brother

SINGLE HEAD ELECTRONIC EMBROIDERY MACHINE

BAS-415

INSTRUCTION MANUAL
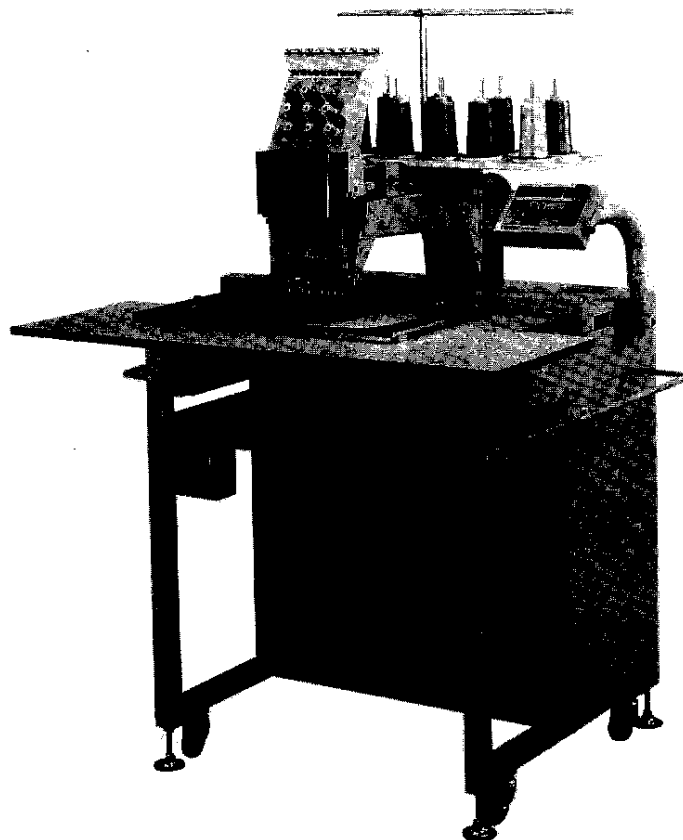
CONTENTS

Machine features
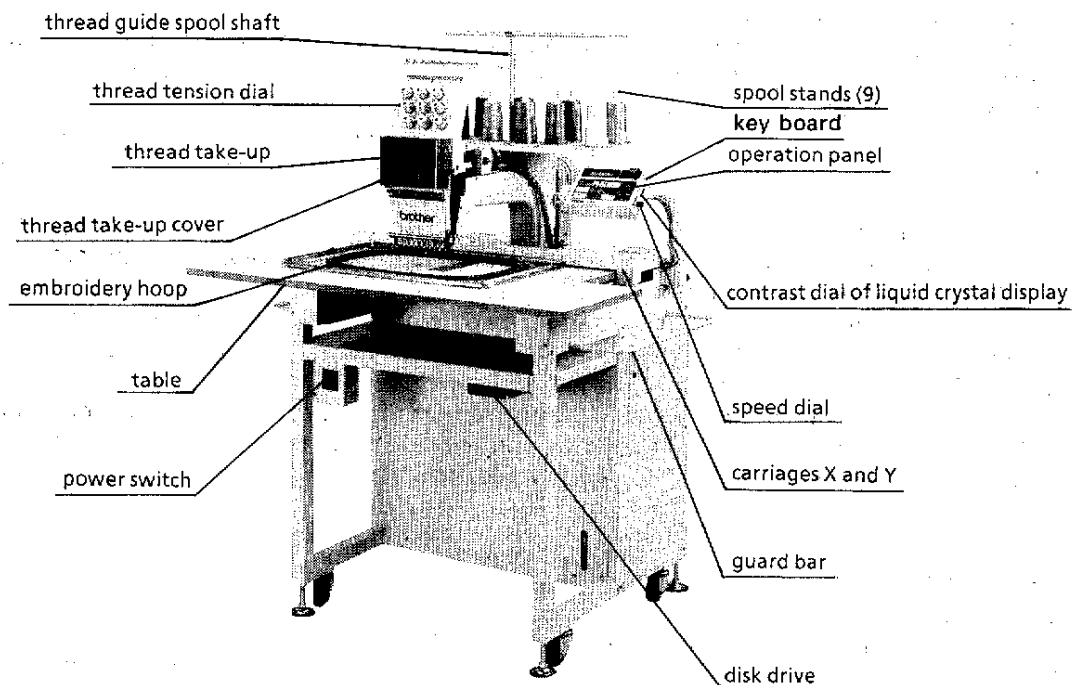
1) This interactive machine is based on dialogue system and enables even a complete beginner to easily embroider multi-colored patterns.
2) By setting a program in advance, thread changing and thread trimming can be done automatically. Up to 99 colors can be put in a pattern and up to 27000 stitches can be stored in the memory as standard use. By running a 2DD floppy disk, up to 240000 stitches can be sewn in a pattern.
3) Up to 16 patterns can be entered in the memory. By entering a pattern in advance, it can be sewn anytime. By using the memory expansion board (optional), up to 280000 stitches can be put in the memory.
4) If the tape reader (optional) is connected, the tapes of Tajima, Barudan and Zangs format (1 inch/8 holes), and the floppy disk of Tajima, and the receive data from Brother's editing system can be used. [NOTE] Brother format data cannot be used.
5) By removing the table and using the cylinder bed, embroidery for tubular materials can be done effortlessly using an optional hoop. The maximum sewing area is H 420 mm x V 240 mm and it is possible to fully embroider the back of the jacket. By attaching cap frame device (optional), beautiful embroidering can be performed on ready made caps.
6) Its wide sewing area is H 450 mm x V 285 mm, and removal of the embroidery frame can be done easily. Also, convenient bobbin thread counter is equipped as standard use.

Specifications

Embroidery machine used	9 needle embroidery machine
Application	Pattern embroidery
Sewing speed	Maximum 1000 spm (4 levels) normal rotation rate 650 spm
Sewing area	V 285 mm x H 450 mm (holder base area) V 240 mm x H 420 mm (tubular square hoop area)
Stitch length	0.1 mm - 12.7 mm (minimum pitch 0.1 mm)
Storage medium	3.5" 2DD floppy disk in Tajima format 3.5" 2HD floppy disk which corresponds to Tajima format paper tape with 1 inch width /8 holes (Tajima, Barudan, Zangs)
Thread trimming	Automatic thread trimmer
Needle thread breakage	Needle thread breakage detector
Power supply	Single phase 240V, 220V, 200V, 120V maximum 500VA
Weight	165kg
Dimensions	W 1050 mm x L 940 mm x H 1380 mm
Options	Paper tape reader, embroidery hoop in each size, ML 651 lamp set, bobbin winder, accessory case, cap frame device, boring attachment, plate for shelf, marking light, memory expansion board

thread guide spool shaft

thread tension dial

thread take-up

thread take-up cover

embroidery hoop

table

power switch

spool stands (9)

key board

operation panel

contrast dial of liquid crystal display

speed dial

carriages X and Y

guard bar

disk drive

*Standard hoop and holder base

·Embroidery hoop ..... plastic square hoop (45 × 32)
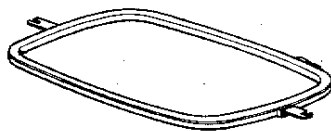
·Holder base .... holder base assembly
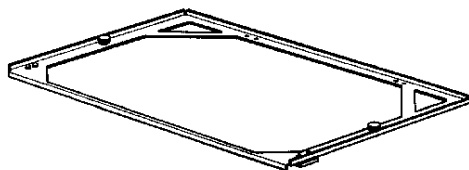
*Optional accessories (sold separately)

· Paper tape reader, accessory case, bobbin winder, cap frame device, boring attachment, plate for shelf, marking light
· Tubular frame holder base (24 × 30), tubular round frame with arms
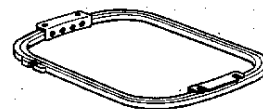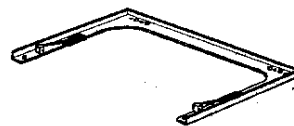
Embroidery hoops (spider net hoops) in various sizes are also available.

* After installing, get the power supply from a dedicated outlet.

1 Carrying machine

When holding the machine, be sure to hold the machine body (frame).
[NOTE] Do NOT hold the table or the guard bar.

2 Installing machine
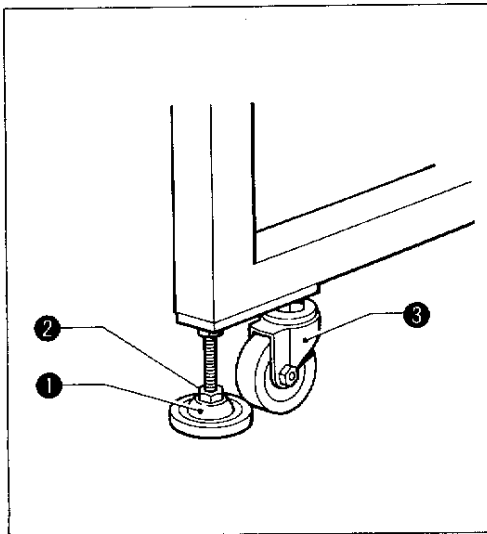
1) Secure the four level adjusters ❶ so that the upper surface of the table is horizontal.
2) If the table wobbles, loosen the four nuts ❷ and turn the four level adjusters ❶ to adjust.

When moving the machine, lift the four level adjusters ❶ so that the machine can be moved by the casters ❸ on the machine body.

3 Installing operation panel
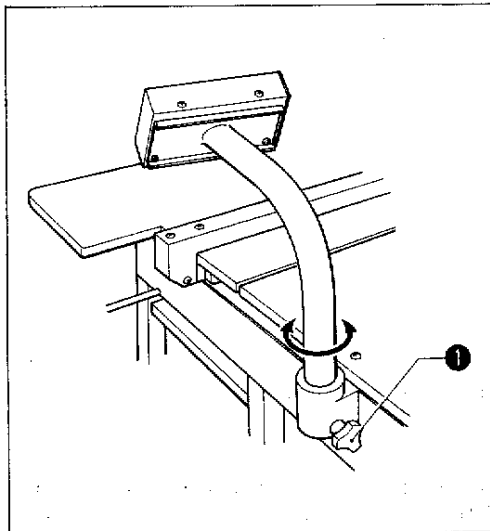
Attach the set screws ❶ so that the panel is in the best position for the operator to use.

④ Installing guard bar
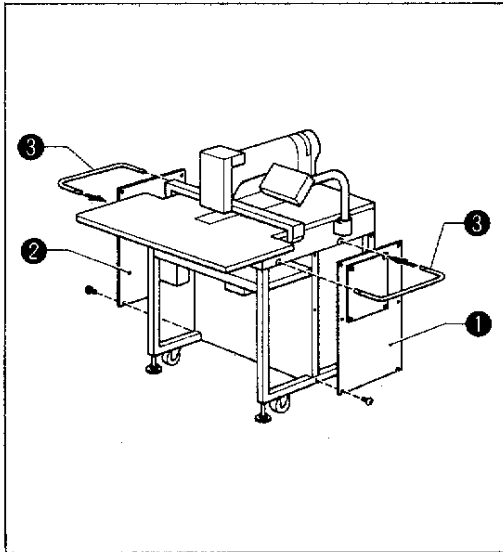
1) Loosen the screws, and covers RD ❶ and LD ❷.
2) Insert the guard bar ❸ and attach it with the bolt and washer from the bottom side of the frame.
3) Install covers RD ❶ and LD ❷ with the screws.
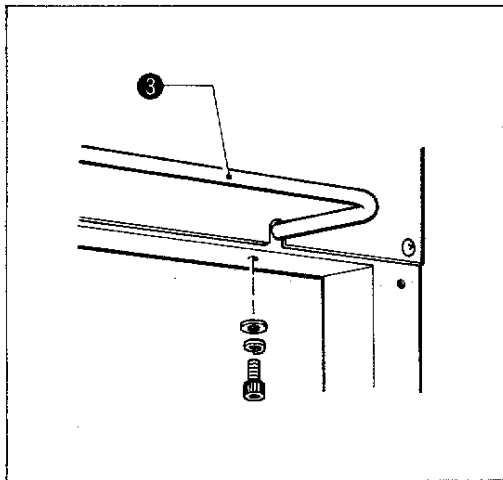
⑤ Setting up machine

Needle bar case side
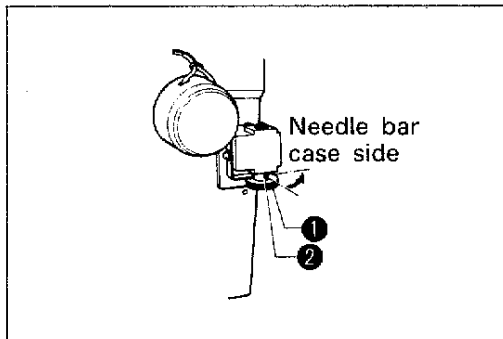
Before shipping, the machine is set as shown in the figure on the left.

Turn the clutch knurl ❶ until its red mark ❷ is on the needle bar case side. The machine will be in the automatic jump condition. This is the standard condition of the machine.

[NOTE] Refer to the note on page 29 "Preparation of machine (4)".

Lubrication is necessary for keeping the machine in good condition.
Every day before using the machine, add 1-2 drop(s) of oil at the each arrow in the figure.

[NOTE] ① Be sure to use the brother-specified sewing machine oil for lubrication.
② Too much lubrication may cause the oil to drip on the material.

1) Lubricate the six places at the arrows.
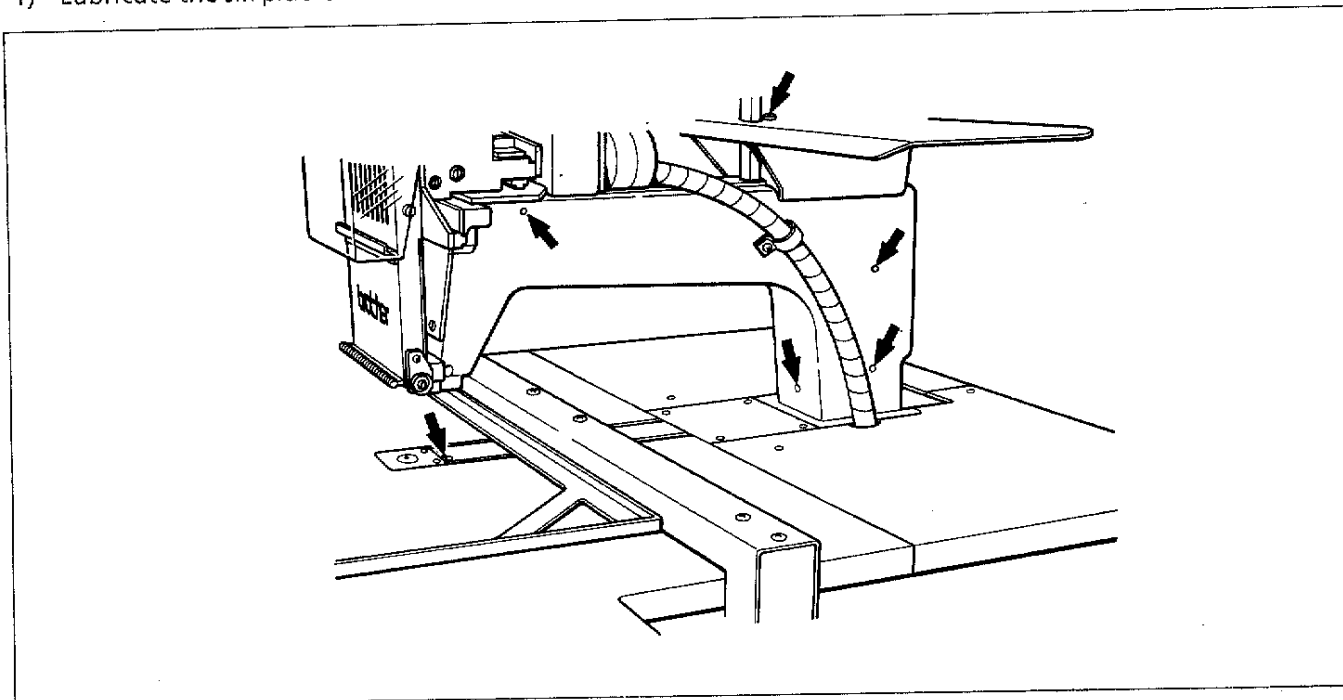
2) Add a drop of oil at the rail of the rotary hook.
[NOTE] Do not lubricate other than the rotary hook.
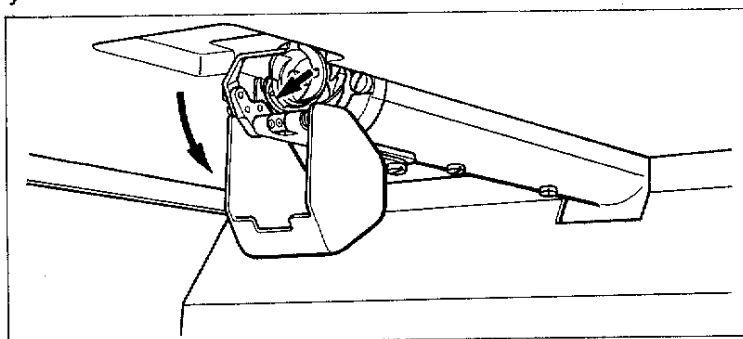
3) Lubricate the two places of each needle of the needle bar. (18 places should be lubricated in total.)
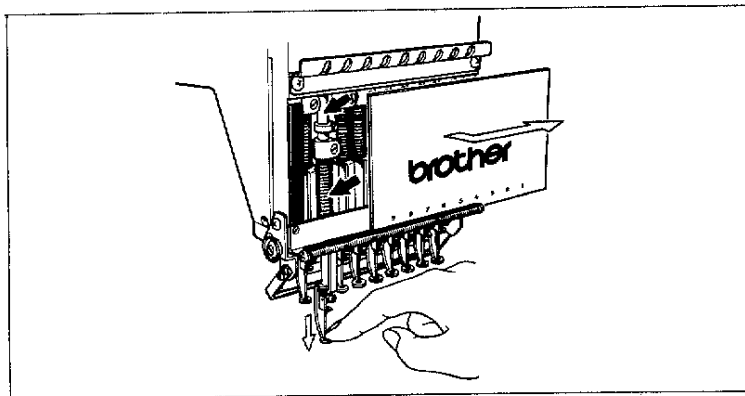
4) Move the needle bar case all the way to the right or the left side. From the side of the machine head, apply one or two drop(s) of grease to the base needle bar and the base needle bar felt.
When the machine is used every day, lubricate daily before using.
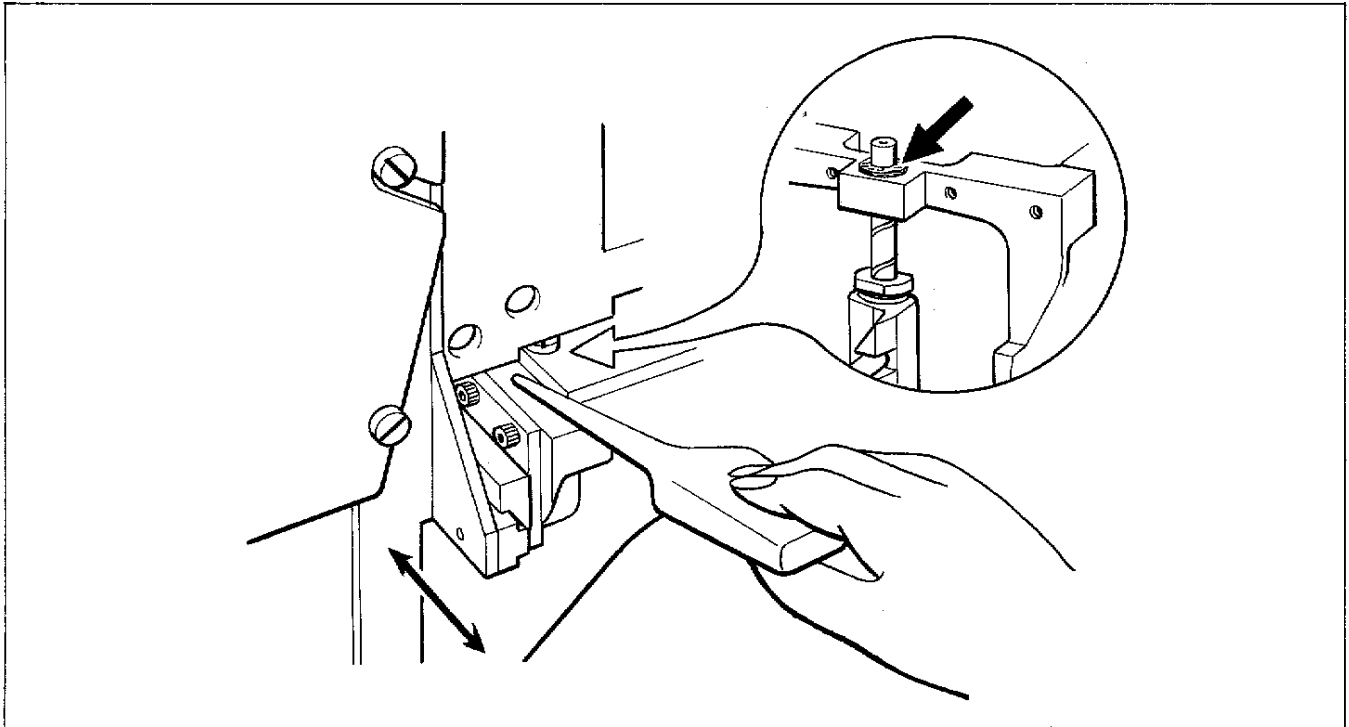
1. Removing bobbin case
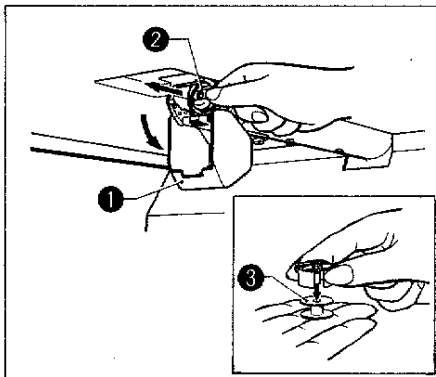
1) Open the rotary hook base cover ❶.
2) Hold the knob ❷ and remove the bobbin case.
3) Close the knob and remove the bobbin ❸.

2. Replacing bobbin

Pull out about 50 mm of thread.

The thread should be wrapped to the right around the bobbin.
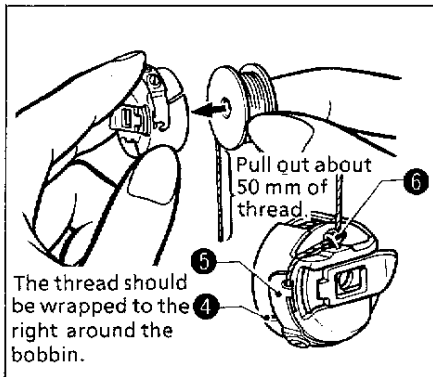
1) Put the bobbin in the bobbin case.
2) Slide the thread under the tension spring ❺ through the notch ❹.
3) Pull out the thread from the hole of the tension spring ❺ and pass it through the hook ❻.
4) Pull out the thread about 50mm.

3. Attaching bobbin case
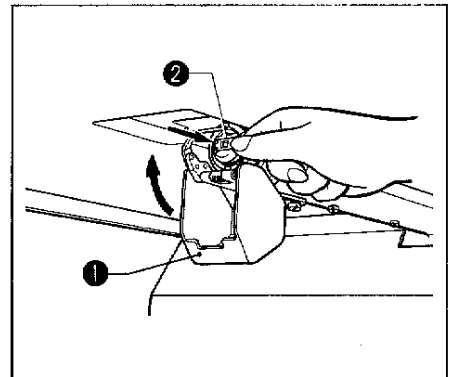
1) Hold the knob ❷ and attach the bobbin case.
2) Close the cover ❶.
* The standard tension of the bobbin thread should be about 20~30g.
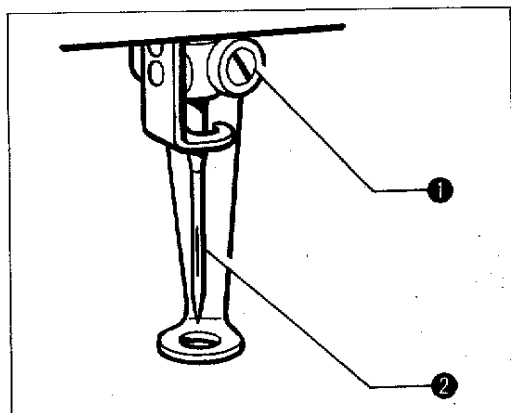
Materials and needle selection

Fabric type	Needles	Needle numbers
Denim Leather	DB × K5	#14, #16, #18
Handkerchief		#9, #10
Shirt Towel		#11, #12, #13

1. Removing needle

Loosen the thumb screw ❶ and remove the needle ❷.

