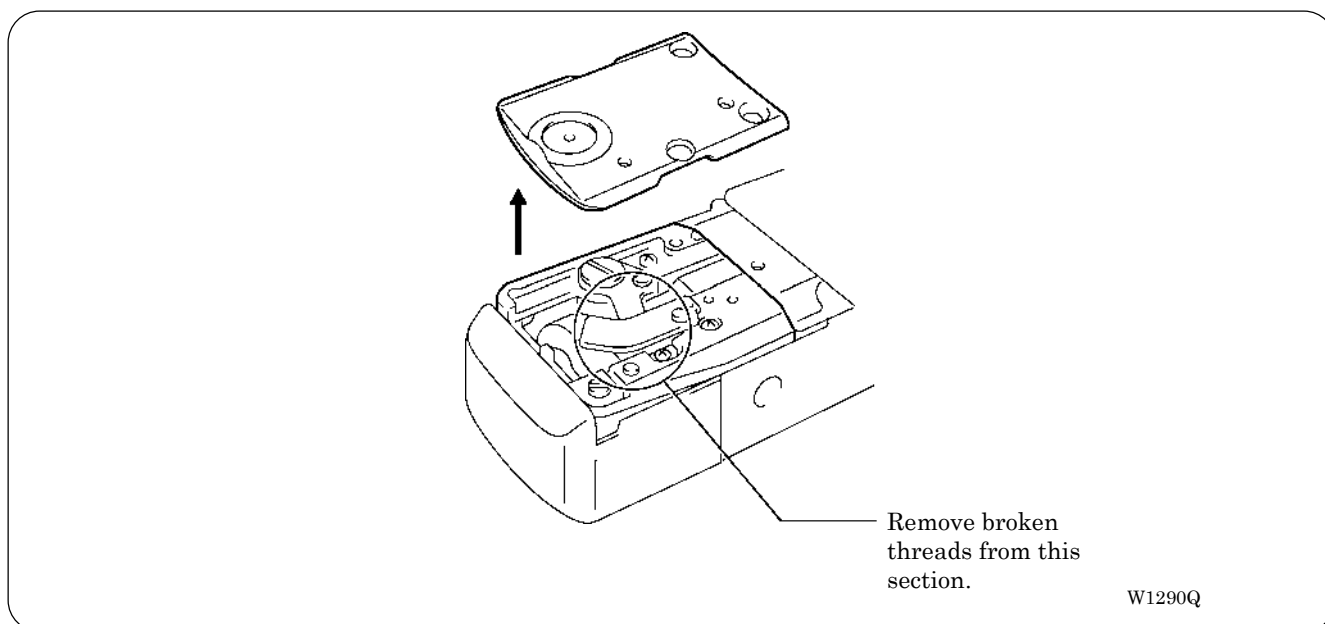
1. Cleaning

1-1 Cleaning and Lubrication of Rotary Hook



- Clean rotary hooks daily using the brush provided at the time of lubrication. If a rotary hook is too dirty, cleaning with a compressor (compressed air) is recommended.
- In case of thread breakage errors or noises of the rotary hook, one drop lubricate the race of the rotary hook in every 3 or 4 hours operation.
- Use the dropper provided to supply oil. Use Brother's specified oil (Nippon Oil, Embroidery Lube 10N; VG10).
- Supply a proper amount of oil. Any excess may stain fabrics, etc.

1-2 Cleaning of Needle Plate



Broken threads left around the movable or fixed knives or the lower thread holding plate may result in thread trimming failure or parts damage. Clean them once a month.

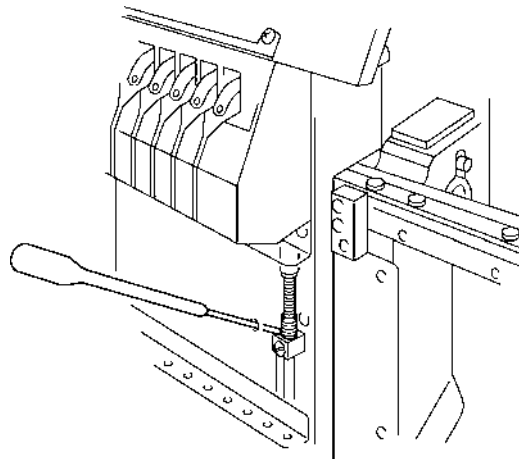
2. Oiling

Supply oil to the following places at regular intervals.

- When oiling, be sure to supply Brother's specified oil (Nippon Oil, Embroidery Lube 10N; VG10) using the dropper.
- Excessive oiling may cause the material to be stained.
- Be sure to wipe off excessive oils with waste cloth etc.

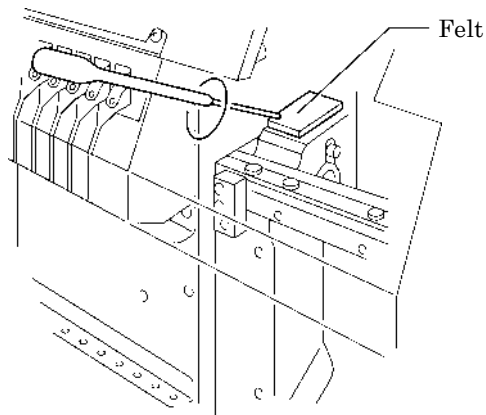
2-1 Head

- Supply one or two drops of oil to each needle bar from the oil supply holes of the lower cover daily.



W1221Q

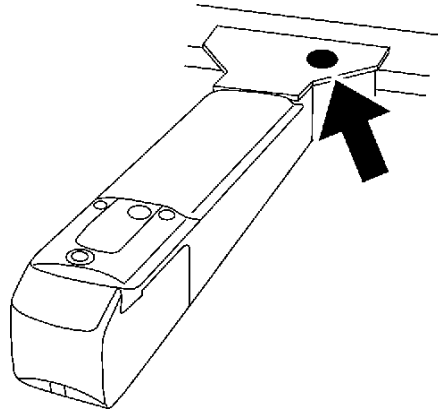
- Lubricate the felt on the top surface of the head once a week.



W1291Q

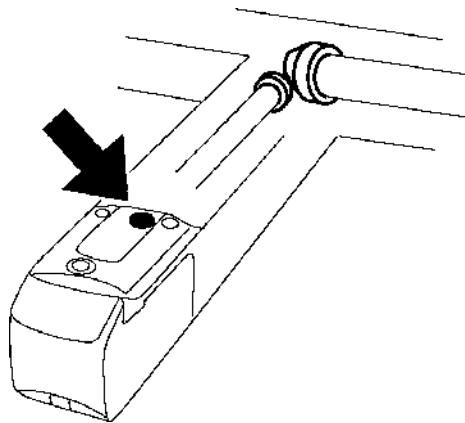
2-2 Lower shaft

- Lubricate the lower shaft bush R through the hole once a month.



W1292Q

- Lubricate the lower shaft bush F every 3 months.



W1293Q

3. Greasing

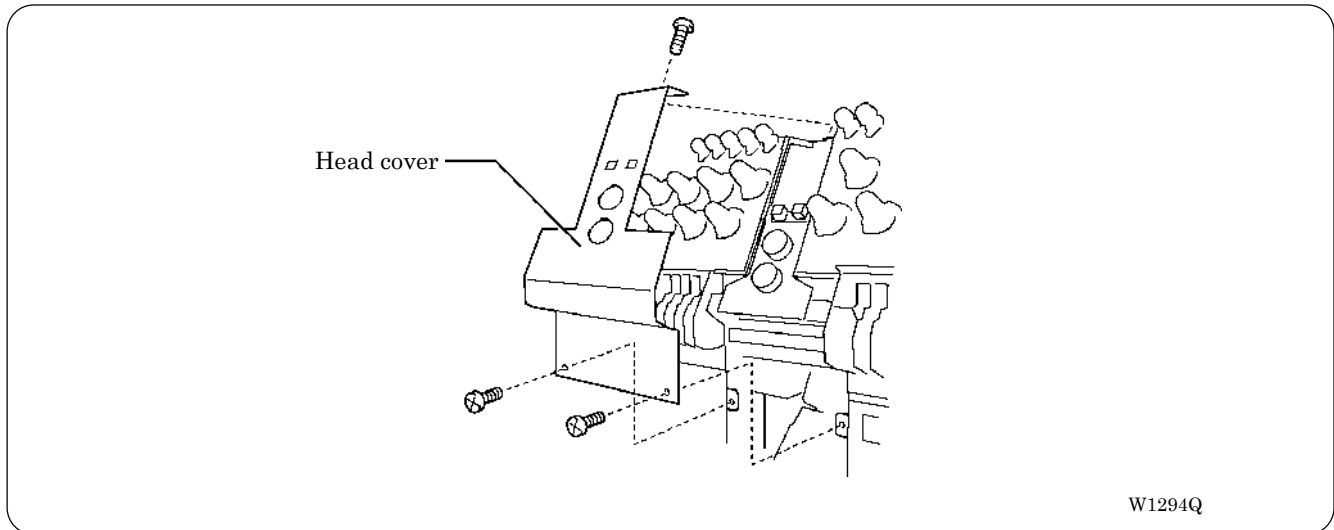
Supply grease to the following places at regular intervals.

- When greasing, be sure to use the grease tank EM-30L (white) provided with the machine.
- For overhauling, contact your distributor or refer it to trained experts.

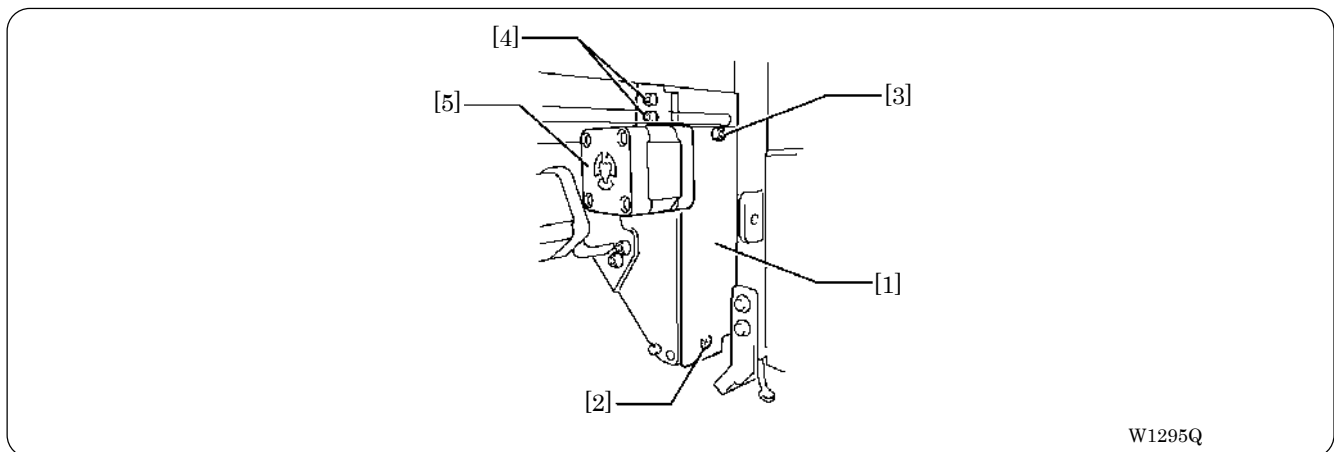
3-1 Cam grooves

- Supply grease to cam grooves (two positions) once a month.