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 thumb screw ❶ firmly.

[NOTE] Set the needle so that the notched part comes on the rotary hook side.

[NOTE1] When using special threads such as the gold, silver and ramé yarn, use a heavy-duty needle (#11~#16). For better finishing, paste the waxed paper on the back of the material.

[NOTE2] For general materials, use DB × K5 #11 or #18 according to the thickness of the material. For knitted materials, use DB × K23 #11. Its round end prevents the knit thread from breaking.

- 7 -
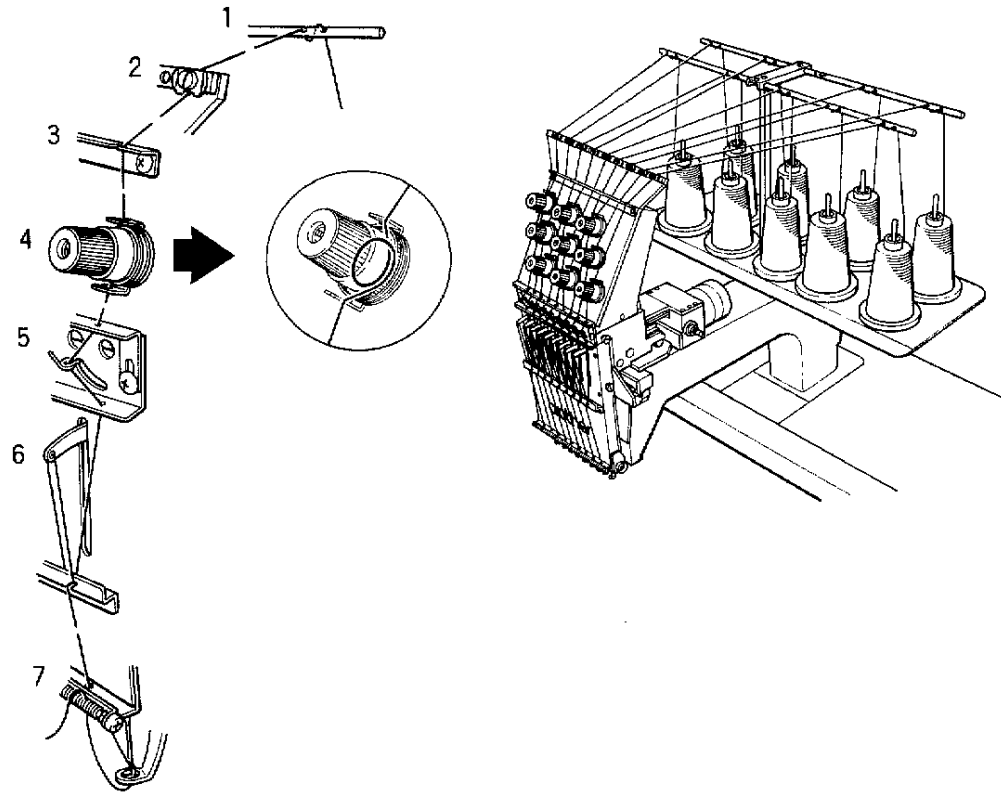
Procedures

1) Pass the thread up through the hole of the thread guide from the stand spool. Then, pass the thread over around and up through the second hole of the thread guide according to the diagram.

2) String the thread by lifting each thread guide disk with a finger.

3) Pass the thread through the upper thread guide via the thread guide disk.

4) Pass the thread through the thread guide, wrapping it once around around the tension disk clockwise.

5) Pass the thread through the upper hole of the 2-stages thread guide, then thread the thread breakage detector spring.

6) Put the thread on the inner thread guide through the hole of the thread take-up. Pass the thread through the inner thread guide again.

7) Put the thread into a hole of the lower thread guide, then pass it through the thread path of the needle clamp, through the presser foot and finally through the eye of the needle.

- 8 -

Needle thread tension
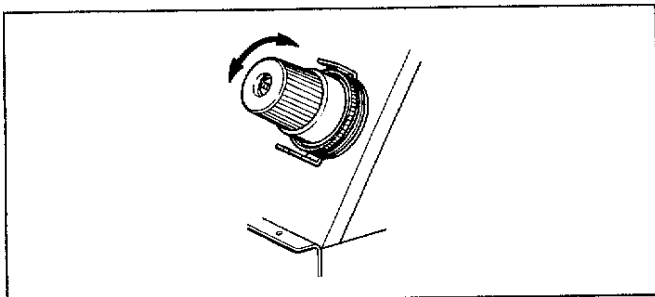
If the needle thread tension is too high, turn the dial counterclockwise, too low, turn the dial clockwise.

Correct sewing tension

Upper stitch width

Needle thread

Bobbin thread
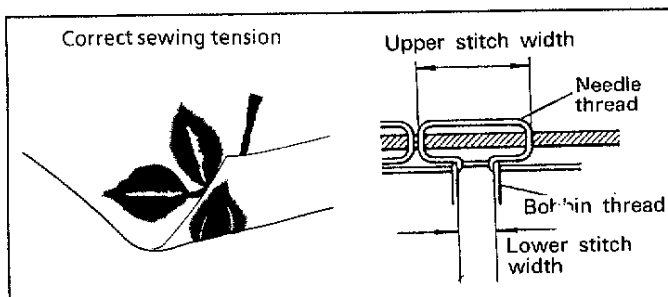
Lower stitch width

Adjust the tension dial so that the needle thread is pulled to the back of the material, and the lower stitch width is about 1/3 of the upper stitch width.

Bobbin thread tension

Correct bobbin thread tension (20-30g)
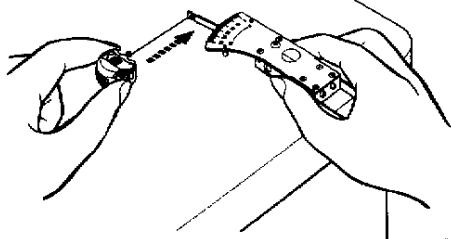
Use a tension gauge to adjust.

Increase tension

Decrease tension
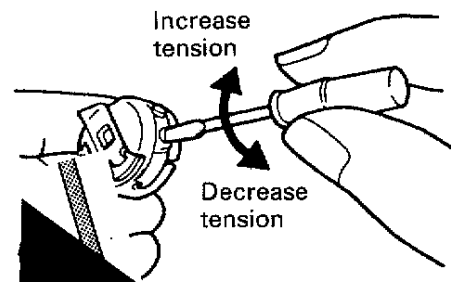
Keep the machine clean and unclogged to prevent machine trouble.
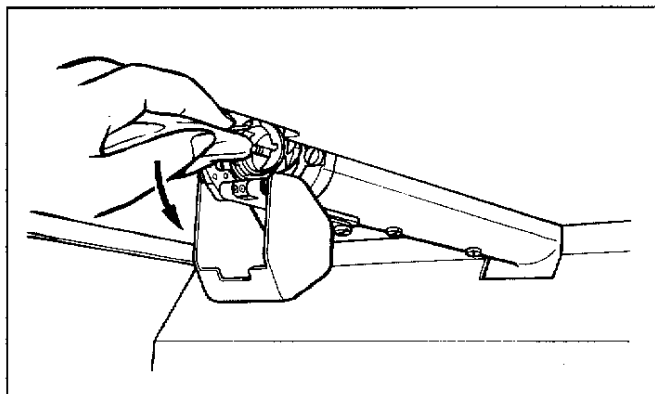
Keep the machine clean:
Remove dirt with a soft, dry cloth. If necessary, clean with the detergent-soaked cloth, then wipe off the detergent with a cloth dampened with (hot) water.

Caution:
Do not clean with benzene, thinner, or other volatile solvents.

1 Adjusting needle bar height

Tighten the screw so that these clearances are even.

needle bar guide rail

Do not strike here.

needle bar guide rail

9 mm
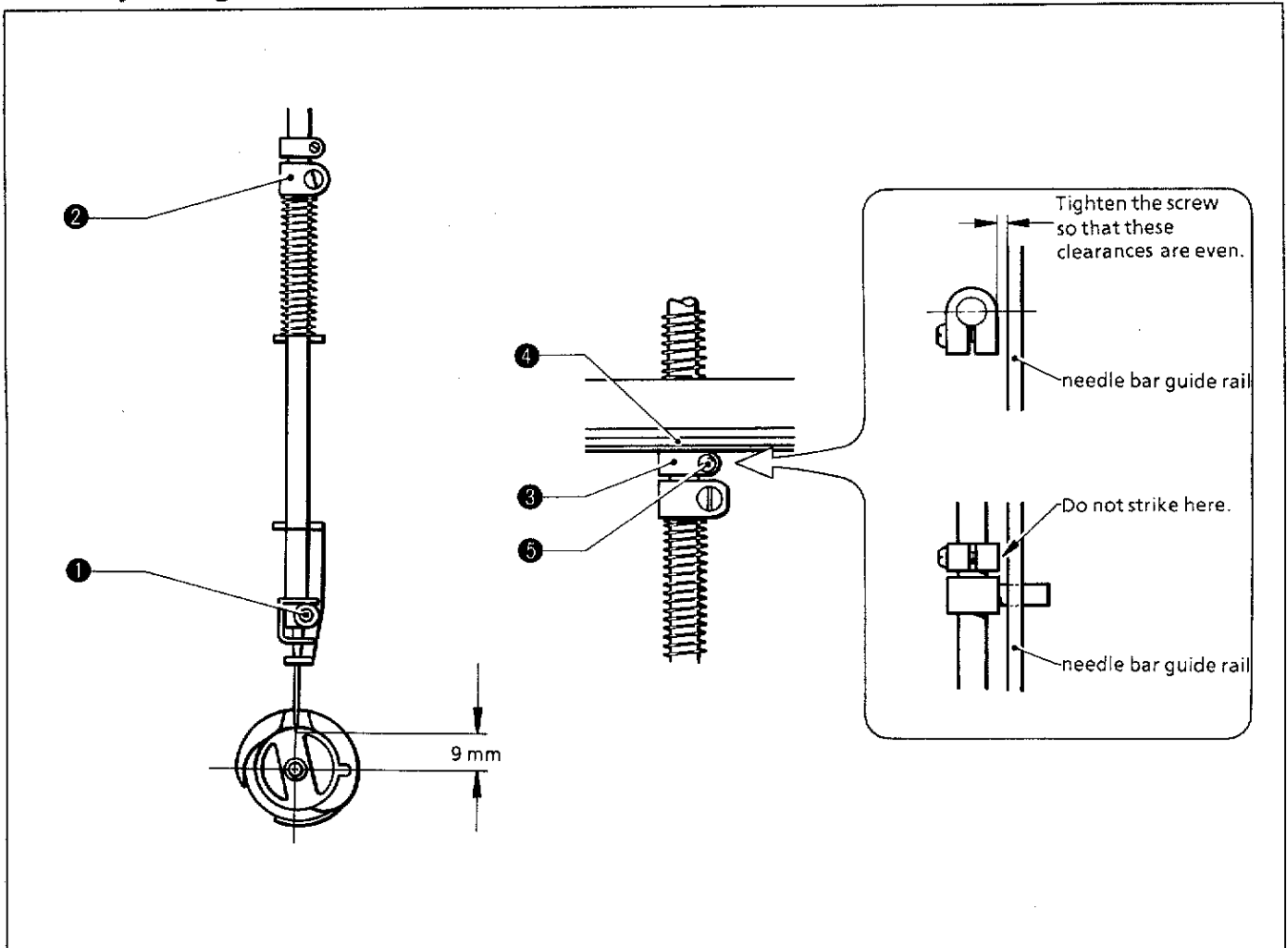
1) Lower the needle bar to its lowest position. When the needle tip is raised 9 mm above the center of the rotary hook shaft, tighten the screw of the needle bar clamp ❷ so that the screw ❶ leans to the right 25° - 30°.

2) Lower the needle bar to its lowest position. Lightly press the stopper ❸ to the cushioning washer ❹ side. Then tighten the screw ❺ so that it is positioned in the front.

NOTE: Make sure that the stopper does not strike the needle bar guide rail.

*   When using gauge (optional)
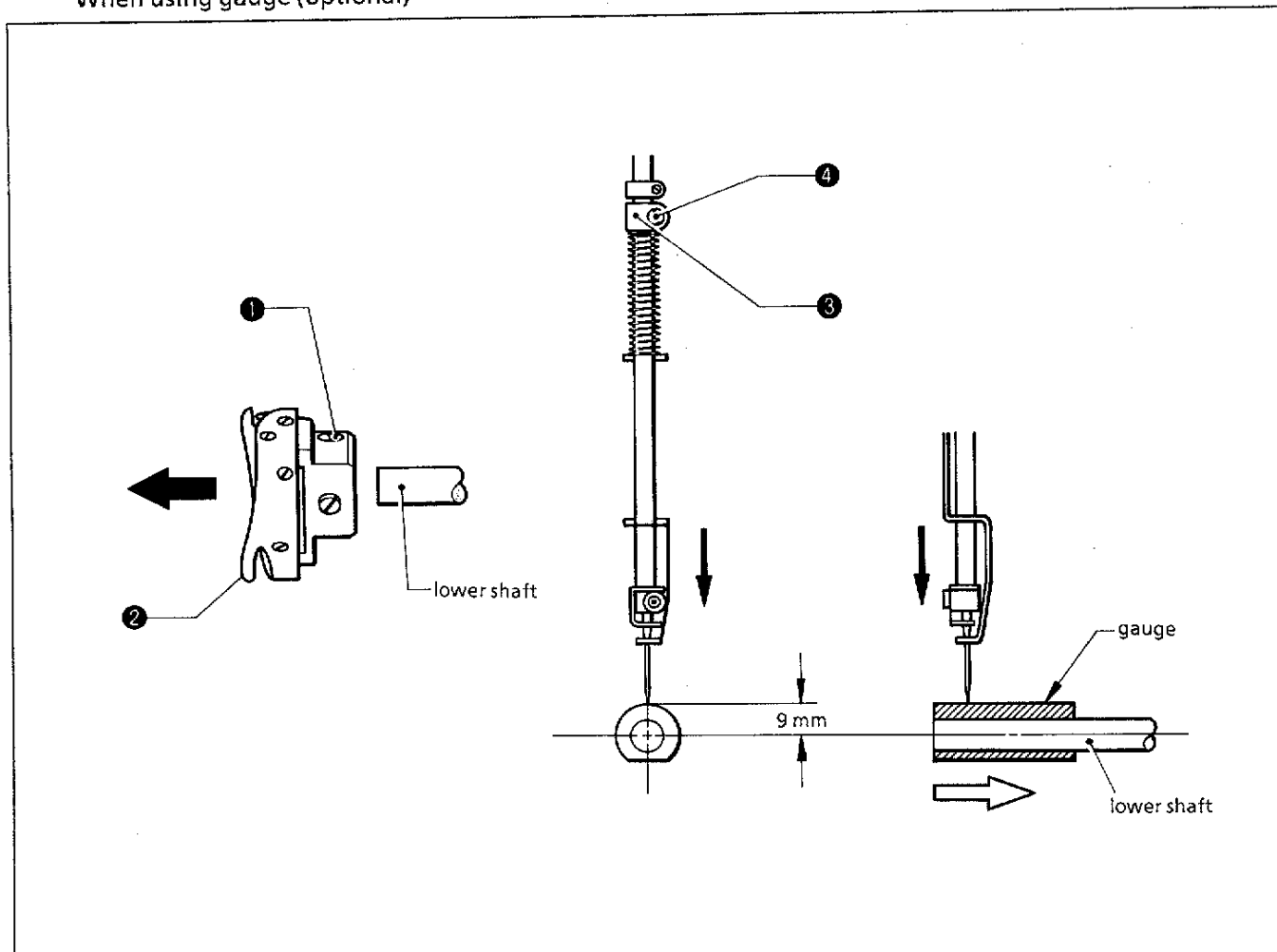
1)   Loosen the screw ❶ and remove the rotary hook ❷ from the lower shaft.
2)   Fit the gauge (optional) into the lower shaft.
3)   Loosen the screw ❹ of the needle bar clamp ❸, turn the pulley and make the needle tip contact gauge lightly.
     [NOTE] Make the needle tip contact gauge in the place except the cut section of the gauge.
4)   Tighten the screw ❹ of the needle bar clamp ❸.
     [NOTE] Check the stopper position again referring to page 10.

② Adjusting timing of needle and rotary hook

fig. A

approx. 1 mm
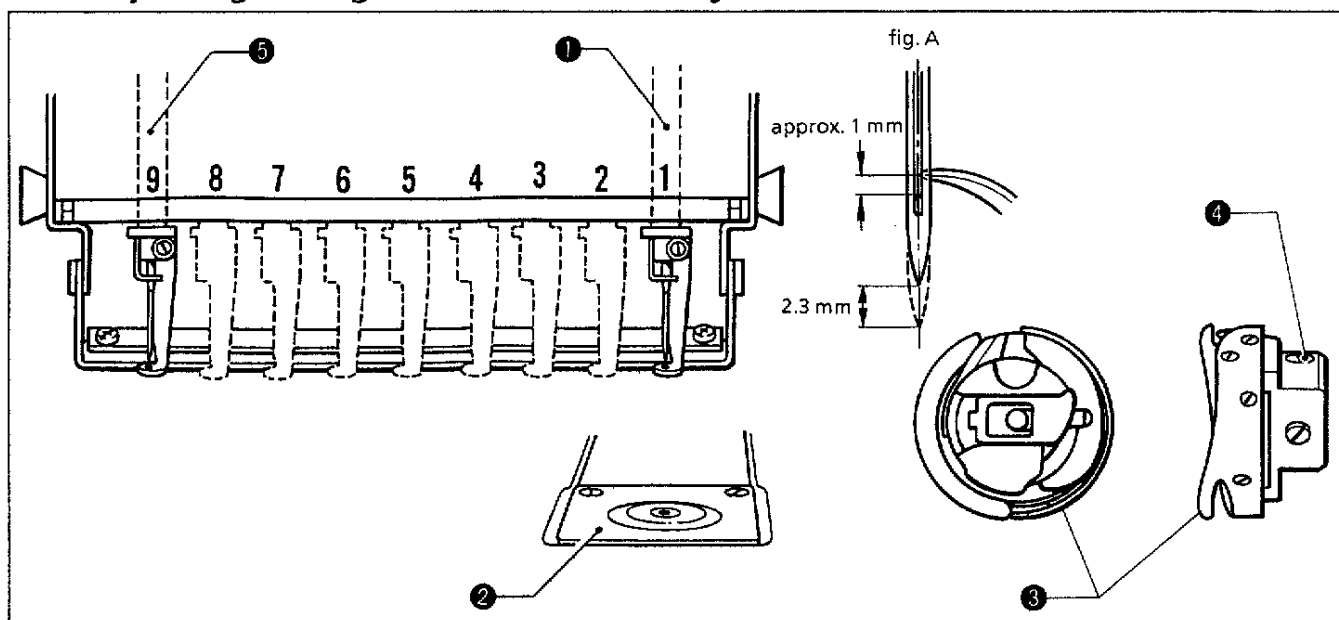
2.3 mm

1) Select the first needle bar ❶.
2) Remove two screws and the needle plate ❷.
3) Loosen the screw ❹ of the rotary hook ❸, and adjust so that the needle meets the rotary hook ❸ point when the needle bar is raised 2.3 mm (201°) above its lowest position (180°). Then, temporarily tighten the two stop screws.
   At this time, the needle bar height should be about 1 mm. (Figure A)
4) Select the ninth needle bar ❺. If the gap between the needle and rotary hook point is 0.01 - 0.2 mm, tighten the three screws of the rotary hook.

③ Adjusting cloth presser height

Cut the three places and attach it.
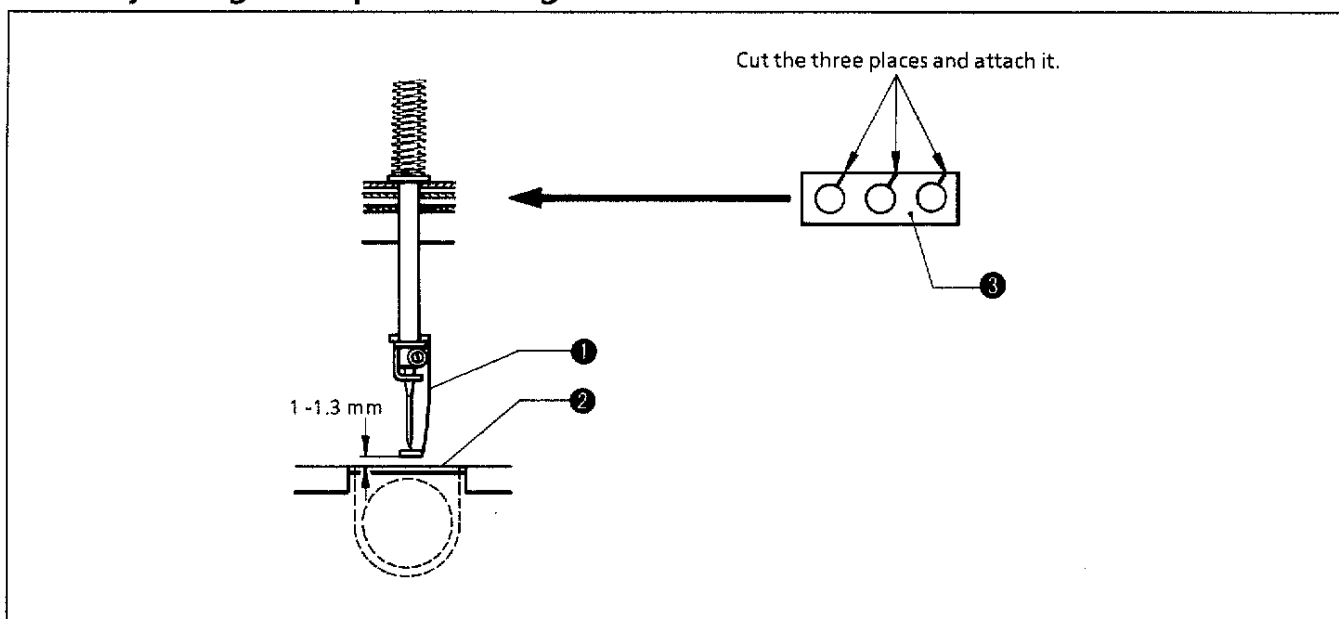
1 - 1.3 mm

Adjust the cloth presser ❶ height with the cushion rubber ❸. The cloth presser ❶ height should be raised 1 - 1.3 mm above the needle plate ❷ at the cloth presser's lowest position. (A sheet of the cushion rubber is 0.5 mm thick.)