1. Remove the head cover.

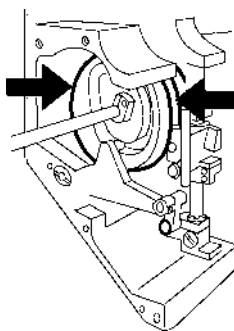


2. Move the needle bar case to the needle bar No.12 position.
3. Unscrew the lower flat screw [2] fixing the head front cover L [1], and loosen the upper fixing screw [3]. Remove the head front cover L [1].



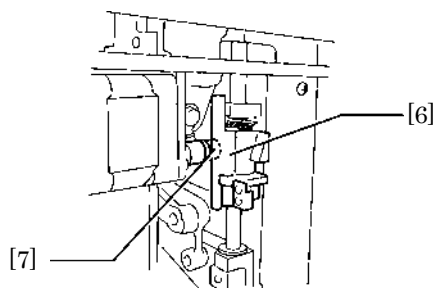
4. Unscrew the two adjusting bolts [4] and detach the jump part stepping motor [5].

5. Grease all the cam grooves of the work clamp cam.



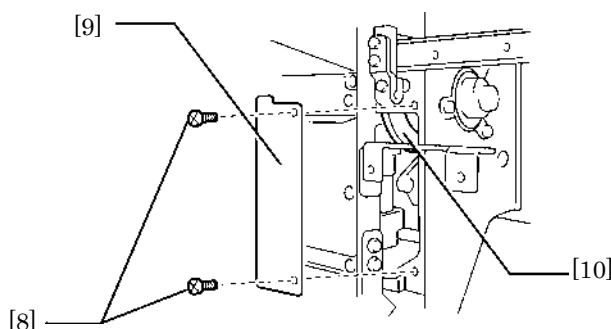
W1297Q

6. Attach the jump part stepping motor [5] and tentatively tighten the adjusting bolt [4].
7. Adjust the position of the bolt [4] so that the jump part [6] touches the roller [7] of the jump lever assembly, then fully tighten the bolt [4].
Adjust the roller [7] not to push the jump part [6] but just touches it.



W1298Q

8. Attach the head cover front L [1].
Apply seal adhesive (equivalent of Three Bond 1215) to the attaching face of the head before attaching the cover.
9. Move the needle bar case to the needle bar No.1 position.
10. Unscrew the 2 fixing screws [8] fixing the head front cover R [9], and remove the head front cover R [9].



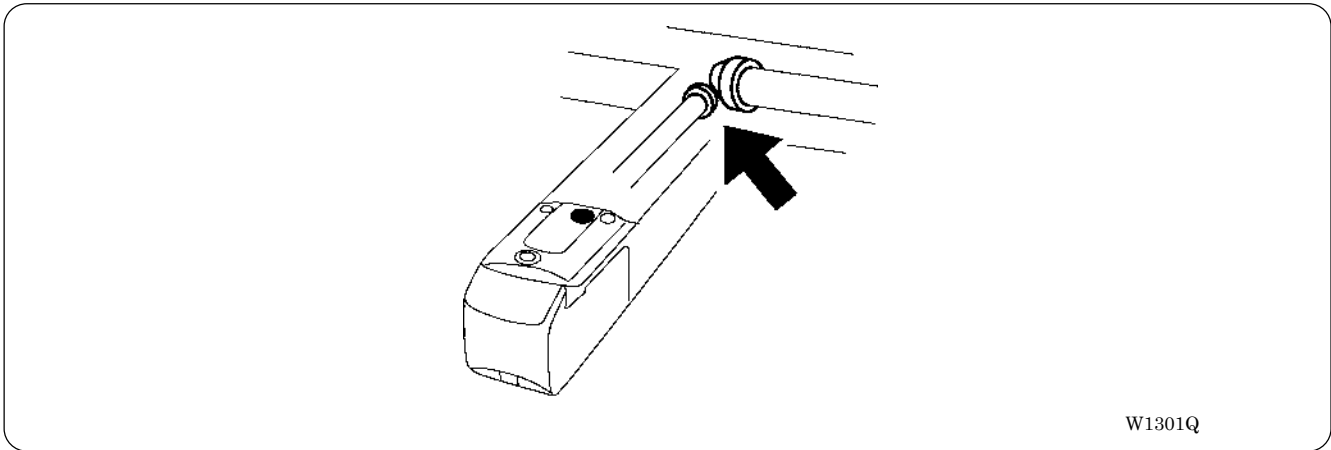
W1299Q

11. Grease all the cam grooves of the thread take-up driving cam [10].
12. Attach the head front cover R [9].
Apply seal adhesive (equivalent of Three Bond 1215) to the attaching face of the head before attaching the cover.

3-2 Lower gear

- Supply grease to the lower gear every three months.

1. Unscrew the 4 flat head screws fixing the bed cover B, and remove the bed cover B.
2. Grease the lower gear.

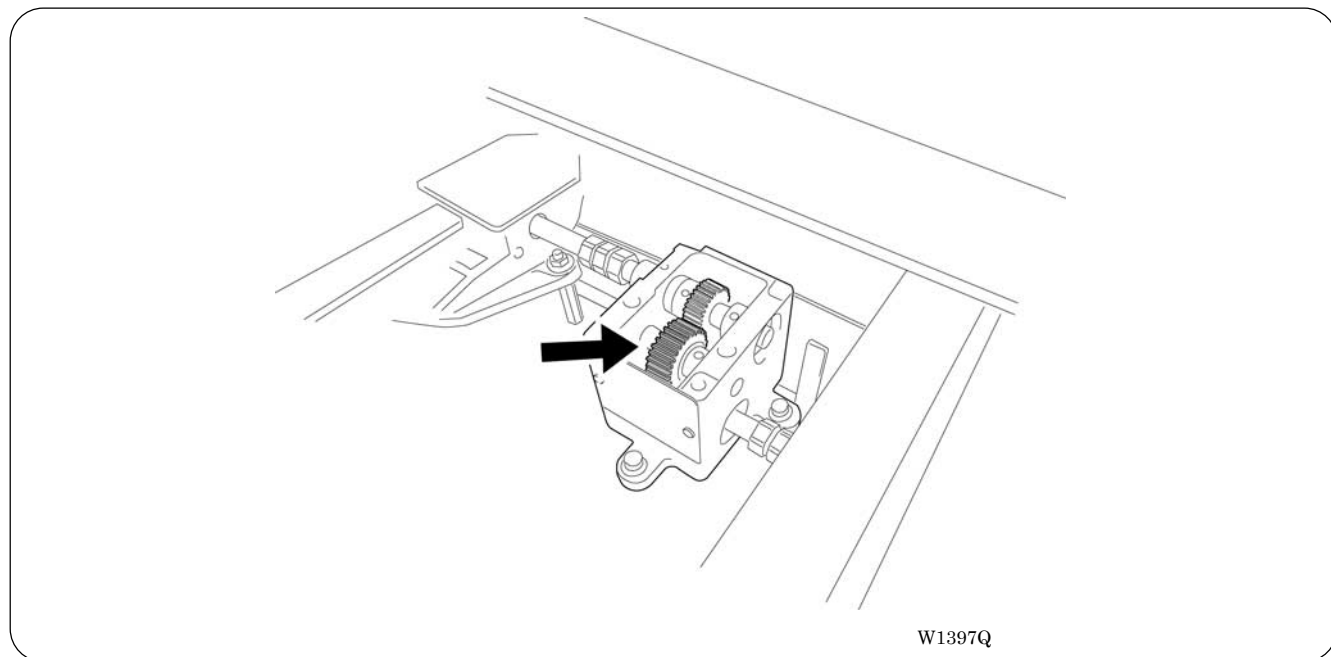


3. Attach the bed cover B.

3-3 Driving shaft

- Supply grease to the driving shaft every three months.

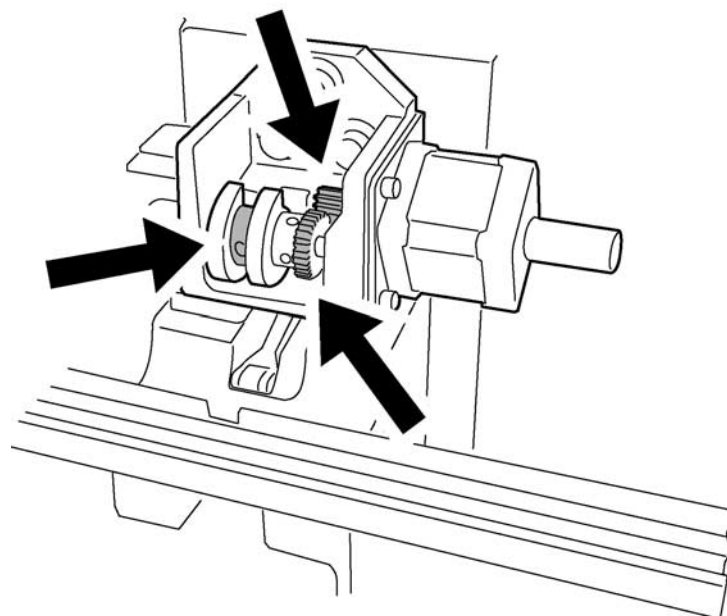
1. Unscrew four screws fixing the table cover L, and remove the table cover L.
2. Grease the intermediate gear.



3. Attach the table cover L.

3-4 Needle bar flip-up mechanism

- Supply grease to the needle bar flip-up mechanism every three months.
1. Unscrew three screws fixing the head cover R, and remove the head cover R.
 2. Grease all the cam grooves and two gears.

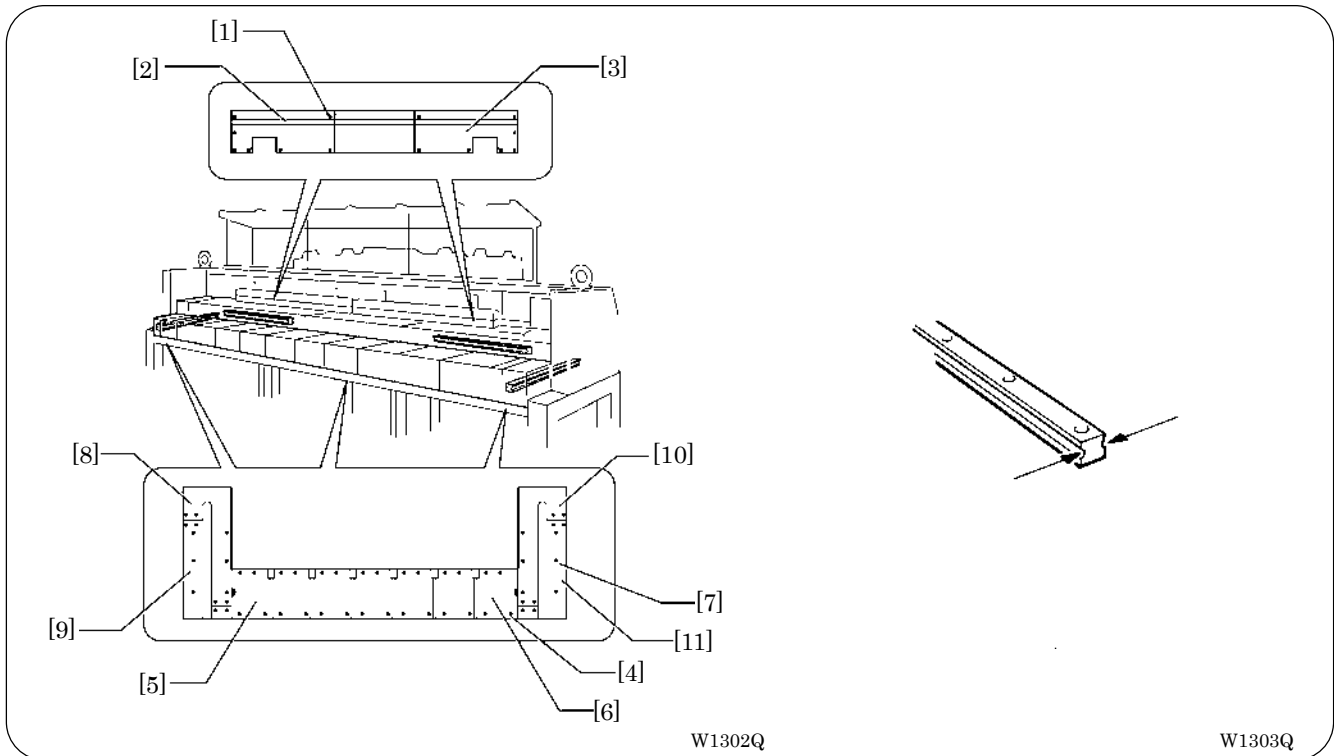


W1398Q

3. Attach the head cover R.

3-5 Feed Guide Section

- Check the X-feed linear guides (2 positions) and the Y-feed linear guides (one each on the right and left, and one point on bed No. 3).