Flow chart
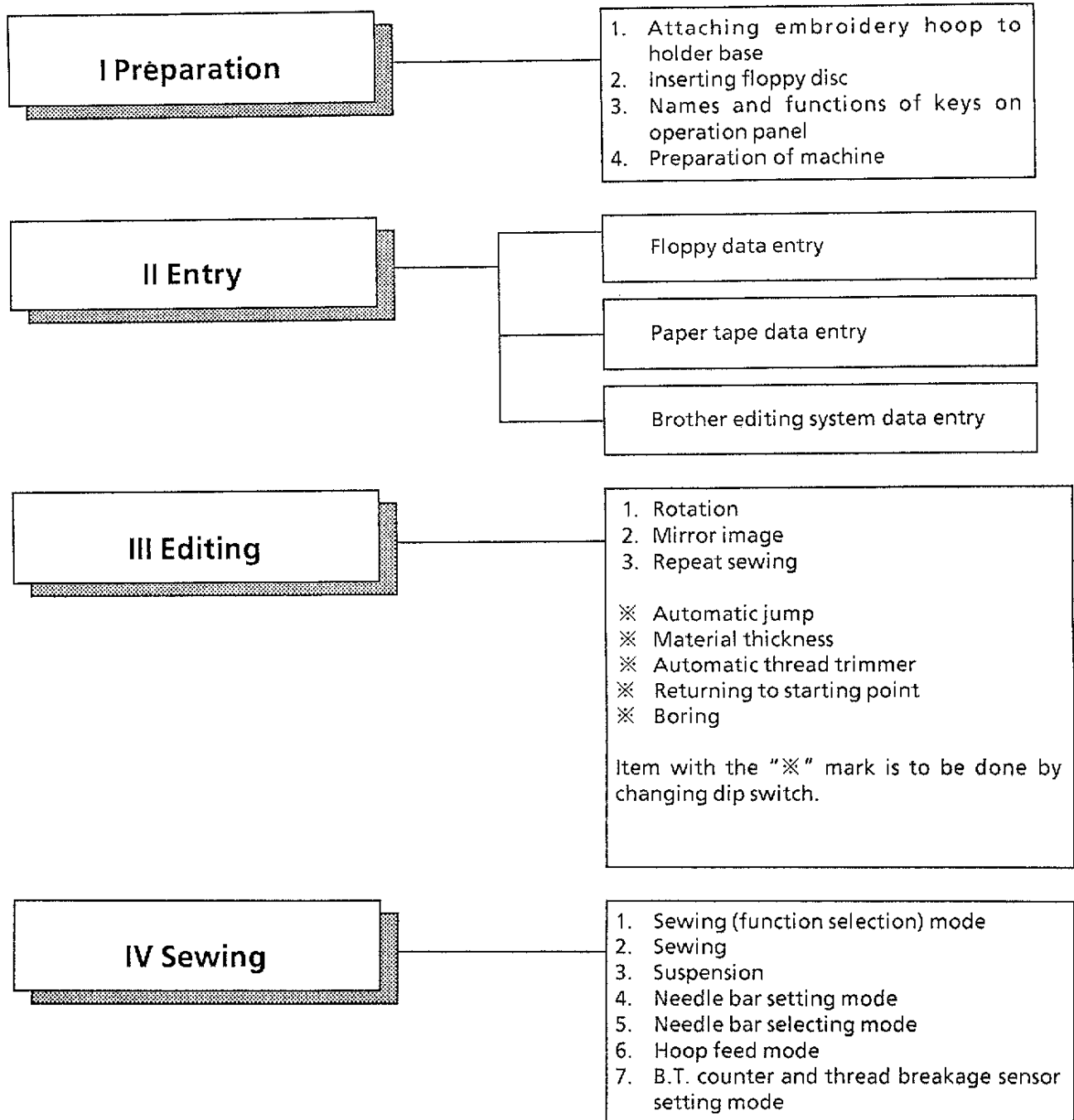
I Preparation

1. Attaching embroidery hoop to holder base
2. Inserting floppy disc
3. Names and functions of keys on operation panel
4. Preparation of machine

II Entry

Floppy data entry

Paper tape data entry

Brother editing system data entry

III Editing

1. Rotation
2. Mirror image
3. Repeat sewing

※ Automatic jump
※ Material thickness
※ Automatic thread trimmer
※ Returning to starting point
※ Boring

Item with the "※" mark is to be done by changing dip switch.

IV Sewing

1. Sewing (function selection) mode
2. Sewing
3. Suspension
4. Needle bar setting mode
5. Needle bar selecting mode
6. Hoop feed mode
7. B.T. counter and thread breakage sensor setting mode

Ⅰ PREPARATION

① Attaching plastic square hoop to holder base

fig. A   fig. B
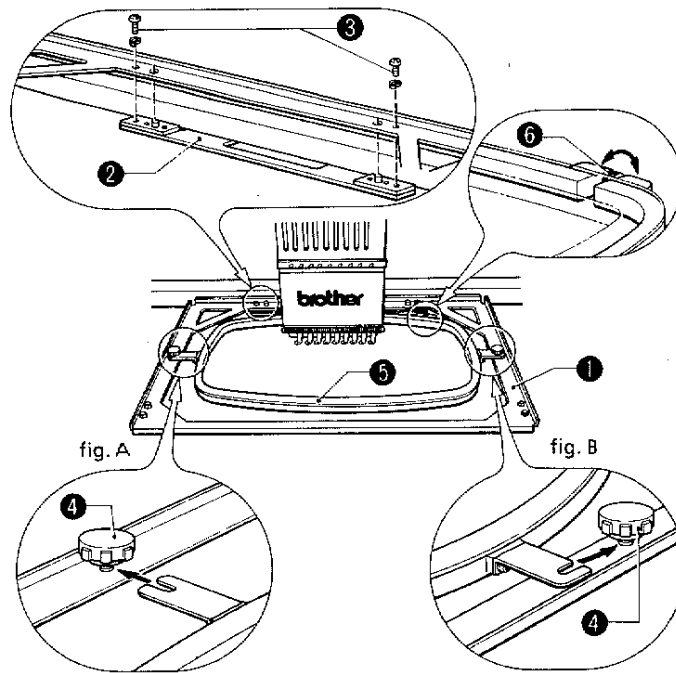
1) Attach the holder base ❶ to the X carriage ❷ and tighten the two screws ❸. (Fit the protrusions of the X carriage in the holes that are closer to the center.)
2) Loosen the two screws ❹ and set the plastic square hoop ❺.
3) Fix the metal fittings on the left side of the hoop as shown in figure A, and fix the one on the right side of the hoop as shown in figure B. Secure the screws ❹.
4) Improper setting of the material in the embroidery hoop may cause skipped stitches, thread breakage, or puckering. Use the screw ❻ for adjustment.

2 Attaching tubular square hoop to holder base

[NOTE] Before using the tubular square hoop and the holder base, remove table (C) of the embroidery machine.

fig. B

fig. C
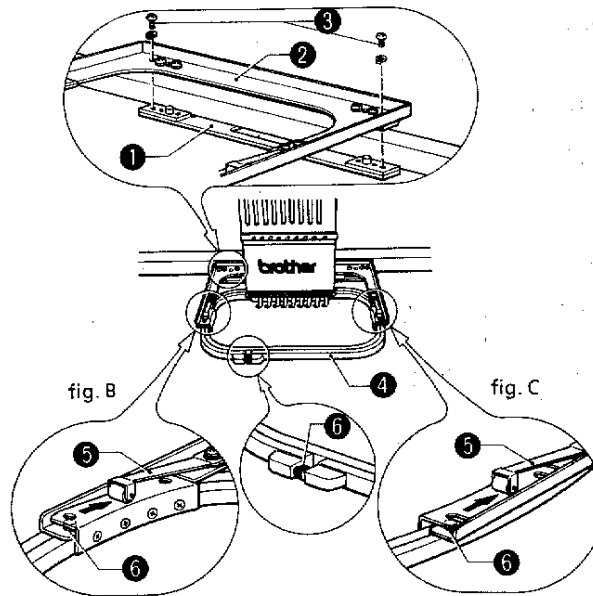
1) Attach the tubular square frame ❷ to the X carriage ❶ with the two screws ❸ as shown in figure A. (Fit the protrusions ❺ of the X carriage in the holes that are closer to the center.)

2) Attach the metal fittings of the tubular square hoop ❹ as shown in figures B and C. When attaching them, lift the plate spring roller ❺ slightly and be sure to fit the protrusions ❻ of the holder base in the holes of the frame.

3) Improper setting of the material in the embroidery hoop may cause skipped stitches, thread breakage or puckering. Use the screw ❼ for adjustment.

- 15 -

Inserting

Ejecting
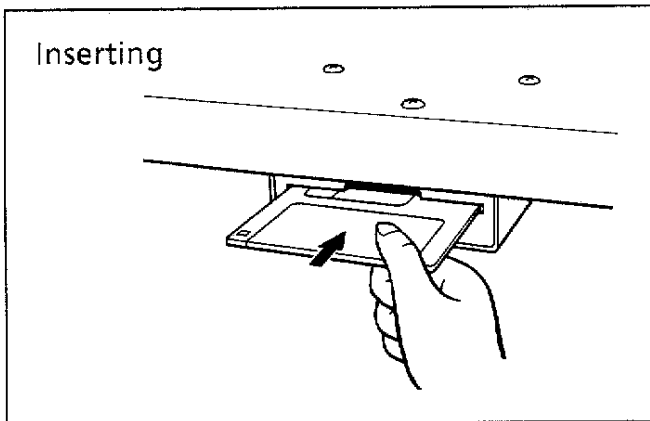
[NOTE 1] If the floppy disk is not properly inserted, the data will not be read.

[NOTE 2] Keep the floppy disk away from magnets and televisions, for the data on the disk can be damaged by magnetism.
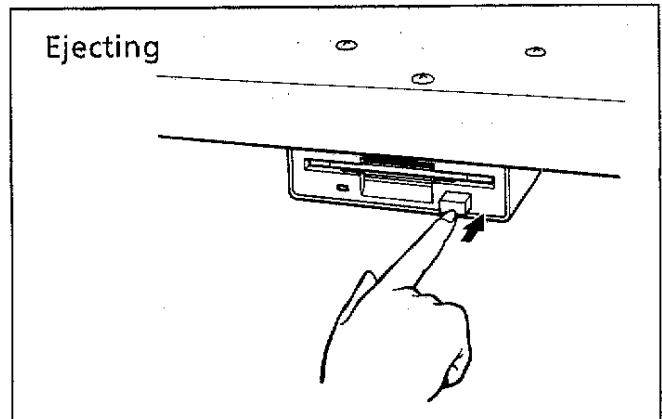
Press the eject button to take out the floppy disk. Do not eject the disk while the drive indicator is on.

電源
POWER

糸切れセンサー
THREAD SENSOR

糸切り
THREAD TRIMMING

枠退避
HOOP FEED

クリア
CLEAR

非常停止
EMERGENCY

開始
START

針棒設定
NEEDLE SET

針棒選択
NEEDLE SELECT

*

後退
BACK

前進
FORWARD

終了
END

#

編集
EDIT

入力
ENTER

brother BAS-415

速度/SPEED

遅い
SLOW

早い
FAST
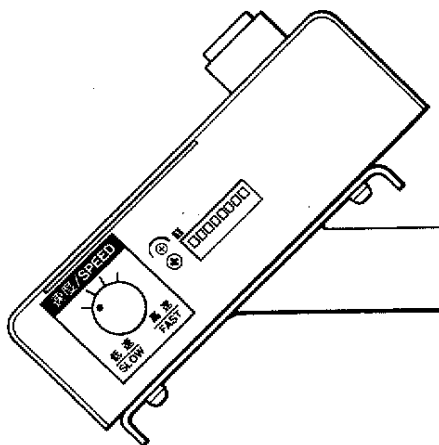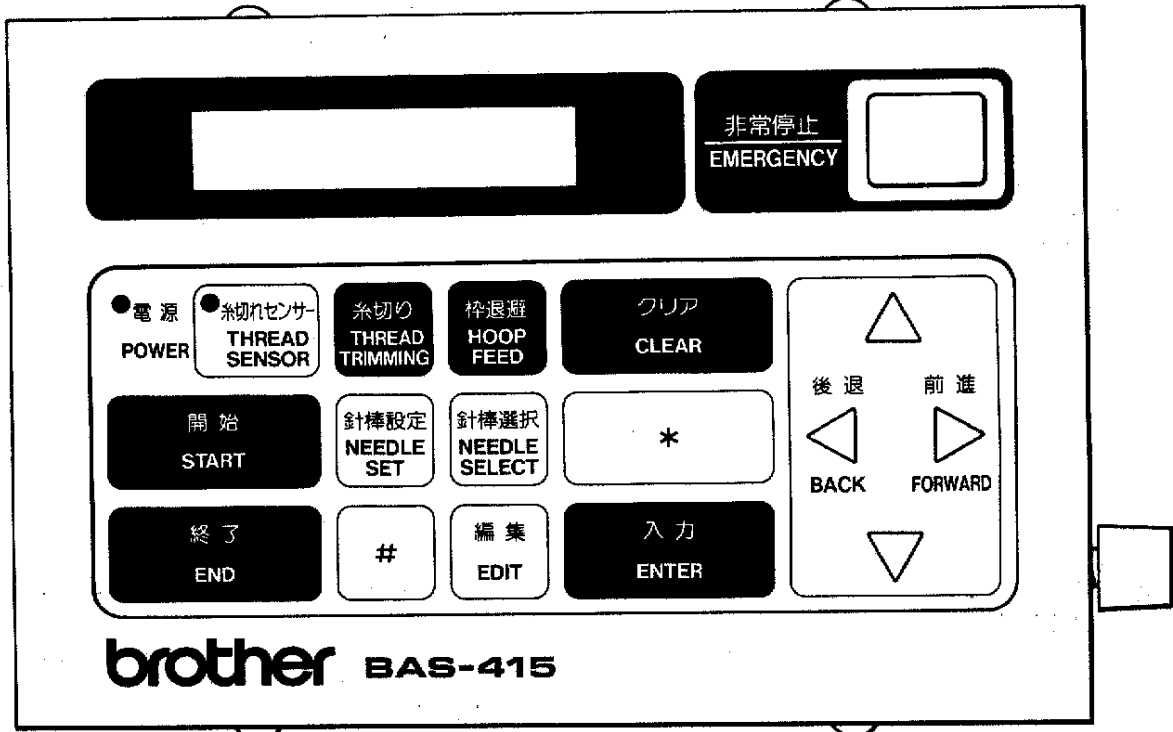
Functions of keys on operation panel

開 始 START

Use this key to;
- Embroider the data stored in just the state it was in last embroidered.
- Restart in the sewing mode during suspension.
- Start after the carriage moved to sewing start point.

終 了 END

Use this key to;
- Exit from each mode after floppy disk data entry, paper tape data entry or editing system data entry .
- Exit from the editing menu (after setting rotation, mirror or repeat sewing) and to exit from editing mode.
- Exit from the needle bar setting mode and needle bar selecting mode.
- Exit from setting THREAD SENSOR or bobbin thread counter.
- Exit from the sewing mode.
- Cancel error during sewing.

入 力 ENTER

Use this key to;
- Enter data entry mode (from floppy disk, paper tape reader, editing system).
- Read a pattern data of file name displayed on the upper row from floppy disk, paper tape reader or editing system. (This is invalid when data is already registered in selecting number.)
- Enter current needle location as hoop feed point and to display its coordinates.
- If data is not registered, read pattern data of the file name displayed on the upper row from floppy disk, paper tape reader, or editing system and to start automatic sewing.
- Decide automatic stop in setting needle bar or not. (" $\boxed{S}$ " (set) mark is displayed alternately.)

クリア CLEAR

Use this key to;
- Clear file data displayed on the upper row and the screen.
- Cancel error.
- Return set values of the registered number displayed on the upper row to default.
- Return selecting needle number to default value.
- Set hoop feed point in the center of the area in hoop feed mode.
- Change current counter number to set value in setting bobbin thread counter.

- 18 -
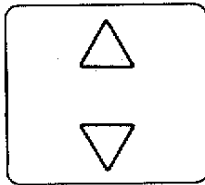
Use this key to;
- Scroll file names registered in floppy disk or editing system.
- Select paper tape type (from Tajima, Barudan, Zangs).
- Scroll editing menu items.
- Set repeat times and space length in setting repeat sewing.
  (The numbers 1 to 9 are scrolled.)
- Select needle number in needle bar setting mode or to enter set times in bobbin thread counter setting mode.
  (The numbers 1 to 9 are scrolled.)
- Move needle location to the desired hoop feed point.
- Feed hoop just after entering sewing mode.
  (This is invalid in sewing mode during suspension.)
- Inch hoop to the desired position by 0.1 mm in inching mode.
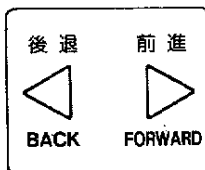
Use this key to;
- Change the cursor position on the number in setting bobbin thread counter.
- Move needle location to the desired hoop feed point.
- Select the needle bar shift direction toward no.1 or no.9 in selecting needle bar.
- Select color order in selecting needle bar.
- Move hoop after entering the sewing mode and to move hoop back or forward along stitch line on data when sewing is suspended.
- Inch hoop to the desired position by 0.1 mm in inching mode.
- Change the cursor position on the number in setting repeat sewing.
- Decide mirror image (Image J → 1 · 1 → J) and rotation angle (0° →270° · 270°→0°).
- Select registered number of input data from floppy disk, paper tape or editing system.

編 集
EDIT

Use this key to;
● Edit in main menu.
● Edit after data input from floppy disk, paper tape or editing system.

針棒設定
NEEDLE SET

Use this key to set needle order after reading data in each mode (main menu mode, floppy disk data entry mode, paper tape data entry mode, editing system data entry mode) and entering sewing mode.

●糸切れセンサー
THREAD SENSOR

Use this key to enter thread sensor and bobbin thread counter setting mode from each mode (main menu mode, floppy disk data entry mode, paper tape data entry mode, editing system data entry mode).
* When THREAD SENSOR is ON, the left upper indicator will light. (Setting ON and OFF can be done cyclically.)

＊
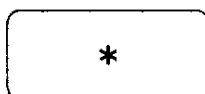
Use this key to;
● Enter test mode from main menu mode.
● Display pattern name of the file name displayed on the upper row when data is entered from floppy disk or editing system.
● Check set values of registered number that was selected on the upper row in editing menu or to check set values of sewing data in sewing mode.

枠退避
HOOP FEED

Use this key to:
● Enter hoop feed mode from each mode (main menu mode, floppy disk data entry mode, paper tape data entry mode, editing system data entry mode, sewing mode after selecting editing menu).
● Exit from this mode after returning from hoop feed point in hoop feed mode.

針棒選択
NEEDLE SELECT

Use this key to select needle bar in each mode; main menu mode, floppy data entry mode, paper tape data entry mode, editing system data entry mode, sewing mode after selecting editing menu.

糸切り
THREAD TRIMMING

Use this key to trim thread regardless of sewing.

Use this key to;
- Select registered data number and to switch hoop feed mode.
  - * Mode changing can be done repeatedly.
- Enter paper tape data reading mode in setting floppy data entry.
- Enter editing system data reading mode in setting paper tape data entry.
- Enter floppy disk data reading mode in setting editing system data entry.
- Decide repeat direction (either vertical or horizontal) in setting repeat sewing.
  - * "V" (vertical direction) and "H" (horizontal direction) are alternately displayed.
- Perform trial feeding just after entering sewing mode.
- Enter inching mode or jump mode in sewing suspension.
- Set needle select number as long as the receive data from editing system is entered.
  [NOTE] For floppy disk data and paper tape data, this key is invalid.
- Decide automatic hoop feed after sewing mode or not.
  - * " S " (set) mark is displayed alternately.

Use this key to;
- Clear the back-up memory when the power is turned on.
- Stop the machine during sewing.

非常停止
EMERGENCY

LED lamp

1) Power lamp (green)
   This indicator is lit when the power is turned on.

2) THREAD SENSOR ON/OFF (red)
   This indicator is lit when the thread sensor operates.

Power lamp

THREAD SENSOR ON/OFF indicator

電源 POWER	糸切れセンサー THREAD SENSOR	糸切り THREAD TRIMMING	枠退避 HOOP FEED	クリア CLEAR	
開始 START	針棒設定 NEEDLE SET	針棒選択 NEEDLE SELECT	*****	後退 ◁ BACK	前進 ▷ FORWARD
終了 END	**#**	編集 EDIT	入力 ENTER		
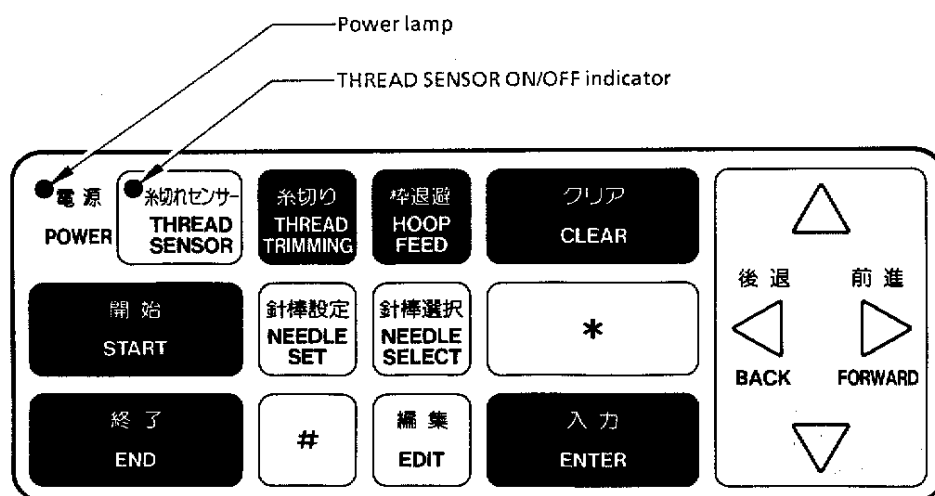
Operation panel display

非常停止
EMERGENCY
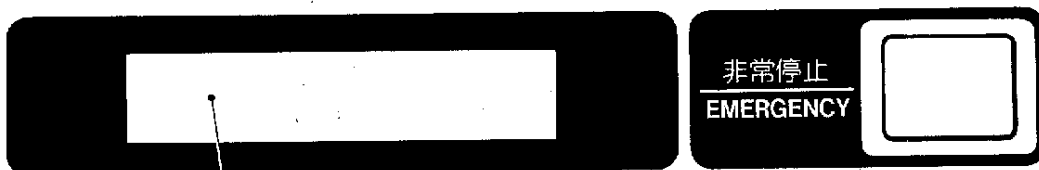
—The operation step, data registered number (with file name), editing information and error messages are displayed here.
One line has 16 letters and up to two lines can be displayed.

速度/SPEED

低速　高速
SLOW　FAST
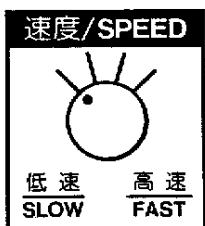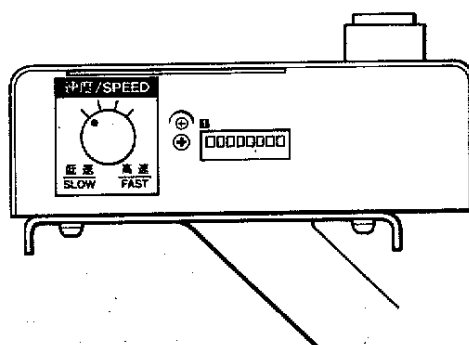
The speed dial is used to select one of the 4 sewing speeds, according to the chart below.

The levels are set according to the stitch length. (not changeable)

range stitch length	0.1 - 4.8	4.9 - 8.2	8.3 - 12.7
1	1000rpm	650	450
2	750	600	450
3	650	550	450
4	450	450	450
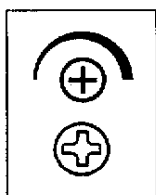
The contrast dial of liquid crystal display is used to adjust the darkness of the display.

1   Dip switch functions on main printed circuit board
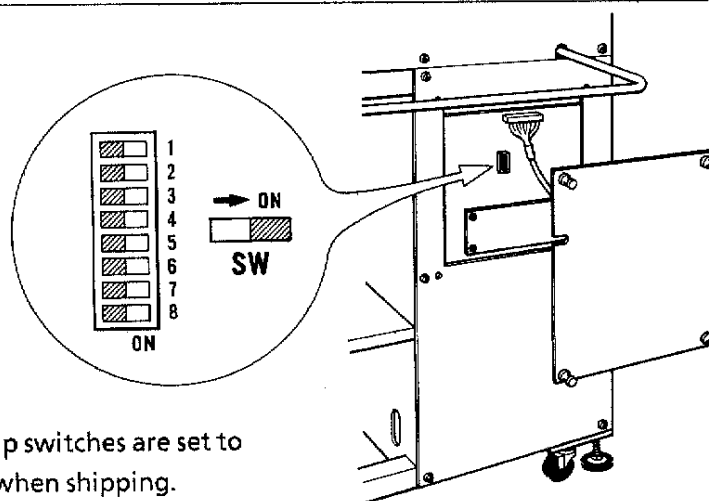
NOTE: All dip switches are set to
OFF when shipping.

switch number	state	function
SW1	OFF	To set paper tape reading speed to 9600 baud
	ON	To set paper tape reading speed to 4800 baud
SW2	OFF	To store data of floppy disk in the memory
	ON	To read and sew data of floppy disk (Data cannot be stored in the memory.)
SW3	OFF	Even if another floppy disk is inserted during data reading or sewing of a character (pattern), machine will continue reading or sewing until it is done.
	ON	If another floppy disk is inserted during data reading or sewing of a pattern (character), machine will stop operation at that point.
SW4	OFF	Spare (Use with OFF.)
	ON	
SW5	OFF	Spare (Use with OFF.)
	ON	
SW6	OFF	Spare (Use with OFF.)
	ON	
SW7	OFF	Spare (Use with OFF.)
	ON	
SW8	OFF	To display Japanese
	ON	To display English

NOTE: The power of the machine should be turned off before changing switch.
If the power is not turned off, functions do not change.
Do not take out the floppy disk from the floppy disk drive during data reading and sewing. It may occur errors or hinder correct sewing.

- 24 -

② Dip switch functions on operation panel

NOTE: All dip switches are set to
OFF when shipping.
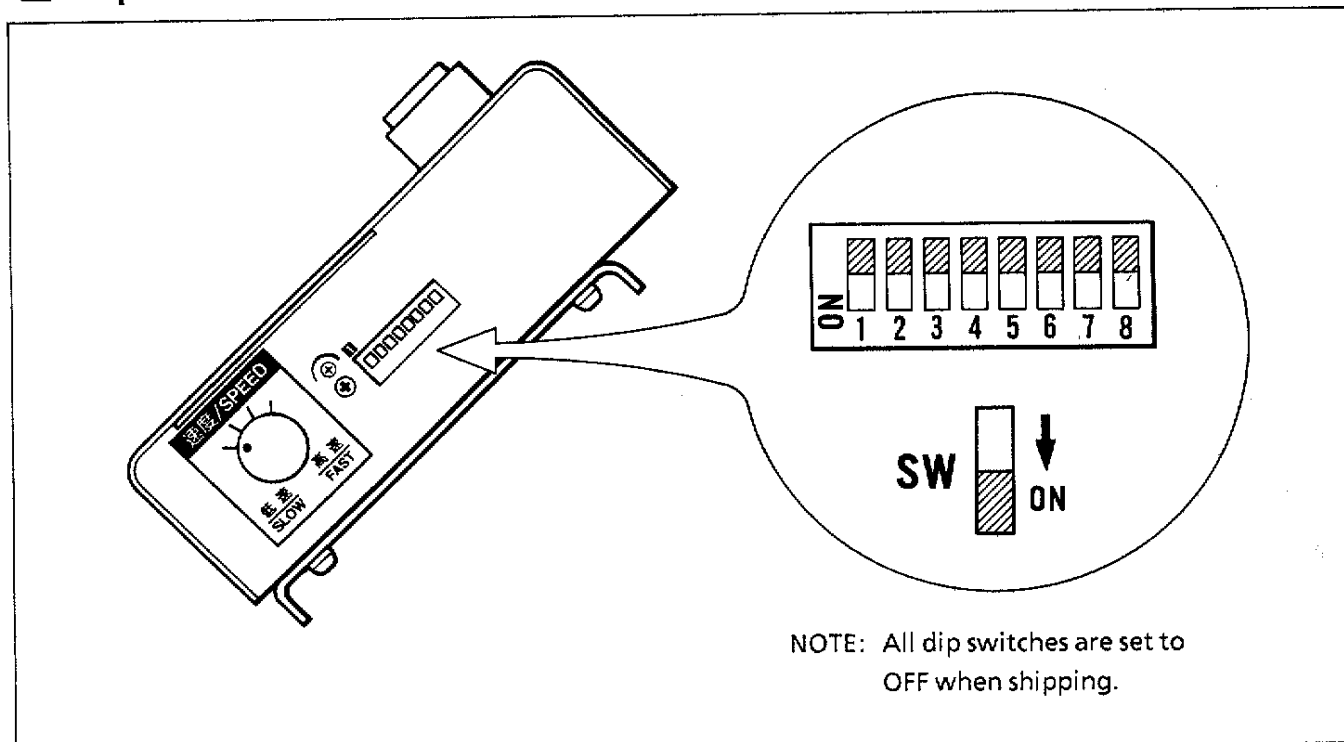
switch number	state	function			
SW1		To jump stitch after thread trimming		SW1	SW2
			more than 8 stitches	OFF	OFF
			more than 5 stitches	ON	OFF
SW2			more than 3 stitches	OFF	ON
			without thread trimming	ON	ON
SW3	OFF	To set boring mode to OFF			
	ON	To set boring mode to ON			
SW4	OFF	To set boring shift to OFF (when dip sw 3 is ON)			
	ON	To set boring shift to ON (when dip sw 3 is ON)			
SW5	OFF	To return to sewing start point after sewing			
	ON	Not to return to sewing start point after sewing			
SW6	OFF	To adjust timing of hoop movement and needle rise for thick material			
	ON	To adjust timing of hoop movement and needle rise for thin material			
SW7	OFF	To set sewing start point of editing system data to first stitch			
	ON	To set sewing start point of editing system data to center of mask			
SW8	OFF	Spare (Use with OFF.)			
	ON				

NOTE: The power of the machine should be turned off before changing switch.
If the power is not turned off, functions do not change.

① Confirm the following before switching on the machine

1. THREAD	2. EMBROIDERY HOOP	3. NEEDLE THREAD POSITION
① Threading is proper? ② The needle is threaded? ③ The bobbin thread is set? ④ The needle thread is set?	① The embroidery hoop securely clamps? ② The embroidery hoop increases the tension of the material?	① The needle thread take-ups form a line? ② The needle bar is at its highest position?

When the power switch is on, the message, "CAUTION MOVING!" is displayed and the buzzer sounds 'beep'. Then, the embroidery hoop automatically moves to the center of carriages X and Y.
At this time, check that there is nothing on the hoop which runs against the point of the needle or the presser foot.

[NOTE] When the power supply cord is connected, be sure to connect the grounding wire as illustrated in the figure below.

grounding wire

- 26 -
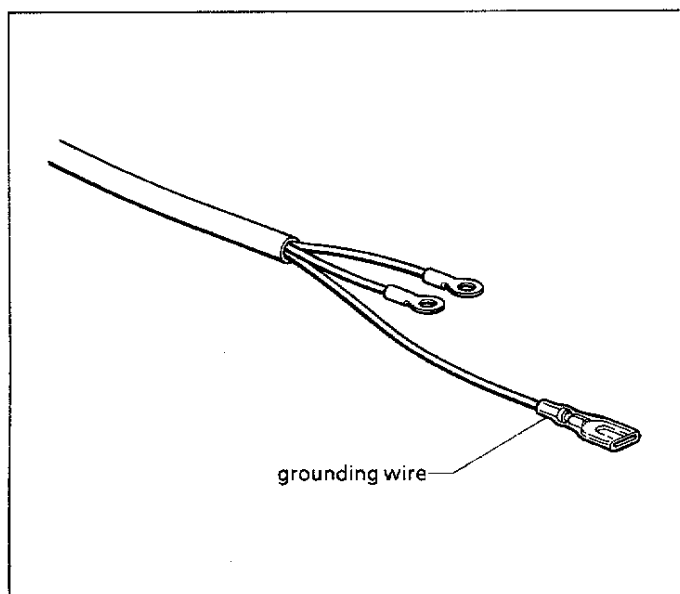
②   When turning on the power of the machine
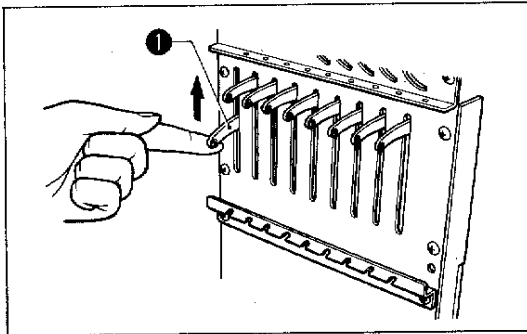
[NOTE] When the needle bar and the pulley are not in the stop position or if even one of the needle thread take-ups is not in line, lift the needle thread take-up ❶ with a finger.
The needle thread take-ups form a straight line at the top of the guide plate.

1. If the following are displayed

(1)

> N Case POS. Error
> Press CLEAR key

needle bar
case side

❶
❷

❸

START
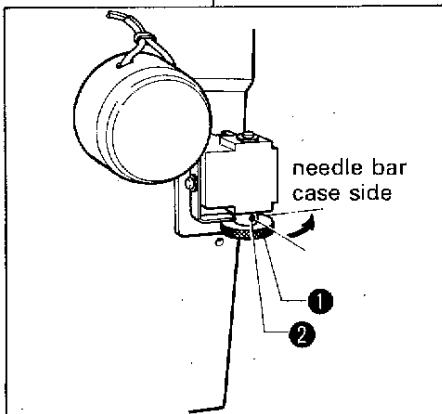
This message shows that the needle bar case is not aligned with the needle hole of the needle plate. The machine cannot operate under this condition.

1. First of all, check that the needle bar stop position is correct.

    When the red mark ❷ of the clutch knurl ❶ is on the side of the needle bar case, it is in the automatic jump condition. This is the normal position.

2. Turn the shaft ❸ slowly.

    If it is unusually heavy or does not turn, the needle thread take-up ❶ or the needle bar is not in the proper position. Check again and adjust it.
    [NOTE] Do not turn the shaft forcefully.
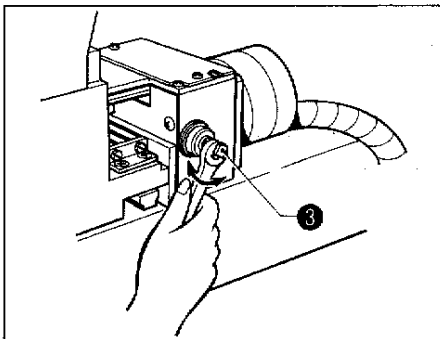
3. When the needle bar case comes to the proper position, in the middle of the undetected area where the needle bar case does not move although the shaft ❸ is turned, the buzzer sounds 'beep' and the messages, "CAUTION MOVING!" and "Press START key" are alternately displayed.

4. Press the <START> key.

- 27 -

(2)

| Needle POS. Error |
| Turn Pulley |

The needle bar is not in the proper position. Under this condition, it is impossible to move the needle bar to the proper position.

timing mark

STOP MARK

When the needle bar stop position is not proper :

1. Set the pulley timing mark to the stop position.
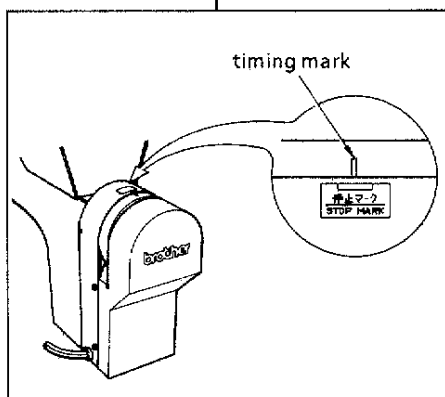
| CAUTION MOVING! |

| Press START key |

2. When the needle bar comes to the proper position, the buzzer sounds 'beep', and the messages, "CAUTION MOVING!" and "Press START key" are alternately displayed.

[NOTE] Check that the needle bar does not go down.
If it does, set the needle bar in the proper needle bar stop position.
Refer to page 29 "* The proper needle bar stop position".

| S T A R T |

3. Press the <START> key.

Carriages X and Y move automatically to the home position of the embroidery area.

| File No. 01 |
| * ▣ * * * ▣ * * * |

4. The main menu is displayed.

* The proper needle bar stop position
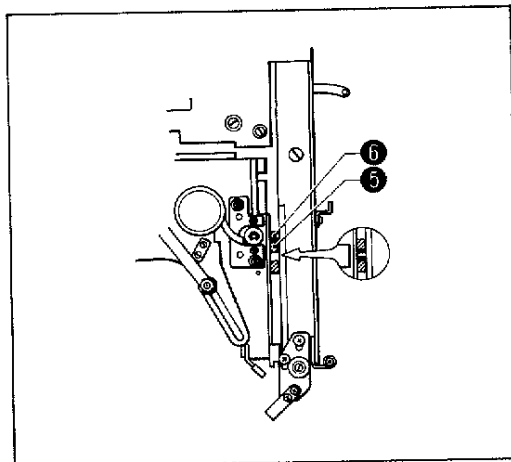
Looking into the inside from the gap, each needle bar is in the jump condition and at its highest point as in the left figure, the needle bar elevating block ❺ is below so as not to run against the needle bar clamp ❻.

All the needle thread take-ups are in a horizontal line.
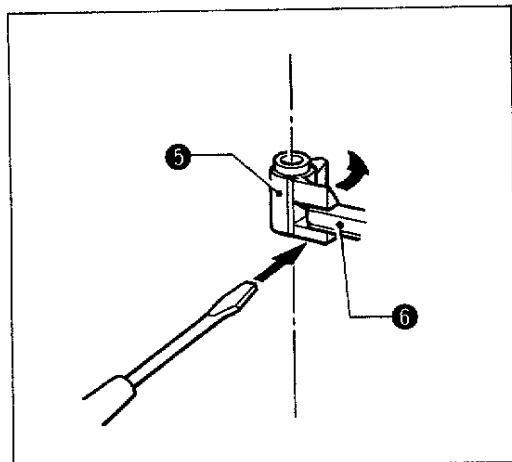
[NOTE] Check that the needle bar stop position is proper when turning on the power and when reopening to sew during standstill or pause.
   (1) The needle thread take-ups should form a horizontal line.
   (2) All the needle bars, including the needle bar in the sewing position, should line up at the highest position.
   If the needle bar in the sewing position is down, it must be disengaged from the needle bar elevating block ❺ and returned to the highest position. To separate them, insert a screw driver in the gap according to the diagram, then push and rotate.
   Once separated, the needle bar moves to the highest point by a spring.

---

2. If carriages X and Y operate unusually (Clearing and resetting memory)

1. When turning on the power not during restarting, carriages X and Y move to an abnormal position after returning to the home position (the center of the embroidery area).
2. After having exchanged the P-ROM on the main printed circuit board of the machine. (The power switch should be off in exchanging.)

[Procedures in clearing and and resetting memory]

1. Turn off the power.
2. While pressing the <EMERGENCY> key, turn on the power. Keep on pressing the <EMERGENCY> key. Do not release it.
3. After the message,"CAUTION MOVING!" is displayed, carriages X and Y start to return to the home position or another message, "Turn Pulley" and so on, is displayed. Release the <EMERGENCY> key after that.
4. The inside memory storage is reset. Carriages X and Y return to the ordinary operation after turning on the power.

3. Restarting

In the following cases, sewing can be resumed.
When the power of the machine is cut off because of a power loss during sewing, or if the power switch is turned on after having been turned off during suspension or sewing:

(1)	Turning off the power :	When the machine is suspended during sewing. After the <EMERGENCY> key has been pressed. When the machine is automatically suspended because of needle thread breakage, and so on.

Calculating now

CAUTION MOVING!

R   St:☐☐☐☐☐☐ Co:☐☐
N☐ No.☐☐☐☐☐☐☐☐☐

1. Turn on the power.
   The embroidery hoop is automatically returned to the position where sewing was suspended before and the machine is suspended during sewing.

CLEAR	START

Set STR   P.   Co:☐☐
N☐ No.☐☐☐☐☐☐☐☐☐

2. Pressing the <START> key, sewing resumes.
   Pressing the <CLEAR> key will cancel sewing.

Sewing

(2) | In case the power of the machine was cut off because of a power loss |

1. Turn on the power.
   The messages, "Restart" and "Sew. Cancel" are displayed.

> Restart > START
> Sew. Cancel > END

```
 START            E N D
```

2. Pressing the <START> key, sewing resumes.
   Pressing the <END> key will cancel sewing and return to main menu.

Sewing

> CAUTION MOVING!

> File No. 01
> * E * * * D * * *

Possible data format

Media type	Data format	Data size per pattern (max.)
Tajima format 3.5" 2DD	Tajima format Barudan format Zangs format	240,000 stitches (See note.)
3.5" 2HD which corresponds to Tajima format	Tajima format Barudan format Zangs format	400,000 stitches (See note.)
Paper tape with 1 inch width 8 holes	Tajima format Barudan format Zangs format	30,000-35,000 stitches in one reel (For more than 27000 stitches, use the memory expansion board [optional]).
Receive data from editing system	Brother stitch by stitch sewing format	999,999 stitches (See note.)

[NOTE] It is possible to sew patterns that exceeded stitch numbers that can use in mounted memory, but its data cannot be registered in the memory, and back-up functions for data cannot be used. Sewing, however, can be resumed after the power is cut off.

Summary of main menu

The main menu

```
FileNo.01          I
* E * **D ** *
```

→ "I" is displayed in hoop moving mode.

→ "*" is displayed if registered. (max.16 "*"s)

"D" is displayed in floppy disk data reading and sewing modes.

"E" is displayed in editing system data reading and sewing modes.

→ The registered number whose data is to be sewn in sewing mode is displayed.

→ "*" related to file number flashes.
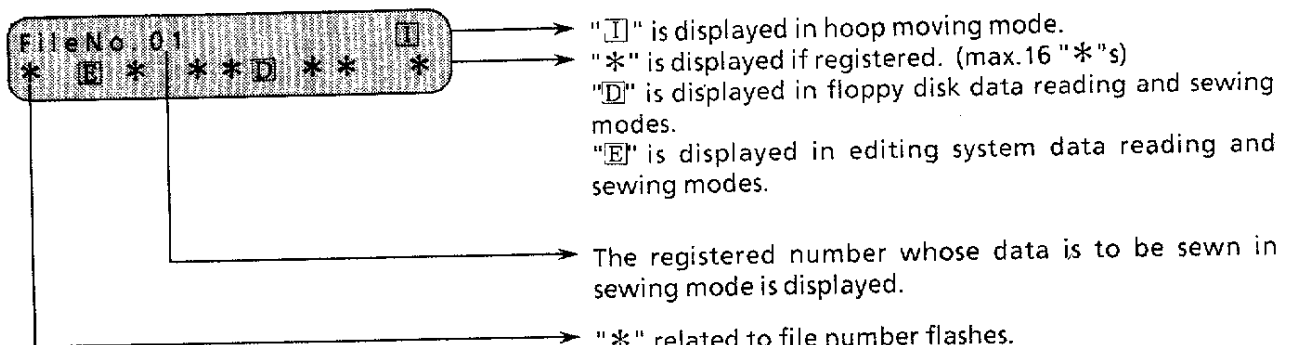
(When the main menu is displayed, pressing the following key will select its mode.)

Available key	Function	Available key	Function
△ ▽	(1) It is invalid in selecting registered data number (2) To move hoop in hoop moving mode	NEEDLE SELECT	To enter needle bar selecting mode
◁ ▷ BACK FORWARD	(1) To select data registered number of machine side in registered number selecting mode (2) To move hoop	THREAD SENSOR	To enter thread sensor and bobbin thread counter setting mode
ENTER	To enter data entry mode from floppy disk, paper tape or editing system	*	To switch following alternately (1) To select registered data number (2) To enter hoop feed mode
START	To enter sewing mode	THREAD TRIMMING	To trim thread
EDIT	To enter editing mode	HOOP FEED	To feed hoop (To enter hoop feed mode.)
NEEDLE SET	To enter needle bar setting mode		

* To make the removal and attachment of the embroidery hoop easier, besides current needle position, a new position can be set as a hoop feed point in range of movable area.
* To make an operation such as material attachment smooth while the machine suspends, pressing the <HOOP FEED> key can move the hoop to the hoop feed point anytime.
* It is possible to set or not automatic hoop feed after sewing. (This cannot be set every registered pattern.)
A feed hoop point can be set every registered pattern.

```
┌─────────────────────────┐
│ Set STR   P.        Co.□□│     (sewing mode)
│ N_ No.□□□□□□□□□□□        │
└─────────────────────────┘
            │
┌─────────────────────────┐
│ R   St:□□□□□□□   Co.□□   │     (during suspension)
│ N_ No.□□□□□□□□□□□        │
└─────────────────────────┘
            │
      ┌───────────┐
      │ H O O P   │            1.  Press the <HOOP FEED>key in sewing mode or during
      │ F E E D   │                suspension.
      └───────────┘
            │
┌─────────────────────────┐
│ Return > Hoop Feed       │
│ Hoop Feeding             │
└─────────────────────────┘
            │
        ┌─────┐
        │  △  │                2.  Set the hoop feed point by pressing the jog key.
        └─────┘                    ※  The coordinates of X and Y axes will be displayed.
    ┌─────┐ ┌─────┐
    │  ◁  │ │  ▷  │
    └─────┘ └─────┘
        ┌─────┐
        │  ▽  │
        └─────┘
            │
      ┌───────────┐
      │ E N T E R │            3.  Decide hoop feed point by pressing the <ENTER> key.
      └───────────┘
            │
┌─────────────────────────┐
│ Return > Hoop Feed    Ⓢ │
│ Hoop Feeding             │
└─────────────────────────┘
            │
      ┌───────────┐
      │     *     │            4.  Set whether hoop feed is performed or not after sewing
      └───────────┘                by pressing the <＊> key.
            │
┌─────────────────────────┐
│ Move to Hoop > ENT    Ⓢ │
│ X : □□□ mm   Y : □□□ mm  │
└─────────────────────────┘
            │
      ┌───────────┐
      │ H O O P   │            5.  After setting coordinate value, press the <HOOP FEED>
      │ F E E D   │                key. The machine will return to sewing mode.
      └───────────┘
            │
┌─────────────────────────┐
│ Set STR   P.        Co.□□│
│ N_ No.□□□□□□□□□□□        │
└─────────────────────────┘
            │
```

* Example

Home position of area
(X: 000 mm Y: 000 mm)

450 mm

285 mm

It is possible to set hoop feed point inside
area (X: 450 mm Y:285 mm)

450 mm

285 mm

Coordinates of hoop feed point
(X: 450 mm Y: 285 mm)

Coordinates of hoop feed point
(X: 225 mm Y: 285 mm)

Available key	Function
△ 後退 前進 ◁ ▷ BACK FORWARD ▽	To move needle position to desired hoop feed point
*	To decide automatic hoop feed after sewing or not (" S " (set) mark is displayed alternately.)
入 力 ENTER	To enter current needle position as hoop feed point and display its coordinates
クリア CLEAR	To set hoop feed point in center of area
HOOP FEED	To return from hoop feed point and exit from this mode

* Needle changes in setting color change can be set up to 99 times. Also, automatic sewing stop can be set every color change.

Set STR P. Co. ☐ ☐ N_ No. ☐☐☐☐☐☐☐☐☐☐	(sewing mode)
R St: ☐☐☐☐☐☐ Co: ☐ ☐ N_ No. ☐☐☐☐☐☐☐☐☐	(during suspension)

NEEDLE SET

1. Press the <NEEDLE SET> key in sewing mode or during suspension.

C_ No: ☐ ☐ Co: ☐ ☐
N_ No. ☐☐☐☐☐☐☐☐☐

◁   ▷

2. Set color order number with the < ◁ > key and < ▷ > key.

△

△

3. Select the needle number with the < ▽ > key and < △ > key.
   * The numbers 1 to 9 are selected cyclically.

END

4. After setting needle bar, press the <END> key and exit this mode. The machine will return to sewing mode.

Set STR P   Co. ☐ ☐
N_ No. ☐☐☐☐☐☐☐☐☐☐

Example) When the third color number of the fifteen colors in all is set

```
C  No:  0 3 Ⓢ        Co. 1 5
     1 2 3 4 5 6 7 8 9 1 2 3 4 5 6
```

| Not displayed | ←→ | Displayed part | | Not displayed |

Available key	Function
後進 ◁ ▷ 前進 BACK FORWARD	To set color order number
△ ▽	To select needle number (The numbers 1 to 9 can be selected cyclically.)
✳	To decide automatic stop or not (" Ⓢ " (set) mark is displayed alternately.)
#	To use needle number set in data regardless of machine side data as long as receive data from editing system is input (This is invalid for floppy disk data and paper tape data.)
クリア CLEAR	To set selecting needle number to default value (The numbers 1 to 9 are selected cyclically.)
終了 END	To exit from needle bar setting mode

* The needle bar can be manually changed to desired number from 1 to 9 regardless of setting in needle bar setting mode.

* A needle bar can be moved in the needle hole of needle plate.

```
┌──────────────────────────┐
│ Set STR  P.       Co.□ □  │   (sewing mode)
│ N_ No.□□□□□□□□□  □ □      │
└──────────────────────────┘

┌──────────────────────────┐
│ R  St:□□□□□□□  Co:□□      │   (during suspension)
│ N_ No.□□□□□□□□□  □        │
└──────────────────────────┘
              │
      ┌───────────────┐
      │  N E E D L E  │
      │  S E L E C T  │
      └───────────────┘
              │
      ┌───────────────┐
      │  Needle No. 1 │
      └───────────────┘
              │
        ┌────┐ ┌────┐
        │ ◁  │ │ ▷  │
        └────┘ └────┘
              │
        ┌───────────┐
        │   E N D   │
        └───────────┘
              │
┌──────────────────────────┐
│ Set STR  P.       Co.□ □  │
│ N_ No.□□□□□□□□□  □ □      │
└──────────────────────────┘
```

1. Press the <NEEDLE SELECT> key in sewing mode or during suspension.

2. Select the needle number with the <◁> key and <▷> key.

3. After selecting needle number, press the <END> key. The machine will return to sewing mode.

Error messages

If following error messages are displayed, press the <CLEAR> key to clear the message and cancel the error.