Procedure

1. Unscrew the screw [1] and remove the X-feed covers R [2] and L [3].
For four head models, just remove the X-feed cover R [2] only.
2. Unscrew the screw [4] and remove the table covers R [5] and L [6].
3. Unscrew the screw [7] and remove the Y-feed covers R front [8], R rear [9], L front [10] and L rear [11].
4. Grease the X-feed linear guide parts (2 positions) and Y-feed linear guide parts (2 positions), and slide those parts to spread the grease.
5. Assemble all the components in the reverse order.

Chapter 8 Adjustment

⚠ CAUTION



Turn off the power switch and pull out the plug before starting adjustment. Failure to do so may start the machine unintentionally through an accidental activation of the START switch, resulting in bodily injuries.

• Adjustment

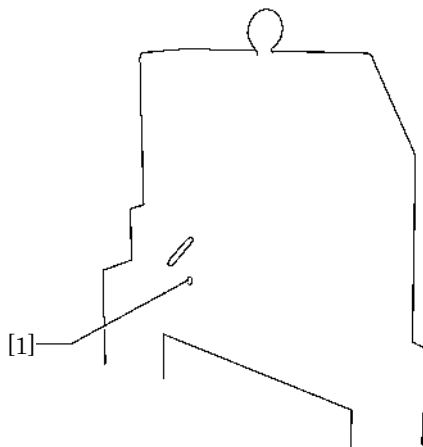


If adjustment should be made while the power switch is turned on, pay special attention to your safety.

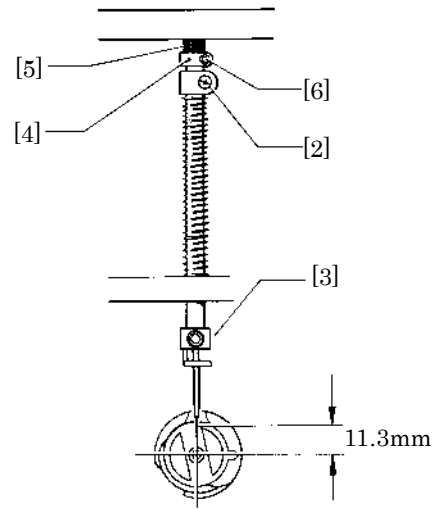


Maintenance and inspection of the machine should be conducted only by trained engineers.

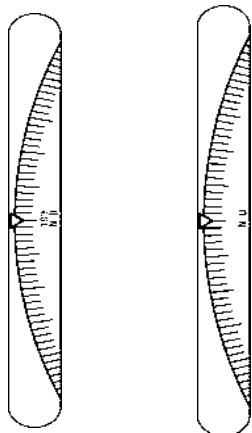
1. Adjusting Needle Bar Height



W1304Q

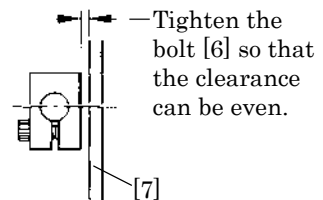
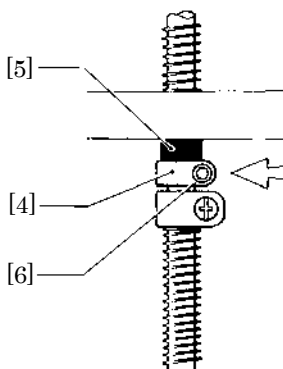


W1305Q

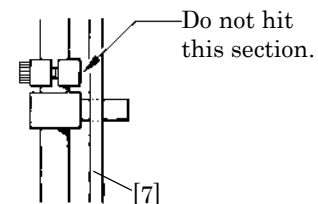


W1306Q

W1296Q



Tighten the bolt [6] so that the clearance can be even.



Do not hit this section.

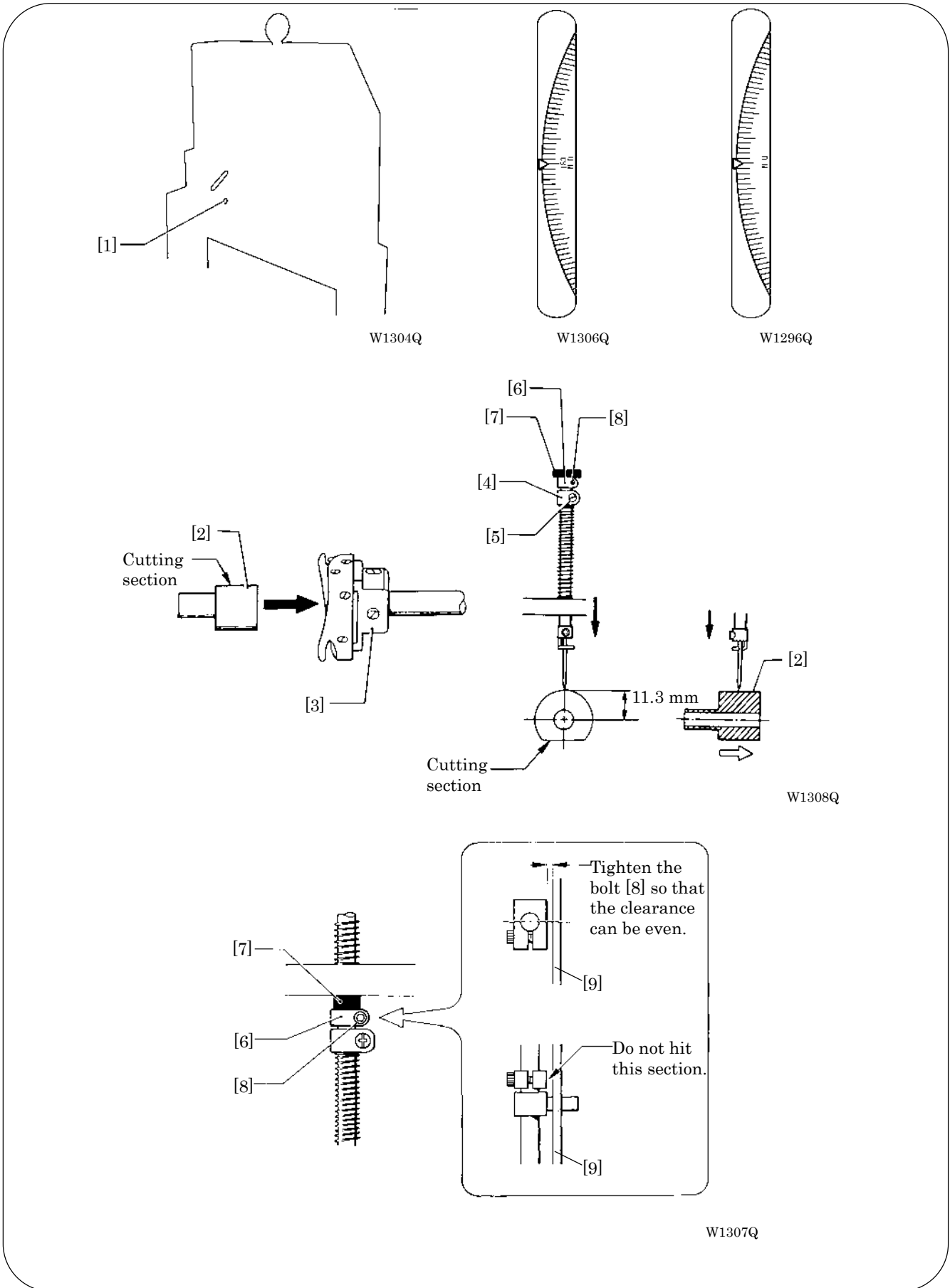
W1307Q

1. Put the attached T-shaped hexagonal wrench (4 mm) into the hole [1] on the left side of the machine body, and adjust the arrow plate to align with 180 degrees (N.D mark) to move the needle bar to the lowest point.
2. Loosen Needle bar guide bracket set screw [2] and the bolt [6] of the top dead center stopper [4] when the needle tip is positioned 11.3 mm above the center of the rotary hook shaft. Adjust the position of the needle bar thread guide so that the set screw [3] on it is turned to the right by 25 ~ 30°. Tighten Needle bar guide bracket set screw [2] securely.

When tightening the needle bar clamp set screw [2], the hole in the needle bar guide should face the front.