1. If the needle bar case is not in proper position

```
┌──────────────────────────┐
│ N_ Case  POS. Error      │
│ Press  CLEAR  key        │
└──────────────────────────┘
```

2. If the needle bar case is locked and would not move

```
┌──────────────────────────┐
│ N_ Case  Lock            │
│ Press  CLEAR  key        │
└──────────────────────────┘
```

Available key	Function
前進 ▷ FORWARD	To select needle bar in direction of number 1
後退 ◁ BACK	To select needle bar in direction of number 9
クリア CLEAR	To cancel error
終了 END	To exit from needle bar selecting mode

[NOTE] Refer to page 74 "Error messages" for details.

* The display is based on counter system which the number is decreased after sewing one pattern is completed or is canceled. After counting is completed, it can show the messages with beep sound when starting next sewing. The counter number can be set from 0 to 99. Also, ON/OFF of thread breakage detection can be switched.
* The bobbin thread counter can be set before data entry, during data input, and after data input.
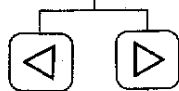
```
Set STR   P.              Co.□ □
N _ No.□ □ □ □ □ □ □ □ □ □
```
(sewing mode)

```
R _ St :□ □ □ □ □ □  Co:□ □
N _ No.□ □ □ □ □ □ □ □ □ □
```
(during suspension)

```
  THREAD
  SENSOR
```

```
B. T. Count :□ □ / □ □      S
ST. Count  :□ □ □ □ □ □ □
```

◁ ▷

△ ▽

*

E N D

```
Set STR   P.              Co.□ □
N _ No.□ □ □ □ □ □ □ □ □ □
```

1. Press the <THREAD SENSOR> key in sewing mode or during suspension.
   * When the <THREAD SENSOR> key is pressed and the upper left indicator lights, thread breakage detection will operate.

2. Move the cursor on the desired row with the < ◁ > key and < ▷> key. (The cursor will move.)

3. Enter the set times with the <△> key and <▽> key.
   * The numbers 1 to 9 are selected cyclically.

4. Press the <✳> key to select ON/OFF of the bobbin thread counter.

5. After entering set times, press the <END> key. The machine will enter sewing mode.

Available key	Function
◁ BACK ▷ FORWARD	To change cursor position on number (The cursor will appear and move.)
△ ▽	To enter set times (The numbers 1 to 9 are displayed cyclically.)
THREAD SENSOR	To switch thread breakage sensor (ON and OFF are alternately displayed.)
CLEAR	To change current counter number to set value
END	To exit from this setting

* **ST. Count :**
  Total stitch number is displayed here until it is cleared.
  It can be stored even though the power is turned off.

Available key	Function
*	To switch ON/OFF of bobbin thread counter function
#	To clear stitch number counter

1 Entering floppy disk data (1)

* Input possible floppy disk
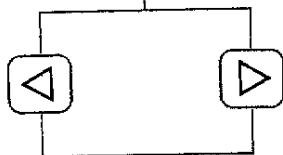 Restricted to Tajima format 3.5" 2DD floppy disk (TFD) or 3.5"2HD floppy disk which corresponds to Tajima format

| Ex. | When entering file name (G0004) and data name (rose) |

1. Turn on the power.

CAUTION MOVING!

FileNo.01
E * **D ** *

◁　▷

2. Using the < ◁ >key or < ▷ > key, select the registered number of the machine side.

3. Press the <ENTER> key. The machine will enter the data entry mode.
   * Up to 16 patterns can be registered.

ENTER

F 01: □□□□□□□□ . □□□
□□□□□□□□ / Disk

F 01: □□□□□□□□ . □□□
Reading / Disk

4. Insert the floppy disk.

F 01: G 0 1 1　　　　　　DST
File Sel / Disk

△　▽
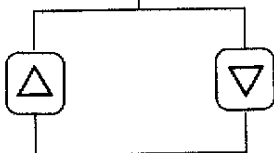
5. Using the < △ > key or < ▽ > key, select the file name, G0004.

F 01: G 0 0 4　　　　　　DST
File Sel / Disk

```
┌─────────────┐
│   ENTER     │
└─────────────┘
```

6. Press the <ENTER> key.

```
┌──────────────────────────┐
│ F 01: G 0 0 4       . DST │
│ Reading  /  Disk          │
└──────────────────────────┘
```
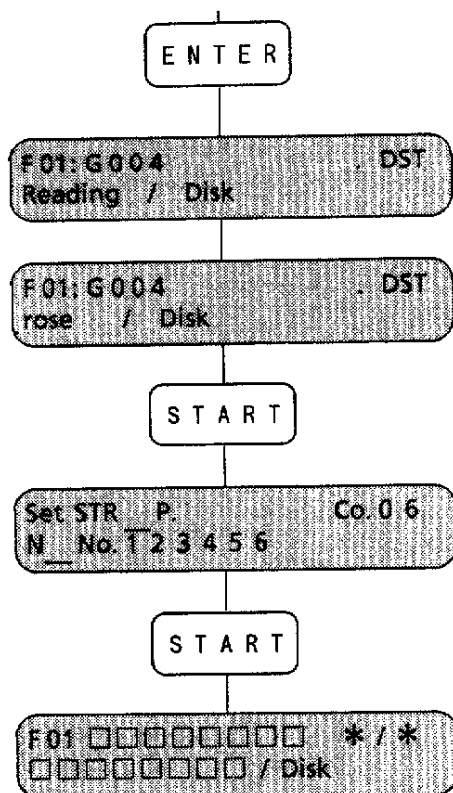
The display message on the lower row will change "Reading" to "rose".

```
┌──────────────────────────┐
│ F 01: G 0 0 4       . DST │
│ rose    /  Disk           │
└──────────────────────────┘
```

```
┌─────────────┐
│   START     │
└─────────────┘
```

7. Press the <START> key.
   The machine will enter sewing mode.

```
┌──────────────────────────┐
│ Set STR  P.        Co.0 6 │
│ N  No. 1 2 3 4 5 6        │
└──────────────────────────┘
```

```
┌─────────────┐
│   START     │
└─────────────┘
```

8. Press the <START> key.
   The machine will start sewing.

```
┌──────────────────────────┐
│ F 01 □□□□□□□□   * / *     │
│ □□□□□□□□ / Disk           │
└──────────────────────────┘
```

[NOTE] Repeat sewing cannot be set during floppy disk data reading or sewing (when ' □ ' is displayed).

Error messages

If the following error message is displayed, press the <CLEAR> key to clear the message and cancel the error.

1. When pattern of input file name is not registered on the floppy disk

```
┌──────────────────────────┐
│ F 01: □□□□□□□□ . □□□      │
│ No  File  / Disk          │
└──────────────────────────┘
```

2. When the floppy disk is not set or it is defective
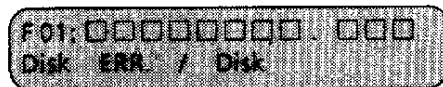
```
┌──────────────────────────┐
│ F 01: □□□□□□□□ . □□□      │
│ Disk  ERR  / Disk         │
└──────────────────────────┘
```

[NOTE] Refer to page 74 "Troubleshooting" for details.

Area over

```
┌─────────────────────┐
│ Area  Over        ▼ │
└─────────────────────┘
          │
         ┌─┐
         │△│
         └─┘
          │
┌─────────────────────┐
│ Set STR  P.    Co. 0 6│
│ N_ No. 1 2 3 4 5 6  │
└─────────────────────┘
          │
      ┌───────┐
      │ START │
      └───────┘
          │
       Sewing
```
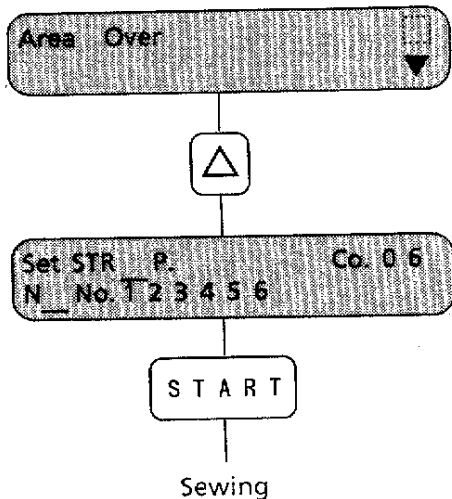
1. When "Area Over" is displayed after inputting data and pressing the <START> key, press the jog key opposite to the currently displayed one to move the embroidery hoop till the display stops flashing.

2. The machine will enter sewing mode.

Thread breakage

```
┌─────────────────────┐
│ Thread  breakage    │
│ Press  CLEAR  key   │
└─────────────────────┘
          │
      ┌───────┐
      │ CLEAR │
      └───────┘
          │
┌─────────────────────┐
│ R_ St:□□□□□□ Co:□□  │
│ N_ No.□□□□□□□□      │
└─────────────────────┘
          │
   ┌──────┴──────┐
┌───────┐   ┌───────┐
│ START │   │ CLEAR │
└───────┘   └───────┘
    │            │
  Sewing         │
          ┌─────────────────────┐
          │ Set STR  P.   Co. 0 6│
          │ N_ No. 1 2 3 4 5 6  │
          └─────────────────────┘
```
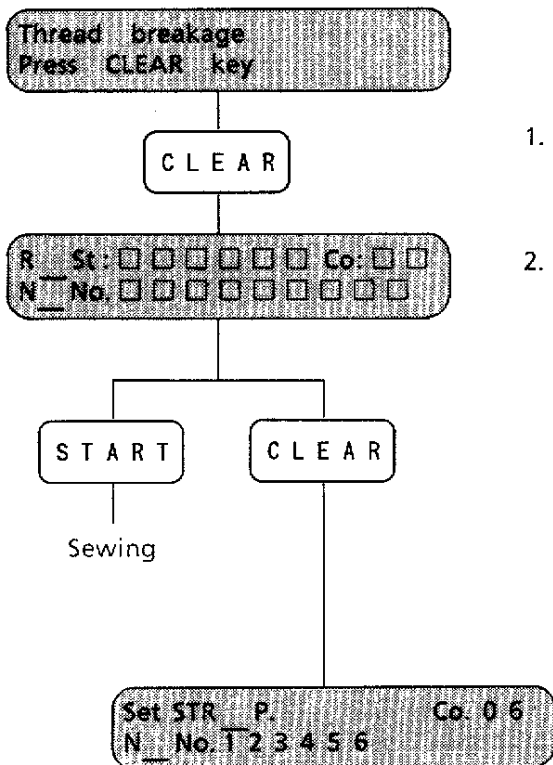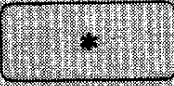
1. Press the <CLEAR> key to cancel the message and pass the thread.

2. The machine suspends. Pressing the <START> key, sewing will resume. Pressing the <CLEAR> key, the machine will enter sewing function selection mode.
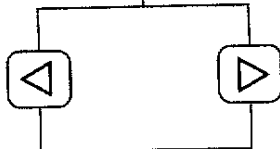
[NOTE] Refer to page 74 "Troubleshooting" for details.

* The following keys are available during floppy data entry:

Available key	Function
△ ▽	To scroll file names registered in floppy disk
◁ ▷ BACK FORWARD	To select registered number of machine side
*	To display pattern name of file name displayed on upper row
クリア CLEAR	To clear file data displayed on upper row and screen
入力 ENTER	To read pattern data of file name displayed on upper row from floppy disk (This key is invalid when data is already registered in selecting number.)
開始 START	To enter sewing mode if data registered
#	To enter paper tape data reading mode
編集 EDIT	To enter editing mode
針棒設定 NEEDLE SET	To enter needle bar setting mode
針棒選択 NEEDLE SELECT	To enter needle bar selecting mode
糸切れセンサ THREAD SENSOR	To enter thread sensor and bobbin thread counter setting mode
終了 END	To return to main menu
糸切り THREAD TRIMMING	To trim thread
枠送り HOOP FEED	To feed hoop (To enter hoop feed mode)

- 43 -

CAUTION MOVING!

1. Turn on the power.
   (Turn on the power of paper tape reader, also.)

File No. 01   [I]
E * **D **   *

2. Press the < ◁ > key or < ▷ > key. Select the number of machine side.

◁   ▷

ENTER

3. Press the <ENTER> key. The machine will go into the data entry mode.
   * Up to 16 patterns can be registered.

F01: □□□□□□□□ , □□□
□□□□□□□□ / Disk

#

4. Press the <#> key to select the paper tape.

F01: □□□□□□□□ , □□□
□□□□□□□□ / Tape

▽   △

F01   TAJIMA
Type SEL   / Tape

5. Press the < △ > key or < ▽ > key to select paper tape type from TAJIMA, BARUDAN and ZANGS.

△   ▽
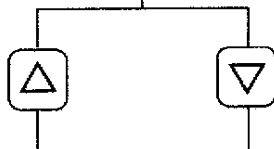
ENTER

6. Press the <ENTER> key.

F01   TAJIMA
Reading   / Tape

F01   TAJIMA
Read   end   / Tape

7. After reading is completed, the buzzer sounds 'beep'.

```
F 01 : TAJIMA  TAPE
S  : □□□□□□ /Tape
```

```
START
```

```
Set STN  P.           Co.□ □
N_ No.□ □ □ □ □ □ □ □ □
```

```
START
```

```
F 01  □□□□□□□□ * / *
N_ No.  □□□□□□□□□
```
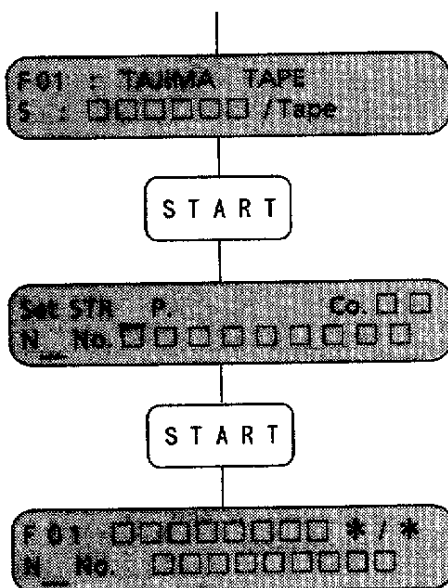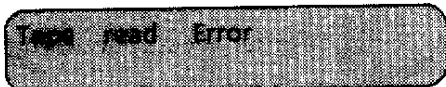
*   S: shows the stitch number of paper tape data.

8. Press the <START> key.
    The machine will enter sewing mode.

Error messages

If the following error message is displayed, press the <CLEAR> key to clear the message and cancel the error.

1. If reading data from paper tape is failed

```
Tape  read  Error
```

2. If the communication line is not normal

```
Off  Line
```

[NOTE] While error message is displayed, the buzzer sounds 'beep' continuously.
Refer to page 74 "Error messages" for details.

* The following keys are available during inputting floppy data:

Available key	Function
△ ▽	To select paper tape type from (TAJIMA, BARUDAN, ZANGS)
◁ ▷ BACK FORWARD	To select registered number of machine side
CLEAR	(1) To clear file data displayed on upper row and clear screen (2) To cancel error
ENTER	To read data from paper tape reader (This is invalid when data is already registered in selecting number.)
START	To enter sewing mode if data registered
#	To enter editing system data reading mode
EDIT	To enter editing mode
NEEDLE SET	To enter needle bar setting mode
NEEDLE SELECT	To enter needle bar selecting mode
THREAD SENSOR	To enter thread sensor and bobbin thread counter setting mode
END	To return to main menu
THREAD TRIMMING	To trim thread
HOOP FEED	To feed hoop (To enter hoop feed mode)

CAUTION MOVING!

FileNo.01
E * * * D * * *

◁ ▷

ENTER

F 01: □□□□□□□ . □□□
□□□□□□□□ / Disk

#

F 01: □□□□□□□ . □□□
□□□□□□□□ / Editor

△ ▽

F 01: □□□□□□□ . □□□
On line / Editor

F 01: □□□□□□□ . □□□
File Set / Editor

ENTER

F 01: □□□□□□□ . □□□
On line / Editor

F 01: □□□□□□□ . □□□
Receiving / Editor

1. Turn on the power.
   Turn on the power of the editing system to enter
   communication mode.

2. Press the < ◁ > key or < ▷ > key to select the registered
   number of machine side.

3. Press the <ENTER> key. The machine will go into the
   data entry mode.

4. Press the < # > key twice to select editing system.

5. Press the < △ > key or < ▽ > key to select the file name
   registered in the editing system.

6. After selecting the file name, press the <ENTER> key.

- 47 -

```
┌──────────────────────────┐
│ F01:□□□□□□□□ . □□□      │
│ Read  end  / Editor      │
└──────────────────────────┘
            │
     ┌──────────────┐
     │  S T A R T    │
     └──────────────┘
            │
┌──────────────────────────┐
│ Set STR  P.        Co.□ □ │
│ N_ No.□□ □□□□□□□□       │
└──────────────────────────┘
            │
     ┌──────────────┐
     │  S T A R T    │
     └──────────────┘
            │
┌──────────────────────────┐
│ F 01  □□□□□□□□ */*      │
│ N_ No.  □□□□□□□□□        │
└──────────────────────────┘
```
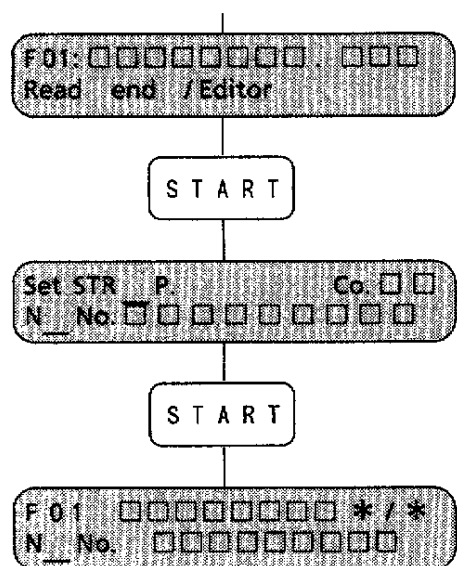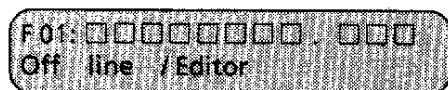
* After reading data is completed, the buzzer sounds 'beep' during fixed time.

7. Press the <START> key.
   The machine will enter sewing mode.

8. Press the <START> key.
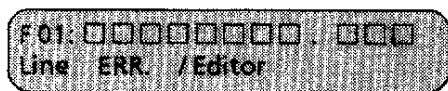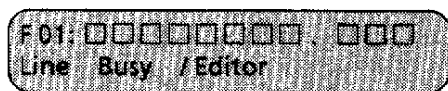   The machine will start sewing.

Error messages

If the following error message is displayed, press the <CLEAR> key to clear the message and cancel the error.

1. If the communication line is not normal or the editing system is communicating with other sewing machine

```
┌──────────────────────────┐
│ F01:□□□□□□□□ . □□□      │
│ Off  line  / Editor      │
└──────────────────────────┘
```

2. If the communication line is not normal

```
┌──────────────────────────┐
│ F 01:□□□□□□□□ . □□□     │
│ Line  Busy  / Editor     │
└──────────────────────────┘
```

```
┌──────────────────────────┐
│ F 01:□□□□□□□□ . □□□     │
│ Line  ERR.  / Editor     │
└──────────────────────────┘
```

[NOTE] While the error message is displayed, the buzzer sounds 'beep'.
Refer to page 74 "Error messages" for details.

* When reading or sewingt the editing system data (' $\boxed{E}$ ' is displayed), setting repeat sewing cannot be done.

* The following keys are available during reading data from editing system;

Available key	Function
△ ▽	To scroll file names registered in editing system
◁ ▷ BACK FORWARD	To select registered number of machine side
*	To display pattern name of file name displayed on upper row
クリア CLEAR	(1) To clear file data displayed on upper row and clear screen (2) To cancel error
入 力 ENTER	To read pattern data of file name displayed on upper row from editing system (This is invalid when the data is already registered in selecting number.)
開 始 START	To enter sewing mode if data registered
枠	To enter floppy disk data reading mode
EDIT	To enter editing mode
NEEDLE SET	To enter needle bar setting mode
NEEDLE SELECT	To enter needle bar selecting mode
THREAD SENSOR	To enter thread sensor and bobbin thread counter setting mode
END	To return to main menu
THREAD TRIMMING	To trim thread
HOOP FEED	To feed hoop (To enter hoop feed mode)

Select [EDIT] in the main menu.

FileNo.01
* 🔲 * **🔲 ** *
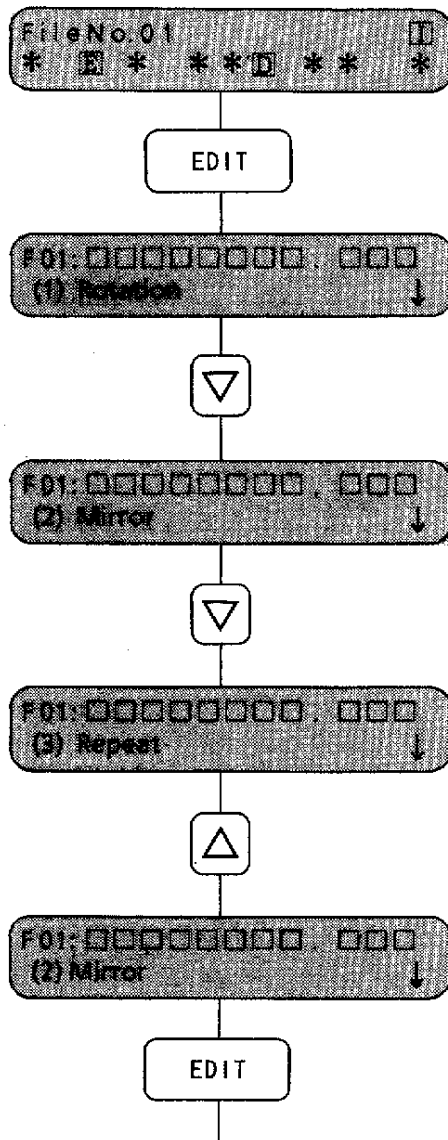
EDIT

1. Press the <EDIT> key. The machine will enter editing mode.

F 01: 🔲🔲🔲🔲🔲🔲🔲 : 🔲🔲🔲
(1) Rotation ↓

▽

2. Press the < ▽ > key to display the three items of the editing menu.
   * The editing menu items will be scrolled.

F 01: 🔲🔲🔲🔲🔲🔲🔲 : 🔲🔲🔲
(2) Mirror ↓

▽

F 01: 🔲🔲🔲🔲🔲🔲🔲 : 🔲🔲🔲
(3) Repeat ↓

△

F 01: 🔲🔲🔲🔲🔲🔲🔲 : 🔲🔲🔲
(2) Mirror ↓

3. After selecting editing item, press the <EDIT> key. The machine can enter the selected editing mode.

EDIT

- 50 -

Checking editing information

F 01: ☐☐☐☐☐☐☐☐ . ☐☐☐
(1) Rotation   ↓

*

Rotation :   90°
Mirror : Image   J

Repeat :   H   5 times
Space : 000   mm

Length
X   : 052 mm   Y   : 050 mm

Escape point   S
X   : 225 mm   Y   : 285 mm

T _ St : 0 0 4 5 3 8   Co : 0 2

F 01: ☐☐☐☐☐☐☐☐ . ☐☐☐
(1) Rotation   ↓
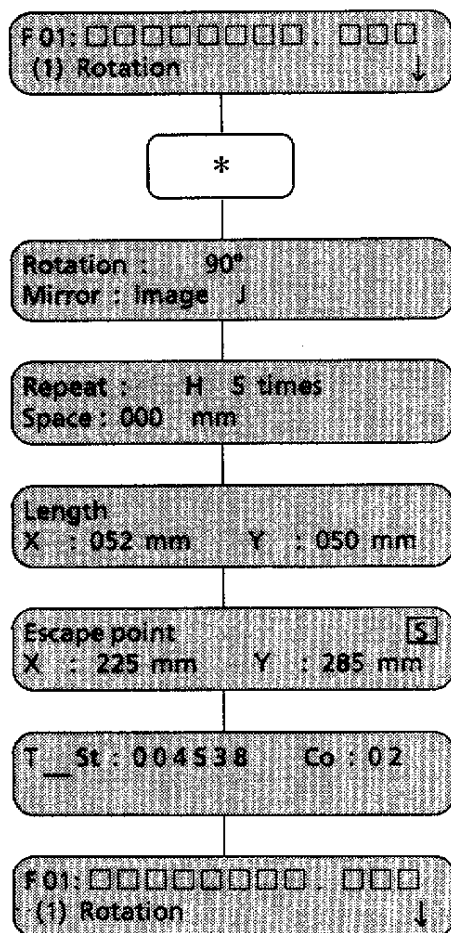
If the <✻> key is pressed in the mode displaying editing menu, screens are displayed in sequence so that the set values can be checked.

After displaying is completed, the machine will return to editing menu mode.
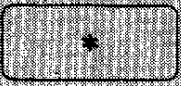
Default value

1.	Rotation:	0° (no rotation)
2.	Mirror image:	"J" (non-reversed mirror image)
3.	Repeat sewing:	once, horizontally (non-repeat sewing) spacing 0 mm

When the <CLEAR> key is pressed, above edit items are set to default values.

- 51 -

* The following keys are available in the editing menu:

Available key	Function
△ ▽	To select editing item cyclically
◁ ▷ BACK FORWARD	To select registered number of machine side
*	To check set values of registered number selected with above key
クリア CLEAR	To clear set values of registered number selected with above key (To return to default value)
編 集 EDIT	To enter editing mode of editing item selected
入 力 ENTER	To enter entry mode
開 始 START	To enter sewing mode
終 了 END	To return to main menu
針棒設定 NEEDLE SET	To enter needle bar setting mode
針棒選択 NEEDLE SELECT	To enter needle bar selecting mode
糸切センサ THREAD SENSOR	To enter thread sensor and bobbin thread counter setting mode
糸切り THREAD TRIMMING	To trim thread
枠送り HOOP FEED	To feed hoop (To enter hoop feed mode)

- 52 -

* The four type angles can be set every registered pattern. (0°, 90°, 180°, 270°)

```
F 01: □□□□□□□□ . □□□
(1) Rotation                    ↓
```
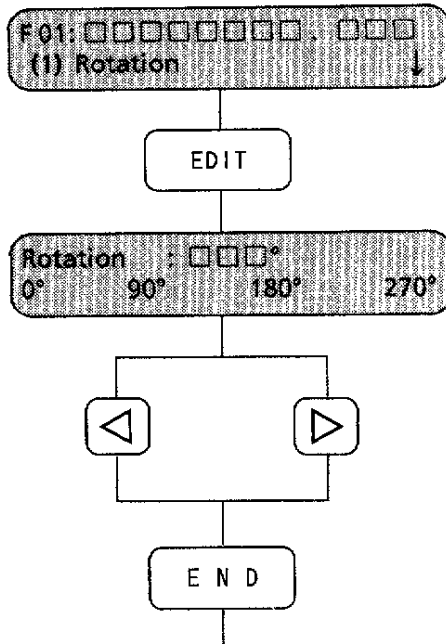
1. After selecting the editing menu, press the <EDIT> key.

EDIT

```
Rotation  : □□□°
0°      90°      180°      270°
```

2. Information of rotation angles is displayed and the rotation angle can be set using the <◁> key and <▷> key.

◁   ▷

E N D

3. After setting rotation angle, press the <END> key.

Available key	Function
前進 ▷ FORWARD	To decide rotation angle counterclockwise (0° → 270°)
後退 ◁ BACK	To decide rotation angle counterclockwise (270° → 0°)
クリア CLEAR	To select 0° angle (default value)
エンド END	To return to editing menu

* Three kinds of mirror image processes -- of X axis symmetry, Y axis symmetry and origin symmetry -- can be set every registered pattern.

F 01:☐☐☐☐☐☐☐☐ . ☐☐☐
(1) Rotation   ↓

[▽]

F 01:☐☐☐☐☐☐☐☐ . ☐☐☐
(2) Mirror   ↓

[EDIT]

Mirror : Image J
                J L Г ٦

[◁]   [▷]

[E N D]
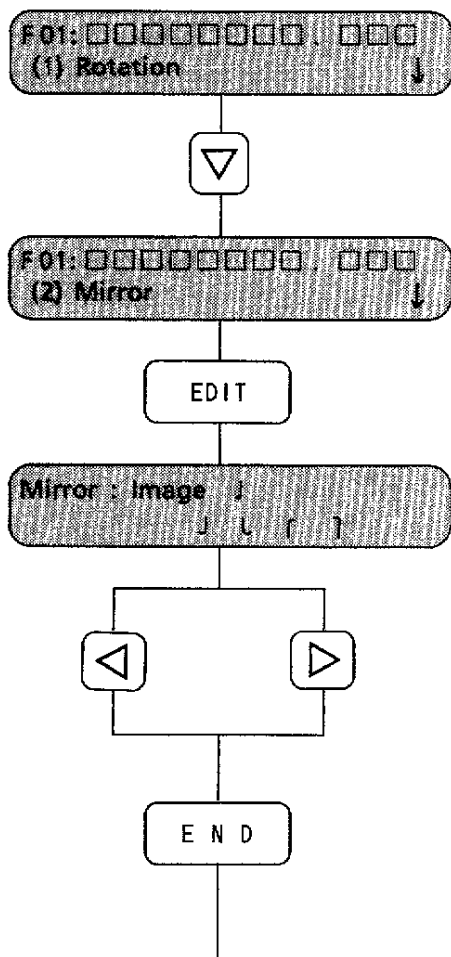
1. Using <▽> key, select editing menu.

2. After selecting editing menu, press the <EDIT> key.

3. The mirror image information is displayed. Select the desired mirror image with the <◁> key and <▷> key.
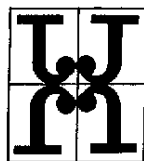
4. After selecting mirror image, press the <END> key.

Available key	Function
▷ FORWARD	To decide mirror image (Image J to ٦)
◁ BACK	To decide mirror image (Image ٦ to J)
CLEAR	To select mirror image J (default value)
END	To return to editing menu

* A monogram can be set horizontally or vertically up to 9 times. Also, space between patterns can be set in the range from 0 mm to 399 mm by 1 mm increment.
These setting can be changed every registered pattern.

```
┌──────────────────────────┐
│ F 01: □□□□□□□  □□□      │
│ (1) Rotation          ↓ │
└──────────────────────────┘
```

[▽]

```
┌──────────────────────────┐
│ F 01: □□□□□□□  □□□      │
│ (2) Mirror            ↓ │
└──────────────────────────┘
```

[▽]

```
┌──────────────────────────┐
│ F 01: □□□□□□□  □□□      │
│ (3) Repeat            ↓ │
└──────────────────────────┘
```

[EDIT]

```
┌──────────────────────────┐
│ Repeat :    V   1 Time  │
│ Space :  006   mm       │
└──────────────────────────┘
```

[◁] [▷]

```
┌──────────────────────────┐
│ Repeat :    V   1 Time  │
│ Space :  006 mm         │
└──────────────────────────┘
```

[△] [▽]
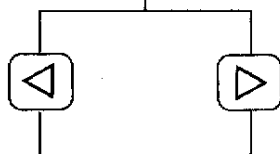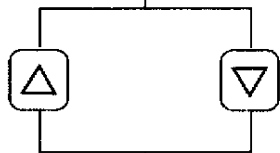
```
┌──────────────────────────┐
│ Repeat :    V   1 Time  │
│ Space :  106 mm         │
└──────────────────────────┘
```

[#]

[E N D]

1. Select "(3) Repeat" in the editing menu with <▽> key.

2. After selecting, press the <EDIT> key.

3. Information of repeat sewing setting is displayed. Change the cursor position on the number with < ◁ > key and < ▷> key.

4. Enter the repeat times and space length with the < △ > key and <▽> key.
   * The numbers 1 to 9 are scrolled.

5. Press the <#> key to select the repeat direction, either vertical direction or horizontal direction.
   * "V" and "H" are displayed alternately.

6. After setting, press the <END> key.

example: setting repeat sewing and spacing

Available key	Function
◁ ▷ BACK FORWARD	To change cursor position on number
△ ▽	To enter repeat times or space length (The numbers 1 to 9 are selected cyclically.)
#	To decide repeated direction (vertical or horizontal) (Repeat direction is selected cyclically.)
クリア CLEAR	To return to default values (once horizontally, spacing 0 mm)
END	To return to editing menu

[NOTE] For the floppy disk data or the editing system data, setting repeat sewing cannot be done in the reading or sewing mode (when ' □ ' or ' □ ' is displayed).

Explanation of sewing function

Set STR P. Co.☐☐ N_ No.☐☐☐☐☐☐☐☐☐	**Sewing function selection mode**

☐1
| F01:☐☐☐☐☐☐☐☐ */* N_ No.☐☐☐☐☐☐☐☐☐ | **Sewing**
During sewing or during test feeding |

| R St:☐☐☐☐☐☐ Co:☐☐ N_ No.☐☐☐☐☐☐☐☐☐ | **Suspension**
An emergency stop results suspension. |

☐2
| C No:☐☐☐S   Co:☐☐ N_ No.☐☐☐☐☐☐☐☐☐ | **Needle bar setting mode**
Needle bar order (color order) may be set. |

☐3
| Needle No. 1 | **Needle bar selecting mode**
To select needle bars. |

☐4
| Return > Hoop Feed   S Hoop Feeding | **Hoop feed mode**
To set hoop feed point. |

| Move to Hoop > ENT   S X : ☐☐☐ mm Y : ☐☐☐ mm | (after the jog key is used) |

☐5
| B T Count : ☐☐ / ☐☐   S ST Count : ☐☐☐☐☐☐ | **Thread sensor ON/OFF, B.T. counter setting mode** |

- 57 -

Following is a procedure of sewing a pattern registered into the design floppy disk.

SEWING CREATION
STAFF
WE CREATE THE NEXT APPAREL GENERATION
BROTHER INDUSTRIES, LTD.

Embroider the pattern above. (four-colored, file name :G001)

CAUTION MOVING!

1. Turn on the Power.

File No. 01
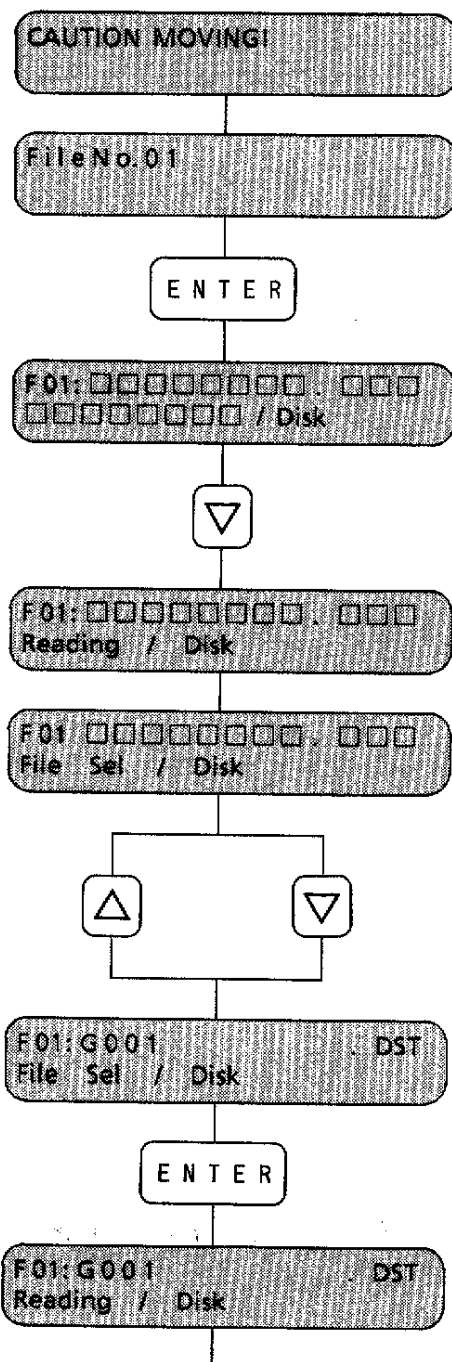
2. Insert the design floppy disk.

ENTER

3. Press the <ENTER> key to enter the data entry mode.

F 01: □□□□□□□□ . □□□
□□□□□□□□ / Disk

▽

4. Press the <▽> key.

F 01: □□□□□□□□ . □□□
Reading / Disk

F 01 □□□□□□□□ . □□□
File Sel / Disk

△   ▽

5. Select the file name, "G001" with the < △ > key and
<▽> key.

F 01: G 0 0 1   . DST
File Sel / Disk

ENTER

6. Press the <ENTER> key to read data.

F 01: G 0 0 1   . DST
Reading / Disk

"Reading" is displayed on the lower row of the display.

- 58 -

```
F 0 1  G 0 1 1               DST
S T A F F  /  Disk
```

When reading data is finished, its pattern name (STAFF) is displayed on the lower row of the display.

```
S T A R T
```

7. Press the <START> key to enter the sewing mode.

```
Set STR  P.           Co. 0 4
N__ No. 1 2 3 4
```

```
△
◁   ▷
▽
```

8. Move the hoop to set sewing start point with the < △ >, < ◁ > , < ▽ > and < ▷ > keys.

```
Set STR  P           Co. 0 4
N__ No. 1 2 3 4
```

```
S T A R T
```

9. Press the <START> key to start sewing.

```
F 0 1  STAFF
N__ No. 1 2 3 4
```

```
EMERGENCY
```

10. If the <EMERGENCY> key is pressed, sewing is suspended.

```
R__ St: 0 1 5 3 9 8   Co. 0 4
N__ No. 3 4
```

```
CLEAR    ◁    ▷
```

Sewing is cancelled.
Return to step 8.

Moving the hoop forward or backward can be done by 1 stitch increment with < ◁ > key and < ▷ > key.

```
#

#

◁    ▷
```

If the < # > key is pressed twice, moving the hoop backward or forward can be done in 100 stitch increments.

```
R__ St: 0 1 5 2 9 8   Co. 0 4
N__ No. 3 4
```

```
R__ St: 0 1 5 0 9 8   Co. 0 4
N__ No. 3 4              □
```

- 59 -

```
R  St: 0 1 5 2 9 8    Co:  0 4
N  No. 3 4
```

`S T A R T`

11. Press the <START> key. Sewing will resume.

```
F 0 1 STAFF
N  No. 3 4
```

Thread brekage

12. If thread breakage occurs, sewing is suspended and the error message is displayed.
[NOTE] Pass the thread again.

```
Thread  breakage
Press  END  key
```

`E N D`

13. Press the <END> key. The error is cancelled and the machine suspends.

```
R  St: 0 0 5 2 9 8    Co:  0 4
N  No. 4
```

When the hoop is moved forcedly

`#`

14. When the <#> key is pressed, the hoop can be moved forcedly.

```
R  St: 0 0 5 2 9 8    Co:  0 4
N  No. 4                    I
```

`△`

`◁`   `▷`

`▽`

15. By pressing the <△>, <◁>, <▽> or <▷> key, the hoop is moved in the direction of pressed key by 0.1 mm increment.
[NOTE] When the hoop is moved forcedly, sewing left unperformed will slip for its hoop movement distance. Pay attention to this usage.
If the hoop and the material do not match properly, correction can be done by pressing the <▷>, <△>, <◁>, and <▽> keys.

```
R  St: 0 0 5 2 9 8    Co:  0 4
N  No. 4                    I
```

`S T A R T`

16. Press the <START> key. Sewing will resume.

```
F 0 1 STAFF
N  No. 3 4
```

```
Set STR  P            Co:  0 4
N  No. T 2 3 4
```

17. After sewing is completed, the machine will return to step 8.

Following is a procedure of repeatedly sewing pattern entered in the floppy disk.
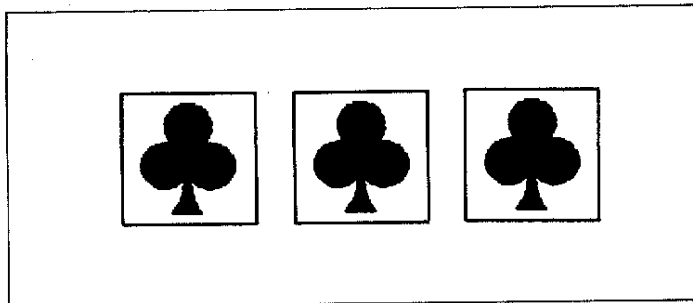
Embroider the pattern above repeatedly. (six-colored, file name :G002)

CAUTION MOVING!

1. Turn on the Power.

File No.01
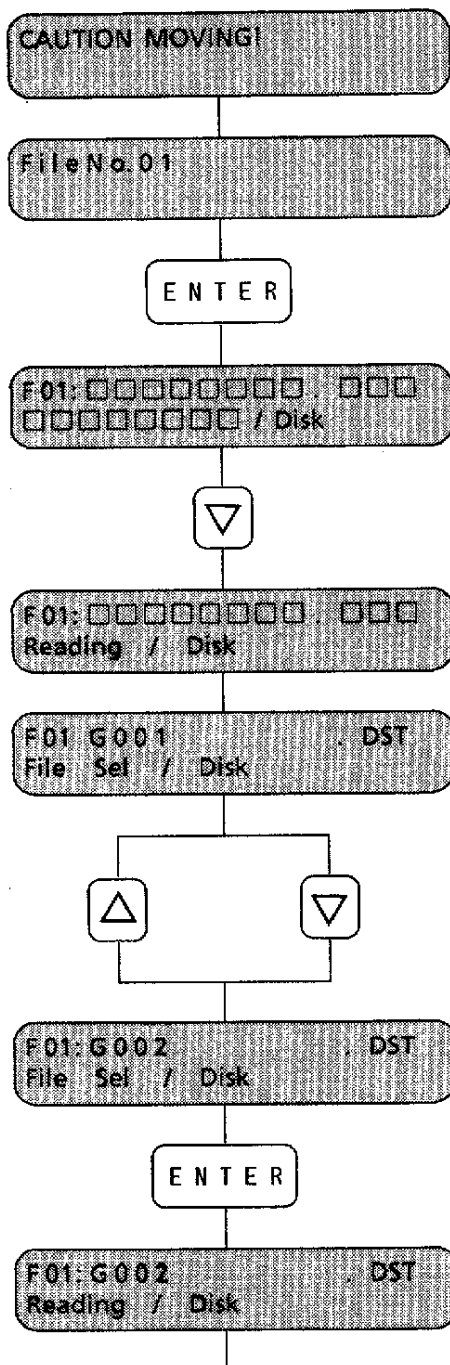
2. Insert the design floppy disc.

ENTER

3. Press the <ENTER> key to go into the data entry mode.

F 01: □□□□□□□□ □□□
□□□□□□□□ / Disk

▽

4. Press the <▽> key.

F 01: □□□□□□□□ □□□
Reading / Disk

F 01 G 0 0 1   . DST
File Sel / Disk

△   **▽**

5. Select the file name, "G002" with the < △ > key and <▽> key.

F 01: G 0 0 2   . DST
File Sel / Disk

ENTER

6. Press the <ENTER> key to read data.

F 01: G 0 0 2   . DST
Reading / Disk

"Reading" is displayed on the lower row of the display.

- 61 -

```
┌─────────────────────────────┐
│ F01:G002              DST    │
│ Clover   /   Disk            │
└─────────────────────────────┘
              │
        ┌─────────┐
        │  EDIT   │
        └─────────┘
              │
┌─────────────────────────────┐
│ F01:G002              DST    │
│ (1) Rotation            ↓    │
└─────────────────────────────┘
              │
          ┌──────┐
          │  ▽   │
          └──────┘
              │
          ┌──────┐
          │  ▽   │
          └──────┘
              │
┌─────────────────────────────┐
│ F01:G002              DST    │
│ (3) Repeat              ↓    │
└─────────────────────────────┘
              │
        ┌─────────┐
        │  EDIT   │
        └─────────┘
              │
┌─────────────────────────────┐
│ Repeat :      H  1 Time      │
│ Space : 000   mm             │
└─────────────────────────────┘
              │
┌─────────────────────────────┐
│ Repeat :      H  3 Times     │
│ Space : 005   mm             │
└─────────────────────────────┘
              │
        ┌─────────┐
        │  END    │
        └─────────┘
              │
┌─────────────────────────────┐
│ F01:G002              DST    │
│ (3) Repeat              ↓    │
└─────────────────────────────┘
              │
        ┌─────────┐
        │ START   │
        └─────────┘
              │
┌─────────────────────────────┐
│ Set STR  P           Co. 0 6 │
│ N  No. 1 2 3 4 5 6           │
└─────────────────────────────┘
              │
          ┌──────┐
          │  △   │
          └──────┘
       ┌──────┐ ┌──────┐
       │  ◁   │ │  ▷   │
       └──────┘ └──────┘
          ┌──────┐
          │  ▽   │
          └──────┘
```
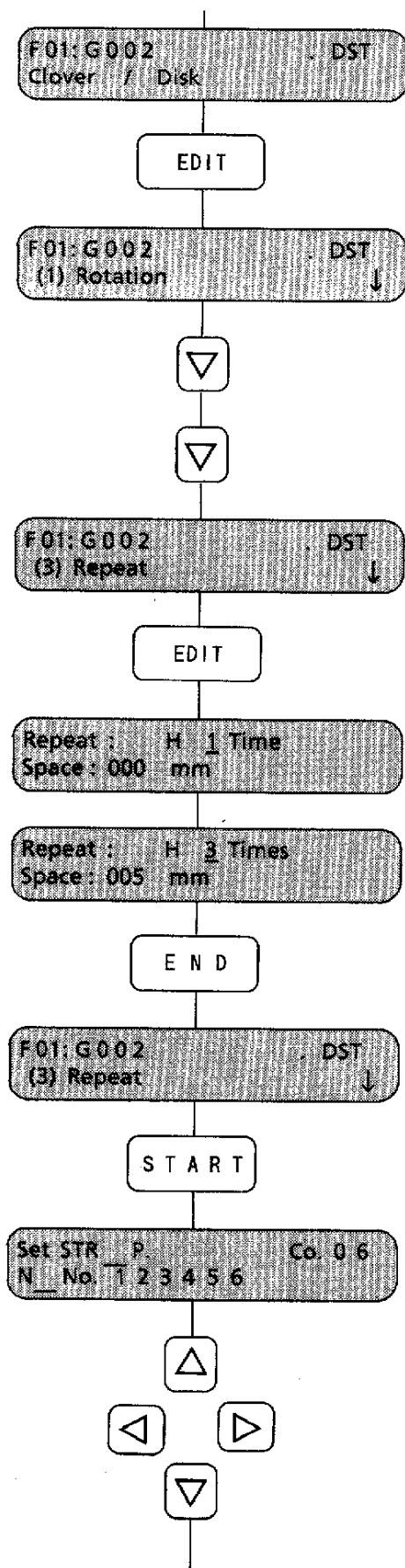
When reading data is finished, its pattern name (Clover) is displayed on the lower row of the display.

7. Press the <EDIT> key to enter the editing mode.

8. Press the < ▽ > key twice to select the repeat sewing setting mode.

9. Press the <EDIT> key to enter the repeat sewing setting mode.

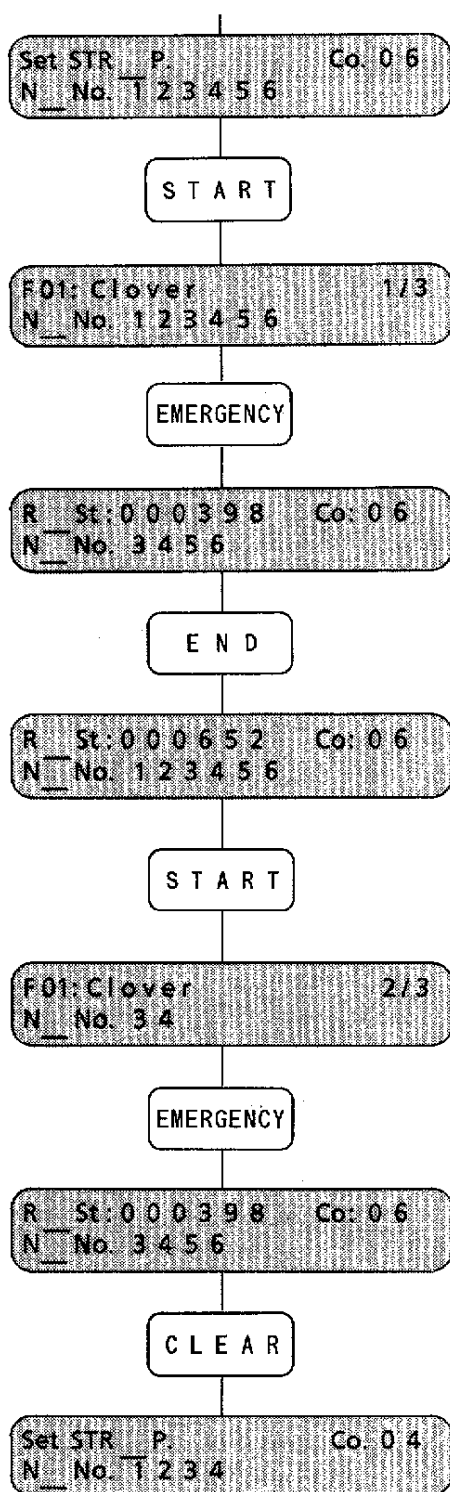10. Set value referring to page 55 "Setting repeat sewing".