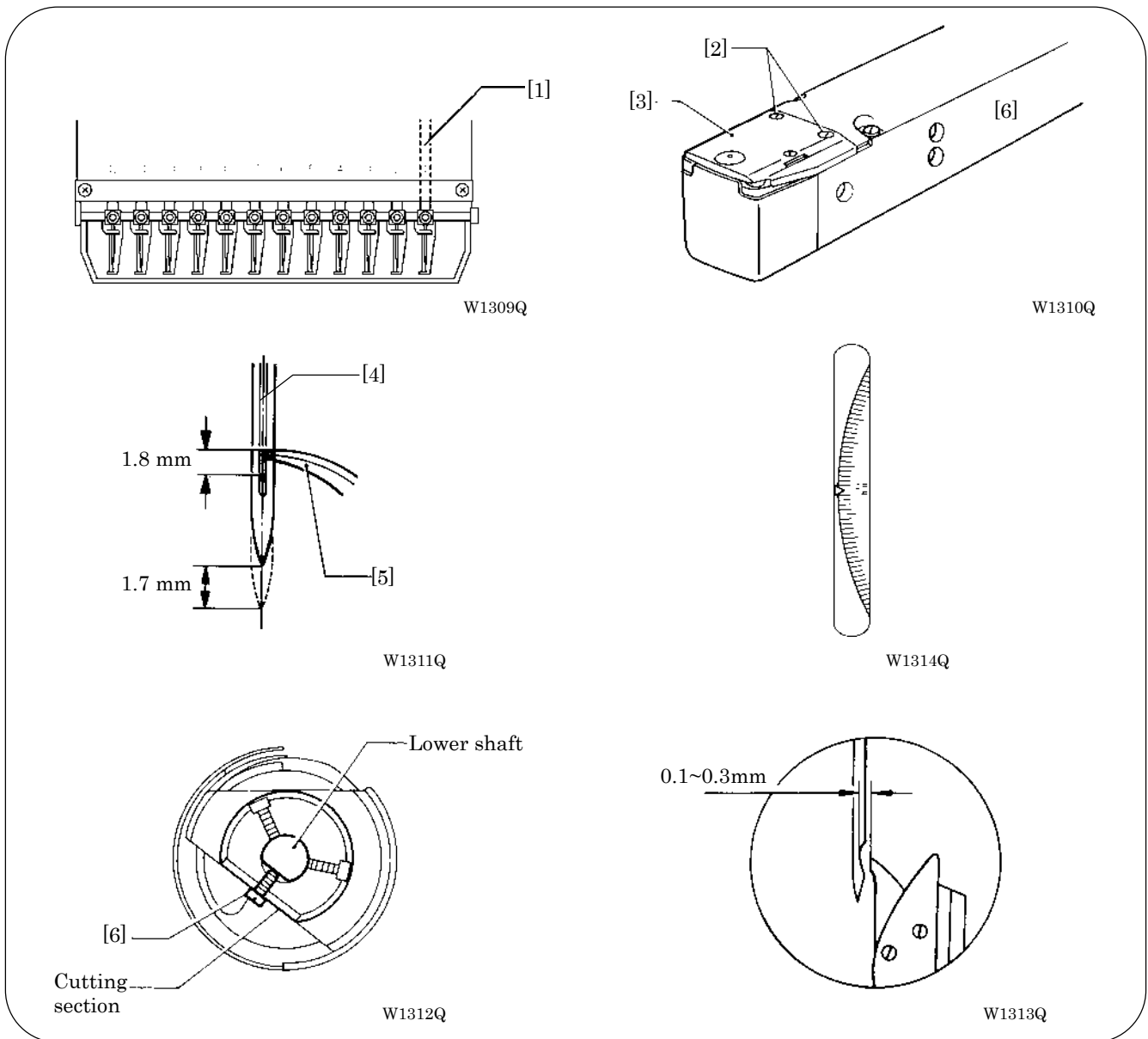
3. Set the needle bar at the highest position (where the arrow plate and the “N.U.” mark are aligned). Lightly press the top dead center stopper [4] toward the cushion rubber [5], and tighten Socket head bolt for top dead center stopper [6] while pressing down the needle bar clamp so that it faces the front. (Tightening torque: 0.78 N.m)
 - Make sure that the top dead center stopper does not hit the needle bar guide rail [7] at this time.
 - When tightening the upper dead point stopper bolt [6], insert the longer side of the attached wrench into the bolt and tighten it by using the shorter side.
Excessive tightening may make the needle bar movement sluggish.

■ When using the bottom dead center gauge



1. Put the attached T-shaped hexagonal wrench (4 mm) into the hole [1] on the left side of the machine body, and adjust the arrow plate to align with 180 degrees (N.D mark) to move the needle bar to the lowest point.
2. Insert the bottom dead center gauge [2] into the rotary hook [3].
3. Loosen the screw [5] of the needle bar clamp [4] and Socket head bolt for top dead center stopper [8], then move the needle bar up and down until the needle tip touches the gauge [2] lightly.
 - The needle point should touch the gauge at a place other than the cutting section.
 - The bottom dead center gauge should be set in or removed from the rotary hook with its cutting section facing upward.
4. Tighten the screw [5] of the needle bar clamp [4] securely.
5. Set the needle bar at the highest position (where the arrow plate and the "N.U." mark are aligned). Lightly press the top dead center stopper [6] toward the cushion rubber [7], and tighten Socket head bolt for top dead center stopper [8] while pressing down the needle bar clamp so that it faces the front. (Tightening torque: 0.78 N.m)
 - Make sure that the top dead center stopper [6] does not hit the needle bar guide rail [9] at this time.
 - When tightening the upper dead point stopper bolt [8], insert the longer side of the attached wrench into the bolt and tighten it by using the shorter side.
Excessive tightening may make the needle bar movement sluggish.

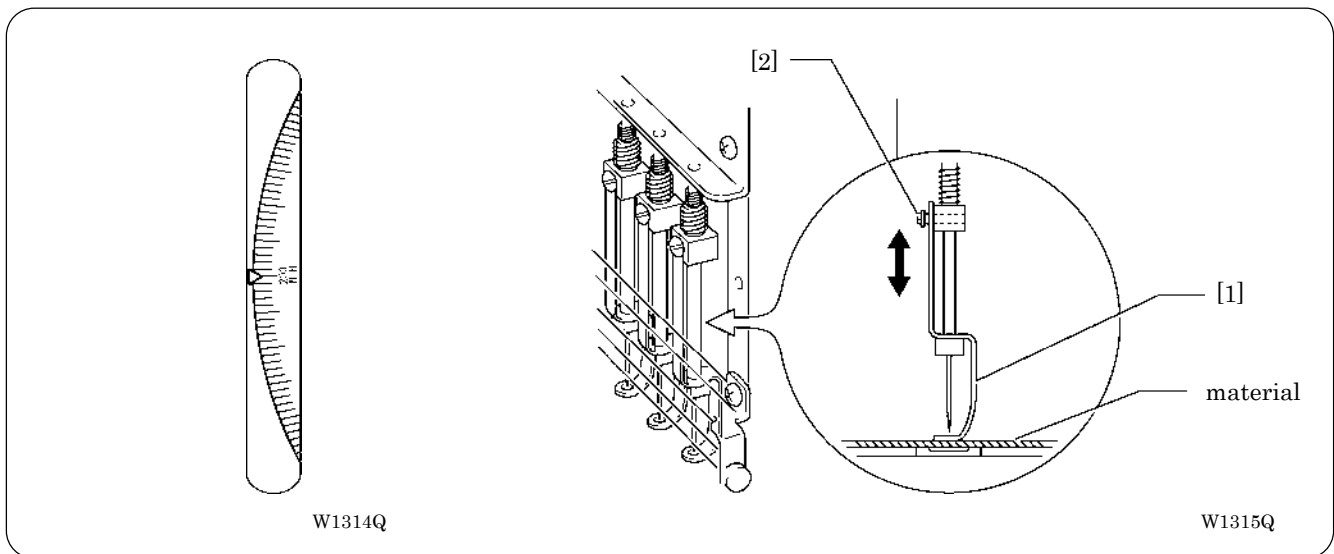
2. Attachment and Adjustment of Rotary Hook



1. Turn the power switch off.
2. Select the needle bar No. 1 [1].
3. Remove two flat screws [2] and dismount the needle plate [3].
4. Adjust so that the needle [4] and the point of rotary hook [5] should meet at the position (where the arrow plate aligns with N.H mark (200 °)) higher by 1.7 mm than the needle bar lowest point (180 °).
Perform this after the height adjustment of the needle bar.
5. Turn the rotary hook manually until the point of rotary hook [5] turns up.
6. Loosen the screw [6] of the rotary hook cutting section and adjust the clearance between the needle and the rotary hook to be within 0.1 to 0.3 mm.
Confirm that the height of the needle bar is 1.8 mm then.

7. Tentatively tighten the screw [6].
8. Check with needle bars of No. 2 to No. 12 if the clearance between each needle and the rotary hook is within 0.1 to 0.3 mm.
If there are any needles with clearances out of the range above, adjust them again to get proper clearances.
9. Fully tighten the screw [6].

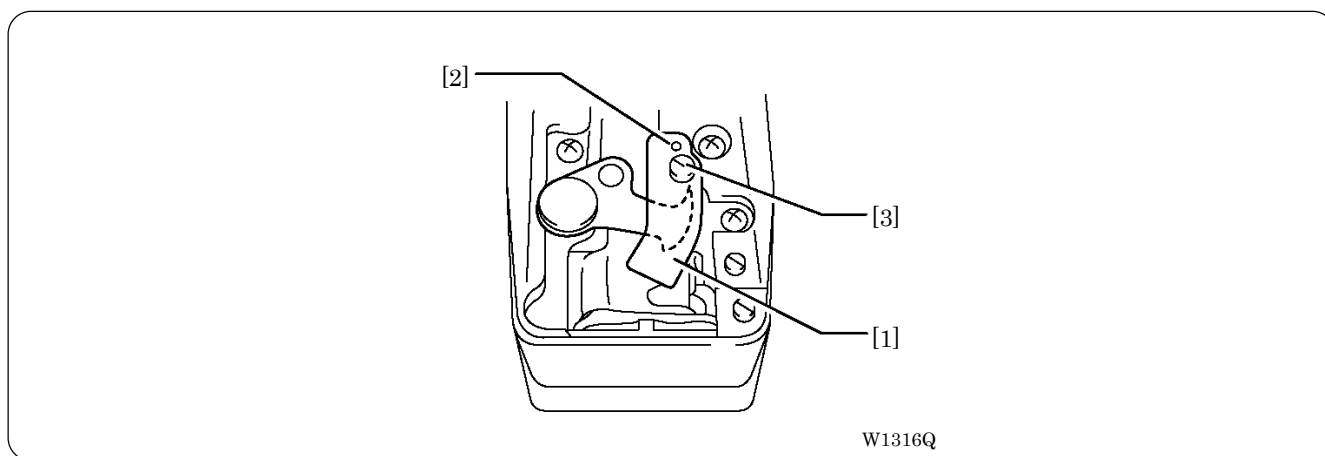
3. Adjustment of Presser Foot Height



1. Turn the power switch off.
2. Select the needle bar No. 1.
3. Loosen the screw [2] of the presser foot [1], and adjust the presser foot [1] until it comes above the cloth top surface when it is at the alignment position (where the arrow plate and the "N.H" mark (200°) are aligned).
When the presser feet have been adjusted in height, check that each needle lowers to the center of the presser foot hole.
4. Adjust the arrow plate to align with 100 degrees, and then change colors.
Adjust the needle bar No.2 - No.12 similarly.