11. Press the <END> key to exit from the repeat sewing setting mode.

12. Press the <START> key to enter the sewing mode.

13. Move the hoop to set the sewing start point with the <△>, <◁>, <▽>, and the <▷> keys.

```
Set STR   P.          Co. 0 6
N_ No. 1 2 3 4 5 6
```

START

14. Press the <START> key to start sewing.

```
F 01: Clover           1/3
N_ No. 1 2 3 4 5 6
```

EMERGENCY

15. If the <EMERGENCY> key is pressed, sewing is suspended.

```
R  St: 0 0 0 3 9 8   Co: 0 6
N_ No. 3 4 5 6
```

END

16. Press the <END> key. Sewing the first pattern will be cancelled and the machine will be ready for sewing the second repeated pattern.

```
R  St: 0 0 0 6 5 2   Co: 0 6
N_ No. 1 2 3 4 5 6
```
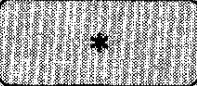
START

17. Press the <START> key. Sewing will start.

```
F 01: Clover           2/3
N_ No. 3 4
```

EMERGENCY

18. If the <EMERGENCY> key is pressed, sewing is suspended.

```
R  St: 0 0 0 3 9 8   Co: 0 6
N_ No. 3 4 5 6
```

CLEAR

19. When the <CLEAR> key is pressed, all the repeat sewing is canceled. The machine will return to step 13 and be ready for sewing the first pattern.

```
Set STR   P.          Co. 0 4
N_ No. 1 2 3 4
```

* The following keys are available in the sewing mode:

Available key	Function
△ ▽	(1) To move hoop in setting sewing start point (2) Inch hoop by 0.1 mm in inching mode when sewing is suspended
後進 前進 ◁ ▷ BACK FORWARD	(1) To move hoop in setting sewing start point (2) Move hoop back or forward by 1 stitch or 100 stitches at a time when sewing is suspended (3) Inch hoop by 0.1 mm in inching mode when sewing is suspended
#	(1) This is invalid in setting sewing start point (2) To switch inching mode or jump mode when sewing is suspended. When this key is pressed one time, machine enters inching mode, pressed twice, jump mode (hoop is moved back or forward 100 stitches).
*	(1) To trace mask line of pattern in setting sewing start point (2) To check set values of a pattern when sewing is suspended
クリア CLEAR	(1) This is invalid in setting sewing start point (2) To cancel sewing when sewing is suspended and to clear error message
EDIT	(1) To enter editing mode in setting sewing start point (2) This is invalid when sewing is suspended
入力 ENTER	(1) To enter data entry mode in setting sewing start point (2) This is invalid when sewing is suspended
開始 START	To start sewing
終了 END	(1) To return to main menu in setting sewing start point (2) To cancel current sewing pattern when repeat sewing is suspended

* The following keys are available in the sewing mode:

Available key	Function
針棒設定 **NEEDLE SET**	To enter needle bar setting mode
針棒選択 **NEEDLE SELECT**	To enter needle bar selecting mode
●糸切れセンサー **THREAD SENSOR**	To enter thread breakage sensor and bobbin thread counter setting mode
糸切り **THREAD TRIMMING**	To trim thread
枠退避 **HOOP FEED**	To feed hoop or enter hoop feed mode

Connect them using RS cable assembly (optional).
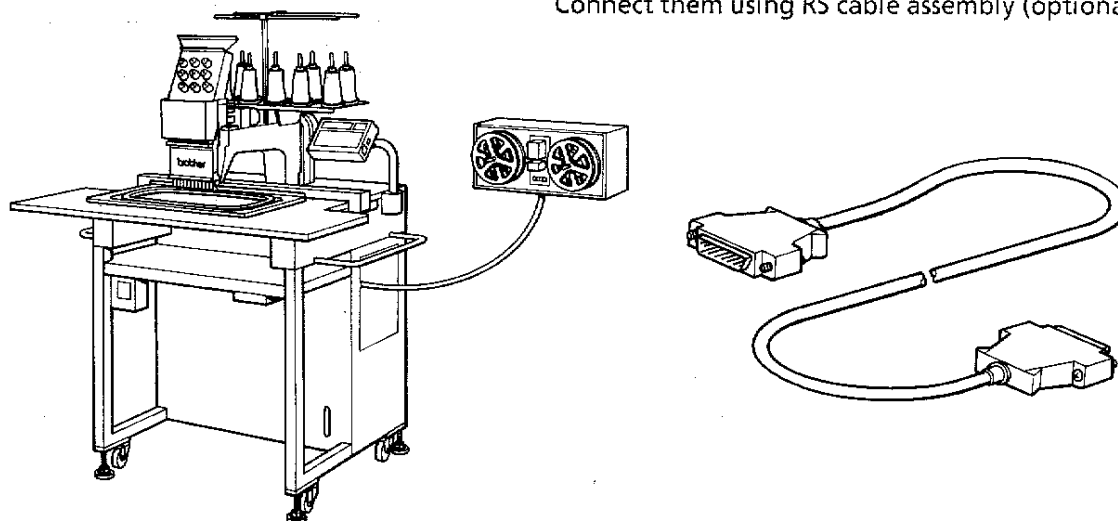
① Connecting cable with machine
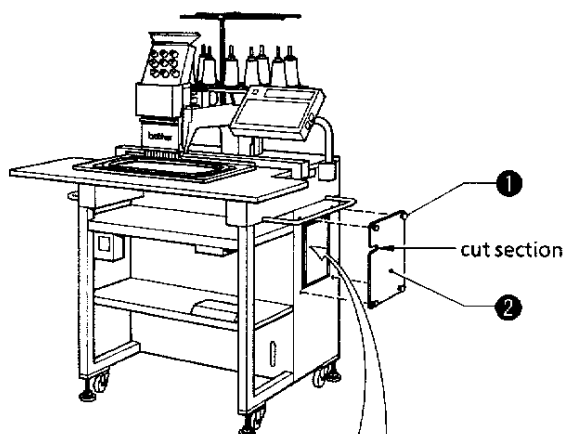
1. Remove the four nylatches ❶ and the circuit board cover ❷.

2. Connect the connector (either of the two may be used) of the RS cable assembly ❸ (optional) with the connector ❺ on the circuit board ❹. Secure the two screws ❻.

cut section

3. Fit the cord of the RS cable assembly ❸ in the cord clamp ❼. Pass the cord through the cut section and secure the circuit board cover ❷ with four nylatches ❶.
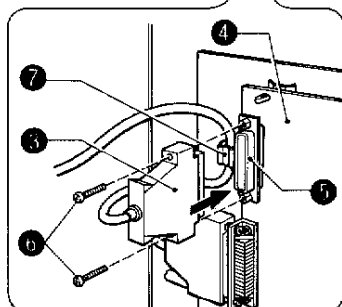
2 Connecting the cable with the paper tape reader

1. Connect the connector of the RS cable assembly (optional) with the RS 232C connector of the paper tape reader.

3 Operating and preparing paper tape reader

* Prepare the machine. (Turn on the power and select "paper tape" in the communication mode.)
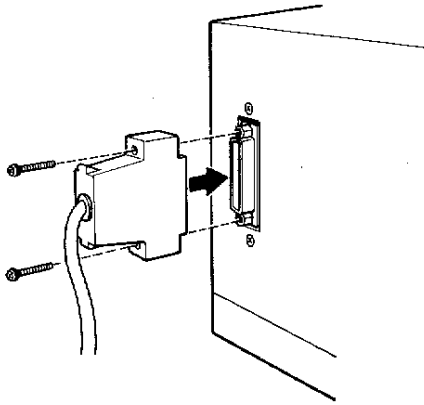
[GNT27]

power switch

paper tape   READ button
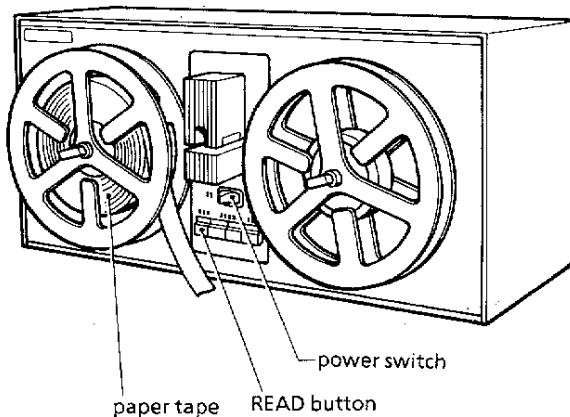
1. Turn on the power of the paper tape reader.

2. Thread the paper tape to the paper tape reader.
   1) For GNT27:
      Turn the "READ" button ON (indicator lights).
   2) For GNT4604:
      Turn the "READER" button ON and set the mode switch on the operation panel to "LINE".
   3) For NPR-5200:
      Turn the "LINE" button ON (indicator lights).
   4) For GNT2910:
      Turn the power ON.

3. Now that the paper tape reader is ready:
   Press the <ENTER> key of the machine to begin.

* If the following error messages are displayed when tape is read:

```
Tape read ERR
```

(CAUSE)
① Communication cable breakage during receiving.
② Paper tape breakage
③ Paper tape reader is turned off.
④ Improper baud rate

```
Off Line
```

(CAUSE)
① The connection between the paper tape reader and the machine is not good.
② Paper tape reader is turned off.
③ Communication cable breakage

```
C L E A R
```

Press the < CLEAR > key to clear the message above.

```
E N T E R
```

Through the paper tape.
Press the < ENTER > key to re-start.

[NOTE1] Use only the paper tape readers in the table below for BAS-415.
Do not use other paper tape readers. Others may not interface with BAS-415 or cause trouble.

Maker	Production code	Interface specification (Connector type)	RS cable type (optional)
GN Telematic Inc.	GNT27	RS232C interface (female)	GNT 27 RS cable assembly Code: S17064-001 and RS cable assembly Code: S15406-001
	GNT4604	RS232C interface (DCE connector female)	RS cable assembly Code: S15406-001
		RS232C interface (DCE connector male)	GNT4604 cable assembly Code: S18957-001 and RS cable assembly Code: S15406-001
	GNT2910	RS232C interface (pin 9 male)	GNT2910 cable assembly Code: S21660-000 and RS cable assembly Code: S15406-001

* Set the paper tape reader switches as follows for BAS-415.

① Character length .... 8 bit
② Stop bit length ...... 1 bit
③ Baud rate .... 9,600 baud (for 4,800 baud-paper tape reader, refer to page 24, "Dip switch functions on main printed circuit board").

*   Among paper tape readers that can be connected with the BAS-415, BROTHER deals in the following paper tape reader as an option. (Contact Brother's shop for details.)

maker	type	name	part code	Vol. Spec.
GN telematic Inc.	GNT27	GNT27-100V assembly	S18444-000	AC120V- area or 240V-area AC220 - 240V-area (in Europe)

[NOTE2]   When you purchase above paper tape reader GNT27;
GNT27RS cable assembly (S17064-001)
comes with it.

[NOTE3]   Three switches on the paper tape reader, ①②③, are already set at shipping.

[NOTE4]   Of the set points ①, ② and ③, only ③ (baud rate) can be changed on the machine. Refer to page 24 "Dip switch functions" for details.

1 Connecting cable with machine
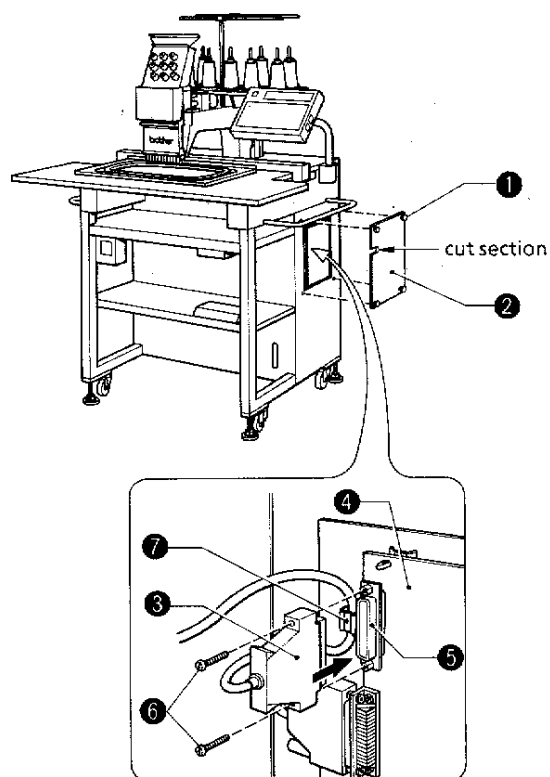
1. Remove the four nylatches **❶** and the circuit board cover **❷**.
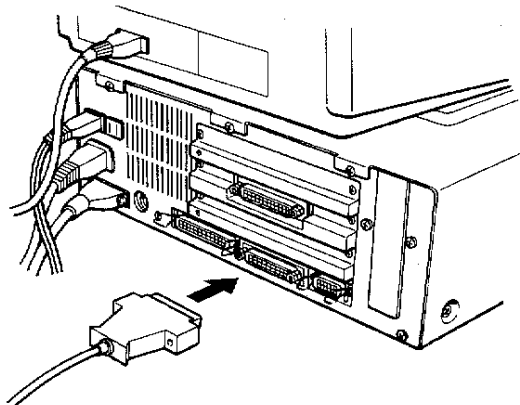2. Connect the connector (either of the two may be used) of the RS cable assembly **❸** with the connector **❺** on the circuit board **❹**. Secure the two screws **❻**.
3. Fit the cord of the RS cable assembly **❸** in the cord clamp **❼**. Pass the cord through the cut section and secure the circuit board cover **❷** with the four nylatches **❶**.

cut section

2 Connecting cable with editing system

Be sure to connect the connector of the RS cable assembly with RS232C connector of the editing system.

F 01: ☐☐☐☐☐☑☐☐ . ☐☐☐
Off line / Editor

(CAUSE)
① The machine is not connected to the editing system.
② The editing system is not in the communication mode.
③ The editing system is turned off.
④ Cable disconnection between the editing system and the machine
⑤ The editing system is in communication with the other machine.

F 01: ☐☐☐☐☐☐☐☐ . ☐☐☐
Line Busy / Editor

This message is displayed when the communication does not start while the line between the editing system and the machine is connected.

(CAUSE)
① Breakdown in entire editing system

(CURE)
① Reset the editing system to enter communication mode.
② Repair the breakdown part.
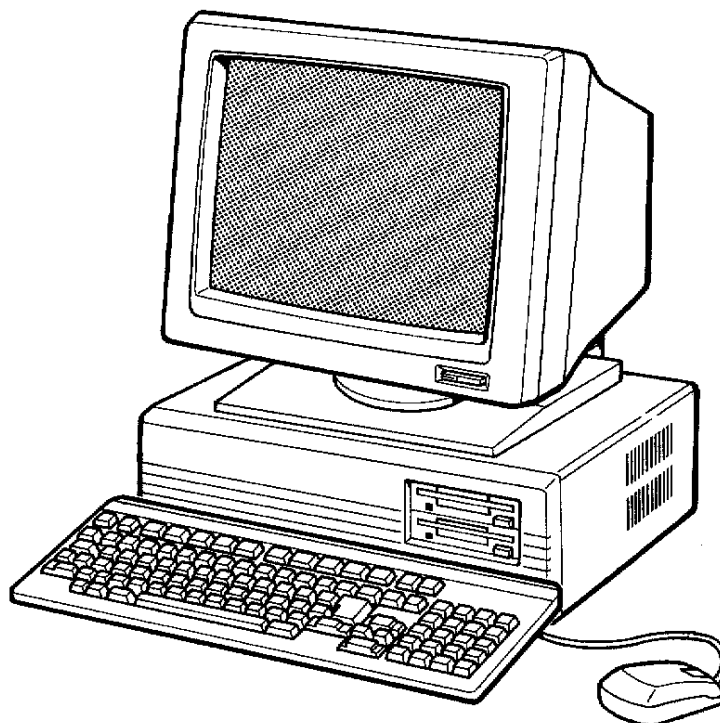
F 01: ☐☐☐☐☐☐☐☐ . ☐☐☐
Line ERR. / Editor

(CAUSE)
① Data error during communication
② Cable disconnection during communication
③ The editing system is turned off during communication.

CLEAR

ENTER

Press the <CLEAR> key to clear the error messages above.
Press the <ENTER> key to re-start.

The Editing System is basically a <u>software</u> program. To use it, the following hardware is required.

Hardware

① IBM Personal Computer AT or PC-AT compatible with:
- 640KB of available memory
- appropriate keyboard
- one or two 3.5-inch floppy disk drive(s)

and the following interface units:
- VGA or EGA video adapter
- printer interface (14-pin connecter)

- hard disk (capacity 20MB or larger)
- VGA or EGA display or equivalent

- mouse interface (compatible with②, below)
- RS-232C interface (9-pin connecter)

② MicroSoft mouse or equivalent

- Use of a math coprocessor will increase the processing speed.
- For operation of the editing system, refer to the "Instruction manual for the Editing System".

Refer to the table below if an error message is displayed.
By pressing the <CLEAR>key, the message will disappear and the display will return to the previous menu.

Message when power is turned on	Cause	Solution
Keyboard ROM NG.	CPU version of key board does not match PROM version of PCB.	Change CPU version of key board, to proper version matching PROM. Contact your dealer.
Needle POS. Error	Pulley is not in proper position.	Turn pulley till needle bar is in proper position.
X ORG. Error Y ORG. Error	Damaged circuit board, sensor defective, cable defective, pulse motor defective, blown fuse.	Contact your dealer.
Over travel	1. X-Y carriages movement exceeds maximum area.	Turn power off. Move carriages X and Y to center of area manually, then turn power on again. If same error message is displayed again, turn power off, then on again while pressing <EMERGENCY> key.
	2. Overtravel sensor is in incorrect position or defective. 3. XY home position sensor is in incorrect position or defective. 4. Damaged circuit board.	Contact your dealer.
Memory CLear	Back-up data in the memory disappears.	Press key according to message.

Message in entry mode	Cause	Solution
No File	Data not registered in the floppy disk is entered.	Check file name of data and re-enter.
Data ERR.	Input data has something wrong.	Check where data was made, then contact your dealer.
Disk ERR.	1. Data is input without inserting floppy disk. 2. While reading data, floppy disk is removed when machine runs in sewing mode.	Insert floppy disk in proper position and re-enter. Do not remove floppy disk from FDD during sewing in this mode.
	3. Damaged circuit board, defective cable, defective FDD.	Contact your dealer.
Memory over	Too much data, or too many stitches of a data is over inside memory capacity and cannot manage it.	If memory expansion board (optional) is not set, set memory expansion board or decrease input data.

Message in editing mode	Cause	Solution
Can-'t edit Data	1. Some of data entered in communication mode has items that cannot edit. 2. Some of data entered in sewing mode while reading data has items that cannot edit. 3. According to editing item, there is item that cannot be set.	Refer to page 48.

Message in sewing mode	Cause	Solution
No inptted Data	Without sewing data entered, you try to set machine to sewing mode.	First, input sewing data, then start sewing.
Short of Area	Entered value exceeds maximum area (450 mm × 285 mm).	This data cannot be sewn.
Data ERR.	Entered data has something wrong.	Check where data was made, then contact your dealer.
Area Over	When sewing starts from current needle position, sewing pattern is over area.	Move the hoop to position where message disappears, or spread area.
B.Thread empty	The set sewing times in bobbin thread counter is completed.	Reset sewing times in bobbin thread counter.
Thread breakage	1. Upper thread breakage. 2. Thread is not wound on thread breakage detector. 3. Bobbin thread breakage 4. Bobbin thread has run out.	Set thread.
Motor Lock	1. Pulley is too tight. 2. Electrical failure	Remove load. Contact your dealer.

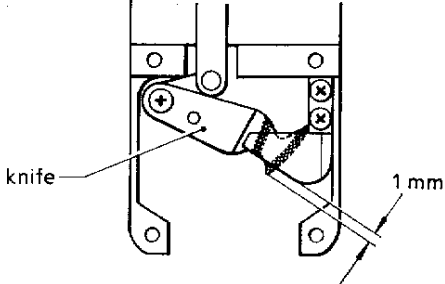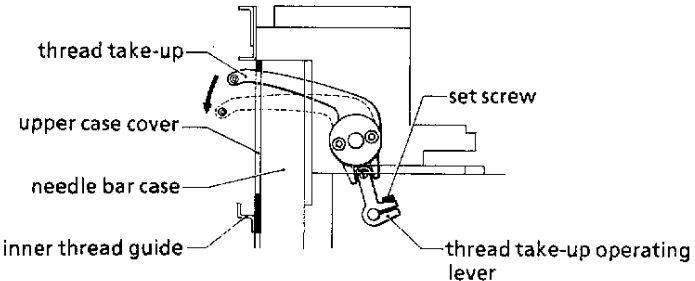| Message in communication mode	Cause	Solution
Off line	1. Paper tape reader or editing system does not connect with machine by cable. 2. Power of paper tape reader or editing system is not turned on. 3. Editing system does not enter communication mode. 4. Editing system is communicating with an other machine.	Link with dedicated cable. Turn on power. Set editing system to communication mode. Wait till communication ends.

Message in communication mode	Cause	Solution
Line ERR.	1. Data error occurs during communicating with editing system. 2. Editing system exits from communication mode while machine is communicating with editing system. 3. Power of editing system is turned off during communicating.	Re-communicate. Set editing system to communication mode, then communicate again. Turn on power of editing system again, enter communication mode.
Line Busy	Editing system is defective, or breakdown.	Turn on power of editing system again, enter communication mode. Contact your dealer.
Tape read Error	1. Poor punch of paper tape. 2. Paper tape runs short. 3. Dirty head of paper tape reader. 4. Power of paper tape reader is not turned on. 5. Paper tape type is wrongly selected. 6. Improper communication baud rate.	Remake paper tape. Clean head. Turn on the power. Select proper type to read paper tape. Adjust baud rate.

Message in replacing needle bar	Cause	Solution
N__Case POS. Error	1. Needle bar is not set properly. 2. Damaged circuit board.	Position needle bar case properly. (Refer to page 27.) Contact your dealer.
N__Case Lock	1. Needle bar case is too tight mechanically, or locked and cannot move. 2. Electrical failure	Remove load. Contact your dealer.

- 76 -

In case of a malfunction, diagnose the problem referring to the table below.
If the problem persists, turn off the power and contact your dealer.

Problem	Check point
1. The display is blank, though power is on.	1. Is contrast dial properly adjusted?
2. The indicator does not light, though a floppy disk is in disk drive.	1. Is floppy disk damaged? 2. Is disk drive functioning properly?
3. Thread breakage	1. Is machine properly threaded? 2. Is thread tension too high? 3. Is rotary hook assembly clogged? 4. Is there thread in the bobbin? 5. Is needle bent? 6. Is there a rough edge or flaw on needle plate, rotary hook, or bobbin case that might cut the thread? 7. Is needle installed correctly?
4. Needle touches embroidery hoop.	1. Is embroidery hoop too small?
5. Bobbin thread cannot be wound.	
6. Needle breaks.	1. Is needle direction and height properly adjusted? 2. Is needle bent? 3. Is needle tip blunted? 4. Is timing of needle and rotary hook correct? 5. Is there looseness or play in the needle bar case? When there is play in the needle bar case Adjust collar when there is looseness of cam shaft in needle bar flip-up mechanism. 6. Is rotary hook holder properly attached so that rotary hook does not rotate?
7. Monograms are not sewn properly.	1. Is material edge caught in the machine? (Are embroidery hoop and other related parts operating correctly?) 2. Is material stretched properly? 3. Is thread tension proper?

Problem	Check point
8. Machine operates incorrectly.	1. Is set screw of rotary encoder loosened? 2. Is set screw of machine pulley loosened? 3. Is set screw of N65 pulley loosened? 4. Is synchronizer adjusted properly? 5. Are wires of carriages X and Y off? 6. Are set screws of wire drums X and Y loosened? 7. Are set screws of pinion gears in pulse motors X and Y loosened? 8. Is sewing data in floppy disk normal?
9. Upper shaft is locked at some point of a cycle.	1. Is movable knife for thread trimming stopped in middle of operation? [How to adjust] · Remove thread or other interruption for good thread trimming operation. · Remove needle plate and reset it in proper position manually as in the figure below. knife 1 mm [NOTE] When movable knife is in middle of operation, the safety system works so that the upper shaft cannot rotate. 2. Is thread take-up stopped with striking upper case cover? [How to adjust] thread take-up set screw upper case cover needle bar case inner thread guide thread take-up operating lever Loosen the bolt of the thread take-up operating lever to adjust movable range of thread take-up, then re-tighten it. 3. Is position of needle bar clamp or stopper correct?

Problem	Check point
10. Upper shaft does not turn.	1. Is thread tangled in rotary hook? [How to adjust] Remove rotary hook and see whether upper shaft rotates or not. If thread is tangled, turn upper shaft by force to trim thread or remove rotary hook and thread.
11. Stitch cannot be made.	1. Is needle attached properly? 2. Is timing of needle and rotary hook correct?
12. When the power is turned on, the hoop moves till the hoop is over the sewing area. 13. When sewing is resumed in restart mode, the hoop moves till the hoop is over the area.	Turn off the power, then turn on the power again while pressing the emergency button. When there is a problem even if this is done, refer to "Flow chart" in the BAS-415 service manual.
14. Thread breakage detector functions and machine stops although thread breakage does not occur.	Is thread breakage detect stud operation normal? (Is spring tension proper?)

Following is displayed when trying to read sewing data from a floppy disk while the floppy disk is inserted into the floppy disk drive.

    ① "Disk ERR." is displayed.
    ② "Data ERR." is displayed.
    ③ "Reading" is displayed and remains .

When another floppy disk is inserted, reading and sewing can be performed normally. The floppy disk drive may not be defective, but it is not clear what is wrong.

[Cause and solution]

  (1) Floppy disk has not been previously defective.
     If it occurs on the floppy disk which was able to use normally before, the floppy disk may be defective. (Repairing is impossible.)
     Carefully deal with floppy disk. And for security, back up data on other storage medium, like personal computer, punching machine and so on.

  (2) The floppy disk was originally defective.
     If it occurs at a first-time use, the floppy disk may be originally defective.
     Consult with shop you bought it or its maker.

  (3) Following floppy disk cannot be used in BAS-415 even though it can be used in other embroidery machine.
     When 3.5" 2HD floppy disk was made in 2DD format.
     When 3.5" 2DD floppy disk was made in 2HD format.

     If your problem does not come under case (1), (2) or (3), please consult with Brother's shop.

[NOTE] The parts indicated by the ※ symbol in the parts code column are standard parts.

1 Holder base

To embroider plain material.
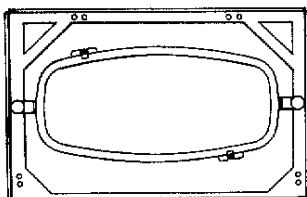
FRAME HOLDER BASE ASSEMBLY
※ S16128-001

|	a × b		
PLASTIC SQUARE FRAME WITH ARMS SPF A-45 × 23		445 × 195	S15654-001
PLASTIC SQUARE FRAME WITH ARMS SPF A-45 × 27		445 × 240	S15658-001
PLASTIC SQUARE FRAME WITH ARMS SPF A-45 × 32	S15654-001	445 × 290	※ S15660-001
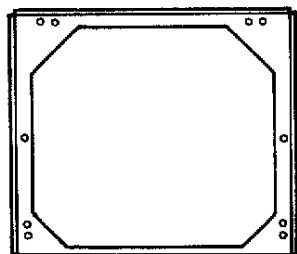
S16129-001
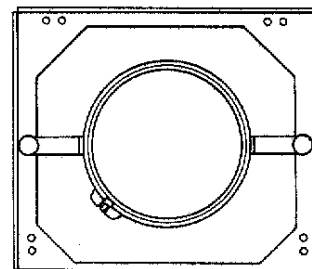
	a × b		
PLASTIC SQUARE FRAME WITH ARMS SPF A-21		Ø200	S15642-001
PLASTIC SQUARE FRAME WITH ARMS SPF A-25	S15642-001	Ø240	S15646-001
PLASTIC SQUARE FRAME WITH ARMS SPF A-24 × 24	S15650-001	226 × 226	S15650-001

- 81 -

② Spider net frames
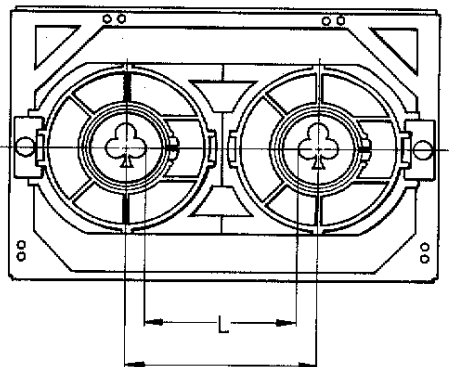
The two spider net frames can be set to the frame holder base. When repeat sewing is horizontally performed twice, input "L" mm space. Sewing can be repeatedly performed.
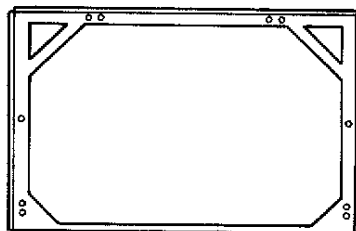
FRAME HOLDER BASE ASSEMBLY
S16128-001

SPIDER NET FRAME HOLDER PFH2-2 S15612-000	SPIDER NET FRAME SPFH-07		Ø223	S15613-000
	PLASTIC ROUND FRAME SPF-07		Ø62	S15618-000
	SPIDER NET FRAME SPFH-09		Ø223	S15614-000
	PLASTIC ROUND FRAME SPF-09		Ø82	S15619-000
	SPIDER NET FRAME SPFH-12	S15613-000	Ø223	S15615-000
	PLASTIC ROUND FRAME SPF-12		Ø112	S15620-000
	SPIDER NET FRAME SPFH-15		Ø223	S15616-000
	PLASTIC ROUND FRAME SPF-15		Ø140	S15621-000
	SPIDER NET FRAME SPFH-18		Ø223	S15617-000
	PLASTIC ROUND FRAME SPF-18	S15618-000	Ø170	S15622-000
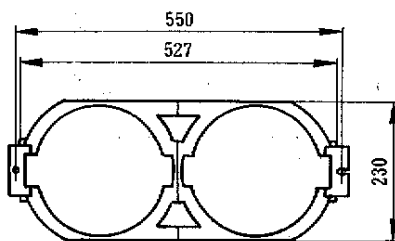
③ Tubular frame

By removing the table plate and using the cylinder bed, embroidery for tubular materials can be done effortlessly.

It is convenient when embroidering sleeves and the body of ready made clothing or back of round-neck shirt.
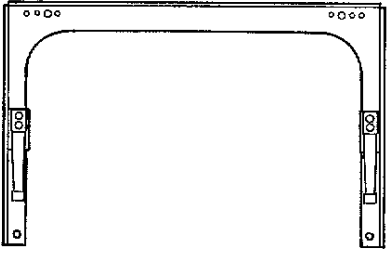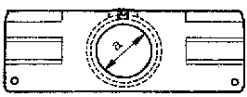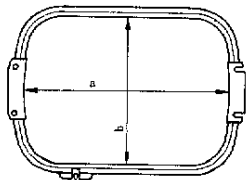
		a × b		
TUBULAR FRAME HOLDER BASE ASSEMBLY S15353-001 	TUBULAR ROUND FRAME WITH ARMS TFA-07	 S15623-000	Ø58	S15623-000
	TUBULAR ROUND FRAME WITH ARMS TFA-09		Ø78	S15624-000
	TUBULAR ROUND FRAME WITH ARMS TFA-12		Ø108	S15625-000
	TUBULAR ROUND FRAME WITH ARMS TFA-15		Ø136	S15626-000
	TUBULAR SQUARE FRAME WITH ARMS TFA-24 × 24	 S15628-000	226 × 226	S15627-000
	TUBULAR SQUARE FRAME WITH ARMS TFA-24 × 30		237 × 308	S15628-000

④ Cap frame device
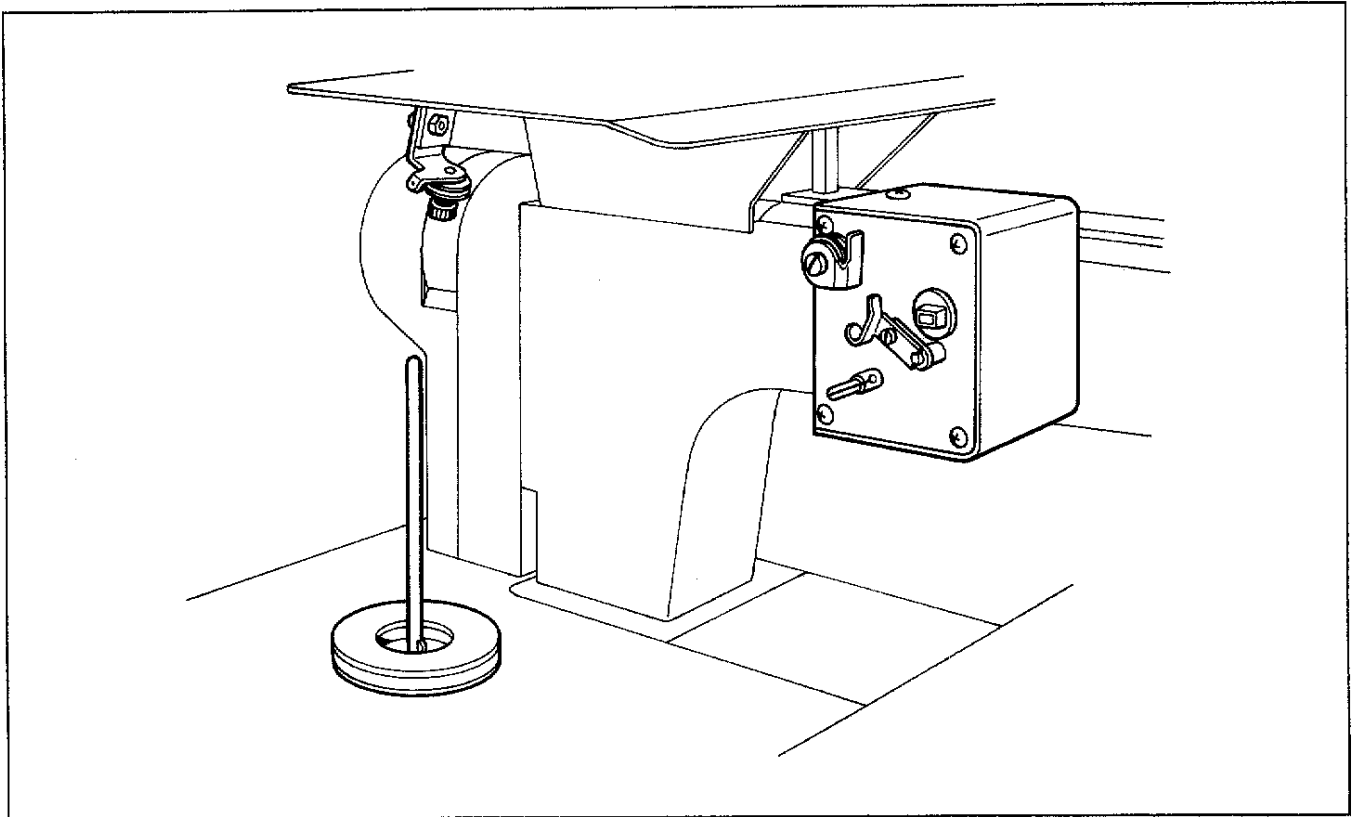
Embroidery for ready made cap can be done finely.
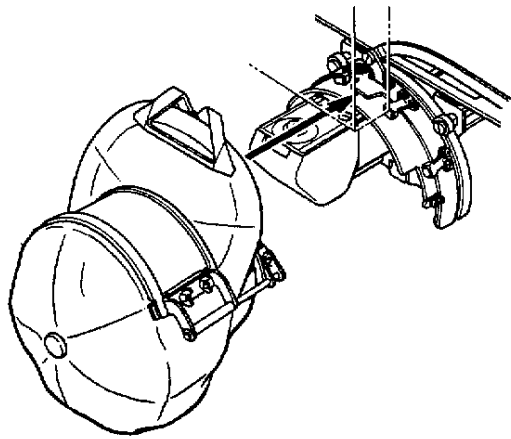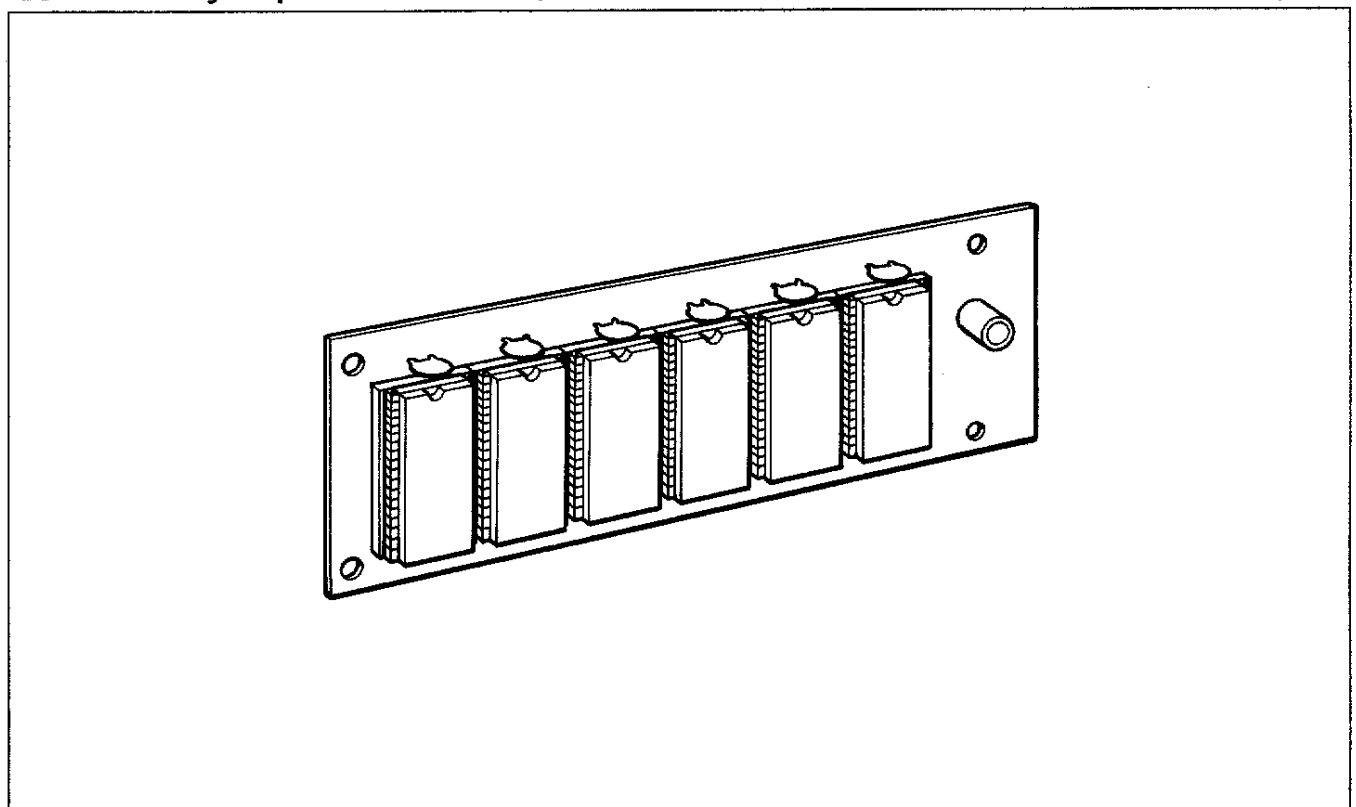
⑤ Boring attachment

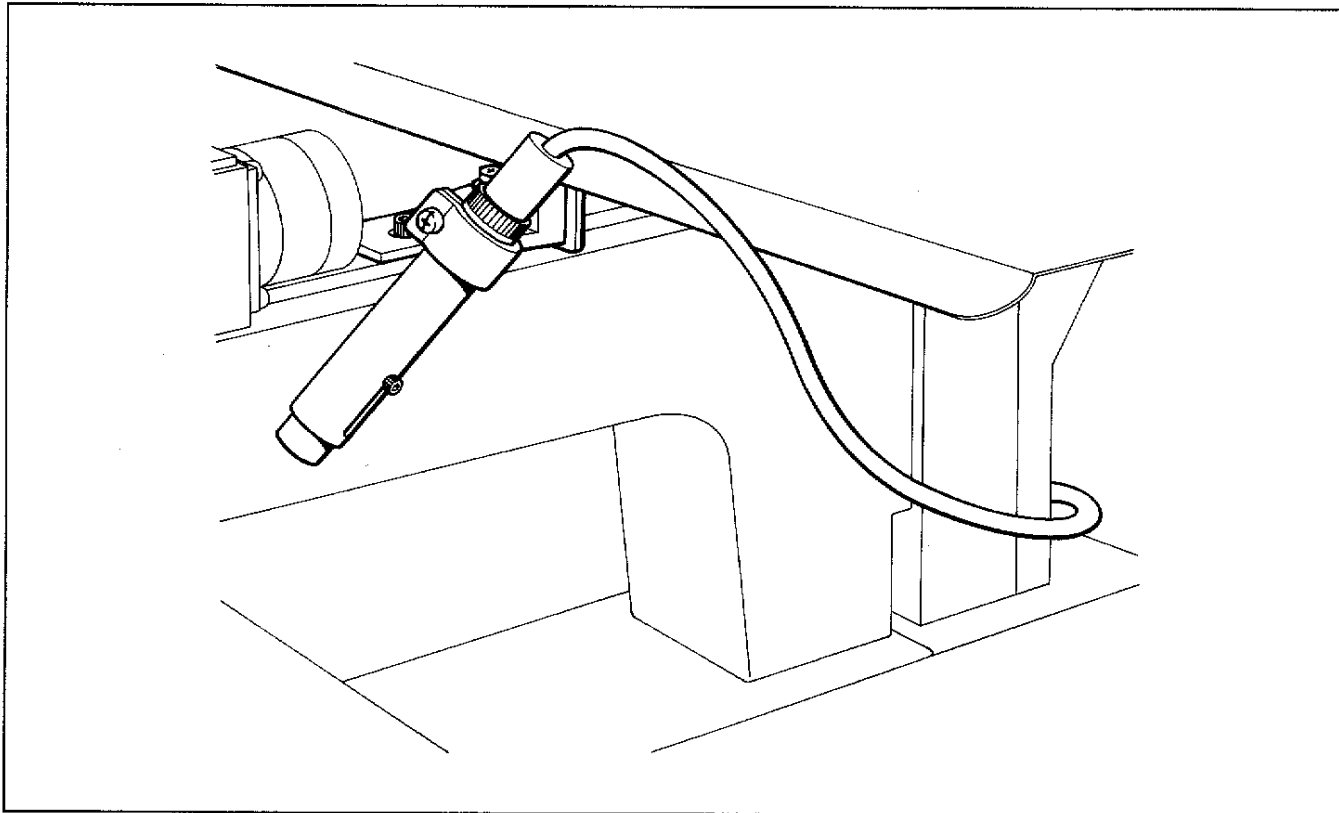Boring embroidery for blouses and tablecloth can be done beautifully.
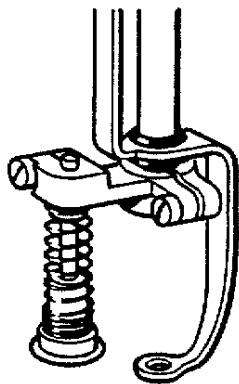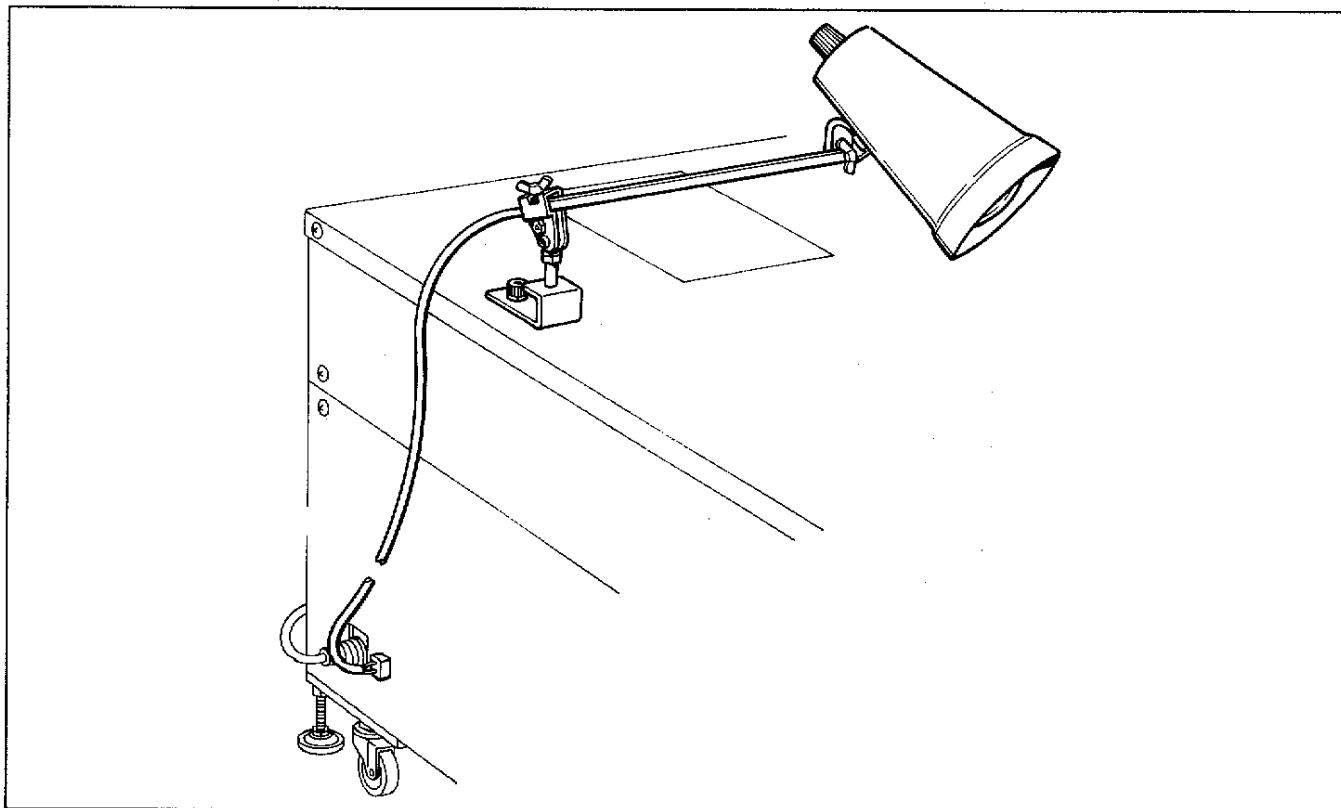
① Bobbin winder (S21074-001)

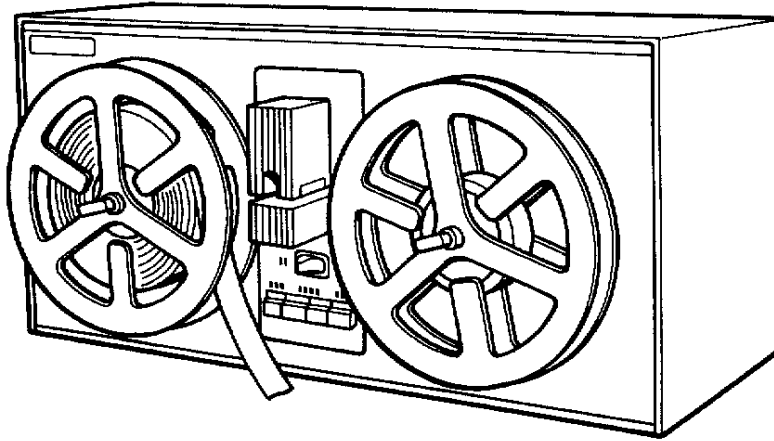## ② Memory expansion board (S18788-001 / circuit board B439064 assembly)

③ Marking light (S21076-000)

④ ML 651 lamp set (S15378-001)

⑤ Paper tape reader (S18444-000)

GNT 27 RS cable assembly (S17064-001) comes in it.