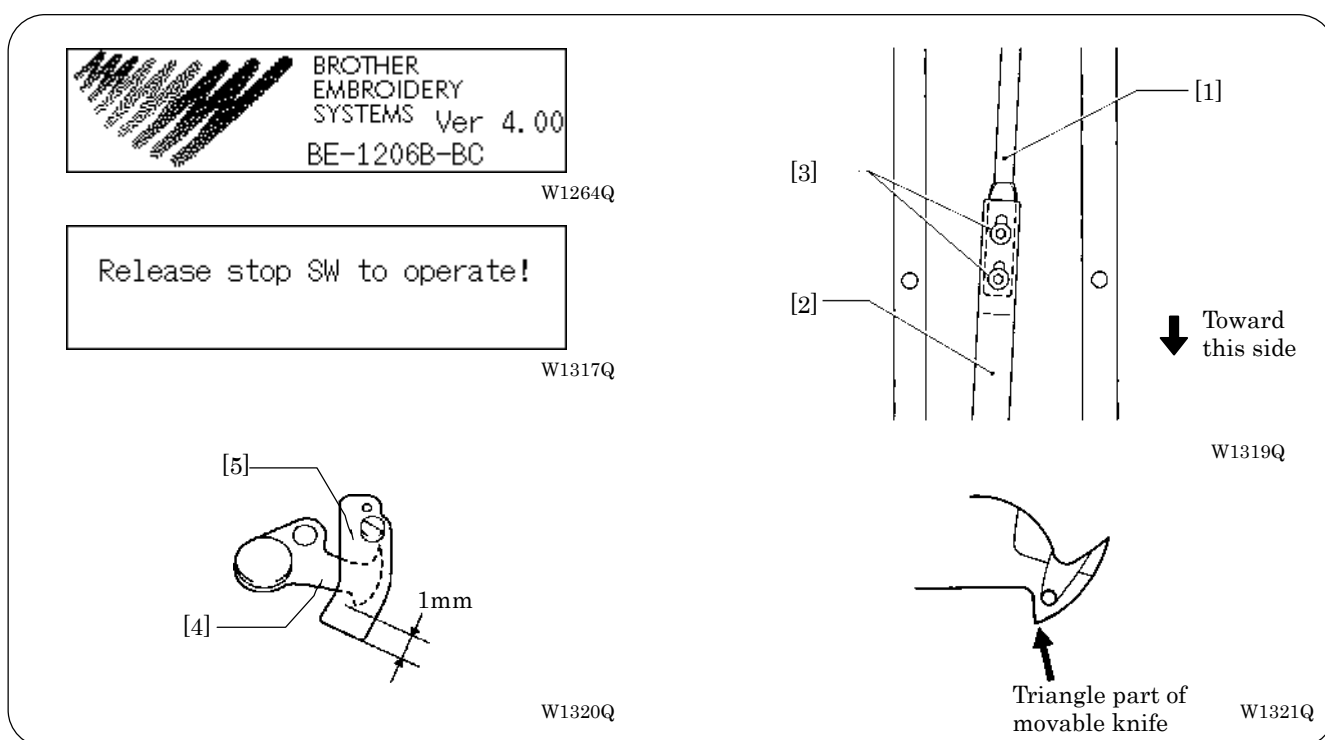
4. Adjustment of Thread Trimmer

4-1 Attaching the Fixed Knife



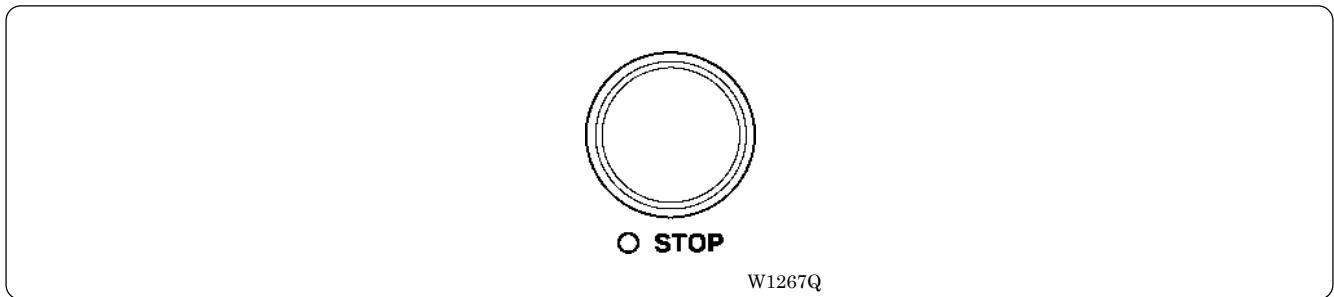
Bring the fixed knife [1] to right side centering on the pin [2]. Tighten the bolt [3].

4-2 Checking the Movable Knife Position



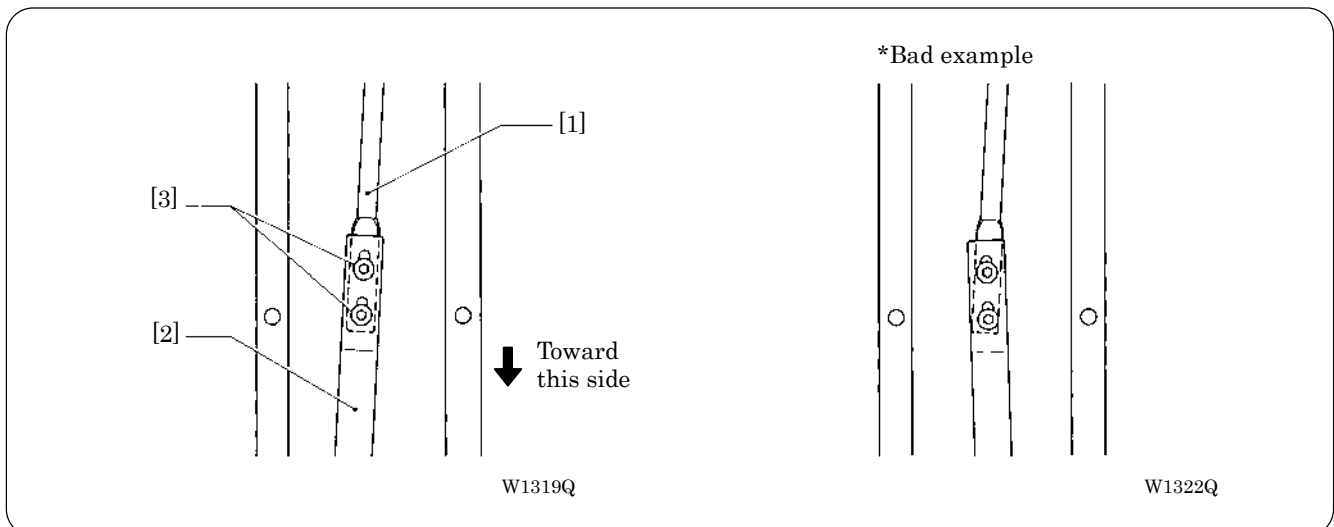
1. Turn the power switch on and wait until the hoop home position detection is finished.

- Press the stop switch in order to ensure maximum safety during adjustment.



Adjust the movable knife position in this state.

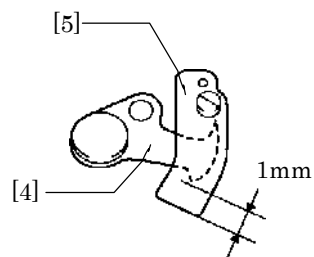
- Loosen two bolts [3] that connect the thread trimmer connecting rods B [1] and A [2].
 - Tighten the two bolts [3] until the triangle part of the movable knife [4] is protuded by 1 mm from the fixed knife [5].
- * Precautions for tightening the two bolts [3]:



- The thread trimmer connecting rod A [2] has a backlash of about 0.1 ~ 0.2 mm back and forth. Tighten the two bolts [3] while pulling them forward by the backlash amount.
- Tighten the two bolts [3] so that the thread trimmer connecting rods A [2] and B [1] are positioned in a straight line.

Release stop SW to operate!

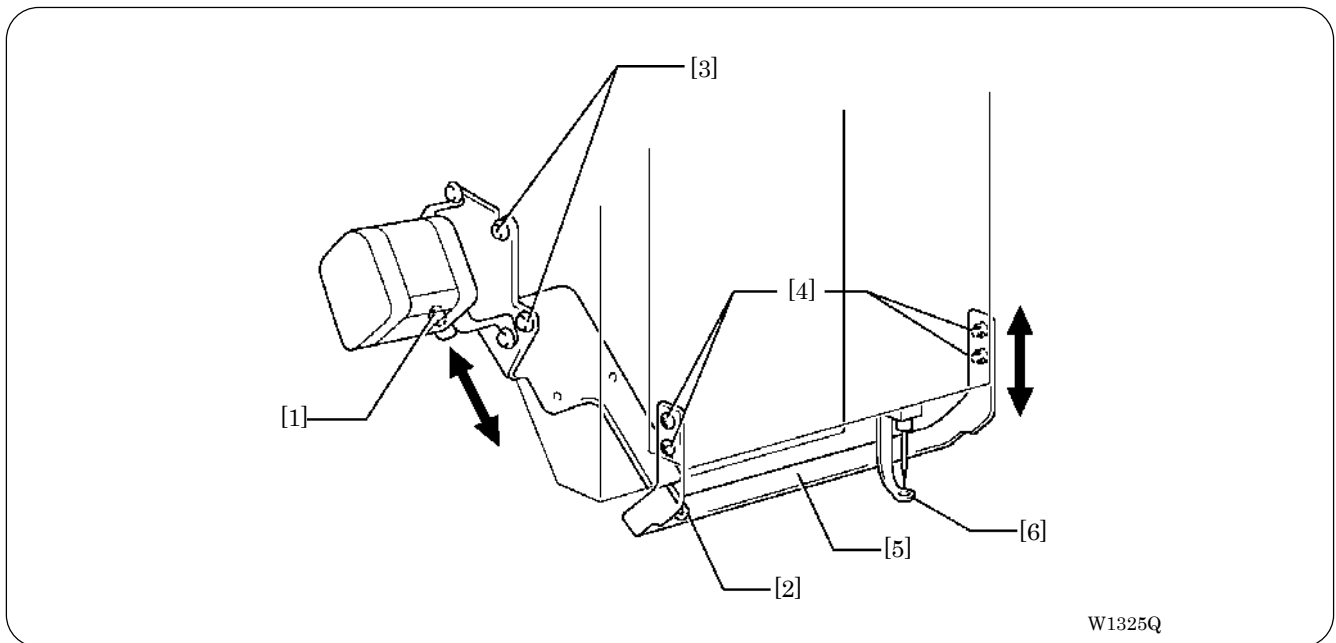
W1317Q



W1320Q











5. After adjustment is finished, reset the stop switch.
"Release stop SW to operate!" disappears.
6. Turn the power switch off once, then on again. Check that the clearance between the movable knife [4] and the fixed knife [5] is 1 mm.
7. When adjusting again, follow the step 2 and after.


















5. Thread Wiper Adjustment






1. Move wiper lever assy [1] in the direction of the arrow with your finger. Loosen two bolts [3] and adjust upper thread hook [2] for smooth movements.
2. If there is a difference in motion between needle bars No. 1 and No.12, loosen four screws [4] and make an adjustment by moving thread nipper assy [5] in the direction of the arrow. Make sure that no interference will occur when pressure foot [6] return to home position.
3. After the above steps are complete, check upper thread hook [2] for smooth movements.






Chapter 9 Error code list

Code	Error Messages	Error	Measures
E-00	ERROR 00	No error occurs.	This is not usually displayed.
E-01	ERROR 01	Either motor of main shaft, X- or Y-axis, or lower shaft has locked.	
E-02	Overtravel	Overtravel occurs during home position detecting movement.	
E-03	Stop SW was pressed during home positioning	The stop switch is pressed during home position detecting movement.	Press the  or turn on the F/B switch on the head to either side to restart the home position detecting movement again.
E-04	Home position detection is out of range	Home position detection out of range	This is not usually displayed.
E-05	Needle stop position error	Needle stop position error	Adjust the pulley stop position (100 degrees) above the needle and press the  or turn on the F/B switch on the head to either side.
E-06	Needle bar case position error	Needle bar case position error	Adjust the position of needle bar case manually, then press the  or turn ON the F/B switch on the head to either side. If the same error occurs again, the color change proper position sensor is faulty.
E-07	Needle case lock	Needle bar case lock	Press the  or turn on the F/B switch on the head to either side. If the same error occurs again, the color change mechanism is faulty.
E-08	ERROR 08	Stop switch or emergency switch was pressed while the needle bar case is traveling.	This is not usually displayed.
E-09	X-axis home position error	X-axis home position detection error	Turn the power off and on once. If the same error occurs again, the X-axis mechanism is faulty.
E-0A	Thread breakage error	Thread breaking error	After passing through the thread, press the  or turn on the F/B switch on the head to either side.
E-0B	ERROR 0B	Stop or emergency stop during sewing	This is not usually displayed.
E-0C	Lower thread breakage error	Lower thread broke during embroidering.	After the replacement of the lower thread, press the  or turn ON the F/B switch on the head to either side.
E-0D	ERROR 0D	The machine does not return to the home position.	This is not usually displayed.
E-0E	ERROR 0E	Mending finish	
E-0F	Needle bar No. reading error	Failed in the reading of needle bar No.	Press the  or turn ON the F/B switch on the head to either side. If the same error occurs again, the I/O CPU communication is faulty, or the color change position sensor is faulty.
E-10	The beam sensor turned ON	Abort by the beam sensor ON	Press the  or turn ON the F/B switch on the head to either side.
E-11	X sensor reading error	Failed in the reading of X home position sensor	Press the  or turn ON the F/B switch on the head to either side. If the same error occurs again, the I/O CPU communication is faulty.
E-12	Y sensor reading error	Failed in the reading of X home position sensor	Press the  or turn ON the F/B switch on the head to either side. If the same error occurs again, the I/O CPU communication is faulty.

Code	Error Messages	Error	Measures
E-13	Performing the home position detection for the hoop position adjustment	This is displayed in case that the machine had been shut down while the hoop was moving and now is started up in a mode without the home position detection, or in case that the machine is started up in a mode without the home position detection after pressing the CAP SW to change the hoop.	Press the  to start the home position moving.
E-14	Y-axis home position error	Y-axis home position error	Turn the power off and on once. If the same error occurs again, the Y-axis mechanism is faulty.
E-15	Press  for restart.	Stop error during SSP processing (when pressing the stop key while the hoop is moving)	Hoop movement restarts if you press  .
E-16	Needle bar No. of the destination is abnormal	Needle bar No. of the destination is out of range	Press the  , or turn ON the F/B switch on the head to either side to cancel the error and set up the needle bar setting again.
E-17	Speed range abnormal	Speed range is out of range	This is not usually displayed.
E-18	X-axis stepping motor connector error	X-axis stepping motor connector error	Turn the power off and on once after checking to see that the connector of the X-axis stepping motor is properly connected.
E-1A	ERROR 1A	Destination coordinates error	This is not usually displayed.
E-1B	ERROR 1B	The machine has reached the mending stop position.	
E-1C	Restart perimeter	The machine stops during mask tracing.	Tracing is cancelled if the  key is pressed when the machine is stopped during mask tracing. Press the  key to continue tracing.
E-1D	Stop while transferring to next repeat pattern	The machine stops while the needle is moving between patterns during repeat sewing.	This is displayed when the stop switch is pressed while the hoop is moving. Press the  to move the hoop again. (It is necessary to press the  again to start sewing.)
Errors E-1C and E-1D are not displayed due to mechanical problems.			
E-1E	Remove unused presser foot, or it may be damaged	When the power is turned on, bed can not be retracted.	This is not displayed in this model.
E-1F	Presser foot down error	Presser foot down error while searching for home position just after the power is turned on.	
E-21	Area over 	Hoop overhang (+X)	Pattern or the needle position is out of the embroidering area. Reset the embroidering area on the panel or move the hoop to the sewable position.
E-22	Area over 	Hoop overhang (+Y)	
E-23	Area over 	Hoop overhang (+X, +Y)	
E-24	Area over 	Hoop overhang (-X)	
E-25	Area over 	Hoop overhang (+X, -X)	
E-26	Area over 	Hoop overhang (-X, +Y)	
E-27	Area over 	Hoop overhang (+X, -X, +Y)	
E-28	Area over 	Hoop overhang (-Y)	
E-29	Area over 	Hoop overhang (+X, -Y)	

Code	Error Messages	Error	Measures
E-2A	Area over	Hoop overhang (+Y, -Y)	Pattern or the needle position is out of the embroidering area. Reset the embroidering area on the panel or move the hoop to the sewable position.
E-2B	Area over	Hoop overhang (+X, +Y, -Y)	
E-2C	Area over	Hoop overhang (-X, -Y)	
E-2D	Area over	Hoop overhang (+X, -X, -Y)	
E-2E	Area over	Hoop overhang (-X, +Y, -Y)	
E-2F	Area over	Hoop overhang (+X, -X, +Y, -Y)	
E-31	Area over	Needle overhang (+X)	
E-32	Area over	Needle overhang (+Y)	
E-33	Area over	Needle overhang (+X, +Y)	
E-34	Area over	Needle overhang (-X)	
E-36	Area over	Needle overhang (-X, +Y)	
E-38	Area over	Needle overhang (-Y)	
E-39	Area over	Needle overhang (+X, -Y)	
E-3C	Area over	Needle overhang (-X, -Y)	
E-40	Remove unused presser foot, or it may be damaged	The status of presser foot is issued as an alarm when every second machine is used.	This is not displayed in this model.
E-41	This function is not supported. Turn off the power	Invalid start-up error	
E-42	XY movement error	XY movement error	Press the or turn on the F/B switch on the head to either side. If this error occurs frequently, check if the tension of the pulley belt is proper.
E-43	Slave I/F EEPROM read error	I/F CPU failed to read EEPROM data	Turn the power off and on once. If the same error occurs again, the main PC is faulty.
E-44	Inter-head CPU communication error	Failed in the communication with inter-head CPU	Press the or turn ON the F/B switch on the head to either side. If the same error occurs again, the connector of communication cable on the inter-head CPU may be disconnected.
E-45	Head CPU communication error	Failed in the communication with head CPU	Press the or turn ON the F/B switch on the head to either side. If the same error occurs again, the connector of communication cable on the head CPU may be disconnected.
E-46	XY CPU communication error	Failed in the communication with XY CPU	Press the or turn ON the F/B switch on the head to either side. If the same error occurs again, the main PCB is faulty.
E-47	I/F CPU communication error	Failed in the communication with I/F CPU	Press the or turn ON the F/B switch on the head to either side. If the same error occurs again, the main PCB is faulty.
E-48	Main shaft rotation abnormal	The main shaft rotated the opposite way	Turn OFF the power and check if the sensors of the encoder A and B are connected correctly, not mixed-up each other. If those connections are correct, then check if the pin connections of the main shaft motor connectors are correct.

Code	Error Messages	Error	Measures
E-49	Can not identify the machine model	Can not identify the machine model	Turn OFF the power, check if the model identification harness is connected properly, and turn ON the power again.
E-4A	I/O CPU communication error	Failed in the communication with I/O CPU	Press the  or turn ON the F/B switch on the head to either side. If the same error occurs again, the connector of communication cable on the I/O PCB may be disconnected.
E-A1	Main (Z) motor lock	Spindle motor lock	Press the  or turn on the F/B switch on the head to either side. If it occurs frequently, the main shaft mechanism is faulty.
E-A2	Main (Z) PCB temperature is too high	Main PC board temperature too high	This is not usually displayed.
E-A3	Main (Z) motor voltage is too low	Spindle motor voltage too low	
E-A4	Main (Z) motor voltage is too high	Spindle motor voltage too high	
E-A5	Spindle CPU error	Spindle motor CPU error	
E-A6	ERROR A6	Spindle motor CPU communication command error	
E-A7	ERROR A7	Spindle motor CPU send/receive error	
E-A8	ERROR A8	Spindle stop position signal error	Adjust the pulley stop position (100 °) above the needle and press the  . If the error occurs frequently, the parts related to the main shaft stop position sensor are faulty.
E-A9	Spindle CPU parameter error	Spindle CPU parameter error	This is not displayed in this model.
E-B0	Lower shaft CPU error	Lower shaft CPU error	
E-B1	Thread jammed in rotary hook	Thread tangle in rotary hook	
E-B2	Hook motor origin point error	Hook motor origin point error	
E-B3	Hook motor standby position error	Hook motor standby position error	
E-B4	Hook motor standby position error	Hook motor motor mode error	
E-B5	Hook motor communication error	Hook motor communication error	
E-B6	Hook motor parameter error	Hook motor parameter error	
E-B7	Hook motor overheat error	Hook motor overheat error	
E-B8	Hook motor overcurrent error Turn off the power	Hook motor overcurrent error	
E-B9	Thread trimming motor origin point error	Thread trimming motor zero point error	Turn the power off and on once. If the same error occurs again, the lower shaft motor is faulty.
E-BA	Power supply frequency error	Power supply frequency error	Turn the power off and check the thread trimmer and turn the power on again. If it occurs again, the thread trimmer is faulty.
E-BC	No power error	No power error	It may usually occur momentarily when turning off the machine. If it occurs when the machine is on, it is a power failure detection error.

Code	Error Messages	Error	Measures
E-BD	Lower shaft flash memory error	Lower shaft flash memory error	This is not displayed in this model.
E-BE	Lower shaft version-up error	Lower shaft version-up error	
E-BB, BF	ERROR BB, BF	Lower shaft motor undefined error	
E-C1	ERROR C1	Area over during embroidering	
E-C2	Wiper out error	Wiper out error	If the wiper is tangled with a thread, remove it. Press the  or turn on the F/B switch on the head to either side.
E-C3	ERROR C3	Embroidering data buffer empty	Check the connection of the communication cable of the panel. If the cable is connected correctly, press the  or turn on the F/B switch on the head to either side. If the cable is disconnected, turn off the power and connect the cable.
E-C4	Presser foot down error	Presser foot down error	This is not usually displayed.
E-C5	ERROR C5	Measured voltage value could not be received from the lower shaft motor CPU.	
E-C6	ERROR C6	Voltage value could not be transferred to the lower shaft motor CPU.	
E-C7	ERROR C7	Lower shaft error	
E-C8	ERROR C8	Hook motor origin point error	
E-C9	Embroidering start error	Embroidering start error	
E-CA	ERROR CA	No sewing permission	
E-CB	Spindle rotation speed error	Spindle rotation speed error	Press the  or turn on the F/B switch on the head to either side to cancel the error and press the  . If the same error occurs again, there is a possibility that the spindle is overloaded.
E-CC	ERROR CC	Shuttle thread entanglement automatic reset	This is not usually displayed.
E-CD	Spindle rotation command sending error	Speed command can not be received.	Turn the power off and on once. If the same error occurs again, the main PCB is faulty.
E-CE	Cylinder bed position error	Cylinder bed position error	This is not usually displayed.
E-CF	ERROR CF	Rated voltage value could not be received from the lower shaft motor CPU.	
E-D0	Power PC board error	Power PC board error	Turn the power off and on once. If the same error occurs again, the power PCB is faulty.
E-D1	Cooling fan motor stop	Cooling fan motor stop.	This is not usually displayed.
E-D2	Power voltage upper limit error	Power voltage upper limit error	(1) The voltage setting is improper. -> Set it again.
E-D3	Power voltage lower limit error	Power voltage lower limit error	(2) Press the  or turn on the F/B switch on the head to either side. If the same error occurs again, the power PCB or the power supply is faulty.
E-D4	Thread trimming motor overcurrent	Thread trimming motor overcurrent	Turn OFF the power. The possible causes for this error are, troubles of the thread trimming motor, troubles of the main PCB, and troubles of the drive PCB.

Code	Error Messages	Error	Measures
E-D5	Needle bar case motor overcurrent	Needle bar case motor overcurrent	Turn OFF the power. The possible causes for this error are, troubles of the needle bar case motor, troubles of the main PCB, and troubles of the drive PCB.
E-D6	Jump motor overcurrent	Jump motor overcurrent	Turn OFF the power. The possible causes for this error are troubles of the jump motor and troubles of the head PCB.
E-D7	Temperature rise error Clean the fan filter	The temperature of the heat sink on the drive PCB rose excessively	Turn OFF the power and check if the fan filter has any clogging.
E-D8	Temperature sensor abnormal	Temperature sensor abnormal	Turn OFF the power. The possible causes for this error are troubles of the thermistor and troubles of the drive PCB.
E-E1	X-axis pulse motor overcurrent stop Turn off the power	X-axis pulse motor overcurrent stop	Turn OFF the power and ON once. If the same error occurs again, the pulse motor or the drive PCB is faulty.
E-E2	Y-axis pulse motor overcurrent stop Turn off the power	Y-axis pulse motor overcurrent stop	
E-E3	Exhaust fan motor stop	Cooling fan motor stop A Press R.	Turn OFF the power and check the fan harness. Turn OFF the power again. If the same error occurs again, the fan or the power PCB is faulty.
E-E4	Hook motor error	Lower shaft communication error	This is not displayed in this model.
E-E5	ERROR E5	Over-run error during interfacing to main PCB CPU	This is not usually displayed.
E-E6	ERROR E6	Framing error during interfacing to main PCB CPU	
E-E7	ERROR E7	Parity error during interfacing to main PCB CPU	
E-E8	ERROR E8	Receiving time up error during interfacing to main PCB CPU	
E-E9	ERROR E9	Send/Receive inconsistent error during interfacing to main PCB CPU	
E-EA	ERROR EA	ACK code receiving error during interfacing to main PCB CPU	
E-EB	ERROR EB	Send/Receive ID code error during interfacing to main PCB CPU	
E-EC	ERROR EC	Send data checksum error during interfacing to main PCB CPU	
E-ED	ERROR ED	Data empty error during interfacing to main PCB CPU	
E-EE	ERROR EE	Abnormal data received in the inner-machine communication	
E-EF	ERROR EF	Receiving error on interface	
E-F1	ERROR F1	Receive time up error	
E-F2	ERROR F2	Request-to-waiting time up error	
E-F3	ERROR F3	Request-to-receive time up error	
E-F4	ERROR F4	Receive command error	
E-F5	ERROR F5	NACK code receiving error	
E-F6	ERROR F6	Data requested for needle position can not be returned.	
E-F7	ERROR F7	It is not receive command for the request one.	
E-F8	ERROR F8	PRE code error	

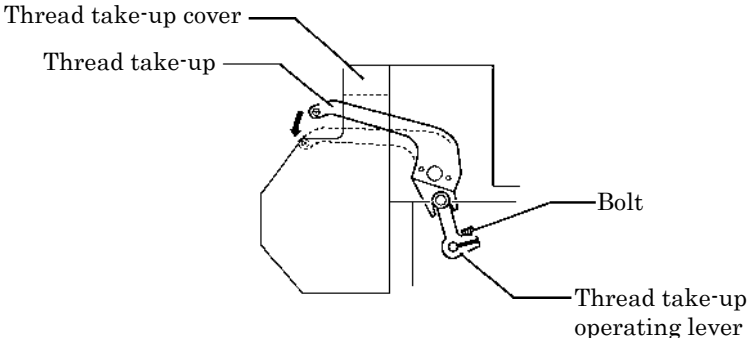
Code	Error Messages	Error	Measures
E-F9	ERROR F9	No applicable command	This is not usually displayed.
E-FA	ERROR FA	Interface receive data check sum error	
E-FB	ERROR FB	Send time up error	
E-FF	ERROR FF	No status is returned from spindle, lower shaft motor, or CPU.	

Chapter 10 Troubleshooting

If there is any indication of trouble with the machine, check and correct as described in the table. If the trouble cannot be corrected, turn off the power and contact your distributor for corrective actions.

Mechanical Section

	Problem	Check point
Check these points once again	<ul style="list-style-type: none"> ■ Thread breakage 	<ul style="list-style-type: none"> • Is the machine properly threaded? • Is thread tension too high? • Is the rotary hook assembly clogged? • Is there thread in the bobbin? • Is the needle bent? • Is there a rough edge or flaw on the needle plate, rotary hook, or bobbin case that might cut the thread? • Is the needle installed correctly (direction, angle, etc.) • Is the presser foot in contact with the material? • Are the thread thickness and needle size correct? • Is a thread with right-hand twist being used? (If such a thread is used, replace with a thread with left-hand twist.) • Is there any adhesive on the needle? • Is the material tension too weak? • Is there too much play between the outer rotary hook and inner rotary hook? • Does the outer rotary hook turn smoothly? • Is the clearance between the rotary hook stopper and the rotary hook adjusted correctly? • Does the thread come out from the bobbin case smoothly?
	<ul style="list-style-type: none"> ■ Needle (presser foot) interference with embroidery hoop 	<ul style="list-style-type: none"> • Is the embroidery hoop too small? • Check the size and needle start position in the sewing data.
	<ul style="list-style-type: none"> ■ Needle breakage 	<ul style="list-style-type: none"> • Is the needle attached correctly (direction, height, etc.)? • Is the needle bent? • Is the rotary hook attached correctly? • Is the timing set correctly? • Is there any backlash with the needle bar case (back/forth and right/left)? • Is the rotary hook stopper correctly attached to stop the rotary hook? • Is the needle size correct and the tip sharp? • Does the thread pass through the hole center of the presser foot?
	<ul style="list-style-type: none"> ■ Not embroidered properly 	<ul style="list-style-type: none"> • Is the material edge caught in the machine? (Are embroidery hoop and other related parts operating correctly?) • Is the material stretched properly? • Is thread tension proper? • Does the lower thread come out smoothly?
	<ul style="list-style-type: none"> ■ Machine operation abnormal 	<ul style="list-style-type: none"> • Is embroidery data normal? • Is the XY carriage belt loosened? • Is the XY carriage belt damaged? • Are any set screws for the XY drive pulley loosened? • Are any fixing screws for the coupling of the Y drive shaft loosened?

	Problem	Check point
Check these points once again	<ul style="list-style-type: none"> Upper shaft locks at a certain point in one cycle 	<ul style="list-style-type: none"> Is the thread take-up stopped due to interference with the thread take-up cover? [Adjustment]  <p>The diagram shows a cross-section of the thread take-up mechanism. It includes a 'Thread take-up cover' at the top, a 'Thread take-up' lever below it, a 'Bolt' on the right side, and a 'Thread take-up operating lever' at the bottom right. Dotted lines indicate the movement of the lever and cover.</p> <p style="text-align: right;">W1326Q</p> <p>Loosen the hexagon socket head cap screw of the thread take-up operating lever and adjust the take-up movable range. Tighten it securely afterwards.</p> <ul style="list-style-type: none"> Are the needle bar clamp and the top dead center stopper positioned correctly?
	<ul style="list-style-type: none"> Stitches cannot be made. 	<ul style="list-style-type: none"> Is the needle attached properly? Is the timing of the needle and rotary hook correct?

Electrical Section

Cautions

- Be sure to turn off the power of the machine and unplug the power cord before checking cable connections.
- When you check connection of the cables as instructed in this manual, also check connection and continuity between connectors.
- Carry out items described in the "Measures" section in order of appearance.
- Some checks and replacement works can be conducted only by repair people. In such cases, contact your dealer.

Symptom	Measures
The machine does not operate even if the power is turned on.	<ul style="list-style-type: none"> • Is the power cord of the machine plugged in? → Plug in the power cord. • Is the connector at the side of the control box connected? → Connect it after checking the connector name. • Is the connector in the control box connected? → Connect it after checking the types and colors of the connectors. • Is the fuse on the PCB in the control box blown? → Replace the fuse with a new one. If the fuse is blown again, something is faulty. Check to see if the wiring is correct. Replace the control box with a new one.
The machine does not operate even if the power is turned on. The message, "Release stop SW to operate!", is displayed on the panel.	<ul style="list-style-type: none"> • Is the stop switch turned on? → Reset the stop switch.
An overtravel error occurs.	<ul style="list-style-type: none"> • Is the frame within the cap frame area? → Move the frame within the cap frame area and turn on the power. • Check to see if the signal of the X area sensor turns ON and OFF in PORT test mode. → When the signal does not change, refer to the block diagram showing the cable connections and check to see if connection from the X area sensor to the main PCB is proper. Replace the X area sensor with a new one.
The needle stop position error occurs.	<ul style="list-style-type: none"> • Is the pulley manually turned and out of the stop angle? → Turn the pulley, adjust the needle at the stop position, and reset the error. • Check the signal of the stop position sensor in the encoder test mode. → Refer to the adjustment or cable connection block diagram and check connection from the needle position detection sensor to the main PCB. Replace the needle position detection sensor with a new one.

Symptom	Measures
The needle bar case lock error occurs.	<ul style="list-style-type: none"> • Is the INDEX motor rotating? <ul style="list-style-type: none"> → If not, refer to the block diagram showing the cable connections and check to see if connection from the INDEX motor to the main PCB is proper. Check the resistance values of pins 1 and 3 and pins 4 and 6 at the connector section of the INDEX motor. The normal resistance value is approximately 6.6Ω. → If it is not normal, replace the INDEX motor with a new one. Also replace the drive PCB with a new one. • Manually turn the color change pulley. <ul style="list-style-type: none"> → If it is abnormally heavy, adjust the color change mechanism and the needle cap case. • Replace the needle bar position sensor (potentiometer) with a new one. • Replace the I/O PCB 0 with a new one.
X-axis or Y-axis home position detection error occurs.	<ul style="list-style-type: none"> • Was the XY carriage moving? <ul style="list-style-type: none"> → If so, refer to the block diagram showing the cable connections and check to see if connection from the X and Y area sensor to the drive PCB is proper. • Was the XY motor rotating? <ul style="list-style-type: none"> → If so, check the XY carriage mechanism. • If the XY motor is not rotating, refer to the cable connection block diagram and check to see if connection from the XY motor to the drive PCB is proper.
The thread breakage error frequently occurs although thread is not broken.	<ul style="list-style-type: none"> • Enter the CASE test mode and turn the thread breakage sensor pulley corresponding to each needle bar of the head with which this error occurs while switching the needle bar from number 1 in ascending order and check to see that the red LED on the head blinks. <ul style="list-style-type: none"> → If there is no problem, lower the thread breakage sensitivity value of the machine controller. (The standard value is 0.) • Check connection from the thread breakage sensor PCB to the thread tension base PCB if it does not blink. • Replace the thread breakage sensor PCB with a new one.
The X-axis motor connector connection error occurs.	<ul style="list-style-type: none"> • Refer to the block diagram showing the cable connections and check the connection from the two X motors (one X motors in four head models) on the left and right to the main PCB.
The main shaft motor lock error occurs.	<ul style="list-style-type: none"> • Enter the encoder signal mode and manually turn the main shaft pulley. <ul style="list-style-type: none"> → If it is abnormally heavy, the main shaft mechanism is faulty. • Does the main shaft motor rotate at all when the error occurs? <ul style="list-style-type: none"> → If it does not rotate at all, check fuse F1 and F2 on the power supply PCB in the control box. Refer to the block diagram showing the cable connections and check to see if connection from the main shaft motor to the drive PCB is proper. • Manually turn the main shaft pulley in the encoder signal test mode and check to see if the stop position signal and encoder signal are proper. <ul style="list-style-type: none"> → If either of the signals does not change, refer to the block diagram showing the cable connections and check to see if connection from the encoder and stop position sensor to the power supply PCB is proper.

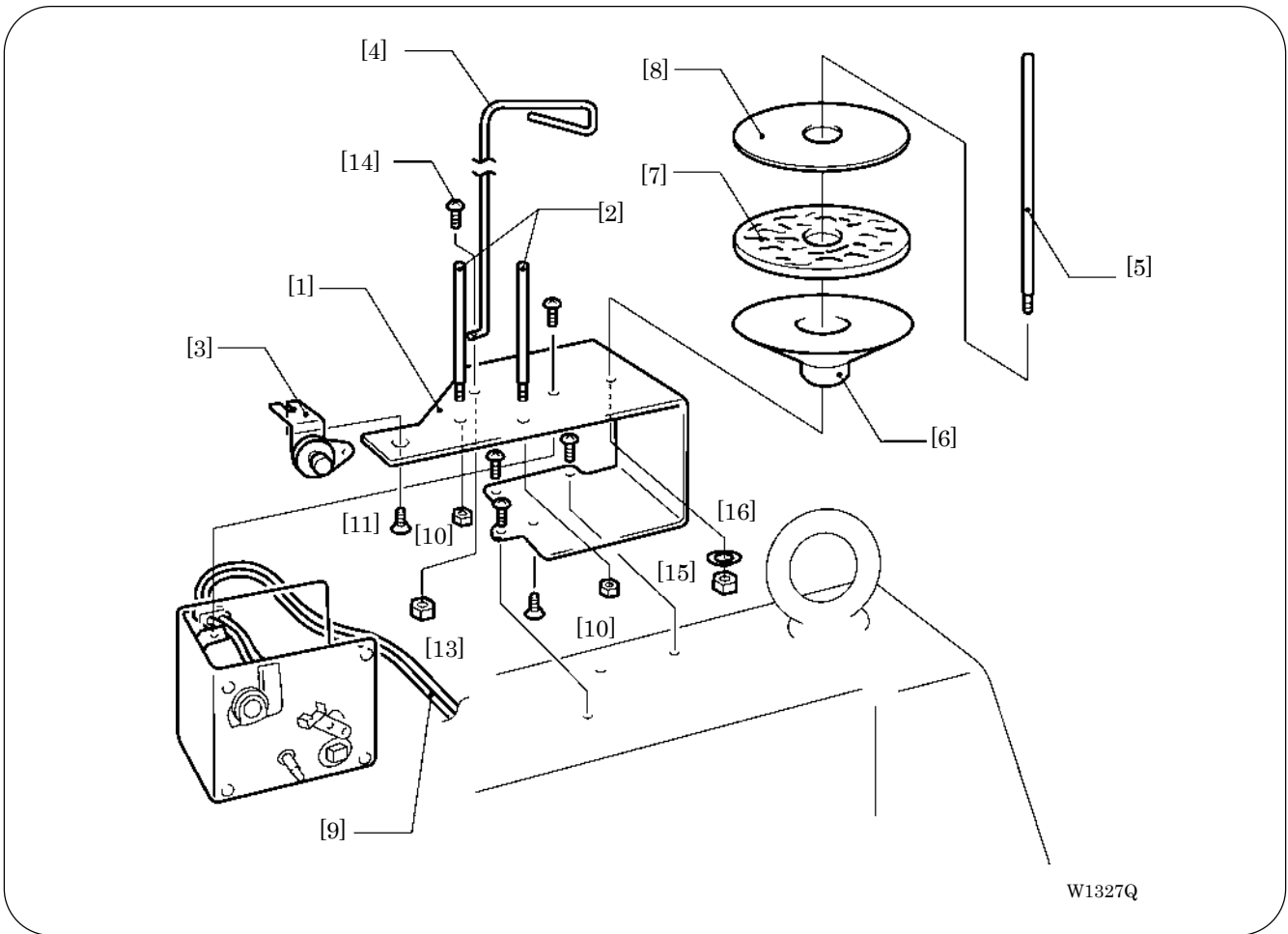
Symptom	Measures
ERROR A8 frequently occurs.	<ul style="list-style-type: none"> • In the encoder signal test mode, manually turn the main shaft pulley and check to see that the stop position signal is correct. → If the signal does not change, refer to the cable connection block diagram and check to see if connection from the stop position sensor to the power supply PCB is proper.
Thread trimming motor home position error occurs.	<ul style="list-style-type: none"> • Is lint clogged between the travelling blades? <ul style="list-style-type: none"> → Remove it. • Is the thread trimming motor operating? <ul style="list-style-type: none"> → If so, refer to the block diagram showing the cable connections and check to see if connection from the thread breakage sensor to the main PCB is proper. Also adjust the thread breakage sensor PCB. (Refer to "Replacing thread breakage sensor PCB.") • If it is not operating, refer to the block diagram showing the cable connections and check to see if connection from the thread trimming motor to the main PCB is proper. • Check to see if connection from connector P3 of the main PCB to connector P9 of the power supply PCB in the control box is proper. • Check fuse F6 on the power supply PCB in the control box. <ul style="list-style-type: none"> → If it is blown, replace it with a new one. If it is blown again, replace the power supply PCB.
Power frequency error occurs.	<ul style="list-style-type: none"> • Check whether the connector P2 of the power supply PCB is fallen out.
Wiper out error occurs.	<ul style="list-style-type: none"> • Does the wiper on the error head remain projected? <ul style="list-style-type: none"> → If the wiper is tangled with a thread, remove it. If the wiper does not return smoothly, adjust it. • Enter the solenoid test mode and operate the wiper motor. Check the icon on the panel. <ul style="list-style-type: none"> → If the icon is not reversed white, check to see if connection from the wiper sensor to the head PCB is proper. Replace the wiper sensor with a new one. Replace the head PCB with a new one.
ERROR C7 occurs.	<ul style="list-style-type: none"> • Turn the power off once and on again. If the same error occurs again, replace the main PCB with a new one.
Main shaft rotation speed error occurs.	<ul style="list-style-type: none"> • Enter the encoder signal test mode and manually turn the main shaft pulley. <ul style="list-style-type: none"> → If it is abnormally heavy, the main shaft mechanism is faulty. • Refer to the block diagram showing the cable connections and check to see if connection from the main shaft motor to the drive PCB is proper.
Cooling fan motor stops. Exhaust fan motor stops. When all three fans in the control box stop	<ul style="list-style-type: none"> • Refer to the block diagram showing the cable connections and check to see if connection from connector P4 of the power PCB in the control box to connector P3 and P4 of the drive PCB . • Check fuse in the fuse holder at the side of the control box. <ul style="list-style-type: none"> → If it is blown, replace it with a new one.

Symptom	Measures
Power voltage upper or lower limit error occurs.	<ul style="list-style-type: none"> • Is the voltage set on the panel? → If not, set it according to the power supply voltage of the area where the machine is used. • Is the tap voltage in the control box (connector connection) adjusted to the power voltage of the area where the machine is used? → If not, switch the connector connection. • Check the input voltage values in the power/voltage check test mode. Measure the power supply voltage with the tester and compare them. → If the voltage value is significantly out of the normal range ($\pm 5\text{v}$ or more), calibrate it with the voltage calibration in the test mode. • When you cannot enter the test mode because this error frequently occurs, set the voltage to a relatively high value with the machine controller if it is E-D2 and to a relatively low value if it is E-D3 to avoid errors. Check and calibrate the voltage in the test mode. • Check to see the connection of connector P2 of the power supply PCB to connector P10 of the power supply PCB in the control box is proper. • Is the power supply abnormally low because a machine with a large capacity (compressor and the like) is used? → Change the power to the other system. Use a stabilizer. • Replace the power PCB with a new one. Replace the main PCB with a new one.
Only a certain head does not operate.	<ul style="list-style-type: none"> • Is the head out of action with either the head switch or the machine controller? • Refer to the block diagram showing cable connections and check to see that other cables are connected to the head switch PCB and the head PCB and the head PCB properly.
Jump motor does not operate.	<ul style="list-style-type: none"> • Check to see if connection from the jump motor to connector P11 and P12 of the head PCB is proper.
Wiper motor does not operate.	<ul style="list-style-type: none"> • Check to see if connection from the wiper motor to connector P8 and P9 of the head PCB is proper. • Replace the head PCB with a new one.

Chapter 11

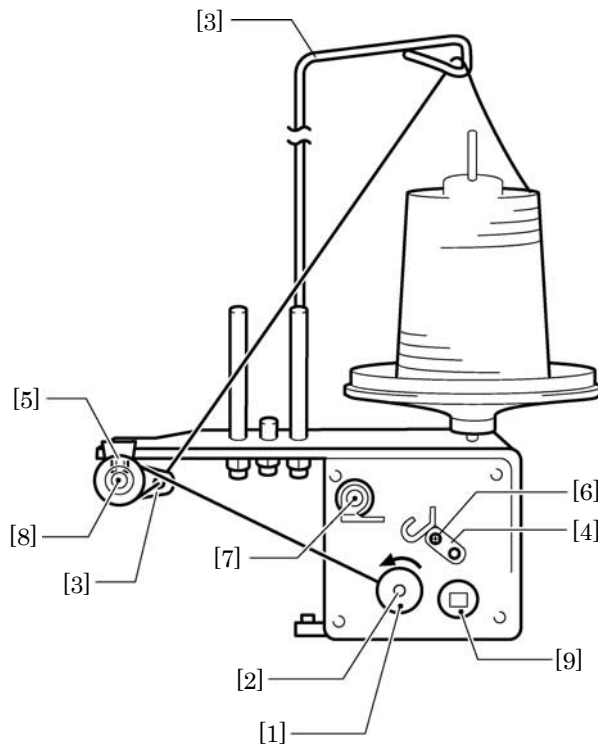
Connection and Installation of Optional Equipment

1. Attaching Bobbin Winder



1. Mount two pieces of bobbin stand L [2] on the thread winder stay [1] with nut 4 [10].
2. Mount the thread winder assembly (set) [3] on the thread winder stay [1] with the tightening screw [11].
3. Mount the thread guide [4] with the drilling bolt set 6 × 20 [14] and nut 6 [13].
4. Mount the spool shaft B [5] and pan [6], spool mat [7], and spool cushion [8] with nut 5 [15] and spring washer [16].
5. Insert the thread winder harness [9] in the 2P (No. 6) connectors on the rear of the control box.

■ Winding lower thread



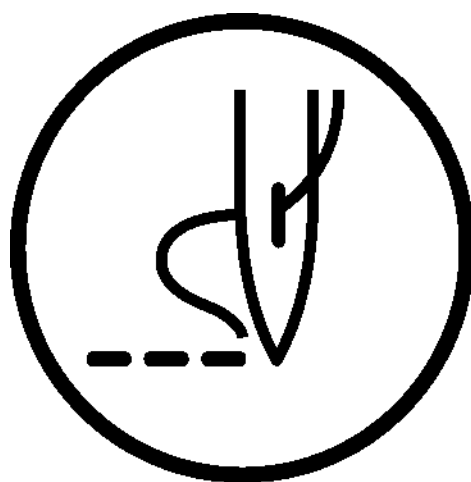
W1328Q

1. Turn the power switch on.
2. Set the bobbin [1] in the bobbin winder shaft [2].
3. Put the thread through the thread guide [3].
4. Wind the thread around the bobbin [1] several times in the direction of the arrow.
5. Press the bobbin hold [4].

If the thread cannot be wound evenly, loosen the screw [5] and move the thread guide [3] right and left for adjustment.

In order to wind more threads around the bobbin, loosen the thread [6] and move the bobbin hold [4].
6. After winding is finished, pull out the bobbin from the bobbin winder shaft and trim the thread using the thread trimmer [7].
 - If the thread is wound too tight and comes off from the tension disk, loosen the knob [8]. If the thread is too loose, tighten the knob [8].
 - If the circuit protector [9] functions, the bobbin winder motor does not rotate. Leave it for a while for cooling. Then press the circuit protector [9]. (The thread does not come out when the motor is not cooled enough.)

brother[®]



INSTRUCTION MANUAL

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